

CSMP
Mathematics
for
Kindergarten

Teacher's Guide



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KINDERGARTEN PREFACE

CSMP Mathematics for Kindergarten owes its existence to the vision and leadership of *CSMP*'s first director, Burt Kaufman, and a special group of people concerned not only about the kind of mathematics being taught to children but also the manner in which it is taught. This distinction is crucial to a child's early exposure to and future relationship with mathematics.

The *CSMP* Kindergarten curriculum is in large part the outgrowth of a great deal of active involvement with students in ordinary classroom settings. Its current form has been strongly influenced by information gathered from field test classes in Fort Collins and Eaton, Colorado, as well as from earlier extended pilot test sites nationwide. But its underlying manner of presentation and many of the pedagogical ideas and tools, which make *CSMP* unique among curricula, are based on the pioneering works of Georges and Frédérique Papy. We acknowledge them here with deep gratitude. We also acknowledge the work of mathematician and psychologist Caleb Gattegno for the fundamental idea of presenting mathematics to students via pedagogical situations.

Earlier versions of *CSMP Mathematics for Kindergarten* dating back to 1973 were due to the efforts of former *CSMP* staff members Martin Caplan, Lowell Carmony, Edward Esty, Jerry Exum, Edward Martin, Sol Pelavin, Christiane Vandeputte and Joan Wakefield.

This revised edition of the program—*CSMP/21*—is a result of new information gleaned thanks to the interest and concern of *CSMP* teachers nationwide. During the 1991–92 school year, the lessons in this edition were tested by Kindergarten teachers Ann Ainsworth, Claudia Benner, Trish Hamilton, Joy Muhr, Judy Seidel, Pamela Sky, Susie Smith and Mary Teets in schools of the Poudre R-1 School District, Fort Collins, Colorado.

In addition, we acknowledge the following individuals for their work in producing the *CSMP/21* edition of the Kindergarten program.

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Notes to the Teacher

KINDERGARTEN WELCOME

Welcome! You are about to teach *CSMP Mathematics for Kindergarten*, perhaps for the first time. We wish you success and hope both you and your students enjoy the activities suggested in this teacher's guide. The purpose of this section is to help you use this book effectively, to describe the *CSMP* materials, to help you set up a number-rich classroom, and to give suggestions for organizing the program. In Section Two, you will find answers to some frequently asked questions; in Section Three, a suggested schedule of lessons; and in Section Four, a suggested teaching guide. The Appendix contains an extensive listing of math-relevant children's literature.

As you and your students take part in these activities during the year, you will discover a definite *CSMP* viewpoint about elementary school mathematics, one we hope you will come to understand and share. Part of that viewpoint is that learning takes place when students react to interesting real-life or fantasy situations (sometimes called a *pedagogy of situations*), such as those in stories or games. You'll find that *CSMP* presents situations that involve students personally and allow arithmetic to take the form of adventures in the world of numbers.

We believe that every child can and does learn something from each situation encountered in the program, sometimes suddenly and dramatically, sometimes latently. For this reason, *CSMP* teachers do not stick to one topic until it is mastered. Indeed, our experience indicates that learning often stops when the purpose of a lesson is merely the mastery of a skill. Instead, we view learning as more of a spiral rather than a linear process in which intuitive leaps play as big a role as the acquisition of small successive pieces of information, and we believe that a variety of situations can provide the interrelated experiences through which we learn.

Further explanation of what we mean by a pedagogy of situations and spiral development can be found in the question and answer section, but you will learn their meanings primarily by experiencing them for yourself as you teach the curriculum. Meanwhile, we assure you that a large number of *CSMP* teachers across the country have come to understand and embrace the *CSMP* style of teaching and learning and are very pleased with the results.

KINDERGARTEN PROGRAM DESCRIPTION

Since the learning process occurs through many interrelated experiences, the *CSMP* curriculum is structured so that no single lesson is an end in itself. It is neither intended nor expected that every student will meet the full challenge of a particular situation in any given lesson. Furthermore, we have found it is most effective to vary the situations from day-to-day rather than to continue one type of situation or topic until so-called mastery has occurred. This spiral development (see page 2-1) is reflected in the materials and curriculum scheduling. This approach allows a student to experience each of several ideas a little at a time and then proceed through increasing levels of sophistication as the situations become more challenging. We hope you will keep in mind the spiral approach as you teach *CSMP Mathematics for Kindergarten*.

Description of Lesson

Teacher's Guide

Following some important introductory sections, the bulk of the teacher's guide contains day-by-day lessons numbered K0–K145. You will start with Lesson K1 and progress as far as possible during the school year.

Each lesson is presented in a format that includes its number, title, a capsule summary, the materials needed, and a step-by-step lesson description. For example, the illustration below shows the first pages from the third mathematics lesson of the year.

The lesson description includes important teaching notes, illustrations of diagrams to put on the chalkboard or otherwise display for the class, examples of possible dialogue, and suggestions for group activities.

K3 WALK OR RIDE GRAPH _____ K3

Capsule Lesson Summary

Materials	
Teacher	<ul style="list-style-type: none"> • <i>Wheels on the Bus</i> by Maryann Kovalski or another selection from the literature list • Pictures of car/bus/bike and walking shoes
Student	<ul style="list-style-type: none"> • One sheet of paper

Advance Preparation: Use Blacklines K3 (a) and (b) to create the car/bus/bike picture and the walking shoe picture.

Description of Lesson

Exercise 1 _____

Read the book *Wheels on the Bus* by Maryann Kovalski or another selection from the literature list.

Exercise 2 _____

T: *Today I noticed that some of you walked to school and some of you rode to school. I wonder if there is a way we can figure out if more children walked or rode to school. Does anyone have an idea how we could find out?*

S: *Line up.*

S: *Hold up hands.*

Write the following question on the board:

Do you walk or ride to school?

Place the car/bus/bike picture on the floor in an open space in the room. Next to it, place the walking shoes picture, leaving some space between them.



T: *Here's one way to answer our question. I have placed two pictures on the floor. One has a car, a bus, and a bike on it. What does this picture show?*

S: *Ways to ride to school.*

T: *Next to the ways to ride to school, I have placed a picture with a pair of shoes on it. What do you think this picture shows?*

S: *Walking to school.*

Distribute pieces of paper, one to each student.

T: *If you rode to school today, take your piece of paper and set it in a straight line on the floor under the picture of the car/bus/bike. Then, stand on the paper.*

K 3

Allow time for students to place their papers and stand in the line.

T: *If you walked to school today, take your piece of paper and set it in a straight line on the floor under the picture of the walking shoes. Then, stand on the paper.*



Once everyone is standing up, compare the number of students in each group by having the students turn and face the person in the column opposite them, and wave. If there are students waving without anyone waving back at them, one group has more than the other.

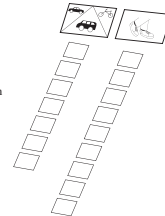
T: *Are there more students who walked or rode? How many more?*

It may be difficult for students to answer the last question because they are standing in a line. Suggest that the students step off their papers so they can see and compare the two groups.

T: *Count aloud as we count the pieces of paper under the picture for riding to school.*

S: *One, two, three, ...*

Write the number of students who rode to school on the board. (You may wish to ask a student to point to the number in a classroom display of numbers.)



T: *Now, count aloud as we count the pieces of paper under the picture for walking to school.*

S: *One, two, three, four, ...*

Write this number on the board. (Again, you may wish to ask a student to point to that number in the classroom display of numbers.)

As you discuss which group has more, which group has less, and how many more or less, you may wish to point to the numbers on the number line or have students point to the number on their desk number lines, counting-on or counting back to help students see how many more or less. You may also want to suggest students line up again on the pieces of paper, and let the "extra" students in the appropriate row count themselves.

At the beginning of the day-by-day lesson guide (K0), there are some recommendations to prepare you for the first day of class—materials *CSMP* assumes are available in your classroom, how to arrange materials so that they are accessible, and visual aids that can improve the learning atmosphere of your classroom.

Every tenth lesson (K10, K20, ...) is called an adjustment/assessment day and provides a time when you can stop and deal with the special needs of your class. Suggestions are provided for additional supplementary activities and assessments. Also, early warnings advise you of any special materials needed in the next nine lessons. See page 1-12 for more information on adjustment/assessment days.

Teacher Materials

In addition to the teacher's guide, you will need certain demonstration or manipulative materials. Those listed here are contained in the *CSMP* Classroom Set.

- **Kindergarten Posters**
- **Demonstration Numeral Cards**
- **Demonstration Dot Cards**
- **0–109 Numeral Chart**
- **Number Line**
- **Magnetic Checkers Set**
- **Robot Walk Grid Sheets**
- **Track Piece Cards**
- **Blacklines**

These and/or other materials needed are listed at the beginning of each lesson. Materials not included in the classroom set are generally readily available or can be prepared from usual classroom supplies. Several lessons call for an overhead or class calculator.

Student Materials

Some individual materials will be needed for each student (or each pair of students). The materials listed here are contained in the *CSMP* Classroom Set.

- ***What Could We Be?* Story-Workbook**
- ***The Playful Numbers, 81 Roses, The Baby is Born* Storybooks**
- **K A-Blocks Set**
- **Individual Number Line**

These and/or other materials needed are listed at the beginning of each lesson. Often, commercially available manipulatives are suggested (such as Unifix[®] cubes, geoboards, counters, blocks, Cuisenaire Rods and so on) along with several alternatives. Some lessons call for the students to have calculators (see pages 1-8 on the role and use of calculators).

Some teachers find it convenient to provide each student with a sturdy cardboard box for storing manipulative materials. Others find it easier to store all the materials of one kind together in a container of appropriate size and to distribute these materials to the students as they are needed. In any case, you should probably keep the storybooks in your storage area and distribute them as called for in the lessons.

Role and Use of Worksheets

Occasionally lessons suggest worksheet options for class, group, or independent work. These worksheets exist as blackline masters and are included with the teacher's guide. Worksheets are designated with numbers corresponding to the lessons with which they are used, and with letters indicating an order in which they can be used. The story-workbook *What Could We Be?* also fits in this category and is available as part of the student materials.

Role and Use of Storybooks

There are 24 storybooks for young readers in the collection *Stories by Frédérique*. Each story is presented in a colorful newsprint booklet and can be used for individual or collective reading at school or at home. The stories are independent of each other and for the most part need no teacher explanation. The storybook titles and their intended age range are as follows:

Ages 5 to 8

The Playful Numbers

The Baby is Born

81 Roses

One Out of Seven

The Old Shoemaker

I Am a Very Happy Boy

The Little Dreamer

Two by Two

The Weird Story of 24

Where's My Nose?

The Happy Puppet

The Magic Box

Summer School in the Old Days

Ages 8 to 12

The Little Donkey

Singing Friends

Dancing Friends

I Am Not My Name

The Living Lines

The Square Trap

Nabu Wins an Award

Ages 10 to 14

The Hidden Treasure

A Valentine Mystery

Election in the Number World

A Very Strange Neighborhood

Three of the 13 storybooks intended for students ages five to eight are used in *CSMP Mathematics for Kindergarten*. Students can become easily engaged in these stories: there are questions to answer, pictures to relate to the story, and new adventures to invent for story characters. Students find expression of emotions and aesthetic senses in the world of numbers, just as in the world of people.

At the Kindergarten level, an important part of the storybook lesson is relating a picture to a story. The non-verbal languages of arrows and strings communicate exciting information to the reader. Your students may want to reread (or just look at) the storybooks several times after they have used them for lessons.

Many lessons suggest reading activities using other books as enhancements. See the Appendix for a list of all the books suggested in lessons and many others you might consider.

Role and Use of Literature, Counting Songs and Fingerplays

Songs, fingerplays, and stories form the basis of many lessons in the Kindergarten curriculum. These contain counting activities and introductions to number concepts as well as other mathematical concepts and language. Students gain beginning experiences with concepts in a physical sense as stories and songs are acted out. The discussion about a story may provide opportunities to associate and use mathematics concepts. Further, students may remember and make connections through the distinctive contexts or rhyme or rhythm. Some students may make some of their first attempts to read through these patterned and predictable texts, thus connecting early mathematics concepts with reading.

Role and Use of Manipulatives

Most Kindergarten students need a variety of experiences to begin to develop an understanding of mathematical concepts. Manipulating concrete materials and interacting with their environment encourages exploration, investigation, and early mathematical thinking.

The following lists of suggested manipulative materials are extensive to convey the idea that there are many alternatives. The starred items are specifically mentioned in *CSMP* Kindergarten lessons or supplementary activities. Others are listed to give ideas for other kinds of activities.

Commercially Available Manipulatives

- | | |
|---|---|
| *Attribute Blocks | *Plastic Chips |
| *Balance | Puzzles |
| *Beads (multi-variant, plastic, wooden) | *Rubber Stamps |
| *Calculators | Rulers |
| *Counters (many shapes, two-color) | Sorting Materials (plastic animals, fruits, and vegetables, vehicles) |
| Color Cubes | Stencils (shapes, numbers) |
| *Cuisenaire Rods | Tangrams |
| *Dominoes | *Telephone |
| Games (Bingo, board, cards) | *Thermometer |
| *Geoboards and Geobands | *Tiles |
| *Geometric Solids | *Unifix [®] Cubes (other interlocking cubes) |
| *Mirrors | |
| *Pattern Blocks | |

*Odds and Ends

- | | | | |
|-------------|------------------|-----------------|---------------|
| Beads | Colored Pom Poms | Macaroni | Pipe Cleaners |
| Beans | Corks | Marbles | Rocks |
| Bottle caps | Counters | Nuts and Bolts | Rubber bands |
| Buttons | Keys | Paper Clips | Shells |
| Coins | Lids | Popsicle Sticks | Spools |

Other Collectibles

- | | |
|-----------------------------------|--------------------------------------|
| *Bottles and Boxes | *Paper Rolls |
| *Clay or Playdough | Peg Boards, Pegs |
| Egg Cartons | *Sand/Water Containers and Equipment |
| Fabrics (with patterns, textures) | *Tape Measures |
| *Jump Ropes | Wallpaper/Wrapping Paper Samples |
| *Magazines and Catalogs | Yarn |

Note: The C-rods referred to throughout *CSMP Mathematics for Kindergarten* are based on the 1-6

Cuisenaire rods coloring system and are centimeter lengths (1–10). Other colored and/or centimeter rods are available under names such as *Numerods*, *Color Factor Rods*, or just plastic rods. If using one of these alternatives, you will have to make suitable color adjustments in the lessons.

Role and Use of Math Journals

Math journals can be a powerful tool for both students and teachers—and even parents. While none of the *CSMP* lessons *require* their use, we hope you will see their value and incorporate them into your classroom.

Journals can look like just about anything. Use whatever is readily available and works for you such as spiral notebooks, small three-ring binders, or pocket folders containing blank paper.

Students can make many kinds of entries in their math journals, using writing or drawings. At different times, you may like to ask them to

- extend or practice a concept in a lesson;
- reflect on what they learned or did in a lesson;
- predict what they are going to learn or do in a future lesson;
- describe how they feel about mathematics;
- estimate how well they did on an activity;
- indicate their level of effort in mathematics class;
- note problems/questions they have for you.

Students will need considerable modeling of what is expected and accepted in the math journals. (Some lessons have specific whole group discussions to give you guidelines.) It is important to help students feel comfortable with their journals by emphasizing that the purpose of a journal is to put their ideas down on paper. Encourage students to think about their idea first and then draw or write about it. Encourage risk-taking and validate all attempts. As you roam around the room, ask students questions such as the following:

- Does this show how you sorted your materials?
- Does this show what you like about the patterns?
- Does this show what you know about ways to make six?

Students may be asked to make a journal entry every few days but not more than one or two kinds of entries at a time.

Students also need an audience for their journals. Whole group sharing is a good way to start because it sets the expectation that everyone is recording their ideas. Encourage students to respond to each other's entries. Point out a new or unique way that a student recorded an idea or make comments such as, "I liked the way that you made the buttons; I can tell that you put them in groups of blue buttons and square buttons," but be careful not to dominate the conversation. Encourage those that are reluctant to help you read the entry aloud to the class.

Small group sharing can be suggested when students finish a small group activity and have recorded in their journals. Ask them to share with another group.

For paired sharing, direct students to choose someone they did not work with today and share their journal entries. (A quick check to see if the conversation is on-task is to ask a few students to tell what their partners shared.)

For teachers, journals can provide information you might otherwise never receive by making a student's thinking process visible. For example, when you interact with a student as he or she makes

a journal entry, or when a student shares an entry with you or classmates, you might observe

- the way the student records an entry using pictures, symbols, numbers, or letters to represent an idea;
- the processes the student uses, looking for signs of new understanding or associations;
- evidence of insight or confusion.

You may want to read or look over the students' math journals from time to time, and return them with comments and suggestions. If you do, don't jump to conclusions if a student's entry seems confused. Discuss it with the student first. Many times a student's reasoning is logical, but not immediately apparent. The evaluation process may be time consuming in the short run, but in the long run the insights gained from student journals provide an invaluable alternative assessment tool. The small amount of time required to read and look over the journals and write positive comments is worth the improvement in students' attitudes toward mathematics.

Occasionally, you may like to send parents a student-selected journal entry. To prepare parents to understand the purpose of a journal, you might send home a letter about how journals are used and what to expect. Without realizing or understanding the value of creative, invented spelling or the development of motor skills, parents may think their child (or the teacher) is not doing a good job.

Math journals can extend students' experiences, provide valuable assessment, and give a concrete sample of the students' work to share with parents. As with any instructional strategy or tool, if used too often it loses its value, and ultimately does a poor job of accurately reflecting students' understanding.

Role and Use of Calculators

The calculator, if used creatively, can have a remarkably beneficial effect on students' interest in and understanding of arithmetic, and can contribute to their developing capabilities. The reasons for this are many and varied, but the following are certainly among them:

- Students enjoy using calculators and respond with enthusiasm to most calculator activities.
- As a pedagogical tool, the calculator contributes to the development of mental arithmetic skills, number sense, and mathematical concepts.
- By removing the burden of mechanical computation, the calculator frees students to concentrate on the thinking that is a necessary part of the solution to any meaningful problem.
- The instant feedback provided by the calculator enables students to explore patterns, and make and test conjectures, both important areas that might otherwise be overwhelming.

Calculators are recommended for several lessons in *CSMP Mathematics for Kindergarten*. Ideally, your class should have access to at least one calculator for every two students and an overhead calculator that matches the students' calculators. If this is not possible, you may want to encourage students to bring calculators from home. Check that your classroom calculators or any calculators brought by students have the following features:

- **Chain operations:** This means that the calculator responds to instructions given in the order in which they are entered. To check, press $4 + 1 \times 2 =$. If you have 10 on the display, then this feature is present.

- **Constant mode:** Some calculators have a switch so that the calculator can be set in constant mode. If your calculator lacks a switch, it is quite likely that the calculator has an *automatic constant*. For calculators with an automatic constant, the first number entered during multiplication is the constant, while for addition, subtraction, or division the second number entered is the constant.

To check your calculator for the constant mode operation of $+$, press $0 + 2 = = =$ and so on. If the number on the display increases by two at each depression of $=$, then $+$ is operating in a constant mode. Check the constant mode operation of $-$ in a similar fashion.

To check the constant mode operation of \times (in which the first number entered will be the constant), press $2 \times 1 = = =$ and so on. If the number on the display doubles at each depression of $=$, then \times is operating in a constant mode.

Calculators without these characteristics are unsuitable for *CSMP* lessons. Even if your calculators have chain operations, check that they operate in the way described above.

KINDERGARTEN SUGGESTIONS FOR ORGANIZING THE PROGRAM

Setting Up Your Classroom (Or Not)

To successfully implement a mathematics program based on an active pedagogy of situations, the classroom must be a stimulating environment rich in materials and mathematical experiences. At the beginning of the day-to-day lesson guide (Lesson K0), you will find suggestions for things to do before school begins. The following are additional suggestions for enriching the classroom environment.

Numbers Are Everywhere... or Should Be!

Adults usually find it very difficult to learn a new language. How is it then that young children learn their native tongue so easily? The early age at which the learning occurs is surely the most important factor. But, in addition to that, children learn the language because they live in a suitable linguistic environment. The way this learning takes place is one of the most beautiful examples of both the spiral approach and the pedagogy of situations. Early-age experiences plus a suitable environment are factors that play an important role in the learning of numbers, too.

You can set up your classroom to create a strong numerical environment. The following suggestions can make the difference between a numerically rich classroom and a numerically impoverished one. You will, of course, think of additional ideas as you become more familiar with the particular needs of your students.

- **Number Displays**

In addition to the suggestions in Lesson K0 (number line, 0–109 numeral chart, desk number lines), you may like to create an attractive display of the numbers 0–20 in a row, each with a corresponding number of some kind of object (dots, birds, teddy bears, flowers, and so on). Number displays will be referred to often in the lessons and you should take advantage of every opportunity to use the displays to help students become acquainted with numbers.

- **Calendar**

Another display of numbers you will want to have in your classroom is a calendar. Working with a calendar may become a routine part of the Kindergarten day during which you can reinforce number recognition and counting skills. Students can also begin to understand the concepts of week, month, and year, and to predict how long until certain events. Students may note numerical order, count by ones and twos, count-on and count backward, and learn what the terms *yesterday*, *tomorrow*, *before*, and *next* mean in relation to the calendar. To record the days, the class can make a pattern of shapes or colors and students can predict what will come next in the pattern. Or, the class might record some item each day (for example, “the weather” or “attendance” or “the snack”) for one month. Then, at the end of the month, they can consult the calendar to make a graph or to make statements regarding the information they gathered.

- **Clock**

Still another display of numbers is on the clock face. Students are usually curious about the passage of time during the day and are anxious to know how to tell time. You can help them recognize the numbers on the clock face, differentiate the two hands, and notice what numbers the hands are pointing toward. Students can begin to count around the clock by ones (hours) and by

fives (minutes), and learn to read the time written in standard form or on a digital clock. You may want to establish regular times in the daily schedule for certain activities and teach the students to recognize those positions on the clock. Students can begin to explore ideas such as how long until an event happens or how many minutes have passed since something occurred. Getting a feel for relative time may be of interest to students. To close their eyes and wait for a minute to pass can be a real surprise to many. Talk about which is longer: a second, minute, hour, or day. How many minutes does it take to make an hour? How many hours to make a day?

- **Daily Activities**

Numbers should be part of many daily routines such as arriving in the classroom, snack time, distributing materials, preparing for an assembly, reading or telling a story, and leaving at the end of the day. The obvious uses of numbers will be in counting, one-to-one correspondence, number sequencing, number comparisons, and numeral recognition. Others might include graphing (favorite snack, wearing sweaters or jackets, size of books) or measurement (capacity of cups, time, length of pencils). Activities dealing with mental arithmetic are particularly important and fun. Some of the most obvious are checking attendance (How many students are present? How many should be here? How many are absent?); checking the date (What is the date today? How many days in the month? How many days left in the month?); and distributing things (How many students are there? Two crackers for each, so how many crackers are needed?).

Schedule of Lessons

The design and schedule of the lessons in this guide should be regarded as a suggestion; the program is not meant to be rigid or followed exactly. Only you will be able to judge which topics are easy for your particular class or which lessons require more or less time.

A master schedule can be found in Section Three. It is constructed for a hypothetical Kindergarten class with the usual range of abilities, devoting approximately 15–30 minutes four or five days a week to mathematics. There are 145 teaching days in the schedule and 14 of these are called adjustment/assessment days (see below). Feel free to adjust this schedule to the abilities, maturity, and interests of your own students, as well as to the length of your school year and the length of time each day that you devote to mathematics.

Each block in the schedule represents one math period. It may be, however, that you will spend more than one period on a few lessons. A lesson that is much too long might be finished the next day, but do not prolong a lesson if it is just a bit too long. Remember, it is better to stop a lesson when student interest is high; the topic will reappear in another context later. If you find that you and your class are more comfortable with a slower pace, still follow the suggested order of the lessons.

Adjustment/Assessment Days

Adjustment/assessment days appear every tenth lesson on the schedule. On these days there is no regular lesson planned so that you will have an opportunity to meet the special needs of your class.

For example, students entering Kindergarten vary widely in their number readiness. You will be aware of these individual needs and can use the adjustment days to work with students who lack certain readiness skills as well give more challenge to students who are ready. Suggestions for activities to use with students of varying abilities are included in these sections. You may want to use one of the assessment checklists, Blacklines K0 (b)–(k), on these days to note students' progress.

You may wish to use some portion of an adjustment/assessment day to repeat certain lessons either with a small group or the entire class. Many lessons can easily be made to appear completely different by changing the story lines and/or the numbers in the lessons. Such repetition is encouraged. Further, you may like to use an adjustment/assessment day to let students work in centers or on a project of your choice.

Of course, you may not want to use an adjustment day when one is scheduled. If you prefer, simply go on to the next lesson.

At the end of each adjustment/assessment section, you will find early warnings about upcoming lessons requiring special materials you may need to prepare or obtain.

Home Activities/Parent Communication

Parent involvement is built into *CSMP Mathematics for Kindergarten* in several ways. In the *CSMP* Blacklines you will find a number of parent/guardian letters designed to make parents more aware of the *CSMP* languages, tools, and methods. These letters can advise parents about the types of mathematical activities their children are involved in. They can be photocopied and sent home at various points throughout the year.

In addition, suggestions for home activities occasionally follow lessons. Home activities are opportunities for parents to work on mathematics with their children. Some are follow-up or practice for a lesson; others are for enrichment or extension.

Cooperative Groups

A cooperative group gives students a chance to talk through what they are learning with other students. They get immediate help and support, and learn to care about the progress of every other member of the class. Cooperative groups give an opportunity for peer teaching. Students enjoy having a peer to discuss their ideas with and to give them assistance when something is difficult. Depending on the situation, pairs or groups of three to four are a nice size for cooperative groups.

Many lessons suggest using cooperative or other group activities. Feel free to use these suggestions as given and to use cooperative or other group activities even in lessons where no such suggestions are given.

Centers

Many classrooms are organized with centers or stations where students can work on activities without the direct assistance of the teacher. The following suggestions are possible ways you might incorporate math centers into the regular classroom set-up, or might enhance and extend the math curriculum into center activities. Centers may be set up so that students work alone or in groups. Many of the activities lend themselves to small groups of students working on their own but in close proximity to each other, sharing results or giving help to others as needed.

Free Exploration Center: Place manipulative materials that will be used in future lessons or were introduced in earlier lessons in a center and allow students to explore them without direction. Blocks, counters, C-rods, K A-blocks, Unifix[®] cubes, and so on might each take a turn in the center. You might also add other types of manipulatives, purchased or handmade, to support a lesson or concept.

Sorting/Graphing Center: Activities at this center might include sorting and/or graphing with specially designed manipulatives or odds and ends. Make a variety of sorting mats and string loops available for sorting/classifying activities. Provide graphing mats for graphing activities.

Sand/Water Center: Sand and water tables can be valuable tools for the study of mathematical concepts at the Kindergarten level. (These tables can be purchased commercially or improvised.) Using a medium that can be poured and/or measured over and over again, students develop concepts of conservation, order, measurement, and so on. To foster this exploration, the tables should include standard measuring utensils—cups, spoons, and familiar containers such as coffee and juice cans, bowls, coffee cups, and so on.

Reading/Writing Numbers Center: Activities here might include practice in writing numerals with different media (yarn, glitter, paint); activities on numeral recognition; or reading the *CSMP* storybooks after they have been introduced. Reading other books and stories about number concepts, and creative writing activities built around *CSMP* lessons are also appropriate for this center.

Relating to Lessons Center: This center can include activities that follow a particular lesson and reinforce the ideas presented there. Suggestions for this type of center activity are at the end of some lessons and you may wish to add others as the need arises in your particular class.

Other centers such as an Art Center, a Dramatic Play Center, or a Science Center also can involve numerous mathematical activities.

Integration with Other Curriculum Areas

There are many opportunities in the daily classroom schedule to introduce and reinforce mathematics concepts with students. You may specifically plan some of these, but many others will arise incidentally in conversations and activities. Opportunities to practice number recognition and counting will occur regularly, as will activities which require looking at patterns, sorting, and using the vocabulary and concepts of mathematics. Literature read and shared in class may suggest mathematical ideas that can be explored further. Books and stories can be found to support and reinforce mathematics topics. Looking for ways to integrate mathematics topics with other subject areas, and using concepts introduced through math to explore other topics can help students to see the relevance and applications of mathematics to their lives.

Reading_____

Selecting books that use mathematics concepts and taking time to reinforce these concepts during the reading process will strengthen the mathematics learning of your students. For example, each time the students open a book they can practice sequencing numbers and number recognition. You might ask students to predict what number comes before and what comes next, or to determine if the number they are looking for is more than or less than a certain number. You can begin to ask students if the number will be near the beginning, middle, or end of the book; or ask if the number is closer to one number than another. Reading numbers with two and three digits and reinforcing place value can be incorporated into these activities.

Patterns_____

Opportunities to recognize, reproduce, and invent patterns occur in many activities. Once students are tuned in to looking for patterns they will see them everywhere—in words, in the environment, using color, shape, and sound—and they will be able to create new ones of their own. Art and music are rich areas for using and integrating patterns. Rhyming patterns are usually a part of the language arts curriculum. You may want to create seasonal patterns for decoration or to use on the calendar. There are several *CSMP* lessons that deal with sound patterns, with placing dots in number patterns, and with creating patterns using shapes, colors, sizes, and designs. These activities can be modified and repeated whenever the students are interested. Patterning plays such an important role in all of mathematics that it is important students be given a solid foundation in patterning in the early years.

Graphs_____

Sorting items and identifying their physical attributes is taught directly in *CSMP* lessons. This skill can be a useful tool in other curriculum areas and can be reinforced outside the realm of mathematics. When children begin to explain why they put certain things together in a group, objects may be related in ways not previously thought of. These activities may lend themselves to written explanations or journal entries by students.

You may like to introduce students to many types of graphs and to have them gather data or construct and infer information from a graph. These activities can engage students in active learning and draw upon experiences from mathematics lessons. Many curriculum areas can be integrated and related to seasonal activities and/or current classroom topics. The class might graph information about how they travel to school, what they have for lunch, or what their favorite cartoon is. They can construct concrete graphs, pictographs, or use strings to display the information. They might discuss how someone else could use their information, for example, a new student at the school. Learning to collect and organize data can be a cooperative experience with different students taking different roles.

Integration_____

Mathematics activities do not just occur during the time designated for math in the daily schedule. They are a part of the total school day and occur at every turn in the curriculum. You may plan them, but they will also arise spontaneously as students work with each other. Taking attendance and lunch count, collecting money and book orders, going over the daily schedule and ordering daily tasks, playing games at recess, and getting to the next class on time are just a few of the math-related activities in which students participate every day. It is not necessary to stop every time and point out the mathematics in a situation, but its presence provides the groundwork for concept understanding and problem solving in formal mathematics lessons.

Throughout the *CSMP* lessons we have tried to integrate other curriculum areas and to suggest ways you might do more within your own classroom. Mathematics is not something that students should see and use during an isolated period, but rather throughout the day. In the same way, mathematics classes should not deal only with numbers, but should incorporate elements of reading, writing, social studies, science, and so on. *CSMP* strives not only to involve all students in the learning of mathematical concepts, but to be part of an integrated school day in which students see the application of each subject to other subjects and to their own lives. Integration allows all students to participate and contribute to the total work of the class.

Suggested Schedule of Lessons

Master Schedule for CSMP Mathematics for Kindergarten

First Month		Second Month							
K1	Free Exploration 4-11	K2	Comparative Sizes 4-13	K3	Walk or Ride Graph 4-15	K1	Free Exploration 4-11	K4	Changes in Size 4-17
K1	Free Exploration 4-11	K5	Odds and Ends 4-19	K6	Ducks 4-21	K1	Free Exploration 4-11	K7	Count and Do 4-23
K1	Free Exploration 4-11	K8	Sorting with Strings #1 4-25	K9	Geoboards #1 4-27	K1	Free Exploration 4-11	K10	Adjustment/ Assessment Day #1 4-29
K11	Sorting with Strings #2 4-31	K12	Changes, Changes 4-33	K13	Five Little Monkeys 4-35	K14	K A-Blocks #1 4-37	K15	Graphing Objects 4-39
K16	Number Readiness 4-41	K17	Ways to Make Six 4-43	K18	C-Rods #1 4-45	K19	Orchestra 4-47	K20	Adjustment/ Assessment Day #2 4-51
K21	Children and Books 4-53	K22	Order by Size 4-55	K23	Numerical Writing #1 4-57	K24	K A-Blocks #2 4-59	K25	Geoboards #2 4-61
K26	Happy Fish #1 4-63	K27	C-Rods #2 4-65	K28	Number Collage 4-67	K29	The Zoo 4-69	K30	Adjustment/ Assessment Day #3 4-73
K31	C-Rods #3 4-75	K32	Nuts Over Graphing 4-77	K33	Everyone Listens, Everyone Acts 4-79	K34	Constructing Patterns 4-81	K35	Electronic Tools 4-83

Third Month		K36	Ways to Make Eight 4-85	K37	C-Rods #4 4-87	K38	Calculator Introduction #1 4-89	K39	The Playful Numbers 4-91	K40	Adjustment/ Assessment Day #4 4-93
		K41	Squirrels and Nuts 4-95	K42	Measuring Tools 4-97	K43	Class Counting Book 4-99	K44	Ways to Make Ten #1 4-101	K45	K A-Blocks #3 4-103
Fourth Month		K46	Yes/No Graphs 4-105	K47	Freight Trains 4-107	K48	Calculator Introduction #2 4-111	K49	Number Bugs #1 4-113	F50	Adjustment/ Assessment Day #5 4-115
		K51	Flying Birds 4-117	K52	Geoboards #3 4-119	K53	One-to-One Correspondence #1 4-121	F54	Number Bugs #2 4-125	K55	Children and Houses 4-127
		K56	C-Rods #5 4-131	K57	People Patterns 4-133	K58	81 Roses 4-135	F59	Calculator Introduction #3 4-137	K60	Adjustment/ Assessment Day #6 4-139
		K61	Length #1 4-141	K62	Numeral Writing #2 4-143	K63	Chicks and Hens 4-145	K64	C-Rods #6 4-147	K65	What's Cooking? 4-149
		K66	Counting Calculator #1 4-151	K67	Telephone Numbers 4-153	K68	Ways to Make Ten #2 4-155	K69	The Baby is Born 4-157	K70	Adjustment/ Assessment Day #7 4-159
		K71	Candy Graph 4-161	K72	The Train 4-163	K73	Robot Walk #1 4-165	K74	Sinking Boat 4-167	K75	What Could We Be? 4-169

Fifth Month		K76	Taking a Trip 4-171	K77	Counting-On #1 4-173	K78	Length #2 4-175	K79	Countdown 4-177	K80	Adjustment/ Assessment Day #8 4-179
		K81	One-Way Roads #1 4-181	K82	Counting Calculator #2 4-183	K83	K A-Blocks #4 4-185	K84	Counting-On #2 4-187	K85	Order #1 4-189
		K86	Geoboards #4 4-191	K87	Robot Walk #2 4-193	K88	K A-Blocks #5 4-195	K89	Counting-On #3 4-197	K90	Adjustment/ Assessment Day #9 4-199
		K91	Length #3 4-201	K92	Coins #1 4-203	K93	Happy Fish #2 4-205	K94	Counting Calculator #3 4-207	K95	Clowns 4-209
		K96	Locating Numbers on a Number Line 4-211	K97	Solids #1 4-213	K98	Strings #1 4-215	K99	Monkeys and Bananas 4-217	K100	Adjustment/ Assessment Day #10 4-219
		K101	Counting Activity 4-221	K102	Order #2 4-223	K103	Robot Walk #3 4-225	K104	Ten Black Dots 4-227	K105	Telling Stories for an Arrow Picture #1 4-229
		K106	Marching Band 4-231	K107	0-109 Numeral Chart 4-233	K108	One-Way Roads #2 4-235	K109	One-to-One Correspondence #2 4-237	K110	Adjustment/ Assessment Day #11 4-239
		K111	The Number Line Game 4-241	K112	Solids #2 4-243	K113	Counting Calculator #4 4-245	K114	Catch The Tiger #1 4-247	K115	Strings #2 4-251
Sixth Month											

Seventh Month		Eighth Month	
K116	Coins #2 4-253	K117	Meter Measure 4-255
K121	Catch the Tiger #2 4-265	K122	Strings #3 4-267
K126	Numeral Chart Bingo 4-275	K127	Calculator Addition 4-277
K131	Number Friends 4-285	K132	Mirror Symmetry #2 4-287
K136	Storytellers 4-295	K137	Counting by Twos 4-297
K141	One Side-Two Sides 4-305	K142	Mirror Symmetry #3 4-309
K118	Twelve Elephants 4-257	K119	Detective Story #1 4-261
K123	Number Facts 4-269	K124	Mirror Symmetry #1 4-271
K128	Pet Graph 4-279	K129	A Counting Snake 4-281
K133	Movie Theatre Seats 4-289	K134	Telling Stories for Arrow Picture #2 4-291
K138	Car Tracks #1 4-299	K139	Detective Story #2 4-301
K143	Car Tracks #2 4-311	K144	Detective Story #3 4-313
K120	Adjustment/ Assessment Day #12 4-263	K125	The Numbers Speak 4-273
K130	Adjustment/ Assessment Day #13 4-283	K135	Strings #4 4-293
K140	Adjustment/ Assessment Day #14 4-303	K145	Jumpy Frogs 4-315

Questions and Answers about CSMP

KINDERGARTEN QUESTIONS AND ANSWERS ABOUT CSMP

As you teach the *CSMP* curriculum or even as you prepare to teach it, some basic questions will come to mind. They are, very likely, the same kinds of questions that parents and supervisors will ask about a curriculum that appears to be different from the traditional program. Perhaps some of the questions that concern you are answered here.

Q: What is the spiral approach? How does it work?

A: We learn through many interrelated experiences. But no experience, particularly a Kindergarten math lesson, is an end in itself. With this in mind, *CSMP* introduces an idea in one lesson, then another in the next lesson, then another. Later, the first idea reappears in a slightly new setting or in a slightly expanded version, perhaps with connections to other concepts; then a second topic reappears; and so on. Each of the many times a particular idea or area of study reappears, it is treated in a different manner and at a slightly higher level than the last time. This is called *spiral development*.

Students learn at different times and at different rates. Only part of the learning of a given topic actually takes place during the classroom lesson. In between the times the topic occurs on the learning spiral, the student is mentally digesting the idea, sometimes consciously, usually unconsciously. In this way the spiral development gives each student a new chance to catch on at each stage.

We find it highly effective to follow this kind of development rather than continuing on and on with a topic until so-called mastery has occurred.

Sticking with the spiral approach requires an act of faith on your part, particularly if you are used to teaching a given topic until you are satisfied that all (or at least most) of the class knows it cold. The spiral approach implies that some lessons may be stopped before some (or even a majority of) students appear to have caught on, or before everyone has successfully completed all the worksheet or workbook pages. It involves knowing that the topic will reappear again and again, and that varying degrees of understanding will come at varying rates and times. It includes the belief that an idea planted now may not sprout until much later, and that it is best not to force its development.

Q: I understand how spiral development works, but how can I assess my students' progress using such an approach?

A: We don't believe it is desirable or reasonable to try to evaluate student mastery of skills from day to day or even from week to week. On the other hand, teachers, parents, and the students themselves benefit by some monitoring of the students' progress and involvement with the activities. Most teachers have their own methods for monitoring with which they are comfortable, and we suggest that you continue to use these methods. In addition, *CSMP* provides several types of assessment checklists, Blacklines K0 (b)–(k), which are noted in lessons or on adjustment/assessment days. You may find these useful. Also, group interactions during the lessons, responses on individual tasks, and center and writing activities provide much valuable information. A spiral approach, in fact, may help rather than hinder your long-term assessment of students' progress.

Q: How does CSMP differ from a traditional mathematics curriculum?

A: The core content of *CSMP* is not revolutionary. The program aims to integrate ideas and facts that have always been considered important in mathematics. The major differences are in method. Traditional teaching generally focuses on rote skills. *CSMP* students, on the other hand, become involved with real mathematical activities from which they develop mathematical understanding.

With a pedagogy of situations, they participate in the learning process which leads to the development of skills—not by rote memorization but by constructing their own understanding. Faced with challenging situations, the students are led by their reactions to important ideas in mathematics—they begin to mathematize situations. This process is fundamental whenever mathematics is applied.

CSMP also makes use of a spiral approach rather than the mastery approach found in most traditional mathematics curricula (see page 2-1).

Q: Are all the topics in the CSMP curriculum really mathematics?

A: Yes. Mathematics is much more than calculation with numbers, and its methods include more than paper-and-pencil algorithms. The *CSMP* curriculum is filled with experiences that directly and indirectly relate to a wide world of numbers, their interrelationships, and the kinds of logical reasoning about these relationships that make mathematics an activity of interest and concern.

Q: Why use the languages of strings and arrows?

A: It is surprising that the language of strings was not used earlier and more extensively to teach mathematics. Mathematicians have used strings for a very long time; they support classification notions so fundamental and natural that they go back to Aristotle. The scope of the string diagrams is broader than mathematics; it is a marvelous instrument for logical thinking. String diagrams permit the understanding of a situation at a glance; they generate math concepts and ideas through related discussion.

Arrow diagrams are probably the most important teaching aid in the *CSMP* curriculum. They are used everywhere in our daily lives: signals, advertisements, directions, and so on. Why not use them to teach mathematics? Arrows are a pictorial way to represent relations. Relations have always been important in mathematics, but in the past seemed to be something rather abstract, elusive, and mysterious. With arrows they become vivid, concrete, and easy to understand.

Q: Some of the CSMP materials are new to me. How do I learn enough to teach a class?

A: *CSMP* training is recommended for every teacher new to the program. This training may be conducted by a local *CSMP* coordinator or a certified *CSMP* trainer. Kindergarten and First Grade program teachers should receive a minimum of 12 hours training; teachers of the Upper Primary Grades program, a minimum of 24 hours training; and teachers of the Intermediate Grades program, a minimum of 30 hours training. During the training, the *CSMP* content is taught to new teachers and suggestions are given for organization of the materials.

The *CSMP* trainer will present a variety of lessons taken from the *CSMP* curriculum and use an integrated spiral approach during the training itself. In this way teachers not only learn how to teach *CSMP* mathematics, but they become familiar with the spirit and pedagogy of the program.

Q: Why are the lesson plans presented as a dialogue?

A: Most of the lessons are written in considerable detail; step-by-step descriptions are frequently given, together with a possible dialogue between teacher and students. These details are given only as suggestions of how a lesson might develop. You should never feel obligated to follow a lesson word for word as it is written in the guide. By the same token, you should never insist that your students give the same responses as those given in the imaginary dialogue. Use your own creativity to draw out student responses as the situations suggest. Read the lesson plans carefully beforehand to get an idea how the lessons are expected to proceed.

Q: Are there goals for each lesson?

A: The principal goal of this program is to provide each student with a great variety of experiences in different fields. Such a goal is difficult to break down in small pieces. What you will find is a *capsule lesson summary* at the beginning of each lesson that briefly describes the activities and experiences included in the lesson. Because the goals of the curriculum spread over a whole series of lessons, specific goals for individual lessons are stated only indirectly. We expect you will easily see the direction and intent of the lessons, however, we decline to predict what will happen in terms of student learning for any one lesson.

Q: How often and for how long should I teach mathematics in Kindergarten?

A: The *CSMP* schedule suggests that you teach mathematics four or five days a week for 15 to 30 minutes each day. If you do not want or are not able to teach mathematics that frequently, that's fine. Just follow the day-by-day guide as far as you can. Or, if you want to teach mathematics more often, we still suggest that you teach no more than five lessons per week out of the day-by-day guide. Use your own initiative to create other lessons (for example, try planning a new lesson of your own, try some of the supplementary activities suggested in the adjustment/assessment days, or try repeating lessons with your own adaptations. In the last analysis, only you can decide how to schedule mathematics in your class.

Q: If I teach math only a couple times a week, I will never get through the whole program. Which topics are prerequisite for the *CSMP* First Grade program?

A: Strictly speaking, no topic is a definite prerequisite for the First Grade program. But the more ___ experiences students have had, the better off they are likely to be. Certain skills are critical for students by the time they enter First Grade, not so much because of the *CSMP* program itself, but because of the gap that will exist between those students' basic knowledge and that of most of their peers. These skills include

- the ability to attend to and carry out simple instructions;
- the ability to situate oneself in time or space (left, right; up, down; before, after);
- knowing the names of basic colors;
- knowing how to count a small number of objects;
- the ability to recite the numbers from one to ten in order;
- the ability to recognize a single numeral.

Indeed, if some of your students have failed to acquire this basic knowledge by the time they complete Kindergarten, it might be worthwhile approaching the appropriate school authorities with a view to discovering if specific (physical or mental) problems are a factor. It might also be worthwhile to consider having the student repeat the Kindergarten year.

Q: Occasionally, when I read a lesson, I feel it's not going to work with my students or it doesn't fit my teaching style. Do I have to teach every single lesson?

A: No, of course not. You know your students, you have to teach the lesson, so you should be the one to make the final decision. However, teaching is a little bit like cooking: sometimes it pays off to be a little adventurous and give a lesson a try even if you have mixed feelings about it.

Q: Is it necessary to follow the suggested schedule exactly?

A: This program is not meant to be a static sequence. The schedule of lessons is only a suggestion based on the teaching experiences of many teachers and *CSMP* staff. If this is your first time teaching the program, you may like specific suggestions for organizing the lessons, so we offer you the suggested schedule as a guideline. You may wish to follow it at the beginning of the school year and then deviate from it as the needs of your students dictate.

Exercise your own professional judgment in deciding when to stop a particular lesson. It is better to stop a lesson when student interest is high than to teach so methodically that everyone in the class understands everything, but is completely bored. In order to be successful with this curriculum, you should adjust the schedule to the abilities, maturity, and interests of your class.

Q: I've just spent my whole summer preparing some really exciting math activities. Can I use them in addition to the CSMP materials?

A: Of course you can! Most Kindergarten teachers are very creative people and as a result there are a lot of exciting activities around. It would be a shame to let them go to waste. Be careful, though, that you don't "overfeed" your students.

Q: For what sort of student is the CSMP elementary curriculum designed?

A: It is designed for *all* students. Students engage with each learning situation at their own level so that they succeed in dealing with some aspects of the situation that challenge them. The pedagogy of situations is particularly effective with all types of learners.

Q: What provisions are made for the variety of abilities in a typical class?

A: Every lesson includes something that allows every student to participate in a meaningful way, regardless of differing abilities. Even your brightest students will have challenges. This means that you should not exclude any student from a full group lesson, but at the same time, you should not expect every student to fully understand everything in a lesson either. You will find that the spiral development leaves many situations open-ended, allowing students to experience them at different levels.

One very efficient way of helping students who need more practice is to work with them in smaller groups, as suggested in many of the lessons. Extension activities, which follow many of the lessons, provide a variety of opportunities for students who need more challenge.

Evaluation has shown that students traditionally labeled "slow" do better in *CSMP* classes than in non-*CSMP* classes. We believe this is due to several things: the spiral development, group work on mathematical activities, and the presence of a wide variety of both numerical and non-numerical situations in the *CSMP* curriculum.

Q: What provision does the program make for students who need more work on number readiness?

A: Every tenth day of the schedule is set aside to address problems of this kind. The suggestions contained on these adjustment days include ideas for dealing with particular needs of certain students; for example, practice at counting a small number of objects or recognizing the numerals from 0 to 10, and so on.

Q: Why are there no lessons on telling time or on measuring weight, volume, and capacity?

A: Since there are many excellent materials already available to help you teach students to tell time, there is no need for us to duplicate them in this guide. Present your usual lessons on this topic. Furthermore, we feel that instruction in telling time belongs more naturally as part of a language program than a mathematics program.

At the Kindergarten level, measurement activities are comparative and this includes comparing weights and capacities. No attempt is made at this level to assign measures based on given units.

Q: Should I supplement the program with more practice in addition and subtraction facts?

A: There is a surprising amount of work on concepts of addition and subtraction. Most is implicit in the activities and is not in the form of practice for its own sake. If you feel it necessary to give supplementary practice, we suggest you keep repetitive drill to a minimum so as not to endanger the students' interest in numerical situations.

Q: How do students learn to use mathematics in practical situations?

A: For elementary school students, a situation that intrigues them, catches their imagination, or piques their curiosity will motivate them to learn whatever is necessary in order to deal with the situation. But situations that adults consider "practical" very often are outside the realm of interest of young students and do not provide motivation for learning. *CSMP* has found that students will indeed learn to use mathematics in situations they consider worthy of their attention. As they approach adulthood, they will begin to consider practical situations worthy of their attention, but in the meantime they are more interested in games, fantasy, puzzles, stories, and so on.

Q: What is the role of storybooks in the curriculum?

A: The storybooks are part of a 24-story collection called *Stories by Frédérique*. Each is presented in a colorful newsprint booklet designed for young students. Three storybooks are used with lessons in *CSMP Mathematics for Kindergarten* (15 copies of each storybook are provided in a classroom set of materials). Each story is illustrated using the mathematical languages of dots, arrows, and strings to reinforce the story idea. Young readers can become personally involved in the stories; there are questions to answer, pictures to relate to the story, and new adventures to invent for the characters. They find that emotions and aesthetics are part of the world of mathematics just as in the world of people.

Many other lessons include suggestions for reading activities using children's literature as an extension or enhancement.

Q: I prefer teaching small groups, but many of the lessons seem to be aimed at the whole group. What do you suggest?

A: If your school routine allows, you might try teaching a lesson twice, once to each half of your class. But if you do this, it might be wise to vary the composition of the groups each day so that you are not tempted to group students according to your perception of their abilities. Always grouping by ability may guarantee that half your students have less experience than the other half, through no fault of their own. The purpose of the full group experiences is to allow interaction among all students in every situation posed in the lessons. Students learn quite a bit from each other's reactions. You will be surprised to find that in some situations the key responses come from students you least expect.

Our answer might give the impression the *CSMP* teaching takes place only in full group settings. This not the case. There are many opportunities to group students in a variety of ways—partners, small cooperative groups, teams, and so on. In addition, there is time allotted for individual work. We also encourage you to arrange small group sessions whenever you have time, particularly for students who need extra practice. Such small group activities may supplement the full group lessons, but should not replace them.

Q: The program makes use of the students' creative freedom. How much room is there for the teacher's ingenuity?

A: *CSMP* not only allows for your ingenuity but depends on it. While the lessons may appear to be rigid by presenting a dialogue for teachers and students, remember that these are only suggested questions, answers, and comments based on our experience with development classes. Even if you follow your part of the script, your students are likely to offer responses which differ from those we have listed. It is the students' responses that will determine the content and direction of a lesson.

In a traditional program your creativity is called upon the first time you develop a particular lesson, and to a lesser extent as you revise lessons in succeeding years. There is little room for spur-of-the-moment creativity once a lesson begins. The *CSMP* curriculum, by creating a free and open situation emphasizing the students' creative freedom, continually presents you with unanticipated student responses and calls on your ingenuity at all times.

Q: How can I explain *CSMP* to parents?

A: Throughout the year there are opportunities to communicate with and involve parents in the math program. The curriculum materials include numerous letters to parents that can provide more introduction to the *CSMP* languages, tools, and methods. Home activities accompany many lessons and are opportunities for parents to become involved with their children in learning mathematics. Sometimes they suggest follow-up or practice and other times enrichment or extension of a class lesson.

You might also extend an invitation to parents to visit your class during the math period. Many times such an invitation leads to a closer parent-teacher relationship or to the parent volunteering as an aide.

Section Four

**Day-by-Day
Lesson Guide**

KINDERGARTEN DAY-BY-DAY LESSON GUIDE

K0	Things to Do Before School Begins	4-5
K1	Free Exploration	4-11
K2	Comparative Sizes	4-13
K3	Walk or Ride Graph	4-15
K4	Changes in Size	4-17
K5	Odds and Ends	4-19
K6	Ducks	4-21
K7	Count and Do	4-23
K8	Sorting with Strings #1	4-25
K9	Geoboards #1	4-27
K10	Adjustment/Assessment Day #1	4-29
K11	Sorting with Strings #2	4-31
K12	Changes, Changes	4-33
K13	Five Little Monkeys	4-35
K14	K A-Blocks #1	4-37
K15	Graphing Objects	4-39
K16	Number Readiness	4-41
K17	Ways to Make Six	4-43
K18	C-Rods #1	4-45
K19	Orchestra	4-47
K20	Adjustment/Assessment Day #2	4-51
K21	Children and Books	4-53
K22	Order by Size	4-55
K23	Numeral Writing #1	4-57
K24	K A-Blocks #2	4-59
K25	Geoboards #2	4-61
K26	Happy Fish #1	4-63
K27	C-Rods #2	4-65
K28	Number Collage	4-67
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K30	Adjustment/Assessment Day #3	4-73
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K34	Constructing Patterns	4-81
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K36	Ways to Make Eight	4-85
K37	C-Rods #4	4-87
K38	Calculator Introduction #1	4-89
K39	The Playful Numbers	4-91
K40	Adjustment/Assessment Day #4	4-93
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K42	Measuring Tools	4-97
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1. Hang the number line except for the negative portion. Above the chalkboard is a good place, but anywhere the students can see it, where you have easy access to it, and where it does not need to be hung in separate parts will do.
2. Hang the 0–109 numeral chart. It should be in a place where students can touch the numerals.
3. Attach two number lines to students’ tables (on opposite sides).
4. Be sure you have colored chalk.
5. Be sure you have plenty of unlined paper and a box of crayons or colored pencils for each student.
6. Decide how you want to organize student manipulatives: envelopes or self-sealing plastic bags for K A-blocks and C-rods, bins or small boxes for Unifix® cubes or other blocks, plastic storage containers for counters or coins, and so on.
7. Prepare demonstration K A-blocks and C-rods with magnetic material or masking tape loops.
8. Locate student C-rods, manipulatives, calculators, and so on.
9. Put manipulatives, such as C-rods, K A-blocks, Unifix® cubes, counters, and so on, in centers for students to explore freely. Centers can serve to introduce students to manipulatives that will be used in lessons and provide free exploration time before the lessons. A list of various manipulatives recommended for free exploration centers is on page 4-7.
10. Prepare odds and ends boxes in which you can keep collections of items such as marbles, beads, nuts, bolts, rocks, buttons, and so on—items that will be used by students in various sorting and graphing activities. A list of odds and ends ideas is on page 4-7.
11. Various sample letters are contained in the Blackline section of this manual. You may wish to make copies of the K0 (a) letter to send home with students on the first day of school. This letter introduces parents to the activities their child will be engaged in by *CSMP*, and asks them to work with their child to collect items for the odds and ends box.
12. Review the first ten lessons and select fingerplays, manipulatives, and literature to use in these lessons. Sample fingerplays and a list of manipulatives that will be used in lessons throughout the year can be found on pages 1-6, and 4-7–4-10. The Appendix contains a list of children’s literature arranged in categories to help you make selections for the lessons.
13. Some lessons contain suggestions for assessments. Sample assessment instruments are provided in Blacklines K0 (b)–(k). Use these suggestions and tools at your discretion.
14. Create a “Home Activities” file. The file can help you keep track of the types of communications you plan to send home to parents throughout the year. This may include activity ideas suggested in the teacher’s manual following various lessons, parent letters, and/or activities of your own. The sample letter on the following page might accompany the first activity sent home in an envelope.

Dear Parent/Guardian:

Activities to accompany various lessons in our mathematics program (*CSMP*) will be sent home with your child periodically. They will be called “Home Activities” rather than “Homework” because we hope you will use them as an opportunity to become involved with your child in learning more about the *CSMP* tools, methods, and skills.

Some home activities will be follow-up or practice for a lesson; others will be for enrichment or extension. It will be helpful if you keep all the activities and materials in the envelope provided. Some materials may be used more than once, and you may want to refer back to previous activities.

Sincerely,

Teacher’s Signature

Early Warning

Among the next nine classroom lessons are some that require extra preparation or involve materials not included with the *CSMP* Classroom Set. The lessons are listed here for your convenience in preparing for them. A more detailed description of the needed materials can be found on the first page of each lesson. (Special materials are listed here only once, even if they are used more often during the nine-day period.)

K1 *Free Exploration*: Manipulatives

K2 *Comparative Sizes*: Flannelboard and flannel cut-outs

K5 *Odds and Ends*: Yes/No cards; string loops

K8 *Sorting with Strings #1*: Chart paper

K9 *Geoboards*: Overhead geoboard or transparency; geoboards and geobands

Several of the lessons also include suggestions for literature and/or fingerplays which are not included here. Please check the materials list at the beginning of the following lessons in advance so you can obtain the necessary literature: K1, K2, K3, K4, K5, K6, K7, K8.

Manipulatives for Free Exploration Centers

Beads (wooden, plastic, or multi-variant)
 Color Cubes and/or Tiles
 Counters (various types and shapes)
 Cuisenaire Rods (C-Rods)

Dominoes
 K A-Blocks
 Pattern or Parquetry Blocks
 Unifix[®] Cubes

Odds and Ends Ideas

Beads
 Beans
 Bottle Caps
 Buttons
 Coins
 Colored Pom Poms
 Corks
 Counters
 Keys
 Lids

Macaroni
 Marbles
 Nuts and Bolts
 Paper Clips
 Plastic Chips
 Pipe Cleaners
 Rocks
 Rubber Bands
 Shells
 Spools

Fingerplays and Counting Songs

Five Little Kindergartners

Five little Kindergartners in a row.
 (Hold up five fingers on one hand)
 The first one is wearing a bright red bow.
 (Hold up one finger)
 The second one's hands are in his lap.
 (Hold up a second finger)
 The third one has a new blue cap.
 (Hold up a third finger)
 The fourth one says, "It's a nice day."
 (Hold up a fourth finger)
 The fifth one met a friend on the way.
 (Hold up all five fingers and wave)
 Who is that friend so new?
 Is that friend you?
 (Point to a friend)

Ready for School

Two little houses closed up tight
 (Fists closed, thumbs in)
 Open up the windows and let in the light.
 (Fingers open)
 Ten little finger people tall and straight
 (Palms to the front, fingers held up)
 Ready for school at half-past eight.

Five Little Ducks

Five little ducks went out one day
 Over the hills and far away.
 Mother said, "Quack, quack, quack!"
 But only four little ducks came back.

Four little ducks went out one day...
 But only three little ducks came back.

Three little ducks went out one day...
 But only two little ducks came back.

Two little ducks went out one day...
 But only one little duck came back.

One little duck went out one day...
 But none of the five little ducks came back.

Sad mother duck went out one day...
 And all of the five little ducks came back.

KO

(Move hands and arms forward)

Ten Red Apples

Ten red apples grow on a tree
(Hold up fingers on both hands)
Five for you and five for me.
(Wiggle fingers on one hand and then the other)
Let us shake the tree just so
(Shake both hands)
And ten red apples will fall below.
(Make falling motions with fingers)
1, 2, 3, 4, 5, 6, 7, 8, 9, 10.
(Count each finger)

Shapes

One straight finger makes a line
(Hold up one index finger)
Two straight lines make a “t” sign.
(Cross index fingers)
Three lines make a triangle there
(Form triangle with index fingers touching and thumbs touching)
And one more line will make a square.
(Form square with index fingers and thumbs)

One to Ten

Number one, touch your tongue.
Number two, touch your shoe.
Number three, touch your knee.
Number four, touch the floor.
Number five, learn to jive.
Number six, pick up sticks.
Number seven, look to the heavens.
Number eight, shut the gate.
Number nine, touch your spine.
Number ten, do it all again.

Fish Story

One, two, three, four, five—
Once I caught a fish alive.
Six, seven, eight, nine, ten—
Then I let it go again.
Why did I let it go?
Because it bit my finger so.
Which finger did it bite?
The little finger on the right.

Elephants Went Out to Play

One elephant went out to play
On a spider’s web one day.
He had such enormous fun
That he called for another elephant to come.

(Continue to any number of elephants, in this case, five)

Five elephants went out to play
On a spider’s web one day.
They had such enormous fun
But there were no more elephants left to come.

One, One—The Zoo is Lots of Fun

One, one, the zoo is lots of fun!
Two, two, see a kangaroo.
Three, three, see a chimpanzee.
Four, four, hear the lions roar.
Five, five, watch the seal dive.
Six, six, there’s a donkey doing tricks.
Seven, seven, elephants look to heaven.
Eight, eight, a tiger and his mate.
Nine, nine, penguins in a line.
Ten, ten, I want to come again.

Five Gray Squirrels

Five gray squirrels sat up in a tree.
 (Hold up five fingers)
 This gray squirrel said, "What do I see?"
 (Point to thumb)
 This gray squirrel said, "Let's have some fun!"
 (Point to index finger)
 This gray squirrel said, "Oh, let's run!"
 (Point to middle finger)
 This gray squirrel said, "Let's hide in the shade!"
 (Point to ring finger)
 This gray squirrel said, "I'm not afraid."
 (Point to little finger)
 Then out came the sun
 (Spread arms to form circle above head)
 And away the squirrels ran, every one.
 (Make running motions with fingers)

Five Little Brown Birds

One little brown bird, up and up she flew.
 (Raise one finger)
 Along came another, and that made two.
 (Raise a second finger)
 Two little brown birds, sitting in a tree.
 (Hold up two fingers)
 Along came another, and that made three.
 (Raise a third finger)
 Three little birds, here comes one more.
 (Hold up three and raise a fourth finger)
 What's all the noise about? That made four.
 (Show four fingers)
 Four little brown birds, and one makes five.
 (Raise a fifth finger)
 Singing in the sun, glad to be alive.
 (Wiggle five fingers)

This Old Man

This old man, he played one,
 He played knick-knack on my thumb.

Chorus: With a knick-knack, paddy-whack,
 Give a dog a bone.
 This old man comes rolling home.

Other verses:
 two—on my shoe
 three—on my knee
 four—on my door
 five—in my hive
 six—with his sticks
 seven—up to heaven
 eight—on my gate
 nine—on his spine
 ten—all again

Teddy Bear, Teddy Bear

Teddy bear, Teddy bear, turn around.
 (Turn in a circle)
 Teddy bear, Teddy bear, touch the ground.
 (Bend over and touch the ground)
 Teddy bear, Teddy bear, show one shoe.
 (Lift one shoe off the ground)
 Teddy bear, Teddy bear, you'd better skidoo.
 (Walk around quickly)

Other verses:
 ...show two ears.
 ...show three buttons.
 ...show four elbows and knees.
 ...show five fingers.

Five Little Speckled Frogs

Five little speckled frogs
(Show five fingers)
Sitting on a speckled log
(Place five fingers on the other arm)
Eating a most delicious bug. Yum! Yum!
(Hold fingers together and make an eating motion)
One jumped into the pool
(Hold up one finger and have it dive into the open palm of other hand)
Where it was nice and cool.
(Fan face with hand)
Now there are four little speckled frogs. Glug!
Glug!
(Show four fingers)
Four little speckled frogs...
(Repeat, each time reducing the number of frogs)
... Now there are no little speckled frogs. Glug!
Glug!
(Show no fingers, closed fist)

Ten Little Candles

Ten little candles on a chocolate cake.
(Hold up ten fingers)
Wh! Wh! Now there are eight.
(Blow twice and hold up eight fingers)
Eight little candles on candlesticks.
(Hold up eight fingers)
Wh! Wh! Now there are six.
(Blow twice and hold up four fingers)
Six little candles and not one more.
(Hold up six fingers)
Wh! Wh! Now there are four.
(Blow twice and hold up four fingers)
Four little candles—red, white, and blue.
(Hold up four fingers)
Wh! Wh! Now there are two.
(Blow twice and hold up two fingers)
Two little candles standing in the sun.
(Hold up two fingers)
Wh! Wh! Now there are none!
(Blow twice and turn palms face up)

Peter Taps

Peter taps with one hammer
One hammer, one hammer.
(Tap lightly with one finger)
Peter taps with one hammer
This fine day.

Peter taps with two hammers...
Peter taps with five hammers...

Peter goes to sleep now
Sleep now, sleep now.
(Place palms of hands together and rest head on hands)
Peter goes to sleep now
This fine day.

Ten Little Kittens

One little, two little, three little kittens
Four little, five little, six little kittens
Seven little, eight little, nine little kittens
Ten little kittens, my, my!

Ten little, nine little, eight little kittens
Seven little, six little, five little kittens
Four little, three little, two little kittens
One little kitten, bye, bye!

Ten Green Frogs

Ten green frogs swimming in the pond
One got out, and then there were nine.

Nine green frogs swimming in the pond
One got out and then there were eight.

Eight green frogs swimming in the pond
One got out and then there were seven.

(and so on)

Capsule Lesson Summary

Use a fingerplay to follow the counting sequence, to associate numbers with objects, and to reinforce counting through repetition and song. Explore various manipulative materials which will become learning tools.

Materials

Teacher	<ul style="list-style-type: none"> • Choice of fingerplay • Numeral cards • Choice of manipulatives 	Student	<ul style="list-style-type: none"> • None
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Advance Preparation: The fingerplays may be printed on sentence strips or chart paper for easy reference, and used throughout the year.

Description of Lesson

Note: This lesson can be repeated several times during the first days of school to allow adequate exploration and familiarization with materials that will be utilized throughout the year. Vary the fingerplays and the manipulatives used each time. The schedule suggests this lesson six times, however additional exploration days may be required based on the experience level of your students. Materials may be used repeatedly in math centers throughout the year and should remain available in the classroom.

Although opportunities to explore all types of materials should be provided for all students, some may choose to work with one or two materials at length. Others may spend short amounts of time with many types of materials. These variations are allowable and acceptable. Students will probably stack the materials, build with them, make “trains,” create patterns, and so on. This free exploration is necessary to reduce the students' tendency to play with them during directed activities. Allow 15–30 minutes of time for the free exploration.

Exercise 1_____

Choose one of the fingerplays such as *Five Little Kindergartners* or *Ready for School* to do with the class. Fingerplays provide students with an active way of using the counting sequence and associating numbers with objects through repetition and song. They are easy to teach and enjoyable for students. Sometimes, you may like to use concrete objects (rather than fingers) and to reinforce numeral recognition by using numeral cards.

Exercise 2_____

Place two or three different sets of manipulatives in centers to be explored by students. For example, you might choose C-rods, pattern blocks, K A-blocks, Unifix® cubes, counters, or other blocks or cubes. Select one set of manipulatives to display and explain. For example, suppose you show the class C-rods.

T: *What do you think these are?*

S: *They look like blocks.*

S: *Colored rods.*

T: *What do you notice about these colored rods?
Has anyone ever seen or used these before?*

Allow time for student discussion and let their comments influence your questions or explanations.

T: *We are going to use these colored rods in our classroom this year. I have put some colored rods (C-rods) in one of our centers. In a few minutes, you will have a chance to go to a center of your choice. You will have time to play with these materials and make some interesting things. While at our centers, there are a few rules that everyone must follow.*

Each day you use this exercise, check to see that students recall the rules. Repeat them to the class or individuals whenever appropriate.

1. Use your hands and eyes to play with the materials.
2. Materials are to stay on the table (or floor) and may not be thrown.
3. Only take apart the things you build.
4. If someone else has an object or material you would like to use, ask for it. But if they say no, you must wait.
5. If there are six[†] students at a center, go to a different center.
6. Leave materials at a center when you go to a new center.

After reviewing the rules, send small groups of students to explore at each of the centers for a period of time. (Rotate groups or students within groups as seems most appropriate.)

While the students are at the centers exploring the materials, observe their interaction with the materials and with other students. You may like to record these observations on the free exploration checklist, Blackline K0 (b). Observed behaviors may include:

Making patterns	Building a tall tower	Cooperative play
Pairing objects	Making a long “snake” or “train”	Solitary play
Sorting objects by attributes	Building a symmetric design	Parallel play

Exercise 3 (optional) _____

After a period of free exploration, let students share what they have been doing with the materials. This may be more appropriate the third or fourth time you use this lesson. You may like to record some responses on the chalkboard or chart paper. Allow time for a variety of responses.

T: *Tell me what you did with the materials today.
Did anyone do something different?
Did anyone make something?
How did you decide what to do?
Did anyone help you?
What else could you have done?
What would you like to do next time you use these materials?*

Home Activity

Make copies of one or two of the fingerplays or counting songs for students to take home and teach to a family member. A sample letter is provided on Blackline K1.

[†]This number is arrived at by taking the class size and dividing by the number of centers.

Capsule Lesson Summary

Use a familiar story to compare sizes and order.

Materials

Teacher	• Flannelboard and flannel cut-outs to go with <i>The Gingerbread Man</i> .	Advance Preparation: Make flannel cut-outs of five different-sized gingerbread men.
Student	• None	

Note: There are many good books in the literature list that lend themselves well to a discussion of comparative sizes, such as *The Three Billy Goats Gruff*, *Goldilocks and the Three Bears*, or *Deep in the Forest*. This lesson uses the popular children's tale *The Gingerbread Man* as an example. If you choose a different story, adjust the dialogue to fit.

Description of Lesson

Read the following version of the folktale *The Gingerbread Man* to the class (or use another story that deals with comparative size).

T: *Once upon a time, there was a little old woman and a little old man who lived in a house by the edge of the woods. One day, the little old man said to the little old woman, "I will be working in the garden today and will come in at lunch time." While the little old man was working in the garden, the little old woman decided to make him a special cookie.*

Allow a little time for discussion. You may like to ask students if anyone has ever made a special cookie for them.

T: *The little old woman thought to herself, "I will bake him a yummy gingerbread man." She made the dough with extra ginger, and rolled the dough with extra flour, and cut the dough with extra care, and set the gingerbread man in a pan.*

"This is the nicest cookie I have ever made," thought the little old woman, "I hope it cooks through and through."

At this point, show students the five cut-outs of gingerbread men. Ask a student to select the smallest one and place it on the flannelboard.

T: *The little old woman popped the cookie into the oven and cooked it for five minutes. Then she peeked carefully into the oven. "It is cooking nicely," said the little old woman, although she noticed it was getting bigger as it cooked.*

Ask a student to select a gingerbread man cut-out just a little bigger than the one on the flannelboard; that is, the smallest one not yet on the board. Instruct the student to place it on the flannelboard next to the one already there.

Repeat the scenario, telling the class that the little old woman peeked into the oven every five minutes and noticed the cookie was getting bigger. Each time, let a student select the smallest gingerbread man cut-out not yet on the board and place it on the flannelboard. When just one cut-out remains (the biggest one), say,

T: *The gingerbread man cooked in the oven for a few more minutes. The old woman peeked carefully into the oven and said, "It is very big now, I bet it is done."*

Call on a student to place the biggest gingerbread man cut-out on the flannelboard.

Direct students to identify biggest, smallest, and the order of the gingerbread man cut-outs on the board.

T: *Show us the smallest gingerbread man.
Show us the biggest gingerbread man.
What happened to the gingerbread man cookie while it was baking?*

You can stop this lesson now, if you like. Or, continue the story to observe pattern and repetition. Each time you introduce someone (or something) that chased after the gingerbread man, let the class say what the gingerbread man said.

T: *Just as the little old woman was about to remove the pan from the oven, the gingerbread man jumped from the pan and ran and ran.*

The gingerbread man said, "Run, run as fast as you can, you can't catch me, I'm the gingerbread man." The little old woman chased him, but he was too fast.

*The little old man chased him, but he was too fast.
What did the gingerbread man say?*

S: *Run, run, as fast as you can, you can't catch me, I'm the gingerbread man.*

T: *A bear chased him, but he was too fast. What did the gingerbread man say?*

S: *Run, run, as fast as you can, you can't catch me, I'm the gingerbread man.*

T: *A cow chased him, but he was too fast. What did the gingerbread man say?*

S: *Run, run, as fast as you can, you can't catch me, I'm the gingerbread man.*

T: *A cat chased him, but he was too fast. What did the gingerbread man say?*

S: *Run, run, as fast as you can, you can't catch me, I'm the gingerbread man.*

T: *Perhaps the gingerbread man is still running to this day.*

Extension Activity

In groups of five, help students line up in order from biggest to smallest and determine which gingerbread man they are like.

You may like to let students draw gingerbread men on pieces of paper and color them.

Capsule Lesson Summary

Make a graph from students' answers to the question, "Do you walk or ride to school?"

Materials

Teacher	<ul style="list-style-type: none"> • <i>Wheels on the Bus</i> by Maryann Kovalski or another selection from the literature list • Pictures of car/bus/bike and walking shoes 	Student	<ul style="list-style-type: none"> • One sheet of paper
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Advance Preparation: Use Blacklines K3 (a) and (b) to create the car/bus/bike picture and the walking shoe picture.

Description of Lesson

Exercise 1 _____

Read the book *Wheels on the Bus* by Maryann Kovalski or another selection from the literature list.

Exercise 2 _____

T: *Today I noticed that some of you walked to school and some of you rode to school. I wonder if there is a way we can figure out if more children walked or rode to school. Does anyone have an idea how we could find out?*

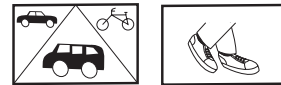
S: *Line up.*

S: *Hold up hands.*

Write the following question on the board:

Do you walk or ride to school?

Place the car/bus/bike picture on the floor in an open space in the room. Next to it, place the walking shoes picture, leaving some space between them.



T: *Here's one way to answer our question. I have placed two pictures on the floor. One has a car, a bus, and a bike on it. What does this picture show?*

S: *Ways to ride to school.*

T: *Next to the ways to ride to school, I have placed a picture with a pair of shoes on it. What do you think this picture shows?*

S: *Walking to school.*

Distribute pieces of paper, one to each student.

T: *If you rode to school today, take your piece of paper and set it in a straight line on the floor under the picture of the car/bus/bike. Then, stand on the paper.*

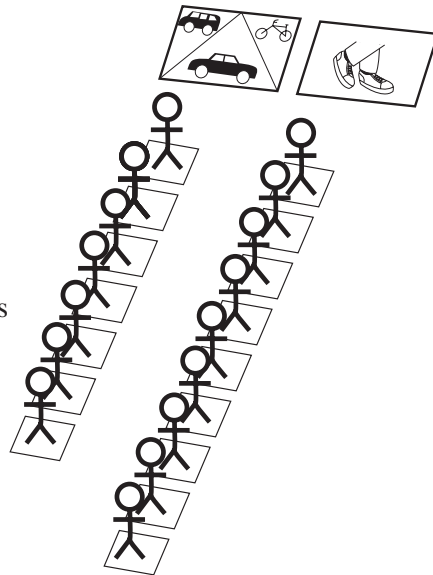
K3

Allow time for students to place their papers and stand in the line.

T: *If you walked to school today, take your piece of paper and set it in a straight line on the floor under the picture of the walking shoes. Then, stand on the paper.*

Once everyone is standing up, compare the number of students in each group by having the students turn and face the person in the column opposite them, and wave. If there are students waving without anyone waving back at them, one group has more than the other.

T: *Are there more students who walked or rode?
How many more?*



It may be difficult for students to answer the last question because they are standing in a line. Suggest that the students step off their papers so they can see and compare the two groups.

T: *Count aloud as we count the pieces of paper under the picture for riding to school.*

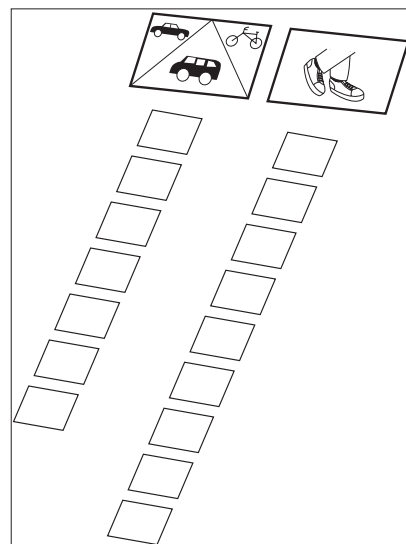
S: *One, two, three, ...*

Write the number of students who rode to school on the board. (You may wish to ask a student to point to the number in a classroom display of numbers.)

T: *Now, count aloud as we count the pieces of paper under the picture for walking to school.*

S: *One, two, three, four...*

Write this number on the board. (Again, you may wish to ask a student to point to that number in the classroom display of numbers.)



As you discuss which group has more, which group has less, and how many more or less, you may wish to point to the numbers on the number line or have students point to the number on their desk number lines, counting-on or counting back to help students see how many more or less. You may also want to suggest students line up again on the pieces of paper, and let the “extra” students in the appropriate row count themselves.

Capsule Lesson Summary

Discuss order and growth concepts through the use of a story (literature).

Materials

Teacher	<ul style="list-style-type: none"> • <i>The Enormous Watermelon</i> by Brenda Parkes or another selection from the literature list • Flannelboard and flannel cut-outs or pictures to go with the story 	Student	<ul style="list-style-type: none"> • Math journal
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Advance Preparation: Prepare flannel cut-outs or pictures to go with the story you select.

Description of Lesson

Read *The Enormous Watermelon* by Brenda Parkes, or the story you have selected, aloud to the class. Discuss with students what happens to seeds that are planted. You might even like to plant seeds in a container and ask students what they think will happen.

Depending on the book you read, questions such as the following can guide the discussion.

T: *How did the plant begin?*

S: *As a small seed.*

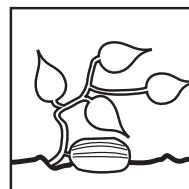
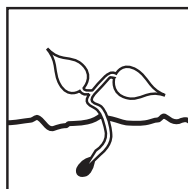
T: *What did it look like next?*

S: *A tiny plant.*

T: *And then?*

S: *A medium-sized plant.*

Continue to demonstrate the growth sequence with flannel cut-outs on a flannelboard or pictures on the chalkboard. Encourage students to use terms such as *first*, *second*, *third*, *last*, and so on.



Extension Activity

Following class discussion, direct students to draw a picture of the growth sequence. Encourage more than three stages of growth. You may like to introduce math journals to students at this time and let students record the growth sequence in their math journals.

Capsule Lesson Summary

Review fingerplays. Brainstorm ways that objects can be sorted and begin to sort them.

Materials

Teacher <ul style="list-style-type: none"> • Fingerplay of your choice • Odds and ends box • Yes/no cards • String loops 	Student <ul style="list-style-type: none"> • Odds and ends
---	--

Advance Preparation: Make a Yes card and a No card by writing the words “yes” and “no” in large, bold letters on heavy paper or card stock. To make string loops, cut pieces of yarn, ribbon, string, or a similar material, approximately 20 inches long, and tie them to form a loop. Save the loops for future lessons. (When you need extra large string loops, jump ropes work well.)

Note: If students have not brought enough odds and ends to class at this time, use other manipulative materials. It may be necessary to allow some free exploration time.

Description of Lesson

Exercise 1 _____

Lead the class in a fingerplay, either a new one or one you have used before.

Exercise 2 _____

Display 15–20 objects from the odds and ends box. Place the **YES** and **NO** cards on the table or floor.

T: *Look at this collection of objects. How are some of these objects alike?*

Allow time for students to make observations about the objects you have selected and to determine an attribute, for example, red. Then, tell the class to sort the objects according to this attribute.

T: *I would like you to help me sort these objects. Let’s sort them by the color red and put all the red objects together. When I hold up an object, ask yourself the question, is it red? If you say yes, I will place the object near the YES card, if you say no, I will place it near the NO card.*

Hold up objects and place them according to student responses.

T: *How are the objects in this pile alike (point to the YES card)? (They are red)*

Let’s put a string around these objects to show that everything inside the string is red. What can we say about the objects outside the string? (They are not red)

Exercise 3 _____

Organize the class into small groups and provide each group with a collection of objects (an odds and ends box). Direct the groups to sort their objects in any way they choose. As you interact with the groups, help them select a way (attribute) to sort. Place a string loop around the objects in one set that students have sorted.

K5

You may find it necessary to guide students to look for different ways to sort by asking questions such as the following:

T: *Can you put all the round objects together?*

Which objects are the same size as this one?

What do we do with a pencil? (Write) Can you put all the things we use to write with here?

Are any of your objects made of wood? Can you put them together?

Extension Activity

Put a large string loop on the floor or on a table. Determine a simple attribute for sorting objects. Tell the students what the attribute is and demonstrate by placing a few objects inside or outside the string. Then, from a collection of odds and ends, ask a student to select an object and place it. Determine if the object has been placed correctly. Keep the attribute simple!

Capsule Lesson Summary

Use a story of a missing duckling to introduce the language of arrows and to relate counting with order and position.

Materials

Teacher	<ul style="list-style-type: none"> • <i>Have You Seen My Duckling?</i> by Nancy Tafuri or <i>Six Little Ducks</i> by Chris Conover • Colored chalk 	Student	<ul style="list-style-type: none"> • None
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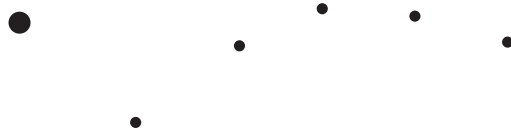
Description of Lesson

Exercise 1 _____

Read aloud a selection from the literature list on comparative sizes, preferably one that involves following/leading, such as *Have You Seen My Duckling?* by Nancy Tafuri or *Six Little Ducks* by Chris Conover. Let students act out the story to familiarize themselves with the meaning of phrases such as *behind*, *in front*, and *in between*. This sort of active participation helps to clarify terms.

Exercise 2 _____

Draw a big dot on the board.



T: *Let's tell a story about some ducks. This dot is for one duck.*

Draw five more dots as shown.

T: *What could these dots be?*

S: *Maybe more ducks.*

T: *Yes, these dots are for other ducks. Here is a mother duck and five baby ducks. Let's count and see how many ducks are in our story.*

Ask a student to count the ducks (dots) and then ask the other students to show the number with their fingers. Point to 6 on the class number line and ask students to point to 6 on their desk number lines. Then write 6 on the board.

T: *The mother duck is leading the others. Which dot could be the mother?*

Students will probably point to the big dot although any choice would be okay at this time.

Draw an arrow as shown.

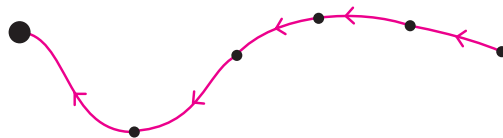


T: *This duck is swimming right behind the mother. It is following the mother duck.*

Draw four more arrows in the picture as you explain that the ducks are swimming in a line and following one another.

K6

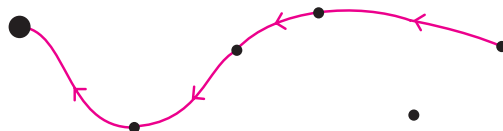
T: *Are the ducks swimming in this direction (point to the left) or in this direction (point to the right)? In our picture the mother duck is swimming at the front. Can someone point to her? The baby ducks are following. How many baby ducks are there? (Five)*



Call on a student to point to the baby ducks (dots) as the class counts. Then, ask someone to point to the first duckling following the mother duck, to the second duckling, to the third duckling, and so on.

T: *Now close your eyes.*

Change your picture as shown. Except for the “lost duckling,” none of the other dots should be moved.



T: *What happened?*

Let the students react. They will probably notice that one duckling got out of line, or got lost. Ask someone to point to the lost duckling. Ask how many ducklings are still following one another with their mother leading.

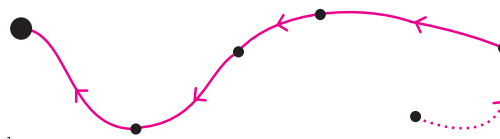
T: *How can we show that the duck family finds the lost duckling?*

Your students will probably come up with some very good ideas. For example:

S: *Erase this picture and draw the first picture again.*

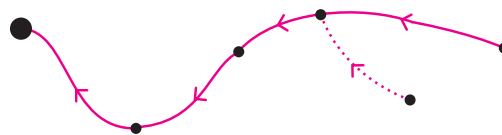
T: *Can we show it without drawing the whole picture over again?*

S (tracing the dashed arrow): *You could draw this arrow to show that the lost duckling follows all the other ducks.*



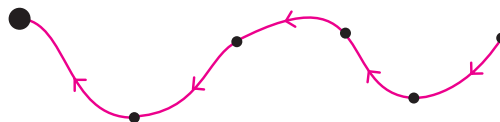
T: *Can anyone suggest how the lost duckling could take the same place it had before and not be lost?*

S (tracing the dashed arrow in the picture): *Maybe it could follow this duck.*



T: *That's a good idea, but now two ducklings are following the same duckling. What if we did this?*

Without changing the position of the dots, reposition one arrow so that the ducklings are following one behind the other.



Extension Activity

Ask students to draw a picture about the story read at the beginning of this lesson. Students may use actual duck pictures to represent the story or they may use dots, strings, and arrows.

Capsule Lesson Summary

Identify and represent numbers with actions.

Materials

Teacher	Student
<ul style="list-style-type: none"> • Counting book from the literature list • 0–10 demonstration numeral cards • Demonstration dot cards 	<ul style="list-style-type: none"> • None

Description of Lesson

Exercise 1 _____

Read a counting book of your choice aloud to the class.

Exercise 2 _____

T: *Today, we are going to play a game called Count and Do. I will start by choosing a numeral card. (Select one of the numeral cards, for example, 6.) Who can read this number?*

S: *Six.*

T: *Yes, Ramon, this card has a six on it. Now I would like you to choose some type of action, like jumping or clapping, for the entire class to do six times.*

S: *Snap their fingers six times.*

The class should perform the action as requested, counting aloud. Other actions students can do include hopping on one foot, patting their heads, tapping a foot, patting legs, blinking eyes, opening/closing hands, and so on.

T: *Ramon, can you find the number 6 on our classroom number line[†] (or 0–109 numeral chart)?*

If the tasks are all performed correctly, ask the student volunteer (Ramon in this example) to choose a numeral card (or dot card) and select the next volunteer to identify the number and choose the action the class will do.

If a mistake is made during any part of this activity, give the student who spots it the next turn. (If no student notices the mistake, you should point it out and designate the next player.)

Continue this activity as long as the class remains interested.

[†]In many of the lessons, students are asked to point to a number. Hence, you will need to have a display of numbers in your room. For this purpose, you can use the 0–109 numeral chart, a number line, a calendar, or some other display of numbers. Symbol recognition is important and opportunities for practice should be provided often. Don't be afraid to display numerals other than those with which the students are already familiar.

Assessment: You may wish to use one of the sample assessment checklists, Blacklines K0 (b)–(k), to note students' number recognition and one-to-one correspondence skills.

Extension Activity

Organize students in groups of three. Let one student select a number from 1 to 10. Have another student then choose an action, such as clapping, and clap that number of times. Direct the third student to use counters to show the number. Then, have the students change roles and repeat the activity several times.

Capsule Lesson Summary

Sort objects and record them in math journals.

Materials

Teacher <ul style="list-style-type: none"> • <i>Ten Little Rabbits</i> by Virginia Grossman or another selection from the literature list • Chart paper • String loops 	Student <ul style="list-style-type: none"> • Manipulatives • Math journal or paper
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Advance Preparation: To make string loops, cut pieces of yarn, ribbon, string, or a similar material, approximately 20 inches long, and tie them to form a loop. Save the loops for future lessons.

Description of Lesson

Exercise 1 _____

Read a counting book such as *Ten Little Rabbits* by Virginia Grossman. Practice counting from 1 to 10 (or 20) with the class. You may like to point to the numbers on the class number line as they count, or have students point to the numbers on their desk number lines.

Exercise 2 _____

T: *Today, when we work in small groups at the centers, I want you to be thinking about what you are doing with the materials so you can share your work at the end of class.*

Let students go to centers and freely explore any of the manipulatives. As you visit each center observe students and ask questions. Bring along various colored string loops. When you observe a student who appears to have sorted their objects ask,

T: *Why do you have different piles? How did you decide what to put in each pile?*

Based on the student's response, restate the qualities or attributes of the different groups and continue.

T: *Since all these (point to one group) are red I am going to put this string around them, so we will know they all belong to the red group. You can put other objects in this string as long as they are red. Would you put something green in this string?*

Continue this process in the other groups. Try to place at least one string loop in each center. About ten minutes before the end of the period gather the class together for a discussion.

T: *I really liked what I saw in centers today. Some of you noticed I put strings around groups of objects in the centers. I did this to give us an easy way to sort things.*

How could I make a record to show someone else what I saw at this center today (point to a center)?

S: *You could draw a picture.*

K8

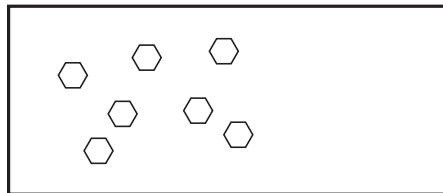
T: *Great idea. I think I will draw it on this paper to show you how to draw it in your math journal.*[†]

Point to a center where the students sorted objects and say,

T: *Belinda sorted objects at her center. How many objects did Belinda put in one pile?*

S: *Seven.*

T: *Count along as I draw seven objects on the paper. Do they look like Belinda's objects? (Yes)*



T: *Next, I will draw a string around the objects in this pile to show they are together.*

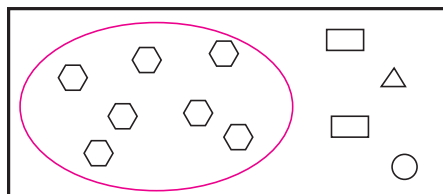
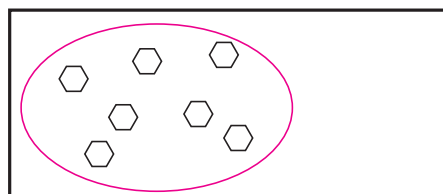
Does Belinda have other objects on the table? (Yes)

Count along as I draw them on the paper.

S: *One, two, three, four.*

T: *The picture shows us how Belinda put certain objects that were the same together.*

Now, I would like each of you to make a picture in your math journal of the objects you have sorted.



Note: It is important to realize that the students' journal entries will be their best effort, but not necessarily the easiest to recognize. In many cases, students will have to explain their pictures. That's okay. Their entries will improve over time.

[†]An explanation of math journals is contained on page 1-7.

Capsule Lesson Summary

Use sorting to separate geobands. Then use some of the geobands to begin free exploration with the geoboards.

Materials

Teacher	<ul style="list-style-type: none"> • Overhead geoboard • Geobands 	Student	<ul style="list-style-type: none"> • Geoboard • Geobands
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Advance Preparation: If you do not have an overhead geoboard, you can make a transparency from Blackline K9.

Description of Lesson

Hold up a geoboard and ask,

T: *What do you notice about this board? Does anyone know what it is called?*

This is called a geoboard, and we are going to be using it to help us understand and build shapes.

Hold up a bag of geobands.

T: *Do you know what these are?*

S: *They're rubber bands.*

T: *What are some ways we use rubber bands?*

S: *They hold things together.*

S: *They stretch.*

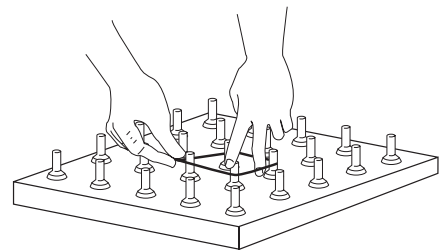
S: *You can shoot them.*

T: *These are a special kind of rubber band. They are called geobands because we will use them on our geoboards. As you know, rubber bands can fly off of things into the air. The same is true of the geobands. I will show you how to work with geobands so that doesn't happen.*

On the overhead, demonstrate the proper way to place and to remove a geoband on the geoboard.

T: *When putting a geoband on the geoboard or taking it off, always keep a finger on top of one of the pegs the band goes around.*

Distribute geoboards and geobands to pairs of students. Allow time for free exploration. As students are playing, check that each pair knows how to put geobands on and take geobands off the geoboards.



K9

After about 10–15 minutes of free play, call the class back to attention and make some group observations about the materials.

T: *What do you notice about the geobands?*

S: *They are different colors.*

S: *They are different sizes.*

Instruct student pairs to sort the geobands according to color and size. Then ask them to select one geoband of each color and put all the others back into their bag.

T: *Which color geoband is the biggest? Which color is the smallest? Put your geobands in order from biggest to smallest.*

Now you may use just these geobands, but you can make any designs that you want with them on the geoboard.

Students may make all kinds of shapes, pictures, letters, and numerals. As you walk around the room observing, you may want to comment on some designs and check that both students in a pair are contributing.

As with any manipulative material, allow a few moments at the end of class to put geobands and geoboards away. If you do not have a classroom set of geoboards, this activity may be done at a center.

Note: See Section One, page 1-12, for an explanation of the purpose of scheduled adjustment days.

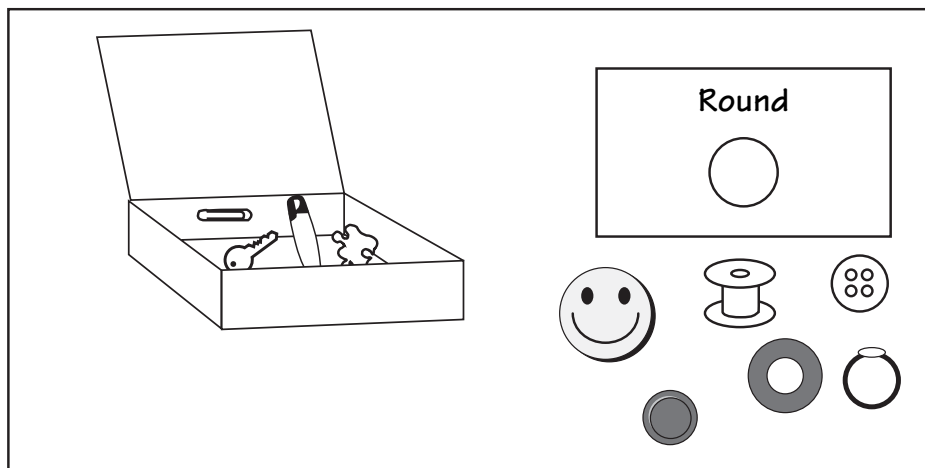
Today you may wish to repeat an earlier lesson either for a small group of students or for the entire class. Many of the lessons can be made to appear completely different by changing the story and/or the materials. If you feel students need to continue with free exploration, repeat Lesson K1. You may wish to repeat Lesson K9 *Geoboards*, letting students use a different collection of geobands or asking for a special kind of design.

The following activity may be used to give students additional practice classifying objects or identifying attributes in the sorting process.

Sort and Guess

Place odds and ends boxes at several locations around the room. For each box, decide on an attribute that describes many objects in the box and picture that attribute on an index card. Set the card next to the box. Send a small group of students to each location and ask them to take objects out of the box and place them near the card if the card describes them (if the object has that attribute). Leave all the other objects in the box. When finished, students should turn over the card.

Then rotate the small groups to other locations. At each location, instruct the group of students to try to guess how all the objects next to the card are alike (the attribute), and then check by turning over the card. Continue the rotations until all students have been at all locations.



Assessment: You may wish to use one of the sample assessment checklists, Blacklines K0 (b)–(k), to note students' sorting and classifying skills.

Early Warning

Among the next nine classroom lessons are some that require extra preparation or involve materials not included with the *CSMP* Classroom Set. The lessons are listed here for your convenience in preparing for them. A more detailed description of the needed materials can be found on the first page of each lesson. (Special materials are listed here only once, even if they are used more often during the nine-day period.)

K11 *Sorting with Strings #2*: String loops

K12 *Changes, Changes*: Building manipulatives

K15 *Graphing Objects*: Floor graph

K17 *Ways to Make Six*: Six identical large objects; small blocks or counters

K19 *Orchestra*: Clap, Tap, Snap visual aid cards

Several of the lessons also include suggestions for literature and/or fingerplays which are not included here. Please check the materials list at the beginning of the following lessons in advance so you can obtain the appropriate literature: K11, K12, K13, K14, K16, K17.

Capsule Lesson Summary

Continue exploration and sorting of manipulatives. Make a picture of the sorting using strings and dots.

Materials

Teacher <ul style="list-style-type: none"> • Fingerplay (optional) • String loops • Chart paper 	Student <ul style="list-style-type: none"> • Math journal or paper
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Advance Preparation: Set up several centers, each one having a different set of manipulatives and one colored string loop.

Description of Lesson

Exercise 1 _____

Lead the class in a fingerplay such as *Ten Red Apples*.

Exercise 2 _____

Direct students to work in small groups at the centers as in Exercise 2 of Lesson K8.

T: *Today at your center, you are going to sort. Put objects you think are alike in some way together inside the string loop.*

Move from center to center observing, questioning, and commenting.

Exercise 3 _____

Stop about 15 minutes before the end of the class period to review how to make a math journal entry (see Lesson K8).

T: *We are going to picture our work at the centers in our math journals.*

Refer students to their journal entries from Lesson K8.

T: *Last time you did this, you tried to draw a picture of each object. How did you like that?*

S: *It was fun.*

S: *It was hard.*

S: *It took a long time.*

T: *You're right. It was hard and did take a long time. Today we are going to try to make it easier.*

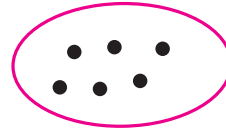
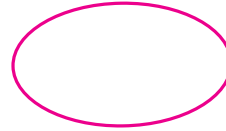
Select one center's sorted objects to use as an example.

T: *I am going to draw a picture of the sorted objects in this center on my paper. First, I'll draw a string to look like the string loop around objects that are alike.*

How many objects are there inside this string (point to string loop at the center)?

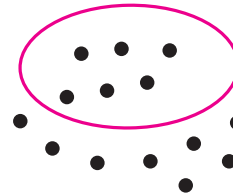
S: *Six.*

T: *Rather than draw an actual picture of each object inside this string, I'm going to draw a dot for each of them. Count along as I draw six big dots.*



Repeat this process for the objects outside of the string.

T: *This picture shows that, at this center, six objects are inside the string loop (point to each dot inside the string) and eight objects are outside the string loop (point to each dot outside the string).*



You may like to ask the students at this center how they decided to put things inside the string loop.

T: *Now, each of you can draw a picture of how you sorted at your center.*

As you observe students' pictures, encourage them to remember how the sorting was done.

Exercise 4 _____

Call on several students to share their sorting pictures with the class.

T: *As you listen to Steven tell us about his picture, think about what you like about his picture. You might also think of a question to ask him about the sorting.*

Capsule Lesson Summary	
In a free exploration environment, use building manipulatives to create patterns, geometric designs, or other structures.	
Materials	
Teacher <ul style="list-style-type: none"> • <i>Changes, Changes</i> by Pat Hutchins or another selection from the literature list 	Student <ul style="list-style-type: none"> • Building manipulatives such as wooden blocks, one-inch cubes, cardboard blocks, pattern or parquetry blocks, Lego® or Duplo® bricks, Lincoln Logs, and so on.

Description of Lesson

Note: This lesson is based on reading *Changes, Changes* to the students. If you use another story to introduce building with blocks, adjust the dialogue accordingly. The small group activities can be used whether you read the story or not.

Exercise 1 _____

Read *Changes, Changes* by Pat Hutchins to your students. On the board, set up a response chart similar to the one shown below, and record student responses to the following questions.

- T:** *What were some of the things that were built out of blocks in this story?*
 What have you actually made using blocks?
 What would you like to make with the blocks that you have not made before?

Changes, Changes	Our class has made	Our class would like to make
Boat Bridge Firehose	Castle Roads City Tower	Airport Garage Skyscraper

Exercise 2 _____

Organize the students into small groups of three to five. Give each group a different set of building blocks. Then instruct the groups to create whatever design, pattern, or structure they like with their blocks. As you observe the group work, encourage students to talk about their buildings. Note how individual students interact with other students and with the materials.

Exercise 3 (optional) _____

Call on student groups to describe their buildings to the class. Encourage students to use size comparisons, ideas of pattern, or shape recognition in their descriptions. You may like to let other students comment on a group’s building or ask questions.

Capsule Lesson Summary

Use the languages of strings and arrows to picture relations in a story.

Materials

Teacher	<ul style="list-style-type: none"> • <i>Five Little Monkeys Sitting in a Tree</i> by Eileen Christolow or another book from the literature list • Colored chalk 	Student	<ul style="list-style-type: none"> • None
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Note: This lesson is based on *Five Little Monkeys Sitting in a Tree*, a book written from the counting backward song given below. If you chose a book from the literature list that is different from *Five Little Monkeys Sitting in a Tree*, the dialogue and diagrams will be different from those presented in this lesson. You may also wish to vary the number concept according to your students' abilities, for example, increase five little monkeys to ten little monkeys.

Description of Lesson

Read *Five Little Monkeys Sitting in a Tree* by Eileen Christolow, or another book from which you can set up a relationship, aloud to the class. Conduct a group discussion of the story.

Five Little Monkeys

Five little monkeys sitting in a tree
Teasing Mr. Alligator, "Can't catch me! Can't catch me!"
Along came Mr. Alligator, quiet as can be, SNAP!

Four little monkeys sitting in a tree...
Three little monkeys sitting in a tree...
Two little monkeys sitting in a tree...
One little monkey sitting in a tree...

No little monkeys sitting in a tree
And Mr. Alligator as fat as can be.

T: *Who are the main characters in this funny story?*

S: *The five monkeys and the alligator.*

T: *Was there a problem in this story?*

Allow students time to discuss what they thought the problem was.

T: *We're going to act out this story, so we'll need five monkeys and one alligator.*

K13

Choose actors. Then reread the story or song with a student sitting down after each “SNAP!” The rest of the class can sing along.

T: *Could we draw a picture to tell this story?*

Someone may suggest drawing a tree with monkeys, a river, and an alligator.

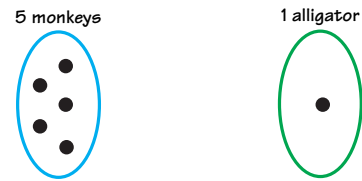
T: *Sure, we could draw a picture of a tree, then draw five monkeys in the tree, and then draw a river with an alligator. But that sounds like a lot of work and I am afraid it will take a long time.*

Do you remember how we drew dots for objects before?

Let’s use dots for the monkeys and the alligator.

Draw this picture on the board.

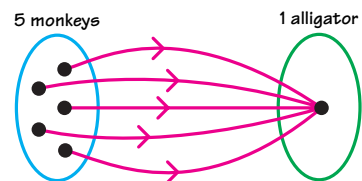
Call on students to point to and count the monkeys and the alligator.



Draw arrows in your picture as shown.

T: *What could the arrows mean?*

S: *“I teased you.”*

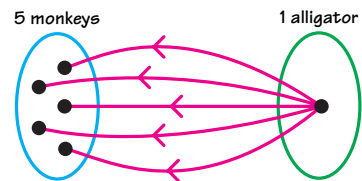


Reverse the direction of the arrows as in the following illustration.

T: *Now, what could the arrows mean?*

S: *“I snapped at you.”*

S: *“I ate you.”*



Writing Activity

In their math journals, ask students to draw their own picture to tell about the story. Some may choose to draw monkeys and alligators; others may draw a picture with dots and strings.

Capsule Lesson Summary

Explore attribute block manipulatives to distinguish aspects of size, shape, and color.

Materials

Teacher	<ul style="list-style-type: none"> • <i>Shapes</i> fingerplay, or <i>Circles, Triangles, and Squares</i> by Tana Hoban, or another book from the shape section of the literature list 	Student	<ul style="list-style-type: none"> • K A-blocks • Math journal or paper
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Advance Preparation: Prepare enough sets of K A-blocks for each student. If you prefer to use wooden or plastic attribute blocks, choose sets with color, shape, and size attributes.

Description of Lesson

Exercise 1 _____

Introduce the fingerplay *Shapes*, or read a book about shapes such as *Circles, Triangles, and Squares* by Tana Hoban. Ask students to look around the room and tell what shapes they see.

Exercise 2 _____

Provide each student with a set of K A-blocks and a flat surface (desk, table, floor) on which to work. Explain that they can use the blocks as they like for a few minutes, perhaps to create some nice designs.

Circulate among the students, encouraging creative activity and exploration. You may like to let students talk with you or with their friends about what they are doing.

Occasionally ask questions to encourage observation of color, number of sides, size comparison, and so on.

T: *Tell me about some of the pieces you are using.*

How did you decide to use those pieces?

Does this piece have corners?

What color is this piece?

Does this piece have the same number of sides as it has corners?

Which of these two pieces has more sides?

Which piece has the most corners?

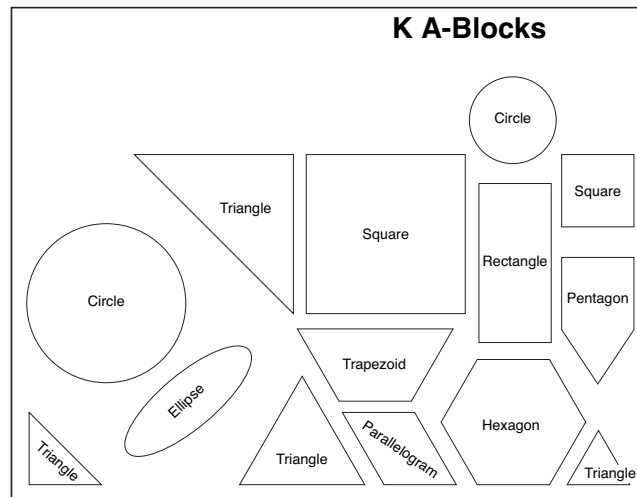
Can some of these pieces be put together to fit onto this piece? How many?

Are all the sides of this piece the same size?

Here are some additional notes about this free exploration activity.

- Comment positively on any designs and sorting that is evident. You may wish to use the observation record on Blackline K0 (c) to make appropriate notes.
- If a student asks you what a certain shape is called, answer simply with a proper name.
- A student may volunteer a name for a shape. If the correct name is used, reinforce it. If the name is original, comment that, although that name is interesting, the shape does have another name and give the common name to the student.
- If a student uses, for example, the name *triangle* when referring to a square, give credit for being aware of the word *triangle*; then correct the identification.

The names of the shapes of the CSMP K A-blocks do not appear on the actual pieces; they appear here for your information only.



Free play activities may include some drawing and coloring in math journals. Students can make freehand drawings, trace around the blocks as if they were stencils, or use a punched-out sheet as a template. Possible directed activities include the following:

- Draw different shapes, but color them in a specified way (green circles, blue triangles, and so on).
- Reproduce just one shape several times, varying the pattern with different colors or different placements.

Center Activity

The following materials may be placed in a center to reinforce shape concepts:

- Shape cookie cutters and clay or playdough. A plastic knife can be used to cut out shapes if cookie cutters are not available.
- Magazines or newspapers from which students can cut out shapes to create a shape collage.
- Felt shapes for students to make designs on flannelboards.
- Popsicle sticks, toothpicks, or pipe cleaners for students to make shapes by gluing these materials on pieces of paper.

Capsule Lesson Summary

Using items from the odds and ends box, graph objects after sorting them.

Materials

- | | | | |
|----------------|--|----------------|--|
| Teacher | <ul style="list-style-type: none"> • Odds and ends box • Three-column floor graph • Blackline K15 | Student | <ul style="list-style-type: none"> • None |
|----------------|--|----------------|--|

Advance Preparation: Place objects in your odds and ends box that can be sorted into three distinct categories. Prepare a three-column floor graph using a robot walk grid sheet[†] or other materials of your choice such as chart paper or a vinyl table cloth. Use Blackline K15 to prepare three-column graphs for centers or for individual students.

Description of Lesson

Note: This graphing activity may be repeated several times, especially with lessons calling for sorting odds and ends.














Explore and discuss ways to sort the odds and ends with the whole class. First, ask each student to select an object from the odds and ends box. Then select three students (who have selected objects with distinctly different attributes) and ask them to place their objects at the base of your floor graph. Discuss with the class how these objects are different and what is special about each object. Next, invite students, one at a time, to describe their object and tell which object at the base of the graph it is most like. In this way, encourage students to suggest an attribute for each column of the graph. Ask students to place their objects in the columns of the graph, getting class agreement for each placement.

S: *My object is used for writing, so I put it in the middle column.*

Once all the students have placed their objects, ask them to compare the lengths of each column. (Do not ask them to count and compare numerical values at this time.)

When all the students have placed their objects, ask a few questions about the graph. For example:

- T:** *What does this graph tell us?*
- Which column has the most objects? How do you know?*
- Which column has the fewest objects? How do you know?*
- Do we have more keys or more buttons?*
- How many buttons do we have?*

[†]The robot walk grid comes with the CSMP Classroom Set.














K15

Call on individual students to count objects in a column and then to record the number on the graph or on a piece of paper at the base (or top) of the column as illustrated here.

Then ask some numerical comparison questions, such as:

T: *Is 6 more or less than 3?*

T: *Which number is the greatest? ...the least?*

4	6	3
---	---	---

Center Activity

Odds and ends boxes can easily be used at centers. Working in small groups, students can sort objects and place them in a graph according to attributes. Blackline K15 is available to make three-column graphs for use in centers.

Capsule Lesson Summary

Associate a number of objects with the dots on demonstration dot cards and numbers on numeral cards.

Materials

Teacher	Student
<ul style="list-style-type: none"> • Counting book with numbers 1–10 from the literature list • Demonstration dot cards (1–10) • Demonstration numeral cards (1–10) • 10 small objects 	<ul style="list-style-type: none"> • None

Advance Preparation: Choose ten small objects, all the same, such as checkers, pennies, buttons, and so on.

Description of Lesson

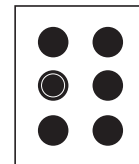
Exercise 1 _____

Introduce a new counting book and read it aloud to the class.

Exercise 2 _____

Invite the students to form a large circle on the floor. In the center of the circle, scatter the 1–10 numeral cards so the numbers are visible. Place a box of objects (for example, checkers) in the center of the circle as well. Show the students a demonstration dot card of your choice; then place it in the center of the circle.

T: *I would like someone to place one checker on each dot. Count how many checkers you are putting on the dot card.*

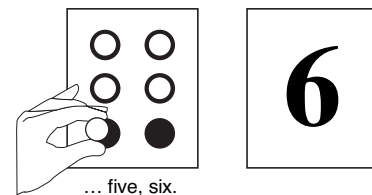


Select a student to place the checkers on the dot card.

T: *Who can find the number that matches this dot card?*

Select a different student to find the numeral card and place it next to the dot card with checkers on it.

Continue this process with the other dot cards. Try to involve all the students, especially those who need more practice counting and associating a number with a number of objects.



As a variation, scatter the dot cards in the circle with the dots visible. Then, show students a numeral card of your choice, place it in the center of the circle, and continue as before. This method allows students to work in reverse, from a written number to a number of dots.

Assessment: You may wish to use one of the sample assessment checklists, Blacklines K0 (b)–(k), to note students' number recognition and correspondence with a number of objects.

Capsule Lesson Summary

Use manipulatives to create different arrangements for 6.

Materials

Teacher <ul style="list-style-type: none"> • Counting song or counting book • Six identical large objects (e.g., wooden or cardboard blocks, shoeboxes, books) 	Student <ul style="list-style-type: none"> • Six small blocks or counters
---	---

Description of Lesson

Exercise 1 _____

Read a counting book aloud such as *Fish Eyes: A Book You Can Count On* by Lois Ehlert, or introduce a fingerplay or counting song such as *Ten Little Kittens*.

Exercise 2 _____

Pass out six identical small blocks or counters to each student. Allow a few minutes, as necessary, for free play.

Put your six identical objects (in this example, boxes) on the floor, in two groups of three.



Seat the students in a large circle so that they can see your boxes.

T: *Arrange your six blocks to look like my six boxes.*

What do you see?

S: *Six boxes, three over here and three over there.*

Write the following on the board or chart paper.

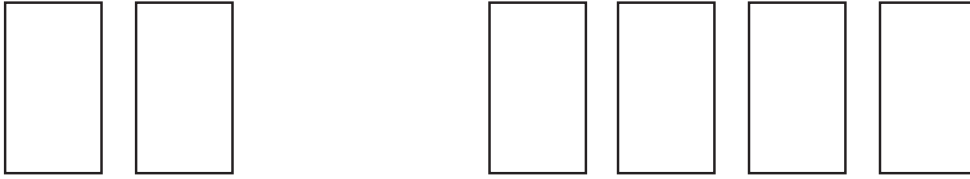
6

Note: You may like to read this as “six is the same as three plus three” or “three plus three equals six.” Do not overemphasize a number sentence at this time.

$3 + 3$

T: *Can anyone rearrange these boxes in another way?*

Suppose a student arranges the boxes like this:



T: *Good, arrange your blocks to look like the boxes do now.*

How many boxes are over here? (Two)

6

And how many over there? (Four)

3 + 3

How many altogether? (Six, just like before)

2 + 4

Repeat this exercise with several other combinations for six. There are, of course, many ways to make six; avoid the temptation to see if the students can find all the possible ways.

6

5 + 1

2 + 2 + 2

3 + 3

1 + 2 + 3

1 + 1 + 4

2 + 4

3 + 1 + 2

1 + 1 + 1 + 1 + 1 + 1

To ensure the students' future enjoyment of similar activities, stop while their interest is still high. You can bring the activity to an end by saying,

T: *Look at all the different ways we found to write 6. Let's read them together.*

Writing Activity

Instruct students to write or draw their favorite way(s) of making six in their math journal.

Home Activity

Suggest that students practice finding combinations (facts) for six, or some other number between 1 and 10, at home with the help of a family member. A sample letter to parents/guardians for this home activity is provided on Blackline K17.

Capsule Lesson Summary

Introduce C-rods to begin work on concepts of length and comparison.

Materials

Teacher	Student
<ul style="list-style-type: none"> • Set of C-rods • Overhead C-rods (optional) • Blacklines K18 (a) and (b) (optional) 	<ul style="list-style-type: none"> • Set of C-rods • Worksheets K18 (a) and (b) (optional)

Advance Preparation: Use Blacklines K18 (a) and (b) to make copies of worksheets if you choose to use them in Exercise 2.

Description of Lesson

Exercise 1 _____

You may like to start calling the materials “C-rods” at this time. Begin with a short period of free exploration with the C-rods. After 5–10 minutes, ask the students to stop what they are doing, and give the following directions.

T: *We are going to work with the C-rods today. It is important for you to be a good listener, because I will be giving you directions. Let’s see who can follow along. To begin, put all the C-rods in front of you.*

I am going to ask you to show me various rods. When I do, hold up the rods I asked for so we can all see.

Ask the students to show you a selection of rods, one after another. Vary the sorts of descriptions you use. For example:

T: *Show me*

- *one red rod*
- *one yellow rod and one black rod*
- *two light green rods*
- *the shortest rod*
- *the longest rod*
- *two rods that have the same color*
- *two rods that have the same length*

Find a rod that is longer than the brown one (hold up a brown rod).

Find two different rods that are shorter than the orange rod (hold up an orange rod).

Exercise 2 _____

In this exercise, work with small groups of three to five students. While you are working with a group, you may like to let the other students do Worksheets K18 (a) and (b). For these worksheets, explain to the students that they should first make the given design with their C-rods; then color the design the color of the C-rods.

K18

Give the following directions to a group of students.

- T:** *Put away all the rods except one white rod, one yellow rod, and one orange rod.
Which of these rods is the longest? (Orange)
Which one is the shortest? (White)
Which one is in between? (Yellow)*

Ask students to place these three rods in their hands and hide them behind their backs. Now ask students to locate one of the three rods by touch alone.

- T:** *Show me*
- *the shortest of the three rods*
 - *the longest of the three rods*
 - *the yellow rod*
 - *the white rod*

End the small group work by asking the students to solve the following riddle.

- T:** *I am not the shortest of these three rods.
I am not the longest of these three rods.
Which one am I?*

Repeat this activity until all students have worked in a small group.

Center Activity

For additional practice, put C-rods in a math center where students can repeat some part of this activity with a partner.

Capsule Lesson Summary

Demonstrate pattern recognition using snapping, clapping, and/or patting and relate to a visual pattern.

Materials

Teacher <ul style="list-style-type: none"> • <i>Tap, Tap, Tap</i> fingerplay • Magnetic checkers • Snap, Tap, Clap cards • Baton (optional) 	Student <ul style="list-style-type: none"> • None
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Advance Preparation: Blackline K19 (a)–(c) provide the Snap, Tap, and Clap visual aid cards. You may wish to mount them on colored construction paper, or perhaps copy them on colored paper and laminate them. To coordinate with the lesson, use red for Tap, blue for Clap, and yellow for Snap. Also, you may find it helpful to write out the fingerplay on chart paper or sentence strips.

Description of Lesson

Exercise 1 _____

Prepare students for this patterning activity by teaching them the *Tap, Tap, Tap* fingerplay.

Tap, Tap, Tap

Point to your toe. Go tap, tap, tap.

(Tap toe)

Press your fingers, snap, snap, snap.

(Snap fingers)

Make your hands go clap, clap, clap.

(Clap hands)

Now it's time to take a nap.

(Put hands together, lay head on hands)

Exercise 2 _____

Divide the class in half. One half will be the Tap group. Their role is to tap on their desktops whenever you (or a student) point to the Tap picture.

The other half of the class will be the Clap group. Their role is to clap their hands together whenever you (or a student) point to the Clap picture. Place the Tap/Clap cards where all can see. Conduct a couple of practice rounds where you point to the picture and the students respond.

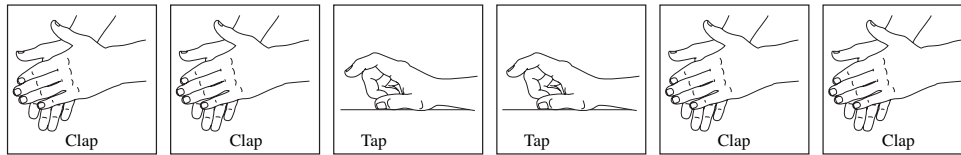
Note: Instead of having students tap their desks, you might like to provide some ordinary percussion instruments (such as tambourines), or let students tap on the floor, on cans, on boxes, and so on.

T: *Okay, I am going to point to the Tap and Clap pictures in a certain order. When I point to your picture, make sure you respond.*

Think about the order when we do this. Here we go!

K19

Point to the Clap card two times in a row. Then, point to the Tap card, also two times in a row. Finally, point to the Clap cards two more times.



T: *What pattern did you notice?*

S: *Clap, Clap... Tap, Tap... Clap, Clap.*

T: *How could we record this pattern to show someone else?*

S: *Draw pictures like you were pointing to. First, two Clap pictures, then two Tap pictures, then two Clap pictures again.*

S: *Write the words "Clap, Clap, Tap, Tap, Clap, Clap."*

S: *Use two different colored checkers, like blue for Clap and red for Tap.*

Record this pattern on the board, explaining that you are going to use red checkers for Tap and blue checkers for Clap.



T: *If I continue this pattern, what do you think will come next?*

S: *Two reds (Taps).*

T: *And then?*

S: *Two blues (Claps).*



Ask the students to tap and clap again; this time, point to the appropriate dots as they do so.

Put the following pattern of colored checkers on the board:



T: *What do the red dots mean?*

S: *Tap.*

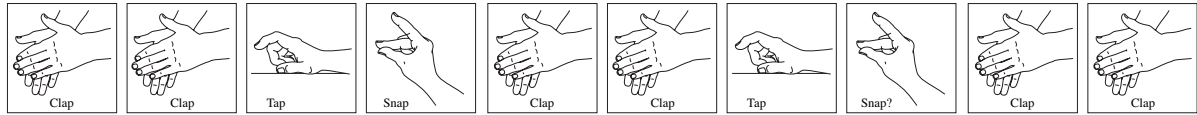
T: *And the blue dots?*

S: *Clap.*

T: *Look carefully at the pattern. Who can do what it says?*

Let volunteers make attempts. As soon as someone manages to do it correctly, let the whole class join in. You may like to give the student who was able to do it correctly a baton to "direct the orchestra." Be sure to give a very clear signal to indicate when they are to begin.

If your class enjoys this activity, introduce a pattern involving Clap, Tap, and Snap.



To represent this pattern with colored checkers, choose a third color for Snap. For example:



Extension Activity

Instruct students to work in small groups with manipulatives that can be patterned (e.g., C-rods, colored blocks, beads, paper clips, or small squares of construction paper). Ask students to create patterns and then to record them in their math journals. Share journal entries with the whole class.

Home Activity

Send home a Clap/Tap/Snap activity for students to do with family members. A parent letter and sample activity can be made from Blackline K19 (d).

Note: See Section One, page 1-12, for an explanation of the purpose of scheduled adjustment days.

Today, you may wish to repeat an earlier lesson either for a small group of students or for the entire class. Many of these lessons can be made to appear completely different by changing the story and/or the numbers in the lesson such as in Lesson K17 *Ways to Make Six*. If you feel any students need to continue with free exploration, repeat Lesson K1 *Free Exploration* using different materials.

If you wish, Lesson K15 *Graphing Objects* can be varied by directing students to make a floor or table graph using a number of the same type of objects; for example, shoes. Call on one student to take off one shoe, and begin a column with it. Starting either at the top or bottom ask the student to identify what type of shoe it is (i.e., one that ties, a boot, a slip-on, a sneaker, and so on). Ask if any other students have similar shoes and, if so, have them place theirs in the same column. Repeat this process for other students with other types of shoes. (If a student has a shoe that does not fit any of the categories, place it off the graph or create another category called “unlike all others” or “unique.”) Direct students to count the number of shoes in each column, and decide which type has the most, the least, or the same.

The following game activities may be appropriate for working on listening skills, attribute recognition, and comparative size with groups of students.

Simon Says_____

Good listening skills and the ability to follow directions will increase the likelihood of success in school. Games, such as Simon Says, provide fun ways of working on these two important skills.

In this well-known game, the teacher (or the player who is “it”) gives directions, which are to be obeyed only if preceded by the words, “Simon says.”

Examples: Simon says, “Hold up three fingers!” (Everyone should hold up three fingers.)
 Simon says, “Jump!” (Everyone should jump.)
 Turn to the right! (Nobody should move.)
 Sally says, “Sit down!” (Nobody should move.)

What If...?_____

Pose a “what if...” question to a group of students and record responses on chart paper. The questions can ask students to recognize a particular attribute such as color, size, shape, or order. For example:

- What if we could only eat red foods; what could we eat?
- What if we could only draw round things; what could we draw?
- What if we could only write numbers less than 8; what numbers could we write?
- What if only people shorter than Tara could sit at this table; who could sit at this table?

K20

Where Does It Go?

Arrange several (three or four) objects by some aspect of size (height, length, mass, capacity, and so on). Then introduce a new similar object and ask,

T: *Where would we place this _____?*
 Why does it fit there?

Assessment: You may wish to use one of the sample assessment checklists, Blacklines K0 (b)–(k), to note students' classification and seriation skills.

Early Warning

Among the next nine classroom lessons are some that require extra preparation or involve materials not included with the *CSMP* Classroom Set. The lessons are listed here for your convenience in preparing for them. A more detailed description of the needed materials can be found on the first page of each lesson. (Special materials are listed here only once, even if they are used more often during the nine-day period.)

K21 *Children and Books*: Pointer; ten storybooks

K22 *Order by Size*: 4 to 6 objects of differing sizes per student or pair of students

K25 *Geoboards #2*: Overhead geoboard or transparency; student geoboards and geobands

K26 *Happy Fish #1*: Goldfish crackers or counters

K27 *C-Rods #2*: Chart paper

K28 *Number Collage*: Large piece of paper; glue; small paper rectangles or other shapes

K29 *The Zoo*: Large string loops; animal labels

Several of the lessons also include suggestions for literature and/or fingerplays which are not included here. Please check the materials list at the beginning of the following lessons in advance so you can obtain the necessary literature: K23, K24, K26, K27, K28, K29.

Capsule Lesson Summary

Use the language of strings and arrows to create a concrete counting experience. Act out and picture giving ten books to four students.

Materials

Teacher <ul style="list-style-type: none"> • Colored chalk • Pointer • Ten storybooks 	Student <ul style="list-style-type: none"> • None
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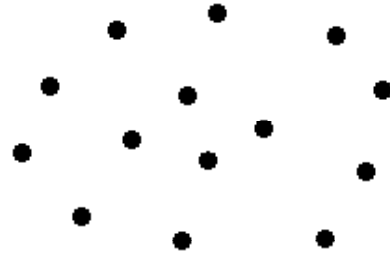
■ Description of Lesson

Draw 14 dots spread out across the chalkboard. Think about how you want the final picture (see next page) to look to plan your layout. When you add strings and arrows to the picture, be sure they are clearly visible (for example, draw them using the side of a small piece of chalk).

Begin the following discussion with your students:

T: *I have drawn some dots: some are for children, some are for storybooks. Count them with me. How many dots are there?*

S: *14.*



Ask a volunteer to check this answer by counting the dots and pointing to each one. Then ask the volunteer to point to 14 on the number line while the others find 14 on their desk number lines. Write 14 on the board.

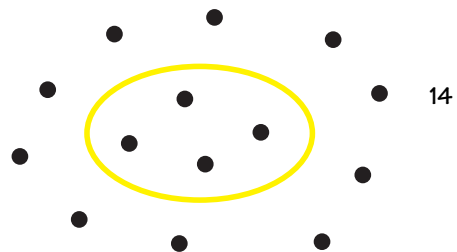
T: *What are the dots for?*

S: *Storybooks or children.*

Draw a string around four of the dots.

T: *The dots inside the string are for the children. How many children are there?*

S: *Four.*



Ask everyone to show four fingers and then point to 4 on their desk number lines. Write “4 children” next to the picture.

T: *How many storybooks are there? How do you know?*

S: *Ten; there are 10 dots outside the string.*

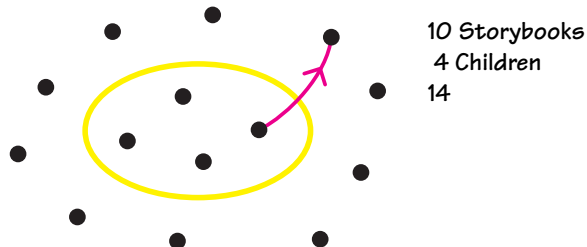
Ask everyone to show ten fingers and then point to 10 on their desk number lines. Write “10 storybooks” next to the picture. Select four students to act out distributing 10 storybooks to 4 students. Instruct each of the four students to count the books they receive.

T: *Let’s show how we gave storybooks to these children.
John, how many storybooks did you get?*

S: *One.*

T: *Can we draw an arrow to show this?*

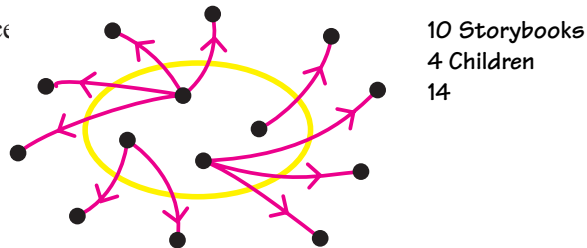
While the class watches, ask the student to trace an arrow using a pointer or a finger. Draw the arrow yourself.



Continue with the other students.

T: *Maria, how many storybooks did you get?*

Let Maria trace arrows to her storybook(s), but once again you should actually draw them. Repeat this process with two other students.



T: *Look carefully at our picture.
Does each child have storybooks?*

Does each child have the same number of storybooks?

Who has the most?

Who has the fewest?

Extension Activity

Repeat the above activity with students working in groups of four. Give each student in a group some objects (e.g., counters or checkers). Then ask the groups to draw a picture of the way you gave the objects to them.

T: *Raise your hand if you have the most checkers in your group.
Raise your hand if you have the fewest checkers.
Raise your hand if you have the same number of checkers as someone else in your group.*

Capsule Lesson Summary

Order a collection of like objects.

Materials

Teacher <ul style="list-style-type: none"> • None 	Student <ul style="list-style-type: none"> • 4 to 6 objects of differing sizes (e.g., leaves, boxes, cans, balls, buttons, cups, paper rolls) • Math journal or paper
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Note: The different-sized items in this lesson can easily be matched to a theme.

Description of Lesson

Exercise 1 _____

Draw a circle on the board.

T: *Look at this circle. Is it big?*

Allow time for students to respond. You should get a variety of responses and conclude that you can't tell for sure.

T: *We can't really tell. Why is it hard to answer this question?*

Again, allow time for students' comments. If no one mentions it, suggest you can't tell because you don't know what to compare the circle to.

Draw a much smaller circle next to the first one.

T: *Now can we tell if the first circle is big?*

S: *Yes, it is big compared to the other circle.*

Erase the board. Draw a square and ask the students about its size.

T: *Is this square small?*

Again, allow time for students to respond, concluding that they can't tell because they don't know what to compare it to.

Draw a much larger square next to the first one.

T: *Now can we tell if the first square is small?*

S: *Yes, compared to that square it is small.*

Exercise 2

Provide each student or pair of students with a set of four to six similar objects. Pose the following questions to the class.

T: *What do you notice about your objects? How are your objects alike? How are they different?*

Take responses from several individuals or pairs.

T: *Now put your objects in order from the smallest to largest (shortest to tallest or longest, and so on).*

Allow a few minutes for this to be done. Then ask students to record the ordering in their math journals or on paper. Before ending the lesson, ask some questions about other ways to order the objects.

T: *Is there any other way to arrange your objects? Did you have any objects that were of equal or the same size?*

Extension Activity

Put students with similar objects in groups of four to six. Then ask the groups to combine their objects and order all of the objects.

Capsule Lesson Summary

Use a variety of methods to assist students in writing numerals 1 through 5.

Materials

Teacher	• Counting song or counting book	Student	• Math journal or paper • Colored pencils or crayons
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Note: This short numeral writing activity can be repeated at various times throughout the year, varying the numbers and the materials.

Description of Lesson

Spend five to ten minutes teaching students a counting song such as *One Elephant Went Out to Play*, or *One to Ten*, or reading a counting book from the literature list.

Ask everyone to show one finger with their pointer finger; then to point to 1 on their desk number line. Instruct everyone to trace a 1 in the air while you point to 1 in a classroom number display.

T: *Watch as I write 1 on the board. On your paper, draw one red dot; then write a beautiful red 1 next to it.*

Repeat this process with the numbers 2–5 perhaps using different colors for different numbers. Let students practice writing all the numbers from 1 to 10 in their math journals or on paper.

Center Activity

Put some of the following materials in centers to use for further numeral writing practice.

- Playdough or clay (Roll a specific number of balls of clay or make a number out of clay.)
- Shaving cream/cornmeal/flour/sand (Make a specified number of dots out of one of these materials or write a number with it.)
- Individual chalkboards (Draw a specific number of objects on the board or write a number on the chalkboard.)
- Pipecleaners (Count out a specified number of pipe cleaners or bend one to form a number.)

Capsule Lesson Summary

Identify K A-blocks with shapes of items in the classroom and in a book. In free exploration with K A-blocks, distinguish aspects of size, shape, and color.

Materials

Teacher <ul style="list-style-type: none"> • <i>Shapes, Shapes, Shapes</i> by Tana Hoban or another selection from the literature list • K A-blocks 	Student <ul style="list-style-type: none"> • K A-blocks
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Description of Lesson

Exercise 1 _____

Provide each student with a set of K A-blocks and space in front of them to lay out the pieces. Point to something in the classroom and ask students to hold up that shape from their K A-blocks. Repeat this with several items in the classroom. Then show the class the storybook *Shapes, Shapes, Shapes*. Show the class the first picture in the storybook and ask students to locate a shape that they see in the picture from their K A-blocks. Discuss the different shapes. Continue this activity with other pages in the book.

Exercise 2 _____

Let students know they can use the K A-blocks to build things or create designs and then provide time for them to simply play with the blocks. Tell the class as you walk around you will look for some beautiful designs or interesting things that they are building. If the students want to talk with you or with their friends about what they are doing, they should be encouraged to do so.

As you are walking around the room, make a point of asking some questions in a casual manner but in a spirit of genuine curiosity. In addition to checking on colors and number of sides or corners, some probing questions can be asked. For example:

T: *Tell me what you are making.*

How did you decide to use those pieces?

Tell me about some of the shapes you're using.

Does this piece have the same number of sides as it has corners?

Which of these two pieces has more sides?

Which of these two pieces has fewer corners?

Can some of these pieces be put together to fit onto this piece? How many?

Are all the sides of this piece the same size?

K24

See Lesson K14 for some additional notes about free exploration with K A-blocks

Free play activities may include some drawing and coloring in math journals (see Lesson K14). For example, students may use the K A-blocks as templates to trace around and make a picture using many different shapes.

Capsule Lesson Summary

Use the geoboard to explore squares and designs made with several squares.

Materials

Teacher	<ul style="list-style-type: none"> • Overhead geoboard and geobands • Cardboard square (K A-block square) 	Student	<ul style="list-style-type: none"> • Geoboard and geobands
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Description of Lesson

Note: If you do not have a classroom set of geoboards, this activity may be done at a center.

Spend a few minutes reviewing the discussion about geoboards and geobands from Lesson K9.

Distribute geoboards and geobands to pairs of students. Allow 5-15 minutes for free exploration. During this time check that individual students know how to put on and take off geobands safely.

When you are ready, call the class back to attention and begin a more directed exploration. Hold up a cardboard square (for example, a K A-block square).

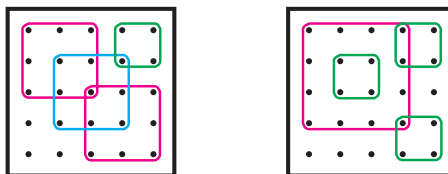
T: *What shape is this?* (Square)
What do you notice about a square?

Encourage observations such as it has four sides and four corners, the sides are all the same (length), and the corners are all the same.

T: *Use one geoband and make a square (a shape like this) on your geoboard.*

As students make shapes, hold up some examples to comment on size and position of squares on the geoboard.

Next, direct each student pair to use four geobands (two per student) to make a design on their geoboard. Suggest they make a square with each geoband and take turns putting on their bands. The following shows examples of student pairs' resulting designs.



You may like to let some student pairs show their designs to the rest of the class.

K25

Let students continue to play freely with the geoboards until you are ready to end the activity. As with any manipulative material, allow clean up time at the end of the class.

Extension Activity

You may like to repeat this lesson several times using different shapes such as a triangle, a rectangle, or a pentagon.

Capsule Lesson Summary

Show five fish in a fishbowl by putting fish in, taking them out, or leaving them alone.

Materials

Teacher	<ul style="list-style-type: none"> • <i>One Fish, Two Fish, Red Fish, Blue Fish</i> by Dr. Seuss, <i>Blue Sea</i> by Robert Kalan, or another selection from the literature list • Magnetic checkers 	Student	<ul style="list-style-type: none"> • Goldfish crackers or counters • Fishbowl paper
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Advance Preparation: Use Blackline K26 to make copies of a fishbowl for students.

Description of Lesson

Exercise 1 _____

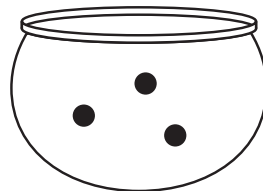
Read *One Fish, Two Fish, Red Fish, Blue Fish* by Dr. Seuss, *Blue Sea* by Robert Kalan, or another literature selection. You may wish to use the counting song *Fish Story* from the list in K0.

Exercise 2: Happy Fish _____

T: *One of my friends owns a pet shop that specializes in all kinds of fish. As you know, fish need to have lots of water and swimming room if they are to be healthy and happy. So, my friend is very concerned about how many fish are in each bowl. He has decided that there should be exactly five fish in each bowl. (Write 5 on the board.) There is only one problem. My friend has a niece, Jody. She loves to help him clean out the bowls and change the water . . . but she can't count very well. Look, here is the first bowl she cleaned yesterday. The checkers (dots) are for fish.*

Draw a fishbowl or a string and place magnetic checkers in it (if this is not possible, draw dots instead). Write 5 near the picture.

5



The students will probably notice that this bowl doesn't contain five fish. Ask them if they can help Jody. If necessary, ask questions such as:

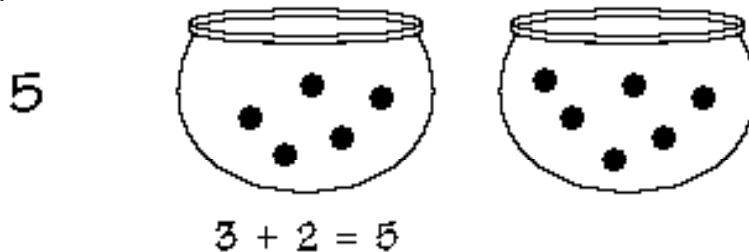
T: *How many fish are there in this bowl?* (Three)
Is that too many or not enough? (Not enough)
What should Jody do? (Add two fish)

K26

Choose a student to add checkers (or draw two more dots) inside the string. Write $3 + 2 = 5$ on the board. Do not emphasize the number sentence.

T: *Three plus two is five.*

Give students counters (or fish crackers) and a fishbowl paper to use at their own desks. Direct them to do what you do on the board. Draw a second string (fishbowl) and slowly put six checkers inside this second fishbowl.



T: *Here is a second bowl with the fish Jody put in. What do you think?*

S: *She put in too many fish. She put in 6, not 5.*

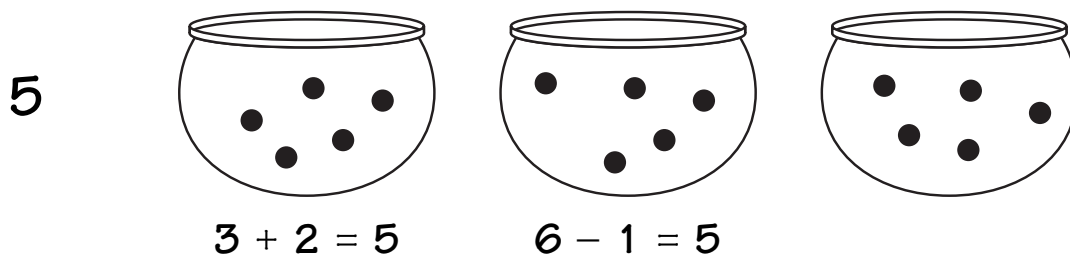
T: *What should Jody do?*

S: *Take one out.*

When this has been done, write $6 - 1 = 5$ on the board and draw a third string. Tell the students to empty their fishbowls and get ready to follow what you do on the board.

T: *Here is Jody's third try.*

Slowly put five checkers in the third bowl and check that the students do so as well.



T: *What do you think about this fishbowl? How did Jody do?*

S: *There are five fish in this bowl. That's the correct number.*

To correct a mistake, ask a student to count the checkers in the string being discussed.

Writing Activity

Direct students to draw pictures representing the story of Jody and the fishbowls in their math journals. Students may draw fish pictures or use strings and dots to show any one of the three fishbowls Jody worked with. Encourage students to write numbers next to their pictures.

Capsule Lesson Summary

Relate an order of C-rods to an order of animals in the story *There Was an Old Woman Who Swallowed a Fly*.

Materials

Teacher	<ul style="list-style-type: none"> • <i>There Was an Old Woman Who Swallowed a Fly</i> by Stephen Kellogg • Chart paper 	Student	<ul style="list-style-type: none"> • Set of C-rods
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Advance Preparation: You may like to find pictures for the animals in the story to use during the lesson.

Description of Lesson

Read the story *There Was an Old Woman Who Swallowed a Fly* by Stephen Kellogg aloud to the class.

On chart paper, record students' responses to the following questions. Print the words and a simple drawing for later reference.

T: *The old woman swallowed a lot of animals. What did she swallow first? What did she swallow second?* (Continue until all animals are recorded.)

What do you notice about the order in which she swallowed the animals?

S: *She swallowed the littlest one first.*

S: *She swallowed the horse last.*

Distribute sets of C-rods to groups of two to three students.

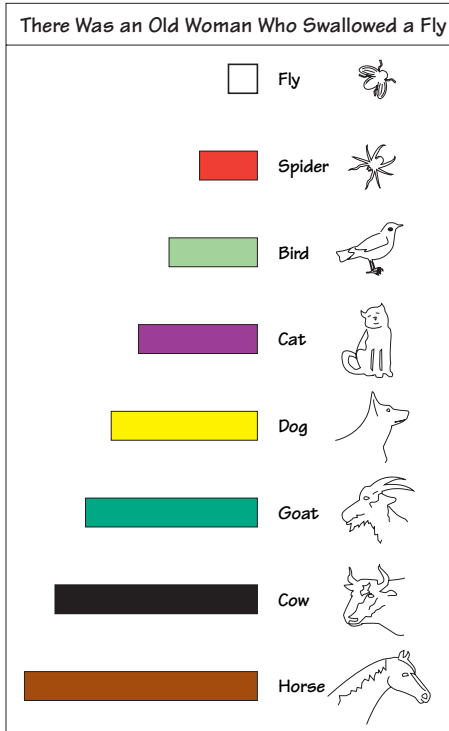
T: *Today we are going to match C-rods with the animals in the story. Which rod should be for the fly?*

S: *The white one (1-rod).*

S: *The littlest one.*

T: *Place that rod in front of you. Which rod should be for the spider? (Red) Put that rod next to the first rod.*

Continue until all of the animals are matched with a C-rod.



K27

T: *What do you notice about the rods and the animals from the story?*

S: *The rods go from little to big like the animals.*

S: *We didn't use two of the rods.*

If students like, try adding two even bigger animals to match with the blue and orange rods.

Capsule Lesson Summary

Choose numbers, write them, name them, and add them to a class collage.

Materials

Teacher	<ul style="list-style-type: none"> • <i>Animal Numbers</i> by Bert Kitchen, <i>Numblers</i> by Suse MacDonald and Bill Oakes, or another counting book from the literature list • Large piece of paper (for example, from a flip chart) • Glue 	Student	<ul style="list-style-type: none"> • Several small paper rectangles or other shapes of various colors and sizes • Crayons, felt tip pens, or paint
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Note: In this lesson, students are to make a collage out of numbers. Feel free to organize the activity as you might other collage activities.

Description of Lesson

Read a counting book aloud to the class such as *Animal Numbers* by Bert Kitchen or *Numblers* by Suse MacDonald and Bill Oakes.

Hang a large sheet of paper in front of the class at a height students can reach (or lay it across a large table). Then, give each student two or three paper rectangles (or other shapes). Ask the students to write a number on each piece of paper. As long as they can write it and name it, they may choose any number and write it in any color, as large or small as they like. You may want to suggest a range (for example, from 1 to 10) to reduce the size of possible numbers and to focus the students.

Then, ask everyone who has written a 0 to come to the front of the class and glue the piece of paper with a 0 on it to the big sheet of paper. Proceed in a similar fashion for those students who have written a 1, a 2, and so on until you reach those who have written a 10. It is not necessary for students to glue their numbers on the paper in any particular order.

Finally, ask students who still have not glued all their pieces of paper to the big sheet to show the remaining numbers, one by one. Ask them to read the number (with help, if necessary) and glue it to the big sheet.

Extension Activity

Ask students to cut out one flower, two bugs, three cars, and so on, from magazines and to add them to the collage next to the appropriate written number.

Capsule Lesson Summary

Sort and group animals using a dot picture. Match numerals to sets.

Materials

Teacher	Student
<ul style="list-style-type: none"> Literature selection or counting song <i>One, One—The Zoo is Lots of Fun</i> Colored chalk Large string loops Animal labels 	<ul style="list-style-type: none"> None

Advance Preparation: Select a book about the zoo such as *Sam Who Never Forgets* by Eve Rice or *Dear Zoo* by Rod Campbell or *Put Me in the Zoo* by Robert Lopshire. Make animal labels as the class discusses different animals during the lesson.

Extension Activity

Exercise 1 _____

Start the lesson by discussing a nearby zoo. Read the zoo book you have selected aloud and/or teach a counting song such as *One, One—The Zoo is Lots of Fun*.

Discuss with the class six or seven kinds of animals that live in a zoo. As you discuss the animals make labels to give students and direct those with the same animal to stand together. (Students may like to act out their particular animal.) Vary the number of animals in each group, for example, five giraffes, three tigers, and so on.

Exercise 2 _____

Draw one dot for each student, well-spaced across the chalkboard.



T: *Each dot is for an animal. How many animals are there?*

The number will vary with class size; for example, 23.

Call on students to come to the board and count the dots, using a pointer. Encourage different students to start counting from different dots. Allow the rest of the class to give verbal assistance to the one who is doing the counting.

T: *You are each holding the name of an animal. Altogether there are 23 animals.*

Ask someone to point to 23 on the number line or the 0–109 numeral chart. Write 23 on the board.

T: *How can we show that all the bears are together?*

Students may suggest surrounding the bears with string loops. Do this, grouping the same animals together. Once all the animals are similarly grouped, let students help you draw the strings on the board in the dot picture.

T: *How can we make our dot picture look like how you are grouped?
How many bears do we have?*

Count and draw with colored chalk a corresponding string around that many dots. Continue with the other kinds of animals. As each group's string is drawn, that group can sit down.

Ask questions about the completed drawing. (Adjust the following dialogue to correspond to the picture created by your class.)

T: *There are exactly three lions. Could the lions come to the board and point to their dots? (In the blue string)
Show me three fingers and point to 3 in our display of numbers.
Who can write 3 on the board?*

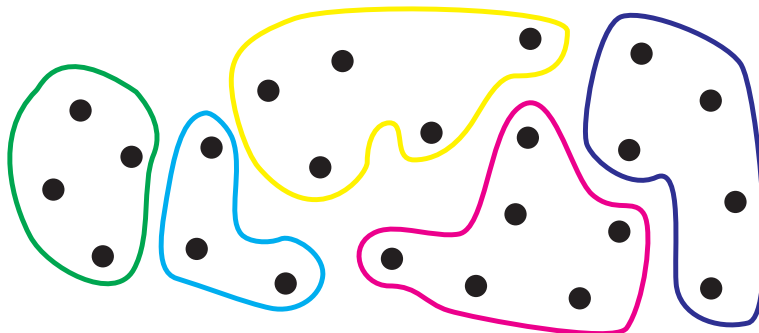
*The elephants—and no other animals—are in the yellow string.
How many elephants are there? (Five)
Show me five fingers and point to 5 in our display of numbers.*

There are exactly four tigers in this zoo. They are all in the same area and, of course, no other animals live in that area with them! Can you see the four tigers? (In the green string)

Is there a string that has six animals in it? (Yes, the red one)

Is there a string that has seven animals in it? (No)

Are there two strings that have the same number of animals in them? (Yes, the yellow and the purple.)

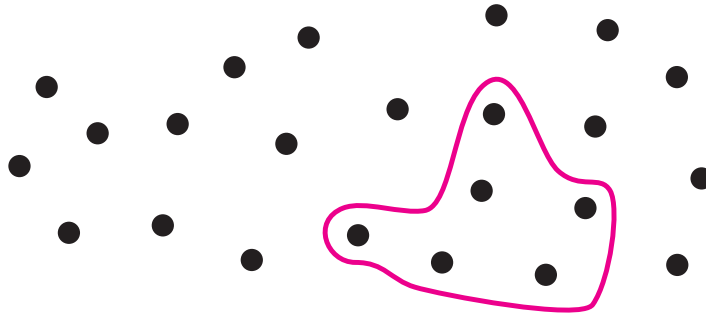


*Show me the string that has the most animals in it. (The red one)
How many animals are in this string? (Six) Tap six times on your desk.*

Erase all the strings but the red one while you explain what happens at this zoo in the evening.

T: *This is a rather special zoo. In the evening the zookeeper opens the different areas and lets the animals run free in the park. But the seals, which are here, (point to the dots in the red string) prefer to stay in their area so that they can be near their pool. All the other animals love to be out of their areas so that they can run and jump all over the park.*

As you say these words, erase all the strings but the red one, letting all the animals except the seals get out of their strings.



T: *How many animals are out of their area? (17)*
How many animals prefer to stay in their areas? (6)
How many animals are there altogether? (23)

Writing Activity

Instruct students to create a zoo picture in their math journals. Tell them they can use dots to stand for the animals or draw pictures that look like the animals. After a few minutes, share some of the pictures with the whole class.

Note: See Section One, page 1-12, for an explanation of the purpose of scheduled adjustment days.

Today, you may wish to repeat an earlier lesson either for a small group of students or for the whole class. Many of these lessons can be made to appear completely different by changing the story and/or the numbers in the lesson. Lessons K22 *Order by Size* and K23 *Forming Numerals* could be altered in this way. This is also a good time to allow students to work in a center or on a project of your choice.

The following game activities may be appropriate for working with students on their numerical readiness.

Numeral Card Shuffle_____

Use the numeral cards from 0 to 10. Shuffle them. Then ask a student to arrange them in order. Repeat with other students.

Dot Card, Numeral Card, Counter Match_____

Put students in groups of three, each group having a set of dot cards, numeral cards, and counters. One student chooses a dot card. A second student selects some counters to “match” the dot card (same number). The third student selects a numeral card for the same number. Direct students to take turns being responsible for each set (dot cards, counters, numeral cards).

This activity can be varied by choosing from the sets in a different order (e.g., numeral card, then dot card, then counters.)

Numeral Card Twister_____

Scatter several numeral cards on the floor and tape them down about one foot or 30 centimeters apart. Direct a student to place various parts of his or her body on different numbers. For example, put one foot on 5 and one hand on 8.

Color By Number_____

There are many color by number books available from which you may select pictures for students to color using number-color correspondence. Blacklines K30 (a)–(d) have other examples of color by number pictures. In these examples, the thing in the picture is not obvious until after it is colored, so coloring will help students answer the question, What is it?

Assessment: You may wish to use the sample assessment checklists, Blacklines K0 (b)–(k), to note students’ numeral recognition and ordering skills.

Early Warning

Among the next nine classroom lessons are some that require extra preparation or involve materials not included with the *CSMP* Classroom Set. The lessons are listed here for your convenience in preparing for them. A more detailed description of the needed materials can be found on the first page of each lesson. (Special materials are listed here only once, even if they are used more often during the nine-day period.)

K31 *C-Rods #3*: C-rods for students

K32 *Nuts Over Graphing*: Sufficient quantities of three different types of nuts (e.g., peanuts, cashews, almonds, pistachios, filberts, and so on) or other graphing materials; three-column graph

K34 *Constructing Patterns*: Clap, Snap, Tap visual aide cards; Unifix® cubes

K35 *Electronic Tools*: Electronic watch and calculator; magazines, catalogs, advertisements; chart paper; glue; scissors

K36 *Ways to Make Eight*: Eight identical large objects; small blocks or counters

K38 *Calculator Introduction*: Overhead calculator or calculator poster; student calculators

Several of the lessons also include suggestions for literature and/or fingerplays which are not included here. Please check the materials list at the beginning of the following lessons in advance so you can obtain the necessary literature or fingerplays: K31, K33, K34, K36, K39.

Capsule Lesson Summary

Use C-rods to reinforce comparisons and counting. Introduce combining sets.

Materials

Teacher	<ul style="list-style-type: none"> • <i>This Old Man</i> or another counting song • Demonstration C-rods • Colored chalk 	Student	<ul style="list-style-type: none"> • C-rods
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Advance Preparation: Demonstration C-rods are enlarged copies of the rods commonly called Cuisenaire rods. Blackline K31 can be used to make a set of demonstration C-rods. If you have rods made by a different manufacturer, you will need to adjust the colors to correspond. Prepare the demonstration C-rods to use on the board with magnetic material (if your board is magnetic) or loops of masking tape.

Description of Lesson

Exercise 1 _____

Introduce a counting song such as *This Old Man*. Many traditional counting songs are now published as books. See the literature list.

Exercise 2 _____

Distribute C-rods to groups of two to three students. Allow the students to play freely with the rods for about five minutes.

Put the demonstration C-rods in a container and show the container to the class.

T: *My C-rods are in this container. Tell me the colors of the C-rods.*

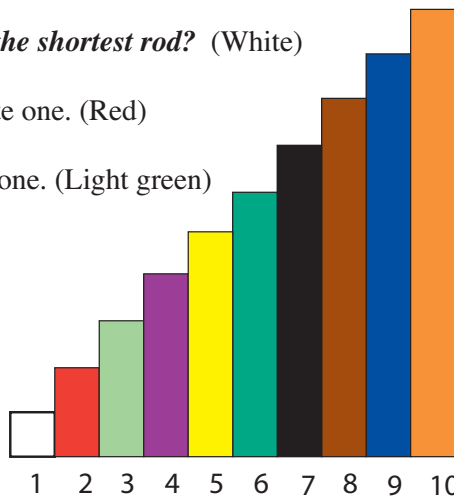
If a student says red, put a red C-rod on the board. If a student says pink, reply that you don't have any pink rods. If a student says green, ask if they are thinking of light green or dark green. Continue until one C-rod of each color is on the board.

T: *Find the shortest rod and hold it up. What color is the shortest rod?* (White)

Next, ask for a rod that is just a little bit longer than the white one. (Red)

Then, ask for a rod that is just a little bit longer than the red one. (Light green)

As the students name the rods in order, construct a staircase at the board with the demonstration C-rods. Also invite students to build a staircase with their rods.



K31

When all the steps have been placed in the staircase, say,

T: *Let's pretend a little mouse is climbing the stairs, counting all the way: One, two, three, ..., nine, ten.* (Point to the rods, one after another, as you count.)

You may wish to repeat the counting with everyone counting in unison.

T: *Now our mouse is at the top of the staircase. Let's get him back down to the bottom of the stairs again. We will have to count backward.* (Place your finger on the top step.) *Ready? Ten, nine, ..., two, one.*

Again, you may need to repeat this once or twice.

T: *Now the mouse is at the bottom of the staircase again. Let's get him to climb up to the top and come right back down again.*

(Place your finger on the bottom step.) *Ready? One, two, ..., nine, ten. Now, ten, nine, ..., two, one.*

Exercise 3 _____

T: *Take one red rod and see how many white rods fit exactly next to (on top of) it.*

You may want to demonstrate this at the board.

T: *How many?*

S: *Two.*



Ask students for a few more combinations, demonstrating them also at the base. For example,

T: *How many red rods fit next to a purple rod?
How many white rods fit next to a yellow rod?
Could you use other rods to fit next to a yellow rod?
Can you fit three rods next to a dark green rod?*



Instruct students to find more combinations using a variety of rods. Or let students find their own combinations to share with the class.

Capsule Lesson Summary

Make a graph of real objects to answer a question and record it as a representational graph.

Materials

Teacher	Student
<ul style="list-style-type: none"> Sufficient quantities of three different types of nuts (e.g., peanuts, cashews, almonds, pecans) or other food items Three-column graph 	<ul style="list-style-type: none"> None

Note: The lesson described here is based on having students select and graph their favorite nuts. You may choose another “favorite things” topic; for example, a different food, counting song or fingerplay, center, shape, and so on. The favorite things that are graphed can relate to a theme or a recent event in your classroom. The importance of the lesson is in the graphing and graph interpretation.

Description of Lesson

Begin the lesson by posing a problem such as:

T: *Mr. Planters is doing a survey. He wants to know which of these three kinds of nuts our class likes best. The choices are peanuts, cashews, and almonds. What should we tell Mr. Planters?*

S: *Peanuts.*

S: *We need to ask everyone.*

Place a three-column graph on the floor or a table, with a small bowl of one type of nut at the base of each column. Ask students to come up, select their favorite nut, and place that nut in the column above the bowl.

After all students have had a chance to place their favorite nuts in the graph, ask some of the following questions:

T: *Does the graph help to answer Mr. Planters’s question?*

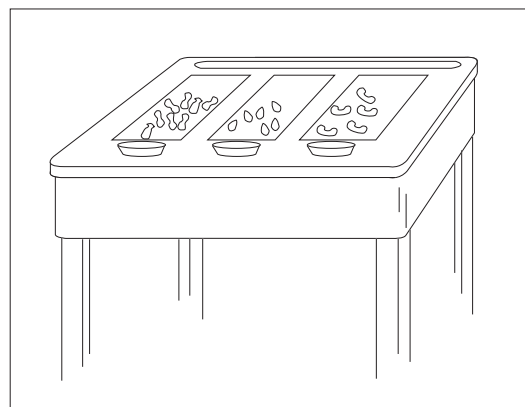
Which type of nut did we like the best?

Which did we like least?

Which types of nuts did an equal (same) number of us like best (if applicable)?

Which kind of nut did no one like best (if applicable)?

How many of us like almonds best?



Writing Activity

K32

Suggest students record the class graph in their math journals. They might draw pictures or draw dots to represent the objects. You might like the students to count the number of nuts in each column and record these numbers below or above the columns.

Capsule Lesson Summary

Play a game to practice following two- to four-step commands.

Materials

Teacher • None

Student • None

Description of Lesson

Exercise 1 _____

Introduce an action song such as *Clap Your Hands* or *Teddy Bear, Teddy Bear*. The latter can be made into a counting song (see K0 list of counting songs).

Clap Your Hands

Clap, clap, clap your hands
Clap your hands together.
Clap, clap, clap your hands
Clap your hands together.

Other verses:

Touch, touch, touch your toes...
Drum, drum, drum your feet...
Flap, flap, flap your arms...
Tap, tap, tap your knees...
Stand up very tall and touch the sky together...

Teddy Bear, Teddy Bear

Teddy bear, Teddy bear, turn around.
(Turn in a circle)
Teddy bear, Teddy bear, touch the ground.
(Bend over and touch the ground)
Teddy bear, Teddy bear, show one shoe.
(Lift one shoe off the ground)
Teddy bear, Teddy bear, you'd better skidoo.
(Walk around quickly)

Exercise 2 _____

Before starting this game, create the atmosphere.

T: *I want the room so quiet that we could hear a pin drop. Everyone open their ears and listen hard. We are going to play a listener's game. Don't start moving until I finish giving all the directions.*

Give a sequence of instructions such as the following. (Notice that later instructions contain more commands than earlier instructions.) After each instruction, give students sufficient time to perform the commands. Once they have completed the actions, ask them to sit down again.

- Instruction 1:** Stand up, clap your hands.
- Instruction 2:** Stand up, take one step forward.
- Instruction 3:** Stand up, take one step forward, snap your fingers.
- Instruction 4:** Stand up, touch your knees, jump twice.
- Instruction 5:** Stand up, turn around, touch the floor, tap your head.
- Instruction 6:** Stand up, clap your hands, jump twice, turn around.

Vary these instructions as much as you can to increase student enjoyment of the game, but keep your

K33

instructions precise and to the point. As a variation, you may like to let students create their own commands.

This game can be made more challenging by eliminating students who make a mistake carrying out an instruction. However, such a rule is likely to eliminate the very students who need the activity the most. Therefore, use this rule only once in a while.

Capsule Lesson Summary

Using Unifix® cubes or other types of counters, replicate a “snap, clap, tap” pattern.

Materials

Teacher	• Snap, Tap, Clap visual aide cards	Student	• Unifix® cubes (or some other counters)
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Advance Preparation: Copies of Blacklines K19 (a)–(c) can be mounted on cardboard to serve as visual demonstration cards.

Description of Lesson

Exercise 1 _____

Review the *Tap, Tap, Tap* fingerplay.

Tap, Tap, Tap

Point to your toe. Go tap, tap, tap.

(Tap toe)

Press your fingers, snap, snap, snap.

(Snap fingers)

Make your hand go clap, clap, clap.

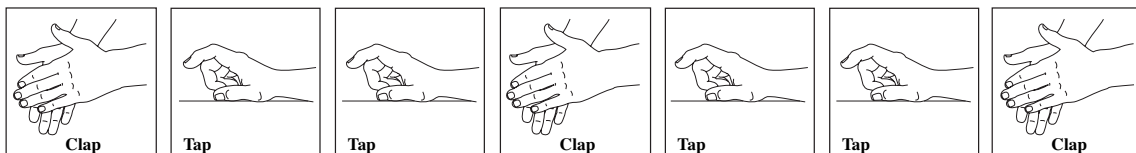
(Clap hands)

Now it's time to take a nap.

(Put hands together, lay head on hands)

Exercise 2 _____

Give each student an equal number of two different color Unifix® cubes (or other counters or interlocking blocks). Using only two of the directions, such as tap and clap, direct students to follow a tapping and clapping pattern. For example, choose clap, tap, tap; clap, tap, tap;... You may want to remind students by pointing to the visual demonstration cards as they actually clap or pat.



T: *Do you think we could make a similar pattern with the cubes?*

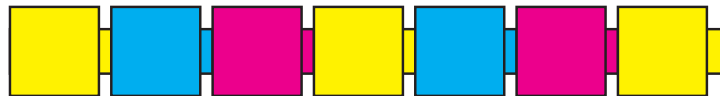
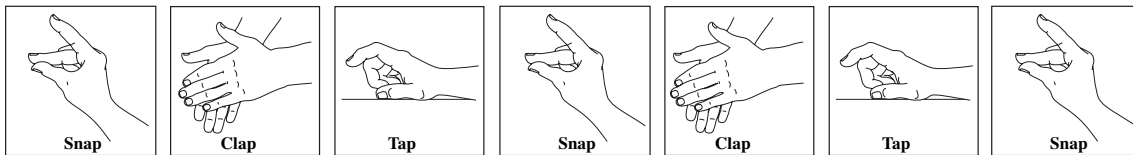
Instruct students to put together the Unifix® cubes (or other manipulatives) to match the clap, tap, tap; clap, tap, tap; ... pattern. As you observe the students work, remind them of the pattern by clapping and tapping yourself. Do not expect everyone to be successful, but when you see a display like the one on the following page, let the class discuss how it matches the clapping and tapping pattern.



Invite students to extend the Unifix® cubes pattern, and then to follow it with clapping and tapping.

Exercise 3 _____

Repeat Exercise 2, but this time give students an additional color Unifix® cube or other block. This allows you to increase the complexity of the pattern to include clapping, tapping, and snapping. For example:



T: *If I continue the pattern, what do you think will come next?*

S: *Clap.*

T: *And then?*

S: *Tap.*

Center Activity

Set up math centers with manipulatives that students can use to create and extend patterns. They should be given some freedom to make patterns of their choice. As an option, ask students to record patterns in their journals. Journal entries may be shared with the entire class.

Capsule Lesson Summary

Discuss various electronic tools and make a graph of examples of electronic tools.

Materials

Teacher	<ul style="list-style-type: none"> • Electronic watch and calculator • Old magazines, catalogs, or ads • Chart paper • Glue 	Student	<ul style="list-style-type: none"> • Scissors
----------------	---	----------------	--

Description of Lesson

Note: With many tools today, it is difficult to determine whether it is an electric tool or an electronic tool. For example, a cordless screwdriver could be considered an electronic tool, while a table saw is an electric tool. A hand-held calculator is considered an electronic tool, while a cash register is considered an electric tool. For our discussion, electronic will refer to tools that have low-level electrical use and use circuits, transistors, chips, or conductors, and some power source, like batteries, to help them function. You probably will not want to distinguish electronic from electric tools with your students.

Exercise 1 _____

Display a watch and calculator for students to see.

T: *Can someone tell the class what these are?*

S: *That is a watch.*

S: *I know that is a calculator.*

T: *These are both electronic tools. Does anyone know of any other electronic tools?*

S: *Nintendo,[®] Gameboy[™].*

S: *Radio.*

S: *Keyboard.*

Exercise 2 _____






Pass out old magazines, catalogs, or advertisements.

T: *I would like you to find pictures of electronic tools in these magazines and cut them out.*

Allow time for students to cut out pictures. Try to arrange that everyone finds at least one appropriate picture to cut out and perhaps not more than three.

K35

Tape a piece of chart paper to the board and label it “Electronic Tools.” Ask volunteers to tape pictures of different kinds of electronic tools to one side of the chart paper. Ask the students to name and describe the electronic tools, if they can. If other students know, let them share; otherwise name and describe the tools yourself. Call on other students who have similar pictures to come to the poster and attach them in a row beside the appropriate picture. Draw lines on the chart paper to form rows.

Calculator	
Clock	
Radio	
Telephone	
Scale	

Continue this process for other pictures students have found. Some questions that may help the discussion of electronic tools are:

T: *Where might you find some of these tools?*

Have any of you used these tools?

How do these tools help us?

Once the electronic tools graph is completed, ask students to count how many of each different tool are graphed. You may want to write the number beside each row after students have counted. Use the graph to talk about the tool found most (or least) often. Examples of some questions are:

- Are there more televisions or clocks? How many more?
- Are there less calculators or radios? How many less?

Home Activity

Suggest that students look for electronic tools at home. Involve parents by asking them to assist their children in finding pictures of electronic tools to bring to school and to discuss what uses different tools have. A sample letter is provided in Blackline K35.

Capsule Lesson Summary

Use blocks to build different combinations for 8.

Materials

- | | |
|----------------|--|
| Teacher | <ul style="list-style-type: none">• Counting book with large objects (e.g. wooden or cardboard blocks, shoeboxes, books) |
| Student | <ul style="list-style-type: none">• Eight small blocks or counters |

Description of Lesson

Repeat Lesson K17 using a different counting book and using eight objects rather than six.

Capsule Lesson Summary	
Introduce C-rod trains and construct a variety of different C-rod trains the same length as a single C-rod.	
Materials	
Teacher <ul style="list-style-type: none"> • Demonstration C-rods 	Student <ul style="list-style-type: none"> • C-rods • Math journal or paper

Description of Lesson

Provide students with C-rods. (You may like students to work in groups of two to three.) Review some previous observations they have made about the rods and allow several minutes for free exploration.

Exercise 1 _____

Using demonstration C-rods, introduce the students to the idea of making C-rod “trains.”

T: *If I put a white rod and a red rod together to form a train, it will be the same length as the light green rod.*
Do this with your C-rods.



Allow students time to do this in their small groups. Check that students understand putting rods together to form a train the length of another rod.

T: *What color rod would be the same as a train with a light green and a white rod?*



S: *Purple.*

T: *Can we make a train with the same length as a yellow rod?*

Instruct students to make different trains in their groups. For example:



Exercise 2 _____

On the board or overhead, model how to record a C-rod train by tracing around the rods and then coloring.

Direct students to work in their groups to find other trains which equal a rod of a particular color. Suggest they also look for trains made of more than two pieces. Instruct them to record at least one train in their math journal or on paper.

If there is time remaining, you may wish to let students share their journal entries by either describing the pieces they combined or demonstrating with C-rods on the board or overhead.

Capsule Lesson Summary

Discuss the calculator as an electronic tool. Explore the calculator and learn how to refer to various parts of a calculator.

Materials

Teacher

- Overhead calculator or a calculator poster

Student

- Calculator

Advance Preparation: A calculator transparency can be made from Blackline K38.

Description of Lesson

Exercise 1 _____

Discuss the electronic tools poster with students. Some questions that might guide the discussion are:

- T:** *Where might you find some of these tools?*
 Have any of you used some of these tools?
 How do these tools help us?

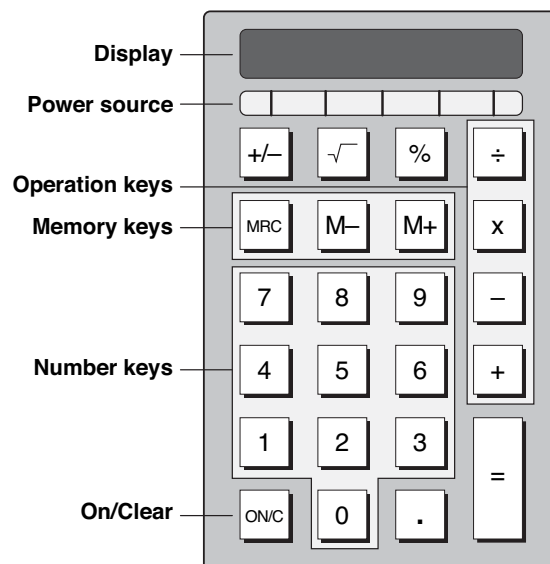
Exercise 2 _____

Display the overhead calculator or a calculator poster.

- T:** *Today we are going to talk about and use a special electronic tool, the calculator.*
 Where might you find a calculator?
 Have any of you used a calculator?
 Who have you seen using a calculator?
 How can a calculator help us?

Point out and talk about various parts of the calculator—the power source, display, number keys, on and off keys, and so on. As much as possible, let students point out and give names to the various calculator parts.

Distribute a calculator to each student or pair of students and allow time for free exploration. Students might want to talk about what happens when they press certain keys.



Capsule Lesson Summary

Use a story without words to create an open-ended experience with numbers.

Materials

Teacher

- One copy of the storybook *The Playful Numbers*

Student

- One copy of the storybook *The Playful Numbers* for each pair of students

Description of Lesson

The Playful Numbers is a delightful little story that contains no words. It is deliberately presented in this way so that this early experience with numbers will be open-ended. Numbers can be viewed from many perspectives, and if students are permitted to explore these possibilities rather than having arbitrarily fixed boundaries laid down for “what numbers are,” their mathematical lives will be much richer.

We encourage you to be an active participant with your students in the exploration of this little book. Ask them to help you create a story about the boy, his number friends, and his other friends. You may very well be surprised and enlightened to discover some new ways of thinking about numbers! The situations pictured in this book might give the appearance of being quite independent from each other, the only link being the quasi-magical effect these playful numbers have on the environment. But, if you take a second look at the pictures, you will notice that there are a few details here and there that provide additional links between them.

For example, three red buttons drop onto the floor on pages 2–3. On pages 12–13, the same three buttons show up again, along with six blue ones.

In the picture on pages 10–11, five of the cats are each holding a white flag. But, wait a minute... so were the five mice on page 7. Whatever could have happened?

Because of the role played by details such as these, it is important for the students to be able to see the pictures very clearly. Therefore, you might want to gather your students close to you and hold up your copy of the book to show them the pictures.

For this particular book, you might not want to distribute copies of the book to your students right at the beginning of the lesson. Experience has shown this to be more distracting than useful.

When you and your students have finished “reading” the story, don’t rush the students into another activity. Instead, give a copy of the storybook to each pair of students and let them look at the pictures at their own pace. Make them feel free to talk about the book with you or with their partner. You may like to leave at least one copy of this storybook permanently available in the classroom for students who wish to glance through it in their spare time.

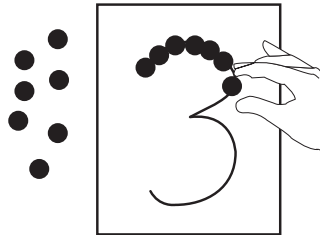
Note: See Section One, page 1-12, for an explanation of the purpose of scheduled adjustment days.

Today you may wish to repeat an earlier lesson either for a group of students or for the entire class. Many of the lessons can be made to appear completely different by changing the story and/or the numbers in the lesson. If you feel students need more practice following directions, repeat K33 and vary the actions. This is also a good time to allow students to work in a center or on a project of your choice.

The following activities may be used to give additional practice with writing numbers and corresponding a number with a number of objects.

Number Covers _____

Provide students with numeral cards and some kind of covering materials (counters, beans, and so on). Direct the students to place the beans or covers so that they just cover the number on a card. This may help students in developing the motor skills associated with writing numbers.



You may also suggest students cover a numeral card with a thin piece of paper—thin enough so they can see the number through the paper. Then ask them to use a thick crayon, marker, or paint to copy the number.

Number Rubbings _____

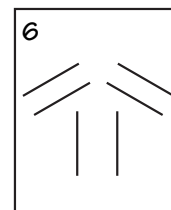
Write numbers on large index cards using a hot glue gun and making the glue fairly thick. When the glue is cool, give these cards to students along with blank pieces of paper. Direct the students to cover a number card with a piece of paper and rub over the paper with the side of a crayon. This may help students to visualize what a number looks like.

Number Designs _____

Provide students with a number of objects (for example, 6) such as toothpicks or beans. Instruct students to make a design with their objects and to display the design on a card by gluing the objects to the card. Ask the students to write the number somewhere on the card. Then invite students to describe their designs to the class, encouraging the use of number combinations. For example:

S: *My design is like a tree. I put two toothpicks for the trunk and two toothpicks on each side for branches.*

You may like to make a classroom display placing different designs for the same number together.



K40

Assessment: You may wish to use one of the sample assessment checklists, Blacklines K0 (b)–(k), to note students' progress in writing numbers and in associating a number with a number of objects.

Early Warning

Among the next nine classroom lessons are some that require extra preparation or involve materials not included with the *CSMP* Classroom Set. The lessons are listed here for your convenience in preparing for them. A more detailed description of the needed materials can be found on the first page of each lesson. (Special materials are listed here only once, even if they are used more often during the nine-day period.)

K41 *Squirrels and Nuts*: Six nuts; large string loops

K42 *Measuring Tools*: Chart paper; various measuring tools brought from home (see note below)

K43 *A Class Book*: Construction paper; glue; magazines; scissors

K44 *Ways to Make Ten #1*: Counters

K46 *Yes/No Graphs*: Yes/No graphs; manipulatives

K47 *Freight Trains*: Large string loops; arrow manipulatives

K48 *Calculator Introduction #2*: Overhead calculator or poster; student calculators

K49 *Number Bugs*: Tactile materials at centers

Several of the lessons also include suggestions for literature and/or fingerplays which are not included here. Please check the materials list at the beginning of the following lessons in advance so you can obtain the necessary literature and fingerplays: K41, K43, K44, K45, K47, K49.

Note: Lesson K42 asks that students bring some measuring tools from home to share with the class. In preparation for this lesson, send home the parent letter on Blackline K40.

Capsule Lesson Summary

Use a fingerplay about squirrels and nuts to introduce a relation. Act out the relation and picture it using the languages of strings and arrows. Involve counting in the investigation of the relation.

Materials

Teacher	<ul style="list-style-type: none"> • Fingerplay <i>Five Gray Squirrels</i> • Six nuts (any type) • Demonstration numeral cards • Large string loops • Colored chalk 	Student	<ul style="list-style-type: none"> • None
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Description of Lesson

Note: This lesson can easily be modified to fit any theme you may want to use, such as hens laying eggs, children picking apples, monkeys eating bananas, children reading books, and so on. Also, you may let students choose the relation, and adjust your drawing accordingly.

Exercise 1 _____

Introduce a fingerplay such as *Five Gray Squirrels* to the class.

Exercise 2 _____

Lay two large string loops on the floor separated by a few feet.

T: *Today we are going to talk about squirrels gathering nuts.*

Select five students to pretend to be squirrels and instruct them to stand inside one of the string loops.

T: *How many squirrels do we have inside this string? (Five)
Can someone point to 5 on the number chart?*

On the board, draw a string with five dots inside and label it “5 squirrels.”

T: *Now, I am going to put some nuts inside the other string. Count the nuts along with me.
(One, two, three, four, five, six)
How many nuts do we have inside this string? (Six) Show me 6 with your fingers. Find 6 on your desk number line.*

On the board, draw a second string with six dots and label it “6 nuts.”

T: *Squirrels usually like nuts, don't they?
One of our squirrels gathers three nuts.*

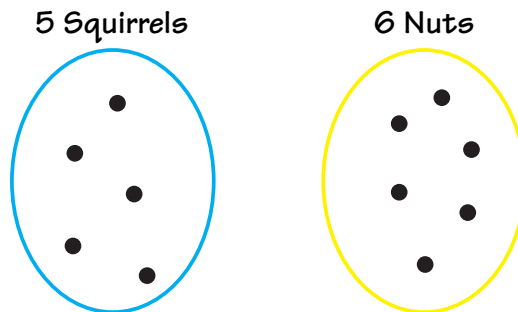
Ask a student to find the numeral card 3 and to give it to one of the squirrel-students.

K41

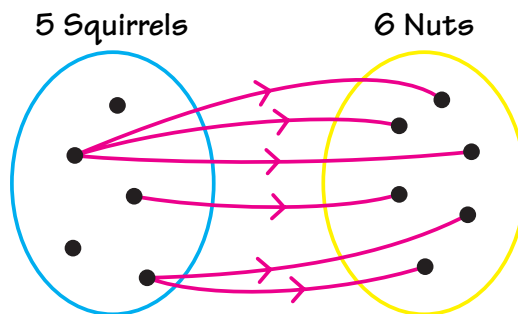
Then ask the chosen squirrel-student to go over to the nut circle and gather three nuts. Repeat this process with another squirrel gathering two nuts and still another gathering one nut.

Refer to the picture on the board.

- T:** *How many squirrels?* (Five)
How many nuts? (Six)
How many nuts did Roberto gather? (Three)



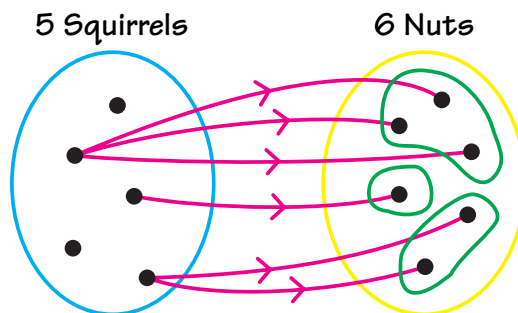
Let another student choose one dot to stand for Roberto's squirrel and three dots to stand for the nuts Roberto gathered. Then, draw three arrows on the board from Roberto's squirrel to the nuts. Repeat this process with the other squirrels and nuts.



Ask various questions about the arrow picture. For example:

- T:** *Did all the squirrels gather some nuts?* (No)
How many did not? (Two)
How many squirrels did gather nuts? (Three)
Are there any nuts left? (No)
 (... pointing to a squirrel) *How many nuts did this squirrel gather?*
 (... pointing to a nut) *Who got this nut?*
Which squirrel got the most nuts?

If your class is still interested, you can ask a few students to trace a string around all the nuts that were eaten by a given squirrel. Your final drawing might look something like this.



This activity can be repeated letting other students do the acting and using other numbers.

Writing Activity

Direct students to record a "squirrels and nuts" story in their math journals.

Capsule Lesson Summary

Discuss how, why, and what people measure, and engage in activities involving comparative measurement.

Materials

- | | |
|--|--|
| Teacher <ul style="list-style-type: none"> • Chart paper • Various measuring tools including a timer, scale, or thermometer | Student <ul style="list-style-type: none"> • Measuring tools from home |
|--|--|

Advance Preparation: The early warning in K40 mentioned a Blackline containing a letter to parents about sending some measuring tools to school with their children. Be sure to send this letter home a couple of days before teaching this lesson and note what kind of measuring tools students bring.

Description of Lesson

Exercise 1 _____

Try to arrange that every student has some measuring tool to share with the class.

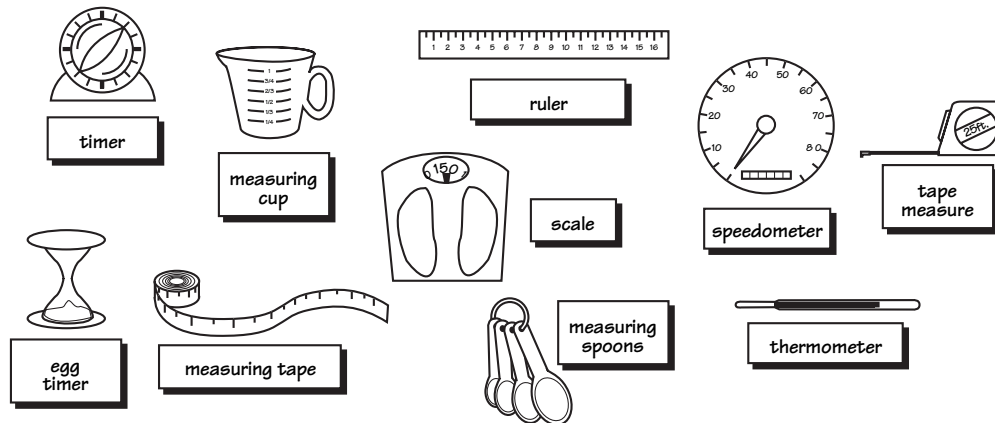
T: *Many of you have brought in things or pictures of things used for measuring. I would like you to share what you brought with the class. If possible, tell us what it is used for.*

It will take some time for students to describe the measuring tools they have brought. As appropriate, let other students contribute to the discussion of a measuring tool.

T: *How could we arrange all of these measuring tools?*

S: *We could put them on the table or hang them on the wall or bulletin board.*

After a student tells the class about his or her tool, ask the student to place it on the desktop or tabletop. Pictures of measuring instruments can be glued on chart paper. Make appropriate labels for the measuring tools. If students suggest arranging tools by categories (for example, placing a ruler, measuring tape, and tape measure together because they measure length), you may want to do this. Do not expect clear delineation of categories.



K42

If there are some interesting measuring tools (such as an egg timer or thermometer) that are not represented in those brought by students, you may want to show and describe these tools yourself.

Center Activity

Centers can provide opportunities for students to engage in activities that encourage comparative measurement. Set up several centers each with measuring tools and things to measure. Model for students what they are to do at each center.

Center	Materials	Activity
1	Tub of water; plastic cups, bowls, measuring cups/spoons	Move water from one size container to another; compare capacities
2	Box of sand; plastic cups, bowls, measuring cups/spoons, food containers	Move sand from one size container to another; compare capacities
3	Large bowl of rice; plastic cups, bowls, measuring cups/spoons, food containers	Move rice from one size container to another; compare capacities
4	Containers with water, snow, ice; thermometer	Take the temperature of the three materials; watch for temperature changes and compare temperatures
5	Scale or balance; rocks, cotton balls, plastic toys	Compare the mass of various items
6	Ruler, measuring tapes, yard or meter sticks	Measure objects around room; compare linear measures

Home Activity

Suggest that parents do some comparative measurement activities with their child at home. Blackline K40 includes a post script with examples.

Capsule Lesson Summary

After reading several counting books, make a class counting book.

Materials

Teacher	Student
<ul style="list-style-type: none"> • Several counting books from the literature list such as <i>Animal Numbers</i> by Bert Ketchen • 10 pieces of paper 	<ul style="list-style-type: none"> • Construction paper • Scissors • Glue • Markers, crayons, or paint • Magazines (optional)

Description of Lesson

Exercise 1 _____

Read *Animal Numbers* by Bert Ketchen or a counting book of your choice to the class.

Exercise 2 _____

Show the class several different counting books, all of which you have read earlier.

T: *Today we are going to make our own counting book. But before we do, let's talk about some of the counting books we've read so far this year.*

What can you tell me about how some counting books are written?

S: *They have numbers up to 10.*

S: *They have animals on the pages.*

S: *Four birds are on the 4 page.*

Encourage students to make several observations about counting books and check some of these observations with the counting books you have on hand.

T: *We need to make some decisions about our counting book. Since we are studying animals (insert the name of a class theme) our book could have animals (or whatever) on the pages. Let's decide what will be on page 1.*

Continue the discussion, allowing students to decide which animals will be on each page. Record their responses for future reference.

Divide the class into ten groups of about two to three students each and assign each group a page of the book to make. Instruct the groups on how to make the animals to go on their page. For example, they can color or paint directly on the page; they can create animals out of construction paper and glue them on the page; or they can find animal pictures in old magazines to cut out and glue on the page.

Exercise 3

K43

After the individual pages are constructed, gather the class together to finalize the book. Ask the groups to describe their pages to the rest of the class. At this time, label the pages, for example, “4 bears,” “10 elephants,” and so on.

Encourage students to make comments on their classmates’ efforts.

Help the students decide on a title for the class counting book. Some possibilities include:

Smith Elementary Number Book
Farm Animals Counting Book
Our Favorite Things: A Counting Book
Ocean Creatures 1–10

Even though a class book is the intended result of this project, you might consider displaying the pages side by side as a wall story first. The pages should be at the students’ eye level. After a week or so, remove the pages from the wall and bind the book to complete the project.

Capsule Lesson Summary

Act out a fingerplay with counters to look at facts for 10.

Materials

Teacher <ul style="list-style-type: none"> • <i>Ten Red Apples</i> fingerplay • Magnetic checkers 	Student <ul style="list-style-type: none"> • Ten counters
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Description of Lesson

Review the *Ten Red Apples* fingerplay.

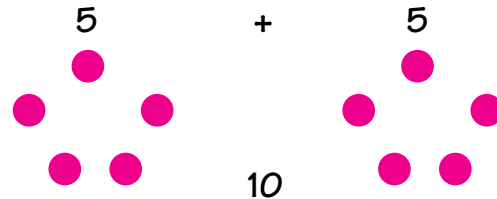
Pair the students and provide each pair with 10 counters.

T: *Today let's use these counters and pretend they are the apples in our fingerplay. Count and make sure that you and your partner have 10 counters together. In our fingerplay, how many apples were for you and how many for me?*

S: *5 for you and 5 for me.*

T: *Show that with your counters.*

As the students do this with a partner, you might arrange 10 magnetic checkers on the board in two groups of 5.



T: *One group of 5 and another group of 5 makes 10.*

Is there another way to make ten?

Start a list of ways to make 10 as suggested by students, or make suggestions yourself. With each new suggestion, you may like to reword the fingerplay accordingly. For example,

T: *Ten apples grow on a tree.
Six for you and four for me.
Let's shake the tree just so
And ten red apples will fall below.
1, 2, 3, 4, 5, 6, 7, 8, 9, 10.*

List the combinations on the board. Do not be concerned with trying to show every combination for 10.

$5 + 5$

$7 + 3$

$2 + 8$

$6 + 4$

$3 + 7$

$9 + 1$

$4 + 6$

$8 + 2$

$1 + 9$

K44

If a student suggests a combination such as $3 + 3 + 4$, accept this and try to reword the fingerplay accordingly; for example, 3 for you, 3 for me, and 4 left in the tree.

Writing Activity

Instruct students to show at least two ways to make ten in their math journals. Suggest that they draw a picture and write the numbers.

Capsule Lesson Summary

Practice shape, color, and size recognition with K A-blocks.

Materials

Teacher <ul style="list-style-type: none"> • Shapes book from the literature list 	Student <ul style="list-style-type: none"> • Set of K A-blocks
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Description of Lesson

Exercise 1 _____

Select a book about shapes from the literature list to read aloud and discuss with the class. A couple of good choices are *Square is a Shape: A Book about Shapes* by Sharon Lerner or *The Wing of a Flea: A Book about Shapes* by Ed Emberly.

Exercise 2 _____

Provide each student with a set of K A-blocks. Describe various K A-blocks to the students as indicated below and instruct the students to figure out which piece you are describing and hold it up. It is easy to vary the level of difficulty of this exercise. Be careful to select sufficiently challenging questions and proceed at a brisk pace. The following are examples of instructions you might give, grouped according to their level of difficulty.

Easy

T: *Show me a red block; a different red block; another different red block.*
 Show me a triangle; a different triangle; another different triangle.
 Show me a blue square; a different one; another different one.
 Show me a block with four sides; a different one; another different one.
 Show me two green circles.

Intermediate

T: *Show me a piece that is not red; a different piece that is not red; another different piece that is not red.*
 Show me a piece that is not a circle; a different one; another different one.
 Show me a square that is not yellow; a different one; another different one.
 Show me two circles of the same color.
 Show me two triangles of different colors.
 Show me a green circle and a red square.

Difficult

T: *Show me a piece that is red and is not a triangle; a different piece that is red and is not a triangle.*
 Show me a piece that is not a circle and is not red; a different piece.
 Show me a piece that is both red and blue. (There is no such piece)
 Show me all the red pieces with four sides. Do they all look alike?

K45

You may like to group the students into pairs or threes and direct them to play the above game with their group.

Assessment: Use this opportunity to observe students' understanding of geometric terms and colors.

Exercise 2

Display some of the K A-blocks on the board or on a table, and make sure that every student can see exactly which pieces are in your display. Then cover the pieces with a towel, move them around under the towel, and then remove one of them in such a way that no one sees which piece you have removed. Uncover the remaining pieces. Ask students which piece is missing.

The first game should be a simple one with, for example, a small red circle, a large yellow triangle, and a small blue square. In later games, the complexity of the initial array of pieces can gradually be increased; for example, start with a small red circle, a large red circle, a small red square, and a small green triangle. Remove one of the circles.

Continue until the precise identification of the missing piece is provided (i.e., its color, shape, and size). You may need to give some hints. For example:

T (pointing to the small red square): *The piece I have is not this shape...* or
The piece I have is this color... or
The piece I have is this size.

Each time you use this activity, play the game several times in a row.

Capsule Lesson Summary

Make graphs in response to yes/no questions.

Materials

- | | | | |
|----------------|---|----------------|--|
| Teacher | <ul style="list-style-type: none"> • Yes/No graphs • Markers • Manipulatives (counters, checkers, or blocks) | Student | <ul style="list-style-type: none"> • None |
|----------------|---|----------------|--|

Advance Preparation: Prepare Yes/No graphs, each with a different question, to place at tables around the room (approximately 4–6). The questions can be tied to a current theme of study or student interest, and they should be easily answered yes or no. Some examples include: Did you work at a center today? Do you like pizza? or Did you watch a certain TV program last night?

Description of Lesson

Begin by placing a two-column Yes/No graph and some manipulatives at each table. Model for students how to answer a yes/no question on a Yes/No graph by placing a manipulative in the column for their answer. If you prefer, students can write their names or put a check mark rather than place a manipulative.

T: *Today, we will go from table to table and answer some questions either yes or no. There are different questions at each table, and you will have a chance to answer all of them. As I come around, I will read the question at your table, then you will answer by putting a block or counter in the yes or no column. After you have answered the question at your table, remain seated quietly until I tell you to move.*

Do you like pizza?	
Yes	No

Move from table to table. When all the students have answered, have them move to the next table and repeat the process. You will need to decide on the best way to manage the movement so that every student has a chance to answer all the questions.

After all the students have answered all the questions, display the questions on chart paper or on the board so everyone can see and read them. Read each question and ask the students at the table with that question to count and verify the numbers of yes and no responses. Write the result on the board next to the question. For example:

	Yes	No
Do you like pizza?	15	4
Did you watch television last night?	10	9
Did you work at a center today?	8	11

K46

Discuss with the class answers to questions such as the following:

- Did more people answer yes or no to the question about _____?
- Which question has the most no answers?
- Did all the students answer each time?
- How do you know?

Extension Activity

Once the class is familiar with yes/no graphing, you may like to ask a “question of the day” to which the students respond yes or no. You can review the graph as a closing activity.

Capsule Lesson Summary

Act out and picture a relationship between engines and freight cars.

Materials

Teacher	Student
<ul style="list-style-type: none"> • <i>Freight Train</i> by Donald Crews or <i>Engine on the Track</i> fingerplay • Colored chalk • Large string loop • Arrow manipulatives 	<ul style="list-style-type: none"> • None

Advance Preparation: Make arrow manipulatives by cutting string or yarn into meter lengths. Make enough so there are approximately as many as there are students in the class.

Description of Lesson

Exercise 1 _____

Read *Freight Train* by Donald Crews or use the *Engine on the Track* fingerplay. Briefly talk with your students about trains. Go back through the book counting cars, discussing long vs. short trains, and position of cars (first, middle, last).

Engine on the Track

Here is the engine on the track.

(Hold up thumb)

Here is the coal car, just in back.

(Hold up pointer finger)

Here is the box car to carry freight.

(Hold up middle finger)

Here is the mail car. Don't be late!

(Hold up ring finger)

Way back here at the end of the train

(Hold up little finger)

Rides the caboose through the sun and rain.

T: *Let's make a class train. Who would like to be our engine?*

Select a student to be the engine and to stand at the front of the class.

T: *Who would like to be our coal car?*

Does our coal car go in front of or behind our engine? (Behind)

Select another student to be the coal car and to stand behind the engine.

K47

Continue with the rest of the cars in the story. After selecting a student to be the caboose, let the remaining students be other cars in between. Remind the engine-student not to move too fast. When the live train has walked around the room, say,

T: *I am the stationmaster and I want to know how many cars are in this train. Let's count them as they pass in front of me.*

Exercise 2 _____

Tell the class that they are going to act out a different train story with you. This time, everyone in the class is going to be a car in a train.

T: *First, we need to know how many students are here today so we know how many cars we have. How can we find out?*

S: *Count ourselves.*

Conduct a count by asking the students to count off as you point to them. Next, choose five students to pretend they are engines. Lay the string loop on the floor and direct them to stand inside of it. Tell the rest of the class to pretend they are freight cars; they should stand outside the string loop.

Ask each engine-student, "How many freight cars (less than 8) would you like on your train?" Give the student one arrow manipulative for each freight car and direct the engine-student to extend an arrow manipulative to each freight car-student they select for their train.

Repeat this process until all the engines have extended arrow manipulatives to their respective freight cars.

Tell the class that you are going to draw a picture of this train story on the board.

T: *These dots are for engines. How many engines are there? (Five)*

Encourage the students to answer without counting. Then let someone check by counting.

T: *Now I'm going to draw dots outside the string for the freight cars. Count them as I draw.*

How many freight cars are there? (14)

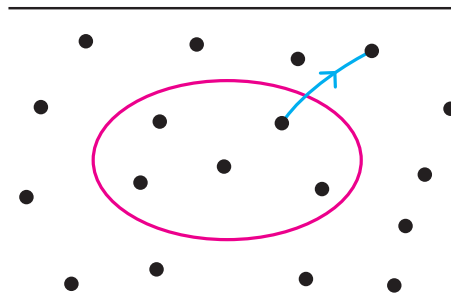
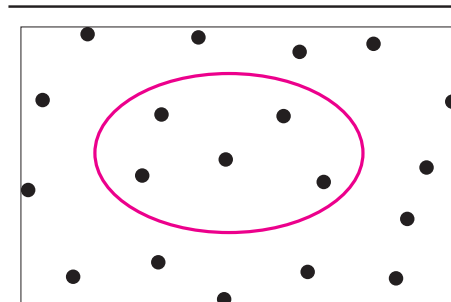
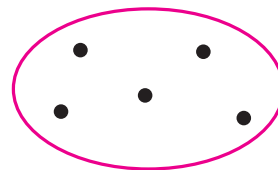
Draw a blue arrow as illustrated. As you draw the arrow, ask,

T: *What do you think this arrow means?*

S: *This engine is pulling this freight car.*

S: *This engine chose this freight car.*

You may need to clarify the direction of the arrow by reading it as you draw the arrow (from engine



to freight car), “This engine pulls this freight car.”

Looking at the arrow manipulatives from each engine-student to freight car-students, add arrows to your drawing one by one. Pause after you complete the arrows starting at one engine to ask,

T: *How many freight cars is this engine pulling?* (Three)

Complete your picture on the board to look like the students’ portrayal of the story. For example:

Continue to ask various questions about the arrow picture. For example:

T: *Which freight cars is this engine pulling?*

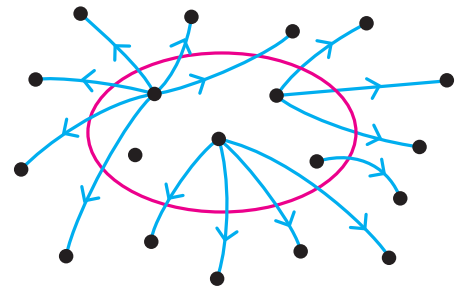
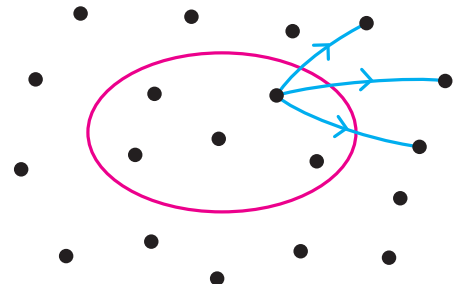
Which engine is pulling this freight car?

What can you tell me about this engine?

Is one engine pulling more freight cars than all the others?

Writing Activity

Invite students to create their own engine and freight car stories. Encourage any form of representation (i.e., pictures, objects, strings and arrows, dots, and so on).



Capsule Lesson Summary

Explore the calculator and locate various keys. Learn how to enter and clear numbers from the display.

Materials

Teacher	• Overhead calculator or calculator poster	Student	• Calculator
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Description of Lesson

Display the overhead calculator or a calculator poster. Review some of the discussion about the calculator as an electronic tool from Lesson K38. If you do not have an overhead calculator, let students locate and name parts of the calculator on the poster, but use a class calculator to check what happens when you press certain keys.

T: *Let's try to find some of the parts of the calculator. What key (button) turns the calculator on?*

Ask students to point out the on key (if available), number keys, display, and clear key.

T: *How would we put 10 on the display?*

S: *Press $\boxed{1}$ and then $\boxed{0}$.*

T: *What happens when you press the clear key?*

S: *0 comes back on the display.*

S: *You erase the 10.*

Discuss and/or review the names of various parts of the calculator. Locate all the number keys in order.

T: *Could we put some other numbers on the display?*

Let students choose other numbers to put on the display; for example, a favorite number, a room number, or the number of students in the class.

Note: If students enter their ages, be prepared to explain how to enter $5\frac{1}{2}$ as 5.5 or agree to just enter 5 or 6.

Distribute a calculator to each student or to pairs of students. Ask students to enter various numbers and then to clear before entering another number. For example, direct them to enter their age, the number of windows in the room, the lunch count, the date, or some specific one- or two-digit numbers. If students are working with a partner, one student might choose a number and the other student enter it.

K48

T: *Put the number 5 on your display. 5 has one digit.
What are some other one-digit numbers?*

If your students are interested, introduce two- and three-digit numbers as well, each time counting the digits. Practice naming two- and three- digit numbers and putting them on the calculator.

T: *What are the most digits we can have in a number displayed on the calculator?*

Let students investigate for awhile until they find that the display will hold no more than eight digits.

Extension Activity

If students are ready to explore other keys, feel free to explain some of them and to give simple explanations. For example, “The +/- key only changes the number from positive to negative.”

Capsule Lesson Summary

Practice making numbers with a variety of materials.

Materials

Teacher <ul style="list-style-type: none"> • Counting book selection from the literature list • Center materials 	Student <ul style="list-style-type: none"> • None
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Advance Preparation: Set up several centers where students can draw numbers using materials such as cornmeal, sand, shaving cream, fingerpaint, and so on.

Description of Lesson

Exercise 1 _____

Select a counting book such as *Count and See* by Tana Hoban to read aloud to the class.

Exercise 2 _____

T: *Do you remember Jody, the girl who works at the pet shop with the fish? Well, Jody was helping her uncle at the pet shop the other day, when a shipment of number bugs and bug houses arrived at the store. Jody was so excited, that she opened the container with the number bugs in it and took them all out. Her uncle noticed that each bug house had a number on it, 0–9. Another bug house had no number, but a layer of sawdust on the bottom. He asked Jody to make sure all the number bugs were placed in the correct bug houses. Jody wasn't quite sure where to begin. Let's help Jody decide which number bug goes into which bug house.*

Discuss with students ways of matching number bugs with bug houses. A student may suggest that Jody put a bug in the bug house with the sawdust to see what happens. If so, ask the following question:

T: *What would happen if Jody put a number bug in the bug house with sawdust?*

S: *The bug would crawl around.*

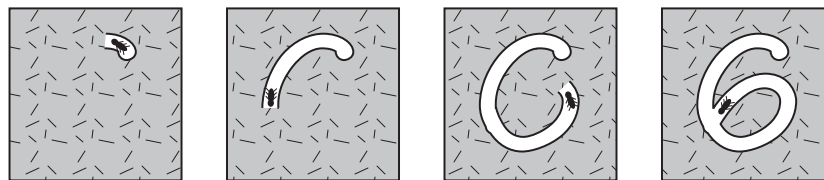
S: *Nothing.*

T: *Number bugs crawl in paths to form numbers in the sawdust. They draw numbers in the sawdust. What number do you think the bug will draw?*

S: *We don't know.*

T: *Jody put a number bug in the bug house with the sawdust and the number bug did indeed draw a number. Jody watched as the number bug made its way through the sawdust.*

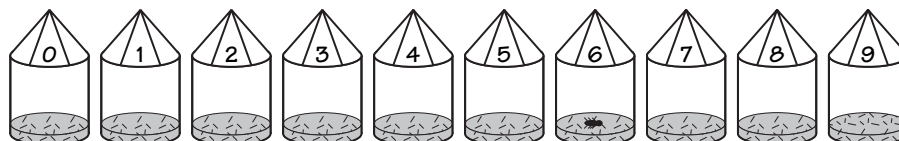
Slowly draw a path on the board to form the number 6. You might use the side of a piece of chalk, or you might cover a small section of the board with chalk and form the number with your finger in the chalk dust.



T: *What bug house should Jody put this number bug into?*

S: *The one with 6 on it.*

T: *Right, Jody can put this number bug in the bug house for 6.*



T: *Jody smoothed out the sawdust, selected another number bug, and placed it in the sawdust. It made a path like this.*



T: *What bug house should Jody put this number bug into?*

S: *The one with the 3 on it.*

T: *Right, Jody can put this number bug in the bug house for 3.*

Direct the students to work at one of the centers where they can draw numbers like the number bugs do.

Allow plenty of time for students to draw numbers at the centers. They may select numbers of their choice, or you can suggest numbers for them to work with.

Writing Activity

Ask students to draw a picture in their math journal of the numbers they made at the center(s) today.

Center Activity

Set up other number writing centers where students can use materials such as pipe cleaners, blocks, or jump ropes to form into numbers. Still other centers might involve students in activities such as those described in K40 (Number Covers or Number Rubbings).

Note: See Section One, page 1-12, for an explanation of the purpose of scheduled adjustment days.

Today you may wish to repeat an earlier lesson either for a group of students or for the entire class. Many of the lessons can be made to appear completely different by changing the story and/or the numbers in the lesson. K34 *Constructing Patterns* can be repeated to help students recognize and extend patterns. K42 *Measuring Tools* can be repeated by setting up stations as listed in Exercise 2 and allowing students to practice measuring at each of the stations.

The following activities are extensions or additional practice with the ideas found in Lessons K34 and K36.

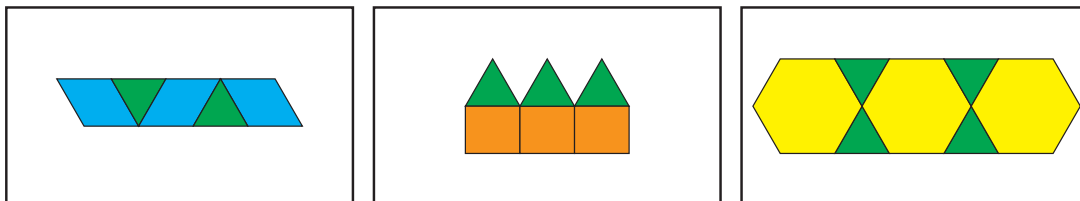
Pattern Walls_____

Provide students with pattern blocks for free exploration.

After a short free play period, direct students to make a wall with their blocks and to try to make the wall have a pattern. For example,



You can make this activity more directed by providing students with pattern wall designs on large index cards. Prepare the cards by first making construction paper cut-outs of pattern block pieces, and then gluing them to the card in the design of a pattern block wall. Give students these cards to first replicate with pattern blocks and then to extend the pattern beyond what is shown on the card. Some sample cards are shown below.

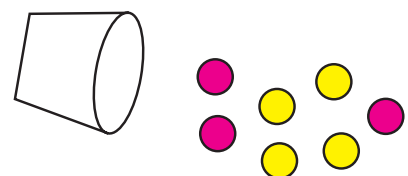


Spill the Beans_____

You can use commercial two-color counters for this exercise or make your own set as follows: Take a bag of large beans (e.g., dried lima beans), lay them on a piece of paper, and spray paint one side of the beans in any color.

T: *We are going to play Spill the Beans today. After spilling the beans, we will draw pictures of our number combinations in our math journals.*

Demonstrate spilling the beans by selecting a number for which you want to find combinations, for example, seven. Place seven beans in the cup, shake them with your hand over the opening, then dump them on a tabletop mat.

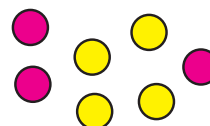


Ask a student to count the number of beans showing one of the colors (for example, red) while you

K50

draw the same number of objects in that color on the board. (Try to draw them the way they look on the tabletop.) Ask another student to count the number of beans showing the other color (for example, yellow) while you draw these, also, on the board in their color.

Ask again for the number in red and the number in yellow and the total number. Write a number sentence as students give you the numbers.



$$3 + 4 = 7$$

Pick up the beans and repeat the process. You will most likely obtain a different combination for 7. After you have modeled finding combinations for 7, let students select a number for which they want to find combinations (4–9 work well). Distribute a cup and beans (counters) to pairs of students or small groups. Then, ask them to replicate the process and record combinations in their journals, taking turns spilling the beans.

Assessment: You may wish to use one of the sample assessment checklists, (Blacklines K0 (b)–(k), to note students' patterning skills or their progress in finding combinations for a number.

Early Warning

Among the next nine classroom lessons are some that require extra preparation or involve materials not included with the *CSMP* Classroom Set. The lessons are listed here for your convenience in preparing for them. A more detailed description of the needed materials can be found on the first page of each lesson. (Special materials are listed here only once, even if they are used more often during the nine-day period.)

K52 *Geoboard #3*: Overhead geoboard or transparency; geopaper transparency

K54 *Number Bugs #2*: Tactile materials to form numerals

K56 *C-Rods #5*: C-rods

K59 *Calculator Introduction #3*: Overhead calculator or transparency

Several of the lessons also include suggestions for literature and/or fingerplays which are not included here. Please check the materials list at the beginning of the following lessons in advance so you can obtain the necessary literature or fingerplays: K51, K53, K54, K55, K58.

Capsule Lesson Summary

Act out a story with birds to work on number transformations (adding to, taking from, more, less).

Materials

Teacher <ul style="list-style-type: none"> • <i>Five Little Brown Birds</i> fingerplay • Magnetic board • Magnetic checkers 	Student <ul style="list-style-type: none"> • Beaks (optional)
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Advance Preparation: Use paper drinking cups or construction paper to make beaks.

Description of Lesson

Exercise 1 _____

Introduce the fingerplay *Five Little Brown Birds* or another of your choice.

Exercise 2 _____

Note: Select the number you work with in this lesson based on the numerical abilities of your students.

Choose five students to pretend they are birds and to “fly” to the front of the class. (If you like you can have each of them wear a beak.)

T: *These are birds and they are flying around. Now they have landed.* (Direct the students to stop moving.) *How many of them are there?* (Five)

Call on a student (not a bird) to locate 5 on the number line while the other students point to 5 on their desk number lines.

Very obviously, select one bird-student and direct him to fly back to his seat.

T: *Are there still five birds here?*

S: *No.*

T: *Are there more than five or less than five?*

S: *Less, because one flew away.*

T: *How many are there?*

S: *Four.*

Ask the bird who sat down to fly back and rejoin the other birds.

T: *How many are there now?*

S: *Five.*

K51

Select three more students to be birds and to join the others at the front of the class. (If the students are wearing beaks, ask the three new birds wear to beaks of a different shape or color.)

T: *Are there still five?*

S: *No, now there are more than five.*

T: *How many more?*

S: *Three.*

Ask the three new birds to return to their seats.

T: *Here are five birds again.*

Very obviously walk one of the remaining five birds to her seat, and bring back one of the three birds sitting down.

T: *Are there still five?*

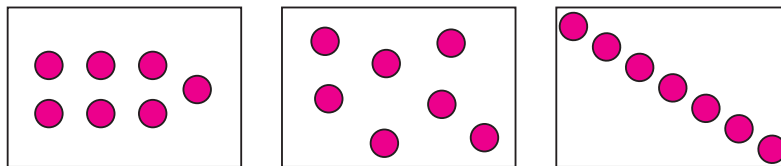
S: *Yes. You only switched birds.*

Tell all the birds to fly back to their seats.

Exercise 3 _____

On the magnetic board, repeat the birds' activities using checkers to represent birds. Choose a different number, for example, seven.

Use seven checkers of the same color. Move them around without adding or removing any (be very obvious about this). Each time, ask if there are still seven.



Alternate examples in which you change the number with examples in which you do not. After each move, go back to the original number of checkers.

Capsule Lesson Summary

Copy shapes on the geoboard. Make and describe changes to a shape on the geoboard. Observe that turning the geoboard does not change a shape or its size.

Materials

Teacher <ul style="list-style-type: none"> • Overhead geoboard and geobands 	Student <ul style="list-style-type: none"> • Geoboard and geobands
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Description of Lesson

Display an overhead geoboard and provide each student or pair of students with a geoboard and just one geoband.

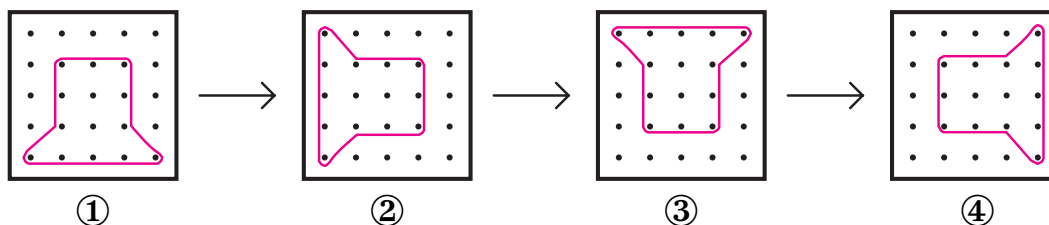
Exercise 1 _____

T: *I'm going to put a shape on my geoboard and I would like you to copy it exactly on your geoboards.*

Put a simple shape such as a 3x3 square on the overhead. As you check that the students are copying the shape on their geoboards, ask the class what they can tell you about this shape (four equal sides, four corners, a square, and so on).

T: *Now, I'm going to change this shape and I'd like you to change yours in the same way.*

Deliberately move the geoband at one corner (see ① in the illustration below) and check that students do the same. Ask the students to describe how the shape changed and to tell you about the new shape. Make a couple more changes asking students to copy what you do on their geoboards (for example, see ② and ③ in the illustration below). After each change, ask the students to describe the change and to tell you about the new shape.



Direct the students to work with a partner using two geoboards (or two sets of partners and two geoboards). One student (pair) puts on a shape with one geoband and then the other student (pair) copies the shape on their geoboard. Then reverse roles.

Exercise 2 _____

Clear your overhead geoboard and announce to the class that you are going to put on a different shape. Again, put on a fairly simple shape such as that shown in illustration ① on the next page.

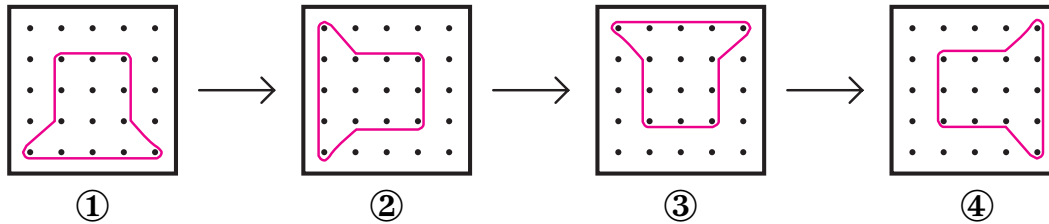
K52

T: *I put a shape on my geoboard and I would like you to copy it exactly on your geoboards.*

Check that students have completed the task and then ask that they tell you about the shape.

T: *Now, watch as I turn the geoboard (turn the geoboard a quarter turn). Do we still have the same shape on the geoboard? How does it look the same? How does it look different?*

Point out that you did not move the geoband. Students should observe that it is still the same shape and size even though it looks different when you turn the geoboard. Continue with a couple more turns and similar questions and observations.



Direct the students to work with a partner using one geoboard. One student puts on a shape with one geoband and the other puts on the same shape and size with a second geoband. Or, at the same time, the two students put on two shapes that are the same size and shape.

Capsule Lesson Summary

Pair different colored counters to establish one-to-one correspondence between children and toys. Discuss varied diagrams of children and toys using the terms *more* and *less*.

Materials

Teacher	<ul style="list-style-type: none"> Counters or checkers Colored chalk 	Student	<ul style="list-style-type: none"> None
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Description of Lesson

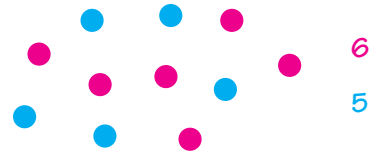
Note: Instead of placing checkers or counters on the floor, you may prefer to conduct this activity using blue and red magnetic checkers on a magnetic board or drawing red and blue dots on the chalkboard. On the chalkboard, draw connections between dots to show a correspondence.

Place six red counters or checkers on a large piece of paper on the floor or on a table.

T: *These red checkers are for children. How many are there? (Six)
Now I am going to put out some blue checkers. They are for toys (or candies or books).
How many toys?*

S: *Five toys.*

T: *Yes. Six children and five toys.*



Write 6 in red and 5 in blue beside the drawing.

T: *Each child wants a toy to play with. What do you think is going to happen?*

S: *There aren't enough toys.*

S: *Two children will have to play with one toy.*

Answers such as these indicate that your students have the right idea. In any case, be noncommittal and say,

T: *Well, let's see. This child takes this toy.*

Move a red checker together with a blue checker.

Invite students to finish pairing the children with the toys as illustrated here.



If you were not very successful when you first asked, "What do you think is going to happen?" you can ask again when there are only two red checkers and one blue checker left.

K53

When the matching is complete, ask some questions and insist that students use the checkers to explain their answers.

T: *Does every child have a toy? (No)*
Have all the toys been taken? (Yes)
In my story, there are six children and five toys. Are there more children or more toys?

S: *Children.*

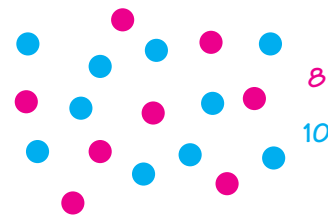
T: *Six is more than five. Five is less than six. There are more children. How many more?*
(One)

Repeat the above activity, this time using eight red checkers for children and ten blue checkers for toys. First, let the students count how many of each and predict what will happen this time.

T: *Are there more children or more toys?*

S: *More toys.*

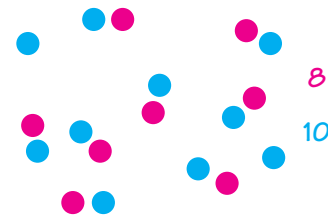
T: *How many more? (There are two more toys than children, but don't worry if this answer is not given now.) Let's check.*



Invite students to pair the children and toys.

T: *Does every child have a toy this time? (Yes)*
Have all the toys been taken? (No)
There are more toys than children. Ten is more than eight. How many more?

S: *Two.*



Call on someone to point to the two left over toys.

Extension Activity

Provide students with red and blue checkers or counters.

T: *In the first story, there were more children than toys. In the second story, there were more toys than children. I would like you to show a story with the same number of children as toys.*

When most of the students have finished, ask some of them to share their stories with the class. Comment on them. For example:

T: *Lionel, how many children are in your story?*

S: *Five.*

T: *And how many toys?*

S: *Five.*

T: *Terry, you have 10 children and 11 toys. Does every child have a toy?*

S: *Yes.*

T: *Does every toy get taken by a child? Look carefully.*

S: *No.*

T: *Look at Mandy's checkers. There are many toys, but we can easily see that every child has a toy and every toy was taken by a child.*

You may like to suggest students draw a picture of their stories in their math journals.

Home Activity

Suggest parents/guardians provide opportunities to use matching (one-to-one correspondence) in answering more/less questions. For example,

- Put some spoons and forks on the table. Are there more spoons or forks?
- Put some coins (pennies and nickels) in a pile. Are there more pennies or nickels?
- Examine a game with two colors of markers or checkers. Are there more of one color or the other?

Capsule Lesson Summary

Practice making numbers with a variety of materials.

Materials

Teacher	<ul style="list-style-type: none">• Counting book• Center materials (see Lesson K49)	Student	<ul style="list-style-type: none">• None
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Description of Lesson

Repeat Lesson K49 choosing a different counting book and possibly different materials to use at centers. Try to arrange that students work at different centers than they did for Lesson K49.

Capsule Lesson Summary

Investigate a relation between children and houses using the languages of strings and arrows. Pose some counting and number comparison questions about the story.

Materials

Teacher	<ul style="list-style-type: none"> • <i>A House for Everyone</i> by Betty Miles or another selection from the literature list • Colored chalk 	Student	<ul style="list-style-type: none"> • None
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Description of Lesson

Exercise 1 _____

Read aloud to the class a story such as *A House for Everyone* by Betty Miles or another selection from the literature list.

Exercise 2 _____

Arrange that several tables in the room can be used as the “houses” described in the following dialogue. Otherwise, choose something else to use as houses for this activity.

T: *Today we are going to pretend that these tables are houses and that children at the tables live in those houses.*

Send three students to one of the tables and then ask one of them,

T: *Susan, how many children live in your house?*

S: *Three.*

Send four students to a second table and two other students to a third table.

T: *Which house (table) has more than three children in it?*

Tom, how many children are living in your house?

S: *Four.*

T (pointing to the third table): *How many children are living in this house?*

S: *Two.*

If you have a fourth table, leave it empty (no children) and ask,

T: *How many children altogether live in these four houses?*

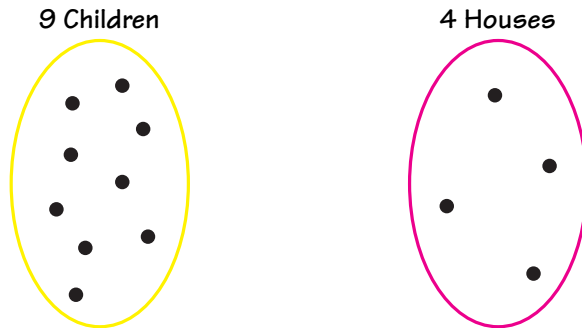
S: *Nine.*

K55

- T:** *Does every house have some children in it?*
S: *One house does not.*
T: *Let's draw a picture of our children and houses story on the board.*

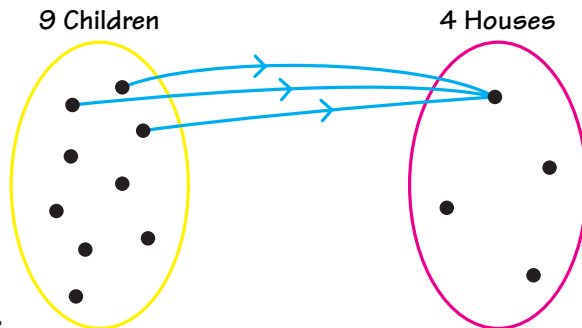
Draw strings and dots on the board as the class reiterates the situation.

- T:** *How many children? (Nine)*
How many houses? (Four)



Draw three arrows from three children to one house as you ask again,

- T:** *Susan, how many children are in your house? (Three)*
T: *What do you think these blue arrows are for?*
S: *These children live in this house.*



T (pointing to one of the child-dots at the start of a blue arrow): *Susan lives in this house.*

This child lives in the same house. (Point to another child-dot at the start of a blue arrow.)

And this child also lives in the same house. (Point to the third dot at the start of a blue arrow.)

No other children live in this house. So how many children live in this first house?

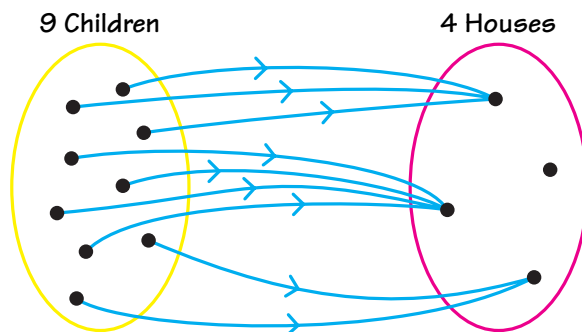
- S:** *Three.*

Point to each child-dot where a blue arrow starts and ask a child at Susan's table to stand.

Complete your drawing on the board, one house at a time, having students suggest where to draw arrows and helping to locate dots for a particular child or house.

Point to a dot in the children string.

- T:** *Can you point to the dot for the house in which this child lives?*

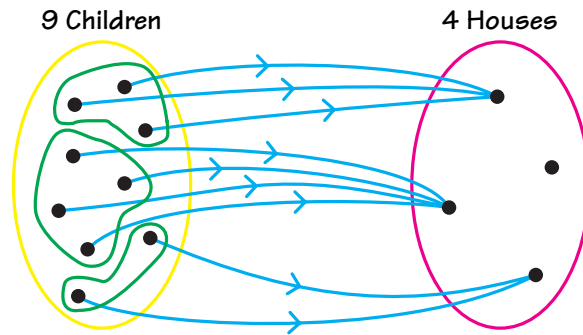


Repeat this for several dots in the children string.

Next, point to a dot in the house string.

T: *Can you point to dots for children who live in this house?*

When a student has correctly indicated all the children who live in a specific house, ask him or her to trace around the children using a finger or a pointer. Draw the string yourself.



Repeat this question for each house that is occupied by children.

T: *Does each of these nine children live in one of the four houses?* (Yes)

Does every house have some of these nine children living in it? (No)

Which house has the most children living in it? (The one with four children)

Which house has the least children living in it? (The one with no children)

Are there two houses with the same number of children living in them? (No)

Writing Activity

Invite students to draw pictures in their math journals about their own children and houses story.

Capsule Lesson Summary

Assign number names to the C-rods as you build a C-rod staircase.

Materials

Teacher	• Demonstration C-rods	Student	• C-rods
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Description of Lesson

Exercise 1 _____

Display your set of demonstration C-rods and provide each student or pair of students with a set of C-rods.

T: *Let's give number names to our C-rods. Which rod is the smallest (shortest)?*

S: *White.*

T: *Let's call the white rod "1."*

Display the white rod and write 1 under it.



T: *Which rod is just a little longer than the white rod?*

S: *Red.*

T: *How many white rods do we need to build a train the same length as a red rod? Try it with your rods.*

When the class decides that two white rods make a red rod, ask,

T: *What number name should we give the red rod?*

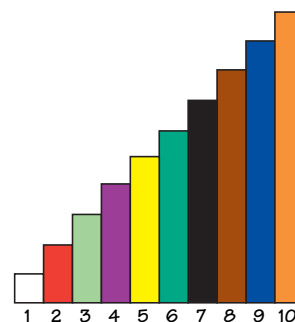
S: *2.*



Agree to name the red rod "2," display it next to the white rod, and write 2 under the red rod.

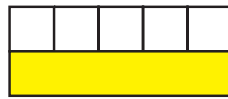


Continue in this way deciding for each rod how many white rods make a train the same length, and then using this count to give a number name to the rod. In this way, your display will eventually look like the staircase in Lesson K31 with numbers from 1 to 10 written under the rods.



K56

You may occasionally want to write a corresponding number sentence on the board when deciding what number name to give a rod. For example:



$$1 + 1 + 1 + 1 + 1 = ? 5$$

You may also like to observe the sequence of rods and numbers generated by adding a white rod. For example,



$$4 + 1 = 5$$

Allow students time to play with the C-rods and encourage them to look for other patterns and trains.

Writing Activity

Suggest students record the C-rod staircase and number names for the rods in their math journals.

Capsule Lesson Summary

Make patterns using people; then use patterning materials to continue and extend patterns.

Materials

Teacher	<ul style="list-style-type: none"> • <i>Peter Taps One Hammer</i> fingerplay 	Student	<ul style="list-style-type: none"> • Manipulatives such as beads, Unifix[®] cubes, blocks, K A-blocks, and so on • Math journal or paper
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Description of Lesson

Exercise 1 _____

Review previous fingerplays or introduce a new one such as *Peter Taps One Hammer*. (Your students' names can be substituted for Peter, and other objects can be substituted for tools; for example, "Kaiby rings one bell this fine day," and so on.)

Exercise 2 _____

Tell the class that today they are going to make patterns with girls and boys.

Ask for volunteers to come to the front of the class to create a pattern. Arrange the volunteers girl, boy, girl, boy, girl, boy.

T: *If we used numbers to describe this pattern, what would it sound like?*

S: *One, two, one, two, one, two, ...*

T: *That's true, if we say "one" for a girl and "two" for a boy. Can you tell us another way these children could make a pattern that sounds the same?*

S: *Stand, sit; stand, sit; stand, sit.*

S: *Arms up, arms down; arms up, arms down; arms up, arms down.*

T: *Great examples. Let's see if we can make a pattern with children that sounds different.*

Let students suggest patterns; then, create them with student volunteers. Ask students to describe them with numbers (or letters) and possibly find other ways of describing the patterns. You may need to suggest another pattern or two yourself before students catch on. Some pattern ideas are the following:

one, one, two; one, one, two; ... — girl, girl, boy; girl, girl, boy; ...
or stand, stand, sit; stand, stand, sit; ...

one, two, three; one, two, three; ... — arms up, arms forward, arms down; arms up,
arms forward, arms down; ...
or face forward, face sideways, face backward; face
forward, face sideways, face backward; ...

K57

Exercise 3

Divide the class into three or four small groups. Provide each group with a set of manipulatives such as beads, Unifix[®] cubes, pattern blocks, K A-blocks, and so on. Ask students to use the manipulatives to make patterns and to record them in their math journals or on paper.

Assessment: You may wish to use one of the sample assessment checklists, Blacklines K0 (b)–(k), to note students' patterning skills.

Home Activity

This would be a good time to send home a letter to parents/guardians about patterns in mathematics and to suggest they look with their child for patterns at home. Blackline K57 has a sample letter.

Capsule Lesson Summary

Use the mathematical languages of strings and arrows to portray incidents in a story.

Materials

Teacher	• One copy of <i>81 Roses</i> Storybook	for each pair of students
Student	• One copy of <i>81 Roses</i> Storybook	

Description of Lesson

Although *81 Roses* uses the mathematical languages of dots, arrows, and strings, it is a story and can be used in class as you might use other storybooks. Observe the string and arrow pictures with the class, but try not to overemphasize the mathematical aspects.

You may wonder why this storybook (and others) is included in the *CSMP* curriculum. Part of the reason is to show students that these mathematical languages are powerful, useful, and as natural as their own spoken language. *CSMP* believes that there is room in the world of mathematics to express emotion and to give free rein to children's wonderful imaginations.

Experience suggests that, for this particular storybook, it is better not to give your students copies of the book right at the beginning of the lesson; it may be more distracting than useful. Take care, however, to give the students an opportunity to look at the realistic pictures in the book as you are reading the story, by holding up your copy. If you wish to focus on a particular picture, copy it onto the board.

Here are some questions you may wish to discuss as you read the story, but be careful not to destroy the story atmosphere.

Page 7

T: *What do you think the blue arrow is for?* (The blue arrow tells you that the dog is following its mother. Point to the dog and then to the mother.)

Page 9

T: *How many dots are there in the blue string? Who are they for?*

Page 13

T: *Can you find the number 37 on this page? What are the other numbers?*

Pages 14–15

T: *How many cookies were there to start with? How many cookies were left after the dog ate three of them?*

Page 16–17

This would be a good place to stop the story if you feel it is too long for your class to take at one sitting. You can finish reading it another time. If you break the story into two sessions, be sure to ask the students what they remember about the story before you start the second session.

Page 20

T: *Which dot do you think represents the mother? What do the other dots represent?*

Page 21

T: *How many dots are there in the blue string? Who are they for?*

Who are the two dots outside the blue string for?

Page 24

T: *Do you have any idea how old the little dog's mother is now?*

Tell the students to pay close attention as you continue to read the story so that they can find out.

After reading the story to the class, you may like to allow students to look at the storybook (with a partner) at their own pace. Encourage them to feel free to talk about the story (with you or with their partner), or to make a drawing about it if they wish. You may like to make at least one copy of this storybook available in a reading center for students who wish to glance through it in their spare time.

Capsule Lesson Summary

Review how to enter and clear numbers from the calculator display. Put a variety of one-, two-, and possibly three-digit numbers on the display.

Materials

Teacher	Student
<ul style="list-style-type: none"> • Overhead calculator or calculator poster • Blocks or other counters 	<ul style="list-style-type: none"> • Calculator

Description of Lesson

Display the overhead calculator or calculator poster. Review the location of various keys on the calculator, how to turn on the calculator, and how to clear (put 0 back on) the display.

T: *What do you notice about how the number keys are located on the calculator?*

S: *They are in order (or reverse order).*

S: *Zero is on the bottom and they go up to 9.*

S: *The rows are 1, 2, 3; 4, 5, 6; and 7, 8, 9.*

Distribute calculators so that each student or pair of students has a calculator to use.

T: *I'm going to write a number on the board. Then, you put the number on the display of your calculator.*

If students are working in pairs, suggest one student enter the number while the other checks. After checking, suggest the other student take the calculator, clear the display, and get ready to enter the next number.

Repeat this exercise with several one-, two-, and possibly three-digit numbers. Then say a number without writing it on the board. After students enter the number on their calculators, write the number on the board for checking. Repeat several times.

If students are working in pairs, instruct them to continue this activity by letting one student say a number and the other put it on the calculator. Otherwise, let individual students explore the calculator as they like for a short while.

Writing Activity

In their math journals, ask students to write some of the numbers they put on the calculator today.

Note: See Section One, page 1-12, for an explanation of the purpose of scheduled adjustment days.

Today you may wish to repeat an earlier lesson either for a group of students or for the entire class. Many of the lessons can be made to appear completely different by changing the story and/or the numbers in the lesson. This is also a good time to let students work in a center or on a project of your choice.

The following activities are suggested to give students more experience in number and pattern recognition.

Numeral Card Game_____

Put students in groups of three to five. One student chooses a numeral card (showing one of the numbers from 0 to 10) and shows it to a second student. The second student “taps” that many times. If the second student taps the number correctly, he or she may choose the next numeral card. If a mistake is made, the student who spots the mistake chooses next.

Some variations of this activity are the following:

- The second student reads the numeral card and then points to it on the number line.
- Play the game using all of the numeral cards in the deck.
- One at a time, each student in the group taps the number in an interesting pattern. Here are several possible patterns for five:

tap, tap, tap, tap tap
 tap, tap - - - tap, tap, tap
 tap, tap - - - tap - - - tap, tap
 tap, TAP, tap, TAP, tap

Who Stole the Cookie?_____

Distribute numeral cards to the students. Sing the song *Who Stole the Cookie* using numbers rather than students’ names. The student with the appropriate numeral card holds it up and responds at the appropriate place in the song. For example,

T: *Who stole the cookie from the cookie jar?* **All:** *8 stole the cookie from the cookie jar.*

S (holding 8): *Who me?* **All:** *Yes, you!*

S (8): *Couldn’t be.* **All:** *Then, who?*

S (8): *10 stole the cookie from the cookie jar.*

S (holding 10): *Who me?*

Continue as long as there is interest or through eight to ten numbers.

Assessment: You may wish to use one of the sample assessment checklists, Blacklines K0 (b)–(k), to note the students’ number and pattern recognition skills.

Early Warning

Among the next nine classroom lessons are some that require extra preparation or involve materials not included with the *CSMP* Classroom Set. The lessons are listed here for your convenience in preparing for them. A more detailed description of the needed materials can be found on the first page of each lesson. (Special materials are listed here only once, even if they are used more often during the nine-day period.)

- K61 *Length #1*: Shoes, shoe outlines; scissors; glue
- K62 *Numeral Writing #2*: Variety of manipulatives; index cards
- K64 *C-Rods #6*: C-Rods
- K65 *What's Cooking?*: Ingredients for a recipe; measuring spoons and cups; bowls; chart paper
- K66 *Counting Calculator*: Overhead calculator; counters; calculators
- K67 *Telephone Numbers*: Play telephones; telephone pictures
- K68 *Ways to Make Ten #2*: Animal handout; counters

Several of the lessons also include suggestions for literature and/or fingerplays which are not included here. Please check the materials list at the beginning of the following lessons in advance so you can obtain the necessary literature: K62, K63, K68, K69.

Capsule Lesson Summary

Order shoe outlines by length and make some length comparisons.

Materials

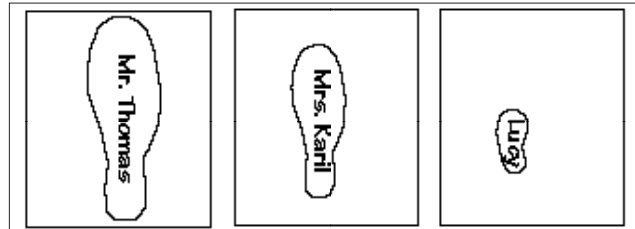
Teacher	Student
<ul style="list-style-type: none"> • Shoes • Shoe outlines 	<ul style="list-style-type: none"> • Shoe outlines • Paper • Scissors • Glue

Advance Preparation: Collect at least three shoes—one a fairly large man’s shoe, one a medium-sized women’s shoe, and one baby shoe. Make shoe outlines of these shoes and label them with the actual names of their owners or just “man,” “woman,” and “baby.”

Description of Lesson

Show the class your collection of shoes. Ask the students to try to identify whose shoes they might be. Let them comment on what things they notice about the shoes to predict their owners. Then show the class how you made outlines of the shoes.

T: *I placed a shoe on paper—sole down—and traced around it. Then I wrote whose shoe it is on the picture.*



Arrange the class in groups of three to five students. Direct the students in each group to make outlines of their shoes (one shoe for each student) on a piece of paper and write their names on their shoe pictures. Then they should cut them out.

Give each group a copy of your shoe pictures. Together with their own shoe pictures, ask the groups to order the shoes from shortest to longest. Provide a large sheet of paper and glue for students to glue down the shoe outlines in order. As groups finish their work, let them share the results with the class. Encourage students to describe how they decided which of two shoes was longer (shorter). Ask some comparison questions.

T: *Whose shoe is longer (shorter), Shelley’s or Andrea’s?
Whose shoe is longer than Mark’s but shorter than Alex’s?
Did any two people have the same length shoes?*

Extension Activity

Make a class picture of students’ shoe outlines in order from shortest to longest.

Capsule Lesson Summary

Practice numeral writing and make individual numeral card sets.

Materials

Teacher	<ul style="list-style-type: none"> • Counting book from the literature list • Variety of manipulatives • Numeral cards 1–9 	Student	<ul style="list-style-type: none"> • Crayons • 3 x 5 index cards
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Advance Preparation: Set up nine stations, one for each of the numerals 1–9. At each station place a large numeral card and that number of manipulatives (counters, beans, blocks, pennies, and so on).

Description of Lesson

Exercise 1 _____

Read aloud to the class a counting book of your choice.

Exercise 2 _____

Demonstrate how to write each numeral at the board. As you do so, you may wish to recite a little verse. Here are some possibilities:

- | | |
|---|---|
| <p>0 Around and around and around we go
That's the way to make a zero.</p> | <p>5 Down and around and then a hat
That's a five that looks so fat.</p> |
| <p>1 Draw a line and then you're done
That's the way to make a one.</p> | <p>6 With a curving line a loop you fix
That's the way to make a six.</p> |
| <p>2 Around and back and then you're through
That's the way to make a two.</p> | <p>7 Across the sky and then straight down
A seven will never cause a frown.</p> |
| <p>3 Around a tree and around a tree
That's the way to make a three.</p> | <p>8 Make an "S" but do not wait;
Go back up to close the gate; that's an eight.</p> |
| <p>4 Down and over and down once more
That's the way to make a four.</p> | <p>9 Draw a loop and then a line
That's the way to make a nine.</p> |

Exercise 3 _____

Give each student ten unlined 3 x 5 index cards and instruct as follows.

- T:** *I am going to hold up my hand and I want you to tell me how many blocks I have in it. (Hold up an empty hand.)*
- S:** *None.*
- S:** *Zero.*
- T:** *Everyone write a zero on one of their cards while I draw zero on the chalkboard. This is your first number card. We are all going to make a set of number cards.*

K62

Direct the students to visit the nine stations in the room and make a different number card at each.

T: *There are nine stations around the room. Each station is for a different number. You can tell which number by counting the manipulatives and reading the number on the card at that station. You should then write the number on one of your small cards to keep for yourself.*

When you finish all the stations, you should have a set of number cards.

Writing Activity

Give students additional numeral writing practice on prepared activity sheets. Use some of your own favorite sheets or use Blacklines K62 (a)–(d) to prepare numeral writing practice sheets.

Capsule Lesson Summary

Explore a relationship between mother hens and baby chicks using strings and arrows to picture the situation.

Materials

<p>Teacher</p> <ul style="list-style-type: none"> • Colored chalk • <i>Good Morning Chick</i> by Mirra Ginsburg, <i>Polar Express</i> by Chris VanAllsburg, or another selection from the literature list. 	<p>Student</p> <ul style="list-style-type: none"> • None
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Description of Lesson

Exercise 1 _____

Read *Good Morning Chick* by Mirra Ginsburg, *Polar Express* by Chris VanAllsburg, or another selection from the literature list. **Note:** Adapt Exercise 2 to use something from the story you choose to read.

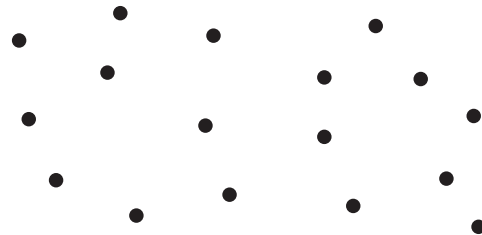
Exercise 2 _____

T: *This story takes place in a farmyard where some mother hens are running around with their cuddly, little, yellow, fluffy baby chicks. Here they all are. Count them as I draw.*

Draw 17 dots spread out across your entire chalkboard:

T: *How many dots are there altogether? (17)*

Ask a student to count the dots aloud and to point to 17 on the number line. Other students should find 17 on their desk number lines.



T: *Seventeen dots. What are they for?*

S: *Chickens.*

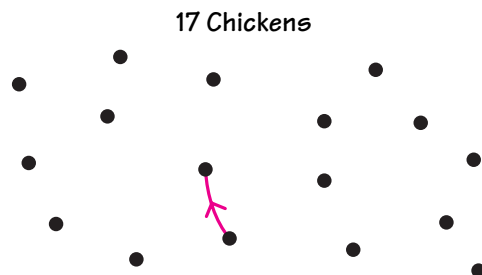
T: *Right. Some are baby chicks, some are mother hens. We don't know which is which for the moment.*

Suddenly there is a thunderstorm with lots of lightning, thunder, and rain. The baby chicks are frightened, so each one runs to its mother.

Draw one arrow and say,

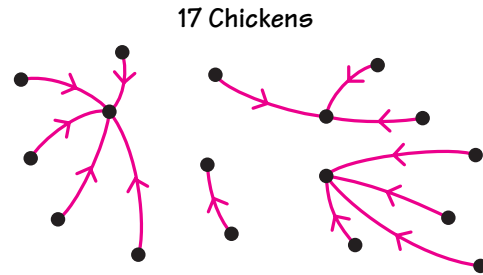
T: *This chick runs to its mother.*

Ask a student to point to the baby chick and to the mother hen. Then ask the students to close their eyes while you complete your drawing.



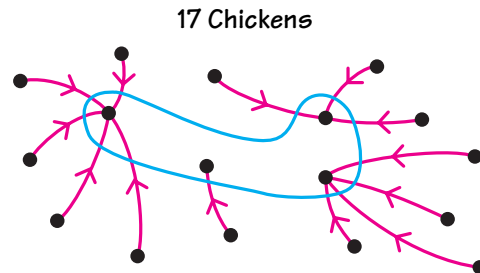
At this point there are several problems you can pose. For example:

- T:** *What does the picture tell us?*
Point to a baby chick.
Point to a mother hen.
Point to two chicks who have the same mother.
 (...pointing to a dot for a hen) *How many chicks does this mother hen have?*
Point to all the mother hens. How many are there? (Four)



Ask someone to trace a string that goes around all four mother hens using a finger or a pointer. When this has been done correctly, draw the string yourself.

- T:** *Point to the hen who has the most chicks.*
Point to the hen who has the fewest chicks.
How many chicks are there altogether? (13)



Extension Activity

In cooperative groups, ask students to create a new story about mother hens and baby chicks. Provide the groups with 20 counters (beans, chips) and paper. Instruct students to work together to decide how many hens and how many chicks are in their story and then to record a picture of the story to share with the class. You may like to ask individual students to record the story in their math journals.

Capsule Lesson Summary	
Model number combinations with C-rods.	
Materials	
Teacher	<ul style="list-style-type: none"> • Demonstration C-rods • Unlined paper
Student	<ul style="list-style-type: none"> • C-rods • Crayons or markers

Description of Lesson

You may like to put the students together in groups of two to four for this lesson. First, using the demonstration C-rods, model building C-rod trains and finding another rod the same length; then let the groups work on other combinations.

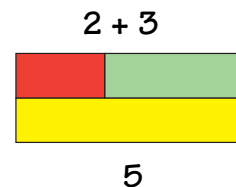
T: *Today we are going to put rods together to form trains. Put a red rod and a light green rod together. Which single rod is the same length as this train? Use your rods to find out.*



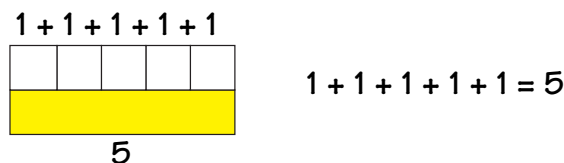
S: *Yellow.*

Remind students about giving number names to the rods by building the staircase as in Lesson K56.

T: *What number is the red rod? (2)
 What number is the light green rod? (3)
 When we make a train, it is the same length as yellow. What number is the yellow rod? (5)
 Let's record this train as $2 + 3 = 5$.*



Ask for another train of rods the same length as (equal to) the yellow, and record it as a number fact. For example,



Treat the number facts
 put the emphasis on

very informally and
 building trains of rods.

While working in groups finding other combinations, suggest that students record some of their C-rod trains on paper (see Lesson K37) and, if appropriate, write number facts for the C-rod trains.

Capsule Lesson Summary

Experiment with wet and dry measurement in a cooking activity.

Materials

Teacher <ul style="list-style-type: none"> • Food ingredients for a recipe of your choice • Chart paper • Bowls • Measuring spoons and cups 	Student <ul style="list-style-type: none"> • None
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Note: If cooking is done on a regular basis in the classroom, concepts from this lesson simply need to be integrated into those activities. This may be a whole or small group activity, or may be set up in a center.

Description of Lesson

Begin by discussing cooking activities students have observed at home.

T: *When someone in your home wants to bake or cook, how do they know how much of each ingredient to use?*

S: *They just know.*

S: *They read a recipe.*

S: *They read the box.*

T: *People often read a recipe and the recipe tells them what and how much to use.*

Display measuring spoons and cups and discuss how they are used to measure.

T: *What do you notice about these spoons?*

S: *They are different sizes.*

T: *How about these cups?*

S: *Some are big, some are not so big.*

Explain how each cup or spoon represents an amount and that the amount is marked on the utensil. Then hold up a teaspoon (t) and a tablespoon (T).

T: *Is a teaspoon smaller or larger than a tablespoon?*

Let students examine or experiment with the spoons to decide. Continue with other examples.

T: *Now we are going to make gorp (or whatever recipe you have chosen).*

It may be helpful to have a recipe printed on chart paper or on an overhead transparency. Proceed to make the recipe allowing students to measure and add ingredients. Then share what you have made.

Capsule Lesson Summary

Review how to enter and clear numbers from the calculator display. Teach the calculator to count by ones.

Materials

Teacher <ul style="list-style-type: none"> • Overhead calculator • Blocks or other counters 	Student <ul style="list-style-type: none"> • Calculator
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Description of Lesson

Display an overhead calculator or calculator poster. Review how to enter and clear numbers from the calculator display.

T: *Can someone tell us how to count by ones?*

S: *1, 2, 3, 4, 5, and so on.*

Discuss counting by ones with the class and model the process using blocks or other counters.

T: *Let's see if we can teach the calculator to count. What number should we start counting with?*

S: *1 (or 0).*

T: *Put the starting number on the calculator.*

Do this on the overhead calculator and put out 0 or 1 counters.

T: *How do we get the next number?*

S: *Add 1.*

S: *Say 2.*

T: *When we count on by ones, each number is one more than the one before, so let's tell the calculator to add one. Press \oplus $\boxed{1}$. Now the calculator can count.*

Choose a student to press $\boxed{=}$ repeatedly (but slowly) as you model counting with blocks or counters placed next to the calculator.

T: *So we teach a calculator to count by ones using the following steps:*

- 1. Put on the starting number.*
- 2. Press \oplus $\boxed{1}$.*
- 3. Then press $\boxed{=}$ $\boxed{=}$ $\boxed{=}$ $\boxed{=}$ and so on.*

Invite students to teach their calculators to count. If students are working with a partner, they can take turns with one student doing the teaching while the other checks by performing step 3. Then they can trade roles. Let students play with counting for a few minutes. Many will like to see the calculator count up to "big" numbers.

Home Activity

Suggest students use a calculator at home to show family members how a calculator counts. A sample parent letter is provided on Blackline K66. The letter mentions that, while most calculators have an automatic constant function built in (which is necessary to program the calculator to count), some may not.

Capsule Lesson Summary

Practice numeral writing and numeral recognition.

Materials

Teacher

- Two play telephones
- Blackline K67

Student

- Telephone picture

Advance Preparation: Use Blackline K67 to write each student's name on the telephone, but leave the phone number blank. Make a telephone picture for each student. Write

Description of Lesson

Give each student a telephone picture and instruct them to write their names on the telephones.

Begin by writing the school phone number or a phone number of your choice on the board.

T: *How many digits are in a telephone number?*

337-0990

S: *Seven.*

S: *Ten.*

T: *There are seven not including the three-digit area code, and ten if you count the area code. Our telephones have enough space for a seven-digit telephone number. Write a seven-digit number on your telephone. If you know your home phone number, you may use it. If you want to use the school phone number, that's okay, too. Otherwise, make up a phone number for your phone.*

While students are working, get out two play telephones.

Select two volunteers to make phone calls and give them the following instructions.

T: *Caroline, read the phone number from your paper and dial the number as you say it aloud. Then say "Ring, ring, ring, ring." Billy, you pretend to answer.*

Once Caroline has correctly dialed her number and Billy has answered, direct the students to hang up and reverse roles.

Instruct students to select a partner and take turns reading their phone numbers, dialing the phone, and answering the phone. At the end of class, collect all the phone number pages and staple them together to make a class telephone book.

Center Activity

The class telephone book together with play telephones can be put in a center for students to practice dialing phone numbers.

Capsule Lesson Summary

In a story situation, find number facts for 10.

Materials

Teacher	<ul style="list-style-type: none"> • <i>Ten Apples Up on Top</i> by Theo LeSeig or another selection from the literature list • Blackline K68 • Counters 	<ul style="list-style-type: none"> • Animal handout • Counters
Advance Preparation: Use Blackline K68 to		
Students	<ul style="list-style-type: none"> • Make copies of the animal handout for students. 	

Description of Lesson

Read *Ten Apples Up on Top* by Theo LeSeig or another selection from the literature list.

T: *In today's story, each animal was trying to end up with more apples on its head than any of the other animals. Eventually, they all had ten apples up on top.*

What if the animals work together, each with a few apples on its head, so all together there are ten apples? What are some ways they can work together?

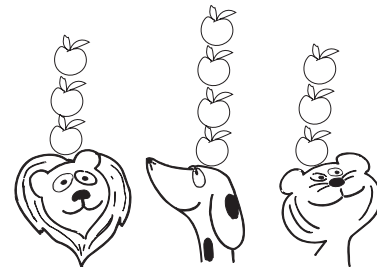
Show a picture of the lion, dog, and cat. Using counters or apple pictures, put apples on the animals' heads to total 10. Allow time for students to suggest a couple different ways to make 10.

T: *How could we record what we see?*

S: *Make a picture.*

S: *Write the numbers on the board.*

T: *Let's record the apples on each animal's head in a number fact.*



$$3 + 4 + 3 = 10$$

You may like the students to work with a partner. Give each student an animal handout and ten counters. Ask each student to place the counters on the animals' heads and to check that the combination is ten.

You may like to suggest that students draw something on the picture to represent the apples (e.g., dots). This will make it easier for students to share their work with the class or put the picture in their math journals.

As you observe students' work, you may wish to ask questions such as:

T: *How many apples are on the lion's head?
How many more apples do you need to make 10?
Can you tell me the way you made ten?*

For some students, suggest they write number facts for the ways they made 10. Allow some time for students to share their ways to make 10 with the class.

Extension Activity

Display the students' pictures of ways to make ten somewhere in the room. A set of manipulatives can be placed nearby so students can use them to check the facts for ten.

Capsule Lesson Summary

Use the non-verbal languages of strings and arrows to illustrate and help tell a story about real experiences.

Materials

Teacher	• One copy of the <i>The Baby is Born</i> Storybook	Student	• <i>The Baby is Born</i> Storybook • Crayons/markers
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Note: If you do not have enough copies of the storybook so that each student may keep one, a sheet of paper will be necessary for each student.

Description of Lesson

The Baby is Born uses the non-verbal languages of dots, arrows, and strings to tell a story which may strike a chord for many of your students. It deals with the birth of the second child into a family and the emotional stress this event places on the firstborn.

Read this story as you would any other story. If you think your students will be able to follow along, distribute copies of the storybook before you begin. If you do not do this, be sure to give the students an opportunity to look at the pictures by holding up your own copy of the book at the appropriate times. The mathematical pictures are simple enough that they can be drawn on the board as you are reading the story. (Remember to use the side of a small piece of chalk to draw large dots and thick strings when reproducing these pictures on the board.)

Take care not to interrupt the flow of the story; it is probably simple enough that everyone can understand it without any additional explanation. One exception to this might be on page 12; ask what has happened before you read the text. Throughout the book, give the students enough time to look at the pictures since they carry quite a lot of information.

When you finish reading the story, give a copy of the storybook to each pair of students (if you haven't distributed them already) and let them look through it again at their own pace. Let students draw a picture of Veronica and her family. If each student has his or her own copy of the storybook to keep, they can draw in the storybook itself. If not, give each student a sheet of paper on which to draw this picture. (You might find it useful at this point to ask someone to remind the class who the people in Veronica's family are.)

When this drawing has been completed, let your students draw a picture of their own families, either in the storybook, or on the back of the sheet of paper. Be prepared to help students who belong to large or complicated families. Students may wish to label the people and pets in their families.

Both of the drawings that the students make will probably be realistic. This is to be expected. If, however, students decide to use dots and arrows instead, they should be free to do so.

Note: See Section One, page 1-12, for an explanation of the purpose of scheduled adjustment days.

Today, you may wish to repeat a previous lesson either for a small group of students or for the entire class. Many of these lessons can be made to appear completely different by changing the story and/or the numbers in the lesson. The measurement lessons K61 and K65 can easily be repeated by choosing a different set of objects to compare or a different recipe. This is also a good time to allow students to work in a center or on a project of your choice.

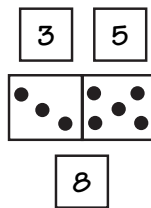
The following game activities can be used for additional experience with number facts and number comparisons.

Dominoes War_____

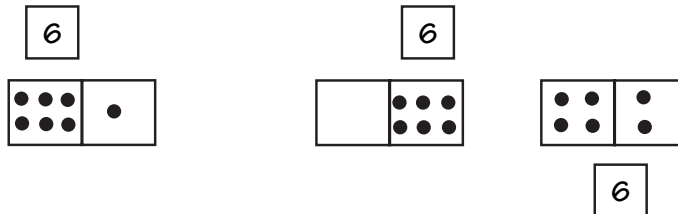
Introduce pairs of students to a game with dominoes similar to the popular card game called “War.” Place dominoes face down between two players. Both players select a domino at the same time and turn it over. Players compare their selected dominoes and the one with the greater number of total dots on his or her domino takes both dominoes. Play continues until the face down dominoes are gone. The player having the most dominoes at the end of the game wins.

Dominoes/Numerals Match_____

Let students work in groups of three for this activity. Scatter numeral cards face up on a table. Select a domino and place it face up on the table. Then ask each student to choose a numeral card to “match” with the domino. For example, there may be as many as three numeral cards to match a domino.



Select a numeral card and ask each student to find a different domino that it will match. For example:



Assessment: You may wish to use one of the sample assessment checklists, Blacklines K0 (b)–(k), to note students’ progress at making number comparisons and corresponding a number with a number of objects.

Early Warning

Among the next nine classroom lessons are some that require extra preparation or involve materials not included with the *CSMP* Classroom Set. The lessons are listed here for your convenience in preparing for them. A more detailed description of the needed materials can be found on the first page of each lesson. (Special materials are listed here only once, even if they are used more often during the nine-day period.)

- K71 *Candy Graph*: Six-column graph; packages of candy
- K73 *Robot Walk #1*: Small doll (robot, fire fighter, police officer, and so on)
- K76 *Taking a Trip*: Chart paper
- K77 *Counting-On #1*: Counters
- K78 *Length #2*: Scissors; masking tape; ball of string

Several of the lessons also include suggestions for literature and/or fingerplays which are not included here. Please check the materials list at the beginning of the following lessons in advance so you can obtain the necessary literature: K72, K74, K75, K76, K79.

Capsule Lesson Summary

Use color (or some other attribute) to sort and graph packages of candy. Use the graph to answer some questions and check predictions.

Materials

Teacher

- Six-column graph
- Blackline K71

- Crayons/markers
- Package of candy

Student

- Six-column graph

Advance Preparation: Use Blackline K71 to make copies of the six-column graph. Select small packages of candy or other edible treats with distinctive colors or some other attribute for sorting and graphing. Choices might be M&M's®, Life Savers®, Froot Loops®, animal crackers, and so on.

Description of Lesson

Distribute six-column graphs and packages of the item you have chosen to sort and graph to pairs of students. Direct the students not to open the packages yet. (The dialogue here uses M&M's; adjust it accordingly.)

T: *What colors do you think are in a package of M&M's?*

As students suggest and agree on colors for M&M's, make color splashes at the bottom of columns of a graph. Direct students to do the same on their graphs. If not all colors are suggested, you can add other colors to the graph when the packages are opened.

T: *Do you think there will be more yellow or more red M&M's in your package?*

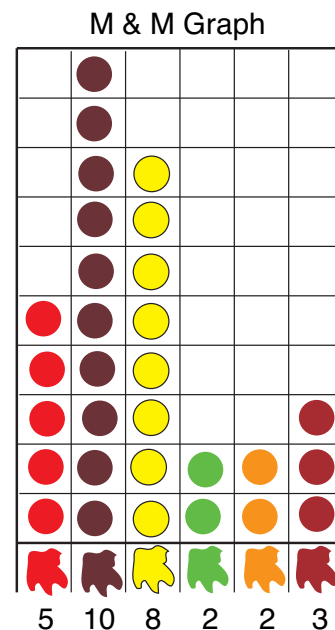
Let students make several predictions before they open the packages. For example, they might predict:

- Which color will have the most/least?
- Will there be more yellow than red?
- How many of a certain color?
- How many total M&M's in their package?

Solicit as many predictions as students are interested in making.

Then instruct the students to open their packages of M&M's and sort them by color by placing the individual M&M's in appropriate columns of the graph. You may want to first model the process on a class graph before students begin, or circulate and help student pairs to place M&M's in their graphs. Warn the students not to eat any M&M's yet.

As students finish putting the M&M's in their graphs, suggest they count how many of each color and write the number at the bottom of that column of the graph.



Since students will probably want to start eating the M&M's, tell them that when they remove an M&M from the graph they should make an **x** or some other mark in its place. In fact, you may suggest they remove all the actual M&M's and put **x**'s in their places.

When all the groups have completed the sorting and graphing work, conduct a class discussion of the graphs. Encourage students to share their graphs and make comments such as the following:

- What does the graph tell you?
- What did you notice about your graph?
- Of which color M&M did you have the most? ... least?
- How does the graph show which color is most? ... least?
- Were there the same number of two colors?
- Did you have some of every color?
- Were our predictions very good?

Capsule Lesson Summary

Act out a “train” and then picture the train using the language of arrows. Use the train to count forward and backward.

Materials

Teacher	<ul style="list-style-type: none"> • <i>The Little Engine that Could</i> by Watty Piper or another selection from the literature list • Colored chalk • 0–109 Numeral Chart 	Student	<ul style="list-style-type: none"> • None
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Description of Lesson

Exercise 1 _____

Read aloud a literature selection about trains such as *The Little Engine that Could* by Watty Piper.

Exercise 2 _____

Begin this exercise on the playground, in the gym, or in an open area of the room.

T: *Let’s make a train with you being the cars of the train.*

Organize the class in one long line with each student holding the waist of the student in front.

Direct the train to move from the playground to the classroom (or around the room) with the engine leading the way and the caboose last.

T: *How many cars are in our train? How can we find out?*

S: *Count us.*

Direct the train to go past the station (your desk or the door of the classroom) and count as they go by. You may ask the student-cars to count off as they go past the station starting with the engine as 1 and the caboose last.

T: *You may sit down now. How many cars were in our train?*

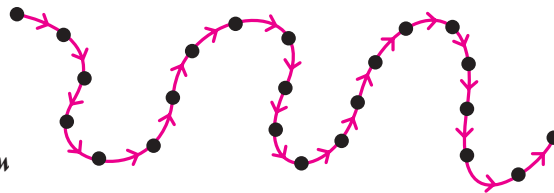
S: *23.*

Ask students to point to 23 on the number line and on the 0–109 numeral chart.

T: *I’m going to draw a kind of picture of our train on the board.*

Draw this arrow picture on the board.

T: *How does this look like our train?
What are the dots for?
What are the arrows for?*



S: *The dots are the cars and the arrows show cars following other cars in the train.*

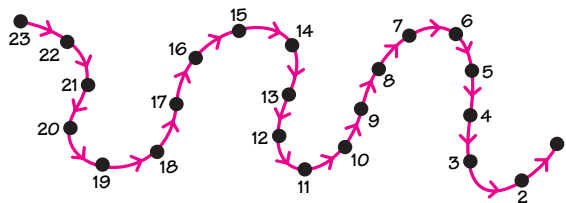
S: *The arrows tell the direction the train is going.*

T: *Can you point to the engine?
Can you point to the caboose?*

Ask various students to locate cars on the train for you. For example:

T: *Raise your hand if you were one of the first three cars.
Point to the first three cars.
Raise your hand if you were one of the last five cars.
Point to the last five cars on the board.
Point to four cars somewhere in the middle of the train.*

T: *Do you remember how we counted the cars as you went past the station?
Let's number the cars in our picture like we counted. What did the engine say?*



S: *1.*

Label the dots in the arrow picture as the students count again from 1 to 23.

T: *What did the caboose say?*

S: *23.*

T: *Do you think we could read the numbers of the cars starting with the caboose.*

Point to the dots one by one as the class reads the numbers from 23 to 1.

Extension Activity

Suggest that students make trains with manipulatives such as Unifix[®] cubes (or other interlocking cubes), large stringing beads, and so on. Allow students to create trains of varying lengths and then record their trains in their math journals. As you observe, note students' use of pictures (dots, arrows, actual train cars) and numbers to tell how many cars are in a train.

Capsule Lesson Summary

Give directions for a robot to move along the lines and between intersections of a grid.

Materials

Teacher	<ul style="list-style-type: none"> • Robot walk grid sheet • Colored checker • Small doll (robot, fire fighter, police officer, and so on) 	Student	<ul style="list-style-type: none"> • None
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Note: The robot walk grid is called for in several lessons in the Kindergarten program. In some lessons (such as this one) nothing is written on the grid, so you can use it again. In other lessons in which you write on the grid, the sheet will not be reusable. Hence, make the best use of the number of grids with which you have been provided. Or, laminate one of your grid sheets and use it repeatedly with erasable markers.

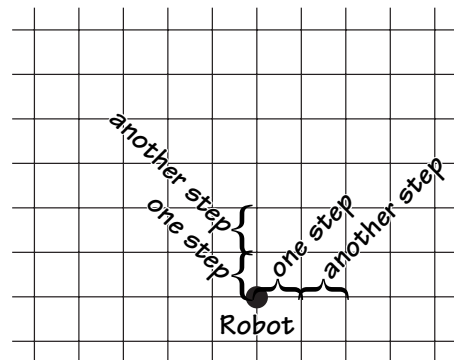
Description of Lesson

Exercise 1 _____

Attach the robot walk grid on top of a table and ask all the students to stand in a circle around it. Ask them to stand a foot or two away from the table so that everyone can see but no one is tempted to lean on the table, play with the robot, and so on. You may want to reinforce this idea by making a loop on the floor and explaining that no one except robots and robot operators are allowed inside that loop.

Explain the following rules clearly, repeating as necessary to be sure everyone understands.

- The robot always obeys the simple directions that are given. The robot always does exactly what is said, so you have to be careful to give good directions.
- The robot can only move along the lines.
- The robot moves along the lines by taking steps.
- One step consists of a move from one corner (intersection) to the next in any of the four possible directions.



Demonstrate what you mean by this last rule.

Place the robot on a centrally located intersection.

T: *Our robot is going for a walk. Let's see where it goes.*

Choose a student to be the robot operator. Give directions to the operator, one at a time.

- Move forward two steps.
- Turn to the window.
- Move back one step.
- Turn to the chalkboard.
- Move forward five steps.

K73

Note: Depending on the experience of your students, you may want to write “North,” “South,” “East,” and “West” on the grid and use those words in your directions. Even if your students know right and left, it will be difficult for them to follow directions like “turn right” in this situation.

Allow several students to take a turn at being the robot operator with you giving directions. Other students should protest (raise hands, for example) if a direction is not followed correctly.

Exercise 2 _____

Proceed as in Exercise 1 with one student as the robot operator, but this time let another student give the directions (still one at a time).

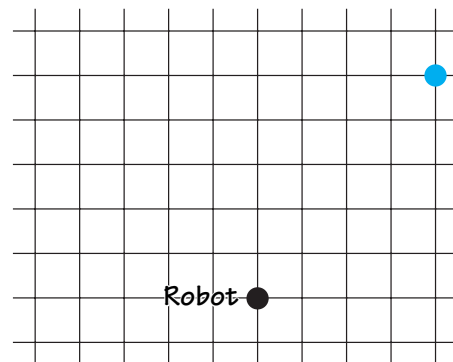
A direction which, if obeyed, would send the robot off the portion of the grid is illegal. When a student gives such a direction, the class should protest and the robot operator should ignore that direction.

Again, let several pairs of students take turns being the robot operator and the person giving directions.

Exercise 3 _____

Place the robot on an intersection and a colored checker on another.

Once again, ask one student to be the robot operator while another gives directions (still one at a time). The goal is to give a sequence of directions so that the robot eventually reaches the colored checker (not necessarily by the shortest route). Allow students to suggest a destination that the checker signifies (school, house, park, store, and so on).



Since there are many routes by which the robot may reach the checker, you can ask two other students to find a second route.

Capsule Lesson Summary

Use a literature selection to focus on comparative size and a sequence of events.

Materials

Teacher	<ul style="list-style-type: none"> • <i>Who Sank the Boat?</i> by Pamela Allen or another selection from the literature list that focuses on comparative sizes 	Student	<ul style="list-style-type: none"> • None
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Description of Lesson

This lesson can be used with any piece of literature about comparative sizes. Adjust the lesson and dialogue to suit your selection.

Before reading *Who Sank the Boat* by Pamela Allen, show the book cover (or the first page in the book showing the five animals) to the class and say,

T: *Let's pretend we have a boat that all of these animals will get into. Can you predict who will sink the boat?*

Record students' responses on the chalkboard. Then, read the story aloud to the class. When you have finished, return to the recorded responses.

T: *Let's check our predictions about who sank the boat. Did the cow sink the boat? How do you know? Did the donkey sink the boat? How do you know?*

Continue through the list.

T: *Who do you think sank the boat?*

Many students will say that the last one in sank the boat. Encourage them to think about all the other animals and their combined weight.

T: *Let's go back through the story and look at where the different animals sat in the boat and what happened to the waterline after each animal got in.*

Reread the story focusing on each animal's position and the waterline.

T: *What if the animals got into the boat in a different order? Would the boat still sink?*

Extension Activity

Set up tubs to hold water. Each small group should have a tray (for example, a plastic food tray) for a boat and a set of objects. Experiment with objects to see how many can be added before the boat sinks and what happens to the waterline after each object is added.

Writing Activity

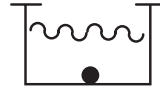
Suggest students record in their math journals what happened in the story you read.

Center Activity

Put a tub of water, a box of odds and ends, and a two-column graph labeled “Float” and “Sink” at a center.



Float



Sink

Capsule Lesson Summary

Find many different things that dots can represent.

Materials

Teacher • *What Could We Be?*
Story-Workbook

Student • *What Could We Be?*
Story-Workbook

Description of Lesson

This booklet gives students a chance to imagine what the eight dots featured in the story could be for. Dots can stand for anything. But eight dots must always represent eight objects. Sometimes a clue is given by means of a realistic picture; other times the students are left free to imagine whatever they like.

To maximize the students' involvement, do not distribute individual copies at the beginning of the lesson. Instead, hold up your copy as you read, making sure that everyone has a clear view of both pages.

The following dialogue may give you an idea about how to start the lesson.

Open the booklet to pages 1 and 2 and read the text aloud to the students. Let them count how many dots there are, and give them time to answer the question, *What could we be for?* Students might answer:

S: *Toys.*

T: *How many?*

S: *Eight.*

T: *Yes, we could be eight toys. What else could we be?*

S: *Eight children.*

S: *Eight butterflies.*

Now show the students pages 3 and 4, and read,

T: *"We could be..."*

S: *Elephants.*

T (reading): *"We could be ... eight elephants in a row."*

Continue in this way throughout the booklet. On pages 8, 9, 10, 16, and 18, you may like to let students point to objects and count them to find that there are eight objects altogether.

When you and your students have finished reading the story together, give a copy of the booklet to each student and let them look at the pictures at their own pace. Make them feel free to share their ideas about what else the eight dots could be with you and their classmates.

Capsule Lesson Summary

Use a story to observe a sequence of events and to follow directions using position words.

Materials

Teacher	<ul style="list-style-type: none"> • <i>Rosie's Walk</i> by Pat Hutchins or another selection from the literature list • Chart paper 	Student	<ul style="list-style-type: none"> • None
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Description of Lesson

Prepare to read *Rosie's Walk* by Pat Hutchins or another selection from the literature list. Before reading the story, show the class the cover of the book and pose some prediction questions:

T: *This story is about an animal that makes a trip. Where do you think she is going?*

S: *Around the world.*

S: *Around the farm.*

T: *What makes you say that?* (Record students' responses on the chalkboard.)

S: *The cover looks like a farm.*

S: *She has to be going somewhere.*

Read the story aloud. Then return to the students' predictions.

T: *Did our predictions come true? Was there any other animal throughout the story that made the same trip?*

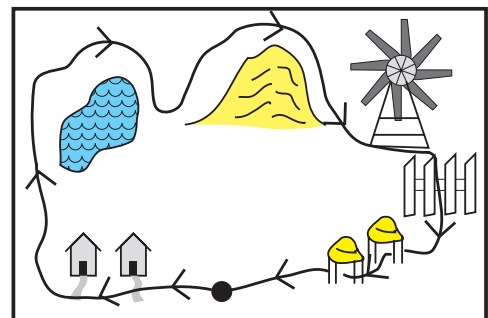
Let's read the story again. This time, let's note everywhere Rosie goes. (Across the yard, around the pond, and so on.)

Encourage students to read along while you record the sequence of events using arrows in a picture you draw on the board or on chart paper. Ask students how to show such things as "over the haystack."

You may like students to follow the arrows in your picture to recall the sequence of events in the story.

Extension Activity

Recreate the story by drawing a map outline on a piece of paper and using blocks for objects in the story. Make paper cut-outs to move around the map following the path taken in the story. You can also use large pieces of chart paper and let students make a map of the story.



Capsule Lesson Summary			
Practice counting-on using manipulatives.			
Materials			
Teacher	• Magnetic checkers	Student	• Ten counters in a cup or bag • Paper

Description of Lesson

Exercise 1

T: *The other day, Jay was helping around the house by picking up things in his room and putting them away. While he was doing this, he found four of his toys.*

Place four magnetic checkers on the board.



T: *Show me with your fingers how many checkers (toys). Point to this number on your desktop number line.*

4

Write the number 4 on the board.

T: *Jay put away the four toys, but he found some more toys when he picked up more things in his room. I will add some more checkers to the board for the other toys Jay found.*

Cover the first four checkers with a paper and then add three more checkers.

T: *How many more toys did Jay find?*

S: *Three.*

T: *How many toys did Jay find altogether?*

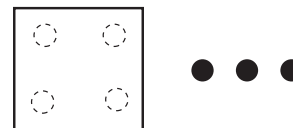
S: *Seven.*

T: *How did you get seven?*

S: *I counted 1, 2, 3, 4, 5, 6, 7.*

S: *I knew there were four to start with and then counted from there; 5, 6, 7.*

T: *A fast way of counting the checkers is to start with what you know, the four here, and then count what was added.*



4

Point to each new checker as you say,

T: *Five, six, seven. Show me four and three more is seven with your fingers. Point to 7 on your number line.*



$$4 + 3 = 7$$

Uncover the first four checkers and write the corresponding number fact on the board.

T: *Jay's brother Matt was helping clean up the room by picking up books. He found this many books.*

Place three checkers on another part of the board.



T: *How many books did Matt find?*

S: *Three.*

T: *Show me 3 with your fingers and point to this number on your desktop number line.*

Write the number 3 on the board.

T: *Matt put away the three books and then he found some more.*

Cover the first three checkers with paper and then add six more checkers.

T: *How many more books did Matt find?*

S: *Six.*

T: *How many books did Matt find altogether?*

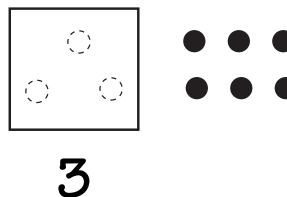
S: *Nine.*

T: *Since he first found three books, let's start counting after three. Start at 3 on your number line, then count after 3 as I point to the checkers.*

S: *Four, five, six, seven, eight, nine.*

T: *How many books did Matt find altogether?*

S: *Nine.*



Uncover the first three checkers and write the corresponding number fact on the board.

$$3 + 6 = 9$$

Exercise 2 _____

Distribute 10 counters in a cup (or bag) and a piece of paper to each student.

T: *Take out five counters and arrange them as you like. Cover the five counters with your paper. Then put out three more counters. Let's count starting after five to find how many counters altogether.*



S: *Six, seven, eight.*

Repeat this activity with several more counting-on problems. You may want to continue modeling what the students are doing with magnetic checkers on the board.

Extension Activity

For additional practice, pair students and let one student tell the other how many checkers to start with and how many to add on. Together they should count-on to find the total number of checkers.

Capsule Lesson Summary

Compare students' step sizes to a given length (longer than, shorter than, or same length).

Materials

Teacher <ul style="list-style-type: none"> • Chalk • Masking tape • Scissors • Ball of string 	Student <ul style="list-style-type: none"> • None
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Advance Preparation: Cut one length of string 30 cm long.

Note: This lesson can be done in an open space in the classroom, the gymnasium, or on the playground. If you choose to do this lesson in a location other than the classroom, have students return to the classroom to tape their strings on the board and discuss the differences.

Description of Lesson

T: *The other day, I overheard a conversation that caused me to wonder. A group of students were discussing measurements like height and shoe size. I heard someone say, "Everybody in Kindergarten has the same size steps when they walk." Do you think that is true?*

S: *I don't know.*

S: *No.*

S: *It could be.*

T: *I thought about it and wondered how we could find out. Do you have any ideas?*

S: *Measure all our steps.*

S: *Stand next to each other and everybody step at the same time.*

Hold up a 30 cm piece of string.

T: *The person who thinks all Kindergartners have the same size steps gave me this piece of string. He said that this is the size of a Kindergarten student's step. What do you think?*

S: *It looks too short.*

S: *I can step farther than that.*

T: *Let's see how big your steps are to check.*

Choose several students and mark places (with chalk or masking tape) for them to stand on the floor.

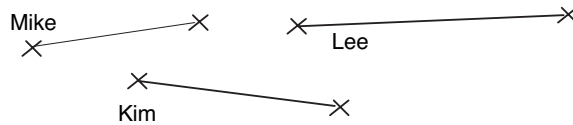
T: *When these students take a step, do you think their steps will be longer, shorter, or the same as this piece of string?*

Let students express their opinions; then prepare to check. Ask students to take a normal step, but since some will want to take their biggest step you may want to allow this. Be sure to tell students you want a step, not a jump.

T: *When I say step, I want you to take a normal step. After your step, stand still so I can mark where your foot is. Ready, step!*

Mark the spot where each student's step ends (again using chalk or masking tape), and direct them to return to their seats.

T: *Who took the biggest step?
How can we find out?*



S: *Measure each step with a ruler.*

S: *Measure each step with blocks.*

S: *Cut pieces of string the size of their steps.*

T: *Okay, I have some string we can use. Let's cut pieces the size of the steps.*

Let the students help you measure and cut the string. Give the piece of string to the student after you measure his or her step. At this time, you may want to give all the students a chance to take a step, have it measured, and receive a piece of string their step size.

T: *I am going to tape this piece of string on the board and label it "K" for Kindergartners.
(Tape your string on the board under the label.)*

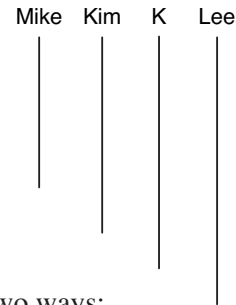
Ask a student to compare his or her string with the one on the board, and to decide with the class if it is shorter, longer, or the same length as the one on the board. A possible dialogue follows:

T: *Kim, do you think your step is shorter, longer, or the same as the Kindergartner's step?*

S: *I think it is the same.*

T: *Bring your string and compare it with the string on the board.*

Help the student align the string with the one on the board. Then tape it on the board and observe whether it is shorter, longer, or the same as the K string. Repeat this process with the other students, making certain the class sees the comparison with the K string first.



Note: You may like to try to organize the strings on the board in one of two ways:

- 1) Put all those shorter than K on one side and all those longer than K on the other side. Those pretty close to the same as K can be placed next to K.
- 2) Try to arrange all the strings from shortest to longest. This will make it easier to answer the question, Who took the biggest step?

Capsule Lesson Summary

Use a story to introduce counting backward from ten.

Materials

Teacher	<ul style="list-style-type: none"> • <i>Ten, Nine, Eight</i> by Molly Bang, <i>Up To Ten and Down Again</i> by Lisa Campbell Ernst, or another counting backward selection from the literature list 	Student	<ul style="list-style-type: none"> • Ten counters
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Description of Lesson

Read *Ten, Nine, Eight* by Molly Bang, *Up to Ten and Down Again* by Lisa Campbell Ernst, or another selection from the literature list.

Distribute counters and check that each student has ten counters on a mat in front of him or her. Re-read the story, this time instructing students to remove counters as the story progresses.

T: *How many counters do you have on your mat?*

S: *10.*

T: *Please count to make sure.*

As we read each section of the book, remove one counter from your mat and whisper the number that will come next in the story.

Continue with the story, stopping appropriately for students to remove a checker and say the next number.

T: *Remove one counter and point to the next number on your desktop number line.*

Continue with the book. Other actions can include tap foot, clap hands, hum, wave arms, clear throats, and so on.

T: *Now that we have read the book twice, let's count backward by just looking at the numbers in the corners of the pages.*

S: *10, 9, 8,*

Extension Activity

Ten, Nine, Eight can be a format for a class counting backward book. Since this story takes place in the character's room, the new book could take place in the classroom, the principal's office, the music room, and so on.

Note: See Section One, page 1-12, for an explanation of the purpose of scheduled adjustment days.

Today, you may wish to repeat an earlier lesson either for a small group of students or for the entire class. Many of the lessons can be made to appear completely different by changing the story and/or the numbers in the lesson. This is also a good time to allow students to work in centers or on a project of your choice.

The following activities can provide additional practice using one-to-one correspondence or equivalent sets.

Student Matches_____

Present a situation in which two groups of students match themselves up to decide which group has more or less of various things. For example:

- Are there more students wearing short sleeves or long sleeves today?
- Are there as many students who walk to school as ride to school?
- Do we have more birthdays in December or in January?
- Did the same number of students choose apple juice as orange juice for snack today?

Such more/less/same problem situations can be posed with manipulatives or the odds and ends materials.

Correspondence_____

Present a practical situation for students to act out or model using one-to-one correspondence or equivalent sets. For example:

- There are six visitors coming today and we need to set up chairs for them.
- There will be ten students working at this table and we need to put papers and pencils on the table, one paper and one pencil for each student.
- For snack today each student gets a cookie and a carton of milk. Set out the snack on a table.

Assessment: You may wish to use one of the sample assessment checklists, Blacklines K0 (b)–(k), to note students' skills at using one-to-one correspondence or equivalent sets.

Early Warning

Among the next nine classroom lessons are some that require extra preparation or involve materials not included with the *CSMP* Classroom Set. The lessons are listed here for your convenience in preparing for them. A more detailed description of the needed materials can be found on the first page of each lesson. (Special materials are listed here only once, even if they are used more often during the nine-day period.)

- K81 *One-Way Roads #1*: Pointer
- K82 *Counting Calculator #2*: Calculators
- K84 *Counting-On #2*: Counters
- K85 *Order #1*: Weekday, ordinal number, and story cards; chart paper
- K86 *Geoboards #4*: Geoboards, geobands, geopaper
- K87 *Robot Walk #2*: Small doll (robot)
- K89 *Counting-on #3*: Five-frames

Several of the lessons also include suggestions for literature and/or fingerplays which are not included here. Please check the materials list at the beginning of the following lessons in advance so you can obtain the necessary literature: K83, K84, K85.

Capsule Lesson Summary

Follow arrows on a one-way road map to take some walks. Explore different ways to go from one place to another following the arrows.

Materials

Teacher	<ul style="list-style-type: none"> • One-Way Road Map #1 poster • Colored checkers • A pointer • Animal pictures (optional) 	Student	<ul style="list-style-type: none"> • None
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Advance Preparation: You may want to laminate the One-Way Road Map #1 poster for future use.

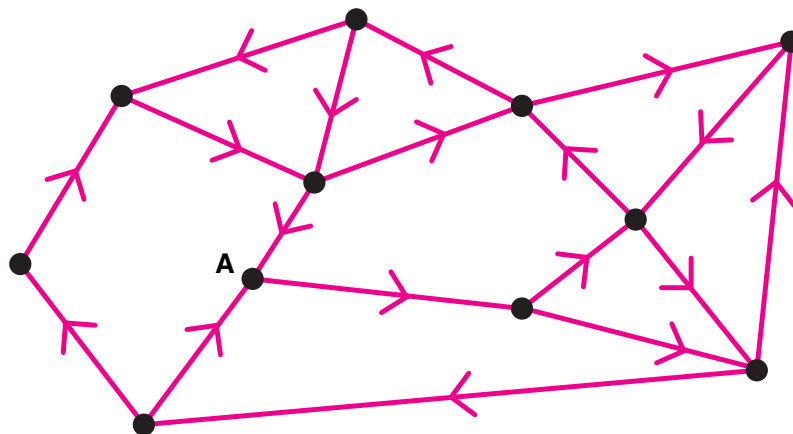
Description of Lesson

Tape your copy of the One-Way Road Map #1 poster to the board.

T: *This is the map of a forest. But it is a special forest because when you walk in this forest, you must follow the arrows.*

Clarify the idea of following an arrow by pointing to two dots at opposite ends of the same arrow and asking a student to trace the arrow in the direction indicated (as you would “walk” between the dots).

T: *Who would like to take a walk through this forest starting here (point to **A**)?*

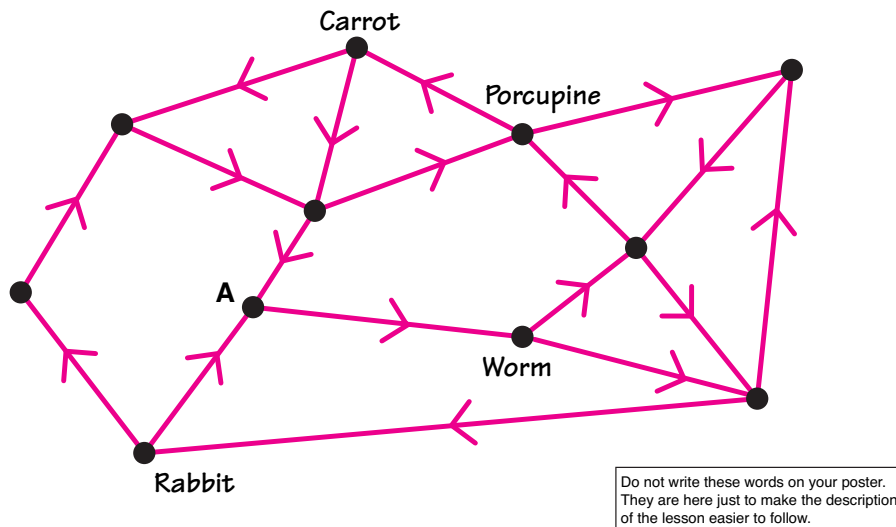


Do not write the letter on your poster. It is here just to make the description of the lesson easier to follow.

Let several students use a pointer to take walks starting at **A**. When a mistake is made (by going against the direction of an arrow), ask the student to stop and let somebody else take a walk. Throughout the lesson, the rest of the class can be involved by pretending to be forest rangers and protesting (for example, by raising both hands) when someone tries to go the wrong way along a one-way path.

After several students have had the opportunity to wander freely through the forest, proceed with the story as follows:

- T:** *At this dot there lives a rabbit.* (Place a checker or rabbit picture by the dot indicated in the picture below.) *And here is a big, juicy carrot.* (Place a checker of a different color or a carrot picture by the dot indicated in the picture.) *Can you help the rabbit reach the carrot?*



Allow several students to find paths from the rabbit to the carrot by following arrows. After one correct way is shown, ask for a different way. Remove the two checkers or pictures before continuing.

- T:** *At this dot there lives a porcupine.* (Place a checker or porcupine picture by the indicated dot.) *Just now, the porcupine has spotted a long, fat worm, right here.* (Place a checker or worm picture by the indicated dot.) *Can you help the porcupine catch the worm?*

Once again, let several students show different ways of following arrows from the porcupine to the worm.

Center Activity

Place a laminated copy of One-Way Road Map #1 together with several plastic forest animals in a center for students to practice following arrows.

Capsule Lesson Summary

Use the counting calculator to recognize a number sequence and compare numbers.

Materials

Teacher	• Overhead calculator
Student	• Calculator

Description of Lesson

Exercise 1 _____

T: *Does anyone remember how to teach our calculators to count by ones?*

Allow time for students to share what they remember. Ask students to come to the overhead calculator to press the right keys. Let a student lead the class in preparing their calculators, or do so yourself, if necessary.

T: *Press \square so 0 is on the calculator display. Now press \oplus \square . Your display should show 1. Do not press any other key right now. We are going to play a game called Fastest Finger. When I say go, I want you to press \square again and again, as fast as you can, until 25 is on your display. Try to stop at exactly 25. If you go past 25, you must start over.*

What does 25 look like?

Call on someone to point to 25 on the number line as you write it on the board.

T: *When you have 25, put your calculator down and raise your hand. Ready, ... set, ... go.*

As you circulate, help students to start over as necessary. It is to be expected that students will go past 25 a couple times because they are trying to be fast. You may want to ask those who go past 25 how much more than 25 they got. After the first few students get 25, check their calculators. Then ask everyone to stop.

T: *Okay, we have some pretty fast fingers. I bet those who don't have 25 are pretty close. What are some numbers you have on your display?*

S: 31.

S: 23.

S: 19.

Exercise 2 _____

Tell the students to again prepare their calculators to count by ones. That is, press \square , then press \oplus \square , and stop for the moment.

T: *Let's again press \square as fast as possible. This time when I say go, let's see who can reach the greatest number in a short time. When I say stop, you must set your calculators down. Then, we will see what numbers you have on your displays.*

Check that all the students have their calculators prepared to count by ones. Then give the signal to go. Use the second hand on a clock or count out 10 seconds (silently); then say stop.

T: *Let's see who has the greatest number?*

Check with several students and ask that they find their numbers on the number line. For example:

T: *What number do you have on the display, Mandy?*

S: *37.*

T: *If your display is more than 37, raise your hand.*

Check with other students until you find the greatest number.

T: *Mandy got 37. Did anyone else get 37? Who got closest to Mandy's number?*

Allow students to discuss how to check which number is closest. This discussion may be lively since closest can be either less or more.

Let students experiment with the calculators for awhile before ending the lesson.

Capsule Lesson Summary

Compare and contrast K A-blocks. Use yes/no questions to guess a hidden K A-block.

Materials

Teacher <ul style="list-style-type: none"> • K A-blocks • <i>Circles, Triangles, and Squares</i> by Tana Hoban or another selection from the literature list 	Student <ul style="list-style-type: none"> • K A-Blocks
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Description of Lesson

Exercise 1 _____

Read *Circles, Triangles, and Squares* by Tana Hoban or another selection from the literature list.

Exercise 2 _____

Hold up two K A-blocks and ask students to find the same two pieces in sets.

T: *How are these pieces different?*
 How are they alike?

Emphasize ideas such as they are different shapes (colors, sizes) or they are the same shape (color, size). Repeat this activity for several pairs of K A-blocks. Students will build up a repertoire of comparisons and contrasts. You can then increase the difficulty of the game by asking for more ways in which the pieces are alike and different.

Exercise 3 _____

Select one of the K A-blocks to hide in a box or behind your back. Let students ask yes/no questions until they are able to identify which piece is hidden. Suppose, for example, you hide a big, green circle.

S: *Is it red?*

T: *No, it is not red. That was a good question.*

S: *Is it a square?*

T: *No, it is not a square. That was also a good question.*

S: *Is it a green triangle?*

T: *No.*

S: *Is it green?*

T: *Yes, it is green.*

S: *Is it big?*

T: *Yes, it is big.*

- S: *Is it a red circle?*
T: *No. Remember it is green.*
S: *Is it a circle?*
T: *Yes, it is a circle.*
S: *A small, green circle?*
T: *Almost....*
S: *A big, green circle?*
T: *Yes!*

Show the hidden piece to the students and repeat with one or two more hidden pieces.

Note: There are at least two important ideas that students can develop by engaging in these activities. First, getting a “no” answer to a question is not a failure. Instead, a “no” answer can give just as much information as a “yes” answer. Another important idea for students to learn is how to ask useful questions. The procedure of first eliminating entire classes of objects instead of individual objects is a useful one. As an initial question, “Is it a small green square?” is not going to give very much information if the answer is no. On the other hand, “Is it green?” will give a lot of information no matter what the answer is. Of course, it will take time for your students to reason in this way. The way you answer can help students; for example, answer useful questions with full sentences (such as, “No, it is not a square”). This gives everyone a second chance to hear what the question was.

If your students enjoy this game, feel free to play it again and again on various occasions as a short activity.

Additional Practice: Ask two or three students to work together. Instruct one student to hide a piece and the other students to ask questions to get clues until they know the hidden piece.

Extension Activity

Ask a student to place something (perhaps brought from home) in a “surprise box.” Then, suggest other students ask questions to guess the object. Allow the student who put the object in the box to give three clues. The student who then guesses what is in the surprise box can bring an object the next day, and the game continues. This can go on everyday for awhile if you like.

Capsule Lesson Summary

Practice counting-on.

Materials

Teacher	Student
<ul style="list-style-type: none"> • Magnetic checkers • Sheet of 8 1/2" x 11" paper • <i>Ten Black Dots</i> by Donald Crews or another selection from the literature list 	<ul style="list-style-type: none"> • Ten counters

■ Description of Lesson

Exercise 1 _____

Read *Ten Black Dots* by Donald Crews or another selection from the literature list.

Exercise 2 _____

Place ten checkers on the board without telling or showing the class how many checkers are on the board. Cover up six checkers with a sheet of paper.

T: *Try to guess how many checkers are on the board. There are six checkers under the paper.*



Let students make guesses. Ask those who say ten to tell the class why they think there are ten. Someone may suggest counting-on from six; otherwise, suggest this yourself. Put your hand over the paper as you say, "Six," and then point to the four visible checkers one at a time as you count.

T: *Let's count-on from six... seven, eight, nine, ten.*

Repeat the demonstration several more times using, for example, nine checkers and covering five with the sheet of paper, using 14 checkers and covering eight with the sheet of paper, and using 12 checkers and covering six with the sheet of paper.

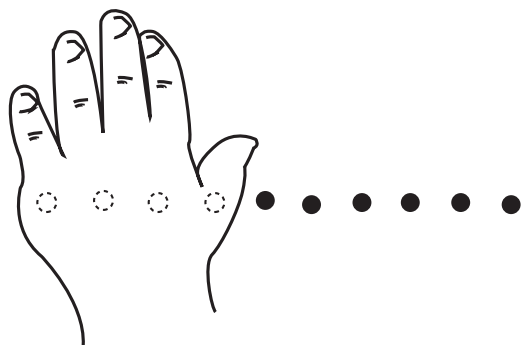
Exercise 3 _____

Distribute ten counters to each student.

T: *Put the counters in a row.*



T: *Now put your left hand over four counters.*



T: *Point to your hand. How many counters are under your hand?*

S: *Four.*

T: *Let's count-on from four.*

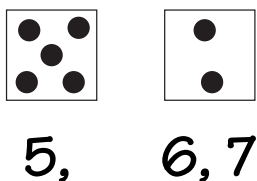
S: *Five, six, seven, eight, nine, ten.*

Repeat this activity hiding a different number of counters under the left hand.

Assessment: You may like to use one of the sample assessment checklists, Blacklines K0 (b)–(k), to note a students' counting and counting-on skills.

Center Activity

Using demonstration dot cards, instruct students to find the number of dots on two dot cards together. For example; observe the first dot card and place it face down. Then count-on with the dots in the second dot card.



These can also be used to count-on from greater numbers like 23, especially if you write the number 23 on back of a card with 23 dots.

Capsule Lesson Summary

In a story context, introduce the order of the days of the week and ordinal number concepts.

Materials

Teacher	Student
<ul style="list-style-type: none"> • <i>May I Bring a Friend?</i> by Beatrice Schenk de Regniers or another book about the days of the week • <i>Here We Go 'Round the Mulberry Bush</i> nursery rhyme • Weekday cards • Ordinal number cards • Story cards • Chart paper 	<ul style="list-style-type: none"> • None

Advance Preparation: Prepare seven cards with the days of the week written on them and another seven cards with ordinal numbers first through seventh written on them. Also prepare cards that illustrate the story you select; for example, for *May I Bring a Friend?* the story cards could be of the different animals.

Description of Lesson

Lead the class in singing *Here We Go 'Round the Mulberry Bush* to introduce the idea of a cycle.

Then, read *May I Bring a Friend?* by Beatrice Schenk de Regniers or another book about the days of the week.

Note: The following dialogue and instructions are based on *May I Bring a Friend?* If you are using another piece of literature, adjust it accordingly.

T: *In our story, the boy came to the castle each day with a new friend. I am going to pass out cards with the names of the days of the week on them.*

As you do this, ask each student to say the name on his or her card aloud.

Distribute the animal cards and ordinal number cards in the same way.

As you read the book again, instruct the student with the appropriate card to stand and hold up the card when that day, ordinal number, or animal is mentioned in the story. For example, when you read that the giraffe was the first animal brought to the castle on Sunday, the students with the corresponding cards should stand, hold up their cards, and then sit down again.



K85

When you read about the second animal, the students with the Monday, Second, and Hippo cards should stand. Continue through the story in this manner. At the part of the story where all the animals are brought to the castle, the students holding the Saturday, Seventh, and all the animal cards should stand.

Direct the students to sit down again, still holding their cards. Then ask the students with weekday cards to organize themselves in order from Sunday through Saturday in front of the class. The rest of the class should help and then compare the order to that shown on a class calendar. Take the cards and tape them in order to the board or to a large piece of chart paper.

Next, call on the students holding ordinal number cards to organize themselves from first to seventh in front of the class. Again ask the rest of the class to help and check. Take these cards and tape them to the board or chart paper under the appropriate weekday cards.

Finally, ask each student with an animal card to recall the story and place their card under the appropriate weekday and ordinal number cards on the board.

Capsule Lesson Summary

Continue free exploration of designs with the geoboards. Transfer the designs to geopaper.

Materials

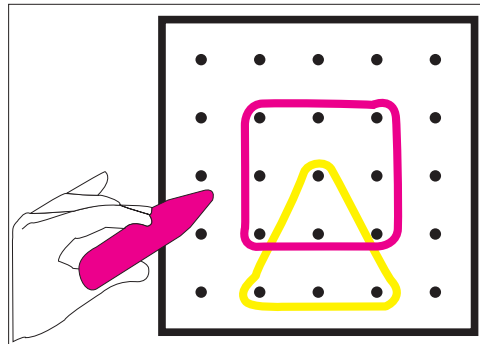
Teacher	<ul style="list-style-type: none"> • Geoboard and geobands • Overhead geopaper • Markers • Blackline K9 	Student	<ul style="list-style-type: none"> • Geoboard and geobands • Geopaper • Crayons/markers
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Advance Preparation: Use Blackline K9 to make geopaper for students and an overhead transparency.

Description of Lesson

T: *Last time we worked with geoboards, I noticed you created some wonderful designs. Unfortunately, when we put away the geoboards our designs were gone. Today, you can again create designs on your geoboards and, when you have a design you really like, you can draw it on a paper like this. Let me show you on the overhead.*

First put a simple design on your geoboard to show the class. Then draw this design on the overhead transparency of geopaper.



Pair students and provide each pair with a geoboard, two geobands (one yellow and one red), and geopaper. Direct partners to create designs as they like on the geoboards and, when they have a design they like, to draw it on the geopaper using crayons or markers. If some student pairs are doing well with just two geobands, you may like to let them use one or two more geobands in their designs.

Note: Using the geoboard, students will be able to make all kinds of shapes, pictures, letters, and numerals. As you walk around the room observing, you may want to comment on some designs. If you notice some students' designs are symmetrical, show them the line of symmetry and explain how it acts like a mirror creating two identical parts. Feel free to ask questions or make comments as appropriate. As with any manipulative material, allow a few moments at the end of class to put geobands and geoboards away.

Capsule Lesson Summary

Practice following directions to move a robot along the lines and between intersections of a grid.

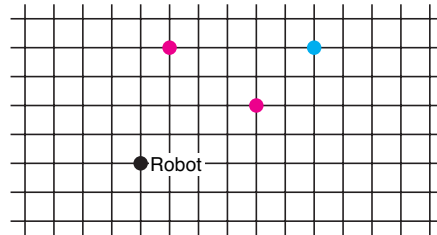
Materials

Teacher	<ul style="list-style-type: none"> • Robot walk grid sheet • Colored checkers • Small doll (robot, firefighter, police officer, and so on) 	Student	<ul style="list-style-type: none"> • None
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Description of Lesson

Repeat Lesson K73. As a variation of Exercise 3, place the robot on one intersection, a blue checker on a second intersection, and some red checkers on other intersections.

Direct one student to be the robot operator and another student to give directions (still one at a time). The goal is to give a sequence of directions so that the robot eventually reaches the blue checker without landing on a red checker (obstacle) on the way.



Capsule Lesson Summary

Find K A-block pieces that are the same or differ from a given piece in specified ways. According to a secret rule, place a sequence of K A-blocks on the board. Let the students guess what the pattern might be.

Materials

Teacher <ul style="list-style-type: none"> • K A-blocks • Masking tape 	Student <ul style="list-style-type: none"> • K A-block set
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Description of Lesson

Each student should have their own set of K A-blocks. Allow a few minutes for free play before doing the exercises below.

Exercise 1 _____

Instruct the students to place the K A-blocks in front of them so that they can easily locate different pieces. Hold up any K A-block piece.

T: *Find and hold up a piece that is the same color as this one.*

Any pieces the same color as the one you are holding are fine, regardless of their other attributes.

Repeat your request using some of the following descriptions. Adjust the difficulty for your class.

- A piece that is the same shape
- A piece that is the same color and a different shape
- A piece that is a different size
- A piece that is a different color and a different size
- A piece that is the same size, same color, and a different shape
- A piece that is different in all three ways
- A piece that is the same in just one way

Exercise 2 _____

Note: If you have a magnetic board, you may wish to use a set of K A-blocks that you have “magnetized” with adhesive magnetic material. If you use masking tape instead, make sure the board is as clean as possible for good adhesion. You may also conduct this activity on the floor or a table, making sure that all students can see.

T: *I’m going to put some K A-blocks in a row. Each time I put one in the row I will follow a rule.*

See if you can guess what my rule is.

Display the following K A-blocks, one at a time, from left to right. These pieces may be any size or shape, as long as they alternate in color: blue-red-blue-red....



T: *Which piece do you think I could put up next? When I count to three, hold up a piece that you think could go next. Ready? One, two, three.*

Let a student come up and select a K A-block piece from your set to go next. If the student selects, for example, a small blue triangle (or any blue piece), say,

T: *Yes, that block follows my rule.*

Place the suggested block on the board. If a student selects a piece of a color other than blue, say,

T: *That block does not follow my rule.*

Every sequence of blocks follows some rule, although the rule may be an arbitrary one (such as blue-red-blue-red-blue-red-green/blue-red-blue-red-blue-red-green/and so on). There are really no wrong answers in this lesson so be careful not to tell students they are wrong, only that a block does not follow your rule.

Continue asking students to select blocks following the alternating color pattern. When you feel most everyone knows your rule (i.e., recognizes the pattern), ask someone to say the rule aloud.

Remove all the blocks and repeat the exercise with a different rule. Be sure to tell the class that you are using a different rule. The following sequence uses a rule that is a little more difficult than the first example:



Color and size are irrelevant here; shape is what matters. You may have to continue the sequence even further before the circle-triangle-square pattern becomes evident. This time, you may want to let students who think they know the rule whisper it to you or judge the choice for a next piece.

Extension Activity

Use other materials (e.g., Unifix[®] cubes, pattern blocks, and so on) to do similar patterning activities. Or let students cut out or trace shapes that follow certain patterns.

Center Activity

Make task cards that direct students to place pieces in a pattern. Put these cards in a center.

Capsule Lesson Summary

Practice counting-on using the number five as a benchmark.

Materials

Teacher <ul style="list-style-type: none"> • None • Blackline K89 (a) 	Student <ul style="list-style-type: none"> • Five-frames • Checkers
--	--

Advance Preparation: Use Blackline K89 (a) to make five-frames.

Description of Lesson

T: *Why do we sometimes count-on rather than starting to count at one every time?*

Give students an opportunity to talk about counting and how sometimes they count starting at a number other than 0 or 1. You may like to remind them of a problem they solved in Lesson K77 or K84 by counting-on.

T: *How can you use counting-on outside of school?*

S: *Playing a card game.*

S: *Finding the score in a ball game.*

You may want to suggest one of the following or another example of counting-on.

- Suppose I have 10 cards and I get two more—10,... 11, 12.
- There are five people in my family and two friends come over for dinner; how many plates do we need? Five,... six, seven.
- The score was 14 and we scored three more points. What is the score now? Fourteen and three more—15, 16, 17.

T: *Today we're going to count-on to get five.*

Bring three students to the front of the class.

T: *Show me with your fingers how many students are here. Point to that number on your desktop number line.*

T: *How many more students do we need to make five?*

S: *Two.*

T: *How did you figure out that we need two more students?*

S: *We have three, so we need two more.*

S: *I started at three and counted until I got to five. So I counted two more—four, five.*

Repeat this exercise a couple of times.

Give students five-frames and counters. Set up exercises similar to those done with the students at the front of the class.

T: *These cards are called five-frames because they have five squares on them. Put checkers on the first three squares. These are like the three students who were standing up here.*

T: *Now, how many more checkers do you need to make five?*

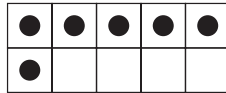
S: *Two, because there are two empty squares.*

T: *Yes. As you put the new checkers on the frame, let's count-on ... four, five.*

Continue with individual practice modifying number combinations.

Extension Activity

Use ten-frames rather than five-frames to do the counting-on activities in this lesson. For example, put on six checkers.



T: *How many more checkers do you need to make ten? (4)*

Use Blackline K89 (b) to make ten-frames.

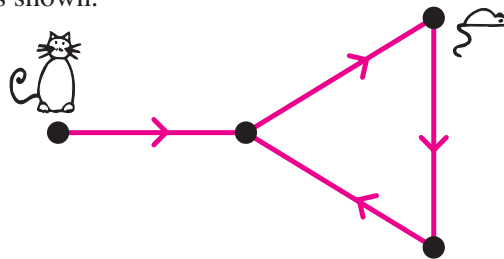
Note: See Section One, page 1-12, for an explanation of the purpose of scheduled adjustment days.

Today you may wish to repeat an earlier lesson either for a small group of students or for the entire class. Many of the lessons can be made to appear completely different by changing the story and/or the numbers in the lesson. You may like to work on pattern recognition by creating patterns with K A-blocks or other manipulatives as described in Lesson K88. This is also a good time to allow students to work in centers or on a project of your choice.

The following activity may be used for additional practice in following arrows.

Cat and Mouse Game_____

Draw this arrow picture on the board. Have small pictures of a cat and mouse handy, each with a loop of tape or magnetic material on the back so that they can be attached to the board. Place the cat and mouse into the picture as shown.



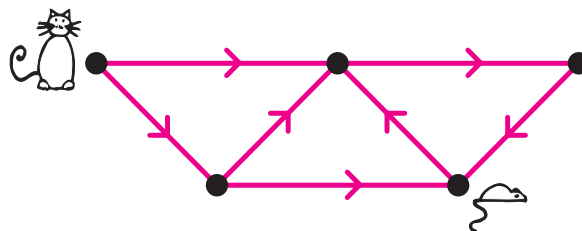
T: *The cat and mouse can only run from dot to dot in the direction of an arrow. Can the cat get to the mouse? Show me how the cat might reach the mouse.*

Allow a student to trace the path from the cat to the mouse.

T: *Try to put the cat and mouse in places so that the mouse will be safe.*

When a student has placed both the cat and mouse, check these new positions by asking if there is still a path by which the cat can reach the mouse. Continue until the mouse is safe.

This activity may be varied by changing the arrow picture. For example, a more sophisticated game might look like the following arrow picture.



Assessment: You may wish to use one of the sample assessment checklists, Blacklines K0 (b)–(k), to note students’ skills in pattern recognition and following directions.

Early Warning

Among the next nine classroom lessons are some that require extra preparation or involve materials not included with the *CSMP* Classroom Set. The lessons are listed here for your convenience in preparing for them. A more detailed description of the needed materials can be found on the first page of each lesson. (Special materials are listed here only once, even if they are used more often during the nine-day period.)

K91 *Length #3*: String

K92 *Coins #1*: Coins; items with price tags

K93 *Happy Fish #2*: Counters; fishbowl paper

K94 *Counting Calculator #3*: Calculators; blocks

K96 *Locating Numbers on a Number Line*: Graduated line

K97 *Solids #1*: Geometric solids

K98 *Strings #1*: String loops

Several of the lessons also include suggestions for literature and/or fingerplays which are not included here. Please check the materials list at the beginning of the following lessons in advance so you can obtain the necessary literature: K95, K98.

Capsule Lesson Summary

Compare the lengths of two difficult to move objects in the classroom. Look for something that has a length between that of the two objects.

Materials

Teacher <ul style="list-style-type: none"> • String • Objects in room to compare lengths • Other comparative measuring tools (optional) 	Student <ul style="list-style-type: none"> • None
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Description of Lesson

To compare measurements, start by choosing two things in the classroom that would be difficult to move; for example, a bulletin board and a long table across the room from the bulletin board.

T: *Do you think this table or that bulletin board is longer? How could we find out?*

Let students express their opinions and ideas. Encourage ideas that involve measuring and pursue a couple ideas. Try first to use an idea that does not involve using a standard measuring tool.

T: *Yolanda suggests we cut a piece of string the same length as the table and a second piece of string the same length as the bulletin board. Then we can compare the strings.*

Follow such a suggestion and then check the results against students' earlier guesses.

T: *Chung suggests we measure the table and the bulletin board with our hands. How would we do that?*

Again, take suggestions from students and try to get an agreement about the procedure; for example, start at one end of the table (bulletin board) and measure to the other end by alternating hands, palms-down. Then count how many hand "prints" made.

With such an idea, you may like to let more than one student measure the table and more than one student measure the bulletin board. Then discuss, if appropriate, why you obtained different numbers. This discussion might lead to the observation that it would be best to use one person's hands to measure both the table and the bulletin board.

After the class has found one or more methods to compare the lengths and has determined which is longer, the bulletin board or the table, pose another problem. (Here we assume the bulletin board is longer.)

T: *Is there something in the room that is longer than the table but shorter than the bulletin board?*

Let the class make suggestions and use their previous methods of comparing lengths to verify.

Center Activity

Put length measuring tools (rulers, tape measures, yard or metersticks, string, adding machine tape, and so on) in a center. Suggest students use these tools to compare linear measures of objects around the classroom or on the playground.

Capsule Lesson Summary

Examine the coins (pennies, nickels, and dimes) to recognize these coins. Assign prices to small items and match coins with the items.

Materials

Teacher <ul style="list-style-type: none"> • Collection of pennies, nickels, and dimes • Items with price tags 	Student <ul style="list-style-type: none"> • None
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Advance Preparation: Prepare approximately ten small items with price tags that read 1¢, 5¢, 10¢.

Description of Lesson

Exercise 1 _____

Show the class a collection of coins: pennies, nickels, and dimes. Take out a few pennies and invite students to tell you about pennies. Pass around some pennies for students to examine. Some questions you might ask include:

- What do you notice about a penny?
- What shape is it? What color is it?
- What do you see on either side?
- How much money is a penny?
- When we toss (or flip) a coin, we say it lands heads up or tails up. Which side is heads?
- Which side is tails?

Repeat this examination for nickels and dimes. Include observations about how the coins are alike as well as different.

Exercise 2 _____

Set out some small items that you have tagged with price tags that read 1¢, 5¢, 10¢. Let a student select an item and hold it up.

T: *How much does this item cost? Look at the price tag.*

S: *5¢.*

T: *Which one coin could we use to buy this item?*

You may need to rephrase your request to be sure students understand you want just one coin. Some students may suggest using a dime and then receiving change. Direct them to suggest a coin for which you would not need change.

Invite a student to select one coin and hold it up.

T: *Which items could we buy with this penny?*

S: *The button.*

S: *The paper clip.*

Let the students suggest several items and then choose one with a price tag of 1¢.

Continue this activity to match each item with one coin so that the price on the item matches the value of the coin.

Center Activity

Suggest students sort a collection of coins into “banks.” Banks can be boxes, mats, cups, and so on labeled with coin values (1¢, 5¢, 10¢) and/or the names of coins and/or pictures of the coins.

Capsule Lesson Summary

Using a story about fish in a pet store, develop an understanding of *less than*, *greater than*, and *equal to* by determining the correct number of fish in each bowl.

Materials

Teacher	• Magnetic checkers	Student	• Goldfish crackers or counters • Fishbowl paper • Math journal or paper
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Advance Preparation: Use Blackline K26 to make copies of fishbowls for students.

Description of Lesson

Repeat Lesson K26. This time, tell students that the pet store has gotten bigger fishbowls and Jody is putting ten fish in each bowl. This would be a good opportunity to use counting-on methods again.

Capsule Lesson Summary

Review how to teach the calculator to count by ones. Use the counting calculator to count-on.

Materials

Teacher	<ul style="list-style-type: none"> • Overhead calculator • Blocks or other counters 	Student	<ul style="list-style-type: none"> • Calculator
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Description of Lesson

Display the overhead calculator or a calculator poster. Review the location and use of various calculator keys.

T: *Do you remember how we taught the calculator to count?*

S: *Start with 1 (or 0) on the display. Next press $+$ 1 . Then press $=$ $=$ $=$ and so on. The calculator counts as you press $=$.*

Distribute calculators to pairs of students. Invite a student to teach the overhead calculator to count by ones while the rest of the class does the same on their calculators. Observe the calculator counting up to about 25. Clear the display.

T: *Sometimes we start counting at numbers other than 0 or 1. For example, how would we start counting at 7?*

S: *Put 7 on the display. Press $+$ 1 and then $=$ $=$ $=$ and so on.*

Model counting-on with blocks or counters as one student in each group teaches the calculator to count-on starting at 7.

Repeat a counting-on exercise starting from 10, for example, and model the process with the number line. In this case one student can press the $=$ key on the calculator while another points to numbers following 10 on the number line.

T: *Sometimes we want to start counting at some number and to stop at another. How could we make the calculator start counting at 16 and stop at 25?*

S: *Put 16 on the display. Press $+$ 1 . Then press $=$ $=$ $=$ and so on until we see 25 on the display.*

T: *Do this on your calculators and let's count how many times we press $=$.*

In pairs, direct one student to press the keys on the calculator while the other student counts how many times $=$ is pressed.

T: *How many times did we press the $=$? (Nine times)*

So the calculator added 9 to go from 16 to 25.

K94

Write this number fact on the board to reinforce what was done on the calculator.

$$16 \times 9 = 25$$

Let the students work in pairs to pose and solve other problems involving starting at a number, counting by ones, and stopping at another number. You may like to suggest some students write number facts about the problems they do on the calculator.

Capsule Lesson Summary

Tell a story about clowns juggling dishes using dots, strings, and arrows. Ask questions about the relation between clowns and dishes.

Materials

Teacher	<ul style="list-style-type: none"> • <i>See the Circus</i> by H. A. Rey or another selection from the literature list • Colored chalk 	Student	<ul style="list-style-type: none"> • None
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Description of Lesson

Prepare the class by inviting students to share some things they know about a circus. You may like to do this by first reading aloud a story such as *See the Circus* by H. A. Rey.

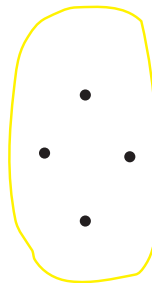
- T:** *Today we're going to tell a circus story.
Has anyone ever been to a circus?
What are some of the things you see at a circus?*

Solicit many ideas from students. When someone mentions clowns, continue.

- T:** *In our circus story there are clowns. These dots are the clowns.*

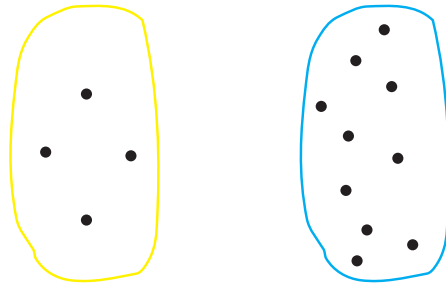
Draw a colored string with four big dots inside.

- T:** *How many clowns?*
S: *Four.*
T: *What do the clowns do at the circus?*
S: *Fall down.*
S: *Make you laugh.*
S: *Juggle.*
T: *In our circus story, the clowns are juggling.
What things might we see the clowns juggling?*
S: *Balls.*
S: *Dishes.*
T: *In this story, the clowns are juggling dishes.
Here are the dishes.*



Draw a second colored string with ten dots inside.

T: *How many dishes are there?* (Ten)



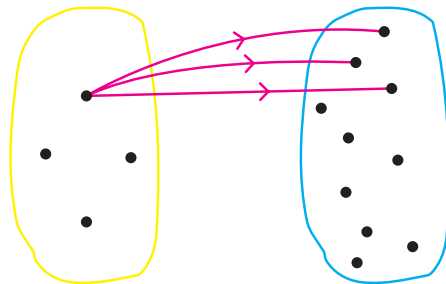
Draw an arrow from one clown-dot to one dish-dot as you say,

T: *This clown is juggling this dish.*

Repeat this two more times.

T: *How many dishes is this clown juggling?*

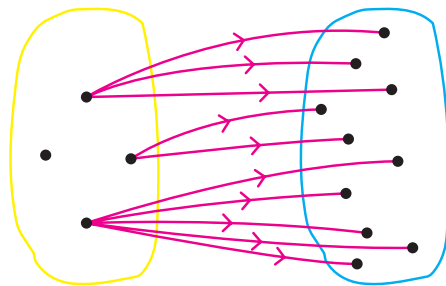
S: *Three.*



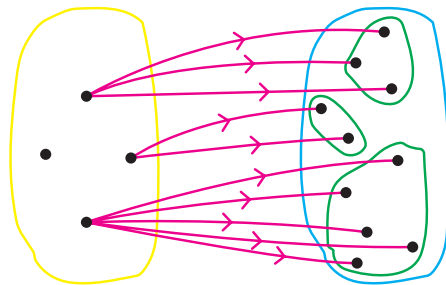
Ask the students to cover their eyes while you complete the picture.

Let students comment freely about the picture. You may ask questions that call for other observations.

T: *Which clown is juggling the most dishes? How many dishes is that clown juggling?* (Five) (Point to one of the other two jugglers.) *How many dishes is this other clown juggling?* (Point to the dot with no arrows.) *What do you think about this clown?*



Invite students to indicate all the dishes being juggled by a particular clown by tracing a string around them. Draw the strings yourself. You may want to observe that $3 + 2 + 5 = 10$.



Writing Activity

Suggest students draw a “clowns and dishes” story in their math journals. You may want to specify a number of clowns or some other restriction. Make a point of walking around the room giving each student a chance to talk about their story.

Capsule Lesson Summary

Create a human number line. Given the location of some numbers, find which numbers to place at other marks.

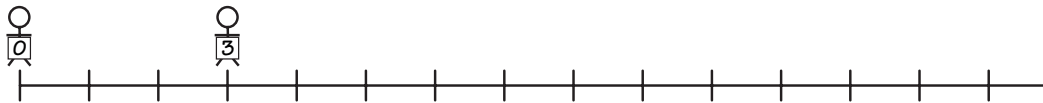
Materials

Teacher	<ul style="list-style-type: none"> • Graduated line • Numeral cards 	Student	<ul style="list-style-type: none"> • None
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Advance Preparation: Draw a long line on the floor (perhaps using chalk or masking tape) and graduate the line with marks equally spaced about 30 cm (or one foot) apart. Have ready the numeral cards 0 to the number of students in the class.

Description of Lesson

Distribute one numeral card to each student. Ask the students with numbers 0 and 3 to stand. Then place them at the marks on the line on the floor.



T: *I positioned 0 and 3 on this number line.*

Ask the student with 1 to stand.

T: *Where should we locate 1?*

Let the class tell the student with 1 where to stand on the number line.

Point to the mark for 5 and ask,

T: *What number goes here?*

When the class agrees that 5 goes there, invite the student with 5 to stand on the mark. Continue this activity until many numbers have been located. Alternate asking the class to identify which number to place at a specific mark with locating the mark for a specific number.

Point to the last mark on your line.

T: *What number goes here?*

Invite students to figure out which number. For example, someone might suggest starting at the mark of the greatest number located so far and counting-on from there to the last mark. After you determine what the last mark is, invite the student with that numeral card (for this example, 15) to stand on the mark and then point to the next to last mark.

T: *What number goes here? (14) How do you know?*

K96

Let all the students with numbers less than 15 find their places on the number line. Ask students how to locate a mark for a number greater than 15.

Additional Practice: You may like to make number lines for students to label. Blackline K96 is available for this purpose. Give students different numbers to start with on these number lines.

Capsule Lesson Summary

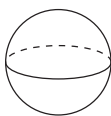
Describe some geometric solids and explore some of their similarities and differences. Investigate some properties of the solids.

Materials

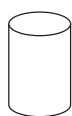
Teacher • Geometric solids

Student • Geometric solids

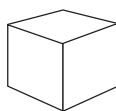
Advance Preparation: Collections of wooden or plastic geometric solids are ideal. If these are not available, collect some from educational toys and games, or from home. Boxes, cardboard tubes, balls, and so on work well. Try to have most of the following:



Sphere



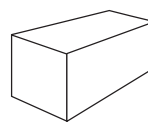
Cylinder



Cube



Cone



Rectanglar
Prism



Pyramid

Description of Lesson

Exercise 1: Free Play _____

If you have several collections of geometric solids, arrange the class into small groups each with a collection. Allow time for free exploration. You may also make geometric solids available in free exploration centers prior to this lesson.

Exercise 2 _____

Bring the class together in a large circle with the solids laid out in the middle. Begin a discussion by asking students to describe some of the solids. Encourage students to give names to them and to recall things they know that look like the solids. Do not worry about using technical or “adult” names for the solids although some students may want to hear their mathematical names. Refer to them as *solids* (not as *shapes*), and talk about the sides as *faces* that are a particular shape. For example, the faces of a cube are squares.

T: *Are there two solids that look alike (or have something in common)?*

Let student volunteers pick up two solids and explain how they are similar. Be flexible. The features by which you compare two solids might not seem significant at all to your students, and vice versa. Some examples of similarities include the following:

- A cube and a rectangular prism are both like boxes.
- A sphere and a cylinder both roll.
- A cylinder and a cone are alike because you can “see circles in them.”
- A cone and a pyramid both have a point.

Exercise 3 (optional) _____

Again, if you have several collections of geometric solids, organize the class into small groups, each with a collection.

Suggest the groups try to answer some of these questions:

- What could you make with some of these solids?
- Which solids can you roll? ...stack? ...slide?
- Which solids have a flat side? ...look the same from all directions?
- What things in the room look like one of these solids?

You might do this by asking all the groups to work on the first question. Then as you circulate, pose some of the other questions for different groups to investigate.

Capsule Lesson Summary

Sort and classify K A-blocks using strings.

Materials

Teacher <ul style="list-style-type: none"> • <i>Look! Look! Look!</i> by Tana Hoban or another shape book from the literature list 	Student <ul style="list-style-type: none"> • Two string loops of different colors • K A-blocks
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Description of Lesson

Read *Look! Look! Look!* by Tana Hoban or another shape book from the literature list.

Exercise 1 _____

Move students through this activity at a brisk pace.

Divide students into groups of three or four and give each student a set of K A-blocks. Let them play freely with the pieces for a few minutes while you give one string loop to each group. When all the groups are ready, ask them to lay out the string loop on the table so everyone can reach it. After this, and each of the following activities, quickly check the groups' work; then instruct them to take all the pieces out of the string.

T: *Put all the green pieces inside the string.*

Continue giving the following directions, one at a time:

- Put all the triangles inside the string.
- Put all the white pieces inside the string. (The string should remain empty.)
- Put all the pieces smaller than your hand inside the string. (Here, each group should place all of its K A-blocks in the string.)

Exercise 2 _____

Note: Do not give away the secret of overlapping the strings. If no one thinks of it during the lesson, just leave the problem open. Later, there will be another lesson opportunity to explore these ideas.

This activity will almost certainly require a good deal more thinking than the preceding one. Start by giving each group a second string loop. (Suppose the strings are yellow and blue.)

T: *This time we are going to use two strings. What color strings do you have?*

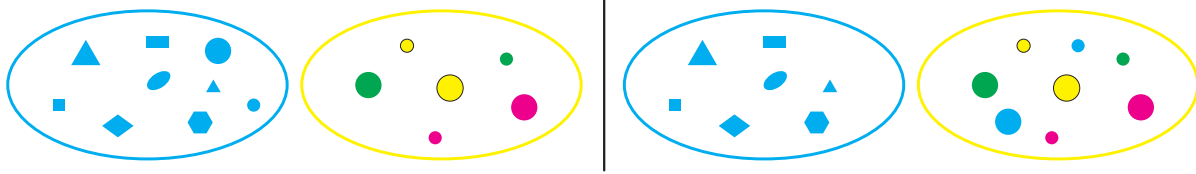
S: *Blue and yellow.*

T: *Fine. Inside the blue string, put all the blue pieces. Inside the yellow string, put all the circles.*

You may want to ask one or two students to repeat these instructions to make sure that everyone heard them.

K98

It is unlikely that your students will solve the problem on their first attempt. Most likely the strings will not be overlapped, resulting in one of the following situations.[†]



In the first situation, point to a blue circle and say,

T: *Isn't this a circle? The other string is for circles.*

When the students move the blue circles to the other string, ask,

T: *But, what is the blue string for? (Blue pieces)*
Are all the blue pieces inside the blue string? (No)

In the second situation, point to a blue circle and say,

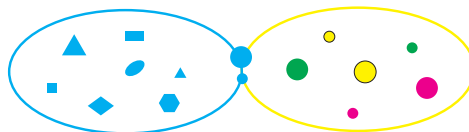
T: *Isn't this blue? The blue string is for blue pieces.*

When the students move the blue circles to the blue string, ask,

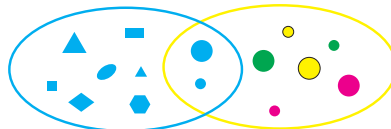
T: *But, what is the other string for? (Circles)*
Are all the circles inside that string? (No)

Walk around the room making similar comments to each group. Some students may suggest putting some of the blue circles in one string and some in the other. Point out that all the circles, not just some, must be inside the string for circles and all the blue pieces must be inside the string for blue pieces.

Some groups may suggest pushing the strings very close together and putting the blue circles on the string such as this:



Remind the students that the blue circles must be inside, not on, both the string for blue pieces and the string for circles. Be patient; do not reveal the secret. Eventually, someone may suggest overlapping the two strings...



...which will allow the blue circles to be put inside both strings. If no one makes this discovery, leave the problem open for the time being.

[†]In this and the other pictures in this lesson, not all the K A-blocks are shown.

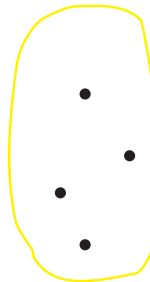
Capsule Lesson Summary			
Tell a story about monkeys and bananas using dots, strings, and arrows. Ask questions about the relation between monkeys and bananas.			
Materials			
Teacher	• Colored chalk	Student	• None

Description of Lesson

Start the lesson by discussing monkeys and what they eat. You may like to put this in the context of visiting the zoo. Then draw a colored string with four big dots inside.

T: *These dots are for monkeys. How many monkeys?*

S: *Four.*



Ask students to show 4 with their fingers and to locate 4 on their desktop number lines.

T: *These monkeys are very hungry. What do you think they would like to eat?*

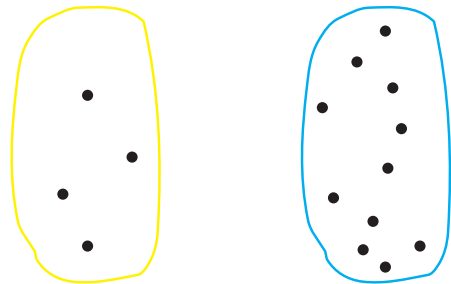
S: *Bananas.*

T: *Yes. Here are some bananas.*

Draw another colored string with eleven dots inside.

T: *How many bananas?*

S: *Eleven.*

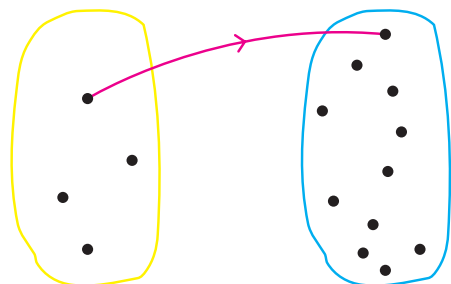


Ask students to locate 11 on their desktop number lines.

T: *These monkeys do not have very nice manners. They grab as many bananas as they can.*

Draw one arrow as you say,

T: *This monkey grabs this banana.*

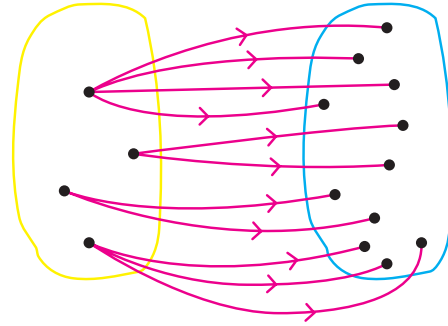


Call on students to point first to the monkey and then to the banana.

Ask your students to close their eyes while you complete the picture. When finished say,

T: *Open your eyes. What do you think?*

Let students make some observations about the picture. You may also like to pose some questions and ask the students to make still other observations. For example:



T (pointing to a monkey dot): *How many bananas did this monkey grab?*

(...pointing to a banana dot) *Which monkey took this banana?*

Point to the monkey who grabbed the most bananas.

Point to the monkey who grabbed three bananas.

Did two monkeys grab the same number of bananas?

Writing Activity

Suggest students record a “monkey and banana” story of their own in their math journals. Students can draw pictures of monkeys and bananas or use dots, strings, and arrows.

Note: See Section One, page 1-12, for an explanation of the purpose of scheduled adjustment days.

Today, you may wish to repeat an earlier lesson either for a small group of students or for the entire class. Many of the lessons can be made to appear completely different by changing the story and/or the numbers in the lesson. If you feel students need more experience in coin recognition, repeat Lesson K92. This is also a good time to allow students to work in a center or on a project of your choice.

The following game activities may be appropriate for working with students on number sense and observation skills.

Read My Mind_____

Choose a number and offer clues as such as:

- | | | | |
|-----------|---|-----------|------------|
| T: | <i>I am thinking of a number between 8 and 10.</i> | S: | <i>9.</i> |
| T: | <i>I am thinking of a number less than 25 and more than 23.</i> | S: | <i>24.</i> |
| T: | <i>I am thinking of a number less than 50.</i> | S: | <i>40.</i> |
| T: | <i>My number is also less than 40.</i> | S: | <i>35.</i> |
| T: | <i>My number is more than 35.</i> | S: | <i>38.</i> |

Choose an object in the room and offer clues such as:

- | | |
|-----------|---|
| T: | <i>I see something that is longer than this pencil but shorter than my book.</i> |
| S: | <i>The stapler.</i> |
| S: | <i>The eraser.</i> |
| T: | <i>I am thinking of something in this room that can roll.</i> |
| S: | <i>That piece of chalk.</i> |
| S: | <i>The ball.</i> |
| T: | <i>Now, I am thinking of a student who is sitting close to the window, is not a boy, and is wearing sneakers.</i> |
| S: | <i>Susan.</i> |

Something About_____

Choose a number and invite students to tell you something about the number. You may need to get it started with one statement.

- | | |
|-----------|--------------------------------------|
| T: | <i>What can you tell me about 4?</i> |
| S: | <i>4 is less than 10.</i> |
| S: | <i>4 is 1 more than 3.</i> |
| S: | <i>$2 + 2 = 4.$</i> |

K100

S: *There are four people in my family.*

S: *4 is between 3 and 5.*

If many statements are alike, make another statement yourself to suggest other possibilities.

Assessment: You may wish to use one of the sample assessment checklists, Blacklines K0 (b)–(k), to note students' number awareness and observation skills.

Early Warning

Among the next nine classroom lessons are some that require extra preparation or involve materials not included with the *CSMP* Classroom Set. The lessons are listed here for your convenience in preparing for them. A more detailed description of the needed materials can be found on the first page of each lesson. (Special materials are listed here only once, even if they are used more often during the nine-day period.)

K102 *Order #2*: Chart paper; magazines; scissors

K103 *Robot Walk #3*: Small doll (robot)

K104 *Ten Black Dots*: Checkers; cups

K106 *Marching Band*: Counters; straight edges

K108 *One-Way Roads #2*: Pointer

Several of the lessons also include suggestions for literature and/or fingerplays which are not included here. Please check the materials list at the beginning of the following lessons in advance so you can obtain the necessary literature: K102, K103, K104, K106.

Capsule Lesson Summary

As a class, do some counting exercises; count forward, backward, and by twos.

Materials

Teacher • None
Student • None

Description of Lesson

Short counting activities such as the ones in this lesson can be done whenever you have a few extra minutes (for example, while the class waits in line or before the bell).

Organize the class in a circle.

T: *Let's see how well the class can count, but we won't all count together. The first person I point to will say "one," the second will say "two." Each person I point to will say the next number. Let's see if we can do it without making any mistakes.*

Go around the circle pointing to the students, in order, until each has participated. Make corrections as necessary. If there is much hesitation or are many mistakes, tell the students you think they can do better and begin again.

Repeat the above counting activity and tell the students they must try to remember their number.

T: *Now we are going to count backward. I will point to each of you in reverse order. When it's your turn, say the same number you said before.*

Go in reverse order around the circle starting with the last person and asking the students to say their same numbers. This should generate counting backward to one.

T: *We are pretty good at counting forward and backward. Let's try something different.*

Arrange the circle so that every other person is standing and every other person is sitting. Again, go around the circle counting by ones and ask students to remember their numbers.

T: *Now, just the people standing (sitting) will count. Say the same number you did before.*

In this counting activity, the students will skip count starting at 1 or 2. You can expect some mistakes because students may forget their numbers. You might suggest counting as before, but this time ask the standing (sitting) students to say their number aloud while those sitting (standing) whisper their numbers.

K101

Center Activity

Place dot-to-dot pictures in centers for additional counting practice. Blacklines K101 (a)–(c) are typical examples which start at 1 and count by ones. Blackline K101 (d)–(f) are examples which start at some other number and count by ones (counting-on). Blacklines K101 (g)–(i) are examples which start at some number and count backward.

Home Activity

Suggest that parents/guardians practice counting with their child. They can count by ones forward and backward, count starting at some number other than one, and count by twos.

Capsule Lesson Summary

Use a story or real situations to further develop concepts of ordinal numbers and sequence.

Materials

- | | |
|---|--|
| Teacher <ul style="list-style-type: none"> • <i>The Very Hungry Caterpillar</i> by Eric Carle, <i>Chicken Soup with Rice</i> by Mary Sardon, or another sequential book selection from the literature list • Chart paper | Student <ul style="list-style-type: none"> • Magazines • Scissors |
|---|--|

Advance Preparation: Prepare a table on the chart paper ahead of time with columns and places for the days of the week.

Description of Lesson

Exercise 1 _____

Read aloud *The Very Hungry Caterpillar* by Eric Carle, *Chicken Soup with Rice* by Mary Sardon, or another sequential book selection.

Note: You may choose to use your literature selection and the actions or events from the book for Exercise 2 rather than the example story presented here.

Exercise 2 _____

T: *Some of my former students go to a school that is taking a break next week. My good friend Tonia is trying to decide what to do during her week off. Let's help her schedule some fun things to do during the break.*

T: *How many days are there in a week? What are they?*

S: *Seven.*

S: *Sunday, Monday, ... , Saturday.*

Display a piece of chart paper with lines drawn to show seven areas.

T: *Across the top of the chart paper, I am going to write the days of the week and the order they come in. What day of the week is first?*

S: *Sunday.*

Write "Sunday" at the top of the first column, "Monday" at the top of the second column, and so on for the remaining days of the week. Your finished chart might look like this:

First	Second	Third	Fourth	Fifth	Sixth	Seventh
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday

T: *What are some of the fun things Tonia could do while on break?*

As students give suggestions, make a list on the board.

S: *Ride her bike.*

S: *Go swimming.*

S: *Play ball.*

S: *Rollerblade.*

S: *Play games.*

It is possible you will have quite a list assembled once everyone has added their favorite thing to do.

T: *Now that we know a lot of fun things Tonia could do, let's help her decide in what order to do them. Remember, Tonia is planning a whole week and wants something to do every day. What might she do on Sunday, the first day?*

A lively discussion will probably follow, since many students will want their fun activity to be first. Help your students narrow down one or two activities for the first day. Write these activities in the appropriate space of the first column. Continue this process through the other days of the week, making sure all suggested fun activities are placed on the chart on one of the days.

Divide the class into seven groups and assign each group one day of the week. Provide magazines and scissors to each group. Instruct students to find and cut out a picture which helps to show the fun activity for that day.

When the groups are ready, let them glue or tape their pictures on the chart paper. While they are doing this, ask the group to say what fun activity the picture is for (for example, swimming, biking, and so on), the day of the week on which it is scheduled, and the order of that day in relation to the rest of the week.

Review the chart when finished.

Capsule Lesson Summary

Find different paths a robot could take between two intersections of a grid. Compare the lengths of paths.

Materials

- | | | | |
|----------------|---|----------------|--|
| Teacher | <ul style="list-style-type: none"> • <i>Round Trip</i> by Anna Jones or another selection from the literature list • Robot walk grid sheet • Colored checker • Small doll (robot) | Student | <ul style="list-style-type: none"> • None |
|----------------|---|----------------|--|

Description of Lesson

Exercise 1 _____

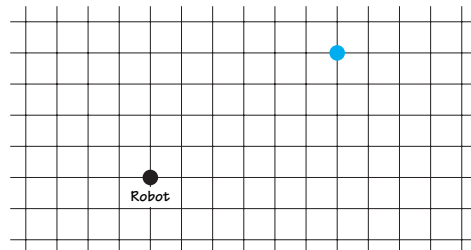
Read aloud *Round Trip* by Anna Jones or another selection from the literature list.

Exercise 2 _____

Set up and remind the class about the robot walks in Lessons K73 and K87.

T: *Today, instead of giving directions to the robot, I would like you to show some possible walks the robot could take.*

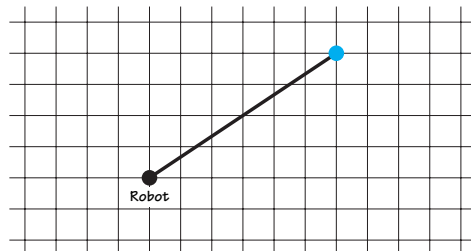
Place the robot on one intersection and a marker (colored checker) on a second intersection as shown here.



T: *Suppose the robot starts here (point to the robot) and walks to here (point to the marker). Can you show one way for the robot to go?*

Allow several different students to trace possible walks (paths) for the robot. You can draw the correct paths with colored markers.

If someone suggests a path like the one illustrated here, remind them that the robot takes single steps from one intersection to the next intersection. So the robot must go along the lines of the grid.



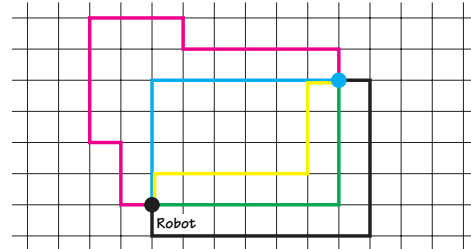
K103

Since there are many ways for the robot to go, encourage students to find a variety of paths by asking,

- T:** *Do you think the robot could take a different path?*
Could the robot's walk be very long?
Could the robot's walk go here (indicate an intersection in the upper left part of the grid) *on the way to the marker?*

After a while, your grid might look like this:

- T:** *Which of these paths is the shortest?*
Which of these paths is the longest?



Let the class discuss how to compare the lengths of different paths. Perhaps someone will suggest counting the number of steps the robot takes. Let students use the robot to follow each path and count the number of steps. In the above picture, three different paths are shortest (blue, yellow, and green are each 10 steps) and the red path is the longest (18 steps).

Capsule Lesson Summary

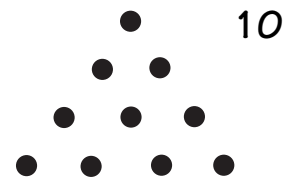
Cover an array of dots in various ways to explore different representations of a number and encourage counting strategies.

Materials

- | | | | |
|----------------|---|----------------|---|
| Teacher | <ul style="list-style-type: none"> • <i>Ten Black Dots</i> by Donald Crews or another selection from the literature list • Sheet of paper • Magnetic checkers (optional) | Student | <ul style="list-style-type: none"> • Checkers • Cup |
|----------------|---|----------------|---|

Description of Lesson

Read *Ten Black Dots* by Donald Crews or another selection from the literature list. Draw this array of dots on the board. If you prefer, use magnetic checkers on a magnetic board or other counters on the overhead. All the dots (checkers) should be clearly visible, but you must be able to cover several at once with a sheet of paper.

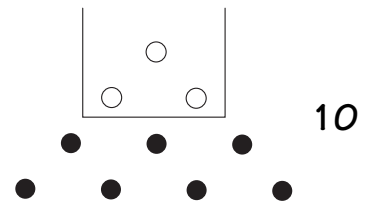


T: *How many dots are there?*

S: *Ten.*

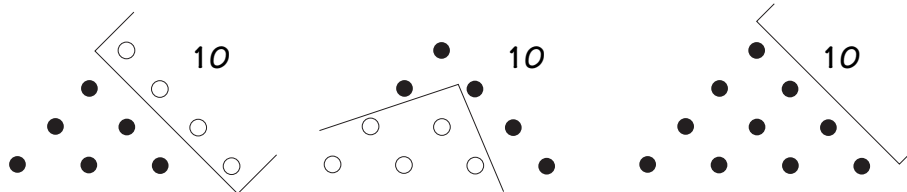
Invite a student to write 10 on the board while the others locate 10 on their desktop number lines. Then ask the students to close their eyes. Hide some of the dots with a piece of paper, and then ask the students to open their eyes again.

T: *How many dots can you see?* (Seven)
How many dots are hidden? (Three)



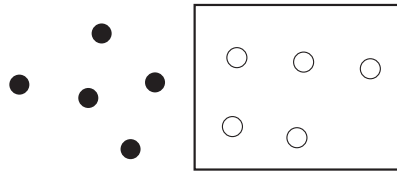
Let students explain how they know three dots are hidden. Accept different methods and try to include counting-on. You may also like to write number facts such as $7 + 3 = 10$ and $10 - 3 = 7$ to describe the situation.

Repeat this activity several times at a brisk pace. Use the following examples or other similar examples.



K104

Variation: Arrange the checkers so that they do not form a symmetric pattern, or use a different number of checkers.



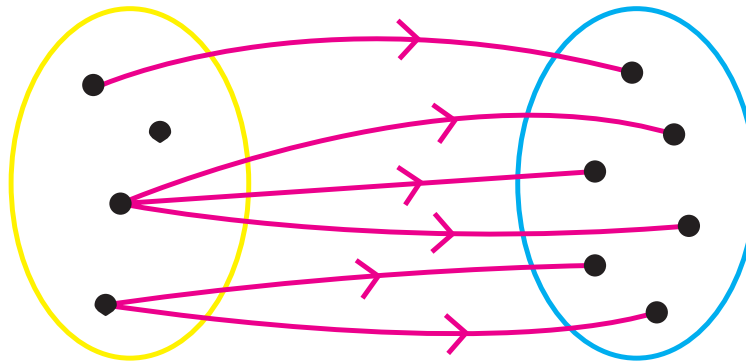
Organize the students in groups of three to six. Provide each student with ten checkers and a cup. Instruct the groups as follows: Each student hides some of their ten checkers under the cup and puts the display (with some checkers visible and some hidden under the cup) in front of them. Taking turns, the other group members try to guess how many checkers are hidden. After guessing, they confirm their guess; for example, three checkers (not hidden) and seven checkers (hidden; lift the cup to check) is ten checkers.

Assessment: You may wish to use one of the sample assessment checklists, Blacklines K0 (b)–(k), to note students' counting abilities.

Capsule Lesson Summary			
Tell stories that could be the interpretation of a picture with dots, strings, and arrows.			
Materials			
Teacher	• Colored chalk	Student	• None

Description of Lesson

Draw this picture on the chalkboard:



T: *Usually I tell you a story to go with our picture. Today it is your turn to make up the story. Try to think of a story to go with this picture.*

You may need to help the students as they tell their stories to ensure that they are explicit about the following points:

T: *What are the dots inside the yellow string for?
What are the dots inside the blue string for?
What are the arrows for?* (The arrows should all have the same meaning within a story.)

Here is a sample dialogue:

S: *My story is about dogs.*
T: *Where are the dogs in the picture?*
S: *Inside the yellow string.*
T: *What are the dogs doing?*
S: *Hiding bones.*
T: *Where are the bones?*
S: *In the blue string.*
T: *And what are the arrows telling us?*

S (tracing one of the arrows): *This dog hides this bone.*

Ask the class some questions about the story. For example:

- T:** *How many dogs are there?* (Four)
 How many bones are there? (Six)
 Which dog hides the most bones?
 Did every dog hide a bone? What about this dog (point to the dot without an arrow)?
 Point to the dog that hides two bones.

Ask for other interpretations of the picture. If students begin to suggest only variations of the first story, ask who has a story that is not about dogs. Some stories may need altering before they fit the picture. For example, suppose the following story is suggested:

Inside the yellow string:	Children
Inside the blue string:	Mothers
Meaning of the arrows:	“You are my mother.”

Let the students discuss the story, guiding them to discover that, in this story, some children seem to have more than one mother—an impossibility! The class may eventually suggest that mothers could be inside the yellow string and children could be inside the blue string. The arrows could then mean “you are my child.”

If you cannot see a way to modify a story so that it fits the picture, say,

- T:** *That’s a very nice story, but it does not seem to fit our picture.*

You may want to draw a second picture which illustrates the student’s story, if this is possible.

Writing Activity

Students can draw their own pictures and tell stories to go along.

Home Activity

Send an arrow picture home with students and suggest family members make up stories to fit. The student can check to see that a story fits. A sample letter and arrow picture is provided on Blackline K105.

Capsule Lesson Summary			
Use counters to visualize a marching band’s formation and different ways of making twelve.			
Materials			
Teacher	<ul style="list-style-type: none"> • <i>Parade</i> by Donald Crews • Straight edge 	Student	<ul style="list-style-type: none"> • Counters • Straight edge

Description of Lesson

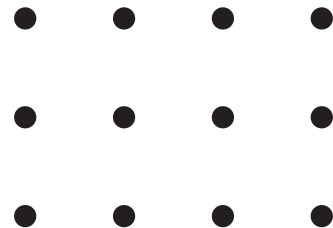
Exercise 1 _____

Read *Parade* by Donald Crews aloud to the class. After you finish reading the book once, go back to the pages where the marching band comes in. Direct students to look closely at the formation of the band.

T: *There are different formations a marching band can make. Let’s make a marching band and decide about some formations for our band. As I select you to be a band member, come to the front of the room.*

Select twelve students for the band and line them up in three rows of four students.

Then draw an array of 12 dots on the board to represent the students.



T: *These dots are our students pretending they are in the marching band. How many are there? (12)*

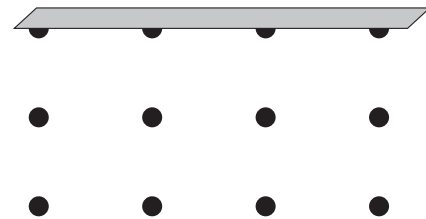
T: *What sort of arrangement are they in?*

S: *In three rows.*

T: *How many band members are in each row?*

S: *Four.*

Ask the students in one row to raise their hands while you use a straight edge to indicate the row in the array of dots on the board. Do this for each row.



You may like to write a number fact to describe the formation.

$$4 + 4 + 4 = 12$$

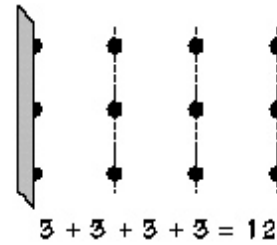
K106

Ask the students to return to their seats. Then distribute 12 counters and a straight edge to pairs of students.

T: *Make your counters look like the dots on the board. Is there another way of looking at this formation?*

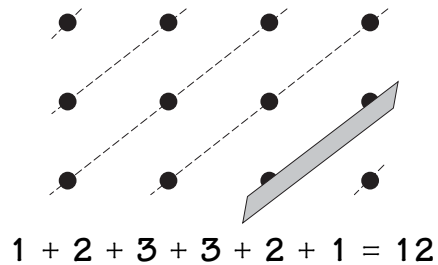
S: *Four rows of three.*

Demonstrate this as in the first case.



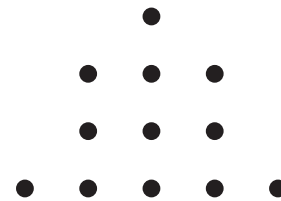
T: *Does anyone see another way of looking at these band members?*

Someone might observe diagonal rows or you might like to show them to the class yourself.

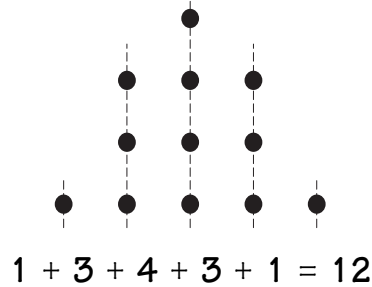
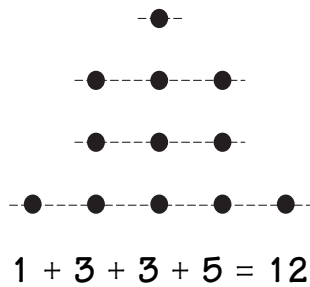


Exercise 2 _____

If the students seem interested, you can repeat Exercise 1 using a different formation for twelve band members. For example:



This could lead to the following ways of looking at the formation.



Capsule Lesson Summary

Use the 0–109 numeral chart to practice reading numbers, to do some counting exercises and to explore some number patterns.

Materials

Teacher	<ul style="list-style-type: none">• 0–109 numeral chart• Blackline K107	Student	<ul style="list-style-type: none">• Pencil or crayon• Individual 0–109 numeral chart
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Advance Preparation: Use Blackline K107 to make student 0–109 numeral charts.

Description of Lesson

Note: During and after this lesson, the 0–109 numeral chart should be on display in the classroom. You may want students to have 0–109 numeral charts at their places.

Many exercises are possible. Try to choose some that are challenging to your class. Continue as long as student interest remains high.

You can ask your students to try the following:

- Read a given column. What do you notice? (All the numbers end with the same digit.)
- Read a given row. What do you notice? (All the numbers start with the same digit; counting by ones.)
- Read a column from bottom to top.
- Read a row from right to left (count backward).
- Start at 0 and read every other number (count by twos).
- Start at 1 and read every other number (count by twos).
- Count backward, starting with various numbers.
- Find a specific number.
- After listening to you read the first row, tell how you are counting. (By ones.)
Do the same exercise with the second, fifth, and last rows.
- After listening to you read the last column, tell how you are counting. (By tens.)
Do the same exercise with the first and fifth columns.

Home Activity

Make a 0–109 numeral chart for each student to take home. Suggest to parents/guardians that they use the chart to practice reading numbers and looking for patterns. For example:

- Read a row of numbers. What patterns do you notice?
- Read a column of numbers. What patterns do you notice?
- Read a diagonal of numbers. What patterns do you notice?
- Cover one or several numbers. Guess which number(s) are covered.

Capsule Lesson Summary

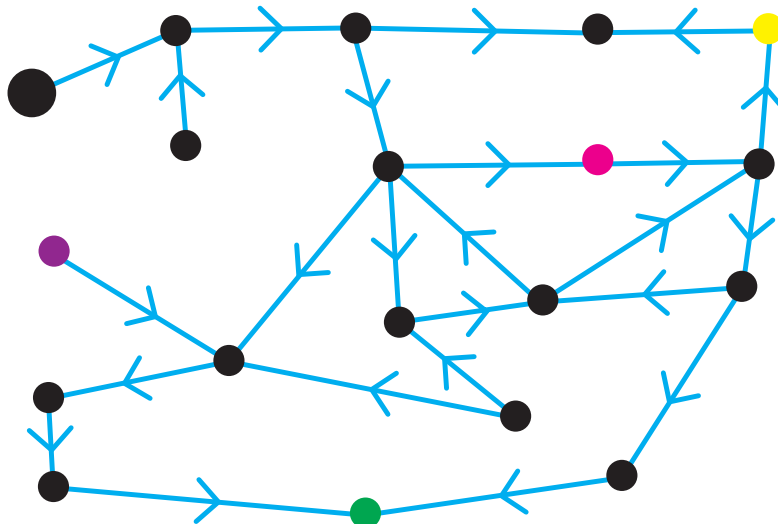
Follow arrows on a one-way road map and take some walks. Explore different ways to go from one place to another following arrows.

Materials

Teacher	<ul style="list-style-type: none"> • One-Way Road Map #2 poster • Pointer • Colored checkers • Flower pictures (optional) 	Student	<ul style="list-style-type: none"> • None
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Description of Lesson

This lesson follows the same pattern as Lesson K81. Attach your copy of the One-Way Road Map #2 poster to the board. (The map is reproduced below. For the moment, do not attach any special significance to the colored dots; they are actually black dots on the poster and are in color here for reference later in the lesson.)



T: *This is the map of a garden. If you would like to take a walk in it, you have to follow the arrows. Who would like to try? Here is the gate into the garden.* (Point to the big, black dot on the left.)

Let several students trace walks in the garden using a pointer. If someone makes a mistake by trying to go against the direction of an arrow, the rest of the class should protest by raising their hands, for example.

T: *Now I am going to point out some special places in the garden. Let's see if we can get to them. Here are the red roses.* (Place a red rose picture or a red checker on the point indicated in the map above.)

Let several students show different ways of going from the gate (big dot) to the roses (red dot). You may want to ask volunteers to plan the path they will take before coming to the board.

If you like, give students who reach the red checker a rose picture.

To avoid confusion you may want to remove the red rose or checker from the map before proceeding.

T: *Here are the daffodils.* (Place a yellow daffodil picture or a yellow checker on the yellow dot on the map.)

Again, let students show different ways of going from the gate (big dot) to the daffodils (yellow dot).

Continue in this way, giving names to other places. For example, the purple dot could be for lilacs and the green dot could be for ivy.

Students should observe that it is impossible to reach the lilacs (purple dot). You may like to ask students how they could change the garden map so it would be possible to reach the lilacs.

Capsule Lesson Summary

Use correspondence to compare quantities of two or three different kinds of things.

Materials

Teacher	<ul style="list-style-type: none">• Counters or checkers• Colored chalk	Student	<ul style="list-style-type: none">• None
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Description of Lesson

Repeat Lesson K53 using different things to correspond and different numbers. Emphasize using one-to-one correspondence to compare quantities.

As a variation, you may like to present a situation with three kinds of things to correspond and compare quantities between them.

Writing Activity

Suggest students record one of the stories you presented in their math journals.

Note: See Section One, page 1-12, for an explanation of the purpose of scheduled adjustment days.

Today you may wish to repeat an earlier lesson either for a small group of students or for the entire class. Many of the lessons can be made to appear completely different by changing the story and/or the numbers in the lesson. If your students enjoy and could use more counting experiences, repeat Lesson K101. This is also a good time to allow students to work in a center or on a project of your choice.

The following game activities may be appropriate for working with students on number awareness.

Catch It _____

Arrange a group of students in a circle with you in the middle. Explain that you are going to toss a ball to one of them, and as you toss the ball you will say a number. The student who catches the ball must say the number that is one more and toss the ball back to you.

For variety, change the game so that the student who catches the ball must say the number that is one less; two more; any number less than your number; any number more than your number.

Assessment: You may wish to use one of the sample assessment checklists, Blacklines K0 (b)–(k), to note students' counting skills and number awareness.

Early Warning

Among the next nine classroom lessons are some that require extra preparation or involve materials not included with the *CSMP* Classroom Set. The lessons are listed here for your convenience in preparing for them. A more detailed description of the needed materials can be found on the first page of each lesson. (Special materials are listed here only once, even if they are used more often during the nine-day period.)

- K112 *Solids #2*: Geometric solids; bags; collection of disposable solids; paint; glue or tape
- K113 *Counting Calculator #4*: Calculators; blocks
- K114 *Catch the Tiger #1*: Catch the Tiger game mat; small toy tiger; dice
- K115 *Strings #2*: String loops
- K116 *Coins #2*: Coins (pennies, nickels, dimes); purses
- K117 *Meter Measure*: Meter sticks; string; charts

Several of the lessons also include suggestions for literature and/or fingerplays which are not included here. Please check the materials list at the beginning of the following lessons in advance so you can obtain the necessary literature: K114, K117, K118, K119.

Capsule Lesson Summary

Introduce the Number Line Game in which students discover a secret number by determining its location on the number line relative to the location of other numbers they guess.

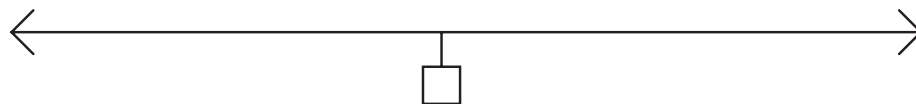
Materials

Teacher • None

Student • None

Description of Lesson

Draw a long line for a number line on the chalkboard. Choose a point near the center of the line and label it with an empty box.



T: *Let's play a game. I have a secret number between 0 and 20.*

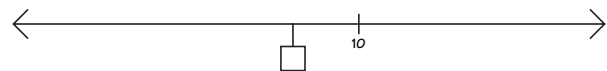
On this number line, my secret number goes right here (point to the box), but it is hidden in this box. Try to guess my secret number.

Ask a student to make a guess. If the number suggested is not between 0 and 20, remind the class of the parameters, and ask for another guess. The following sample dialogue assumes that your secret number is 8.

S: *Is your number 10?*

T: *No, 10 is more than my number. I'll show you where 10 is on the number line. This might not be exactly the right place, but I'll try to be as accurate as I can.*

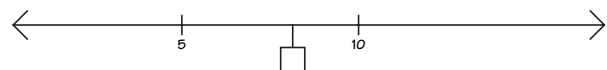
My secret number is less than 10.



Another guess?

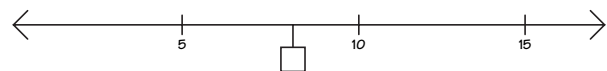
S: *5.*

T: *5 is less than my number.*



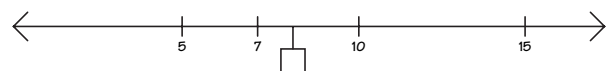
S: *15.*

T: *15 is more than my number.*



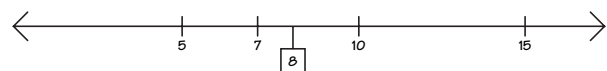
S: *7.*

T: *7 is less than my number.*



S: *8.*

T: *That's it. 8 is my secret number.*



Play the game a few more times, choosing other secret numbers between 0 and 20, or increasing the starting interval to between 0 and 50. You may wish to let the student who guessed correctly choose the next secret number, whispering it to you.

Note: Initially you will want to play the game without value judgement about student guesses. As students' skills improve, you may want to ask other students what they think about a guess like 15 in the example above. There the class had already found the secret number was less than 10 so it certainly could not be 15.

Capsule Lesson Summary

In cooperative groups, manipulate solids and create a “solid sculpture.”

Materials

Teacher	Student
<ul style="list-style-type: none"> • Geometric solids • Bags with solids in them 	<ul style="list-style-type: none"> • Collection of disposable solids • Paint • Glue or tape

Advance Preparation: Prepare two or three paper or cloth bags, each with one geometric solid in it. Tie or staple the bags closed. Try to arrange that the solids in each bag are duplicates of the ones in your collection of geometric solids. Collect a variety of disposable solids (e.g., paper rolls; oatmeal boxes; ice cream cones or cone sleeves; rectangular or cubic boxes such as those that hold tacks, brads, staples; and so on).

Description of Lesson

Exercise 1

Organize the class in a circle and place your collection of geometric solids in the middle. Review and continue some of the discussion about solids from Lesson K97.

Show students one of the bags you prepared before class with one of the solids in it.

T: *I put one of these solids in this bag. Let's see if you can guess which one.*

Let students suggest ways to figure out which solid is in the bag. Some may want to ask questions such as, “Does it have any corners?” Others may like to look in the bag. Allow students to ask yes/no questions or to feel (not *look* in) the bag. When many students appear to know which solid is in the bag, reveal it to the class.

Repeat this activity with one or two more bags with solids in them.

Exercise 2

Divide the class into cooperative groups and prepare work surfaces for painting. Let students know they must take turns painting in their groups. Distribute several types of disposable solids to each group. Ask various questions to give students practice identifying the solids.

T: *Show me a cylinder,... a cube,... a cone.*
If you paint an end of your cylinder, what shape will you see painted? (A circle)
If you paint a face of your cube, what shape will you see painted? (A square)

Instruct students in their groups to paint the solids. As the groups are working, you may like to circulate and ask questions about the solids they are painting.

T: *You are painting a cube. How many faces are there to paint?* (Six) *How many corners does the cube have?* (Eight)

When students complete the painting, put the solids aside to dry.

Exercise 3 _____

When the painted solids are dry, instruct students to create a sculpture. You may suggest that the sculpture reflect a unit you are working on. For example, if you are studying insects, students might make dragonflies, ladybugs, and so on. (You may wish to come back to this part of the lesson later in the day or the next day.)

Note: Painting will enhance the students' understanding of the shapes and composition found in a solid, however, the questioning and sculpting can be done without the painting activity.

Capsule Lesson Summary

Review how to teach the calculator to count by ones. Teach the calculator how to count backward and associate counting backward with subtracting 1.

Materials

Teacher <ul style="list-style-type: none"> • Overhead calculator • Blocks or other counters 	Student <ul style="list-style-type: none"> • Calculator
--	---

Description of Lesson

Display the overhead calculator. Review how to teach the calculator to count by ones, first starting at 0 or 1, and then starting at some other number.

T: *Suppose we teach the calculator to count by ones and we make it stop at 15. Could we teach the calculator to count backward starting at 15 and going back to 1 (or 0)?*

Discuss what it means to count backward. Some students may like to show that they can count backward from 10 to 0. Model counting backward with blocks, students, or other counters.

T: *Let's teach the calculator to count backward. Suppose we want it to start at 15.*

Put 15 on the display and put out 15 blocks or counters.

T: *How do we get the next number?*

S: *Take away (subtract) 1.*

S: *Say "14."*

Model with the blocks or counters.

T: *Each time we count backward the next number is one less. So let's tell the calculator to subtract one. Press \square \square 1. Now the calculator can count backward.*

Choose a student to press \square repeatedly as you model counting backward with the blocks or counters. Stop before or at 0.

T: *So we teach a calculator to count backward using these steps:*

1. *Put on the starting number.*
2. *Press \square 1.*
3. *Press \square \square \square and so on.*

Distribute calculators and invite students to teach their calculators to count backward. Some students may like to start the counting at a "big" number like 100.

Capsule Lesson Summary

Play a game involving counting and chance.

Materials

Teacher <ul style="list-style-type: none"> • <i>1 Hunter</i> by Pat Hutchins, <i>Wildlife 1–2–3</i> by Jan Thornhill, or another selection from the literature list • Catch the Tiger game mat • Small toy tiger (or any other animal) • Dice or number cubes 	Student <ul style="list-style-type: none"> • None
--	---

Advance Preparation: In the *CSMP* Classroom Set, you will find several Catch the Tiger game mats on a poster. Cut them out to use as separate mats. To increase the life of these game mats, you can laminate them.

Description of Lesson

Exercise 1 _____

Read *1 Hunter* by Pat Hutchins, *Wildlife 1–2–3* by Jan Thornhill, or another selection from the literature list.

Exercise 2 _____

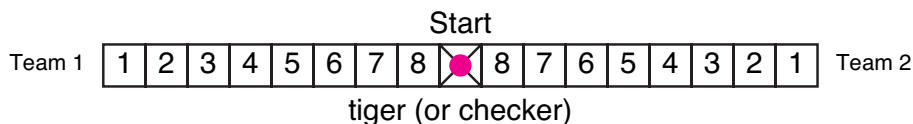
Show your students the toy tiger and explain that they are going to play Catch the Tiger. (Modify this game as necessary if you are using another animal. If you use a checker, explain that the checker stands for the tiger.)

T: *This tiger walks back and forth along this track.*

Show the students the game mat, and place the tiger on the central square.

T: *You are going to try to catch the tiger.*

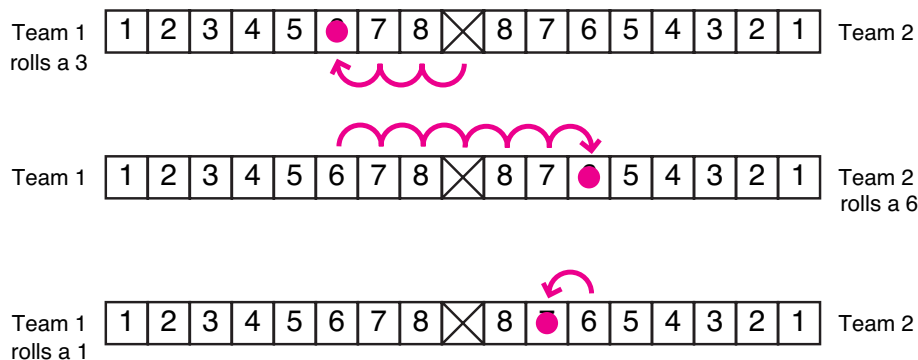
Divide the students into two teams. Stand one team at one end of the game mat and the other team at the other end.



T: *The tiger is safe as long as it stays on the track, but as soon as it steps off this end of the track (point to the left side) Team 1 will catch it; and as soon as it steps off the other end (point to the right side), Team 2 will catch it. You can move the tiger following the rules of the game.*

Rules of the Game

1. The two teams take turns.
2. The members of a team take turns rolling a die (number cube) when it is their team's turn.
3. Each time the die is rolled, the number obtained is noted and the tiger is moved that many squares toward the team who rolled the die. For example,



4. The winner is the team that succeeds in “catching the tiger,” that is, on whose turn the tiger walks off their side of the game mat.

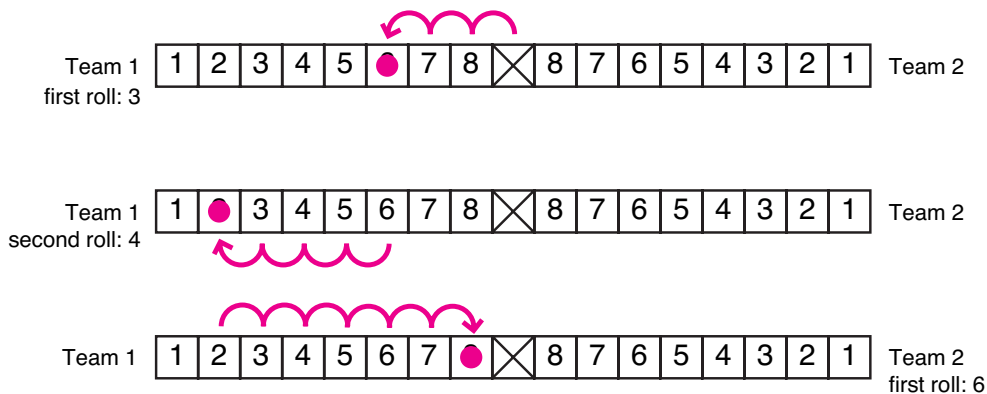
In most games, you will notice that the tiger just keeps prowling back and forth on a safe track. Hence, a game can go on for a long time without anybody catching the tiger.

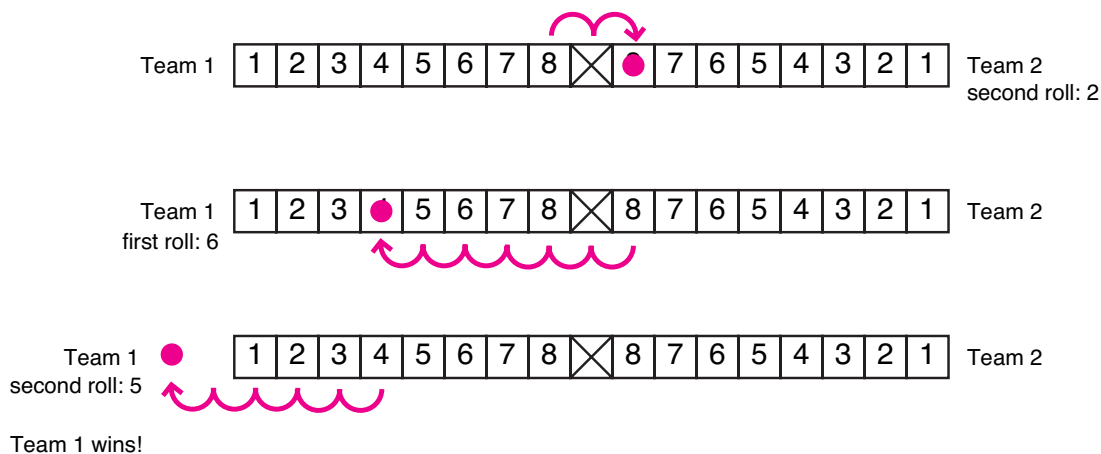
If this happens, discuss with the class how the rules might be changed so that it will be easier for a team to win. One of the following two suggestions might be made, or make the second suggestion yourself.

- Make the game mat shorter.
- Let each team roll the die twice in one turn.

Both of these solutions will indeed shorten the game. The following sample illustrates the second suggestion.

Start the game over again using the new rule which allows each team to roll the die twice on their turn.





You may occasionally want to ask questions of students while they are playing the game. For example:

T: *Can you catch the tiger on this turn?*

How close is the tiger to Team 1? ...to Team 2? ...to the middle?

Do you have a good chance of catching the tiger on this turn?

Note: After the students understand the game, you may prefer to have several games going on simultaneously. If so, divide the class into several groups of four to eight students and let each group form teams to play the game.

There is a second lesson using this game (K121), but feel free to play it as often as you like.

Capsule Lesson Summary

Classify K A-blocks using two attributes and discover overlapping sets.

Materials

Teacher • None

Student

- String loops in two different colors
- K A-blocks

Description of Lesson

This lesson is a second chance for students to tackle the problem they first encountered in Lesson K98, Exercise 2, which may have been left unsolved. Even if some of the students discovered overlapping strings in Lesson K98, you may want to repeat the experience here.

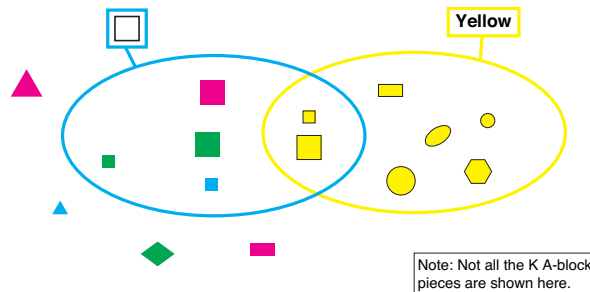
Exercise 1 _____

Repeat Exercise 2 of Lesson K98, possibly changing the classifications involved.

Exercise 2 _____

Ask the students to remove the K A-blocks from the strings.

T: *This time, put all the squares in the blue string and all the yellow pieces in the yellow string.*



As you circulate around the groups, ask questions such as:

T: *What shapes do you have here?* (Indicate with your hand the middle region, the overlap of the two strings.)

S: *Yellow squares.*

T: *And here?* (Indicate inside the blue string but outside the yellow.)

S: *Squares that are not yellow.*

T: *And here?* (Indicate inside the yellow string but outside the blue.)

S: *Yellow shapes that are not squares.*

T: *Are there some pieces that belong outside both strings?*

S: *A red triangle; a blue circle....*

Capsule Lesson Summary

Sort a collection of coins and describe the collection. Learn to recognize coins and the values of a penny, nickel, and dime. Make coin trades for equal amounts. Find combinations of coins to make a given amount of money.

Materials

Teacher	• Coins (pennies, nickels, dimes)	Student	• Purse with coins in it
----------------	-----------------------------------	----------------	--------------------------

Advance Preparation: Purses can be any small container for holding coins. Prepare several purses, each with a collection of pennies, nickels, and dimes. Make the contents of the purses different but arrange that every purse has some of each coin and approximately fifteen coins in total.

Description of Lesson

Exercise 1 _____

Divide the class into groups of two to three students. Let each group choose one of the purses. Instruct the groups to empty their purses and sort the contents. Ask that they prepare to describe the contents to the class. For example:

- What kind of coins were in the purse?
- How many pennies?
- Were there more dimes than nickels?

During the discussion, let students name the various coins and tell you their values. Write this information on the board.



Penny 1¢



Nickel 5¢



Dime 10¢

To practice coin recognition, ask one person to hold up the correct coin as you call out its name or value. Make sure everyone in a group has a chance to participate.

Exercise 2 _____

Continue with a discussion of trades. For example, bring two students to the front of the room; give one a nickel and the other some pennies.

T: *How many pennies should I give Raole so that he can trade with Loyce and still have the same amount of money?*

Emphasize equal trades. Then invite students to make a few equal trades. Explore trades of five pennies for a nickel, 10 pennies for a dime, and two nickels for a dime. Some of your students may suggest trades such as five pennies and one nickel for a dime, or 10 pennies for two nickels. Some students may confuse the number of coins with their value. In your discussion, include some cases where trades cannot be made.

K116

T: *Now I would like each group to put exactly 7¢ into the purse.*

Invite someone from each group to show the class how they solved the problem.

S: *Our group put seven pennies in our purse.*

S: *We put one nickel and two pennies in our purse.*

Direct the groups to empty the purses. Then suggest other amounts of money for the groups to put into their purses; for example, 10¢ or 13¢.

Home Activity

Suggest to parents/guardians that they find opportunities to sort a collection of coins with their child.

Capsule Lesson Summary

Using a meterstick, compare lengths of various items and students' heights to a meter.

Materials

- | | | | |
|----------------|--|----------------|---|
| Teacher | <ul style="list-style-type: none"> • A meterstick • <i>The Line Up Book</i> by Marisabina Russo or another selection from the literature list. • Blackline K117 | Student | <ul style="list-style-type: none"> • Meterstick for each group of students • Blank chart for each group |
|----------------|--|----------------|---|

Advance Preparation: Use Blackline K117 to make the blank chart for each group of students.

Description of Lesson

Exercise 1 _____

Read *The Line Up Book* by Marisabina Russo or another selection from the literature list.

Exercise 2 _____

Draw a chart on the chalkboard like the one illustrated here

Shorter	Equal	Longer

Hold up your meterstick and explain what it is and how it is used to measure. Organize students into groups of three to four and provide each group with a meterstick. Give each group a blank chart on which to record items shorter than, equal to, or longer than a meter.

As you give directions to the groups, model how to compare the lengths of various items to a meterstick and how to record them on a chart.

T: *With your group, find some things in the room that you can compare to this meterstick. If you find something shorter than the meterstick, put it in the Shorter column on your chart. If you find something that is the same length as the meterstick, put it in the Equal column. If you find something longer than the meterstick, put it in the Longer column.*

Encourage all the students to get involved and to share responsibilities within the group. The chart record can be made with pictures or words (if students can write them) or with actual items if they are easy to move.

When most groups have found at least one item in each category, call the class back together to talk about what they found.

Exercise 3 _____

Continue the class discussion thinking about comparing peoples' height to one meter.

T: *Do you know anyone who is a lot shorter than one meter?*

S: *My baby sister.*

T: *Do you know anyone whose height is about equal to one meter?*

S: *Maybe one of us.*

Use the meterstick and let students compare their heights to one meter. Most students will probably be a little taller than a meter, but you will probably find one or two who are close to one meter tall.

T: *Do you know anyone who is much taller than one meter?*

S: *You.*

Compare yourself to the meterstick.

T: *Do you think I could be taller than two metersticks?*

Let students help you place two metersticks end to end and compare your height to two meters.

T: *Am I taller than two meters?*

S: *No.*



T: *Do you know anyone who is taller than this* (point to the two metersticks)?

S: *My father and mother.*

A human being taller than 2m is a rarity, so it is unlikely that the students will know anyone who fits that description. Nevertheless, they will probably volunteer some answers. (Some very tall basketball players are more than 2m tall. So are certain animals, such as giraffes and elephants.)

Home Activity

Give each student a 1m piece of string. Direct them to go home and compare the heights of family members to one meter. Let students report to the class which of their family members were shorter, taller, or equal to one meter. Those students who think their fathers or mothers are 2m tall can check by using a 2m string to compare.

Capsule Lesson Summary

In the context of a circus story, discover many different ways to make 12.

Materials

- | | | | |
|----------------|--|----------------|--|
| Teacher | <ul style="list-style-type: none"> • <i>The Right Number of Elephants</i> by Jeff Sheppard, <i>Circus Numbers</i> by Rodney Peppe, or another selection from the literature list • Colored chalk | Student | <ul style="list-style-type: none"> • None |
|----------------|--|----------------|--|

Description of Lesson

Exercise 1 _____

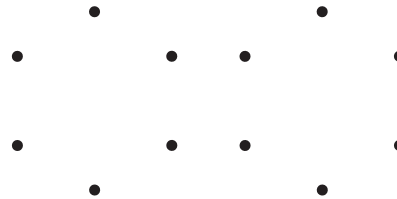
Read *The Right Number of Elephants* by Jeff Sheppard, *Circus Numbers* by Rodney Peppe, or another selection from the literature list.

Exercise 2 _____

Start this exercise by letting the students talk about a circus.

T: *Let's pretend we are at the circus. Here come the elephants!*

Draw twelve dots on the board as illustrated.

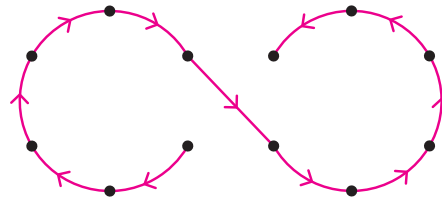


T: *These dots are for elephants. How many elephants are there?*

S: *Twelve.*

T: *The elephants are walking one behind the other, each one using his trunk to hold on to the tail of the elephant in front of him.*

Draw arrows as shown here. As you draw each arrow, say,



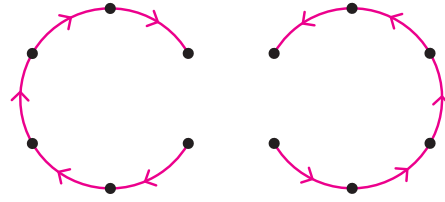
T: *This elephant is holding onto the tail of the elephant in front of him.*

When all the arrows have been drawn, ask students to point to the appropriate dots to answer the following questions:

T: *Which elephant is at the very front of the line?
Which one is at the back of the line?*

K118

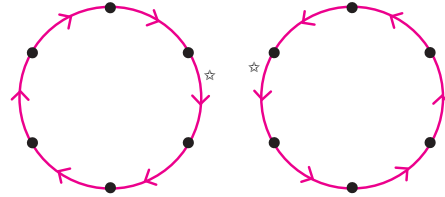
Direct the students to close their eyes while you do something to the picture. Quickly erase one arrow and then ask the students to look again at the picture.



T: *What has happened?*

S: *One elephant let go.*

Direct the students to close their eyes again while you do something to the picture. Quickly draw arrows by the ☆s in the illustration; then ask the students to look.



T: *What has happened now?*

S: *They are going in circles.*

Clarify this statement as follows:

T: *You're right. Now they are walking around in two groups, holding onto each other's tails. How many elephants are there altogether?*

S: *Twelve.*

T: *Yes, six here and six over there.*

Without comment, write the following to one side of the chalkboard.

$$12$$

$$6 + 6$$

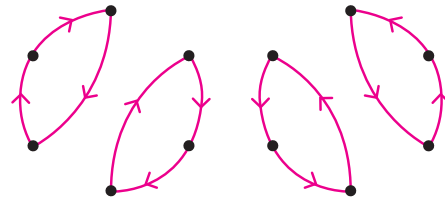
Again ask the students to close their eyes while you change the picture.

T: *What has happened now?*

S: *They are walking in smaller groups.*

T: *You're right. How many elephants are in each group? (Three)*

How many groups are there? (Four)



Without comment, add this information to what's on the board.

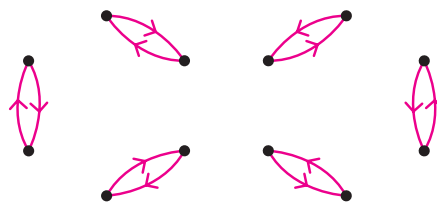
$$12$$

$$6 + 6$$

$$3 + 3 + 3 + 3$$

Change your picture again:

- T: *What has happened now?*
 S: *They are walking two by two.*
 T: *How many pairs are there?* (Six)



Again, without comment, add this information to what is on the board.

$$12$$

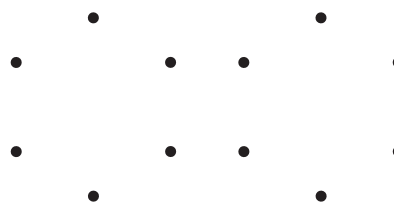
$$6 + 6$$

$$3 + 3 + 3 + 3$$

$$2 + 2 + 2 + 2 + 2 + 2$$

Make one final change.

- T: *What is happening now?*
 S: *Each one is by itself now. They are no longer holding onto another elephant's tail.*



Add the following to your record:

$$1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1$$

- T: *That's the end of the show.*

Writing Activity

Direct students to record one way to write twelve in their math journals. They may choose a way from the chalkboard or they may create their own. Suggest they draw dots and arrows if they like.

Capsule Lesson Summary

Discover a secret number using several clues about counting by twos, less than, and showing the number with fingers.

Materials

Teacher	<ul style="list-style-type: none"> • <i>Detective of London</i> by Robert Krause or another selection from the literature list • Paper with 6 written on it 	Student	<ul style="list-style-type: none"> • None
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Description of Lesson

Read *Detective of London* by Robert Krause or another selection from the literature list. Then hold a short discussion with the class about what detectives do. Tell students that they are going to be detectives and try to discover a secret number. Show the class your folded piece of paper.

T: *I wrote the secret number on this piece of paper, but you can't see it because it's folded.*

Clue 1

T: *Here's the first clue: You will say the secret number if you count by twos (or skip-count) from 2 to 12.*

What could the secret number be?

Invite students to skip-count from 2 to 12 while you record the numbers they say on the board. You may like to ask a student to point to the numbers on the class number line while the other students do the same on their desktop number lines.

2, 4, 6, 8, 10, 12

T: *There are many possibilities for the secret number. Do you know which one it is? What do you need?*

S: *Another clue.*

Clue 2

T: *Here's another clue: The secret number is less than 8.*

Let students discuss what information they get from this clue. As they determine the secret number cannot be 8, 10, or 12, cross them off the list.

T: *Could the secret number be 6? (Yes) ...4? (Yes) ...2? (Yes)*

At this point, you may like to erase the crossed out numbers leaving only 2, 4, and 6 on the board.

K119

T: *Now there are just three possibilities for the secret number. Do you know which one it is? What do you need?*

S: *Another clue.*

Clue 3

T: *Here's the last clue: You cannot show the secret number with the fingers of one hand.*

Again, let students discuss what information they get from this clue. Students should show 2 and 4 with the fingers of one hand and conclude these two numbers can be crossed off the list.

S: *The secret number is 6!*

Unfold your piece of paper and show everyone that indeed 6 is the secret number.

Note: See Section One, page 1-12, for an explanation of the purpose of scheduled adjustment days.

Today you may wish to repeat an earlier lesson either for a small group of students or for the entire class. Many of the lessons can be made to appear completely different by changing the story and/or the numbers in the lesson. The Number Line Game in K111 is one you may like to repeat. This is also a good time to allow students to work in a center or on a project of your choice.

The following activities are appropriate for additional work on patterns and number recognition. You may like to use the Bingo game before Lesson K126.

Necklaces _____

Show the class a necklace made of beads or some other stringing material where a pattern was used in its construction. For example, a necklace of beads might have a blue bead between every two red beads.



Provide a variety of stringing materials (beads, macaroni shapes, fruit loops, and so on) along with string and invite students to make their own necklaces. Encourage students to use a pattern in making a necklace and to describe the pattern they use.

Bingo _____

Blackline K120 has Bingo cards for this game.

Provide each student with a Bingo card and some chips (checkers, counters, beans). Shuffle the numeral cards 0–29 and place them as a deck face down. Then turn up the numeral cards one at a time and read the number. Students who have that number on their bingo card should cover the number with a chip. Continue until a student wins by getting a Bingo—in this case, three numbers covered in a row, column, or diagonal.

Assessment: You may wish to use one of the sample assessment checklists, Blacklines K0 (b)–(k), to note students' patterning and number recognition skills.

Early Warning

Among the next nine classroom lessons are some that require extra preparation or involve materials not included with the *CSMP* Classroom Set. The lessons are listed here for your convenience in preparing for them. A more detailed description of the needed materials can be found on the first page of each lesson. (Special materials are listed here only once, even if they are used more often during the nine-day period.)

K121 *Catch the Tiger #2*: Catch the Tiger game mat; small toy tiger; dice

K123 *Number Facts*: Counters

K124 *Mirror Symmetry #1*: Full length mirror

K126 *Numeral Chart Bingo*: Numeral cards 0–49

K127 *Calculator Addition*: Calculators; counters and/or pennies

Several of the lessons also include suggestions for literature and/or fingerplays which are not included here. Please check the materials list at the beginning of the following lessons in advance so you can obtain the necessary literature: K121, K128, K129.

Capsule Lesson Summary

Play a game involving counting and chance.

Materials

Teacher	Student
<ul style="list-style-type: none">• “We’re Four Ferocious Tigers” from <i>Something Big Has Been Here</i> by Jack Prelutsky, or another selection from the literature list• Catch the Tiger game mat• Small toy tiger (or another animal)• Dice	<ul style="list-style-type: none">• None

Description of Lesson

Read “We’re Four Ferocious Tigers” from *Something Big Has Been Here* by Jack Prelutsky, or another selection from the literature list.

Repeat Lesson K114, Exercise 2. You may choose to play the game as a class or in several groups. Use the version that you and your students like best, but remember that making the game mat shorter or letting teams roll the die twice per turn will shorten the game.

Capsule Lesson Summary

Place K A-block pieces in strings. Use a set of blocks to answer questions about a string picture.

Materials

Teacher <ul style="list-style-type: none"> • Shape book • Set of K A-blocks 	Student <ul style="list-style-type: none"> • Set of K A-blocks
--	--

Description of Lesson

As a class, read a new shape book or an old favorite. (See the literature list for selections.)

Display a set of K A-blocks and draw two strings on the board labeled as in the illustration below.

T: *The red string is for all the red pieces.*
 The blue string is for all the triangles.

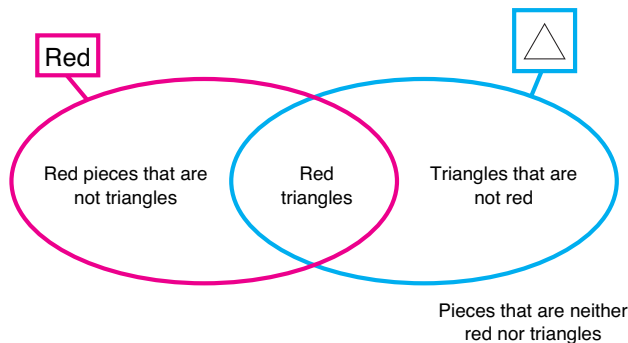
Hold up a triangle that is not red.

T: *Where should I put this?*

Call on a student to place the piece in the picture.

Continue by letting students take turns selecting a piece from the set of K A-blocks and placing it in the string picture.

The following diagram describes where pieces should be placed.



When students have difficulty finding the correct location for a piece, first make sure they understand what each string is for. Even if this is not a problem, mistakes can occur. One of the most common is to misplace pieces that belong inside both strings (in this case, the red triangles). If a student selects a red triangle, for example, and does not place it in the middle region, your conversation might be similar to the following.

T: *What color is your piece?*

S: *Red.*

T: *So it belongs in the red string.* (Make a grand motion with you hand encompassing the entire area inside the red string.) *What shape is your piece?*

S: *A triangle.*

T: *So it belongs in the blue string.* (Make a motion with your hand encompassing the entire area inside the blue string.)

Repeat these motions as you say,

T: *Your piece belongs in the red string because it is red; and it also belongs in the blue string because it is a triangle.*

By now, someone will most likely know where to place the red triangle.

Distribute sets of K A-blocks to the students and remove the K A-blocks from the picture.

Remind the students that the red string is for red pieces and the blue string is for triangles.

T: *I am going to point to a place in this string picture. If you have a piece that we could put there, hold it up.*

Do this, and wait until everyone is holding up a correct piece. The previous illustration describes where pieces can be placed.

T: *Can you find another piece that could be here? ... And another?*

Center Activity

In a center, place two string loops, a set of K A-blocks, paper, and crayons. Instruct students to use two strings to create their own string problem and then to place K A-block pieces in correct locations. You may like to ask students to record a string picture in their math journals.

Capsule Lesson Summary

Introduce some addition and subtraction facts while telling a story about a visit to the zoo.

Materials

Teacher • Magnetic checkers

Student • Counters

Description of Lesson

Begin the lesson with a discussion of what animals you might see at the zoo.

T: *Last week Arlan and his sister went to the zoo. They saw lots of different kinds of animals, but they liked watching the deer the most. They spent a long time at the deer exhibit. When they first got to the exhibit there were eight deer outside.*

Place checkers or draw dots on the board as you say,

T: *These checkers (dots) are for the eight deer outside.*

Ask students to check that there are eight by counting, and to point to 8 on their desktop number lines while you write 8 on the board.

T: *After a while Arlan saw two of the deer go into their shed. How many deer were left outside?*

S: *Six.*

Invite a student to take away two checkers or erase two dots while you write and read the number fact on the board.

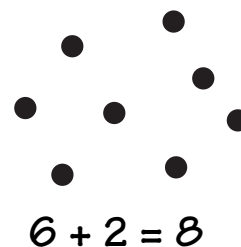
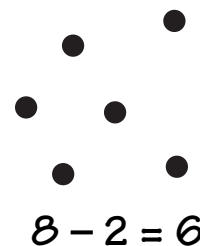
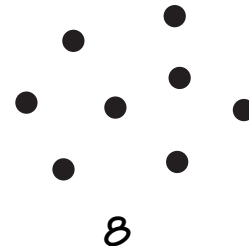
T: *A short time later, the same two deer came out of the shed and joined the other deer outside. How many deer are there outside now?*

S: *Eight.*

Invite a student to put two checkers back on the board or draw two more dots as you write and read the corresponding number fact.

T: *How many deer are there altogether now?*

S: *Eight.*




K123

T: *Soon another five deer went into the shed.
Then how many deer were left outside?*

S: *Three.*

Invite a student to take away five checkers or erase five dots while you write and read the corresponding number fact.


$$8 - 5 = 3$$

Continue the story depending on your students' abilities and interest. You may like to provide students with counters to use while you continue the story.

Note: Repeat this lesson as often as you like with other stories and number facts.

Writing Activity

Suggest students draw dot pictures for addition or subtraction facts of their choice in their math journals.

Capsule Lesson Summary

Introduce symmetry informally by using a mirror and observing how the mirror image follows the person standing in front of the mirror.

Materials

Teacher • Full length mirror

Student • None

Description of Lesson**Exercise 1**

Choose one student to stand in front of a full length mirror and position the others so that they can see at least part of the student's image in the mirror.

T: *Look at Byron in the mirror. Do you know what we call the "other person" we see in the mirror?*

Let students talk about what they see in the mirror and introduce the terms *image* and *reflection*.

Ask the student in front of the mirror to move the arm that is nearest the chalkboard (or some other specific object in the classroom). You will want to avoid the words *left* and *right*, since they tend to confuse more than clarify what happens with the mirror image.

T: *What does the image do?*

S: *It also raises the arm nearest the chalkboard.*

Direct the student at the mirror to try other motions, each time using specific objects as reference points.

T: *Move your head toward the door. What does the image do?*

Let the class make observations and discuss them.

Include some instructions such as the following:

T: *Take one step toward the mirror. What does the image do?*

S: *It takes one step.*

S: *It moves (toward the mirror).*

T: *Now step away from the mirror. What does the image do?*

S: *It also moves away.*

Exercise 2: The Mirror Game

This activity should immediately follow the one above. Ask the students to face each other in pairs. One student in each pair is to act as the person in front of the mirror and the other is to act as the image in the mirror. After a while, let the students switch roles so that everyone gets a chance to be an image. For example, if the first student raises his or her right arm, the image must raise his or her left arm. (Again, however, avoid the use of the terms *left* and *right* in this activity.)

Let the students who are acting as the person in front of the mirror make whatever movements they like.

If any images appear to be confused, take them up to the mirror one at a time. Ask them to move an arm or a leg and to observe what their mirror image does. Then let them return to their partners.

Capsule Lesson Summary

Review the relations *more than* and *less than*. Investigate the *is less than* relation in an arrow picture.

Materials

Teacher • Colored chalk

Student • None

Description of Lesson

Exercise 1

Tell your class that you are going to play a game and that they should not answer unless you point to them. Below is a sample dialogue.

T:	<i>3 is less than ...</i>	S:	<i>5.</i>
	<i>5 is less than ...</i>		<i>9.</i>
	<i>9 is less than ...</i>		<i>10.</i>
	<i>10 is less than ...</i>		<i>11.</i>
	<i>11 is less than ...</i>		<i>12.</i>
	<i>12 is less than ...</i>		<i>20.</i>
	<i>20 is less than ...</i>		<i>50.</i>
	<i>50 is less than ...</i>		<i>100.</i>

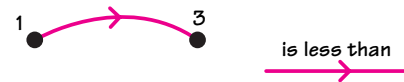
If your students begin to give consecutive numbers, you might suggest a skip to encourage them not to restrict their thinking. When you think the numbers are getting too big, change to an *is more than* game.

T:	<i>Now listen carefully.</i>	
	<i>100 is more than ...</i>	S:
	<i>50 is more than ...</i>	<i>50.</i>
	<i>40 is more than ...</i>	<i>40.</i>
	<i>25 is more than ...</i>	<i>25.</i>
	<i>4 is more than ...</i>	<i>4.</i>
		<i>0.</i>

Continue this activity for several minutes. Refer students to the number line if they have difficulty.

Exercise 2

Draw and label four dots on the board as you tell this story.



T: *One day the numbers 1, 3, 6, and 10 met on the way to school. The number 1 looked at 3 and said,...*

Stop and ask the class what 1 might say to 3.



T: *Could it say, "I am less than you," or "I am more than you"?*

S: *"I am less than you."*

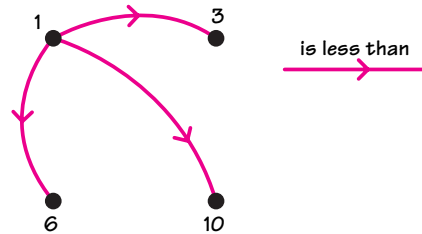
Draw a key arrow for *is less than* and the arrow showing 1 is less than 3.

Trace the arrow as you say, "1 is less than 3."

T: *Could I say, "I am less than you," to the other numbers?*

S: *Yes, 1 is less than 6 and 1 is less than 10.*

Invite students to trace and then you draw arrows from 1 to 6 and from 1 to 10.



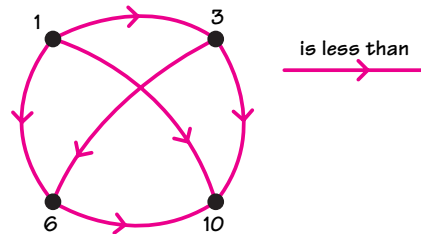
T: *Can we draw any more red arrows? (Yes)
Who can show us where to draw a red arrow from some number that says, "I am less than you," to another number?*

Call on a volunteer to trace an arrow. If it is traced correctly, draw it yourself. After the arrow has been drawn, trace it saying, for example, "6 is less than 10."

Continue allowing students to trace *is less than* arrows. After each arrow has been drawn, trace it again and explain what it means, or ask a student to explain.

If a student suggests an incorrect arrow, trace the suggested arrow and say, for example, "6 is less than 3." This will probably cause your class to protest and correct the error. If a student traces an arrow correctly but has difficulty with the direction, you may wish to trace the arrowhead for the student or even draw the arrow lightly on the board.

Continue until all the arrows have been drawn.



T: *Which number speaks to all the other numbers? (1)
Which number cannot speak to any other number here? (10)
How many numbers does 3 speak to? (Two)*

Extension Activity

Exercise 1 can be adapted to practice mental measurement. For example, play the game by looking around the room and comparing length or mass measures.

T: *My desk is longer than ...
This book is longer than ...
A pencil is longer than ...*

S: *This book.
A pencil.
An eraser.*

Capsule Lesson Summary

Introduce a simplified Bingo game using the 0–109 numeral chart. By focusing on columns in the chart, begin experience with counting by tens.

Materials

Teacher	Student
<ul style="list-style-type: none"> • 0–109 numeral chart • Numeral cards 0–49 • Magnetic checkers or paper squares 	<ul style="list-style-type: none"> • None

Advance Preparation: Before playing the game, fold the 0–109 numeral chart in half so only 0–49 shows. Then mount it at the front of the class. If you attach it to a magnetic board, you will be able to use magnetic checkers to cover numbers as they are called. Otherwise, use paper squares that you can tape to the chart. *CSMP* provides demonstration numeral cards which cover the range 0–30, so for this activity you will need to make additional numeral cards for 31–49. You may prefer to make a new set of numeral cards 0–49 using index cards.

Description of Lesson

Note: Before this lesson introduce students to some version of Bingo such as that in Lesson K120 or a commercial game.

Refer to the numeral chart on which you have highlighted the numbers 0 to 9.

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49

T: *We are going to play a Bingo game with our numeral chart. The chart is like a giant Bingo card and all of us will use it.*

Divide the class into ten teams (most likely pairs) giving each team a numeral card from 0–9. The rest of the numeral cards, 10–49, will serve as a deck during the game.

T: *This is your team number. If you look at the chart, you will see four numbers in the column underneath your team number. These four numbers are for your team. Like Bingo, the team that gets all its numbers covered first wins.*

Shuffle the numeral cards 10–49 to use as a deck. Turn over the top card in the deck and show the class. Let students identify which team has this number and then ask one of the members of that team to locate the number in the chart and cover it.

K126

For example, if you hold up 33, the dialogue might be something like this:

T: *Which team has this number?*

S: *Team 3.*

Ask one member of Team 3 to find and cover 33 on the numeral chart.

Continue in this way until one team has all its numbers covered (Bingo).

Repeat the game several times depending on the interest of the class.

Capsule Lesson Summary

Locate and name the operation keys of a calculator. Learn how to use the $\boxed{+}$ key in solving problems.

Materials

Teacher <ul style="list-style-type: none"> • Overhead calculator • Counters (between 50 and 70) in a container • Pennies (optional) 	Student <ul style="list-style-type: none"> • Calculator • Counters
---	---

Description of Lesson

Display the overhead calculator. Conduct a quick review of the calculator: location of keys, how to turn on the calculator, how to clear the display, and so on.

T: *Today we are going to use the calculator to help us solve problems.*

Exercise 1 _____

Show the class your container with counters.

T: *This container has quite a lot of counters in it. Do you have an idea about how many?*

Allow students to make some guesses.

T: *How could we find out exactly how many?*

S: *Count them.*

T: *Let's try to share the job of counting so that no one has to count all of the counters.*

Divide the class into four to six groups of students (with about four students per group). Give each group a handful of counters (less than 20) and ask each group to count just their counters. Group members should each count the counters and check each other; as a group they should agree on how many counters they have.

T: *Each group will tell us how many counters they have. As they put their counters back into the container, we will put the number on the calculator. What key should we press to tell the calculator to add that number of counters to what's in the box already?*

S: $\boxed{+}$.

Carry out the process. Start with nothing in the container and 0 on the calculator display. As each group puts its counters into the container and says how many there are (for example, 13), press the appropriate keys ($\boxed{+}$ $\boxed{1}$ $\boxed{3}$). After the last group puts in its counters, be sure to press $\boxed{=}$ and say what the total count is. Compare the total with previous estimates.

Exercise 2

Use counters or pennies to model another addition problem. You may like to invite students to create the piles with counters or pennies in the problem.

T: *Let's have the calculator help us solve another problem. Suppose I have 19 pennies in one pile and 23 in another pile. Then I push the two piles together. How many pennies do I have altogether in this bigger pile?*

Write $19 + 23$ on the chalkboard and invite students to explain how to use the calculator to find $19 + 23 = 42$.

Distribute calculators and counters to students and invite them to make up problems to solve on their calculators.

Some students will want to use this time for free play with the calculator. Others may pose problems they can share with the class or with you.

Extension Activity

In groups, let one student pose an addition problem and another student use the calculator to solve the problem. Instruct students to record problems in their math journals.

Capsule Lesson Summary

Make a graph based on information about pets.

Materials

- | | |
|---|---|
| Teacher <ul style="list-style-type: none"> • <i>Early in the Morning</i> by Nancy Taturi, <i>Pet Show</i> by Ezra Keats, or another selection from the literature list. | Student <ul style="list-style-type: none"> • None |
|---|---|

Description of Lesson

Read *Early in the Morning* by Nancy Taturi, *Pet Show* by Ezra Keats, or another selection from the literature list. Start the lesson by briefly discussing your students’ pets. When you feel that the scene has been set, continue as follows, adjusting the dialogue to fit your class.






T: *It seems to me that several of you have cats, dogs, and gerbils. Let’s imagine that we all brought our pets to school one day. I wonder if there would be more dogs, more cats, or more of something else. How could we find out?*

Accept various sensible ideas; for example:




- Ask all those who have a dog to raise their hand; then count the hands. Do the same for those who have cats, and so on.
- Line up all the people who have a dog. Do the same for all those who have a cat, and so on. See which line is longer. (If a student has both a dog and a cat, this might not work so well, but if someone suggests it, try it.)
- Make a graph. (If no one suggests this, do so yourself.)

Below are two possible ways to set up a graph.

1. List all the kinds of pets owned by at least one of your students, and set up a graph similar to this one.

 cat																			
 dog																			
 gerbil																			
 fish																			
 snake and so on																			






2. List only the two or three most popular pets (here, for example, they are cats, dogs, and gerbils). Lump all other pets together into the category “others.”

 cat																			
 dog																			
 gerbil																			
others																			

K128

In either type of graph, direct students to mark an **X** or write a name in the box for each pet they own. Since you are trying to find out which kind of animal would have the strongest representation if all your students brought their pets to class, a student who has three cats should fill in three boxes in the cat row, but twins who have one dog between them should not record it twice.

A completed graph might look like the following:

 cat	X	X	X	X	X	X				
 dog	X	X	X	X	X	X	X	X		
 gerbil	X	X	X	X						
 fish	X	X								
 snake	X									

Ask various questions about the graph. For example:

- T:** *If all our pets were brought to class, which animal would there be the most of?* (Dogs)
How many more dogs would there be than cats? (Three)
Which would there be fewer of, gerbils or cats? (Fewer gerbils than cats)
How many fewer gerbils than cats? (Two)

At some point ask,

- T:** *If someone walked into our classroom, what could that person find out just by looking at the graph?*

This question has many possible responses. Let students give their ideas.

The person could, for example, find out that no one in the class has a pet parakeet or perhaps that kind of pet was not considered. He or she could also find out that among your students' pets there are six cats. What is not clear from the graph is, for example, how many of your students own a cat. (It might be that all six cats belong to one student who is an ardent cat-lover!)

Capsule Lesson Summary

Counting by ones, form a human counting snake; then label the dots in a similar snake-like arrow picture. Use the arrow picture to introduce the relation $+1$ and practice writing numbers in counting order.

Materials

- | | |
|---------|--|
| Teacher | <ul style="list-style-type: none"> • <i>1 is One</i> by Tasha Tudor or another selection from the literature list • Numeral cards 1–no. of students in class |
| Student | <ul style="list-style-type: none"> • None |

Description of Lesson

Exercise 1 _____

Read *1 is One* by Tasha Tudor or another selection from the literature list.

Exercise 2 _____

Draw a long snake-like curve on the floor or blacktop. (Chalk will work nicely on carpet or outside. You may need to improvise on other surfaces.)

T: *We are going to make a human snake.*

Distribute numeral cards from 1 to the number of students in the class in random fashion so that each student has a card.

T: *Who has the number 1?*

S: *I do.*

T: *Okay; number 1, you are at the beginning of our snake.*

T: *Who should be in front of you?*

S: *Two.*

T: *Number 2, come on up.*

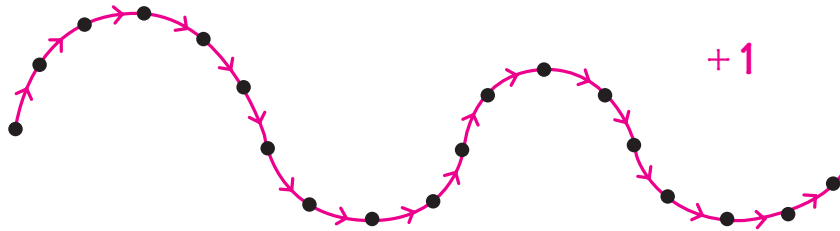
Position the number 2 student in front of number 1 on the curve if he or she does not go there spontaneously.

Continue in this manner until all students have their positions. Direct the students to count forward by ones from the beginning of the snake and then backward from the end of the snake. You may like to let the snake move around the classroom.

K129

Exercise 3

Tell the students you are going to draw a picture of this snake. Then draw an arrow picture.



T: *This is a counting snake like you. The dots are for the numbers you hold.*

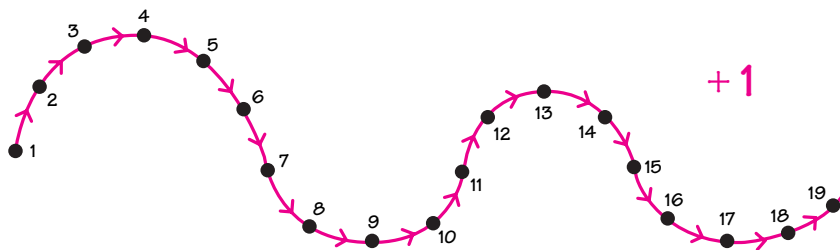
Point to the beginning dot and look at the student at the beginning of the snake.

T: *What number do you have? (1)*

Label the first dot 1.

T: *When we count by ones, what number comes right after 1? (2)*

Continue in this way labeling the dots as you do. You may like to collect the numeral cards from the students as you ask for the numbers in order and label the dots.



Extension Activity

Direct the students to teach a calculator to count by ones starting at 1. Then follow the counting snake with the counting calculator. You may observe that the arrows in the counting snake are for +1.

Writing Activity

Counting by ones, suggest students write the numbers in order starting at 1 in their math journals. Let students write numbers as far as they like.

Note: See Section One, page 1-12, for an explanation of the purpose of scheduled adjustment days.

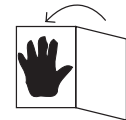
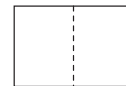
Today, you may wish to repeat an earlier lesson either for a small group of students or for the entire class. Many of the lessons can be made to appear completely different by changing the story and/or the numbers in the lesson. To continue working on number facts and recognition, you may like to repeat Lessons K123 and K126. This would also be a good time to let students work in a center or on a project of your choice.

The following activity provides additional experience with ideas of symmetry.

Symmetric Designs_____

Direct students to make symmetric designs following these steps:

1. Fold a piece of unlined paper in half and then unfold it.
2. Use paint to make a design on one side of the paper.
3. While the paint is still wet, fold the paper again and press together.
4. Open the paper to see a symmetric design.



Note: For step 2 above, students can use fingerpaint and make a hand print as shown in the illustrations. A rubber stamp with a stamp pad can also be used. In this case, the stamp pad should be well-inked and students should be quick to fold the paper and press hard.

Let the students share some of their symmetric designs and ask the class what they notice. In the case of hand prints, they may notice that one side looks like the left hand and the other a matching right hand.

Assessment: You may wish to use one of the sample assessment checklists, Blacklines K0 (b)–(k), to note students' understanding of symmetry.

Early Warning

Among the next nine lessons are some that require extra preparation or involve materials not included with the *CSMP* Classroom Set. The lessons are listed here for your convenience in preparing for them. A more detailed description of the needed materials can be found on the first page of each lesson. (Special materials are listed here only once, even if they are used more often during the nine-day period.)

K131 *Number Friends*: Counters or checkers

K132 *Mirror Symmetry #2*: Mirrors; scissors; half-picture; activity sheets

K133 *Movie Theatre Seats*: Numeral card deck

K137 *Counting by Twos*: Calculators

K139 *Detective Story #2*: Die or number cube

Several of the lessons also include suggestions for literature and/or fingerplays which are not included here. Please check the materials list at the beginning of the following lessons in advance so you can obtain the necessary literature: K131, K133, K135, K137, K138.

Capsule Lesson Summary

Find numbers that add to 9; then draw arrows for “You are my 9-friend.” (Two numbers are 9-friends if and only if their sum is 9.)

Materials

Teacher	<ul style="list-style-type: none"> • <i>This Old Man</i> by Carol Jones or another selection from the literature list • Numeral cards 0–9 • Colored chalk 	Student	<ul style="list-style-type: none"> • Counters or checkers
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Description of Lesson

Exercise 1 _____

Read *This Old Man* by Carol Jones or another selection from the literature list.

Exercise 2 _____

Organize the class in pairs. Give each pair a numeral card (0–9) and a number of checkers (counters) corresponding to the number on the card. You may like to let students count out their own checkers. Then direct the partners to find another pair of students to join so that altogether they have nine checkers and their numeral cards add up to 9. You may need to help the student pairs with 0 and 9 to find each other. Instruct the two pairs (four students) to sit together and to put their two numbers and nine checkers in front of the group.

T: *Now, you all have found your 9-friends. I’m going to draw a picture on the board for 9-friends.*

First draw ten dots labeled 0 to 9 on the board.

T: *These dots are for the numbers you had to start.*

Point to one of the dots, 3 for example, and ask,

T: *Who had the number 3?*

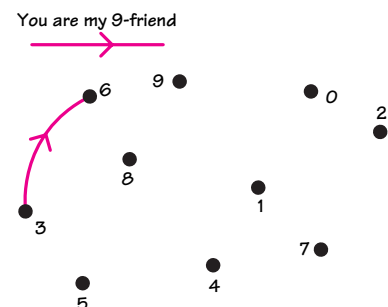
The appropriate students should hold up their numeral card for 3.

T: *What number did your 9-friends have?*

S: 6.

First check with the group that three checkers together with six checkers is nine checkers. Ask the two pairs to hold up their numbers, 3 and 6. Draw an arrow from 3 to 6 as you say,

T: *So 3 says to 6, “You are my 9-friend.”*



K131

In this way, continue to add arrows to your picture. At some point a student might suggest that 6 says to 3, “You are my 9-friend,” in which case you would draw an arrow in the opposite direction from 6 to 3. Otherwise, hold this observation until you have one arrow between pairs of numbers.

T: *We know 3 says to 6, “You are my 9-friend.” How about 6? Can 6 say “You are my 9-friend,” to any number?*

You may want to check with the partners having the numeral card for 6 and ask,

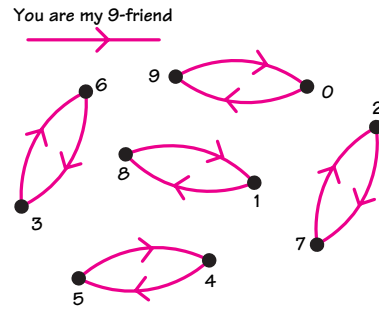
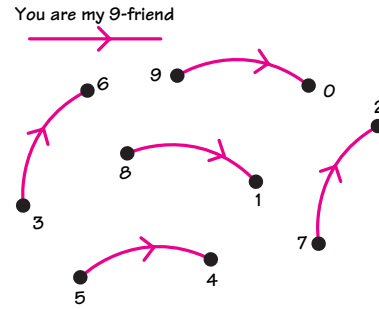
T: *Who is your 9-friend?*

S: 3.

Draw the arrow from 6 to 3 as well as the other opposite arrows.

Writing Activity

Suggest students record 9-friends in their math journals.



Capsule Lesson Summary

Investigate a symmetric picture by first looking at just half of the picture, then looking in a mirror to see the whole picture, and finally cutting out the whole picture.

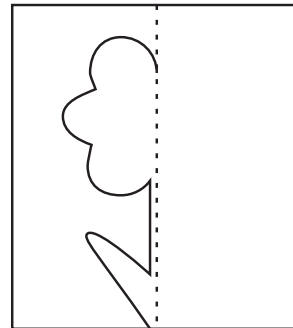
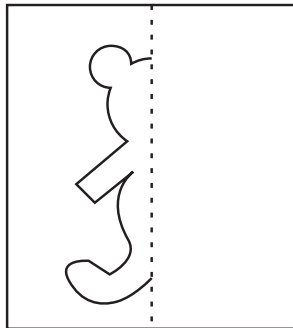
Materials

Teacher	<ul style="list-style-type: none"> • Half-picture • Mirror • Scissors • Blacklines K132 (a)–(d) 	Student	<ul style="list-style-type: none"> • Activity sheets • Mirror • Scissors
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Advance Preparation: Prepare half of a simple, symmetric picture on a large piece of paper (see the illustration below). Locate mirrors that have a straight side and can be held easily with one hand. Use Blacklines K132 (a)–(d) to make student activity sheets.

Description of Lesson

Tape a large paper to the board on which you have drawn half of a simple, symmetric picture. Try to choose pictures that will be familiar to students such as a teddy bear or a flower.



T: *I was drawing a picture but only drew half of it. The whole picture will look like what you see if you place a mirror on this dotted line. Can you imagine what the whole picture will look like?*

S: *A teddy bear (a flower).*

Invite several students to trace on your paper how they think the missing half of the picture should be drawn. Then place a mirror on the dotted line and let students see if the whole picture looks like what they thought.

T: *I would like to cut out my picture, but I want the whole picture, not just half. What can I do?*

The most accurate way to do this is to fold the piece of paper along the dotted line, and then cut both layers at once following the lines of the half-picture you have drawn. If no one makes this suggestion, do so yourself. Then cut out your picture using this method.

K132

Display the whole picture cut-out. Use a mirror again to check that the whole picture looks the same as the picture you see when you place a mirror along the dotted line.

Students may enjoy making their own symmetric pictures. Blacklines K132 (a)–(d) provide some examples of half pictures that can be used to make simple, symmetric pictures. If students prefer to draw their own, suggest they first draw half of a picture, then fold along the line for placing a mirror, and finally cut out the picture as you did in class.

If you use copies of Blacklines K132 (a)–(d), let students choose which pictures they want to make and direct them to follow these four steps:

1. Imagine the other half of the picture (but do not draw it) and/or place a mirror along the dotted line to see what the whole picture will look like.
2. Fold the paper along the dotted line (mirror line).
3. Cut out the picture.
4. Compare the picture with what you imagined or saw in the mirror.

Capsule Lesson Summary

Recognize and identify two-digit numbers by playing a game in which the object is to find a seat in a movie theatre.

Materials

- | | | | |
|----------------|--|----------------|--|
| Teacher | <ul style="list-style-type: none"> • <i>I Can Count to 100, Can You?</i> by Katherine Howard or another selection from the literature list • 0–109 numeral chart • Magnetic checkers or paper squares • Numeral cards 11–49 (excluding 20, 30, and 40) | Student | <ul style="list-style-type: none"> • None |
|----------------|--|----------------|--|

Advance Preparation: Before playing the game, fold the 0–109 numeral chart in half so only 0–49 shows. Then mount it at the front of the class. If you attach it to a magnetic board, you will be able to use magnetic checkers to cover the numbers. If this is not possible, tape the paper squares over the numbers as shown in the illustration below. Prepare a deck of numeral cards as you did for Lesson K126, but remove 10, 20, 30, and 40.

Description of Lesson

Exercise 1 _____

Read *I Can Count to 100, Can You?* by Katherine Howard or another selection from the literature list.

Exercise 2 _____

Refer to the numeral chart.

	0	1	2	3	4	5	6	7	8	9
10	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
20	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
30	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
40	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

T: *How many of you have ever been to a movie theatre?
We are going to pretend our numeral chart is the seating plan at a movie theatre where each seat is numbered.*

Who can show us where to find seat 45?

K133

Select a student to point to where 45 is in the numeral chart. If correct, remove the cover and identify seat number 45. Indicate one row and column as you say,

T: *That's right, 45 is in the same row as 40 and the same column as 5.*

Invite students, one at a time, to choose a card at random from your deck of numeral cards, read the number, and then take the appropriate seat (that is, uncover the number on the numeral chart). This activity might sound easy, but in fact you may find that many of your students need to make several attempts before they are able to locate their seats.

Once everyone has “taken their seat” in the movie theatre, ask the students if they can say which seats are still empty (numbers still covered).

Capsule Lesson Summary

Make up stories that could be possible interpretations of a dot, string, and arrow picture.

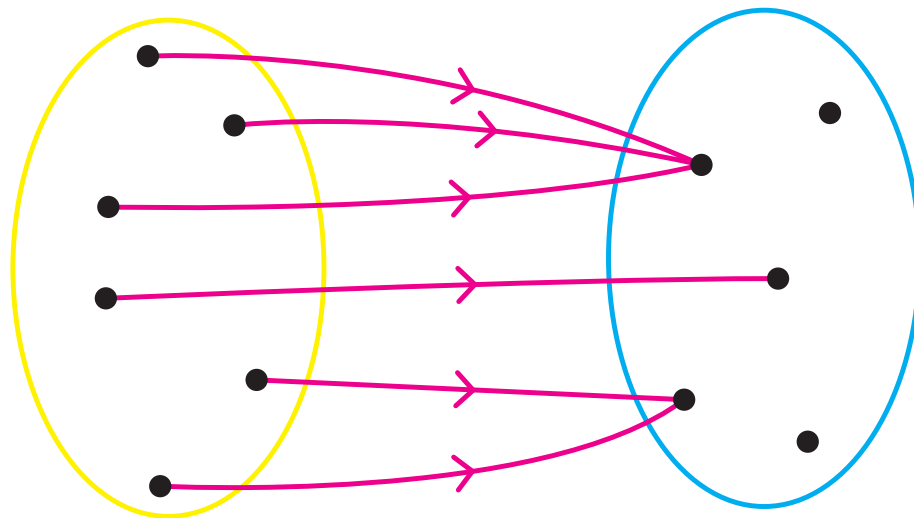
Materials

Teacher • Colored chalk

Student • None

Description of Lesson

Repeat Lesson K105 using this arrow picture.



Note: In this picture each dot in the yellow string has just one arrow starting at it while the dots in the blue string may have more than one arrow ending at them. This situation is the opposite of that in Lesson K105, and stories for this picture should reflect this difference.

Possible stories for this picture might have these elements:

- Inside the yellow string: Birds
- Inside the blue string: Nests
- Meaning of arrows: ...lives in...

- Inside the yellow string: Children
- Inside the blue string: Games
- Meaning of arrows: ...is playing...

- Inside the yellow string: Nuts
- Inside the blue string: Squirrels
- Meaning of arrows: ...was eaten by...

Capsule Lesson Summary

Locate dots for animals in a class string picture with overlapping strings.

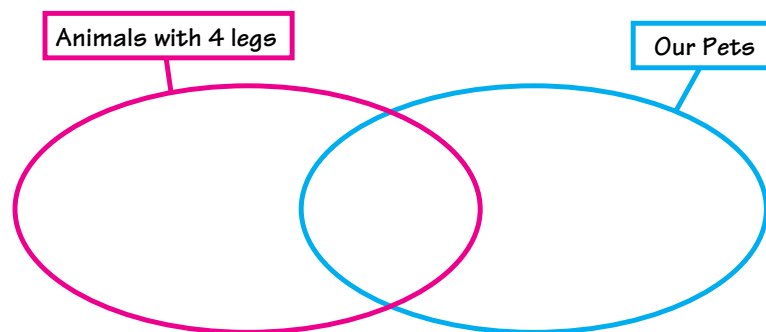
Materials

Teacher	<ul style="list-style-type: none"> • <i>Best Friends</i> by Steven Kellogg, • <i>Pet Show</i> by Ezra Keats, or another selection from the literature list • Colored chalk 	Student	<ul style="list-style-type: none"> • None
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Description of Lesson

Read *Best Friends* by Steven Kellogg, *Pet Show* by Ezra Keats, or another selection from the literature list.

Draw two large overlapping strings on the board and label them as follows:



T: *The red string is for animals with four legs.*

The blue string is for our pets. Who can tell us about an animal and draw a dot for it in our picture?

Allow students to offer answers. You probably will have little trouble obtaining a variety of responses. As necessary, help students to locate the correct placement for animals they describe and draw dots for them in the picture. For example:

T: *Steven wants to put a dot for his snake in the picture. Steven, is your snake a pet?*

S: *Yes.*

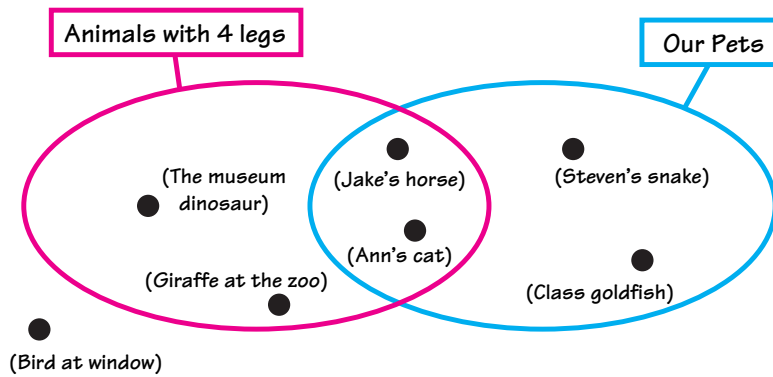
T: *Then it goes in this string.* (Make a hand motion covering the region inside the blue string.)

Does your snake have four legs?

S: *No.*

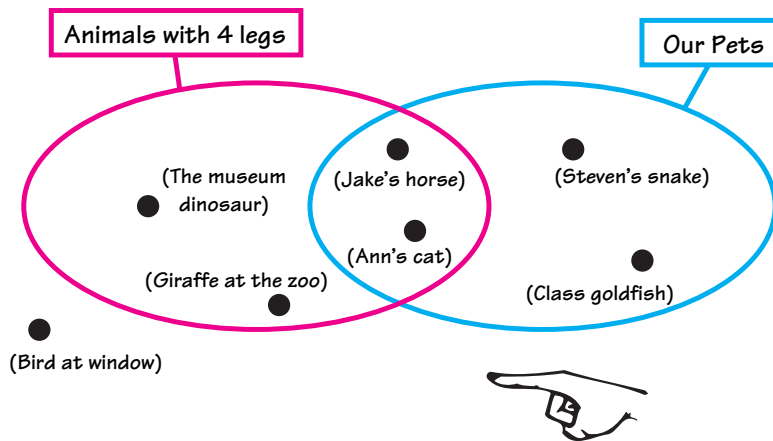
T: *So it does not go in this string.* (Indicate the red string. Then point to the region outside the red string but inside the blue string.)

After a while, your drawing might look like the following:



You can label the dots or not, as you like. Students may like to see dots for their pets labeled in the picture.

You may like to encourage students to think of particular kinds of animals by pointing to one of the regions and asking if someone knows an animal that goes in that region.



T: *Can you think of another animal that goes here? What animal could I draw a dot for here?*

S: *A whale.*

Writing Activity

Suggest students draw a string picture in their math journals. Direct them to draw dots or pictures of the animals that fit in the regions of their picture.

Home Activity

This would be a good time to send home a letter about the use of strings for classification. Such a letter can include several problems for parents/guardians to do with their child. See the sample letter on Blackline K135.

Capsule Lesson Summary

Discuss an arrow picture in which the dots are for children and the arrows are for “told a story to.” Pose several questions about the relation that involve comparing and counting.

Materials

Teacher <ul style="list-style-type: none"> • Colored chalk (or magnetic checkers) 	Student <ul style="list-style-type: none"> • None
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■ Description of Lesson

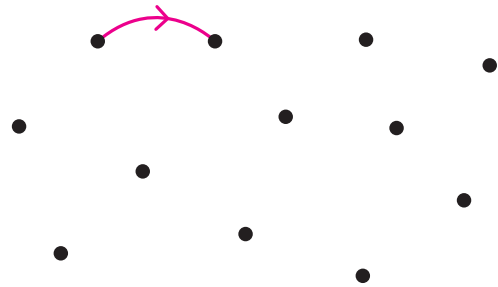
T: *These dots are for some of the children who were in my class last year.*

As you are saying this, draw twelve dots on the board as illustrated below. Be sure to make your drawing large and well spread out.

T: *These children loved to tell stories. Sometimes one child would tell a story to another child.*

Draw a red arrow as you say,

T: *This child told a story to this child.
Point to the child who told the story.
Point to the child who heard the story.*



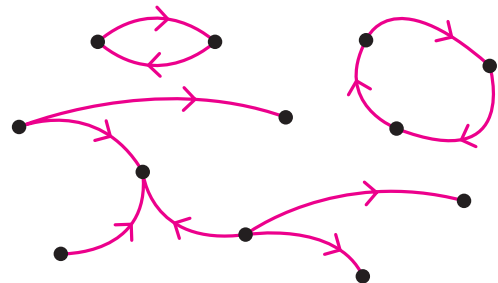
Now tell the students to watch carefully and to think about the arrows as you complete the picture slowly. Remind them that the red arrow means “... told a story to...”

Your students will probably have something to say about the picture without any prodding from you. Let them feel free to make observations.

S: *These two children told stories to each other.*

S: *This child told stories to two other children.*

S: *That child didn't tell a story to anyone.*



After the students have commented, feel free to choose among the following questions:

T: *Is there a child who told a story to just one other child?*

Is there a child who didn't tell a story to any other child?

T: *Which child told stories to the greatest number of other children?*

Which child heard stories from the greatest number of other children?

Can you find a child who told a story to just one other child and heard a story from just one child?

Can you find a child who told stories but didn't hear another child's story?

Can you find a child who was told stories but didn't tell a story?

Which student would you like to be? Why?

Capsule Lesson Summary

Count by twos using the 0–109 numeral chart and then in a counting snake. Follow a +2 arrow picture with a calculator counting by twos.

Materials

- | | | | |
|----------------|--|----------------|--|
| Teacher | <ul style="list-style-type: none"> • 0–109 numeral chart • Numeral cards (even numbers 0–48) • Magnetic checkers or paper rectangles • Overhead calculator | Student | <ul style="list-style-type: none"> • Calculator |
|----------------|--|----------------|--|

Advance Preparation: For Exercise 2, fold the 0–109 numeral chart in half so only 0–49 shows. Then mount it at the front of the class. If you attach it to a magnetic board, you will be able to use magnetic checkers to cover the odd numbers. If this is not possible, tape paper rectangles over the odd numbers as shown in the illustration below. Use the deck of numeral cards from Lesson K126 or K133, but remove the odd numbered cards.

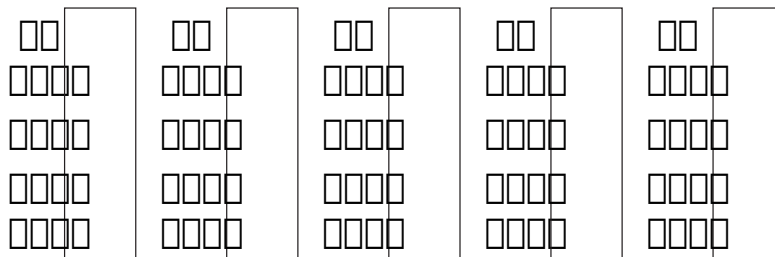
Description of Lesson

Exercise 1 _____

Teach the *Ten Little Candles* fingerplay to the class.

Exercise 2 _____

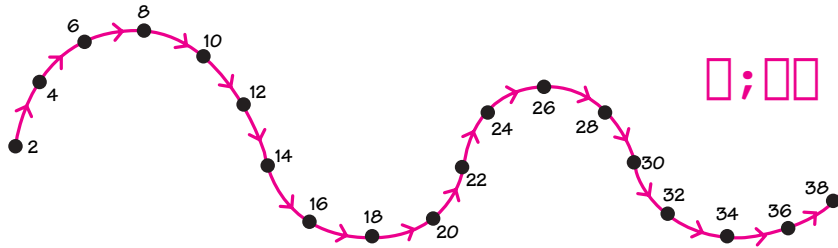
Use the 0–109 numeral chart to count by twos, that is, skip count starting at 0. You may like to do this by covering every other column of the chart.



In this case, be sure to ask students what they notice about the chart and mention that you can only see every other number.

T: *Today we are going to make another counting snake, but this time we are going to use the numbers we say when we skip-count (count by twos) starting at 0.*

Repeat Lesson K129, Exercises 2 and 3, using the even numbered cards 0–48. Draw a counting by twos snake-like arrow picture.



Exercise 3 _____

Display an overhead calculator.

T: *Do you remember how we taught the calculator to count, and then it could follow a counting (by ones) snake?*

Encourage students to recall the process of teaching the calculator to count by ones:

1. Put on the starting number.
2. Press $\square O \square C \square D$
3. Press $\square S \square C \square S$ and $\square S$ on.

T: *This +2 arrow picture is also a counting snake, but instead of counting by ones it shows counting by twos (or skip-counting). Do you think we could teach the calculator to count by twos and follow our +2 arrow picture?*

Allow a few minutes for students to discuss the question and observe that the difference is +2 rather than +1. That is, counting by twos requires adding 2 each time to get the next number rather than adding 1. They should decide to teach the calculator to count by twos in the following way:

1. Put on the starting number.
2. Press $\square O \square C \square E$
3. Press $\square S \square C \square S$ and $\square S$ on.

Do this on the overhead or class calculator and observe the calculator following the arrow picture.

Center Activity

Place dot-to-dot pictures in centers for additional counting practice. Blacklines F137 (a)–(c) are examples which start at 0 and count by twos.

Home Activity

Students may like to share a fingerplay they have learned with family members. *Ten Little Candles* can be put into booklet form using Blackline K137 (d). Make copies for students to illustrate and take home.

Capsule Lesson Summary

Construct a race car track using straight and curved sections.

Materials

- | | | | |
|----------------|---|----------------|--|
| Teacher | <ul style="list-style-type: none"> • <i>Things that Go</i> by Richard Scary or another selection from the literature list • One sheet of track pieces | Student | <ul style="list-style-type: none"> • Track pieces |
|----------------|---|----------------|--|

Note: A sheet of track pieces has 16 sections, eight curved sections and eight straight sections. You may like to store sets of track pieces (pieces from one sheet) in envelopes.

Description of Lesson

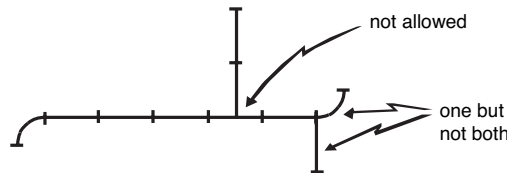
Read *Things that Go* by Richard Scary or another selection from the literature list. Then, seat the students in a large circle. Display a set of track pieces punched out from one sheet (eight curved sections and eight straight sections) in the middle of the circle.

T: *These are called track pieces, and today we are going to use them to build a big race car track.*

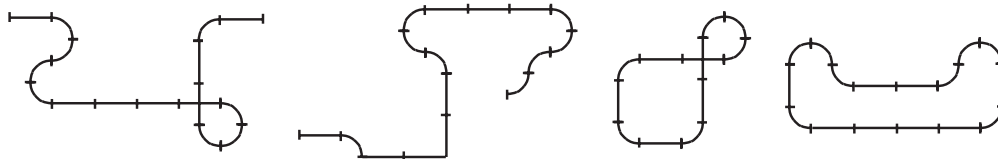
Lay down a straight section.

T: *Here is the first section for a track. Who would like to continue my track?*

Let several students add track pieces one at a time. You might have to make it clear that the next piece should only be added at one of the two ends of the portion of racing track already built. You do not want the track to end up having “branches.”



Here are some possible race car tracks:



When all 16 pieces have been laid down or else a closed curve (circuit) has been completed, ask the class to comment on the track they have built. They may observe its circular nature (circuit) or how it has a beginning and an end.

K138

Divide the students into groups of two or three and assign each group a space on the floor. Give each group a sheet of track pieces which they can punch out and use to build their own race car track. Encourage students to work together to build a track, each one in the group having a chance to add sections to it. Groups may like to join each other and build race car tracks with the track pieces from more than one sheet.

Note: It may happen that no group builds a closed circuit. If this does happen, however, be enthusiastic about it! For example, say,

T: *Look at this group's track. A racing car could go around and around and around.*

Resource: If you have access to the HyperCard® program on a Macintosh computer, a stack called Train Set provides a technological tool that accomplishes the same task.

Capsule Lesson Summary

Discover a secret number by using several clues about counting by twos, the 0–109 numeral chart, the numbers on the faces of a die or number cube, and order.

Materials

Teacher <ul style="list-style-type: none"> • 0–109 numeral chart • Paper with 4 written on it • Die or number cube 	Student <ul style="list-style-type: none"> • None
--	---

Description of Lesson

Write 4 on a piece of paper and fold it up. Show the class your paper; tell them you wrote a secret number on the paper and they are going to be detectives trying to find the secret number.

Clue 1

T: *Here's the first clue: You will say the secret number if you count by twos (skip-count) from 0 to 20.*

What could the secret number be?

Invite students to skip-count from 0 to 20 while you record the numbers on the board. You may like to ask a student to point to these numbers on the class number line or 0–109 numeral chart while others count.

0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20

T: *There are many possibilities for the secret number. Do you know which one it is? What do you need?*

S: *Another clue.*

Clue 2

T: *Here's a second clue: The secret number is in the first row of the numeral chart.*

Let the students react to this clue. As they decide the secret number cannot be any of the two-digit numbers, erase them or cross them off your list.

Check with the class that the remaining numbers (0, 2, 4, 6, 8) are all in the first row of the numeral chart. At this time, you should have only 0, 2, 4, 6, and 8 on the board.

0, 2, 4, 6, 8

T: *Now there are five possibilities for the secret number. Do you know which one it is? What do you need?*

S: *Another clue.*

K139

Clue 3

Show the class a die or a number cube. Toss the die, and explain that you look at the top face for the result.

T: *Here's a third clue: You can get the secret number when you toss a die (number cube).*

Let students discuss what information they get from this clue. Using the die to check, they should decide the secret number can still be 2, 4, or 6, but cannot be 0 or 8. Erase 0 and 8 from your list.

2, 4, 6

Clue 4

Observe with the class that now there are just three possibilities for the secret number.

T: *I have one last clue: The secret number is not the least one and it is not the greatest. Hold up your fingers to show what number you think is the secret number.*

Note: See Section One, page 1-12, for an explanation of the purpose of scheduled adjustment days.

Today, you may wish to repeat an earlier lesson either for a small group of students or for the entire class. Many of the lessons can be made to appear completely different by changing the story and/or the numbers in the lesson. This would also be a good time to allow students to work in a center or on a project of your choice.

The following game activities involve students in using a variety of number concepts and reasoning skills.

What's My Number? _____

Show a group of, at most, ten students the numeral cards from 1 to the number of students. Ask the students to stand in a circle and explain that you are going to pin a card with one of these numbers on everyone's back. The students should not be able to see their own number, but by walking around the circle each student should see everyone else's number.

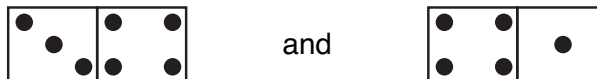
Call on students individually to walk around the circle (several times if necessary), look at all the other numbers, and try to decide what number is on the card on their own backs.

This game can be made more difficult by using a larger group of players, using only even numbers, or using the numbers in a range such as from 20 to 29.

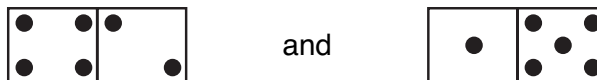
Matching Dominoes _____

Introduce two notions of matching dominoes:

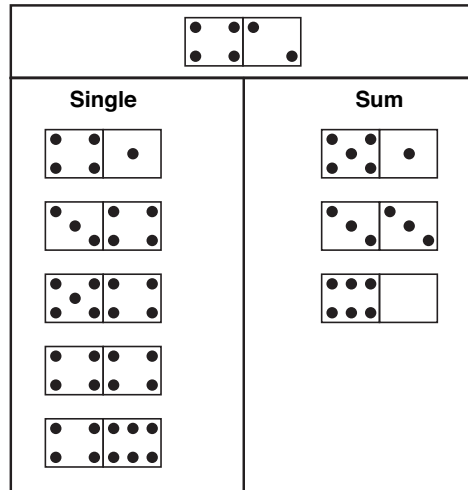
Single Match – The number on one side only of the two dominoes is the same. For example:



Sum Match – The total number on the two dominoes is the same. For example:



Play a cooperative game with two to four players in which the teacher selects a domino and places it on a mat as shown in the next illustration. Then the players take turns finding matching dominoes to place on the mat.



The object is to find as many matching dominoes as possible. When the group believes they have found all the matching dominoes, you may like to ask some of these questions:

- Did you find more single matches or sum matches?
- How many of each kind of match?
- How many more single matches than sum matches?
- Do you think we will always find more single matches?

Assessment: You may wish to use one of the sample assessment checklists, Blacklines K0 (b)–(k), to observe students' development of number concepts.

Early Warning

Among the next five lessons are some that require extra preparation or involve materials not included with the *CSMP* Classroom Set. The lessons are listed here for your convenience in preparing for them. A more detailed description of the needed materials can be found on the first page of each lesson.

K141 *One Side-Two Sides*: Reversible jacket; cylindrical bands; Möbius bands

K142 *Mirror Symmetry #3*: Masking tape; mirrors; C-rods

K144 *Detective Story #3*: Collection of pennies, nickels, and dimes

K145 *Jumpy Frogs*: Blue paper; counters in cups; fingerplay

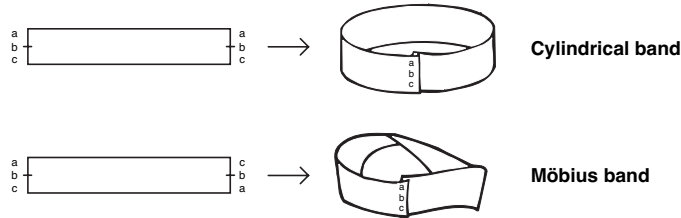
Capsule Lesson Summary

Investigate two-sided and one-sided surfaces and discover a surprising one-sided band—the Möbius strip.

Materials

Teacher	<ul style="list-style-type: none"> • A coat or jacket with different colors on the inside and outside (for example, a reversible parka) • One large cylindrical band and one large Möbius band • Colored marker 	Student	<ul style="list-style-type: none"> • Cylindrical band and Möbius band • Crayons
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Advance Preparation: Cylindrical and Möbius bands are easy to make. For the large ones, use a long strip (approximately 20 cm by 100 cm) of flexible paper, heavy enough so that a colored marker does not bleed through. For the students' bands, use paper strips approximately 7 cm by 70 cm, possibly from a roll like cash register tape. The illustrations below show how to make a cylindrical band and a Möbius band.



For the Möbius band, twist the strip one half turn to match the letters.

Description of Lesson

Show the class a coat (or jacket) with different colors on the inside and outside. The students will probably notice this fact fairly quickly. Conclude that a coat has two sides. If the coat you are using for this demonstration is in fact reversible, show the children how you can wear it with one color side out or with the other color side out. Point out, however, that not all coats have this feature; you have to be careful not to wear most coats inside out.

Hold up the large cylindrical band.

T: *What do you notice about this band?*

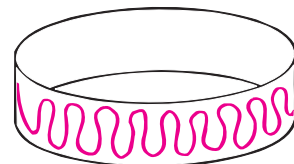
Allow a few moments for observations.

T: *Does it have two sides?*

S: *Yes.*

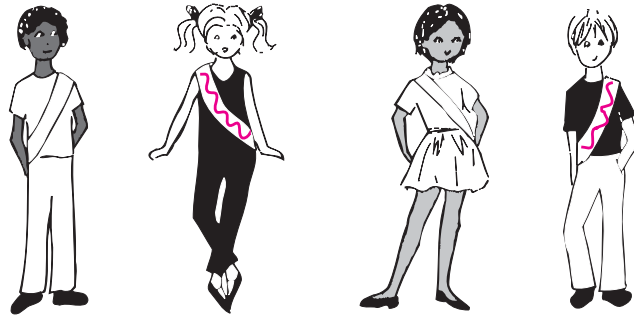
T: *Let's color a red squiggle on one side.*

Invite a student to draw a red squiggle on the outside of your cylindrical band.



K141

Give everyone a chance to observe that one side now has a red design while the other side does not. Show the students how they could wear the band as a sash. Then put it on different students asking which side they wish to wear out.



Next, hold up the large Möbius band.

T: *What do you notice about this band?*

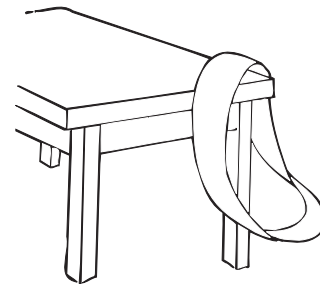
Again, allow a few moments for observations.

T: *What about this band? Does it have two sides?*

You might expect most everyone to think that it does.

T: *Let's color a red design on one side.*

Invite a student to try to do this. A practical way of managing this is for you to slide the Möbius band over the corner of a table or over the arm of a chair while the student draws the red squiggle.



The class may begin to observe that what they thought were two different sides are both colored with the red marker. Hold up both bands so the students can notice that, while the Möbius band is marked all over with red, the cylindrical band has only one side marked with red; the other side is unmarked. (Don't belabor this idea, just let students look at both bands for a few minutes.) You may like to let students experiment with wearing the Möbius band as a sash.

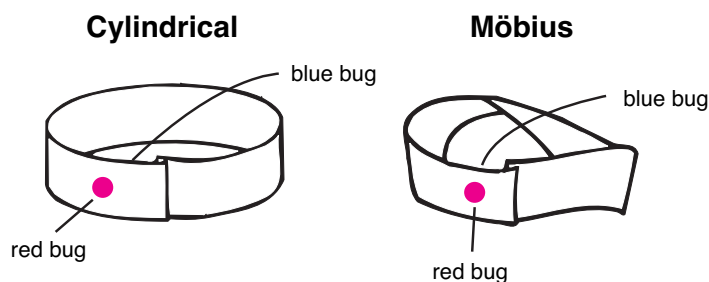
Next, hand out cylindrical bands to the students and ask them to predict what will happen if they color one side. Then let them do so. Suggest that they choose a place to work where they can slide the bands over the corner of a table or a chair.

When students finish coloring their cylindrical bands, ask them to show you one side and the other side. Then give them a Möbius band to color.

Note: You might wonder why a Möbius band is introduced here. The primary reason is that it gives students experience with a one-sided surface so as to better understand usual two-sided surfaces. Students are familiar with many examples of two-sided surfaces (a piece of paper, a tablecloth, a glove, a dress). As they see in this lesson, the Möbius band has only one side. This surprising discovery brings into question what we know about two-sided surfaces and thus may highlight some of the properties of surfaces.

Extension Activity

Another way to highlight for students the one-sided feature of a Möbius band is to have them imagine two bugs crawling first on the cylindrical band and then on the Möbius band. Place the bugs directly opposite each other on what appears to be the two sides.



Explain that the bugs can crawl around anywhere they like, but if they hit an edge, they fall off. Can the red bug visit the blue bug? (On a cylindrical band, no; on a Möbius band, yes.)

Capsule Lesson Summary	
Using C-rods, create designs that have reflective symmetry.	
Materials	
Teacher <ul style="list-style-type: none"> • Masking tape 	Student <ul style="list-style-type: none"> • C-rods • Mirror for each pair of students

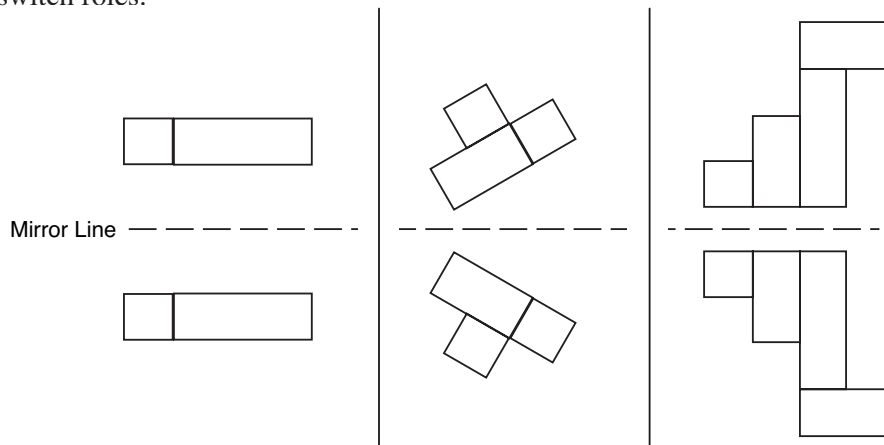
Description of Lesson

Exercise 1 _____

Seat pairs of students at desks, tables, or on the floor so that they are facing each other. Between each pair of students, draw a line or affix a line of masking tape to represent a mirror.

Provide each student with a small number of C-rods (three or four) and arrange that the two students in a pair each receive the same number of the same colors of rods. If you prefer, distribute full sets of C-rods and instruct students to work with only three or four of them.

Instruct one student in each pair to make a simple construction with her C-rods. Then tell the other student to use his C-rods to make what he thinks the mirror image would look like. After a while let the students switch roles.



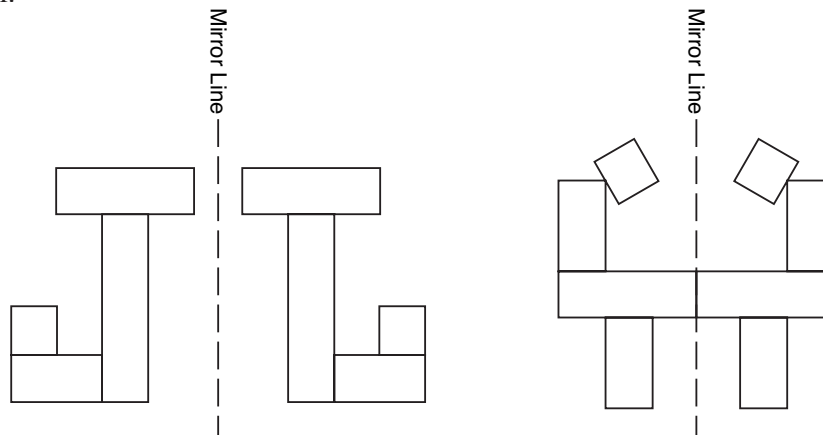
Suggest to students that they use mirrors to check their work. To do so, have them place the mirror along the line so that it faces the first student’s construction. Direct students to look first at the mirror image and then at the second student’s construction. Make sure both students can see the original pattern, the second student’s construction of a mirror image, and the actual mirror image.

If some students become adept at this activity, you may want to give them more C-rods to use in their constructions.

K142

Exercise 2

Repeat Exercise 1, but this time instruct the student pairs to sit next to each other instead of across from each other.



Center Activity

Put books involving investigations of mirror (reflective) symmetry in a center for further exploration. Examples of such books are several by Marion Walter: *Look at Annette*; *Make a Bigger Puddle*, *Make a Smaller Worm*, and *The Mirror Puzzle Book*.

Capsule Lesson Summary

Construct race car tracks using straight and curved sections. Attempt to find closed circuits.

Materials

Teacher • Track pieces

Student • Track pieces

Advance Preparation: See Lesson K138.

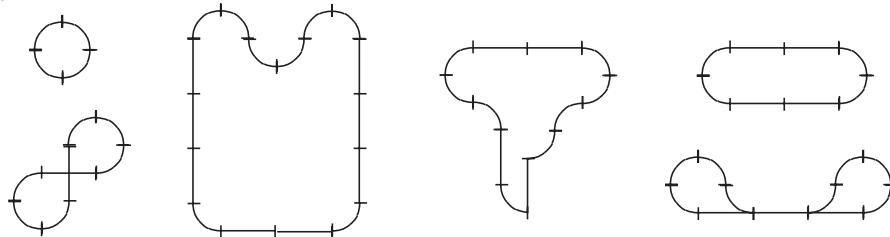
Description of Lesson

Repeat Lesson K138 but encourage students to find tracks that are closed curves (circuits) today.

T: *On this race car track, the car can go from here to there* (point to the two end points of an open track). *But on this one* (point to a closed circuit), *the car can keep going around and around.*

Today, let's try to build race car tracks on which a car can just keep going without having to stop.

Give pairs of students an envelope of track pieces (eight straight sections and eight curved sections), and ask them to build closed race car tracks. Do not insist that all 16 pieces be used in the construction.



Center Activity

Put track pieces in a center for further exploration.

Writing Activity

Suggest students draw simplified pictures of their race car tracks in their math journals.

Capsule Lesson Summary			
Discover a secret number using several clues involving counting by twos, order relations, and amounts of money with three coins.			
Materials			
Teacher	<ul style="list-style-type: none"> Colored chalk Collection of pennies, nickels, and dimes Paper with 7 written on it 	Student	<ul style="list-style-type: none"> None

Description of Lesson

Show the class your folded piece of paper with 7 written on it. Tell them that you have hidden a secret number on this paper, and that they are going to be detectives trying to discover the secret number.

Clue 1

T: *Here is a clue: You will say the secret number if you count by twos (skip count) from 1 to 19.*

Invite students to skip count, starting at 1, while you record the numbers they say on the board. Suggest students use the number line or the 0–109 numeral chart to help them count by twos. You may like to ask a student to point to the numbers on the class number line while the other students do the same on their desktop number lines.

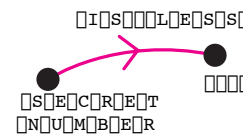


T: *There are many possibilities. Do you know which number is the secret number? What do you need?*

S: *Another clue.*

Clue 2

Draw this arrow picture on the board as you say,



T: *The secret number is less than 10.*

Let students use this information to decide that the secret number cannot be 11, 13, 15, 17, or 19 and erase these numbers from the list. The secret number could be one of the following:



T: *Now there are five possibilities. Do you know which of these numbers is the secret number? What do you need?*

S: *Another clue.*

K144

Clue 3

Show the students a collection of coins: pennies, dimes, and nickels.

T: *Here's another clue: With exactly three coins, you can get the secret number as an amount of money.*

Let students experiment with the coins. They should find that the secret number could be 3 because you can get 3¢ with three pennies. It could also be 7 because you can get 7¢ with a nickel and two pennies. This second possibility will probably be hard for some students to find. They should determine that the secret number cannot be 1, 5, or 9 and erase these numbers from the list.



T: *Now there are just two possibilities for the secret number.*

Clue 4

T: *Here's the last clue: The secret number is the greater of these two numbers.*

Let the students show the secret number with their fingers or point to it on their desktop number lines. Unfold the paper and show the class that 7 is the secret number.

Note: If Clue 3 is too difficult for the class, you could change it to:

With exactly one coin, you can get the secret number as an amount of money.

Then, after Clue 4, the class should find the secret number to be 5.

Capsule Lesson Summary

Follow a story about frogs jumping into and out of a pond with counters and with an arrow picture.

Materials

- | | | | |
|----------------|---|----------------|--|
| Teacher | <ul style="list-style-type: none"> • Colored chalk • <i>Five Little Speckled Frogs</i> fingerplay | Student | <ul style="list-style-type: none"> • Piece of blue paper • Cup containing counters |
|----------------|---|----------------|--|

Description of Lesson

Lead the class in the fingerplay *Five Little Speckled Frogs*.

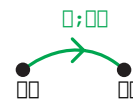
Give each student a piece of blue paper and a cup containing about 15 counters (frog counters are ideal).

T: *Let's pretend we are walking and come upon a pond. This piece of blue paper is the pond. All around the pond there are lots of frogs. These are the frogs* (point to the counters in one student's cup). *First there are no frogs in the pond.*

Draw a dot labeled 0 on the board.

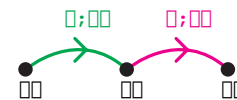
T: *While we watch, three frogs jump into the pond.*

Ask each student to take three counters out of the cup and place them on the blue paper; that is, tell them to put three frogs in their pond. (As the lesson proceeds, each of your statements should be followed by students placing or removing counters on the blue paper.) Record this observation on the board by drawing an arrow labeled +3 and a second dot labeled 3.



T: *A few minutes later, two more frogs jump into the pond.*

Direct the students to put two more frogs in their ponds as you record the information in your picture on the board.



T: *How many frogs are in the pond now?*

S: *Five.*

Check that all the students have five frogs in their ponds. You may like to ask them to show you 5 with fingers.

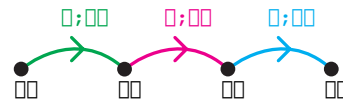
T: *One more frog jumps into the pond.*

K145

Tell students to add one more frog to their ponds as you record the information on the board.

T: *How many frogs are in the pond now?*

S: *Six.*

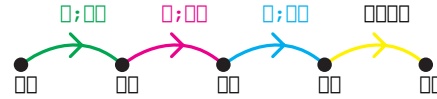


T: *Then two frogs decide to jump out of the pond.*

Tell students to take two frogs out of their ponds as you continue the picture on the board.

T: *How many frogs are left in the pond?*

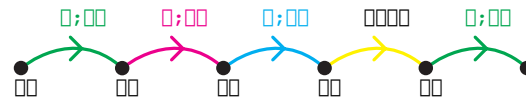
S: *Four.*



Draw another arrow in your picture on the board and ask,

T: *What happened now?*

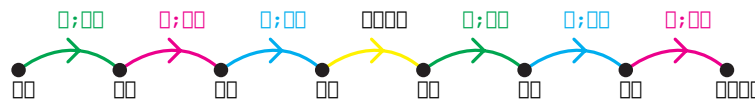
S: *Three more frogs jumped into the pond.*



Direct students to put three more frogs into their pond and tell you how many there are now.

S: *Seven frogs.*

Continue in this way, drawing a couple more arrows in the picture on the board. Each time, ask what happened and how many frogs are in the pond.



Writing Activity

Suggest students draw a picture in their math journals for a frog story of their own.