# Developing Mathematical Concepts and Oral <br> Language Strategies for Primary Students 

Presenter: Susie Whisnant

## LESSON 1 (See attached Page 1)

Teddy Bears' Picnic, Kennedy, Jimmy
Summary: Illustrated version of the familiar song.
Activity: Read this story before the Introductory Activity. Tell the students that they are going to learn about the kinds of bears and how they are alike and different. This story tells about what bears do on a picnic. Today you will also learn about bears at school.

## LESSON 16 (See attached Page 16)

Count and See, Hoban, Tana
Summary: Black and white photographs of objects on one page match the number of dots on the facing page. This allows the student to match the number of objects to the number of dots and helps to establish a 1-to-1 correspondence.
Activity: After reading the book and discussing how each page has the same number, tell the students that now you would like for them to make a set with one more than the number represented on each page. As you go through the book again, have one student come to the front and use counters to match the number of dots on the page and then add "one more."

## GAME OF MORE OR LESS

Game for 2 Players: Place 15 to 20 counters in a pile between two players. Have 1 player separate the pile into 2 approximately equal piles. The other player should select the pile he thinks has more. To find out who has more, players slide 1 counter each toward the middle of the table until there are no more matches. The player with the extra counters is the winner. She says, "I am the winner because I have more." Reverse roles and play again.

## LESSON 47 (See attached Page 47)

Three Ducks Went Wandering, Roy, Ron
Summary: Three little ducks wander away from their mother and fall into dangerous situations from which they manage to escape.
Activity: Read the story, then give each student 3 yellow interlocking cubes. Tell them that as you read the story again, you want them to act it out by pretending that the three cubes are the three little ducklings. As you read the story again, stop and count the ducks any time you say, "three little ducks." Ex: "One fine day, three little ducks wandered away from their mother's nest." Also say, let's count them: one, two, three. Have the student touch and move their ducks as they count. Also, reinforce positional words by having the students move their ducks up or down as the ducks in the story go up or down.

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## LESSON 27 (See attached Page 27)

Circus Shapes, Murphy, Stuart J.
Summary: Circus animals and performers form basic geometric shapes as they put on a show.
Activity: After reading the story, use masking tape or yarn to make three different large shapes on the floor-a circle, a square, and a triangle. Tell the students that you are the ringmaster and will call a student's name and tell them to go to a circus ring. They must listen carefully so that they go to tell them in which circus ring to the stand. You can also use the rings to play a "Simon Says" game. Simon says, "Stand in the triangle ring."

## LESSON 75 (See attached Page 75)

Ten Flashing Fireflies, Sturges, Philomon
Summary: A young boy is proud of having caught a jar full of fireflies, which seems to him like owning a piece of moonlight.
Activity: Use this story to introduce the "Towers of One More" activity. Give each student ten interlocking cubes and tell them that these will be their "fireflies". As you read the story have them show the number of fireflies that they have caught. Before you turn each page to find the number, have them add one cube to their tower and tell how many fireflies they have as one is added each time. Students will delight in being able to check their answers by reading the next page in the story.

LESSON 120 (See attached Page 120)
One Gorilla, Morozumi, Atzuko
Summary: A child lists all the things that he loves starting with one gorilla and ending with 10 and 1 gorilla.
Activity: As you read the story have the students use counters to show how many things the child loves on each page. For example: two butterflies and one gorilla. The students would show two counters for the 2 butterflies and then 1 for the gorilla. That would make 3 things that the child loved. Since the one gorilla is added to each page, this will give additional practice of adding "one." Next have each student think of two different things that they love. They will illustrate and fill in the frame sentence: (Name) loves (number)(what) and one (what). That is the (number) things that he/she loves. If needed, the students may use manipulatives to help them decide how many things they love.
These pages may be placed in a class book or on a bulletin board titled, "Things That We Love."

## LESSON 123 (See attached Page 123)

Two Greedy Bears, Ginsburg, Mirra
Summary: A clever fox teaches two bears a lesson about greed and what is equal. Activity: Use this story to introduce the lesson. The last line of the story says, "But they were equal." Have the students explain what that means in their own words. The story implies it means "the same." Tell them that when they are working a math problem they will use a special sign called an equal sign. Continue the lesson as described under "Introductory Activities."

Objective: To identify a whole set and part of a set. To identify the number of objects in a set as "one" or "many." To identify "in, out, inside, outside."

Materials: Teddy bear counters, shoebox, yarn, red and white construction paper, glue, black markers, scissors

Vocabulary: many, one, all, none, in, out, inside, outside, set, group

StoryTime:

## (i)Teddy Bears' Picnic, Kennedy, Jimmy

## 1 Introductory Activity

## This important activity begins the development of the fundamental concept <br> NOTE of number based on set theory. The children will observe the increase and decrease in the number of bears in the whole set.

## The Bears at School

In the classroom, describe the whole set as "many" and each part of the set as "one." As the number of bears changes, describe the size of the set as "fewer" or "more."

Have the class sit in a circle. Place a shoebox decorated as a schoolhouse on the floor so all children can see it. The box should contain at least 1 teddy bear for each student. I have a box decorated like a schoolhouse. What do you think is inside the schoolhouse? Open the box. Inside the box are bears.

Make a large yarn loop on the floor. Identify the loop as the play area for the bears. Take out and display 1 bear. How many bears do I have in my hand? (one) And how many bears are still in the box? (many, lots, zillions) Yes, there are many bears still in the school. Put the bear in the play area as you say, The bear is outside the schoolhouse.

Call one child at a time, asking the child to take out 1 bear in his right hand and place it in the play area, until all the bears have been removed. Each time, ask how many bears each child has in his right hand. Stress that as each child is taking one bear out, there are fewer and fewer bears in the shoebox school, until finally there are no bears in the shoebox school.

After all the bears are in the play area say, Now there are no bears in the school. They are all in the play area. We will call this our whole set of bears. How many bears are there? (many) We can see that many is more than one.

End the activity by having the children, one by one, put a bear in the box until all the bears are inside the school house. How many school houses are there? (one) How many bears are there? (many) How many bears are in the play area now? (none)

Ask students if they have play bears at home. Ask students to bring bears to class to share.


## 2 Connections Activity

Point to the picture of the school. Review with the students "outside" vs. "inside" the school house. Have students use teddy bear counters and place 1 bear inside the school house and 1 bear outside the school house.

Tell a story about your picture using the words one, many, inside, outside, group, set, one by one. Have each student share his or her story with a partner.

## 3 Follow-Up Activities



Lots of Bears Are Going To School (Sing to the tune of Mary Had a Little Lamb.) Lots of bears are going to school, going to school, going to school. Lots of bears are going to school, having lots of fun.

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## Shoebox School

Students may decorate several shoebox schools to store bears in for small group activities. They may use red and white paper for walls and windows. Cut a door and color it black.

## Sorting and Comparing



Bears of School

Objective: To identify which group has more.
Materials: Small teddy bear counters, Same, More, Less (Unit 1 Master Workmat), oat cereal pieces (optional)
Vocabulary: more
Storytime:
(E)Count and See, Hoban, Tana

Reinforce: matching objects one to one (pages 14 and 15)

## 1 Introductory Activity

## Unit 1 Master Workmat: More

Using Same, More, Less (Unit 1 Master Workmat)
located at the end of the student book, have the students place 1 to 4 small bears on the footprints at teacher direction. Place one bear on the footprint ... place one bear on the footprint, etc. Put one treat for each bear on the other side of the mat. Now add one more treat than there are bears.

Check students' work.

## 2 Connections Activity

On this page, children will use teddy bear counters to make a group of teddy bears that has one more teddy bear (on the bottom) than the pictures of bears (on the top).

Find the pictures of bears in the top row. Point to the first picture in this row. Put a bear (or oat cereal piece) under this picture. Repeat for the other bear in the first row.

Wait for students to complete the task and check their work.

Now add one more bear on the right of your row of bears so there is one more bear counter than pictures of bears.

Is the number of teddy bear counters more or less than the number of pictures of bears? (There are more bear counters than pictures of bears, or there is one more bear counter.)

Now, take off the bears one at a time, and draw a picture of each bear as you take it off. (Children may draw a bear face or just a circle for each bear.) You drew a set of bears that was "one more" than the set of bears on the page.

Repeat the instructions for the bears in the middle and bottom rows.

## 3 Follow-Up Activities



## Who Has More

Sort out a pile of small teddy bear counters.
Name 2 students and ask each of them to take a handful of small bears.


Is the number of bears $\qquad$ has the same or different than the number of bears $\qquad$ has? Who has more bears?

Put the bears in front of you and match bears, one by one, until 1 person has no more bears.

Ask the question again and have a student describe her answer. (Student A has more bears than student B because when 1 bear from each person was matched together, student A had bears left over.)

Repeat so that each person has an opportunity to take a handful and match bears with a partner. If the partners have the same number, students should respond that neither person has more or that they both have the same number because the bears matched one-to-one and there were no leftovers.

## Skill Builders 3-1

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## Make a set with $\mathbf{1}$ more. Draw a picture. MOre



Objective: To match 3 objects with the numeral 3 .
Materials: Teddy bear counters or interlocking cubes, small empty margarine tubs, salt box

Vocabulary: three
StoryTime:
Three Ducks Went Wandering, Roy, Ron
Reinforce: 1, 2, and many (pages 43 and 45)

## 1 Introductory Activity

## Counting 3

Name 3 children, asking them to stand in front. How many children are here in front of the class? Touch and count 1,2,3, and make a circular motion as you say, 3 children.

Find an object in the room of which there are exactly 3 (e.g., round tables). How many round tables are in this room? How can we find how many? (by counting) Touch and count "one," touch and count "two," touch and count "three, three round tables" as you make a circular motion with your hand.

Make the number 3 in the salt box as you say, around a tree and around a tree, that's the way to make a three. Have children make a 3 in the salt box.

## Connections Activity

Find the pictures of bears and chairs. Touch and count each bear with me (1, 2, 3, 3 bears) Touch and count the chairs with me (1, 2, 3, 3 chairs) How does the number of bears compare to the number of chairs? (They are the same, there are as many chairs as bears)

Here is how we write 3 as a number and as a word. Practice tracing the number 3 with me in the air. Practice tracing the number 3 on your arm with your finger. Now practice tracing the number 3 on your paper with your crayon.

Now look at the pictures below the crayon. We want to color each picture that shows 3 objects. What do you see in the first picture? (cubes) Place 1 cube on each picture of a cube. How many cubes are in the picture? (3) Should we color the cubes? (yes) Look at the next picture. Place 1 cube on each triangle. How many triangles? (2) Should we color the triangles? (no)

Continue in the same way with the remaining pictures.


## 3 Follow-Up Activities

## A Model of 3

Have students sit in a circle on the floor. Empty a pile of teddy bear counters or interlocking cubes in the center of the group. Pick up 1 teddy bear in your right hand and place the teddy bear in front of you on your left side. Pick up 1 more teddy bear in your right hand and place it in front of you to the right of the last teddy bear. Pick up 1 more teddy bear in your right hand and place it in front of you to the right of the last teddy bear. How many bears do you have in front of you? (3) How do you know? (I counted the bears.) Show me how to touch and count the bears. One, two, three, three bears. (circular motion)


## Matching Threes

Place cubes under six margarine tubs with the following number of cubes under each tub: $1,2,3,3,4,5$. Mix up the tubs and arrange them in 2 rows. Children take turns lifting 2 tubs to see if they can find the matching number of cubes. Mix up the order of tubs between turns.

Name $\qquad$

the pictures of 3 .

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## Goldilocks and the Three Bears RAP

Down through the forest came a rappin', a tappin', a pretty little Goldilocks and upon the door she was a knockin', she was a knockin'.
Tap, Tap, Tap!
No one was there! Un Uh! No one was there. So she walked right in, yes, she walked right in. She didn't care, un uh, she didn't care.

Then home, home, home, came the three bears.
"Someone's been eatin' my porridge", said the Papa Bear.
"Someone's been eatin' my porridge", said the Mama Bear.
"Ba Ba Ba Ree bear," said the little Wee Bear. "someone has broken my chair!" CRASH!

Then Goldilocks woke up, broke up, the party and beat it out of there.
"Goodbye, goodbye, goodbye", said the Papa Bear.
"Goodbye, goodbye, goodbye", said the Mama Bear
"Ba Ba Ba ree bear," said the little Wee Bear.
And this is the story of the Three Little Bears!
Yeah!


Objective: To identify the triangle and its properties.
Materials: Attribute blocks, a large triangle cut from construction paper, yarn, salt or sand box, a camera, squares of colored paper, crayons

Vocabulary: triangle

## Storytime:

(E)Circus Shapes, Murphy, Stuart J.

Reinforce: circles and squares (pages 25, 26)

## 1 Introductory Activity

## Introducing the Triangle

Display a large triangle cut from construction paper and identify it as a triangle. Run your finger along the sides of the triangle. Ask children to identify other triangles in the room (a pennant, a triangle musical instrument, a folded napkin).

Distribute a set of attribute blocks to each pair or small group of children. Ask the students to select 1 triangle of any color or size.

Run your fingers along the outside of the shape. Trace a triangle in the sand box. Next, trace a triangle on your arm. Last, trace a triangle in the air. Describe the shape to your partner (flat, smooth, space inside, has points or corners, has straight sides, it does not roll, it slides).

Have each group make a yarn ring. Have the children one at a time select 1 triangle and place it inside the ring. What shall we name the shapes inside the ring? (triangles)

What shall we name the other shapes-the ones that are not inside the ring? (not triangles)

Emphasize that the triangles are part of the whole group of shapes.

Ask students to find how many different sized triangles there are in the ring. (2)

Have the children take turns selecting the small triangles until only large triangles remain in the ring. Identify the 2 groups as the set of small triangles and the set of large triangles. Emphasize that these triangles are part of the whole group of shapes.

Have 3 children lie on the floor to make a triangle.
Take a picture of the children forming the triangle. Be sure to show them so they can see the triangle they made.

## Connections Activity

Point to the word "triangle" at the top of this page. Say the word out loud, and have students repeat it with you 3 times.

Use your finger to trace around the triangles at the top of the page. Here is an example of a triangle that we might see outside. This is a sign. Point out the picture of the yield sign.

Now, take a triangle block and place it on a triangle

on the bottom of this page. Check that students have correctly identified a triangle shape.

Move your block and color the triangle yellow.
Continue until all triangles have been colored.

## 3 Follow-Up Activities



Give each student in a small group a square of colored paper. Have the students fold the paper in half diagonally to make a triangle.


Lay the triangle down with the longest side at the top, and fold the top 2 corners down to make "ears."


Have students draw a dog face on the paper.

## Skill Builders 15-1

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the triangles yellow.


Objective: To order the numbers 1 to 10 .
Materials: Interlocking cubes, number stair, Numeral Cards 1-10, cubes and margarine tubs
Read One Bear with Bees in His Hair, Wood, Jakki
Fish Eyes, Ehlert, Lois
One Gorilla, Morozumi, Atsuko
Ten Flashing Fireflies, Sturges, Philomon (Activity 75)

## (1) Introductory Activity

## Review: Towers of 1 More

On page 58, children used the pattern of "1 more" to make towers for the numbers 1 to 5 . On this page, the activity is continued for the numbers 6 through 10. If available, a plastic number stair should be used at the end of the activity to store the towers.

In an earlier chapter, we built towers to 5 following a special pattern. The special pattern was that each new tower was made by matching the old tower and making the new tower 1 story more. Today we continue the activity and make towers up to 10 stories. First, build a tower 1 story high. Now, build a new tower by matching your old tower and making the new tower 1 story more. (Repeat 9 times.)

Now, build a new tower by matching your old tower and making the new tower 1 story more. How many stories are in your tower? (10)

Touch your shortest tower and say aloud the number of stories. Count the number of stories in each tower from your shortest tower to your tallest tower. (1, 2, 3, 4, 5, 6, 7, 8, 9, 10)

## Counting from a Tower

After children can touch and count from 1 to 10 , have them begin to count forward from a number.

Today we are going to count up to 10 , starting from a tower other than the 1 tower. Touch your 2 tower. Count aloud from 2 to 10. $(3,4,5,6,7,8,9,10)$ Remind the children that they should not say aloud the tower they are starting from; rather, they are to count forward from that tower. This activity of counting from a number is an important readiness activity for success with addition where students should learn to count up from a number rather than having to count by ones from 1 to the number.

## Connections Activity

Place your towers on the matching picture. Color the pictures of cubes the same color as the cubes in your tower. Write the number of stories in each tower inside the highest cube of each tower.


## 3 Follow-Up Activities



## A STAIRCASE OF TOWERS

This game is for 2 children. Each pair will need 100 interlocking cubes and 2 sets of numeral cards $1-10$. Shuffle the cards and place them face down between the 2 players. Players take turns selecting a card and building a tower to match the number selected. After each play, the card is returned to the bottom of the deck.

The object of the game is to build the towers from 1 to 10 in order. The first player to complete the staircase is the winner. If a card is selected for a tower the child has already built, the child loses that turn. After all cards have been selected once, the cards in the pile may be shuffled and used again.

## ONE MORE

Hide from 1 to 9 cubes in random order under margarine tubs. Hold up 1 tub and ask the students to write the number of cubes they see under the tub.

Place 1 more cube under the tub. Ask the students to write the number of cubes under the tub now. Lift up the tub. Ask a volunteer to count the cubes. If children make a mistake, have them erase their answer and write the correct answer.



Objective: To explore at the concrete level by joining up to 6 counters and telling and writing how many there are in the set.

Materials: Teddy bear counters, interlocking cubes, number stair, frozen dinner trays having 3 sections

One Gorilla, Morozumi, Atzuko (Activity 120)

## Introductory Activity

## Making up Problems and Finding the Answer

Review modeling and telling stories as described on page 119 of this chapter. Continue the activity, this time having the students tell how many bears there are in all. Make up stories involving the addition of one more to the bears in the sand box.

Use problems without clue words as well as problems with clue words so that the children must think and make sense of the story rather than listening for particular words.

An example without clue words is as follows: There are 3 bears in the sand box. One other bear came. How many bears are in the sand box?

The same example with clue words: There are 3 bears in the sand box. One more bear was added. How many bears are there altogether?

## 2 Connections Activity

These problems involve adding one more to a number. Look at the pictures in the first row. Tell a story about what is happening. (There are 3 bears in the sandbox. One more bear came to play. There are 4 bears in the sandbox.) Have students tell and model each story using teddy bear counters placed on the Sand Box Storyboard.

After each story has been modeled, write the numerals from the story on the chalkboard. For example, after the first story is acted out, you would write a 3,1 , and 4 on the chalkboard and say that this is a story about 3,1 and 4. The children write the numerals on the blanks. Repeat with the next 2 stories.

## 3 Follow-Up Activities

## Making Up Stories

Have students continue to make up their own stories for the rest of the class to model. Be sure to keep a checklist of the children who have had turns so that everyone will get a chance to participate.

Frozen dinner trays partitioned into three sections may be used for adding two parts and showing the sum. Counters, cubes, buttons or small toys may also be used for the activity. The cubes encourage the children to use their imaginations to make up problems, e.g., 3 red cubes

and one yellow cube. You have 3 apples and 1 banana. How many pieces of fruit do you have?


Use a variety of manipulatives, classroom objects and real people to continue providing real-life experiences involving addition. Ex. $\qquad$ has 5 crayons in her box. She put one more crayon in the box. How many crayons are in her box?

## Reviewing the Number Stair

Review making the towers of one more from chapter 4, page 75 . Practice counting from 1 to 10 as the students touch and say the numbers aloud.

Then review counting from a number. Now I want you to count with me from 3. I want you to count on from 3 , so you will not say 3 aloud but only the numbers you say when you count forward from 3. Touch 3. Count on (or forward) from 3. (4, 5, 6, 7, 8, 9, 10)

Review counting up 1 step from a number. I want you to count forward or to count on one more from a number I name. Touch the 3 tower. Count forward (or count on) 1 step from 3. (4)

Repeat by having children touch the 2 counter and count on 1. (3) Continue counting on 1 from each of the numbers on the number stair. Point out that the stair can help children see numbers and how to add on 1 more to a number "in their heads."

Name $\qquad$

## One More



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-     -         -             -                 -                     - 

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## Daily Oral Review: K-21

Objective: To introduce the equals sign.
Materials: Teddy bear counters, Teddy Bear Storyboard (Master 11), egg cartons, Addition Flash Cards (Master 20), zipper bags, Numeral Cards (Master 22)

Vocabulary: equals, number sentence

## 1 Introductory Activity

## Modeling a Story, Introducing the Equals Sign

Have children model the following story using teddy bear counters on the Teddy Bear Storyboard.

First, 2 bears were playing in the sand box. Next, 1 more bear came to play with them. Last, how many are playing in the sand box? Find the number cards that tell this story $(2,1,3)$.

What sign goes between the 2 and 1 ? Why? (the plus sign because we are putting together 2 numbers) Put the plus sign between the 2 and the 1 .

What does the 3 represent? (the number in all or the answer) What sign do we use to tell the end of the story, the answer, is coming? (equals sign)

Since 2 plus 1 has the same value as 3, we say it is equal to 3. Put the equals sign in the correct place. Children should now show these cards under the storyboard.


Say the number sentence that tells the story. Two plus 1 equals 3. Repeat with other stories.

## 2 Connections Activity

This page involves sums to 6 . Have volunteers tell a story for each picture. Ask how many bears in all should be drawn in the sandbox. Notice that these problems require the child to visualize the number of bears being added. Write the signs that go in the boxes. Write the missing number.

## 3 Follow-Up Activities

## Modeling Problems from Flash Cards

Make a copy of Master 20 for each student. Have the students cut the cards and store in a zipper bag.

Players turn their sets of cards face down in front of them and select one card at a time. Players make up a problem about the numbers on the flash card for their partners to model and solve using teddy bear counters or interlocking cubes. Roles are reversed as the second player draws a card and makes up a problem.

Circulate to check on the use of correct language and on the solution of the problem.


## Sand Box Addition

Have student make up a story and draw a picture of an addition fact about a sandbox. Save the page for the Chapter Portfolio.

Ex. $2+1=3$


## Egg Carton Addition

Distribute teddy bear counters, one egg carton and numeral cards to each pair or small group.

Display 1 teddy bear in the egg carton. Put the number card which matches the number of teddy bears below the carton.

Put 2 more teddy bears in the carton. Put the number card which matches the bears you added below the carton.

How many bears are in the carton? Put the number card which shows how many in all to the right of the other number cards. Use the plus sign and equals sign to complete the story. Tell a story about the teddy bears in your carton.

Repeat with other examples.

Name
Equals Draw

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## NCTM Las Vegas 2013 Thank you for attending today's presentation!

"What you have been obliged to discover by yourself leaves a path in your mind which you can use again when the need arises."

- G.C. Lichtenberg

Name $\qquad$
Title $\qquad$
School District $\qquad$
Address $\qquad$
City $\qquad$ State $\qquad$ Zip $\qquad$
Daytime Phone $\qquad$ Grade Level $\qquad$
E-mail $\qquad$

What was the most useful activity or idea covered in the workshop?
$\qquad$
$\qquad$

How can these activities be used in your classroom?

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