

Base-Ten and Place Value

Jumping Jelly Beans

Hundred Board-O

Order Up!

Number Neighborhood

Stretching Numbers

Place Value Pause

Place Value Bingo

JUMPING JELLYBEANS

Objectives

Students will recognize number patterns in the base-ten numeration system.

Students will use jellybeans to practice counting by tens.

Anticipatory Set

Place a large jar of multicolored jellybeans on your desk or in another widely viewed location. Then invite students to count with you to 100, first by ones and then by twos, fives, and tens. Ask students which method of counting is the slowest (*counting by ones*) and which is the fastest (*counting by tens*).

Purpose

Arithmetic and mathematical knowledge should be based first on concrete situations rather than abstract concepts.

Tell students that they will look for patterns on a hundred board. The patterns that they discover will help them to see how numbers are arranged to show different values. Explain that when you understand the patterns, you can group numbers together to count items faster.

Input

Copy the **Hundred Board reproducible (page 6)** onto an overhead transparency, and give each student a photocopy. Point out how the 10 numerals along the top row are repeated over and over again throughout the board. Guide students to point out various patterns that they find on the board. For example, in the column under *10*, every number ends in *0*. Have students count by tens to 100 again, this time pointing to the numbers on the board as they go along.

Modeling

Show students the jellybean jar. Tell them, “I want to know exactly how many jellybeans are in this jar, but to count them all by myself would take a long time. How might we be able to work together to count these jellybeans?” Allow several students to respond, and then explain that you want them to help you put the jellybeans into groups of 10 so you can count them quickly.

Show students a small paper cup and count aloud as you place 10 jellybeans in the cup. Count out 10 more jellybeans and place them in a separate cup. Say, “There are 10 jellybeans in each cup. I can count by tens, and I know that I have 20 jellybeans so far. You will work in pairs to make sets of jellybeans just like these. Then we can all count by tens together to see how many jellybeans we have in all.”

Guided Practice

Organize students into 10 small groups or pairs. Give each group 10 small paper cups and 1 large cup filled with jellybeans. Instruct students to count out 10 jellybeans and place them in 1 cup.

Checking for Understanding

Check to make sure that each group has one cup with 10 jellybeans in it. Ask how many jellybeans should be in each cup (10).

Independent Practice

Ask groups to finish counting out the rest of their jellybeans in sets of 10. Circulate and monitor student work and interactions. When all the jellybeans have been counted, ask each group to count by tens to show how many jellybeans they have. Jellybeans that could not be grouped in a set of tens should be counted as ones. Invite a student from each group to use an overhead marker to color the box on the hundred board transparency that matches the number of jellybeans for the group.

Closure

Have groups collect their cups of jellybeans and bring them to a table at the front of the room. Combine all of the single jellybeans into one bowl and have volunteers create sets of 10 with them. Then have students arrange the cups into groups of 10 while counting aloud to 100. Ask, “How many groups of 10 does it take to make 100? How many sets of 100 would it take to make 1,000?” Using the sets of cups as a model, count by hundreds to determine how many jellybeans there are in all. Have students draw pictures in their math journals to show how the jellybeans were grouped and counted.

HUNDRED BOARD-O

Objective

Students will use their knowledge of place value to identify numbers on a hundred board.

Anticipatory Set

Ask students to describe various types of Bingo games that they have played. For example, they may have played Bingo games that used rhyming words, synonyms and antonyms, or addition and subtraction facts. Display a transparency of the **Hundred Board reproducible (page 6)** on the overhead projector. Tell students that they will play a Bingo game using numbers and place value.

Charts in different arrangements (e.g., 1 to 100) offer many opportunities for students to explore number patterns.

Purpose

Explain to students that each digit in a number has a specific value based on its place within that number. This is called *place value*. The Bingo game that students will play will help them practice identifying numbers by listening to descriptions of place values.

| | H | T | O |
|-----|---|---|---|
| 43 | | 4 | 3 |
| 100 | 1 | 0 | 0 |
| 2 | | | 2 |
| 58 | | 5 | 8 |
| | | | |

Input

Draw a place value chart on the board with spaces for hundreds, tens, and ones. Write the numbers 43, 100, 2, and 58 in a column next to the chart. Fill in the place value chart for the number 43 by writing 4 in the tens column and 3 in the ones column. Explain that the 4 is worth 4 tens, or 40. The 3 is worth 3 ones. Say, “ $40 + 3 = 43$.” Ask volunteers to fill in the chart for the remaining numbers.

Modeling

Tell students that as they play this game, you will call out numbers in terms of their place value. Choose a number, such as 56, and say, “5 tens and 6 ones.” Use your overhead transparency of the Hundred Board and cover the square for 56. Explain that 56 is the same as 5 tens and 6 ones. Point out how the number 5 is in the tens place and the number 6 is in the ones place. Repeat with several more numbers.

Guided Practice

Give each student two copies of the Hundred Board reproducible and several paper squares. Have students cut apart one Hundred Board into separate number squares and place the squares in a paper bag. Organize students into

pairs, and explain that each pair will play its own game. Tell students to choose one player to go first. Player 1 draws a number square from his or her bag and describes the number using place value, such as, “3 tens and 1 one.” Player 2 then finds the matching number on his or her Hundred Board and covers it with a paper square. Players then switch roles. Tell students that they will continue playing in this manner until one player has an entire row on the board covered horizontally or vertically. That player calls out “BOARD-O!” and wins that round. Players can continue playing rounds until you end the playing period.

Checking for Understanding

Ask if students have any questions. Make sure they understand that they need to describe their numbers based on place value and that they should not name the numbers directly.

Independent Practice

Allow students to play the game with their partners for a designated amount of time. Circulate around the room to make sure students are using place value appropriately. Offer corrective feedback if you notice any errors.

Closure

Encourage students to think about what they learned. Give them 2 minutes to talk with their partners about the activity and reflect on their learning. Suggest that they draw a simple place value chart in their math journals and diagram three numbers using the chart. Then have them complete this sentence frame for each of the three numbers: “The number _____ has _____ hundreds, _____ tens, and _____ ones.”

Name _____ Date _____

Hundred Board

| | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|-----|
| 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 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

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ORDER UP!

Objective

Students will compare and order whole numbers to 1,000.

Anticipatory Set

Collect a variety of take-out menus from restaurants with which students might be familiar. Staple each menu into a construction-paper folder. Organize students into pairs, and give each pair a restaurant menu and a copy of the **Place Your Order reproducible (page 9)**.

Direct students to cut out the two guest checks and take turns acting as a restaurant customer and a server. Tell the server to write down and add up the cost of the customer's order on a guest check. Provide calculators for adding if needed. Afterward, have students hold their guest checks and arrange themselves in order from the least expensive meal to the most expensive. Ask students to read the totals on their guest checks, and help them correct any errors in how they ordered themselves.

Purpose

Tell students that when they worked together with the menu, they used numbers that were less than 100. Explain that in the next activity, they will practice ordering numbers from 0 to 1,000.

Input

Review place value with students. Draw three place value charts on the board with columns for hundreds, tens, and ones. Call on a volunteer to name a number, and write that number in the middle chart. Then ask another student to name a number that is smaller than the first. Write that number in the left-hand chart. Finally, ask a student to name a number that is larger than the first, and write it in the right-hand chart. Ask students to explain how they know which number is largest and which is smallest. Repeat the process with several more numbers.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| H | T | O | H | T | O | H | T | O |
| 1 | 2 | 2 | 3 | 5 | 6 | 7 | 2 | 9 |

Modeling

Tell students that they will compare numbers and order them on a giant number line. Hang a clothesline from one end of your room to the other at a height suitable for students to clip numbers to it. Write the numbers 0 and 1,000 on two separate index cards. Use clothespins to clip the 0 at the far-left end of the clothesline and the 1,000 at the far-right end. Gather enough index cards so there are two for each student and two for you. Write one number between 1 and 999 on each index card. Do not duplicate any numbers.

Choose two index cards, and say, “This is the number _____. About where should I place it on the number line?” Invite several students to show you where they think the number belongs. Ask a volunteer to clip it on the clothesline number line. Hold up the second number, and say, “This is the number _____. Is it between 0 and [the first number] or [the first number] and 1,000? About where should I place it on the number line?” Allow several students to show you where they think the number belongs. Ask another volunteer to clip it on the number line.

Guided Practice

Distribute the remaining index cards so each student has two numbers. Have students take turns sharing their numbers and using clothespins to clip them on the number line. Offer corrective feedback when needed.

Checking for Understanding

Make sure students have a good sense of the order of numbers. Ask them about several other numbers, and have them identify which are larger and which are smaller.

One way to assist students in remembering the meaning of what was learned is to have them write it down in a journal after each lesson where something new is presented.

Independent Practice

Give students a copy of the **Order Up! reproducible (page 10)**. Invite them to complete the activity independently. Explain that they will need to write the numbers in correct order on the guest checks.

Closure

Suggest that students answer the following question in their math journals: “What should I look for when I want to put numbers in order from smallest to largest?”

Place Your Order



| Guest Check | |
|-------------|--|
| 1. | |
| 2. | |
| 3. | |
| 4. | |
| 5. | |
| 6. | |
| Total | |
| Thank you! | |
| Come again! | |



| Guest Check | |
|-------------|--|
| 1. | |
| 2. | |
| 3. | |
| 4. | |
| 5. | |
| 6. | |
| Total | |
| Thank you! | |
| Come again! | |

Name _____ Date _____

Order Up!

Directions: Look at the numbers in each box. Write them in order from smallest to largest on the blank guest checks.

| | |
|-----|-----|
| 920 | 130 |
| 65 | 17 |
| 212 | |

| | | | | |
|--|--|--|--|--|
| | | | | |
|--|--|--|--|--|

| | |
|-----|-------|
| 4 | 1,000 |
| 462 | 62 |
| 463 | |

| | | | | |
|--|--|--|--|--|
| | | | | |
|--|--|--|--|--|

| | |
|-----|-----|
| 831 | 15 |
| 108 | 653 |
| 1 | |

| | | | | |
|--|--|--|--|--|
| | | | | |
|--|--|--|--|--|

| | |
|-----|-----|
| 394 | 823 |
| 318 | 768 |
| 444 | |

| | | | | |
|--|--|--|--|--|
| | | | | |
|--|--|--|--|--|

| | |
|-----|----|
| 10 | 79 |
| 100 | 85 |
| 7 | |

| | | | | |
|--|--|--|--|--|
| | | | | |
|--|--|--|--|--|

NUMBER NEIGHBORHOOD

Objective

Students will use randomly drawn digits to create the largest possible number.

Anticipatory Set

Ask students how long it would take them to count to 1,000. Challenge a student to count as high as possible in 2 minutes. Then let a few other students try while you keep track of the time.

Purpose

Tell students that they will play a game today. Their goal is to create the largest number possible. To do this, they will need to remember what they have learned about place value.

Input

Explain to students, “When comparing two numbers, you should look at the far-left digit to judge which number is larger. For example, if you have the numbers 329 and 419, you would look at the hundreds place and compare 3 and 4. The number with the 4 in the hundreds place is the larger number. Another way to compare numbers is to look at the number of digits. If one number has four digits and the other has only three digits, the four-digit number is larger.”

Modeling

Tell students that they will play a place value game called Number Neighborhood. The object of the game is to make the largest number possible. The player with the largest number in each round gets to move forward on the game board. The person who reaches the last square on the game board first wins the game.

Prepare a game board by gluing the **Number Neighborhood Game Board reproducible (page 13)** to the inside of a file folder. Cut 5 index cards in half to make 10 cards, and then number the cards 0 to 9. Make a second set of number cards for your opponent, and invite a volunteer to help you demonstrate how to play the game.

1. Each player shuffles a set of number cards and places them facedown in a pile.
2. Each player draws four boxes in a row on a sheet of paper. Players will place cards in these boxes to create four-digit numbers.

3. Each player draws the top card from his or her pile and places it in any of the four boxes. The goal is to create the largest number possible. After players place their cards, the cards cannot be moved.
4. Players continue drawing number cards and placing them in the boxes until all four boxes are filled.
5. Players compare the two 4-digit numbers and decide which number is larger.
6. The player who made the largest number moves his or her game marker forward two spaces on the game board.
7. Players then reshuffle all their cards and play another round. The game continues until one player reaches the end of the path on the game board.

Guided Practice

Let students choose partners to play the game. Give each pair a copy of the Number Neighborhood Game Board reproducible and a file folder. Direct them to glue the page to the inside of the file folder. Then have each student cut five index cards in half and use them to make number cards 0 through 9. Finally, have them draw a row of four boxes on a sheet of paper and select small objects to use as game markers, such as counters or buttons. Guide students through one round of the game. At the end of the first round, have each pair name the two numbers they created and identify the larger one.

Checking for Understanding

Encourage students to ask questions. Initiate a quick discussion about any strategies that they used in creating the largest possible numbers.

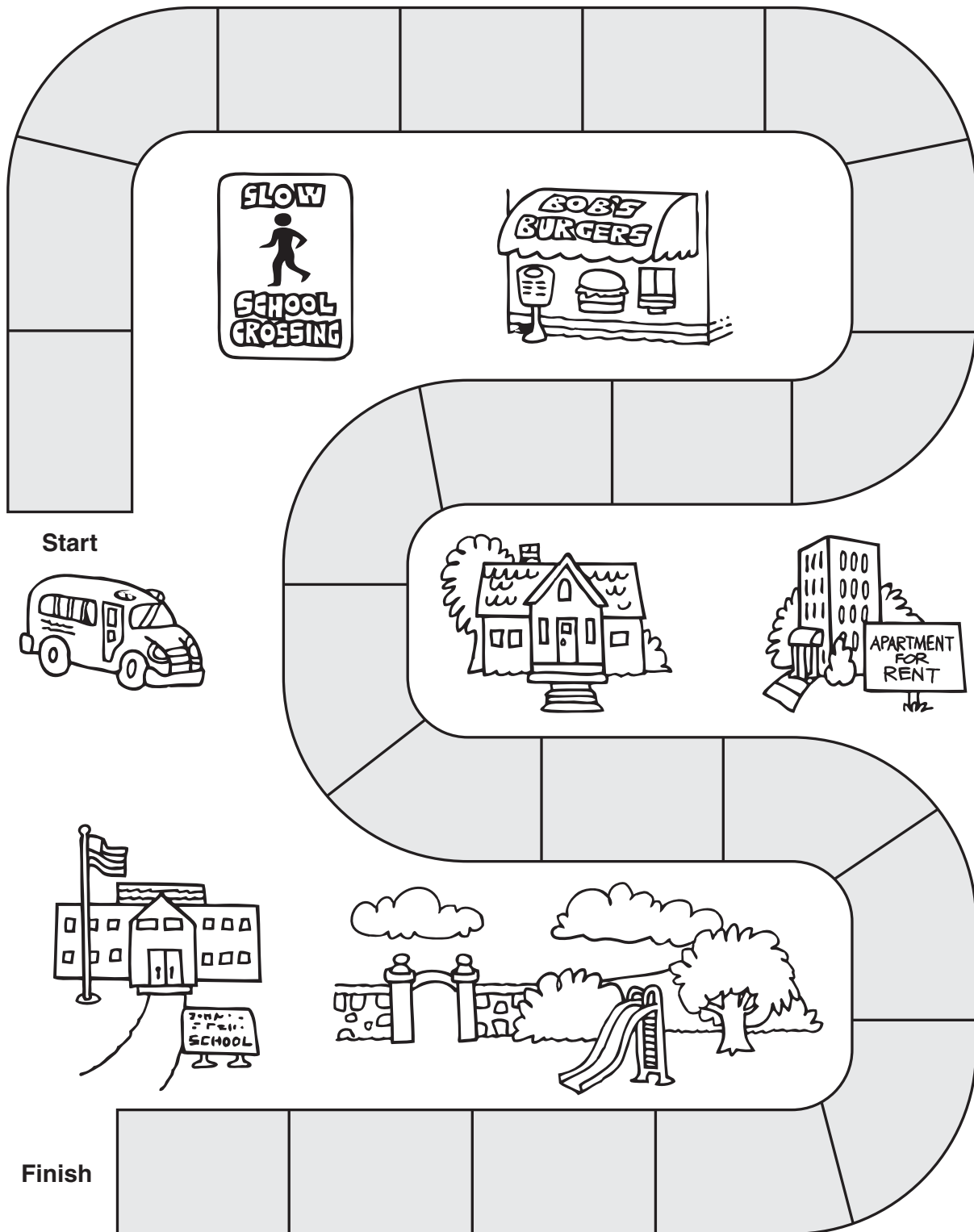
Independent Practice

Allow students to play the game for a designated amount of time. Circulate around the room, and watch for strategies to evolve.

Closure

Bring students back together to discuss the game as a class. Ask questions such as, *What kinds of strategies did you use to play the game?* and *Did they work all the time or just some of the time?* Have students describe at least one strategy they used for the game in their math journals.

Number Neighborhood Game Board



STRETCHING NUMBERS

Objective

Students will represent numbers in expanded form.

Anticipatory Set

Use a heavy-duty elastic band or other similar item that can be stretched. Attach one end to the classroom doorknob and hold on to the other end. Walk slowly away from the door, pulling and stretching the elastic band as you move. Stretch it as far as you can, acting like you are working very hard. When you cannot stretch the band any farther, stop and say, “Whew! Stretching is hard work!” Make note of where you stopped, and invite a few students to see how far they can stretch the band.

Purpose

Explain to students that numbers can be represented in a variety of ways. One way is called *expanded notation*, which involves writing a number to show the value of each digit. Tell students, “When doing expanded notation, you stretch out the number and turn it into an addition problem.” In this activity, students will learn how to write numbers in expanded form.

Input

Ask students to tell you the value of different digits in numbers. Write 432 on the board, and ask, “What is the value of the 3?” (30), “What is the value of the 2?” (2), and “The 4?” (400). Repeat this process for several additional numbers until you are sure students understand the value of digits in numbers.

Modeling

Draw a large grid on the board with four columns and six rows. Label the columns “Thousands,” “Hundreds,” “Tens,” and “Ones.” Choose a number with digits in the thousands place and write it in the grid. Write each digit in the correct column according to its value. For example, if your number is 6,539, write 6 in the Thousands column, 5 in the Hundreds column, 3 in the Tens column, and 9 in the Ones column.

Tell students that you are going to stretch the number into its expanded form as if it were a rubber band: “The 6 in this number has a value of 6,000, so I am going to write 6,000 in the third row.” Demonstrate how to write 6,000 in the chart. Then say, “The next digit in the number is 5. Can anyone tell me the value of the 5?” (500). Write 500 in the fourth row of the chart.

Continue filling in the chart until each digit is represented. Then show students how to write the values in a mathematical sentence to show the original number. Write “6,000 + 500 + 30 + 9” on the board. Read aloud the sentence, and say, “This shows the number 6,539 in expanded form.”

Guided Practice

Copy the **Stretch It Out reproducible (page 16)** onto an overhead transparency for each student, and distribute the transparencies with drawing paper, wet-erase markers, and erasers. (Have students place the drawing paper under the transparency. This makes the transparency easier to see.) Then write 7,657 on the board. Guide students through the process of filling out their charts using that number. Continue practicing as a group with a few more numbers, and invite volunteers to write the expanded form of each number on the board.

| Thousands | Hundreds | Tens | Ones |
|-----------|----------|------|------|
| 6 | 5 | 3 | 9 |
| 6 | | | |
| | 5 | | |
| | | 3 | |
| | | | 9 |

$$6,000 + 500 + 30 + 9 = 6,539$$

Checking for Understanding

As you circulate around the room, check students' work to see if anyone still needs more guided practice. Provide students with additional numbers for more practice if needed.

Independent Practice

For in-class practice or homework, give students a copy of the **Stretching Numbers reproducible (page 17)** to complete independently. Explain that they may use the Stretch It Out page to figure out the expanded form of each number, and then they must write each equation on the Stretching Numbers page.

Closure

Have students write a number in expanded form in their math journals and then draw a diagram of the number using base-ten blocks. Direct them to draw cubes for thousands, large squares for hundreds, rectangles for tens, and small squares for ones.

Name _____ Date _____

Stretch It Out

| Thousands | Hundreds | Tens | Ones |
|-----------|----------|------|------|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

_____ + _____ + _____ + _____

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Name _____ Date _____

Stretching Numbers

Directions: Write the expanded form for each number.

373

1,231

422

3,789

8,671

PLACE VALUE PAUSE

Objective

Students will recognize place value to 10,000.

Anticipatory Set

Write the numbers 0 through 9 in black marker on separate sheets of drawing paper, one number per sheet. Make a comma sheet as well. Make the numbers large enough to be seen from far away. Photocopy several sets of numbers and commas to make cards for the activity. If you wish, laminate the sheets for durability. Pass out a number or comma to each student.

Gather students together in a large group. Reinforce number value by giving a variety of directions such as, *Hold up your card if it is the smallest digit, Stand up if you have the largest digit, Raise your hand if your digit has no value, and Clap if you can multiply your digit times itself to get 1.*

Purpose

Tell students that they will use the numbers 0 through 9 to practice forming large numbers.

Input

Tell students that a digit's value depends on where it is located in a number. For example, write 56 on the board. Explain that 56 is 5 tens (or 50) and 6 ones. Write the number in expanded form: $56 = 50 + 6$. Then write "2,957," and ask students the value of 5 in this number (50). Then write the number in expanded form: $2,957 = 2,000 + 900 + 50 + 7$.

Modeling

Tell students that they will be playing a game called Place Value Pause. The object of the game is to work together to form the largest possible number in 10 seconds. When 10 seconds are up, they will pause so their number can be judged by the rest of the class.

Write the numbers 0 through 9 on separate index cards, and place them in a bag. Draw four numbers from the bag, and write them on the board. Call four students with those numbers to the front of the room, along with a "comma" student. Have these students hold their cards in front of them so the class can see the numbers. Ask the class, "Which digit should come first to make the largest number possible?" Guide them to answer the largest digit. Ask them to tell you which digit should come next. Continue until all four digits and the comma are in the correct positions. If needed, position students in the proper order to form the largest possible number. Ask the class to verify the number.

Guided Practice

Explain that five students will now follow the same process without help from the class. Tell students that you will call five of them to the front of the room and that they will have 10 seconds to form the largest possible number. The class will then give them a thumbs-up if the number is the largest possible or a thumbs-down if there is a way to make a larger number.

Call five students to the front of the room (four numbers and one comma), and say, “Go!” Use a stopwatch to time them for 10 seconds, and then shout, “Pause!” Ask the class to verify the number. Play several rounds of the game until students have a good understanding of place value.

Checking for Understanding

To assess understanding of the concept, draw several more sets of numbers from the bag. Invite students to write the largest possible number on a sheet of paper at their desks. Walk around the class, and check student work.

Independent Practice

Leave the number and comma cards in the math center for students to play the game with independently. Invite students to compete in teams, and award points to the team that forms the highest number fastest.

Extend the learning by challenging students to make the smallest numbers possible. You may also decide to add more digits to the numbers, extending into the ten thousands and hundred thousands.

For more practice, place a set of number cards in two bags in the math center. Invite student pairs to play a game to see who can form the larger number. Each student chooses one of the bags and draws numbers from that bag. The student who forms the largest number wins that round.

Closure

Invite students to reflect on the activity in their math journals. Ask them whether forming the numbers with their bodies instead of on paper was a helpful learning technique.

PLACE VALUE BINGO

Objective

Students will understand place value to 10,000.

Anticipatory Set

Gather dried beans, small paper squares, or chips to use as Bingo markers. Copy the **Place Value Bingo Card reproducible (page 22)** onto a transparency, and randomly write the numbers 0 through 9 in the boxes to fill in the card.

As students get ready for math class, sing the “Bingo” song. Encourage students to join in and sing along with you:

There was a farmer, had a dog,

And Bingo was his name-o.

B-I-N-G-O,

B-I-N-G-O,

B-I-N-G-O,

And Bingo was his name-o!

Keep learning and searching for new ways to have fun with numbers.

Purpose

Explain that the class will use a Bingo game to practice recognizing place value.

Input

Write the number 16,824 on the board. Ask students to identify which digits are in the ones, tens, hundreds, thousands, and ten thousands places, for example, “In which place is the 8?” (*hundreds*) and “Which number is in the ten thousands place?” (1). Write the number in expanded form: “ $16,824 = 10,000 + 6,000 + 800 + 20 + 4$.”

Modeling

Give each student a copy of the Place Value Bingo Card reproducible and a handful of game markers. Invite students to write the numbers 0 through 9 randomly in the boxes on their cards. Explain that you will write a number on the board. If students have any digits in the same place column, they should cover them with markers.

Demonstrate using your Place Value Bingo Card transparency. Write a number on the board. (Make sure that the number you write contains at least one digit in the corresponding place on your Bingo card.) For example, if you write the number 93,415, you might have 3 in the thousands column of your

Bingo card. Cover the 3 with a marker. If you have a 3 in the ones column, you do not cover it.

Guided Practice

After making sure all students have filled in their Bingo cards, write a number on the board. Invite students to mark their Bingo cards if they have one of the digits in the matching column.

Checking for Understanding

Ask if any student marked a digit. Ask him or her to share the digit marked and the column in which it was found. Check to make sure that the digit falls in the correct place column. Repeat several times if needed to make sure students understand how to play the game.

Independent Practice

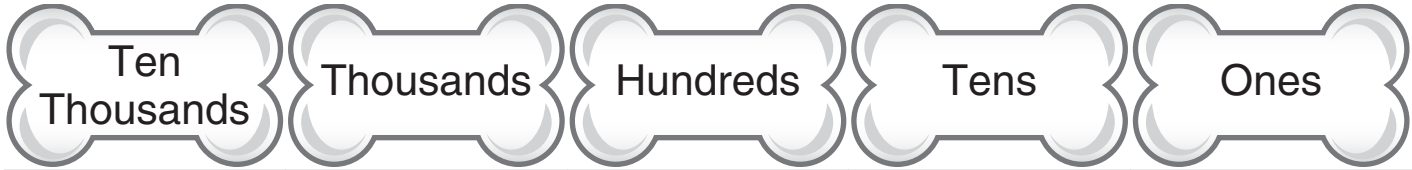
Continue playing the game by writing new numbers on the board and allowing students to check their Bingo cards and mark any matching spaces. When a student marks five spaces in a row horizontally, vertically, or diagonally, he or she shouts, "Bingo!" Make sure to list the numbers in sequence on the board as you call them so you can go back later and check that the student has all the correct answers. Play as many rounds as time allows.

Closure

Ask students to reflect in their math journals on how playing Bingo helped them learn about place value. Invite them to work with partners to think of other fun games they could play to reinforce this math concept.

Name _____ Date _____

Place Value Bingo Card



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|--|--|--|--|--|
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| | | | | |
| | | | | |