BRIDGES IN MATHEMATICS 2

GRADE 2 SUPPLEMENT

Set A4 Number & Operations: Place Value

Includes

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Skills & Concepts

- ★ read and write whole numbers to 1,000
- ★ connect place value models with their numerical equivalents to 1,000
- ★ identify the ones, tens, and hundreds place in a number and the digits occupying them
- ★ compare whole-number quantities through 999 by using the terms is less than, is greater than, and is equal to, and the symbols <, >, and =
- ★ write three-digit numbers in expanded form
- ★ analyze the magnitude of digits in numerals through 9,999 on the basis of their place values
- ★ generate estimation strategies to determine the approximate number of objects in a set of no more than 1,000

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Bridges in Mathematics Grade 2 Supplement
Set A4 Numbers & Operations: Place Value

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Bridges in Mathematics is a standards-based K–5 curriculum that provides a unique blend of concept development and skills practice in the context of problem solving. It incorporates the Number Corner, a collection of daily skill-building activities for students.

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Set A4 ★ Activity 1

ACTIVITY

Hundreds of Seeds

Overview

Students learn that harvester ants gather seeds and store them in their chambers to make a special "ant bread". This information serves as a point of departure for a counting project in which students work together to count a large collection of buttons.

Skills & Concepts

★ generate estimation strategies to determine the approximate number of objects in a set of no more than 1,000

★ connect place value models with their numerical equivalents to 1,000

★ identify the ones, tens, and hundreds place in a number and the digits occupying them

★ compare whole-number quantities through 999 by using the terms is *less than*, is *greater than*, and *is equal to* and the symbols <, >, and =

You'll need

★ Harvester Ants (pages A4.7–A4.9, run 1 copy of each, see Advance Preparation)

★ bucket of buttons from your Bridges kit (see Advance Preparation)

★ 1 gallon-size resealable plastic bag (see Advance Preparation)

★ 10 portion cups for each group of 3–4 children (see note)

★ small margarine tubs or paper soup cups, 1 per group plus several extra

★ 3 sheets of 9″ × 12″ construction paper, 1 white, 1 blue, and 1 yellow (see Advance Preparation)

★ six 3″ × 5″ index cards or pieces of white construction paper

Advance Preparation Pour all the buttons into the re-sealable plastic bag. Write "Hundreds" on the yellow sheet of construction paper, "Tens" on the blue sheet, and "Ones" on the white sheet. Find Harvester Ants on pages A4.7–A4.9. Make one copy of each sheet and mount them on construction paper or butcher paper, or simply hang the three sheets on the board near your discussion area.

Note If your entire school is using Bridges, the first and the third grade kits each come with 250 plastic 1-ounce portion cups. Borrow a supply of these cups from either a first or third grade teacher if you don't have any of your own.

Instructions for Hundreds of Seeds

1. Invite students to your discussion area. Tell them that you have a new ant song to share with them. Explain that you're going to read (or sing) it, while they listen carefully to find out what these ants eat and how they prepare their food. Read (or sing) the song to your class, and then ask the students to read or sing it with you a second time. Then discuss the fact that harvester ants gather seeds, store them, and later crush the seeds to make a special "ant's bread".

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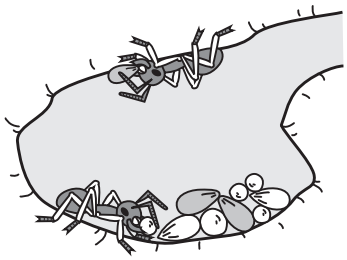
Activity 1 Hundreds of Seeds (cont.)

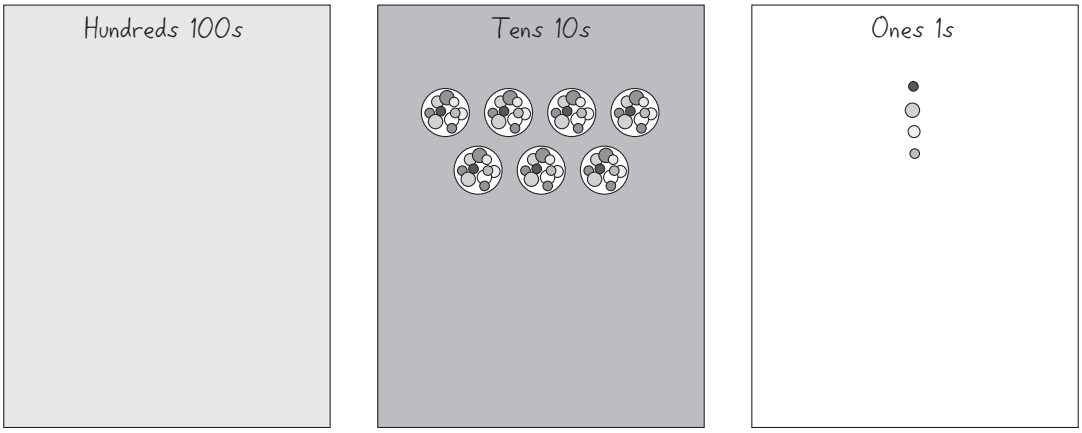
2. Ask the children to take a careful look at the picture of the ants on the second page of the song. How many seeds have the two ants collected, counting the seeds they are carrying?



3. When students have counted to determine that there are 10 seeds in all, explain that they are going to pretend to be harvester ants today, gathering seeds to store in their nest. They will work in groups of 3 or 4, and like the ants, they will count their "seeds" into sets of 10.

4. Now show students the bag of buttons they'll be using for pretend seeds. Ask students to estimate how many "seeds" are in the bag. Record their estimates on the board. If two or more children have the same estimate, underline the number as many times as necessary. Then ask students to form a circle in your discussion area. Set out a margarine tub (or similar container) for each group of 3–4 children as the students watch from where they are sitting in the circle. Pour some of the buttons from the bag into each tub until you've used them all. The buttons do not have to be divided evenly; you want each group to have a slightly different quantity.

5. Move all the tubs aside except one. Dump the buttons out of this tub, and ask the students sitting on either side of you to help count them into sets of 10. Have your helpers place each set of 10 buttons into a portion cup. If there are extra buttons left at the end, leave them loose. Set out your construction paper counting mats, and have these students help you move the cups of tens onto the blue mat, and the loose ones onto the white mat.



6. Discuss the total with the class. Here are some questions to pose:

- How many buttons are there on the mat right now?
- How do you know?
- How many tens are there?
- How many ones are there?
- Why aren't there any buttons on the mat that says "Hundreds"?

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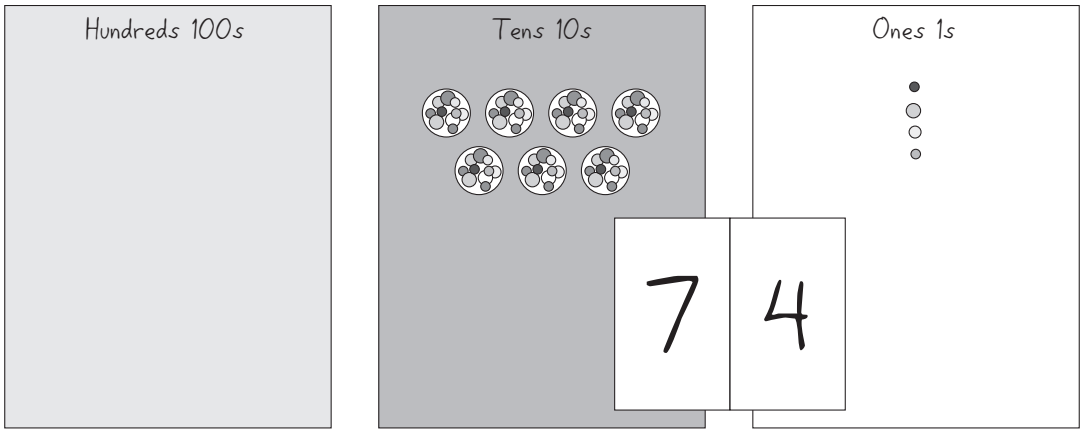
Activity 1 Hundreds of Seeds (cont.)

7. Count the buttons on the mats by tens and ones with the class to confirm the quantity with them. Write a numeral on each of two index cards to match the number of tens and ones. Place the two cards side by side below the mats, and ask students to read the 2-digit number. Then discuss the place values and meanings of the digits.



Teacher *What does the 7 in 74 mean?*

Students *It means 7 tens.*
It's for the 7 cups of buttons, I mean seeds!
It's on the tens mat because it means the tens.

Teacher *What does the 4 in 74 mean?*

Students *It's for the 4 ones.*
That's why it's mostly on the ones mat.

8. Pick up both index cards and place them back on the mats in reverse order. Ask students to comment. Is this okay? Does the number mean the same amount? Why or why not?

Jade *You can't do it that way.*

Teacher *Why not? This number still has a 4 and a 7 in it.*

Students *But it says 47. There are more than 47 on the mats.*
The 7 has to go on the tens mat. There are 7 tens, not 4 tens.
And the 4 has to go on the ones side because there are 4 ones.
There are 74 buttons on there, not 47. You're trying to fool us.

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Activity 1 Hundreds of Seeds (cont.)

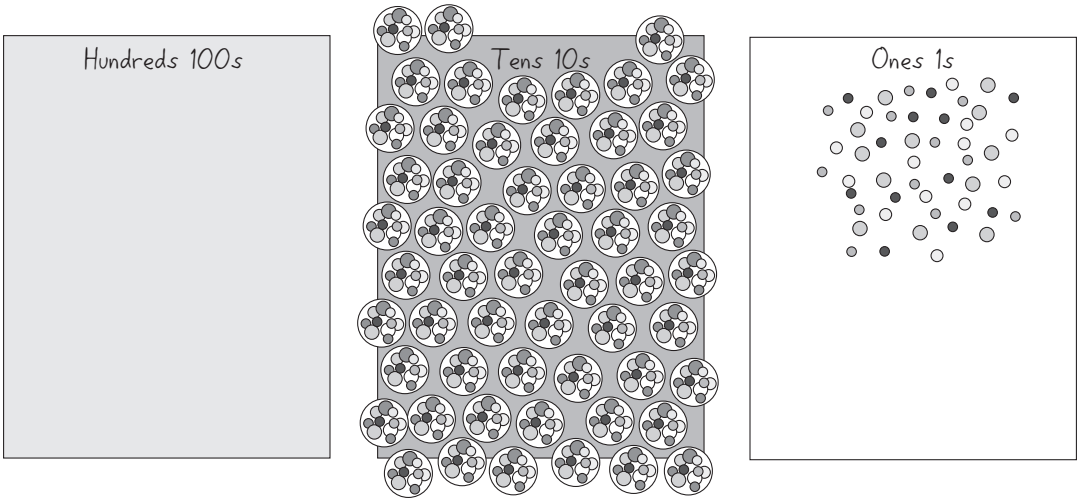
9. Move all the other tubs of buttons back into view of the class. Now that they know how many buttons are in one of the tubs, does anyone want to change his or her estimate? Are there any estimates that can be eliminated from the chart? Why? Add revised estimates to the chart in a different color, and discuss the possibility of crossing out some of the original estimates. Model the language of "greater than" and "less than" as you work with the children, and ask them to use the terms as they are able.

How many "seeds" are in the bag?

~~100~~	300	450
~~62~~	~~120~~	700
~~75~~	175	500
900	208	~~50~~
400	600	550
1,000	2,000	

10. Assign students to groups of 3 or 4 (or have them gather in their table groups). Give each group one of the tubs of "seeds" and some portion cups. Have them work in or near the discussion area, or at their table to count the buttons in their bowl into sets of tens. When they are finished, have them set the cups of ten on the tens mat, and any loose ones on the ones mat, and return to their places in the discussion circle.

11. When all the groups have placed their buttons on the mats and taken their place in the circle, examine the results with the class. How might you organize the buttons so they are easier to count?



Students *There are too many tens!*
Put some of the tens into hundreds. Get the bowls we used before.
Make some of the ones into cups of 10. There are too many on the ones mat!

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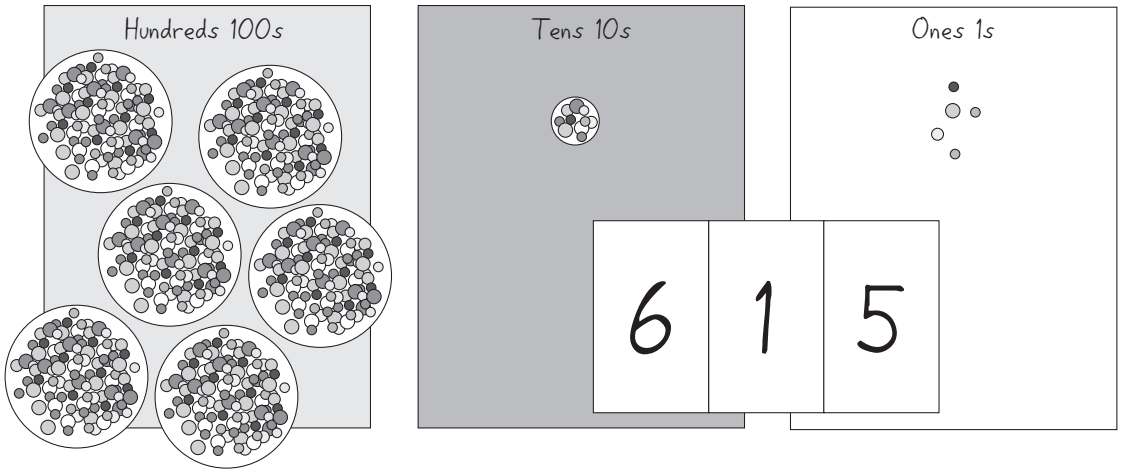
Activity 1 Hundreds of Seeds (cont.)

12. Work with input from the class to regroup the buttons. Create groups of 100 by dumping 10 tens into each empty margarine tub. Have the students count with you by tens each time you create a new group of 100. Ask a couple of students to group the ones into cups of 10 and move them over to the tens mat so they are available to be dumped into bowls of 100.

13. When the buttons have been completely regrouped, ask students to pair-share ideas about the total. Then count the buttons by hundreds, tens, and ones with the class to confirm the total. Record a numeral on each of 3 index cards to match the numbers of hundreds, tens, and ones. Place the cards side by side and ask the children to read the number. Discuss the place value and meaning of each digit. Does the number make sense if you change the order of the digits? Why not?



14. Ask students to find the number on the estimate chart that comes closest to the actual total. Circle that number in red. Is that number less than or greater than the actual total? Write a comparison statement on the board using the greater than or less than sign, taking the opportunity to introduce or review these signs with students. Have children find 3 numbers on the chart that are greater than the actual total, and 3 that are less than the total. Write comparison statements on the board for these numbers as well.

How many "seeds" are in the bag?

~~100~~	300	450
~~62~~	~~120~~	700
~~75~~	175	500
900	208	~~50~~
400	600	550
1,000	2,000	

We counted 615 seeds.

600 was the closest estimate.

Less Than	Greater Than
600 < 615	700 > 615
500 < 615	900 > 615
400 < 615	2,000 > 615

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Activity 1 Hundreds of Seeds (cont.)

Extension

- Leave the estimate chart and at least one example of each type of comparison statement on the board. Assign students to write a collection of 8–10 comparison statements based on the total number of buttons and the numbers on the estimate chart.

Note *Save the Hundreds, Tens, and Ones mats for use in Set A4, Activity 5. You may want to laminate them.*

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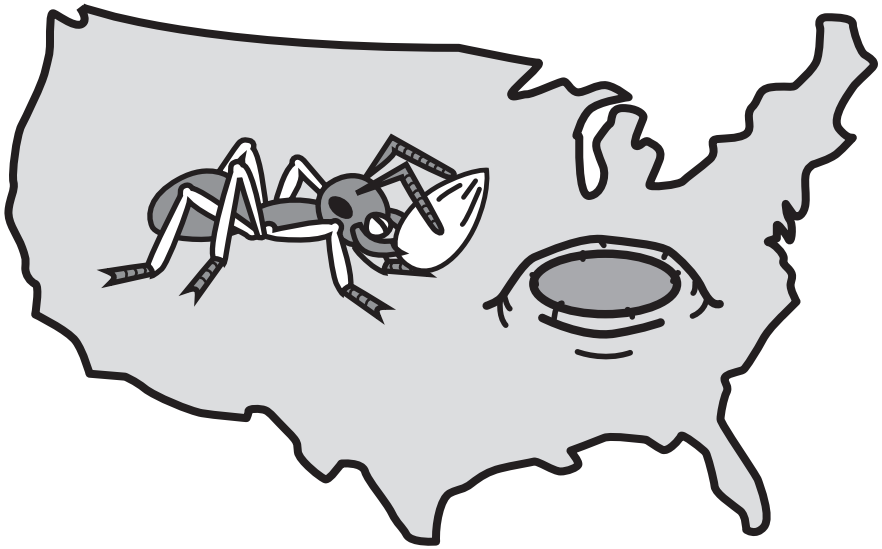
Harvester Ants

(to the tune of "She'll Be Comin' Round the Mountain")



They live in dry, warm, sandy U.S.A.
They harvest seeds to feed the colony.
They pick them up or cut them off,
Then haul them to their "granaries."
These harvesters make special "ant's bread."

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They store the seeds in chambers in their nests,
They throw the husks outside the entrances,
They crush the seeds to make a mash,
Then add saliva—mix it up,
These harvesters make special "ant's bread."

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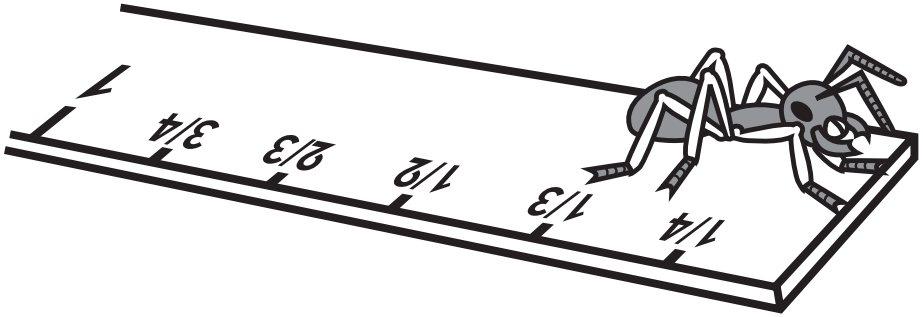
Harvesters have quite a painful sting.
Their legs are long and they're either red or black.
Their nests are mounds with tunnels deep.
They're ants who are one third inch long.
These harvesters make special "ant's bread."

by Donna Burk
illustrated by Tyson Smith



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Set A4 ★ Activity 2

ACTIVITY

Pick Up Sticks

Overview

Students estimate the total number of craft sticks you've placed in 6 containers. Then they work in groups of 4–6 to count the sticks in one of the containers and reconvene to record, compare, and order the number of sticks in each container. Finally, they find the total number of sticks and compare it to their original estimates.

Skills & Concepts

- ★ read and write whole numbers to 1,000
- ★ connect place value models with their numerical equivalents to 1,000
- ★ identify the ones, tens, and hundreds place in a number and the digits occupying them
- ★ compare whole-number quantities through 999 by using the terms is *less than*, is *greater than*, and *is equal to* and the symbols <, >, and =
- ★ write 3-digit numbers in expanded form
- ★ generate estimation strategies to determine the approximate number of objects in a set of no more than 1,000

You'll need

- ★ Pick Up Sticks Record Sheet (page A4.10, run a class set)
- ★ craft sticks (see Advance Preparation)
- ★ rubber bands (100+)
- ★ three 3″ × 5″ index cards, one labeled "100s", one "10s", and one "1s"
- ★ clipboards or other hard writing surfaces

Advance Preparation Find the craft sticks that came with your Number Corner materials. (There were originally 1,000 in the box, but if you've lost a few since, that's okay.) Divide them into 6 baskets or plastic containers, varying the number in each.

Instructions for Pick Up Sticks

1. Place the 6 containers of craft sticks in the center of your discussion circle and invite the students to join you. Explain that you're going to use these sticks to play a game, but you need the students to help you count them today. Ask students to estimate how many sticks there are in all the containers put together. Record their estimates at the board.

How many sticks do you think we have in all?

600	1,000	6,000	900
450	2,000	1,000,000	470
500	390	1,500	750

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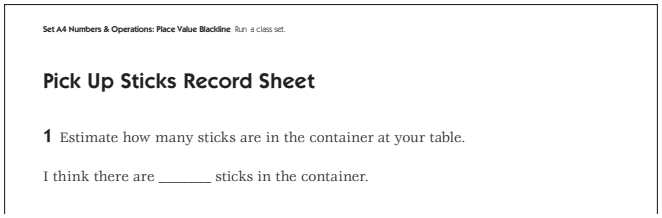
Activity 2 Pick Up Sticks (cont.)

2. Let students know that they'll be working at their tables in groups of 4–6 to count the sticks. Rather than counting the sticks one by one, they'll need to group them by 10s. Take 10 sticks out of one of the containers and show the students how to wrap a rubber band around the bundle. When they get back to their tables, they'll need to dump the sticks out of the container into a pile they can all reach, give everyone some rubber bands, and start bundling. Every time they collect 10 groups of 10, they'll need to use a rubber band to bundle those together to make a set of 100.

3. Then distribute copies of the Pick Up Sticks Record Sheet and review the instructions at the top. Be sure students understand that they need to put their name and date on the sheet and estimate how many sticks are in their container before they start counting. It's okay if they dump the sticks out on the table to get a better view. They may even want to pull off a benchmark of 10, but the idea is to record a quick estimate and get to work counting the sticks. Let them know that they'll complete the rest of the sheet after all the groups have counted their sticks and the class meets back at the discussion circle.


Set A4 Numbers & Operations: Place Value Blackline Run a class set.

Pick Up Sticks Record Sheet

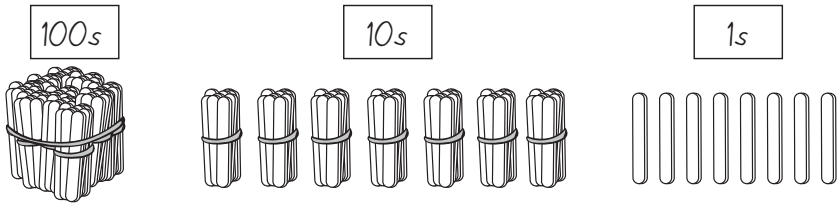
1 Estimate how many sticks are in the container at your table.

I think there are _____ sticks in the container.

4. Send students back to their tables. Give each group a container of sticks and a good supply of rubber bands, and let them go to work. Circulate to provide guidance as needed, and encourage the children to count carefully and work together. You'll know when they're ready to return to the circle because they'll have their sticks laid out in bundles of 100s and 10s, with any extra 1s in a row to the side. Ask early finishers to read quietly until all the groups are ready. (You may also want to have some of these students help at other tables where things are going more slowly.)

5. When all the groups have finished, ask a helper at each table to carefully place the bundles and single sticks back in the container. Have students return to the discussion circle with their container of sticks, pencils, record sheets, and clipboards or other hard writing surfaces (e.g., picture books).

6. Set the 3 index cards you've prepared in the middle of the circle. Invite a helper from one of the groups (it doesn't really matter which) to set the bundles and single sticks from his or her container under the appropriate labels.



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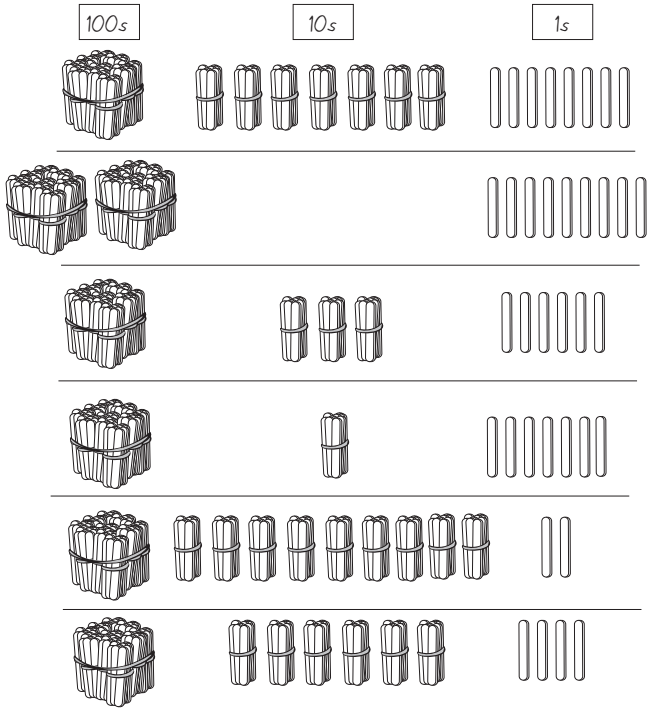
Activity 2 Pick Up Sticks (cont.)

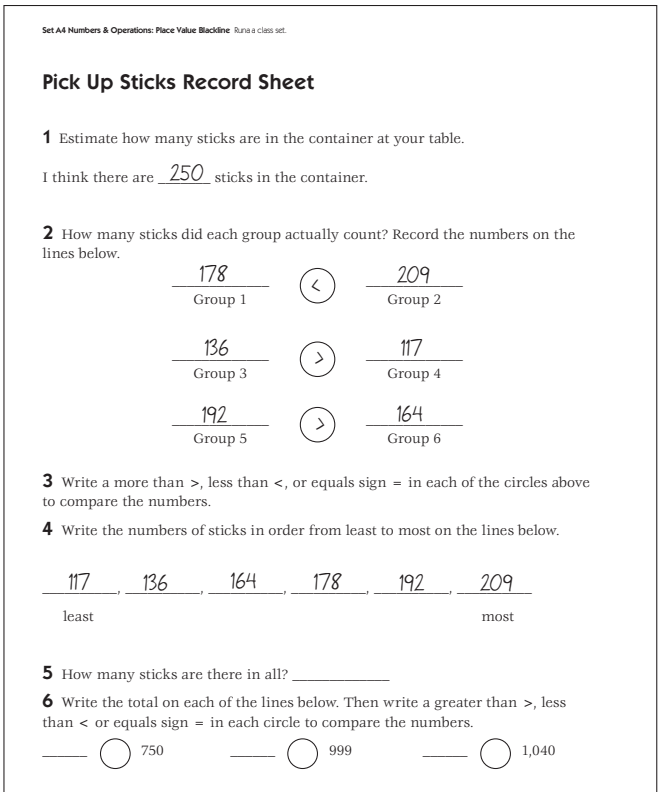
7. Ask students to count the sticks silently and give the thumbs-up sign when they've determined the total. Then invite a couple of volunteers to share and explain their answers.

> ***Alesha*** *It's 178 because there's 1 hundred, 7 tens, and 8 ones.*
>
> ***Eduardo*** *I knew there was 100. Then I went 10, 20, 30, 40, 50, 60, 70. That made 170. Then I counted 8 of the 1s, so that made 178.*

8. Have students record the number in the appropriate location on their sheets.

9. Repeat steps 6–8 until each group has had a turn and all the sticks are on display in the center of the circle. (Have each group lay their sticks in a row below the previous group's.) Then work with the students to complete items 3 and 4 on their sheets. Encourage them to help one another. Model how to use the greater than, less than, and equals signs if necessary.





Set A4 Numbers & Operations: Place Value Blackline Runs a class set.

Pick Up Sticks Record Sheet

1 Estimate how many sticks are in the container at your table.

I think there are 250 sticks in the container.

2 How many sticks did each group actually count? Record the numbers on the lines below.

178 Group 1	<	209 Group 2
136 Group 3	>	117 Group 4
192 Group 5	>	164 Group 6

3 Write a more than >, less than <, or equals sign = in each of the circles above to compare the numbers.

4 Write the numbers of sticks in order from least to most on the lines below.

117, 136, 164, 178, 192, 209

least most

5 How many sticks are there in all? _____

6 Write the total on each of the lines below. Then write a greater than >, less than < or equals sign = in each circle to compare the numbers.

_____ ◯ 750 _____ ◯ 999 _____ ◯ 1,040

10. Have students determine how many sticks there are in all. In order to do this, they'll need to regroup some of the 1s into bundles of 10, and some of the 10s into bundles of 100. Depending on the needs and strengths of your class, you may want to have them record this transaction in the form of a column addition problem on the back of their sheet. (This is an opportunity to share the standard algorithm for addition, although the total can also be found simply by regrouping and counting the sticks.)

11. Once the total has been determined, ask students how it compares with their original estimates. Then have them use the information to complete the rest of the sheet. Place all the sticks, still bundled into 100s, 10s, and 1s into one of the containers for use in Set A4 Activity 3.

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NAME _____ **DATE** _____

Pick Up Sticks Record Sheet

1 Estimate how many sticks are in the container at your table.

I think there are _____ sticks in the container.

2 How many sticks did each group actually count? Record the numbers on the lines below.

_____ Group 1	◯	_____ Group 2
_____ Group 3	◯	_____ Group 4
_____ Group 5	◯	_____ Group 6

3 Write a greater than >, less than <, or equals sign = in each of the circles above to compare the numbers.

4 Write the numbers of sticks in order from least to greatest on the lines below.

_____, _____, _____, _____, _____, _____

least greatest

5 How many sticks are there in all? _____

6 Write the total on each of the lines below. Then write a greater than >, less than < or equals sign = in each circle to compare the numbers.

_____ ◯ 750 _____ ◯ 999 _____ ◯ 1,040

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Set A4 ★ Activity 3

ACTIVITY

Place Value Triple Roll

Overview

Students play a variation of Base 10 Triple Spin, in which they build, record, compare, and order numbers to 999. If you have not already played Base 10 Triple Spin with your class, you'll find it helpful to read Bridges, Volume Two, pages 549–552 before you conduct this activity.

Skills & Concepts

★ read and write whole numbers to 1,000

★ connect place value models with their numerical equivalents to 1,000

★ identify the ones, tens, and hundreds place in a number and the digits occupying them

★ compare whole-number quantities through 999 by using the terms is *less than*, is *greater than*, and *is equal to* and the symbols <, >, and =

★ write three-digit numbers in expanded form

Recommended Timing

Anytime after Set A4 Activity 2

You'll need

★ Place Value Triple Roll Record Sheets 1 and 2 (pages A4.14 and A4.15 back-to-back class set plus 1 for yourself)

★ craft sticks bundled into 100s, 10s, and 1s from Set A4 Activity 2 (9 hundreds, 9 tens, and 9 single sticks)

★ base 10 pieces (9 mats, 9 strips, and 9 units)

★ 2 cafeteria trays (see Advance Preparation)

★ seven 3″ × 5″ index cards (see Advance Preparation)

★ blue masking tape (see Advance Preparation)

★ two pieces of 3″ × 5″ construction paper, one red and the other blue

★ a die numbered 4–9

★ clipboards or other hard writing surfaces

Advance Preparation Use 6 of the index cards to prepare 100s, 10s, and 1s labels, two of each. Write the word "More" on the front of the seventh card, and the word "Less" on the back. Place the collection of sticks on one tray and the base 10 pieces on the other. Divide the floor area in the middle of your discussion circle with a 3′–4′ length of blue masking tape.

Instructions for Place Value Triple Roll

1. Lay out the 100s, 10s, and 1s cards you've prepared, one set on either side of the blue tape line. Have students join you in the circle. They'll need to bring their pencils and clipboards or other hard writing surfaces with them.

2. Explain that you're going to play a game with the sticks they counted and bundled during the previous activity. Divide the group into 2 teams, the Reds and the Blues. Roll the die to see which team will go first, and give that team their choice of collecting bundled sticks or base 10 pieces during the game. Place the blue pieces of construction paper on the Blue team's side and the red pieces on the Red team's side.

3. Next, show students your "More/Less" card. Hold it above your head and let it fall to the floor. Whichever side lands up determines whether the teams will play for more or less in the first round. After that's been determined, hand out copies of the Place Value Triple Roll Record Sheet. Ask students to

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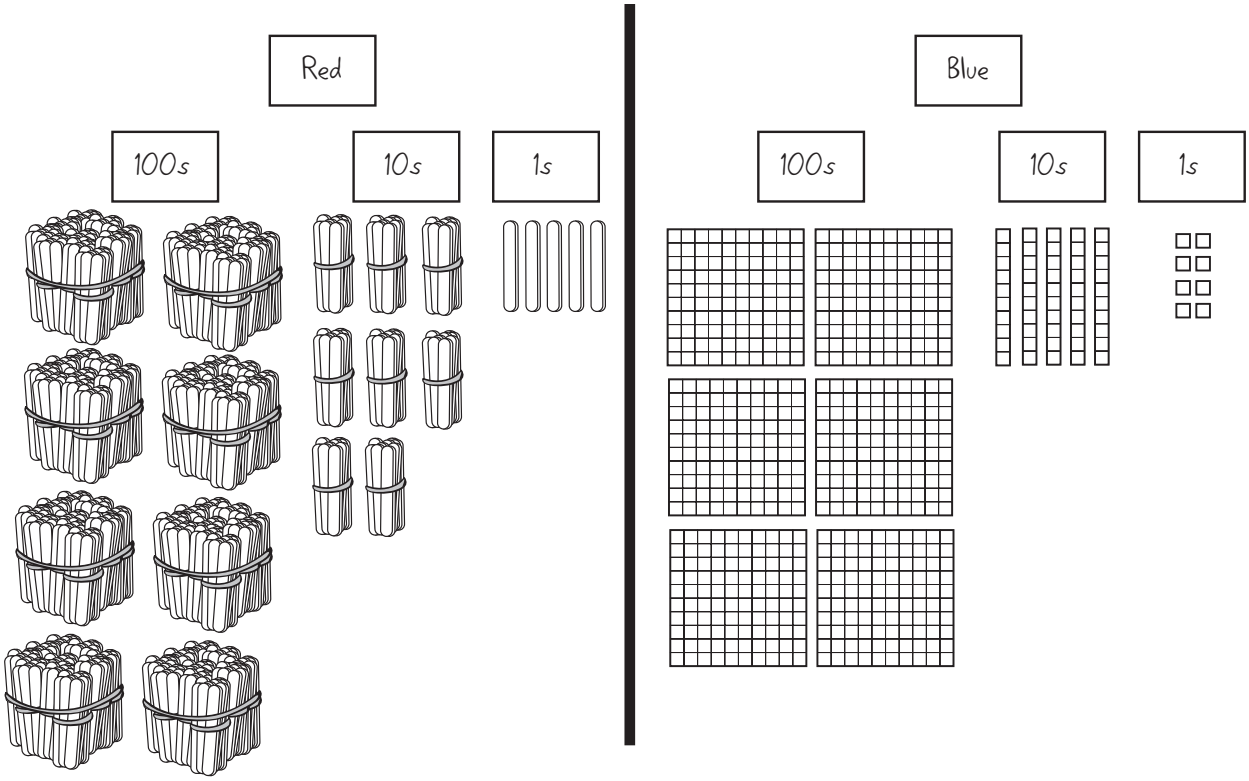
Activity 3 Place Value Triple Roll (cont.)

label the sheet with their name and date, and circle whether they're playing for more or less in Round 1. (Tape a copy of the record sheet nearby so you can track the game along with the children.)

4. Now have a member of the first team roll the 4–9 die and report the number rolled. Ask the team to decide whether they want to take that number in 100s, 10s, or 1s, and give them a minute to discuss the issue. Their choice will be influenced by whether the teams are playing for more or less. Once they've made a decision, they can't change their minds. Let them know that they'll get 3 rolls. They have to take one of the numbers rolled in 100s, one in 10s, and one in 1s, but they can take them in any order.

5. Once they've decided, have a member of the team use the sticks or pieces to set out the designated number of 100s, 10s, or 1s on their side of the blue line.

6. Give the other team a turn. Then have the two teams take turns until both have taken 3 rolls.



Jose *Oh no! I told you we should have taken the 6 in 1s instead of 100s just in case we rolled a higher number later. Now the Reds won!*

Abby *They would have won anyway because they got two 8s. The highest number we could have made was 865, and they got 885.*

7. Record the results for both teams on your record sheet as students do so on theirs. Ask them to draw boxes to show the 100s, lines to show the 10s, and dots to show the 1s. Have them compare the teams' scores at the bottom of the Round 1 box. (The order in which they write the scores doesn't matter as long as they place a sign between the two that shows the correct relationship.)

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Activity 3 Place Value Triple Roll (cont.)

Set A4 Numbers & Operations: Place Value Blackline Run a class set.

NAME Cole DATE April 2

Place Value Triple Roll Record Sheet 1

Round 1	**Are you playing for more or less?**		
100s	10s	1s	Blue team total
	IIIII	:: ::	658
100s	10s	1s	Red team total
	IIIIIIII	:: ::	885
Use the more than >, less than <, or equals sign = to compare the scores.			
658 < 885			

8. Ask helpers to clear the floor area, placing the sticks and pieces back on their trays. Play 2 more rounds of the game, repeating steps 3–7 each time. Be sure to drop the "More/Less" card at the beginning of each new round so students know whether they're playing for more or less. The team that wins the most rounds wins the game.

9. At the end of the third round, have students complete the lower half of the second page of the record sheet. Encourage them to help each other, and provide modeling and guidance as needed. The last task on the sheet is an optional challenge in which students find each team's "grand total" and flip the "More/Less" card to see who wins the game.

Put the 6 scores in order from least to most.

_____, _____, _____, _____, _____, _____

least most

CHALLENGE

Add the 3 scores for each team below. Then flip the More/Less card to see who wins the entire game. Circle the winning team.

Blue Team			
	100s	10s	1s
Round 1			
Round 2			
Round 3			
Total			

Red Team			
	100s	10s	1s
Round 1			
Round 2			
Round 3			
Total			

NAME _____ **DATE** _____

Place Value Triple Roll Record Sheet 1

Round 1	**Are you playing for more or less?**		
100s	10s	1s	Blue team total
100s	10s	1s	Red team total
Use the greater than >, less than <, or equals sign = to compare the scores.			

_____ ◯ _____

Round 2	**Are you playing for more or less?**		
100s	10s	1s	Blue team total
100s	10s	1s	Red team total
Use the greater than >, less than <, or equals sign = to compare the scores.			

_____ ◯ _____

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NAME _____ **DATE** _____

Place Value Triple Roll Record Sheet 2

Round 3	**Are you playing for more or less?**		
100s	10s	1s	Blue team total
100s	10s	1s	Red team total
Use the greater than >, less than <, or equals sign = to compare the scores.			

_____ ◯ _____

Put the 6 scores in order from least to most.

_____, _____, _____, _____, _____, _____

least greatest

CHALLENGE

Add the 3 scores for each team below. Then flip the More/Less card to see who wins the entire game. Circle the winning team.

Blue Team			
	100s	10s	1s
Round 1			
Round 2			
Round 3			
Total			

Red Team			
	100s	10s	1s
Round 1			
Round 2			
Round 3			
Total			

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Set A4 ★ Activity 4

ACTIVITY

Target 700

Overview

Target 700 is another game designed to provide students with opportunities to develop deep understandings of numbers to 999.

Skills & Concepts

★ read and write whole numbers to 1,000

★ connect place value models with their numerical equivalents to 1,000

★ identify the ones, tens, and hundreds place in a number and the digits occupying them

★ compare whole-number quantities through 999 by using the terms is *less than*, is *greater than*, and *is equal to* and the symbols <, >, and =

★ write three-digit numbers in expanded form

Recommended Timing

Anytime after Set A4 Activity 3

You'll need

★ Target 700 Record Sheet (page A4.24 class set plus 1 for yourself)

★ base 10 pieces (25 mats, 18 strips, and 18 units; have extras available)

★ 2 cafeteria trays (see Advance Preparation)

★ nine 3″ × 5″ index cards (see Advance Preparation)

★ blue masking tape (see Advance Preparation)

★ two pieces of 3″ × 5″ construction paper, one red and the other blue

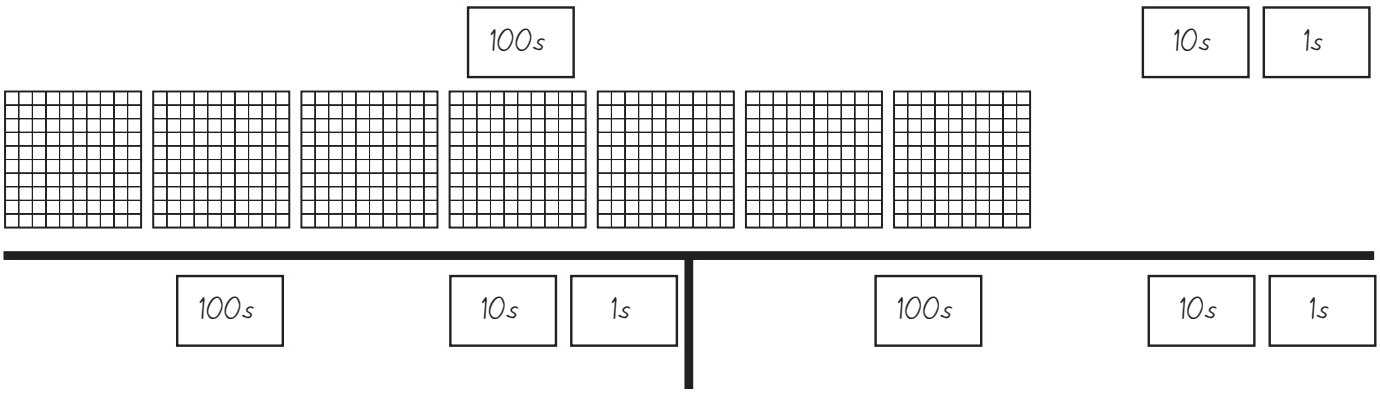
★ a die numbered 4–9

★ clipboards or other hard writing surfaces

Advance Preparation Use the index cards to prepare 100s, 10s, and 1s labels, three of each. Keeping 7 mats in reserve, divide the rest of the base 10 pieces into 2 equal sets of 9 mats, 9 strips, and 9 units, and place one set on each tray. Divide the floor area in the middle of your discussion circle with a 3′–4′ length of blue masking tape, and add another 3′–4′ length across the top to form a "T".

Instructions for Target 700

1. Lay out the 100s, 10s, and 1s cards you've prepared, one set on either side of the blue tape line. Lay the third set of place value labels, along with 7 mats at the top of the blue line. Have students join you in the circle. They'll need to bring their pencils and clipboards or other hard writing surfaces with them.



Activity 4 Target 700 (cont.)

2. Explain that you're going to play another place value game today. Divide the group into 2 teams, the Reds and the Blues. Roll the die to see which team will go first. Place the blue pieces of construction paper on the Blue team's side and the red pieces on the Red team's side.

3. Call students' attention to the collection of base 10 pieces above the blue line. How many are there in all? Ask them to count silently and give the thumbs up sign when they know. Ask a couple of volunteers to share and explain their answers.

4. Explain that this game is a lot like Place Value Triple Roll. Each team will get 3 turns to roll a die numbered 4–9. Each time they roll, they have to take the number of rolls in 100s, 10s, or 1s. They can choose the order in which they take the 100s, 10s, and 1s, but they have to take each denomination once in the course of three rolls. The goal in this game is to make a number as close to 700 as possible. The team that gets closest wins the round, and you're going to play 3 rounds. This time, both teams will take their rolls in base 10 pieces.

5. Now have a member of the first team roll the 4–9 die and report the number rolled. Ask the team to decide whether they want to take their first roll in 100s, 10s, or 1s, and give them a minute to discuss the issue. Once they've decided, have a member of the team use the pieces from one of the trays to set out the designated number of 100s, 10s, or 1s on their side of the blue line.

6. Give the other team a turn. Then have the two teams take turns until both have taken 3 rolls.

7. Record the results for both teams on your Target 700 Record Sheet as students do so on theirs. Tell the students, that instead of sketching the 100s, 10s, and 1s, they are to record their results in expanded notation and show the totals. After the totals have been determined, students are asked to record 700 and the two scores in order from least to greatest. Use your record sheet to model these processes as necessary.

Set A4 Numbers & Operations: Place Value Blackline Run a class set plus 1 extra.

Target 700 Record Sheet

Round 1	100s	10s	1s	Total
Blue Team	800 +	40 +	5 =	845
Red Team	600 +	80 +	4 =	684

Write 700 and both teams' scores in order from least to most. Circle the score that is closer to 700.

684 < 700 < 845

Round 2	100s	10s	1s	Total
Blue Team	_____ +	_____ +	_____ =	
Red Team	_____ +	_____ +	_____ =	

Write 700 and both teams' scores in order from least to most. Circle the score that is closer to 700.

_____ < _____ < _____

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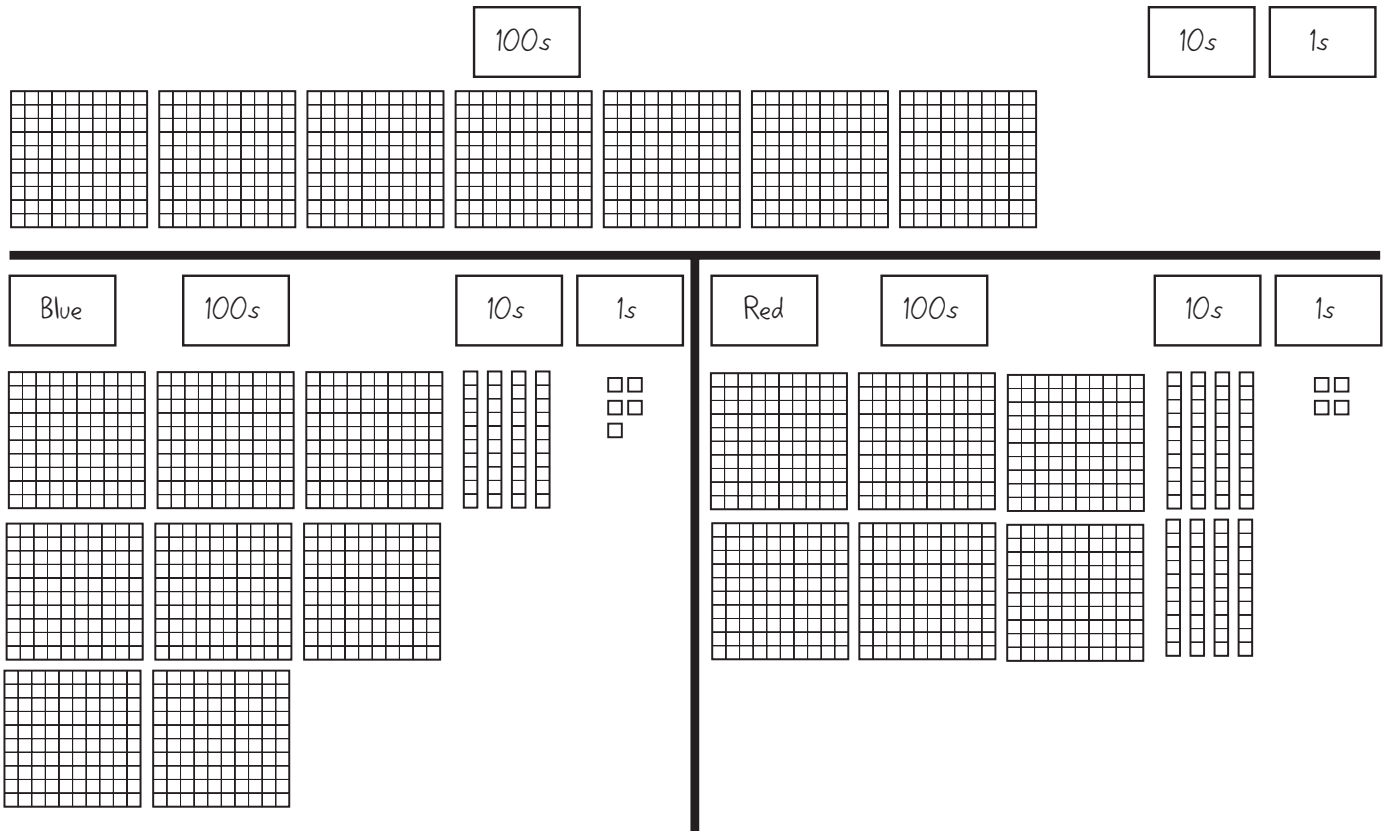
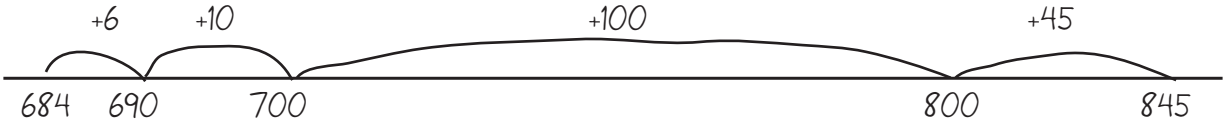
Activity 4 Target 700 (cont.)



8. Before you move on to the next round, ask students to determine which of the 2 scores is closer to 700, and circle it. Some children may want to use base 10 pieces to compare each of the scores to 700, or do some figuring on their record sheet. Counting up from the lower to the higher number is another strategy we've seen students use. After they've had some time to work with the problem, ask volunteers to share their solutions and strategies with the class. Record some of their ideas on the board. Using an open number line to illustrate counting upward is particularly helpful. If this strategy doesn't emerge from your group, share it yourself and encourage students to use it as you play the rest of the game. It's more accessible to some second graders than subtracting to find the differences and encourages good mental math.

> ***Alesha*** *684 is way closer to 700. I counted up. 84 up to 90 is 6, and then 10 more gets you up to 700, so it's only 16 away.*
>
> ***Shelby*** *845 is way more than 700 because you have to go 100 up to 800, and then 45 more.*



9. Play 2 more rounds of Target 700. The team that scores closer to 700 more times wins.

Extension

- Revisit this game several times with your class. Change the target from 700 to 750 or 775 for a more challenging version.

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NAME _____ **DATE** _____

Target 700 Record Sheet

Round 1	100s	10s	1s	Total
Blue Team	_____ +	_____ +	_____ =	
Red Team	_____ +	_____ +	_____ =	
Write 700 and both teams' scores in order from least to greatest. Circle the score that is closer to 700. _____ < _____ < _____				

Round 2	100s	10s	1s	Total
Blue Team	_____ +	_____ +	_____ =	
Red Team	_____ +	_____ +	_____ =	
Write 700 and both teams' scores in order from least to greatest. Circle the score that is closer to 700. _____ < _____ < _____				

Round 3	100s	10s	1s	Total
Blue Team	_____ +	_____ +	_____ =	
Red Team	_____ +	_____ +	_____ =	
Write 700 and both teams' scores in order from least to greatest. Circle the score that is closer to 700. _____ < _____ < _____				

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Set A4 ★ Activity 5

ACTIVITY

4-Digit Shuffle

Overview

Students draw numbered index cards from a deck and place them in a pocket chart to form and read 1-, 2-, 3-digit numbers. Each time they form a 3-digit number, they work together to build it with place value pieces and record it using expanded notation. After the class has built several 3-digit numbers, a fourth place is added, and children form, read, and discuss the place values of 4-digit numbers.

Skills & Concepts

★ connect place value models with their numerical equivalents to 1,000

★ identify the ones, tens, and hundreds place in a number and the digits occupying them

★ write 3-digit numbers in expanded form

★ analyze the magnitude of digits in numerals through 9,999 on the basis of their place values

You'll need

★ 24 3″ × 5″ index cards (see Advance Preparation)

★ a 9″ × 12″ piece of green construction paper (see Advance Preparation)

★ Hundreds, Tens, and Ones mats from Set A4, Activity 1

★ base 10 pieces (11 mats, 10 strips, 10 units)

★ a pocket chart

★ individual chalkboards/whiteboards, chalk/dry wipe pens, erasers

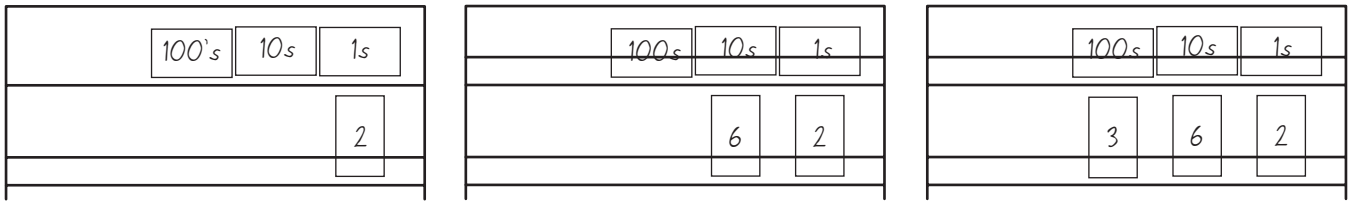
Advance Preparation Use a wide-tipped permanent marker to write a numeral on each of 20 cards. Make two cards for each numeral, 0 through 9. Use the other 4 cards to make place value labels: ones, tens, hundreds, and thousands. Write "Thousands" on the green construction paper. You may want to laminate the paper and the cards.

Instructions for 4-Digit Shuffle

1. Ask students to pick up chalkboards/whiteboards, chalk/dry wipe pens, and erasers, and meet you in the discussion area. Have them form a semi-circle where they can see the pocket chart. As they watch, post the ones, tens, and hundreds labels across the top row of the pocket chart. Hold the thousands label in reserve for now. Then show students the 20 numeral cards. Shuffle these cards and fan them out in your hand in such a way that students cannot see the writing on them.

2. Invite a volunteer to pick a card from your hand and post it in the second row of the pocket chart below the ones label. Have the class read the numeral together, and then choose another volunteer to select a second card from your hand. Ask him or her to post it in the pocket chart below the tens label. Work with the class to read the 2-digit number that results.

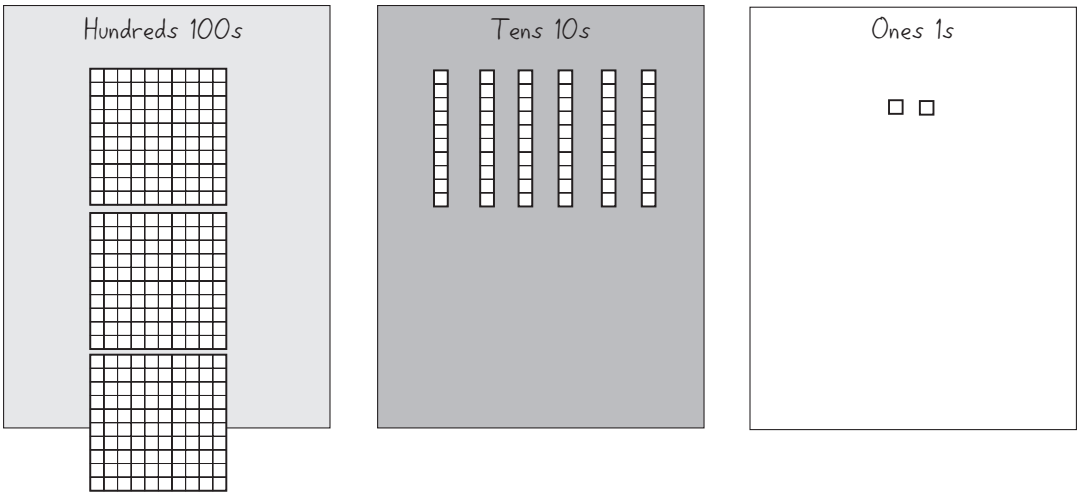
3. Ask a third volunteer to choose a card and post it in the pocket chart below the hundreds label. Work with the class to read the 3-digit number that results.



Activity 5 4-Digit Shuffle (cont.)

Students *First it was 2. Then it was 62 because Marco got a 6.*
Then Denice got a 3, and that put on some hundreds, so it's 362 now.

4. Set out the Hundreds, Tens, and Ones mats in the middle of the semi-circle. Choose several helpers to build the number with place value pieces, setting the mats, strips, and units in the appropriate locations. Have the class count the pieces to make sure they match the number in the pocket chart.



Students *100, 200, 300, 310, 320, 330, 340, 350, 350, 360, 361, 362 – yep, it's 362!*

5. Write two equations to match the number as students do so on their chalkboards or whiteboards. Press students to explain how and why the two equations mean the same thing.

$$300 + 60 + 2 = 362$$
$$362 = 300 + 60 + 2$$

Students *You can write it both ways. It doesn't matter.*
Equals is like saying the same as. 362 is the same as 300 + 60 + 2.
They are kind of like the opposite of each other, but they both work.

6. Repeat steps 2–5 several times. Clear the cards out of the pocket chart, and have students remove the base ten pieces from the mats and erase their boards each time. After the second repetition, ask students to record the equations on their own, and call on volunteers to share their work with the class.

7. After the class has built and recorded four or five 3-digit numbers, place the thousands card in the pocket chart, and set the green Thousands mat to the left of the Hundreds mat on the floor. Ask students to share what they know about 1,000. How does it relate to 100? How much is 1,000? Have they ever seen a thousand of anything? Would a thousand children fit into your classroom? Would the cafeteria or the gym hold that many students? Can they think of a place large enough to hold a thousand second graders?

8. As students watch, set 10 units on the Ones mat. Can these be traded for a single piece? Yes, so invite one of the children to move the collection of 10 units to the Tens mat and replace them with a single strip. Place 9 more strips on the Tens mat as students count with you by tens. Invite another student to move the 10 strips over to the Hundreds mat and replace them with a single mat. Place 9 more mats on

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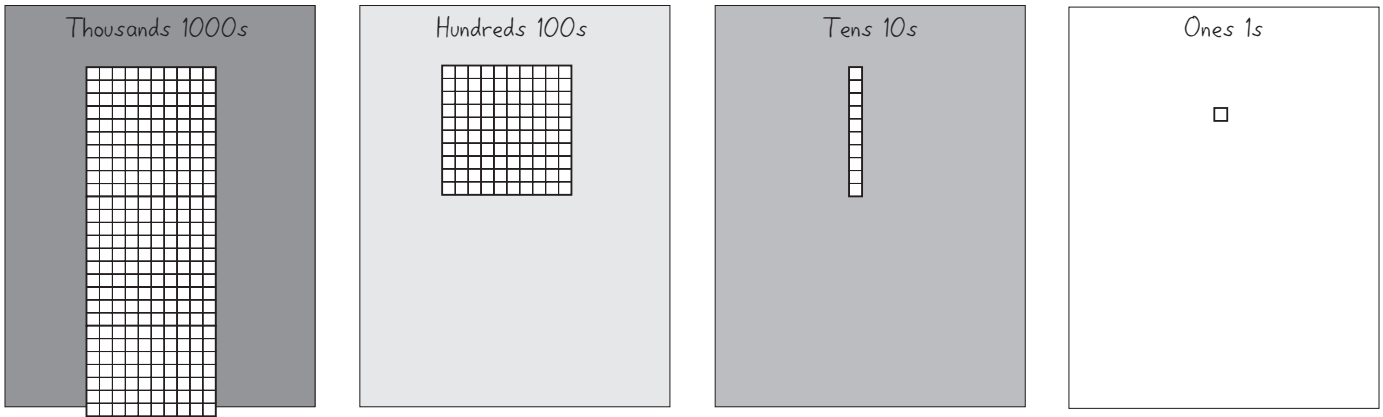
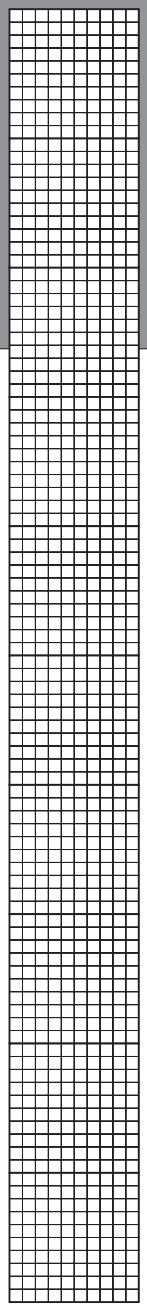
Activity 5 4-Digit Shuffle (cont.)

the Hundreds mat as students count with you by hundreds to one thousand. Can the 10 mats be traded for a single piece? Discuss this briefly, and then have students help you lay the mats out in a line. Then set out 1 mat, 1 strip, and 1 unit. Ask students to pair-share observations, and then invite volunteers to share their thinking with the class.





Students *A thousand is really huge!*
A thousand is ten hundreds. It goes 100, 200, 300, 400, 500, 600, 700, 800, 900, 1,000!
The thousand is like a really giant strip, do you see?
Yeah! Instead of 10 ones in a line, it's 10 hundreds in a line.

9. Ask students to help you clear the base ten pieces away for now. Then call up 4 volunteers in turn to choose numeral cards from your hand and place them in the pocket chart. Read each number as it is formed, first the 1-digit number, then the 2-digit number, then the 3-digit number, and finally, the 4-digit number.

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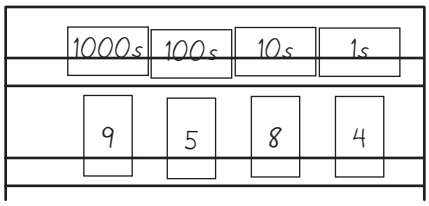
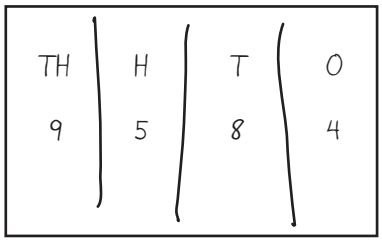
Activity 5 4-Digit Shuffle (cont.)

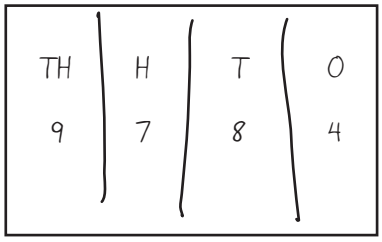


Students *Nine thousand, five hundred eighty-four.*
That's huge! One thousand is big enough. That number has 9 thousand in it!

10. Now have students draw 4 columns on their boards and label each with an abbreviation for the place value word: TH, H, T, O. Then have them copy the number on the pocket chart, placing each digit in the appropriate column.



11. Finally, play a few rounds of a digit-switching game, in which you ask students to replace the number in one of the columns with a different number. For instance, you might say, "Change the digit in the hundreds place to a 7." Each time they change a digit, do so in the pocket chart to confirm their work, and have them read the new number. You can also ask them to decide whether the new number is greater than or less than the last one they had on their boards.



Students *Nine thousand, seven hundred eighty-four.*
That number is bigger. There are more hundreds in it.
It was a 5 in the hundreds place. Now it's a 7. It has to be bigger.

Extension

- Repeat part or all of this activity more than once to give students more practice with expanded notation and place value. The digit switching game described in steps 9–11 is fast, easy, requires little in the way of materials, and can be played more than a few times during Number Corner the last month or two of school.

INDEPENDENT WORKSHEET

Use Set A4 Independent Worksheets 1 and 2 to provide students with more practice connecting place value models with their numerical equivalents to 1,000, identifying the ones, tens, and hundreds place in a number and the digits occupying them, writing three-digit numbers in expanded form, and analyzing the magnitude of digits in numerals through 9,999 on the basis of their place values.

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Set A4 ★ Activity 6

ACTIVITY

Will the Real Value Please Stand Up?

Overview

Students work in groups of four to create sets of place value cards and use them to play a whole group game.

Skills & Concepts

- ★ connect place value models with their numerical equivalents to 1,000
- ★ identify the ones, tens, and hundreds place in a number and the digits occupying them
- ★ write 3-digit or 4-digit numbers in expanded form
- ★ analyze magnitude of digits in numerals through 9,999 on the basis of their place values (see Extensions)

You'll need

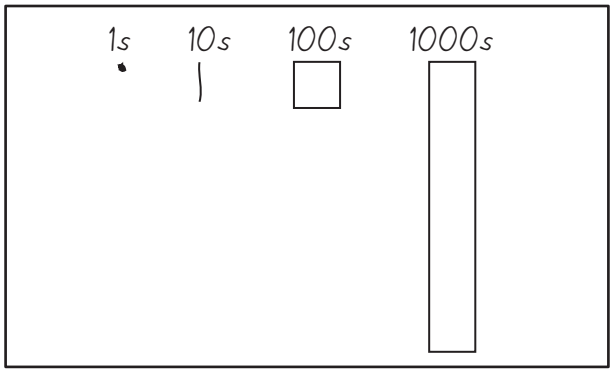
- ★ 5″ × 8″ index cards or pieces of white construction paper, class set, plus 8 extra
- ★ pencils, black crayons or felt markers
- ★ individual chalkboards/whiteboards, chalk/dry wipe pens, erasers
- ★ several small slips of scratch paper

Instructions for Will the Real Value Please Stand Up?

1. Assign students to work in groups of 4, and assign each student within a group the letter A, B, C, or D. Explain that they are going to work in their teams to create cards for a new place value game. Write the following instructions on the board as students watch:

A: Ones
B: Tens
C: Hundreds
D: Thousands

2. Remind students of the conventions you have developed this year for quickly sketching units (1s), strips (10s), and 100s (100s). Introduce a way to sketch thousands right now.



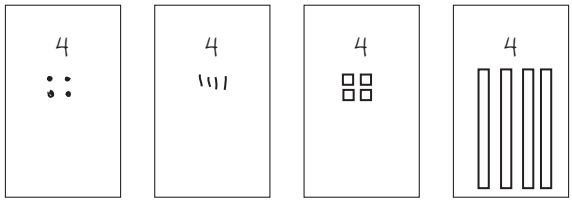
Teacher *We're going to use dots for ones, lines for tens, squares for hundreds, and long rectangles for thousands.*

Activity 6 Will the Real Value Please Stand Up? (cont.)

3. Show students the 5″ × 8″ cards or pieces of construction paper and explain that you are going to come around in a minute and give out the cards. When you do, you will assign each group its own number. If you assign a group the number 4, for instance, each person in that group will write the numeral 4 at the top of the card, large enough to see easily. Then Student A will draw 4 dots, Student B will draw 4 lines, Student C 4 squares, and Student D 4 long rectangles.

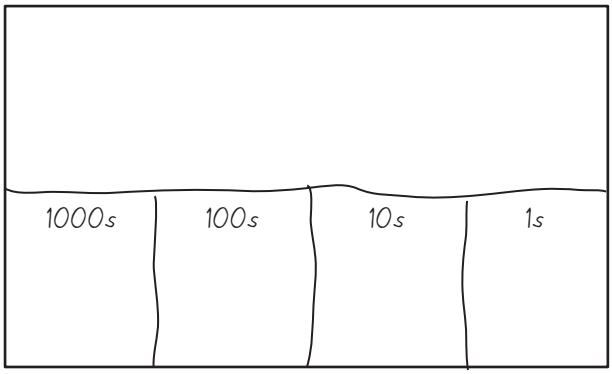
Note *It is important that each student in a group work with the same number. If you have a small class, you may only be able to assign the numbers 1 through 6, or perhaps you'll choose to assign 2 through 7, or 3 through 8 instead. If you prefer to stick with 3-digit numbers, assign students to groups of three instead of four. In classes with over 27 students, one group of three can be assigned 0. These students can write the numeral 0 at the top of their cards and decorate them with colorful designs. In classes of over 30, include the thousands place, or ask a few of the children to be game helpers.*

4. Make a quick set of four cards to demonstrate as students watch. Work in black crayon or felt marker. Acknowledge that students assigned higher numbers may have to make the thousands a little smaller to fit them on the card.



5. Ask students to each get out a pencil and a black crayon or felt marker. As they do so, circulate from one group to the next to distribute cards, and assign each group its own number. Ask them to go to work as soon as they get their cards.

6. As students finish making their cards, label your whiteboard as shown below. Write the place values high enough to show over the tops of children's heads, but leave room up above to do some other recording. Distribute chalkboards/whiteboards, chalk/dry-wipe pens, and erasers, and ask students to replicate your drawing on one half of their board, leaving the other half free for now.



7. When most students have finished making their cards and preparing their whiteboards, reconvene the class and start the game. Show them one of your small slips of scratch paper. Then write a 4-digit number on the slip in such a way that they cannot see what you are writing. Explain that you will tell

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Activity 6 Will the Real Value Please Stand Up? (cont.)

them which digit goes in each place. As you do, the student holding the correct card will come and stand where he or she belongs, turn around, and hold up his or her card for everyone to see. If they listen carefully enough, they will be able to figure out what number you have written on the paper.

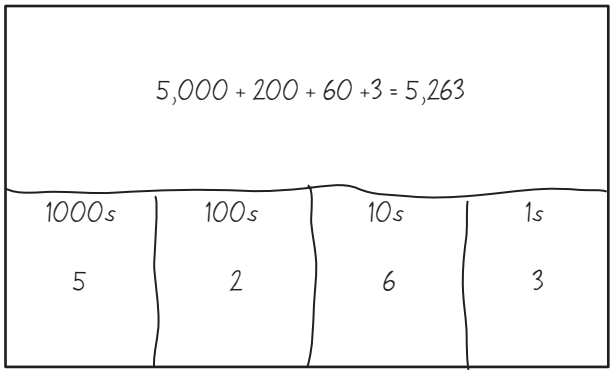
8. Before you start playing, pose a few hypothetical situations.

> ***Teacher*** *What if I say my number has a 6 in the tens place? Who should come up to the whiteboard?*
>
> ***Lin*** *Me! I have a 6 on my card!*
>
> ***David*** *But you have 6 hundreds on your card. I have 6 tens on my card. I would go up there, right?*
>
> ***Lin*** *Oh, I get it. But if Ms. Nolan said 6 hundreds, that would be me.*

9. When most students understand what to do, tell them to pay very close attention, and give them 4 clues. Have the student holding the correct card come up to the whiteboard as you give each clue. Here is an example:

- My number has a 6 in the tens place.
- My number has a 2 in the hundreds place.
- My number has a 3 in the ones place.
- My number has a 5 in the thousands place.

10. When all four students are standing, have the rest of the class read the number they have formed. Then have each of the students write their numeral on the whiteboard in the appropriate place. Have them return to their seats and ask the whole class to write the number on their boards, locating each numeral in the correct column. Ask them to read the number again, and then write an equation to match. Demonstrate at the board so they can follow along if they need to.



11. Finally, show students the number you wrote on your slip of paper at the beginning of the game. Does their number match?

12. Play more rounds of the game as time allows. Then ask students to put their name on the back of their card. Collect the cards and save them to play the game again. Once students get comfortable with the game, they can take turns writing the mystery numbers on slips of paper and giving the clues to their classmates.

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NAME _____ **DATE** _____

Set A4 ★ Independent Worksheet 1

INDEPENDENT WORKSHEET

Large Numbers

1 Trace the numerals and the words.

1 one 2 two 3 three 4 four 5 five

6 six 7 seven 8 eight 9 nine 10 ten

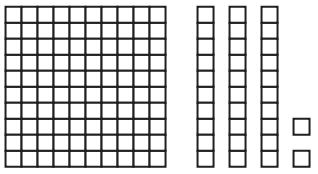
20 twenty 30 thirty 40 forty

50 fifty 60 sixty 70 seventy

80 eighty 90 ninety 100 one hundred

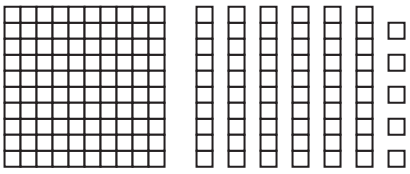
2 Label each set of base 10 pieces with the correct number name.

example



one hundred thirty two

a



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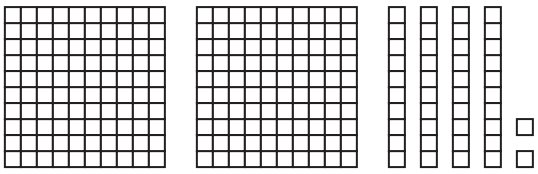

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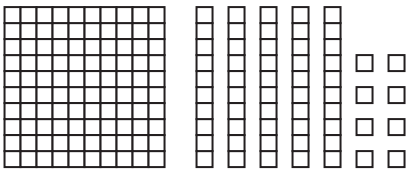

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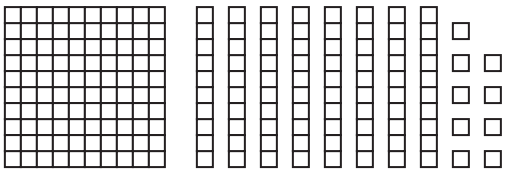

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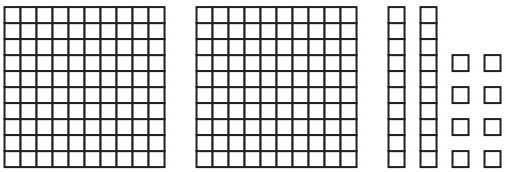

Independent Worksheet 1 Large Numbers (cont.)

3 Read each number. Then write it in expanded form.

example three hundred twenty-nine $329 = 300 + 20 + 9$	**a** four hundred thirty-eight
b two hundred sixteen	**c** five hundred seventy-three
d one hundred ninety-eight	**e** six hundred three
f nine hundred sixty-seven	**g** eight hundred seventeen

4 Add the numbers.

a 300 + 60 + 5 = _____ **b** 500 + 40 + 5 = _____ **c** 200 + 10 + 6 = _____

d 400 + 90 + 9 = _____ **e** 100 + 10 + 8 = _____ **f** 600 + 7 = _____

g	**h**	**i**	**j**	**k**	**l**	**m**
300	400	600	800	700	100	900
40	20	30	70	80	10	30
+ 5	+ 6	+ 7	+ 8	+ 9	+ 5	+ 6
____	____	____	____	____	____	____

5 Circle One

a The 4 in 574 is in the	ones place	tens place	hundreds place.
b The 4 in 493 is in the	ones place	tens place	hundreds place.
c The 4 in 114 is in the	ones place	tens place	hundreds place.
d The 4 in 5,348 is in the	ones place	tens place	hundreds place.

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NAME _____ **DATE** _____

Set A4 ★ Independent Worksheet 2

INDEPENDENT WORKSHEET

Thinking about Place Value

1 Trace the numerals and the words.

1 one 2 two 3 three 4 four 5 five

6 six 7 seven 8 eight 9 nine 10 ten

11 eleven 12 twelve 13 thirteen

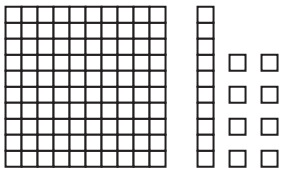
14 fourteen 15 fifteen 16 sixteen

17 seventeen 18 eighteen 19 nineteen

100 one hundred

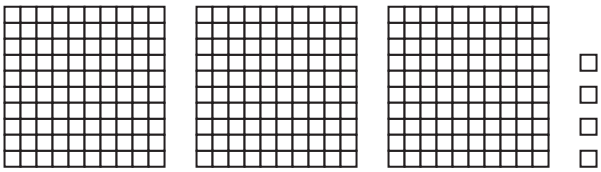
2 Label each set of base 10 pieces with the correct number name.

example

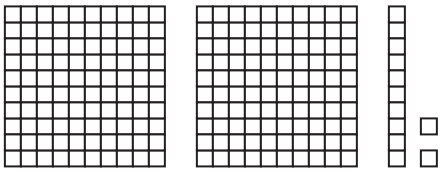


one hundred eighteen

a



b



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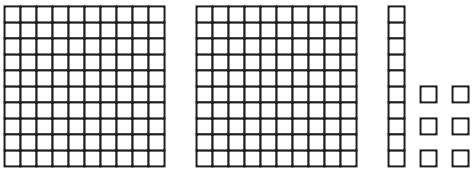
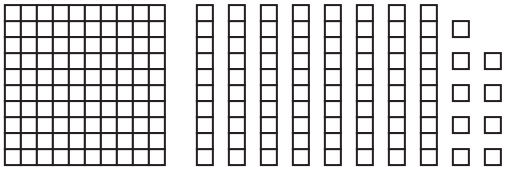
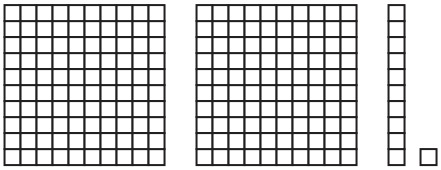


d



e



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Independent Worksheet 2 Thinking about Place Value (cont.)

3 Tell what digit is in each place.

a 643 ____ is in the tens place. ____ is in the ones place. ____ is in the hundreds place	**b** 286 ____ is in the ones place. ____ is in the hundreds place. ____ is in the tens place.
c 119 ____ is in the tens place. ____ is in the hundreds place. ____ is in the ones place.	**d** 903 ____ is in the tens place. ____ is in the ones place. ____ is in the hundreds place
e 2,643 ____ is in the tens place. ____ is in the ones place. ____ is in the hundreds place	**f** 5,502 ____ is in the tens place. ____ is in the ones place. ____ is in the hundreds place

CHALLENGE

4 Solve these number riddles.

a I have a 9 in the tens place. I have a 4 in the hundreds place. The number in my ones place is less than 3. I am an even number. What number am I? _____	**b** I have a 7 in the thousands place. I have a 0 in the hundreds place. I have a 3 in the tens place. The number in my ones place is greater than 7. I am an odd number. What number am I? _____

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