erikson
early mathematics education
INNOVATIONS
Learning Lab #2

Afternoon Handouts
2nd & 3rd

Reprinted from *Reasoning Algebraically About Operations* by D. Schifter, V. Bastable, S.J. Russell & S. Monk (Dale Seymour Publications, 2008).

CASE 7

Adding 1 to an addend

Maureen

GRADE 2, JUNE

I decided to investigate my students' thinking concerning what happens when you add one more to an addend, resulting in an answer that increases by one. I hope to explore these questions: What do my students understand? What do they understand beyond seeing a pattern of adding 1 more to an addend and the answer "going one higher"? How will they explain it? Will they begin to generalize their idea to include other numbers or all numbers?

I recorded the lesson. The following episode includes the highlights of our discussion.

I begin the lesson using some simple doubles. I ask students to pretend they are explaining to a first grader, who doesn't understand, what happens to the numbers when you add one more to one of the addends. I write on the board:

$$4 + 4 = 8 \qquad 4 + 5 = 9$$

Tia begins. She came to our school late in the year and is just beginning to feel comfortable talking about her ideas in math class. Looking at the double 4 + 4 = 8, she explains that the answer is 8 because she counted up from 4 on her fingers. She demonstrates. This is something she has been working on the past few weeks. Some students continue the discussion.

ESTER: If you have 4 + 4 = 8, right? You're adding 1 to the other 4. It gets you to 5. So that's 4 + 5 = 9. (Ester gets cubes to demonstrate.)

TEACHER: What changed in the number sentence? (Referring to the number sentences on the chart board: 4 + 4 = 8, 4 + 5 = 9.)

CONNIE: The 4 changed to a 5. The number always changes. You are just adding one more to the 4.

TEACHER: So did anything else change in these equations?

TIA: You can see a pattern. I see the 8, and I see the 9 and the 4 and the 5.

TEACHER: How come the 8 changed to a 9, Tia?

TIA: If you add 4 and the other 4, you get the answer 8. I see the 8 changed into a 9.

TEACHER: Why did the 8 change to a 9?

TIA: Cause 4 + 5 = 9.

TERRY: Because the 4 and 4; the last 4 gives 1 to the 5 and makes 9.

SEMA: (Gets cubes) You have 4 + 4 = 8. If you add 1 more to one of the 4s it equals 9. So, 5 + 4 = 9.

TEACHER: Anyone else?

CONNIE: If you... Sema says 5 + 4 = 9. They are just adding 1 more and putting it on the 4 so it can turn to a 5.

TEACHER: What else changed besides the 5?

CONNIE: The 8. The 8 changed to a 9.

TEACHER: Why did the 8 change to a 9?

ESTER: Because if you got the 4 and the 4, right? The—well you're adding one more to the other 4. It gives you 5. So that means that 8 changes to a 9.

TEACHER: Let's try something else. First graders might know 5 + 5 = 10. So, what would happen if we changed the number sentence to 5 + 6?

TERRY: It equals 11 because the 5 from 5 + 5 = 10, it changed into a 6. It gives the other 5 a 1, and it changes into a 6 + 5 = 11.

TEACHER: I'm going to make the numbers a little bigger now. 21 + 23.

seems like a big jump

JOE: 44

TEACHER: What if I change it to 21 + 24? What would happen to the answer?

JOE: 45

TEACHER: Pretend that you're explaining to a first grader how the number sentence changes from 21 + 23 = 44 to 21 + 24 = 45.

JOE: The... (Long pause)

I repeat the question.

JOE: Because the 21 stayed the same, and 23 went higher, and the answer changed.

TEACHER: How much did the answer change by?

JOE: One.

TEACHER: Why did it change by 1?

Joe: Because you just add 1 to the 23.

Teacher: Could I do it for other numbers?

Class: Yes.

Teacher: If I did that with another number, what would happen?

Sema: It would go to the next number. You add just 1 more, but if you were adding 2 more, it would go to the number after that one.

Teacher: Can you think of another number sentence?

Connie: 51 + 53 equals... (Thinking it out, she whispers 50 + 50.)

Joe: (To Connie) What's 50 + 50?

Connie: 103

Teacher: You're close.

Connie: 104. I know that 50 + 50 = 100. I forgot to add the other one on the 3.

Teacher: What would your next number sentence be?

Connie: 51 + 54 = 105

Teacher: You didn't do much thinking about that. I didn't see you add the numbers.

Connie: The 53 changes to 1 more, 54, and you just add 1 more, so it's 105—because if you know the first one, you know the second one if you add 1 more.

Teacher: Where did you add 1 more?

Connie: From the 104. I add the 1 more from the 104.

Ester: Connie did not add from the 104. She added 1 more to the 53 to get to 105. She ended up on 54, and she got 105.

Teacher: This is the big question. Ester says you didn't add the 1 to the 104. You added it to the 53 to make it 54. Can anyone talk about that? Where did we add the extra 1 and what happened?

Connie: I agree with Ester. You just added 53 and 1 more to make it a 54.

Teacher: When we did that, what happened?

Connie: It equals 105.

Ester: The answer changed to 105.

Terry: (Looking at the list of numbers) First, you do it with doubles; then, you don't do it with doubles.

Teacher: Does it work when I don't do it with doubles?

Joe: Yes.

TEACHER: How come?

JOE: Because it could work with any number.

TEACHER: Why?

CONNIE: It can work with any number because for the one I worked on, it did. You can do anything with the numbers.

TEACHER: This is a tough question. I think some of you have answered it.

ESTER: You know how people say numbers never stop, so if you can do it with all these numbers, you can do it with the rest of the numbers, cause the numbers never stop, so if the numbers never stop, then you can do it with any kind of number you want. (I'm glad I had a tape recorder to follow this idea!)

JOE: It can work with any number because if it works with 0 + 1 = 1; 0 + 2 = 2.

TEACHER: What does that tell you?

JOE: It will work with any number.

SEMA: You're just adding 1 more to the other number. You'll make the next number after that one.

GIOVANNI: (Hesitantly offers an equation he's not sure will work) 10 + 0 = 10; 10 + 1 = 11.

TEACHER: Did the pattern work?

GIOVANNI: Yes.

At this point, students begin to consider larger numbers.

JOE: 1,000 + 10 = 1,010; 1,000 + 11 = 1,011.

TEACHER: Does the pattern work?

JOE: I don't know. It works with big and small numbers. It's a hard question.

As we take a break, some students "corner me" because they have more ideas that they would like to mention.

JOE: 50,000 + 1 = 50,001; 50,000 + 2 = 50,002.

ESTER and CONNIE: What about times (multiplication)? What about subtraction?

JOE: Adding one more to the number you had...to any number you pick, it changes 1 higher than the other one, than the other number. 10 + 10. 10 + 11. The 10 changes 1 higher.

TEACHER: What else changes?

JOE: The answer.

I am surprised and impressed by how long these second-grade students "stayed" with this lesson, thinking hard and listening carefully to their classmates' ideas. They seemed to enjoy the give-and-take of the discussion.

In this lesson, students began to consider a wider variety of numbers than in previous lessons. I feel some students were seeking a different and new way to "prove" their conjecture.

In reviewing the lesson, I notice a "progression of ideas." I started the lesson by presenting smaller doubles 4 + 4 = 8 and 4 + 5 = 9. Soon, the students began to explore other possibilities: non-doubles. Connie introduced her own examples of 51 + 53 and 51 + 54. Joe wondered what would happen if 0 was one of the addends. This seemed like a different situation to him, but he worked through it. Next, the class tried bigger numbers 1,000 + 10; 1,000 + 11; 50,000 + 1; 50,000 + 2. As the lesson was winding down, Connie and Ester wondered, "What about times and subtraction?" As the tape ran out, Joe made what I consider a clear generalization, "Adding one more to the number you had—to any number you pick—it changes one higher than the other one, than the other number: 10 + 10 and 10 + 11. The 10 changes one higher." I questioned Joe, "What else changes?" Joe responded, "The answer."

Lesson 3 Every Number Has Its Place

Lesson Overview

Estimated Class Sessions 2

This activity reviews grouping by ones, tens, and hundreds. Base-ten pieces are presented as a convenient tool for representing quantities.

Key Content

- Grouping and counting by ones, tens, and hundreds.
- Representing two- and three-digit numbers using connecting cubes, base-ten pieces, place value charts, and symbols.

Key Vocabulary

- base-ten pieces
- bit
- flat
- place value
- skinny

Math Facts

DPP item J provides practice with addition math facts.

Homework

Assign the *Building Numbers* Homework Pages.

Assessment

1. Students complete the *What's Another Way?* Assessment Pages.
2. Use Assessment Indicator A2 and the *Observational Assessment Record* to record students' abilities to represent numbers greater than 100 using manipulatives and place value charts.

Curriculum Sequence

After This Unit

Base-Ten Pieces

In Grade 2 students use base-ten pieces to develop addition and subtraction concepts and procedures in Unit 9 *Ways of Adding Larger Numbers* and in Unit 11 *Ways of Subtracting Larger Numbers.* Students continue to use base-ten pieces in Grades 3, 4, and 5 to develop place value concepts for larger whole numbers and decimals. They also use base-ten pieces to develop procedures for all four operations. For examples, see Grade 3 Unit 4 *Place Value Concepts,* Unit 6 *More Adding and Subtracting,* and Unit 15 *Decimal Investigations.* For Grade 4, see Unit 6 *Place Value Patterns,* Unit 7 *Patterns in Multiplication,* Unit 10 *Using Decimals,* and Unit 13 *Division.* For Grade 5, see Unit 2 *Big Numbers* and Unit 4 *Division and Data.*

Materials List

Supplies and Copies

Student	Teacher
Supplies for Each Student • 1 set of base-ten pieces (3–5 flats, 20 skinnies, and 21 bits)	**Supplies**
Copies • 1 copy of *What's Another Way?* per student (*Unit Resource Guide* Pages 55–56)	**Copies/Transparencies** • 1 transparency of *Base-Ten Board* (*Student Guide* Page 143) • 1 transparency of *Base-Ten Recording Sheet* (*Student Guide* Page 145)

All blackline masters including assessment, transparency, and DPP masters are also on the Teacher Resource CD.

Student Books

Base-Ten Board (*Student Guide* Page 143)
Base-Ten Recording Sheet (*Student Guide* Page 145)
Base-Ten Numbers (*Student Guide* Pages 147–148)
Building Numbers (*Student Guide* Pages 149–150)

Daily Practice and Problems

DPP items I–L (*Unit Resource Guide* Pages 19–20)

Note: Classrooms whose pacing differs significantly from the suggested pacing of the units should use the Math Facts Calendar in Section 4 of the *Facts Resource Guide* to ensure students receive the complete math facts program.

Assessment Tools

Observational Assessment Record (*Unit Resource Guide* Pages 11–12)

Introduction

This activity introduces students to base-ten pieces and several key place value ideas.

- **Base-ten pieces** are a convenient tool for representing quantities and for solving problems.
- A number can be represented with pieces in a way that corresponds to our written number system. For example, 134 can be represented with 1 flat (one hundred), 3 skinnies (three tens), and 4 bits (four ones).
- The order in which the pieces are placed does not affect the quantity represented. This is different from the written **place value** system in which the value of a digit in a multidigit number depends on its position within the number. For example, the digit 2 in 213 has a different value than the digit 2 in 123—a critical difference between the written place value system and base-ten pieces.
- Base-ten pieces can represent all numbers 10 and greater in more than one way. However, one particular representation corresponds in a special way to the base-ten place value system.

We suggest the following format for an introductory lesson on the use of base-ten pieces.

The beginning of this activity is an extension of Lesson 2 *Pasta Place Value.* In Lesson 2 students grouped connecting cubes by tens. They skip counted by tens and counted leftovers by ones to determine the quantity. Base-ten pieces, in this lesson, will be presented as another tool that can represent numbers. Given an arrangement of base-ten pieces, students will also determine the quantity they represent.

By the end of this lesson, students will represent numbers in more than one way with the base-ten pieces, make a record of the pieces, and recognize an arrangement of pieces that most closely corresponds to the base-ten place value system. Working with base-ten pieces will help students visualize the number system's ten-for-one equivalencies. It will also lay the conceptual groundwork for performing addition and subtraction of multidigit numbers.

Base-Ten Pieces. We refer to the pieces as flats, skinnies, and bits to give the teacher an easy way during discussion to distinguish between the manipulatives themselves and the quantities they represent. This terminology is also useful in later grades when we change the value each piece represents. For example, when discussing decimals, a flat may represent one and the bit $\frac{1}{100}$ or 0.01. In second grade this is not an issue—so if you find it simpler for the children, you can substitute "hundreds," "tens," and "ones" as you refer to the pieces. Note, however, that the student pages use flats, skinnies, and bits.

Teaching the Activity

Begin by introducing the different base-ten pieces—**bits** (ones), **skinnies** (tens), and **flats** (one hundreds). Discuss the values of the different pieces. Consider these another tool for representingnumbers. After exploring the pieces, students may comment that they will be more convenient to work with than

connecting cubes, because individual pieces (bits) are already attached to form groups of ten (skinnies) and one hundred (flats).

After an initial investigation and discussion of this new tool, ask students to represent quantities with the pieces. Any combination of pieces that correctly represents the quantity is acceptable. For example, to represent the number 32, the following are possible combinations of pieces:

- 32 bits
- 3 skinnies and 2 bits
- 2 skinnies and 12 bits
- 22 bits and 1 skinny

Remind students of their work with connecting cubes in Lesson 2. Ask questions similar to the following:

- *Can you use connecting cubes to represent 32?*
- *How are the base-ten pieces and the connecting cubes alike?*
- *How are they different?*
- *Which do you like better? Why?*

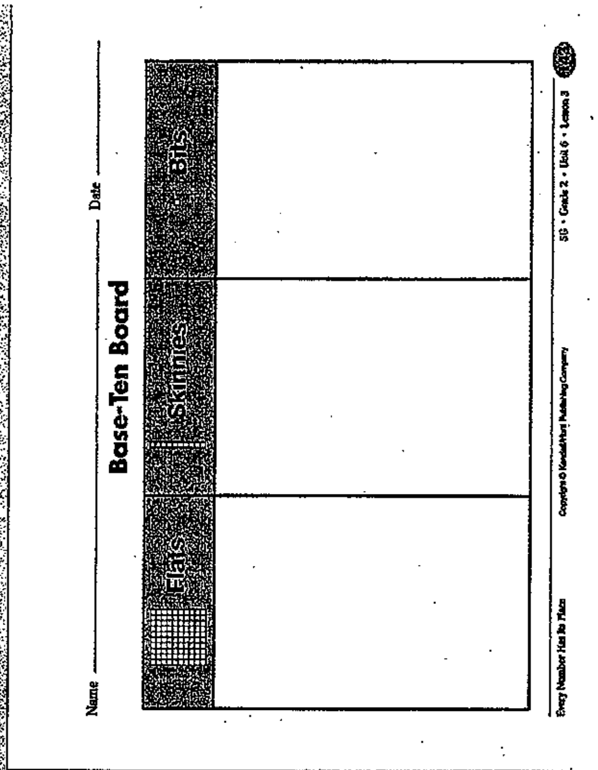
As students represent numbers with base-ten pieces, they will discover that it does not matter how they place the pieces on their desks. Each piece has the same value regardless of where it is placed, e.g., a bit always has a value of one. Provide many opportunities for students to represent quantities with the pieces. As students share their arrangements, call attention to groupings that correspond to the digits in the numbers. In the above example, 3 skinnies and 2 bits most closely corresponds to the written number 32. Also, with each representation offered, ask:

- *Is there another way to represent the number?*

Once students are comfortable with the pieces, provide additional opportunities for them to both represent quantities with the pieces and determine a quantity from an arrangement of pieces.

We suggest students have the opportunity to:

- represent numbers that have repeated digits such as 33, 77, and 222.
- represent numbers that have a zero such as 40 and 107.
- discover that they can represent a large number, in some cases, with fewer pieces than a small number. For example, they can represent 101 with two pieces (one flat and one bit), whereas a smaller number like 19 needs at minimum ten pieces (one skinny and nine bits).



Name ________ Date ________

Base-Ten Board

Flats	Skinnies	Bits

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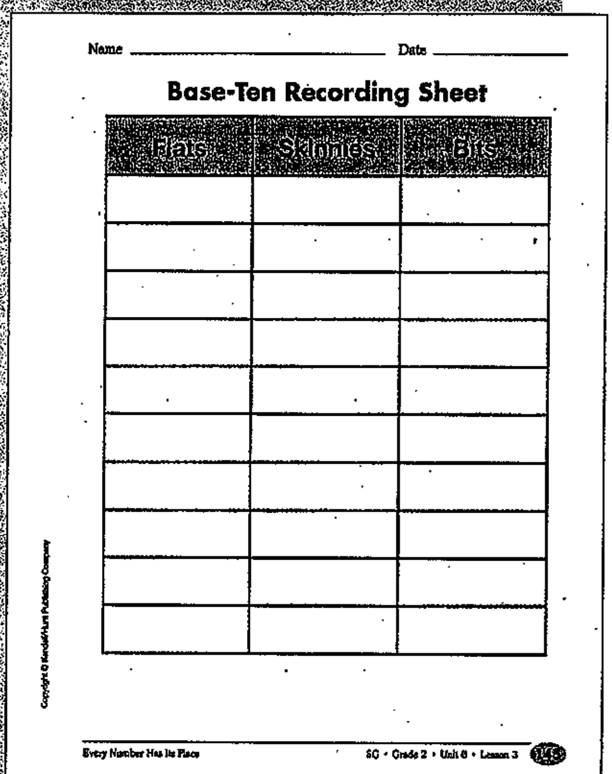

Name ________ Date ________

Base-Ten Recording Sheet

Flats	Skinnies	Bits

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- represent pairs of numbers such as 34 and 43. Discuss the value of the 3 in 34 in comparison to the value of the 3 in 43.

Students' answers, representations, and comments should provide the transition to using the *Base-Ten Board* and *Base-Ten Recording Sheet* Activity Pages. After discussing with students several possible ways to represent the same number, their responses can provide an introduction to the *Base-Ten Board.* Each representation of 32 is correct in Figure 1. However, by comparing each student's arrangement to the written number 32, the class may agree that Rachel's most closely matches.

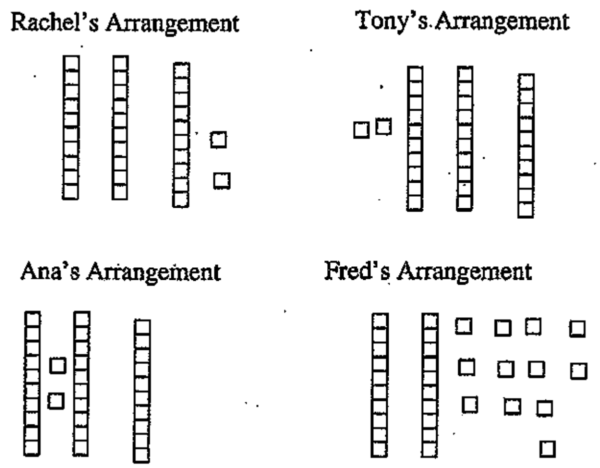


Figure 1: *Representing 32 with base-ten pieces*

At this point, ask students to turn to the *Base-Ten Board* and *Base-Ten Recording Sheet* Activity Pages. Using a transparency of the *Base-Ten Board* Activity Page, model, along with students, the placement of 3 skinnies and 2 bits in the appropriate columns on the board. On the *Base-Ten Recording Sheet* Activity Page, students record a 3 in the Skinnies column and a 2 in the Bits column. See Figure 2.

Tony and Ana, in the figure above, use the same pieces as Rachel but arrange them differently. Point out that their arrangements represent the same quantity. This is unlike the written number system—32 and 23 are not the same.

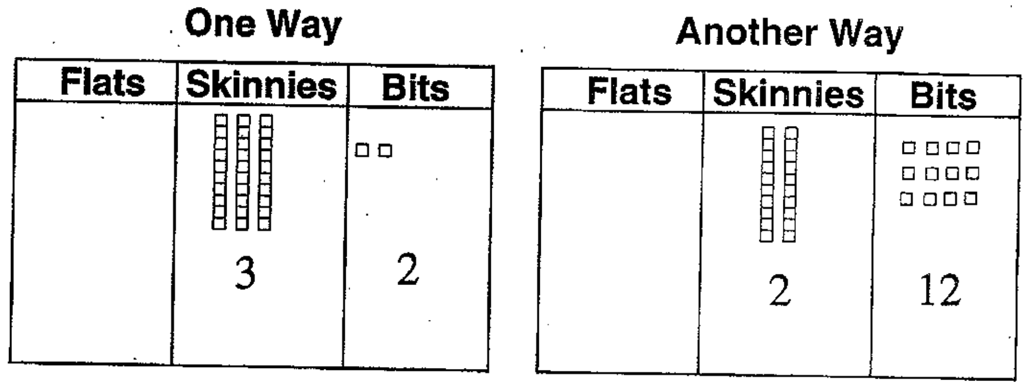


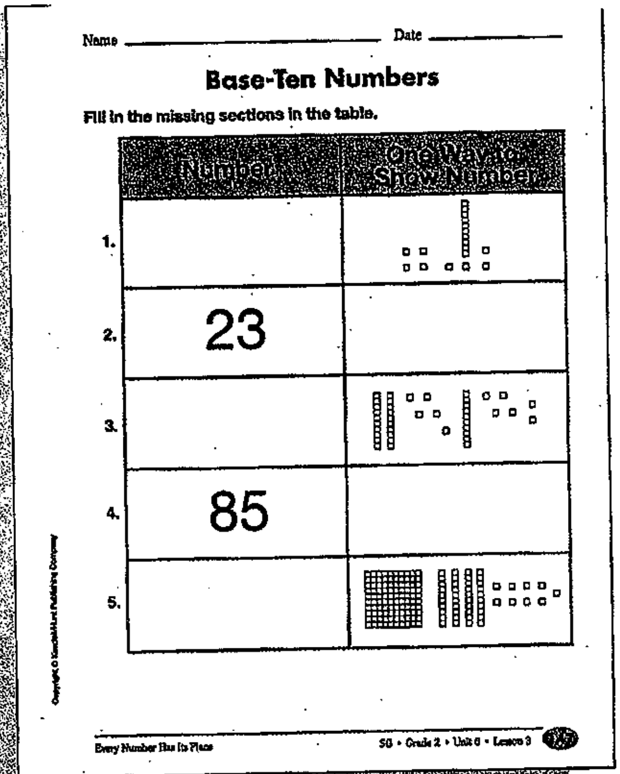
Figure 2: *Using the* Base-Ten Board *and* Recording Sheet

To record Fred's arrangement, students first place two skinnies and twelve bits in the appropriate columns on the board and then record a 2 in the Skinnies column and a 12 in the Bits column on the *Base-Ten Recording Sheet.* Again, point out that the pieces Rachel, Tony, and Ana chose more closely match the written number 32. See Figure 2.

Using the transparency of the *Base-Ten Recording Sheet,* provide more opportunities for students to represent quantities with the pieces and to determine quantities from the pieces. For example:

- Record a number of flats, skinnies, and bits. Record 4 flats, 12 skinnies, 3 bits. Students copy these numbers onto their *Base-Ten Recording Sheets,* lay the appropriate pieces on their boards, determine the quantity, and record the number. Sometimes make the number of flats, skinnies, or bits more than 10 as in the example.
- Record a number, such as 87, and ask students to represent the quantity with pieces on their *Base-Ten Boards.* Then, students record their answers on their *Base-Ten Recording Sheets.*
- Call attention to arrangements that correspond to the written number system.
- Continually ask students if there is another way to represent a given quantity.
- Ask students to represent quantities with zero, such as 50 or 308.
- Ask students to represent quantities such as 88, 111, or 444.

While students represent quantities and record and compare their answers, let them discover for themselves how to make a given arrangement of pieces, such as 4 flats, 2 skinnies, and 13 bits, correspond more closely to the written number—in this case, 433.



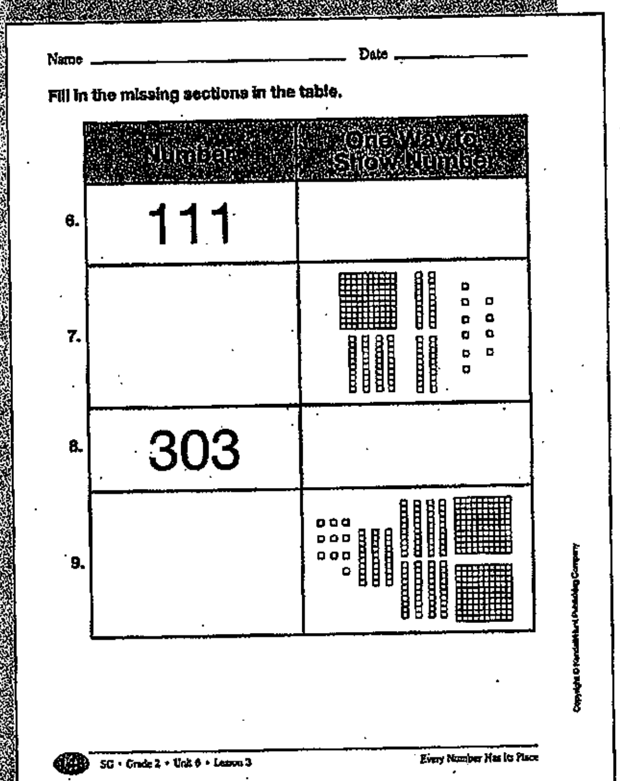
Name ______________________ Date ____________

Base-Ten Numbers

Fill in the missing sections in the table.

	Number	One Way to Show Number
1.		
2.	23	
3.		
4.	85	
5.		

Student Guide - page 147 (Answers on p. 57)



Name ______________________ Date ____________

Fill in the missing sections in the table.

	Number	One Way to Show Number
6.	111	
7.		
8.	303	
9.		

Student Guide - page 148 (Answers on p. 57)

trading or exchanging ten bits for a skinny, and ten skinnies for a flat. Refrain from asking students too soon to trade and exchange ten of one piece for one of another. Summarize their discoveries by saying:

- *Remember to make as many flats and skinnies as possible.*

Or

- *Make as many big pieces as you can.*

For example, if a student has 3 skinnies and 15 bits, ask:

- *Are 3 skinnies the most you can have?*
- *Can you make another skinny?*

Ask student pairs to complete the *Base-Ten Numbers* Activity Pages for further practice with base-ten pieces. In some problems, they determine and record the quantity represented by a given set of base-ten pieces. In others students represent a quantity with base-ten pieces on their *Base-Ten Boards*. Then they express in words, or with a picture, which pieces they used. Accept all combinations of pieces that correctly represent the quantities. However, when students share their answers, call attention to those that most closely match the written number system.

Math Facts

DPP item J provides practice with addition math facts.

Homework and Practice

- Students complete the *Building Numbers* Homework Pages.
- DPP items I and K provide practice with time. For item L students estimate with links.

Assessment

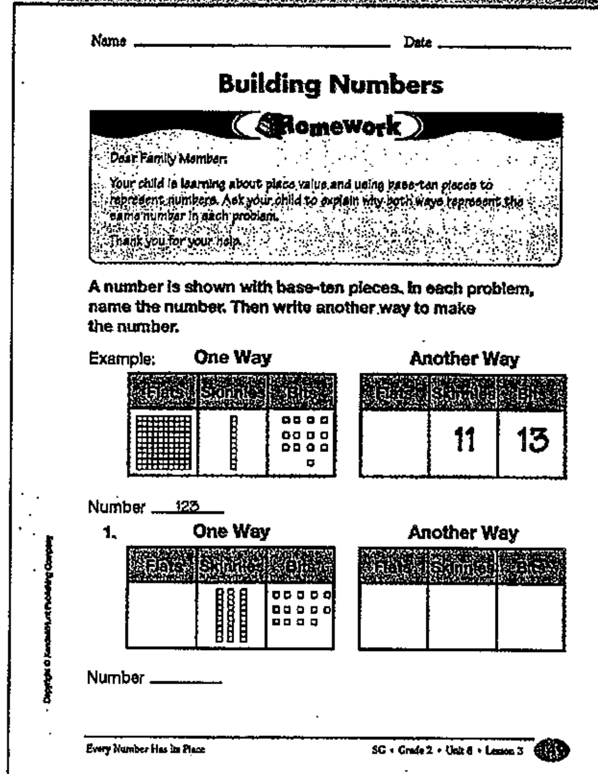
- As students learn to model numbers with their base-ten pieces, observe their processes. Ask students to tell you the value of the numbers they recorded. For example, if a student records the number 24, ask him or her to tell you the value of the 2 and the value of the 4. Record your observations on the *Observational Assessment Record.*
- Students complete the *What's Another Way?* Assessment Pages from the *Unit Resource Guide.* Students can record their "way" by either sketching base-ten pieces or writing numbers in the appropriate columns. ***Question 5*** has been left blank. Fill in the *Base-Ten Board* with drawings of pieces to create an appropriate problem for your class. Record your observations on the *Observational Assessment Record.*

Extension

Ask students to solve the following problem:

Find several ways to show numbers using exactly six pieces from your set of base-ten pieces. Record the numbers on your *Base-Ten Recording Sheet.* One requirement in solving the problem is that you must use each kind of piece (bits, skinnies, and flats).

Answers:	114	123	132	141	213
	222	231	312	321	



Name ______ Date ______

Building Numbers

Homework

Dear Family Member:

Your child is learning about place value and using base-ten pieces to represent numbers. Ask your child to explain why both ways represent the same number in each problem.

Thank you for your help.

A number is shown with base-ten pieces. In each problem, name the number. Then write another way to make the number.

Example: One Way / Another Way

Flats	Skinnies	Bits
	11	13

Number 123

1. One Way / Another Way

Number ______

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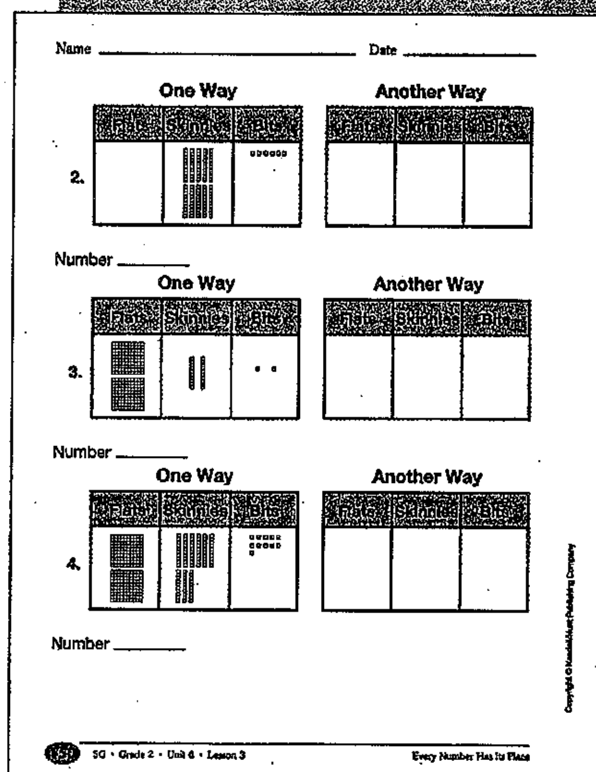
Student Guide - page 149 (Answers on p. 58)



Name ______ Date ______

2. One Way / Another Way

Number ______

3. One Way / Another Way

Number ______

4. One Way / Another Way

Number ______

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Student Guide - page 150 (Answers on p. 58)

5•2 Reading, Writing, and Ordering Numbers

GRADE 3

Objective To provide practice for reading, writing, comparing, and ordering numbers less than 100,000.

1 Teaching the Lesson

Key Activities

Children read, compare, and order numbers up to 100,000. They also play *Number Top-It*.

Key Concepts and Skills

- Read and write numbers up to 100,000. [Number and Numeration Goal 1]
- Identify the places in numbers through ten-thousands and the values of the digits in those places. [Number and Numeration Goal 1]
- Compare and order whole numbers less than 100,000. [Number and Numeration Goal 6]
- Distinguish between the maximum and median numbers in a given data set. [Data and Chance Goal 2]

Key Vocabulary

maximum • median • > (is greater than) • < (is less than)

materials

- ☐ *Student Reference Book*, pp. 218, 219, 302, and 303
- ☐ Home Link 5•1
- ☐ Teaching Aid Masters (*Math Masters*, pp. 422 optional; 423 and 424)
- ☐ Transparency (*Math Masters*, p. 422, optional)
- ☐ glue or tape, slate
- ☐ number cards 0–9, 4 of each
- ☐ half-sheets of paper
- ☐ chart paper and markers, optional

See **Advance Preparation**

2 Ongoing Learning & Practice

Children practice with place value and counting.

Children practice and maintain skills through Math Boxes and Home Link activities.

Ongoing Assessment: Recognizing Student Achievement Use journal page 104. [Data and Chance Goal 2]

materials

- ☐ *Math Journal 1*, p. 104
- ☐ Home Link Master (*Math Masters*, p. 123)
- ☐ *Minute Math*®+, pp. 23, 27–29, and 31

3 Differentiation Options

READINESS

Children use a number line to compare and order numbers.

ENRICHMENT

Children generate 5-digit numbers and compare those numbers to each other as well as other numbers.

ELL SUPPORT

Children add *median* and *maximum* to their Math Word Banks.

materials

- ☐ Teaching Masters (*Math Masters*, pp. 124 and 125)
- ☐ *Differentiation Handbook*
- ☐ 5 dice
- ☐ index cards

Additional Information

Advance Preparation Each pair of children will need a Place-Value Mat, glued or taped together from *Math Masters*, pages 423 and 424.

Technology

Assessment Management System
Math Boxes, Problem 2
See the **iTLG.**

Getting Started

Mental Math and Reflexes

Dictate numbers. Have children write the numbers on their slates. For each number, ask questions such as:

- Which digit is in the thousands place?
- What is the value of the digit x?
- How many ten-thousands?

Suggestions:

●○○ 5,674; 4,361; 6,035; 8,006

●●○ 42,877; 35,091; 72,004

●●● 1,247,498; 3,957,204; 8,502,053

Math Message

Open your Student Reference Book to pages 218 and 219, Animal Clutches. On a half-sheet of paper, list the names of the animals in the order of the most eggs they can have in a clutch.

Home Link 5·1 Follow-Up

As you go over the answers, ask the class to look for patterns.

- Which digit changes when adding or subtracting 10? The tens digit and the hundreds digit change when moving from the 8,800s to the 8,900s.
- 100? The hundreds digit and the thousands digit change when moving from the 8,000s to the 9,000s.
- 1,000? The thousands digit and the ten-thousands digit change when moving from the 9,000s to the 10,000s.

1 Teaching the Lesson

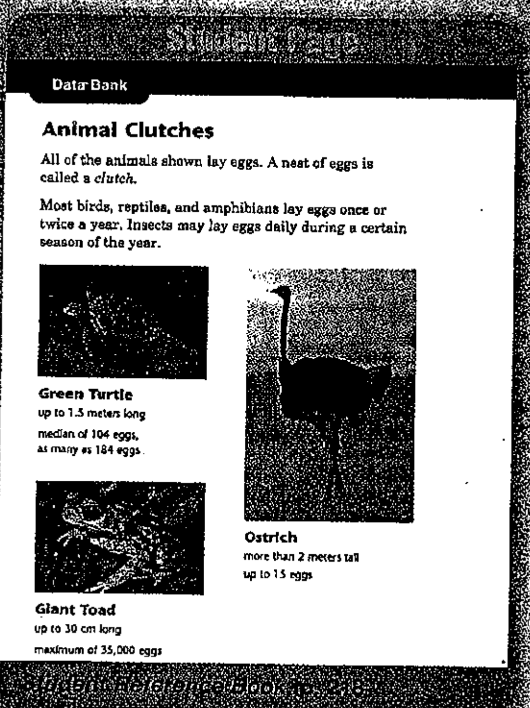
▶ Math Message Follow-Up

WHOLE-CLASS DISCUSSION

(*Student Reference Book,* pp. 218 and 219)

The Math Message problem asks for the names of the animals in the order of the most eggs they can have in a clutch. The order from the largest clutches to the smallest is giant toad, queen termite, green turtle, python, Mississippi alligator, agama lizard, ostrich.

Take a moment to review the terms **maximum** (highest value) and **median** (middle value), and help children distinguish between the maximum and the median numbers of eggs in a clutch.



Student Page

Data Bank

Animal Clutches

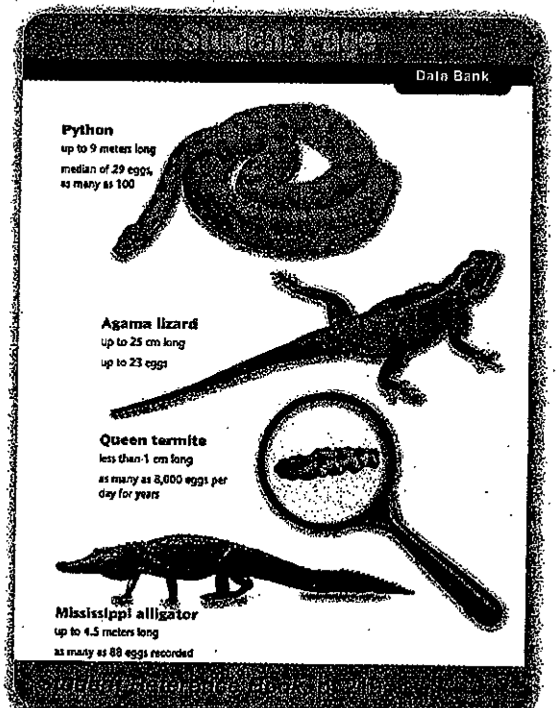
All of the animals shown lay eggs. A nest of eggs is called a *clutch.*

Most birds, reptiles, and amphibians lay eggs once or twice a year. Insects may lay eggs daily during a certain season of the year.

Green Turtle
up to 1.5 meters long
median of 104 eggs,
as many as 184 eggs

Ostrich
more than 2 meters tall
up to 15 eggs

Giant Toad
up to 30 cm long
maximum of 35,000 eggs



Student Page

Data Bank

Python
up to 9 meters long
median of 29 eggs,
as many as 100

Agama lizard
up to 25 cm long
up to 23 eggs

Queen termite
less than 1 cm long
as many as 8,000 eggs per day for years

Mississippi alligator
up to 4.5 meters long
as many as 88 eggs recorded

▶ Reviewing How to Read and Compare Numbers

WHOLE-CLASS ACTIVITY

(*Math Masters*, p. 422)

The following activities prepare children to work with larger numbers in Lesson 5-3.

- ▷ Using either the board or the transparency of the place-value chart found on *Math Masters,* page 422, write any number with five or fewer digits. Ask a volunteer to read the number. Then repeat with several other numbers, but do not erase the numbers already written. *Suggestions:* 467; 435; 6,009; 6,090; 52,749; 52,974

Adjusting the Activity ELL

To connect number words to their numerical representations, consider having children make and display a number words chart. (*See margin.*) Children can also make charts in other languages for display.

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- ▷ Select two numbers from the list (such as 52,749 and 52,974), and ask which is greater. 52,974 How can children tell?
- ▷ One possible strategy is to write the two numbers, one under the other, so that same-place digits are aligned, and then to compare the values of aligned pairs of digits, starting with the first pair on the left. *For example:*

The ten-thousands digits are the same; their value is 50,000 each.

52,749
| | |
52,974

The thousands digits are the same; their value is 2,000 each.

The hundreds digits are not the same; 900 is greater than 700, so 52,974 is greater than 52,749.

- ▷ Write 52,974 > 52,749 on the board.
- ▷ Remind children of the meaning of **> (is greater than),** and ask them to read the number model aloud.
- ▷ Review the meaning of **< (is less than).** Ask children to write a second number model with the numbers 52,749 and 52,974 using <. 52,749 < 52,974
- ▷ Choose other pairs of numbers from the list. Have children compare the numbers and write number models using > or < on their slates.
- ▷ Finally, ask children to help you order the numbers listed on the board from least to greatest.

Name Date Time

5-Digit Place-Value Chart

Ten-Thousands	Thousands	Hundreds	Tens	Ones

Number Words

One 1	Eleven 11	Ten 10
Two 2	Twelve 12	Twenty 20
Three 3	Thirteen 13	Thirty 30
Four 4	Fourteen 14	Forty 40
Five 5	Fifteen 15	Fifty 50
Six 6	Sixteen 16	Sixty 60
Seven 7	Seventeen 17	Seventy 70
Eight 8	Eighteen 18	Eighty 80
Nine 9	Nineteen 19	Ninety 90

hundred 100
thousand 1,000
ten-thousand 10,000
hundred-thousand 100,000
million 1,000,000

NOTE A hyphen is written with the multiples of ten (twenty through ninety) to suggest that words are attached; for example, twenty-three.