

Discuss



The base-ten pieces are one model of the place value system. You have built models of base-ten pieces for numbers up to 1,000,000. We have given special names to the base-ten pieces to help us talk about the patterns in our base-ten number system. Starting in the ones place we use the names bit, skinny, flat, super bit, super skinny, super flat, and megabit.

9. What patterns do you see in the shapes of the base-ten pieces?
10. The sizes of the pieces also form a pattern.
 - A. How many bits make a skinny?
 - B. How many skinnies make a flat?
 - C. How many flats make a super bit?
 - D. Describe the pattern. Do all the pieces follow the pattern?

We can write the value of each piece using the powers of 10. For example, $100 = 10 \times 10$ and can be written as 10^2 . This is read as "10 to the second power," or "10 squared." $1000 = 10 \times 10 \times 10$ and can be written as 10^3 . This is read as "10 to the third power," or "10 cubed." The following chart helps to show these patterns.

11. Draw the chart on your paper and fill in the missing spaces.

Base-Ten Chart

Base-Ten Piece	Written as a Power of 10	Value
Bit	1	1
Skinny	$1 \times 10 = 10^1$	
Flat		100
Super Bit	$10 \times 10 \times 10 = 10^3$	
Super Skinny		10,000
Super Flat		
Megabit		

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9. Beginning with the bit, the shapes form the pattern: bit (cube), skinny, flat, bit (cube), skinny, flat, bit (cube).
10. A. * 10
B. * 10
C. * 10
D. * Each piece is 10 times as large as the piece to its right. All the pieces follow the pattern.

11.

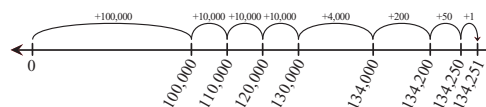
Base-Ten Chart

Base-Ten Piece	Written as a Power of 10	Value
Bit	1	1
Skinny	$1 \times 10 = 10^1$	10
Flat	$10 \times 10 = 10^2$	100
Super Bit	$10 \times 10 \times 10 = 10^3$	1,000
Super Skinny	$10 \times 10 \times 10 \times 10 = 10^4$	10,000
Super Flat	$10 \times 10 \times 10 \times 10 \times 10 = 10^5$	100,000
Megabit	$10 \times 10 \times 10 \times 10 \times 10 \times 10 = 10^6$	1,000,000

12. 134,251; Look for an understanding of the values of the pieces. Mr. Gupta's super flat shows 100,000, the 3 super skinnies show 30,000, the 4 super bits show 4000, the 2 flats show 200, the 5 skinnies show 50 and the bit shows 1.

13. $100,000 + 30,000 + 4,000 + 200 + 50 + 1 = 134,251$

14.



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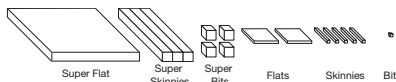
Each repeating core pattern is called a period on the *Place Value Chart*. The bit-skinny-flat group makes up the **ones** period. The super bit-super skinny-super flat group makes up the **thousands** period. The megabit begins the **millions** period.

Millions			Thousands			Ones		
HUNDRED	TEN	ONE	HUNDRED	TEN	ONE	HUNDRED	TEN	ONE
		8	7	6	5	4	3	2

Each period takes its name from the number that the cube represents in that period. In Lesson 1, you learned that a comma or space is placed between each period to make reading easier. Remember, the comma or space alerts you to say the period name. For instance: 8,765,432 is read as eight **million**, seven hundred sixty-five **thousand**, four hundred thirty-two.

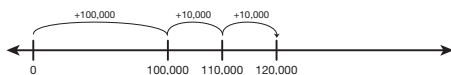
✓ **Check-In: Questions 12-14**

12. Mr. Gupta used these Big Base-Ten Pieces to model a number for his students:



What number did Mr. Gupta model? Tell why he used the pieces he did by explaining how much each of these pieces represents.

13. Write a number sentence for the number Mr. Gupta showed in Question 12.
14. Shannon started to show Mr. Gupta's number on a number line with base-ten hoppers. Copy and finish Shannon's work.



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*Answers and/or discussion are included in the lesson.


- 15. Irma
- 16. Possible response: 1,230,569
- 17. Possible response: 9,653,021

Homework

Questions 1–7 (SG p. 231)

- 1. Students play the game at home.
- 2. 500
- 3. 25,000
- 4. 8000
- 5. 5
- 6. 700,000
- 7. 0

Draw, Place, and Read
 Play *Draw, Place, and Read*. Directions are in the *Student Activity Book*.



Explore

Tanya and Irma played *Draw, Place, and Read*. After all seven digit cards had been drawn, Tanya's number looked like this: 5,369,210. Irma's number looked like this: 6,935,021. Read each number.

- 15. Which of the girls recorded the larger number?
- 16. Use the same seven digit cards to make a number smaller than Tanya's and Irma's.
- 17. Use the same seven digit cards to make a number larger than Tanya's and Irma's.

Homework

1. Play *Draw, Place, and Read* at home with your family.

In Questions 2–7, fill in the box to make each statement true.

- 2. $1000 + \square + 80 + 8 = 1588$
- 3. $\square + 300 + 20 + 8 = 25,328$
- 4. $708,865 = 700,000 + \square + 860 + 5$
- 5. $500,000 + 200,000 + \square = 700,000 + 5$
- 6. $\square + 22 = 300,000 + 400,000 + 20 + 2$
- 7. $890,500 = 800,000 + 90,000 + \square + 500$

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Student Activity Book

Name _____ Date _____

Big Numbers

- Roberto found that 8952 people lived in his town. Roberto started to show the number he found using base-ten shorthand. Finish what Roberto started.



- Roberto showed 8952 on the Base-Ten Pieces Recording Sheet. Record three other ways to partition 8952 on the Base-Ten Pieces Recording Sheet.

Base-Ten Pieces Recording Sheet

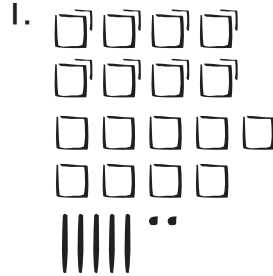
Thousands	Hundreds	Tens	Ones	Number Sentence
				$8900 + 50 + 2 = 8952$

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Big Base-Ten Pieces

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Questions 1–8 (SAB pp. 197–199)



- Answers will vary. Three possible responses:

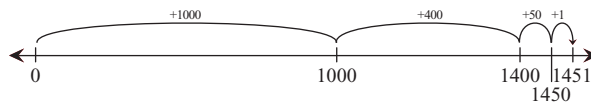
Super Bit (Pack) Thousands 1000s	Flat Hundreds 100s	Skinny Tens 10s	Bit Ones 1s	Number Sentence
	89	5	2	$8900 + 50 + 2 = 8952$
8	9	5	2	$8000 + 900 + 50 + 2 = 8952$
8	8	15	2	$8000 + 800 + 150 + 2 = 8952$

- Answers will vary. Possible responses:

Super Bit (Pack) Thousands 1000s	Flat Hundreds 100s	Skinny Tens 10s	Bit Ones 1s	Number Sentence
230	0	52	5	$230,000 + 0 + 520 + 5 = 230,525$
230	5	5	5	$230,000 + 500 + 20 + 5 = 230,525$
230	5	50	25	$230,000 + 500 + 25 = 230,525$

- Jackie's number is larger. Possible response: her number has 230 packs and Roberto's has only 8.

- A. Possible solution:



- one +1000 hop

- Answer will vary. One possible number sentence is: $1000 + 400 + 50 + 1 = 1451$

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Name _____ Date _____

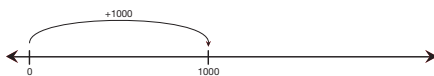
- Jackie read that 230,525 people lived in her town. She decided to show her number on the Base-Ten Pieces Recording Sheet. Record two other ways to partition Jackie's number on the Base-Ten Pieces Recording Sheet.



Base-Ten Pieces Recording Sheet

Thousands	Hundreds	Tens	Ones	Number Sentence
				$230,000 + 0 + 520 + 5 = 230,525$

- Whose number is larger, Jackie's or Roberto's? How do you know?
- A. Ming read that the Willis (formerly Sears) Tower in Chicago is 1451 feet tall. Help Ming finish showing this number on the number line.



- How many +1000 hops did Ming make to show 1451? _____
- Write a number sentence to show Ming's hops including the ones you finished for him.

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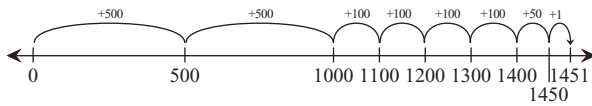
Big Base-Ten Pieces

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D. Possible response:



$$500 + 500 + 100 + 100 + 100 + 100 + 50 + 1 = 1451$$

6. 29 +1000 hops

7. Answers will vary. Three possible responses:

Super Bit (Pack) Thousands 1000s	Flat Hundreds 100s	Skinny Tens 10s	Bit Ones 1s	Number Sentence
29	0	0	35	$29,000 + 35 = 29,035$
	290	0	35	$290 \times 100 + 35 = 29,035$
29	0	3	5	$29,000 + 30 + 5 = 29,035$

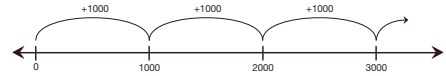
8. Possible response: Linda's number is larger. Her number has 29 packs in the thousands place of the Base-Ten Pieces Recording Sheet and Ming's has only 1 pack in the thousands place.

Name _____ Date _____

D. Show 1451 another way using a base-ten hopper. Write a number sentence to show the hops.



6. Linda read that Mount Everest is 29,035 feet above sea level. Linda started to show her number using big base-ten hops. She started by making +1000 hops and stopped.



How many +1000 hops would Linda have to make for 29,035? _____

7. Linda decided a better way to show 29,035 would be on a Base-Ten Pieces Recording Sheet. Record two different ways to partition Linda's number.

Base-Ten Pieces Recording Sheet

Thousands	Hundreds	Tens	Ones	Number Sentence
29	0	0	35	$29,000 + 35 = 29,035$

8. Whose number is larger, Linda's or Ming's? How do you know?

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