

2 ACTIVITY: Writing Repeated Factors

Math Practice

Repeat Calculations
What patterns do you notice with each problem? How does this help you write exponents?

Work with a partner. Copy and complete the table.

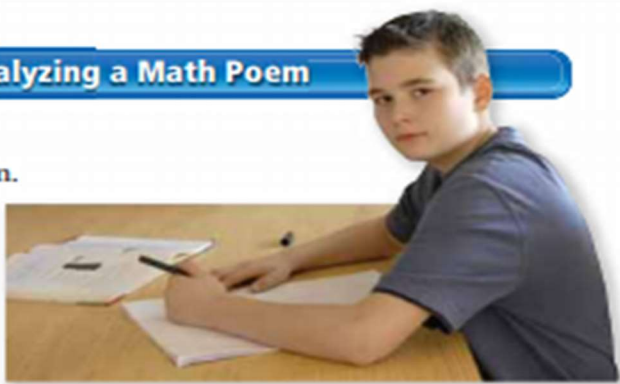
Repeated Factors	Using an Exponent	Value
a. 4×4		
b. 6×6		
c. $10 \times 10 \times 10$		
d. $100 \times 100 \times 100$		
e. $3 \times 3 \times 3 \times 3$		
f. $4 \times 4 \times 4 \times 4 \times 4$		
g. $2 \times 2 \times 2 \times 2 \times 2 \times 2$		

- h. In your own words, describe what the two numbers in the expression 3^5 mean.

3 ACTIVITY: Writing and Analyzing a Math Poem

Work with a partner.

- Write your own "St. Ives" poem.
- Draw pictures for your poem.
- Answer the question in your poem.
- Show how you can use exponents to write your answer.



What Is Your Answer?

- IN YOUR OWN WORDS** How can you use repeated factors in real-life situations? Give an example.
- STRUCTURE** Use exponents to complete the table. Describe the pattern.

10	100	1000	10,000	100,000	1,000,000
10^1	10^2				

Practice

Use what you learned about exponents to complete Exercises 4–6 on page 14.

1.2 Exercises

Vocabulary and Concept Check

- VOCABULARY** How are exponents and powers different?
- VOCABULARY** Is 10 a perfect square? Is 100 a perfect square? Explain.
- WHICH ONE DOESN'T BELONG?** Which one does *not* belong with the other three? Explain your reasoning.

$$2^4 = 2 \times 2 \times 2 \times 2$$

$$3 + 3 + 3 + 3 = 3(4)$$

$$3^2 = 3 \times 3$$

$$5 \cdot 5 \cdot 5 = 5^3$$

Practice and Problem Solving

Write the product as a power.

- 9×9
- 13×13
- $15 \times 15 \times 15$
- $2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$
- $14 \times 14 \times 14$
- $8 \cdot 8 \cdot 8 \cdot 8$
- $11 \times 11 \times 11 \times 11 \times 11$
- $7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 \cdot 7$
- $16 \cdot 16 \cdot 16 \cdot 16$

13. **ERROR ANALYSIS** Describe and correct the error in writing the product as a power.



$$4 \cdot 4 \cdot 4 = 3^4$$

Find the value of the power.

- 5^2
- 4^3
- 2^5
- 14^2

Use a calculator to find the value of the power.

- 7^6
- 4^8
- 12^4
- 17^5

22. **ERROR ANALYSIS** Describe and correct the error in finding the value of the power.



$$8^3 = 8 \cdot 3 = 24$$

- POPULATION** The population of Virginia is about 8×10^6 . About how many people live in Virginia?
- FIGURINES** The smallest figurine in a gift shop is 2 inches tall. The height of each figurine is twice the height of the previous figurine. Write a power to represent the height of the tallest figurine. Then find the height.



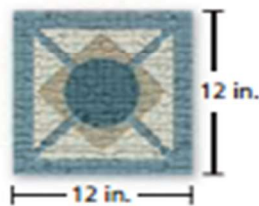
Determine whether the number is a perfect square.

25. 8 26. 4 27. 81 28. 44
 29. 49 30. 125 31. 150 32. 144
33. **PAINTING** A square painting measures 2 meters on each side. What is the area of the painting in square centimeters?



34. **NUMBER SENSE** Write three powers that have values greater than 120 and less than 130.
35. **CHECKERS** A checkers board has 64 squares. How many squares are in each row?

36. **PATIO** A landscaper has 125 tiles to build a square patio. The patio must have an area of at least 80 square feet.
- What are the possible arrangements for the patio?
 - How many tiles are not used in each arrangement?



37. **PATTERNS** Copy and complete the table. Describe what happens to the value of the power as the exponent decreases. Use this pattern to find the value of 4^0 .

Power	4^6	4^5	4^4	4^3	4^2	4^1
Value	4096	1024				

38. **REASONING** Consider the equation $56 = \square^2$. The missing number is between what two whole numbers?
39. **Repeated Reasoning** How many blocks do you need to add to Square 6 to get Square 7? to Square 9 to get Square 10? to Square 19 to get Square 20? Explain.



Fair Game Review

what you learned in previous grades & lessons

Find the value of the expression. (*Skills Review Handbook*)

40. 6×14 41. 11×15 42. $56 \div 7$ 43. $112 \div 16$
44. **MULTIPLE CHOICE** You buy a box of gum that has 12 packs. Each pack has 5 pieces. Which expression represents the total number of pieces of gum? (*Skills Review Handbook*)
- (A) $12 + 5$ (B) $12 - 5$ (C) 12×5 (D) $12 \div 5$

