Name: _____ Period: _____ Date: _____

Math Unit 1: Numerical Expressions and Factors

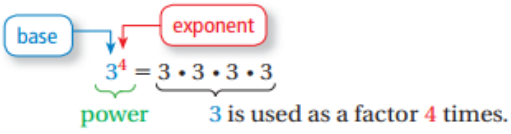
Lesson 1.2- Powers and Exponents

SWBAT:	**Paraphrase:**

Essential Question: How can you use repeated factors in real-life situations?

Vocabulary

A **power** is a product of repeated factors. The **base** of a power is the repeated factor. The **exponent** of a power indicates the number of times the base is used as a factor.



Power	Words
3^2	Three *squared*, or three to the second
3^3	Three *cubed*, or three to the third
3^4	Three to the fourth

Example 1

Write each product as a power.

a. $4 \cdot 4 \cdot 4 \cdot 4 \cdot 4$

Because 4 is used as a factor 5 times, its exponent is 5.

∴ So, $4 \cdot 4 \cdot 4 \cdot 4 \cdot 4 = 4^5$.

b. $12 \times 12 \times 12$

Because 12 is used as a factor 3 times, its exponent is 3.

∴ So, $12 \times 12 \times 12 = 12^3$.

Your Turn

Write the product as a power.

1. $6 \cdot 6 \cdot 6 \cdot 6 \cdot 6 \cdot 6$

2. $15 \times 15 \times 15 \times 15$

Example 2

Find the value of each power.

a. 7^2

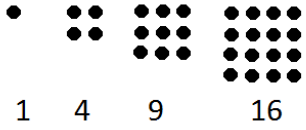
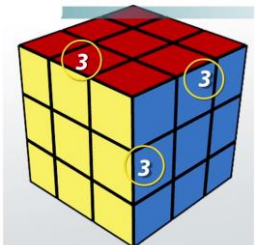
$7^2 = 7 \cdot 7$ Write as repeated multiplication.

$= 49$ Simplify.

b. 5^3

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

$= 125$

Your Turn	**Find the value of the power.** **3.** 6^3 **4.** 9^2 **5.** 3^4 **6.** 18^2
Example 3	Perfect Square:  1 4 9 16 Perfect Cube: 
	Determine whether each number is a perfect square. **a.** 64 Because $8^2 = 64$, 64 is a perfect square. **b.** 20 No whole number squared equals 20. So, 20 is not a perfect square.
Your Turn	**Determine whether the number is a perfect square.** **7.** 25 **8.** 2 **9.** 99 **10.** 100
Notes / Questions	