

Name: \_\_\_\_\_

Ms. Napolitano

Date: \_\_\_\_\_

CCSS: \_\_\_\_\_

Topic: Exponents

Day 1\_ Monday March 23<sup>rd</sup>

Key Points\_ Label the base, exponent, and power.

**Model\_ Let's put all of this information together!**

**Definitions:**

Power: or exponent of a # tells you how many times to multiply the base by itself

Base: the # or variable that gets multiplied when using an exponent.

Exponent: tells you how many times to multiply the base by itself.

**LET'S LABEL POWER, Base, Exponent**

Base  $\leftarrow$   $7^2$   $\rightarrow$  Exponent

$7 \times 7$   
Expanded Form

49  
Solution/Value

**Expressions raised to the exponent of zero.**

$1^0 = 1$     $2^0 = 1$     $3^0 = 1$     $100^0 = 1$     $X^0 = 1$

Any number **raised to the power** of **zero** besides zero is equal to **ONE**.

**Expressions raised to the exponent of ONE.**

$1^1 = 1$     $2^1 = 2$     $3^1 = 3$     $10^1 = 10$     $X^1 = X$

Any number **raised to the power** of **ONE** besides zero is equal to **itself**.

**Expressions "squared".**

$1^2 = 1 \times 1 = 1$	$2^2 = 2 \cdot 2 = 4$	$3^2 = 3 \cdot 3 = 9$	$10^2 = 10 \cdot 10 = 100$	$X^2 = X \cdot X = X^2$
Expanded Form: $1 \times 1$	Expanded Form: $2 \cdot 2$	Expanded Form: $3 \cdot 3$	Expanded Form: $10 \cdot 10$	Expanded Form: $X \cdot X$
Value: $1$	Value: $4$	Value: $9$	Value: $100$	Value: $X^2$

**Expressions "cubed".**

$1^3 = 1 \cdot 1 \cdot 1 = 1$	$2^3 = 2 \cdot 2 \cdot 2 = 8$	$3^3 = 3 \cdot 3 \cdot 3 = 27$	$10^3 = 10 \cdot 10 \cdot 10 = 1000$	$X^3 = X \cdot X \cdot X = X^3$
Expanded Form: $1 \cdot 1 \cdot 1$	Expanded Form: $2 \cdot 2 \cdot 2$	Expanded Form: $3 \cdot 3 \cdot 3$	Expanded Form: $10 \cdot 10 \cdot 10$	Expanded Form: $X \cdot X \cdot X$
Value: $1$	Value: $8$	Value: $27$	Value: $1000$	Value: $X^3$

### Independent Practice

1. State the base, exponent, determine the value and write the power in words.

Power	State the base.	State the exponent.	Expanded Form	Evaluate (Value)	Words
$3^0$				1 ***Any number raised to the zero power is 1.	
$3^1$		1			
$3^2$					Three raised to the second power. Or Three Squared. Or 2 factors of 3.
$3^3$			$3 \times 3 \times 3$		
$3^4$	3				

2. Write each expression as a power.

Expressions/Repeated Factors	Power (Exponential Form)	Evaluate (Value)
$6 \times 6$		
$P \times P$		
$2 \times 2 \times 2$		
$100 \times 100 \times 100$		
$3 \times 3 \times 3 \times 3$		
$1 \times 1 \times 1 \times 1 \times 1$		
$10 \times 10 \times 10 \times 10 \times 10 \times 10$		

3. Find the value of a power. (Evaluate)

a.  $11^2 =$  \_\_\_\_\_

b.  $6^3 =$  \_\_\_\_\_

c.  $(\frac{1}{2})^2 =$  \_\_\_\_\_

**4. Error Analysis:**

Jaden was asked to evaluate  $10^2$ . He said that the value of the power  $10^2$  is 20 because  $10 \times 2 = 20$ . Do you agree with Jaden? If not, what is the correct answer? Justify your answer.

**5. Error Analysis:**

Ms. Napolitano asked the class to evaluate  $10^0$ . Bella said that  $10^0$  is 10 because any number to the zero-power equals the base. Petra disagreed with Bella and said  $10^0$  is 0 because  $10 \times 0 = 0$ . However, Madison disagreed with both Petra and Bella because any number besides zero raised to the 0 power is equal to 1. Who do you agree with? Justify your answer.

**6. Error Analysis:**

Ms. Napolitano asked write five and three tenths cubed in exponential form. Omar said the wrote down the following answer  $(5.3)(5.3)(5.3)$ . Nazier wrote down  $0.53^3$  as his final answer. Zion wrote  $5.3^3$  as his final answer and Ashley wrote  $5.3^2$  as her final answer. Who is correct? Justify your answer.

**7. Create a power, then state the base, exponent, determine the value and write the power in words.**

Power	State the base.	State the exponent.	Expanded Form	Evaluate (Value)	Words

# Practice Makes Perfect!

Write using exponents.

1.  $3 \times 3 \times 3 \times 3$  \_\_\_\_\_

2.  $364 \times 364$  \_\_\_\_\_

3.  $2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$  \_\_\_\_\_

4.  $13 \times 13 \times 13$  \_\_\_\_\_

5.  $8 \times 8 \times 8 \times 7 \times 7$  \_\_\_\_\_

6. 49 \_\_\_\_\_

Write in expanded form.

7.  $10^4$  \_\_\_\_\_

8.  $6^5$  \_\_\_\_\_

9.  $3^2$  \_\_\_\_\_

10.  $7^3$  \_\_\_\_\_

11.  $12^4$  \_\_\_\_\_

12. 5 cubed \_\_\_\_\_

Write in standard form.

13.  $5^4$  \_\_\_\_\_

14.  $2^6$  \_\_\_\_\_

15. 11 squared \_\_\_\_\_

16.  $10^7$  \_\_\_\_\_

17.  $12^2$  \_\_\_\_\_

18. 6 cubed \_\_\_\_\_

Compare using  $<$ ,  $>$ , or  $=$ .

19.  $4^2 \bigcirc 2^4$

20.  $4^3 \bigcirc 3^4$

21.  $5^8 \bigcirc 5^9$

22.  $3^8 \bigcirc 3 \times 8$

23.  $2^5 \bigcirc 5^2$

24.  $10^3 \bigcirc 10 + 10 + 10$

25.  $5^3 \bigcirc 5 \times 5 \times 5$

26.  $7^3 \bigcirc 3^7$

27.  $10^4 \bigcirc 4 \times 10$

Compare using  $<$ ,  $>$ , or  $=$ .

19.  $4^2 \bigcirc 2^4$

20.  $4^3 \bigcirc 3^4$

21.  $5^8 \bigcirc 5^9$

22.  $3^8 \bigcirc 3 \times 8$

23.  $2^5 \bigcirc 5^2$

24.  $10^3 \bigcirc 10 + 10 + 10$

25.  $5^3 \bigcirc 5 \times 5 \times 5$

26.  $7^3 \bigcirc 3^7$

27.  $10^4 \bigcirc 4 \times 10$

For each number in exponential notation, identify the base, exponent, and power. Use a calculator to write each number in standard form.

28. A typical American kid watches about  $18^4$  television advertisements between birth and high school graduation.

base \_\_\_\_\_

exponent \_\_\_\_\_

power \_\_\_\_\_

standard form \_\_\_\_\_

29. The highest point in Kentucky is Black Mountain. Its height is about  $2^{12}$  feet.

base \_\_\_\_\_

exponent \_\_\_\_\_

power \_\_\_\_\_

standard form \_\_\_\_\_