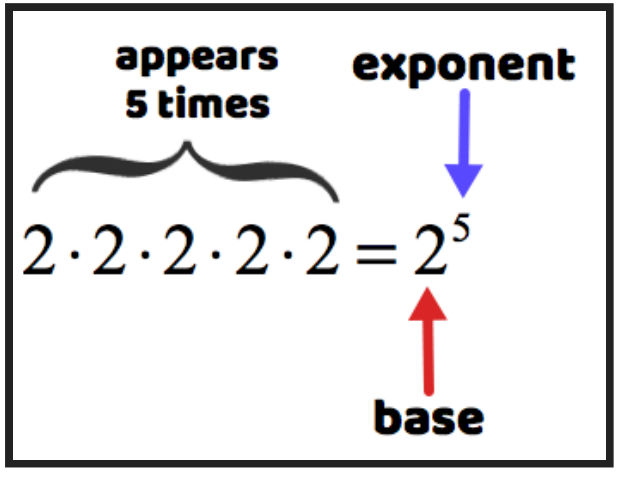
EXPONENTS: THE PRODUCT RULE

LEARNING GOAL

1. I can identify the **base** and the **exponent** in an exponential expression.
2. I can multiply exponential expressions using the **product rule.**



Write each expression in expanded form:

1. $7^5 =$
2. $x^4 =$

Write each expression using a single base and a power:

1. $2 \cdot 2 \cdot 2 =$
2. $3x \cdot 3x \cdot 3x \cdot 3x =$

Exponential Rules

Product Rule

$$a^x \times a^y = a^{x+y}$$

$$a^2 \times a^3 = a^5$$

Quotient Rule

$$a^x \div a^y = a^{x-y}$$

$$a^7 \div a^3 = a^4$$

Power Rule

$$\left(a^x\right)^y = a^{xy}$$

$$\left(a^7\right)^2 = a^{14}$$

Negative Rule

$$a^{-x} = \frac{1}{a^x}$$

$$a^{-4} = \frac{1}{a^4}$$

Zero Rule

$$a^0 = 1$$

Name:_____

Exponents
Worksheet 1

	Exponent Form	Base	Exponent	Expanded Form	Standard Form
1.	10^2				
2.				$2 \cdot 2 \cdot 2$	
3.		$\frac{1}{4}$	2		
4.	15^1				
5.				$1 \cdot 1 \cdot 1 \cdot 1$	
6.	x^2				
7.		b	3		
8.				$y \cdot y \cdot y \cdot y \cdot y \cdot y \cdot y$	
9.		$2x$	4		
10.				$5n \cdot 5n \cdot 5n$	
11.	$4(xy)^2$				
12.				$3 \cdot y \cdot y \cdot y \cdot y$	
13.		2xyz	3		
14.	$-2x^6$				
15.		-4y	2		

Name:_____

Exponents
Worksheet 1

Directions: Complete the table below.

Directions: Complete the chart below.

		Expanded Form	Single Base and a Power
1.	$2^{10} \cdot 2^2$		
2.	$3^2 \cdot 3^4$		
3.	$5^3 \cdot 5^6$		
4.	$x^5 \cdot x$		
5.	$y^3 \cdot y^5$		
7.	$a^3 \cdot a^4$		
8.	$m^2 \cdot m$		
9.	$x^3 \cdot x^6 \cdot x^3 \cdot x^2$		
10.	$5y^3 \cdot y \cdot y^5$		
11.	$2b^3 \cdot 3b^{10}$		

12. Compare the 2nd and 4th columns in the table above. Describe, in words, what you notice about the relationship you see between them.