

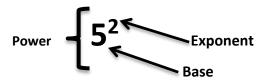
## Rules of Exponents

**N.RN.1** *I CAN... rewrite expressions involving rational exponents using the properties of exponents.* 

#### Aocapajakh:

**Monomial** A number, a variable, or a product of a number and one or more variables

Examples: 34xy, 7a2b



#### rules of exponents:

<b>Product of Powers:</b> $a^m \bullet a^n = a^{m+n}$						
If multiplying two numbers with the same base, ADD the exponents						
$5^2 \bullet 5^6$	y <sup>4</sup>	$\bullet y^3 \bullet y$				
$(7y^5)(6y)$	(-	$3x^2y^7)(5xy^6)$				
Quotient of Powers: $\frac{a^m}{a^n} = a^{m-n}$						
If dividing two numbers with the same base, SUBTRACT the exponents						
$\frac{y^6}{y}$	$\frac{6^{13}}{6^2}$	$\frac{10a^{7}b^{9}}{15a^{5}b^{9}}$				

## Rules of Exponents

Zero Exp	onent:	$a^{0}$	$=\hat{x}$	1
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Any nonzero number with an exponent of zero is equivalent to 1

WHY?? Let's explore  $\frac{8^2}{8^2}$  ......

 $(-3x+7)^0$ 

 $8x^{0} + 5$ 

### **Negative Exponent** $a^{-n} = \frac{1}{a^n}$

For any nonzero number "a" raised to a negative exponent, place the power in the denominator to rewrite the power with a positive exponent

WHY?? Let's Explore  $\frac{b^2}{b^5}$ ......

 $2^{-3}$ 

 $(-3)^{-3}$ 

# Rules of Exponents

Power of a Power: $(a^m)^n = a^{m \cdot n}$					
If raising a power to a power, multiply the exponents					
Examples: Simplify. Write	Examples: Simplify. Write each answer using only positive exponents:				
$(x^2)^8$		$(y^{-3})^{-4}$			
Powe	er of a Produc	$t: (ab)^m = a^m b^m$			
Find the power of <b>each</b> factor in the parenthesis and multiply					
$\left(4x^3yz\right)^3$	$\left(7xy^{-2}\right)^{-2}$	$\left(6x^{-6}y^{-7}z^{0}\right)^{-2}$			
Power of a Quotient: $\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$					
For any numbers "a" and "b" where $b \neq 0$ , if the quotient of a and b is raised to a					
power, raise both the numerator and the denominator to the given power					
$\left(\frac{3}{5}\right)^2$		$\left(rac{2a^5}{b^7} ight)^2$			
$\left(\frac{3a^{-4}}{b^7}\right)^3$		$\left(\frac{a^{-2}b^{-5}}{c^{-11}}\right)^{-6}$			



I hope you enjoyed the Rules of Exponents
Guided Notes! You may also enjoy the Rules of
Exponents Reference Sheet or Rules of
Exponents: Different Question/Same Answer
Partner Activity, which are both available in my store.

Thanks..... Come back soon!!

Elizabeth Kissel ©