

NAME: _____

Math _____, Period _____

Mr. Rogove

Date: _____

LEARNING OBJECTIVE: We will raise bases to the 0th power. (G8M1L4)

CONCEPT DEVELOPMENT:

Raising to the 0th power:

$$x^0 = 1$$

Two explanations:

$$\frac{5^3}{5^3} = 5^{3-3} = 5^0 = 1$$

$$\frac{5^3}{5^3} = \frac{5 \cdot 5 \cdot 5}{5 \cdot 5 \cdot 5} = 1$$

$$x^3 \cdot x^0 = x^{3+0} = x^3,$$

↑
1
so x^0 must be 1

Rewriting Numbers Using Powers of 10

Think about place value when rewriting numbers:

$$\begin{aligned} 1 &= 10^0 \\ 10 &= 10^1 \\ 100 &= 10^2 \\ 1000 &= 10^3 \\ 10,000 &= 10^4 \end{aligned}$$

987,654

✓ (A) $7 \times 10^3 = 7000$

X (B) $7 \times 10^4 = 70K$

✓ (C) $4 \times 10^0 = 4$

X (D) $4 \times 10^1 = 40$

Example: $8,374 = (8 \times 10^3) + (3 \times 10^2) + (7 \times 10^1) + (4 \times 10^0)$

$8000 + 300 + 70 + 4$

GUIDED PRACTICE:

Steps to Simplifying Exponents with Zero Exponents

1. Simplify all exponents.
2. Set numbers raised to the 0th power equal to one.

$\frac{y^{12}}{y^{12}} = y^{12-12} = y^0 = 1$	$\frac{6^{11}}{6^{11}} = 1$
$(7(123.456789)^4)^0 = 7^0 (123.456789)^{4 \cdot 0} = 1 \cdot 1 = 1$	$(6x^3)^0 = 6^0 x^{3 \cdot 0} = 1 \cdot 1 = 1$

NAME: _____

Math _____, Period _____

Mr. Rogove

Date: _____

Steps to Simplifying Exponents with Zero Exponents

1. Simplify all exponents.
2. Set numbers raised to the 0th power equal to one.

$\frac{4x^2y^0}{x^2} = \boxed{4}$	$\frac{-12y^0}{y^0} = \boxed{-12}$
$\frac{2^5}{2^5} \cdot \frac{1}{2^2} \cdot \frac{2^2}{1} \cdot \frac{1}{2^5} = \frac{2^5 \cdot 2^2}{2^5 \cdot 2^2} = 1 \cdot 1 = 1$	$\frac{x^{12} \cdot y^{19}}{y^{19} \cdot x^{12}} = 1$

Steps for Rewriting Numbers using Powers of 10

1. Identify the place value of each number and multiply it by the appropriate power of 10.

<p>6,906,174</p>	<p>326,103</p>
<p>INDEPENDENT</p>	
<p> $(5 \times 10^7) + (3 \times 10^6) + (9 \times 10^5) + (1 \times 10^4)$ $+ (5 \times 10^3) + (2 \times 10^2)$ $+ (7 \times 10^1) + (8 \times 10^0)$ </p> <p>5,915,278</p>	<p> $(4 \times 10^4) + (5 \times 10^3) + (3 \times 10^2)$ $+ (9 \times 10^1) + (8 \times 10^0)$ </p> <p>45,398</p>

NAME: _____

Math _____, Period _____

Mr. Rogove

Date: _____

INDEPENDENT PRACTICE:

ACTIVATING PRIOR KNOWLEDGE:

We know the rules for multiplying and dividing exponents

$\frac{7x^5}{7x^3}$	$12^3 \cdot 12^{10} \cdot 12^2$
---------------------	---------------------------------

CLOSURE:

Hand out exit Ticket

TEACHER NOTES:

Fluency sprint toward the end. Need to make copies!!