Name: **Date:**

Unit 8, Day 2 Notes **Period:**

Learning Targets

- I can simplify expressions with negative exponents.

Look at this pattern:

$2^5 =$____ $2^4 =$____ $2^3 =$____ $2^2 =$____ $2^1 =$____

What happens each time the exponent decreases by one? _____

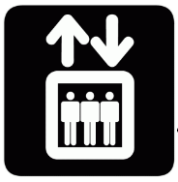
If this pattern continues, what would the value of 2^0 equal? _____

What would 2^{-1} equal? _____

$2^0 =$____ $2^{-1} =$____ $2^{-2} =$____ $2^{-3} =$____ $2^{-4} =$____

DEFINITION of NEGATIVE EXPONENTS

a^{-n} is the **reciprocal** of a^n : $a^{-n} = \frac{1}{a^n}, \quad a \neq 0$



Think of the "-" as an elevator; if you started on the top (numerator) then take the elevator down (denominator) and if you started on the bottom then take the elevator up!

Examples

1. m^{-7}
2. 3^{-2}
3. y^0
4.
5. $\left(4x^7\right)^{-2}$

YOU TRY:

A. x^{-3} B. 2^{-3} C. y^{-6} D. x^0 E. $\left(\frac{1}{2}\right)^{-3}$

F. H. $\left(3a^3b^5\right)^{-3}$

Simplifying Expressions That Have Negative Exponents

Simplify $2x^{-3}y^{-5}$ by rewriting with positive exponents. (Remember that the –3 exponent ONLY goes with the x and NOT the coefficient)

The sign of the exponent changes when the exponent is moved from the numerator to the denominator and vice versa!

$$2x^{-3}y^{-5} \rightarrow \frac{2}{x^3y^5}$$

STEPS:

1. **Make it a fraction**
2. **Move the factor across the fraction line (take the elevator)**
3. **Drop the negative sign.**
4. **Combine like terms.**

A. $x^{-2}y^5$

B. $2x^{-7}$

C. $\frac{2a^{-3}b^4}{c^4d^{-5}}$

D.

E.

YOU TRY:

1. x^8y^{-5}	**2.** $5x^{-3}$	**3.** $\frac{3a^2b^{-7}}{c^{-3}d^4}$	**4.**	**5.**

CHALLENGE! $\left(\frac{2x^3}{y^4}\right)^{-1}$