Standard 8.EE.1 **7.1 Zero and Negative Exponents** Unit 2 Day 2

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| **Properties: Zero and Negative Exponents** |
| **Zero as an Exponent** | For every nonzero number a,  | Examples: |
| **Negative Exponent** | For every nonzero number *a* and integer *n*,  | Examples: |

**Zero Base and Zero Exponents**

Why can’t you use 0 as a base and an exponent? Solve each of the following.

However, consider the following pattern.

It is not possible for to equal both 1 and 0. Therefore, is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Simplifying Powers**

What is the simplified form of each expression?

Got it? What is the simplified form of each expression?

**Simplifying Exponential Expressions**

What is the simplified form of each expression?

Got it? What is the simplified form of each expression?

**Evaluating an Exponential Expression**

What is the value of for s = 2 and t = -3?

Got it? What is the simplified form of each expression if n = - 2 and w = 5?

1. n-4w0
2. 
3. 
4. 

**Using an Exponential Expression**

A population of marine bacterial doubles every hour under controlled laboratory conditions. The number of bacterial is modeled by the expression  , where h is the number of hours after a scientist measures the population size. Evaluate the expression for h = 0 and h = -3. What does the value of the expression represent in the situation?

A population of insects triples every week. The number of insects is modeled by the expression , where w is the number of weeks after the population was measured. Evaluate the expression for w = -2, w = 0, and

w = 1. What does each value of the expression represent in the situation?

**Lesson Check!** Simplify each expression.

1. 
2. 
3. 
4. 

Evaluate each expression for a = 2 and b = -4.

1. 
2. 
3. A positive exponent shows repeated multiplication. What repeated operation does a negative exponent show?
4. A student incorrectly simplified as shown below. Find and correct the student’s error.