

**Learning Target(s):** I can define & identify inductive reasoning.  
 I can find & describe patterns in data.  
 I can define & make conjectures, evaluate others conjectures and find counterexamples.

**Notes: 2.1 Use Inductive Reasoning**

**conjecture:** an unproven statement that is based on observations

**inductive reasoning:** the process of finding a pattern for specific cases and then writing a conjecture for the general case

**Ex. 1**

Describe the pattern in the numbers  $-1, -4, -16, -64, \dots$  Write the next three numbers in the pattern.

multiplying by 4  
 $-64 \cdot 4 = -256$ ,  $-256 \cdot 4 = -1024$ ,  $-1024 \cdot 4 = -4096$

**counterexample:** a specific case for which the conjecture is false

**Ex. 2**

A student makes the following conjecture about the subtraction difference of two numbers. Find a counterexample to disprove the student's conjecture.

**Conjecture:** The difference of any two numbers is always smaller than the larger number.

$$\frac{9}{-2} = 7$$

$$\frac{-10}{-5} = -5$$

negatives  
 counterexample

$$\frac{-29}{-0} = 29 \leftarrow \text{zero}$$

**Try it!**

1. Describe how to sketch the fourth figure in the pattern and then sketch it. What would the fifth figure look like?

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