

Lesson 2.1: Inductive Reasoning

In this lesson you will:

- learn how inductive reasoning is used in science and mathematics
- use inductive reasoning to make conjectures about sequences of numbers and shapes

Inductive reasoning is the process of _____ data, recognizing _____, and making _____ based upon those patterns. (*Add “inductive reasoning” to your vocabulary.) You probably use inductive reasoning all the time without realizing it. For example, suppose your science teacher likes to give “surprise” quizzes. You notice that, for the first four chapters of the book, she gave a quiz the day after she covered the third lesson. Based on the pattern in your observations, you might generalize that you will have a quiz after the third lesson of every chapter. A generalization based on inductive reasoning is called a **conjecture**.

Inductive reasoning guides scientists, investors, and business managers. All of these professionals use past experience to access what is likely to happen in the future.

•Example 1: A scientist dips a platinum wire into a solution containing salt (sodium chloride), passes the wire over a flame, and observes that it produces an orange-yellow flame. She does this with many other solutions that contain salt, finding that they all produce an orange-yellow flame. Make a conjecture based on her findings.

•Example 2: Consider the sequence 2, 4, 7, 11... Make a conjecture about the rule for generating the sequence. Then find the next three terms.

Investigation 2.1: “Shape Shifters”

Look at the sequence of shapes below. Pay close attention to the patterns that occur in every other shape.



A.) What patterns do you notice in the 1st, 3rd, and 5th shapes?

B.) What patterns do you notice in the 2nd, 4th, and 6th shapes?

C.) Draw the next two shapes in the sequence.

D.) Use the patterns you discovered to draw the 25th shape.

E.) Describe the 30th shape in the sequence. You do not have to draw it! ☺

Sometimes a conjecture is difficult to find because the data collected are unorganized or the observer is mistaking coincidence with cause and effect. Good use of inductive reasoning depends on the quantity and quality of data.

⇒**ASSIGNMENT:** _____