

1E What's Your Hypothesis?

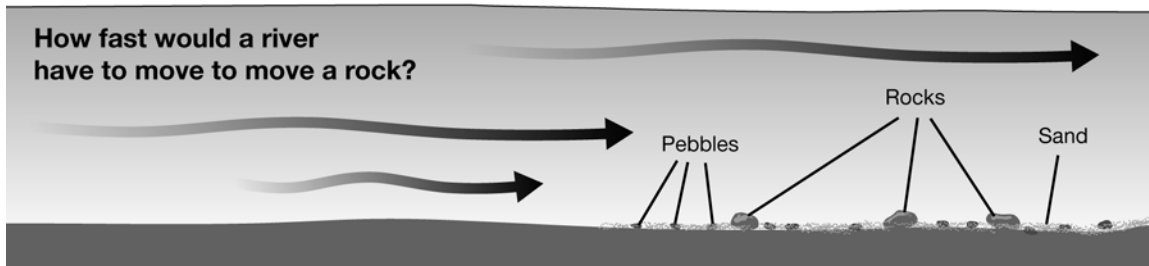
Read:

After observing nature, a scientist forms a question based on observations and then attempts to answer that question. A tentative, testable statement that tries to explain a set of scientific observation is called a **hypothesis**. It is important to remember that a hypothesis is not always correct. A hypothesis must be testable so that you can determine whether or not it is correct.

Example:

In science class your teacher has told you that the ability of a river to transport material depends on how fast the river is flowing. Imagine the river has three speeds—slow, medium, and fast. Now, imagine the river bottom has sand, marble-sized pebbles, and baseball-sized rocks. Come up with a hypothesis for the answer to the following question. Then justify your reasoning:

Research question: At which flow rate—slow, medium, or fast—would a river be able to transport baseball-sized rocks?



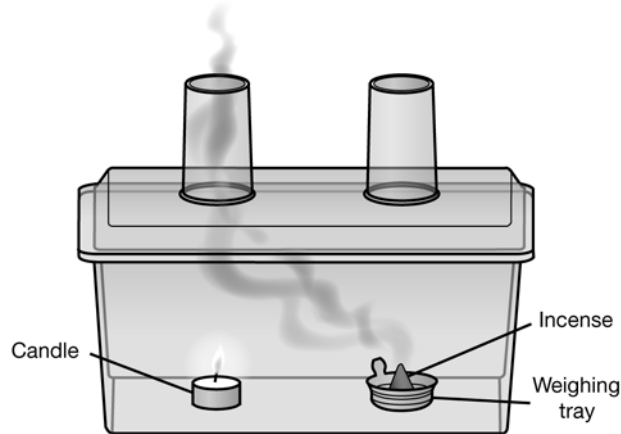
Example hypothesis and justification: A fast flow rate is necessary for the river to transport baseball-sized rocks. It takes more force to move larger rocks than small pebbles and sand. Fast flowing water has more pushing force than medium- or slow-flowing water. I know this from an experience I had wading in a river one time. As I waded from still water to areas where the river was flowing faster, I could feel the water pushing against my legs more and more.

Practice:

1. You left a glass full of water by a window in your house in the morning. Three hours later you walk by the glass, and the water level is noticeably lower than it was in the morning. You have made the observation that the water level in the cup is lower. Then, you ask the following question: “Why is the water level in the cup lower?”

What is a possible hypothesis you could make?

2. Your teacher shows you a demonstration in which there is a box with two chimneys. Under one chimney is a lit candle, and under the other chimney is smoke from burning incense. You observe that the smoke always goes towards the candle and then exits the box from the chimney above the candle. You ask the following question: “Why does the smoke go toward the candle and leave the chimney above the candle?”



What is a possible hypothesis you could make?

3. You have learned in science class that *evaporation* is a process that describes when a liquid turns to a gas at a temperature below the boiling point. You are now about to investigate evaporation and factors that may increase the rate at which it occurs. You ask the question, “What causes the evaporation rate of water to increase?”

What is a possible hypothesis you could make?

4. Rivers and streams flow at various speeds. You ask, “What factors increase the flow rate of a river?”

What is a possible hypothesis you could make?

5. It is late fall and you notice that flower bulbs in your yard have been dug up and some have been eaten. You ask, “What has happened?”

What is a possible hypothesis you could make?

- 6. You know that sea otters eat sea urchins and that sea urchins eat kelp. You ask, “What would happen to this ecosystem if all the kelp died?”

What is a possible hypothesis you could make?

- 7. In Alaska, lynx (wild cats) are predators of the snowshoe hare. In the wintertime, the coat of the snowshoe hare turns from brown to white. You ask, “Why does the snowshoe hare change color in the winter?”

What is a possible hypothesis you could make?

- 8. In the deserts of the southwestern United States, coyotes are dog-like animals that eat many different things such as small animals and cactus fruit. They are also scavengers, which means they eat dead and decaying animals. You ask, “Are there coyote-like animals that serve as predator-scavengers in other deserts on other continents?”

What is a possible hypothesis you could make?
