

UNIT 1: Scientific Investigation, Reasoning, and Logic



THINK About It: Observations and the Senses

SOL 3.1.a 2.1.a, 2.1.b 1.1.a, 1.1.b K.1.a, K.1.b, K.2.a, K.2.b

Our **senses** allow us to experience the world around us. Most people have five senses: **sight** (*eyes*); **hearing** (*ears*); **smell** (*nose*); **taste** (*tongue*); and **touch** (*skin*).

These senses help us figure out the **properties**, or features, of objects. They let us know when something tastes sweet, sour, bitter, or salty. They allow us to feel whether something is rough or smooth, hard or soft, cold or hot. They let us hear whether sounds are loud or soft, high or low. And they let us see when something is bright or dull.

When we use our senses to notice the properties of the world around us, we are making **observations**. You should use all of your senses when making an observation. Sometimes we need tools to help us make better observations. For example, people use magnifying glasses to help them see very small objects.

Since we all make mistakes, we should repeat our observations to make sure that the first one was correct. You should also make observations from different positions—an object like a car looks different from the side than it does from the front. Make sure to observe the top and bottom, front and back, and sides of an object.

1 Which of these is NOT part of making a good observation?

- A Use all of your senses
- B Repeat the observation
- C Notice properties
- D Look at the front only

2 Sam is observing an ant, but he is having trouble seeing it. He should —

- F look at the bottom of the ant
- G use his sense of smell and hearing
- H use a tool to help him see better
- J repeat his observations

When you describe an observation it is important to tell only what you see, hear, smell, taste, or touch. When you express an idea *about* an observation, then it is no longer an observation. It becomes a **prediction** or a **hypothesis**.



THINK About It: Predictions and Hypotheses

SOL 3.1.a, 3.1.c 1.1.f, 1.1.g K.1.g

When observing the properties of an object, you will likely have questions. You may wonder whether an object is made of more than one material. You may ask yourself whether other objects have similar properties. These kinds of questions are important. You can use them to make a **hypothesis**.

A hypothesis is a kind of **prediction** about the object you are observing. This type of prediction is not just a guess. It is supported by your observations and what you already know about the world.

You should write your hypothesis in a certain way. It is stated as a cause and an effect using the words *If* and *then*. For example: *If* an object is torn in half, *then* both halves of the object will have the same properties.

3 Which of these is a properly stated hypothesis?

- A Why is this kind of leaf red?
- B This kind of leaf is red because it was on a tree in autumn.
- C If this kind of leaf is on a tree in autumn, then it will turn red.
- D I predict that this kind of leaf will turn red in autumn.

Once you form a hypothesis, you must perform an **experiment** to test your prediction and answer your question. An experiment is a way to gather information, or **data**. Suppose you want to test your hypothesis about the properties of an object torn in half. The experiment might be to tear the object in half. Then you would record the results. The results may or may not support your hypothesis.

4 Kim found a rock that is smooth and dark in some parts, and bumpy and light in other parts. Which prediction about the rock makes the most sense?

- F Testing the rock will show that it is made of two materials.
- G Testing the rock will show that it is not a rock at all.
- H Testing the rock will show that it is made of one material.
- J Testing the rock will show that it is two rocks that look like one.

In order to perform a useful experiment, you need to know how to measure data and record results. You will now review how to measure important data with the proper **tools** and record the results with special **units**.