Communication is the Key

By Trista L. Pollard

[1] After scientists unlock mysteries in their laboratories, they need to provide the key for the rest of the world to understand their discoveries. That key comes in the form of the science process skill called **communication**. Once scientists have completed their observations, measurements, and experiments, they need to communicate or record their results. Scientists define words **operationally**, describe observations of objects and events, and construct visual aids to explain their results.

[2] When scientists define words operationally, they describe the words by their actions. For example, let's say that you are researching an important test question in class. You are trying to find out how many licks it takes to get to the center of a Charms Blow Pop©. Before you can start the actual experiment, you need to define the word *lick*. As a class, you determine that a complete lick would be "from the bottom of the lollipop to the top of the lollipop on one side." This is important because even though everyone eats lollipops by putting them in their mouths, we have different ways of licking the lollipops. Your class would also need to define operationally how you would know you reached the center of the lollipop. This could be accomplished by saying, "Reaching the center means the candy coating is not covering any portion of the bubblegum." Operational definitions help scientists to narrow the guidelines they will use to help study objects and events.

[3] Once you have gathered data about your lollipop licks, you need to **record** that data. Like scientists, you can write your information in a data log or on a data sheet. Your information may include the average number of licks that students took before they reached the center of the lollipop. You may also include measurements taken of the lollipops before and after the experiment. This information would be useful to determine the thickness of the candy coating on the lollipop. Your partner could also write what he or she observed (drool and all) as you made your way to the center of the blow pop. If scientists did not record the data they acquired after experiments and observing events and objects over time, we would not have information about some of the world's most famous inventions.

[4] When scientists record their data, some of that information is recorded in the form of visual aids. Scientists will draw graphs and charts to show changes in objects and events over time, for example plant growth over a period of months. They may make diagrams and pictures to show the steps of certain events like the life cycle of frogs. Maps would be designed to demonstrate how volcanologists can find the location of active volcanoes. A common way of displaying scientific results is to construct a **model** or to organize an **exhibit**. By using models and exhibits, scientists could demonstrate how objects work and how events occur.

[5] There are many ways to find the answers to science's most probing questions. However, there is only one key to making these answers public, and that is through scientific communication.

Name _____ Science Pd: _____

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1. Scientists use different forms of communication to _____.
   - (A) Record their autobiographies
   - (B) Record their summer vacations
   - (C) Record their scientific results
   - (D) None of the above

2. Defining words operationally means to describe the words based on their actions.
   - (A) False
   - (B) True

3. Scientists use models and exhibits to _____.
   - (A) Demonstrate how time is used in laboratories
   - (B) Demonstrate how measurement occurs
   - (C) Demonstrate how science changes over time
   - (D) Demonstrate how objects work and events occur

4. What would be the best forms of communication to describe changes in animal populations in a certain area over time?

5. What do scientists use to record data acquired from observations?

6. Scientists design maps to list changes in events over time.
   - (A) False
   - (B) True

7. Diagrams and pictures may be used to show _____.
   - (A) The operational definitions of an experiment
   - (B) The results of stopping certain events
   - (C) The steps that occur in certain events
   - (D) The growth of certain objects

8. What would be the best form of scientific communication to demonstrate a food chain that occurs in nature?