

Name:

Class:

Date:

OBSERVATION AND INFERENCE HW

SKILLS INTRODUCTION: *Observing and Inferring*

(adapted from a Pearson Education Publication)

The first day of school is an exciting time. You find out who your teachers are, who else is in your classes, and where your classrooms are. When you look around to see what the room looks like and who is there, you are making observations.

What is an observation?

Observing is using one or more of your senses—sight, hearing, smell, taste, and touch—to gather information about the world. For example, seeing a green chalkboard, hearing a bell ring, smelling smoke, tasting a sour lemon, and feeling a smooth desktop are observations. Information gathered from observations is called evidence, or data. Making and recording observations is the most basic, and the most important, skill in science.

When you make observations in science, you want them to be accurate and objective. An accurate observation is an exact report of what your senses tell you. *An objective observation avoids opinions, or bias, based on specific points of view.*

Example 1: Sixteen students were present for roll call, and five other students arrived afterward. (accurate and objective)

Example 2: Half the class was late. (not accurate)

Example 3: The friendliest people were there first. (not objective, a personal opinion)

What are the two types of observations?

Observations can be either **qualitative** or **quantitative**. **Qualitative** observations are descriptions that do not use numbers. For example, if you report colors, smells, tastes, textures, or sounds, you are making qualitative observations. **Quantitative** observations, on the other hand, *do* include numbers. If you count objects or measure them with standard units, you are

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SKILLS INTRODUCTION: *Observing* [continued]

making quantitative observations. Quantitative observations are often made using tools.

Example 4: The classroom walls are yellow. (qualitative)

Example 5: The classroom floor is shiny. (qualitative)

Example 6: There are 21 students in the room. (quantitative)

Example 7: The chalkboard is 1 meter high and 2 meters wide. (quantitative)

What is an Inference?

In science, observations are usually followed by attempted explanations, or **inferences**. When scientists make inferences from observations, however, they keep the two processes separate. That's because although an accurate observation is considered to be factual evidence, the inferences may not be correct. When you make and record your observations, write down just what your senses perceive.

Example 8: There's an empty aquarium tank in the classroom. (observation)

Example 9: The tank is 50 cm long, 30 cm wide, and 18 cm deep.
(observation)

Example 10: The tank used to contain live fish. (an inference, not an observation)

Example 11: The tank is waterproof (an inference, not an observation)

Tips for Making Observations

- ❑ Use the senses of sight, hearing, touch, and smell to make qualitative observations. (Important: For safety's sake, do not taste any unknown substances.)
- ❑ Review your observations to make sure they are accurate and objective.
- ❑ Whenever possible, count or use instruments to make quantitative observations.
- ❑ Make sure you include the unit that identifies each measurement, such as a mass measurement of 5 grams or a distance measurement of 15 meters.
- ❑ If no tools are available to make measurements, try to estimate common quantities by referring to known standards. For example, you might state that an object is about as long as a new pencil or has the mass of a paper clip.
- ❑ Check your observations to be sure that they are statements about information gained through your senses, not explanations of what you observed.

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Skills Practice: Identify the following as a qualitative observation, quantitative observation, opinion, or an inference. Circle your choice.

1. There are 7 black puppies and 3 tan puppies. (qualitative, quantitative, opinion, inference)
2. The water in the bay smells bad. (qualitative, quantitative, opinion, inference)
3. The bowling ball weighs 10 pounds. (qualitative, quantitative, opinion, inference)
4. The bay smells bad, so it must be polluted. (qualitative, quantitative, opinion, inference)
5. The video game is loud, colorful, and has various levels of difficulty. (qualitative, quantitative, opinion, inference)
6. In the park, there are 17 people having a picnic, 10 people swimming, and 14 people playing kickball. (qualitative, quantitative, opinion, inference)

PLEASE VISIT THIS LINK TO SUBMIT AND CHECK YOUR RESPONSES:

<http://bit.ly/2y1jslw>

You can also get the form from Jupiter OR

contonascience.weebly.com → Announcements and Info

7. Explain the difference between a quantitative and a qualitative observation in your own words.

- For a 4, be sure to elaborate on your response with an example or detail.
- The example or detail can come from your life or the text you read.
