

Step 5: Observe, Record, & Analyze Data (Part 1)

While conducting your experiment, it is very important to make clear and accurate observations. An observation involves using all five senses to make sense of the world around you. Scientists use observations to gather the data that will support or disprove their hypothesis.

There are two basic types of observations: quantitative and qualitative. **Quantitative observations** are observations that involve a number in the form of an amount or measurement. Noticing that there are 12 students working in the library is a quantitative observation. Scientists try to use quantitative observations as much as possible because they are more accurate and precise. **Qualitative observations** are observations that use non-numerical descriptions. Noticing that your friend's sweater is blue and green is a qualitative observation.

Read each observation below. Write whether the observation is quantitative or qualitative.

1. Marques missed an easy question on the math test. _____
2. Lisa lost seven pencils last week. _____
3. The concrete mix gets hard when mixed with water. _____
4. The fire alarm is very loud. _____
5. These grapes are sour. _____
6. The swimming pool holds five kiloliters of water. _____
7. There are eight new emails in my inbox. _____
8. About 52% of a chimp's diet comes from fruit. _____
9. After the chemical was added, the water turned yellow. _____
10. The red car did not stop at the stop sign. _____

Observe the classroom around you. Make five quantitative and five qualitative observations about your classroom. Write them in complete sentences in the chart below.

Quantitative Observations	Qualitative Observations
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.

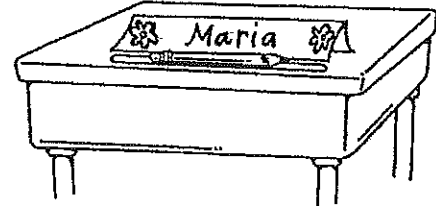
Step 5: Observe, Record, & Analyze Data (Part 2)

When conducting research, good scientists go beyond making simple observations. Scientists attempt to explain their observations based on patterns and past experiences. When you explain or interpret the things you observe, you are making an inference. Inferences are logical explanations that help us make sense of what we observe. It is important to remember that inferences are not wild guesses, but rather logical explanations based on what you already know. There may often be several logical inferences for an observation. You may not be sure which inference is the best explanation, so an inference may need to be changed when new observations are made.

Example:

Observation: Maria is not at school today.

Possible Inferences: Maria has the flu.
Maria is at the dentist.
Maria missed her bus.
Maria and her family are on vacation.



We will not know which inference is correct until we gather more information from various observations.

Read each observation below. Then, write an inference that could possibly explain the observation. Remember, the inference MUST be logical!

1. Observation: The flowers grew taller on the front porch than on the back porch.

Inference: _____

2. Observation: The teacher hands Alysha her test back and Alysha smiles.

Inference: _____

3. Observation: The principal calls a student from the classroom.

Inference: _____

4. Observation: You leave school and see the street is wet.

Inference: _____

5. Observation: The lights in the classroom are off.

Inference: _____

6. Observation: You hear a siren going past your house.

Inference: _____

7. Observation: You see a child crying as she and her mother are leaving a store.

Inference: _____

8. Observation: Your dog is barking at the front door.

Inference: _____

9. Observation: At lunchtime, the sky begins to get very dark.

Inference: _____

10. Observation: All the students in class have brought their lunches from home.

Inference: _____