Observations and Inferences

Mr. Troshak
Science 8
What is an observation?

- When you observe, you become aware of something using one of your five senses.
  - Smell, taste, touch, hear, and see
- An observation is a statement describing a fact.
- Example: Mr. Kohler has eyes.
- Two types of observations
  - Qualitative
  - Quantitative
Observations-Qualitative

- Qualitative observations **describe** what we observe
- **Qualitative**=quality (descriptive)
- These observations use adjective to describe something
  - Example: Mr. Kohler has blue eyes
  - Example: A basketball is round
Quantitative observations measure what we observe.

Quantitative = quantity (numerical)

These observations use numbers to measure something in a quantitative way.

Example: Mr. Kohler has two eyes.

Example: He has four basketballs.
Which is better?

- Both types of observations are valuable in science.
- In an experiment, quantitative observations can be precisely and objectively compared.
  - Qualitative: The marble rolled fast down the ramp to the finish line.
  - Quantitative: It took the marble 1.4 seconds to roll from down the ramp to the finish line.
Sometimes in science it is helpful to turn qualitative into quantitative

Example: Someone might say the boys’ locker room smells like a foot.
- It is difficult to know HOW smelly the boys’ locker room is though.
- To make the boys’ locker smell into a quantitative observation, you could ask the person to rate the “smelliness” on a scale of 1-5.
- This would allow you to assign a number to the “smelliness” of the locker room.
Inference

- Inferences are an explanation for an observation you have made.
- They are based on your past experiences and prior knowledge.
- Inferences often change when new observations are made.
  - Example: When you leave school, you see that the ground is wet. You infer that must have rained.
  - John hears a smoke alarm and smells burnt bacon. John can infer that his neighbor burnt her breakfast.

- Click here to watch two children argue about their inferences over the weather.
Comparing Observations vs. Inferences

- **Observations** are information we gather directly through our five senses. **Inferences** help explain those observations.

<table>
<thead>
<tr>
<th>Sample Observations</th>
<th>Sample Inferences</th>
</tr>
</thead>
<tbody>
<tr>
<td>The footprints in the soil each have five toes.</td>
<td>An animal made the footprints.</td>
</tr>
<tr>
<td>The larger footprints are about 20 cm long.</td>
<td>A bear made the footprints.</td>
</tr>
<tr>
<td>The space between each pair of footprints is about 30 cm.</td>
<td>The animal was walking, not running.</td>
</tr>
</tbody>
</table>

**OBSERVATION VS. INference**

**Observations**
- That plant is extremely wilted.
- The car stopped running.

**Inferences**
- That plant is extremely wilted due to a lack of water.
- The car stopped running because it was out of gas.
Assignment

Tomorrow for class you need to be prepared to complete the following task

1.) Discuss the importance of knowing the difference between observations and inferences in science.

2.) Be prepared to list observations and inferences after watching a demonstration.

Additional Resources:

If you’re struggling and do not fully understand observations and inferences, please see the links below

If you want to check your understand and continue to learn. Click on the resources below

Help:

- https://www.youtube.com/watch?v=CFmj_NY5tvg
- https://www.youtube.com/watch?v=fBIR7taW9jk

Opportunity to learn more and check for understanding:

- http://www2.gcs.k12.in.us/jcooke/Unit%201%20-%20Intro%20to%20ICP/2012-08-15%20Observations%20and%20Inferences%20Part%201.pdf
- http://www2.moundsviewschools.org/chippewa/userfiles/swansonk/observationinferenceworksheet.pdf
- file://bc.local/staff$/homedirs/atroszak/Downloads/observation_or_inference5-6_wksh%20(1).pdf
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