

# Teacher Tune-up

## Quick Content Refresher for Busy Professionals

### How are qualitative and quantitative observations different?

Not surprisingly, qualitative observations are observations of qualities (think characteristics like green or putrid, types like mammalian or reptilian, sensation like slimy or dry...), while quantitative observations are observations of quantity (think count, length, time, speed, density, temperature, angle...). The basic distinction is usually clear, but there can be overlap. For example, some data like color might be described qualitatively or quantitatively in different circumstances; we commonly think of color as a quality (green, blue green, yellowish green, viridian), but a certain shade of green might also be described in terms of its wavelength, or by a hexadecimal value used to encode color for computer screens.

Qualitative	Quantitative
<ul style="list-style-type: none"> <li>▶ Descriptive, often adjectives</li> <li>▶ Can use tools too... such as microscopes</li> <li>▶ Focus on the qualities (academic use) of something... like texture or color or stickiness</li> <li>▶ Unquantified sensations like color, smell, texture</li> <li>▶ Even though based on the senses, observers should aim for “objective”</li> </ul>	<ul style="list-style-type: none"> <li>▶ Need a number</li> <li>▶ Counted or measured and then recorded as a quantity... (sometimes it's just counting, sometimes it's a unit length, sometimes it's a rating on a scale)</li> <li>▶ Frequently rely on tools like stopwatches and rulers.</li> <li>▶ If there's not a scale, we make one (Scoville pepper hotness, Mohs hardness, Richter earthquake, etc)</li> </ul>

*It could be argued that qualitative observations can be more subjective, but both are subject to bias and error. Tools and systems for data gathering and recording are important for both.*

Students should understand that one is not necessarily better than the other. The value of qualitative and quantitative data depends on the thing being observed and the purpose of the description. Sometimes it's important to use both.

For example, in observing a field of butterflies, both qualitative and quantitative observations might be useful.

Qualitative	Quantitative
<p>Some butterflies are solid-colored and others are multi-colored</p> <p>Most fly close to the ground most of the time</p> <p>When the breeze blows many butterflies take flight</p> <p>Some butterflies have antenna that are shaped like a hook</p>	<p>Butterflies landed on a single milkweed plant 17 times between 1PM and 1:15PM</p> <p>At 5 degrees Celsius there is less movement among butterflies as compared to 15 degrees</p> <p>One specimen gathered had a mass of 5.5 grams and a wingspan of 6.3 centimeters</p> <p>The median time aloft for 20 butterflies observed was 24 seconds.</p>