



Name \_\_\_\_\_

## Observations & Inferences



**Safety:** Use care with the tubes; they will break!

**Purpose:** To practice making observations & Inferences

**Background Information:** One of the most important skills in science is that of **OBSERVATION**. Most of the time we think of observation as something we do with our eyes; when we see something, we observe it. However, all five of our senses can be used to make observations: sight, hearing, taste, touch, and smell.

A good scientist is observant and notices things in the world. She or he notices what's going on in the world and becomes curious about what's happening. Observing can include reading and studying what others have done in the past because scientific knowledge is collective.

Observations in science are called **DATA**.

We can make two kinds of observations: those that are **FACTS**, and those that are **OPINIONS**. Facts are those things that are true for everybody. A scientist looks seriously at information and attempts to avoid all sources of bias in making observations. Opinions are beliefs based on personal preference.

An **INFERENCE** is an assumption or conclusion based on an observation. It is a logical interpretation based on observations and prior knowledge.

Data may also be **QUALITATIVE** or **QUANTITATIVE**.

Qualitative data is information that is hard to measure, count, or describe in numbers. It describes the qualities or characteristics of something. Examples are colors, tastes, and sounds. Qualitative data is recorded in **DATA CHARTS**. Charts may have numbers, pictures, or sentences.

Quantitative data is information that can be expressed in numbers. If information can be counted or measured, then it is quantitative data. Tools are often used to collect quantitative data. Examples include amounts, temperature, mass, and length.

Quantitative data is recorded in **DATA TABLES**: Tables contain numerical data.

**Materials:**

Set of three tubes	Meter stick	Stopwatch
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**Procedure:**

1. Work with your partner
2. Read the procedure carefully.
3. Make a data table and a data chart to record your observations **before you begin.**
4. Pick one tube (it does not matter which one).
5. Move the tube so that the bubble inside tube moves up and down the tube.
6. Record your qualitative and quantitative observations in your table.
7. Repeat with the other tubes.

**Data:**

