

NTI Day 2 Lesson

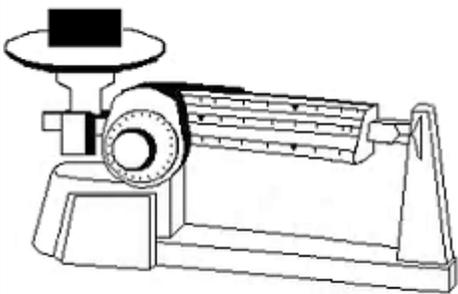
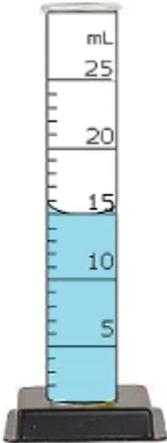
Content Standard A: Scientific Inquiry and Lab Safety and Tools

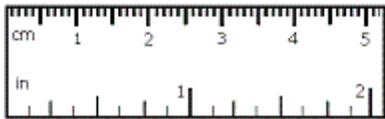
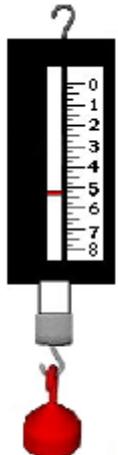
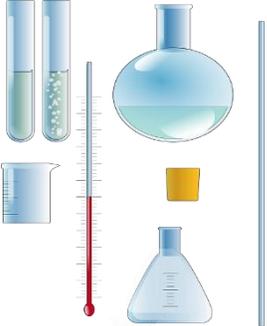
Class: Chemistry

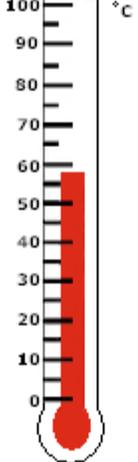
Teacher: K. Kelly

Laboratory Tools

Laboratory tools are used to make measurements and gather data in lab. Knowing how to use these tools is important for making precise and accurate measurements. Common laboratory tools include a **triple beam balance, graduated cylinder, ruler, spring scale, glassware (beakers, test tubes, and flasks), microscope, stopwatch, telescope, and thermometer.**

<p><b>Triple Beam Balance</b></p>		<p>A triple beam balance is used to measure the mass of solid objects in grams (g). It has three beams that each measure mass to a different unit place (ones, tens, hundreds).</p>
<p><b>Graduated Cylinder</b></p>		<p>A graduated cylinder is used to measure the volume of liquids in milliliters (mL). It is read by looking at the very bottom of the curve of liquid in the cylinder. This curve of liquid is called a <i>meniscus</i>.</p>

<p><b>Ruler</b></p>		<p>A ruler is used to measure the length of objects. It usually has two edges, one that measures in metric units (centimeters), and one that measures in English units (inches).</p>
<p><b>Spring Scale</b></p>		<p>A spring scale is used to measure the weight, or gravitational force, of an object. It is used by attaching an object to the hook at the end of the scale. Then, the weight is displayed on the tube of the scale in Newtons (N) or pounds (lb).</p>
<p><b>Glassware</b></p>		<p>Different types of glassware such as beakers, test tubes, and flasks are essential tools to making observations and taking measurements in chemistry.</p>
<p><b>Microscope</b></p>		<p>A microscope is used to view objects, such as cells, that are too small to be seen with the naked eye.</p>

<p><b>Stopwatch</b></p>		<p>A stopwatch is used to measure time in seconds and minutes.</p>
<p><b>Telescope</b></p>		<p>A telescope is used to view objects, such as planets and moons, that are very far away.</p>
<p><b>Thermometer</b></p>		<p>A thermometer is used to measure temperature in either degrees Celsius (<math>^{\circ}\text{C}</math>) or degrees Fahrenheit (<math>^{\circ}\text{F}</math>). A thermometer is read by looking at the number that is displayed at the top of the red line inside of the thermometer.</p>

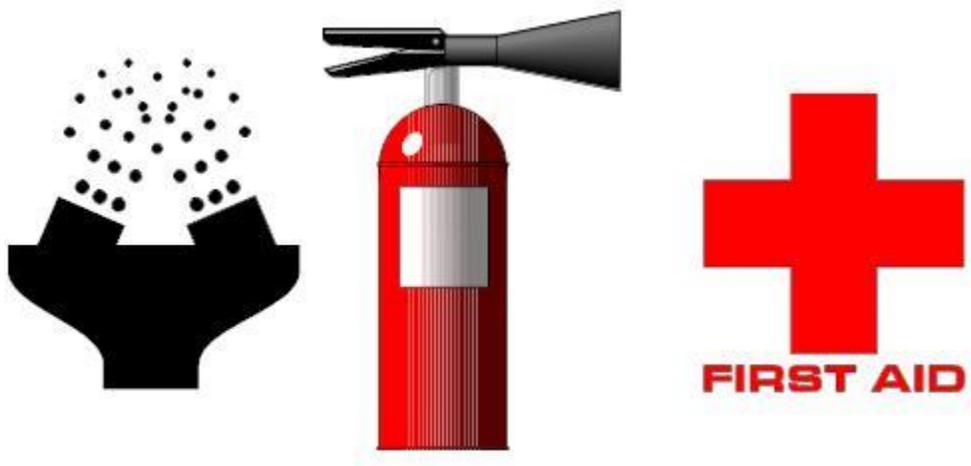
## Laboratory and Field Safety

The following rules are essential for keeping you and your classmates safe in the lab:

### General Lab Safety

- Read the entire lab procedure before you begin an experiment.
- Only perform the assigned experiment when the teacher has given you permission to do so, and when the teacher is supervising.

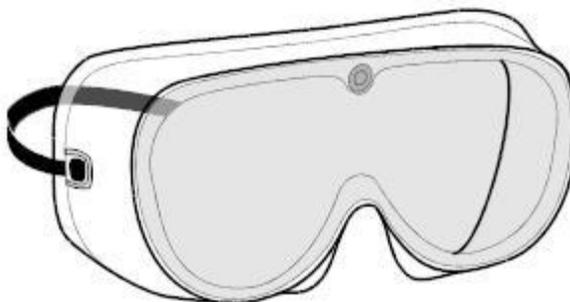
- Know where all the safety and emergency equipment (e.g. eyewash station, fire extinguisher, fire blanket, first-aid kit, etc.) is located in the lab.



- Only bring necessary materials into the lab area; keep your work area uncluttered.

## Personal Safety

- Always wear closed-toe shoes, safety goggles, a protective lab apron or lab coat, and protective gloves when working in the lab.



- If possible, wear clothes made of cotton. Synthetic materials can melt onto your skin if they catch fire.
- If a chemical gets in your eye(s), go to an eyewash station and flush your eyes with water for at least 15 minutes. Notify the teacher.
- Tie back long hair, and roll up loose sleeves.
- Never eat, drink, or apply makeup in the lab.



- Do not touch your face or eyes while conducting an experiment.
- If you have to cut something, cut in a direction that is away from your body.
- Wash your hands thoroughly with soap and water after completing experiments.

## Chemical Safety

- Never taste any chemicals in the lab.
- Avoid contaminating stock solutions; never return unused chemicals to their original container.
- Do not directly inhale any gas or vapor; use your hand to waft the fumes toward your nose.
- Always pour an acid or base into water, not vice-versa. Use the mnemonic *A&W* to help you remember that you should add Acid to Water, not water to acid.
- Report any chemical spill to your teacher immediately.

## Glassware, Heating, and Electrical Safety

- Do not use glassware with cracks and chips; ask the teacher for a replacement.
- Never insert glass tubing into a rubber stopper without teacher permission.
- Never use electrical equipment with a damaged cord.
- When heating chemicals in a test tube, point the opening of the test tube away from yourself and others.
- Use tongs or insulated gloves to hold or pick up hot objects.

