

Essentials for Survival Description Cards

To be printed off

Beaker

- A **beaker** is used for mixing, stirring, and heating chemicals. Most beakers have spouts on their rims to aid in pouring.
- The mL lines are for estimating volume, beakers should never be used for exact measurements
- Beakers come in a wide range of sizes. The size is indicated by the total volume the beaker can hold, which may not be the highest line.

Erlenmeyer Flask (E-Flask)

- The **Erlenmeyer flask** was named after its inventor in 1861. It has a narrow neck and expands toward its base. This allows easy mixing and swirling of the flask without too much risk of spilling.
- The mL marks on the side are meant primarily for estimation rather than precise measurements.
- An important safety tip here is to never heat this flask while it is capped. This could cause a pressure build-up that could result in explosion.

Test Tube

- A **test tube** is a glass tube with one end open and the other end closed. The closed end is rounded. Test tubes are used to hold small samples.
- They are generally held in a test tube rack specifically designed for the purpose. If the test tubes become unsafe to touch with bare hands (whether due to heat or another reason), test-tube tongs can be used to move them.
- Be careful when using a stirring rod in a test tube. Do not break the glass on the bottom.

Watch Glass

- A **watch glass** is just a round piece of glass that is slightly concave/convex (think of a lens). It can hold a small amount of liquid or solid. They can be used for evaporation purposes and also can function as a lid for a beaker.

Crucible

- A **crucible** is a small porcelain cup that can withstand extreme temperatures. They are used for heating substances in a Bunsen burner or oven.
- Crucibles have lids and special tongs to transport them.

Funnel

- A lab **funnel** is just like any other funnel except that it was designed to be used in a laboratory setting. They can be made of plastic or glass and can have either a short stem or a long stem, depending on what they are needed for.
- Funnel are often used in the filtering process.

Graduated Cylinders

- **Graduated Cylinders** are used to make exact measurements of volume.
- Graduated cylinders come in many sizes. Choose a size that is close to the volume you are trying to measure.
- Read the graduated cylinder when it is sitting flat on the counter, don't hold it up to measure.
- Make the measurement by reading the bottom of the curved meniscus line.

Droppers

- Droppers are small plastic tubes with narrow tips on one end and a bulb on the other.
- They suck up liquid that can then be squeezed out in small drops.
- These can be used to transfer small amounts of a liquid.
- Droppers are NOT to be used as a squirt gun



Ring Stand

- The **ring stand** is used to attach clamps or rings so that beakers, flasks, crucibles, etc. can be above a heat source.
- It is tall and has a solid base.

Clamps

- **Clamps** are used in coordination with a ring stand. Always make sure everything is clamped to the stand tightly. When clamping glass, be careful not to shatter the glass. Only tighten until snug.

Wire Mesh/Gauze

- When using a ring on the stand, there are usually other pieces necessary to accomplish the goal. **Wire mesh** is laid across the ring to distribute evenly heat and support a beaker or E-flask.

Clay Triangle

- A **clay triangle** with an open center is used to suspend crucibles when using ring stand and metal ring to heat things up. They are heat resistant and perfect for holding crucibles.

Test Tube Tongs/holders

- **Test Tube tongs** are used for grabbing test tubes that should not be touched by the hand. They are small and light weight and wrap neatly around the test tube for a solid grasp.
- Test tube tongs will open when squeezed, so practice how to use them ahead of time.

Beaker Tongs

- **Beaker Tongs** are for grabbing things that should not be touched by hand. Beaker tongs are have a wide circular grip that fits around a beaker. They often do not close completely.

General Tongs/Crucible Tongs

- **General Tongs** are used for grabbing things besides beakers and test tubes. They are solid and sturdy and usually come to a point where their two sides touch, for pinching and grabbing small items.
- They have a diamond shaped opening for reaching around a picking up a hot crucible.

Forceps/Tweezers

- **Forceps** are used to grab small things like solid chemicals that are broken into chunks, so they can be safely handled and added to containers.

Metal Spatulas

- **Spatulas** are used for both scooping and scraping chemicals out of different glassware or its original container onto a weighing tray so it can be weighed (and then back into its glassware or original container).

Scoopulas

- **Scoopulas** are for scooping solid chemicals. They are typically used to scoop a chemical out of its original container onto a weighing tray so that it can be weighed on a balance.

Digital Thermometer

- A **digital thermometer** measures the temperature of liquids or gases. It is often made of a thermocouple made of different metals. Digital thermometers display the temperature digitally.
- Be sure to use the Celsius setting for science.

Bunsen Burner

- A **Bunsen burner** is a mechanical apparatus that is made of metal and connected to a flammable gas source. There is a knob to adjust the amount of gas flow and a rotating collar that controls airflow. These both must be adjusted to get an ideal flame for heating purposes. The burner is lit with a lighter.
- Utmost safety is required when using a Bunsen burner.

Electronic Balance

- A balance is used to weigh chemicals. The chemicals are always in some form of container and never placed directly on the balance.
- To use a balance to determine the weight of a chemical, first put the empty container that the chemical will be in on the balance. Once you have a reading, press the "tare" or "zero" button on the balance. Remove the container from the balance and add the chemical (never add chemicals to a container while it is on the balance). Reweigh after adding the chemical to find the weight of only the chemical.
- It is important to keep the balance clean.

Ring

- A **ring** is clamped to the ring stand and is used as a sort of a shelf to hold things while they are heated and observed.
- The height of the ring can be adjusted depending on the size of the object or the flame below it.
- Wire gauze or a clay triangle can be placed on a ring to support containers for heating.

Glass Stirring Rod

- A Glass stirring rod is used to stir substances, usually in a beaker or test tube.
- Glass is used because it won't react with chemicals or heat.
- Be careful to not let stirring rods roll off the edge of the counter.

Lighter

- Lighters are used to ignite a heat source such as a Bunsen burner or candle.
- Lighters often have a safety button that must be pressed to light it.
- Lighters are expensive to continually replace and should not be wasted or treated as toys.

Triple Beam Balance

- A triple beam balance is used to measure items too heavy for the electronic scale.
- The sliding bars are moved until the lever arm (beam) balances and the lines meet up.

Rubber Tubing

- Rubber tubing is used to connect a Bunsen burner to the gas jets.
- It can also be connected to a faucet to supply water to equipment that need it.
- Tubing should be inspected to make sure there are no cracks or breaks that could cause a leak.

Wash Bottle

- A wash bottle holds distilled water used in experiments.
- It's design allows water to be squeezed out into glassware to help with rinsing.
- Was bottles are not toys and should not be used to squirt people.
- Never refill with tap water, only distilled water.

Mortar & Pestle

- The mortar is a bowl shaped container used to hold a substance that will be broken or ground up. The pestle is used to break or grind substances into small pieces or powders.

Hot Plate

- A hot plate is used to heat substances at a lower temperature than a Bunsen burner.
- A hot plate gives more control over the temperature setting.
- Hot plates should never be turned on without something on top to absorb the heat (like a beaker of water), or the ceramic top can crack.