Essentials for Survival Description Cards

To be printed off

Beaker

- A **beaker** is a common container in most labs. It is used for mixing, stirring, and heating chemicals. Most beakers have spouts on their rims to aid in pouring. They also commonly have lips around their rims and markings to measure the volume they contain, although they are not a precise way to measure liquids. Beakers come in a wide range of sizes.
- Because of the lip that runs around the rim, a lid for a beaker does not exist. However, a watch glass can be used to cover the opening to prevent contamination or splashing.

Erlenmeyer 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 narrow opening also allows for the use of a rubber or glass stopper. It can easily be clamped to a ring stand as well as heated or shaken mechanically.
- Once again, the marks on the side are meant primarily for estimation rather than precision.
- 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.

Boiling Flask

- Also known as a **boiling flask**, the Florence flask has a round bottom and a long neck. It is used to hold liquids and can be easily swirled and heated. It can also easily be capped by rubber or glass stoppers.
- Once again, safety dictates that this flask never be heated when capped. Pressure build-up and explosions can and do occur.

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 primarily used for qualitative assessment and comparison. A common place to see these is the biochemistry lab. When a large number of samples need to be tested and compared, test tubes are used to make this easier. They are also easily capped with a rubber or glass stopper.
- 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.
- Never heat a capped test tube.

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 clay cup made of a material that can withstand extreme temperatures. They are used for heating substances and come with lids.

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. There are several sizes that can be chosen from based on the amount of liquid that needs to go through them quickly.

Graduated Cylinders

- **Graduated Cylinders** are the primary measuring tool for the volume of a liquid. There are several markings up and down the length of the container with specific increments. Graduated cylinders come in many sizes. The smaller they are in diameter, the more specific the volume measurements will be.
- When reading the volume from a graduated cylinder, you will notice that the liquid seems to have an indentation. The liquid around the edges will be higher than the liquid in the center, sloping down like the sides of a trampoline when someone is standing in the middle. This is called the meniscus. Line the lowest point of the meniscus up with the nearest marking, keeping the cylinder level to properly read the volume.

Volumetric Flask

- A **volumetric flask** is a round flask with a long neck and flat bottom. It is used to measure an exact volume of liquid. There is a small line on the neck that indicates how far to fill the bottle (use the bottom of the meniscus). They come with special caps that will not let anything in or out.
- Remember that temperature affects volume; therefore avoid using liquids that will fluctuate in temperature (hot water that will cool, for example)

Droppers

- Droppers are small glass tubes with narrow tips on one end and a rubber bulb on the other. They suck up liquid that can then be squeezed out in small drops. These can be used to add an indicator to a solution about to be titrated.

Pipettes

- There are a large variety of pipettes designed to accomplish specific goals. However, they are all for measuring an exact volume of liquid and placing it into another container.

Buret

- A buret is a glass tube that is open at the top and comes to a narrow pointed opening at the bottom. Right above the bottom opening is a stopcock that can be turned to control the amount of liquid being released. There are markings along the length of the tube that indicate the volume of liquid present.
- A buret is used for extremely accurate addition of liquid. By adjusting the stopcock, the amount of liquid that is released can be slowed to a drop every few seconds. Burets are one of the most accurate tools in the lab.
- Burets are set up by using a buret clamp in combination with a ring stand, discussed below.
- To determine how much liquid is added, write down how much is initially in the buret. Then when you're finished adding, write down how much is left. Subtract the final amount from the initial amount and you have the volume of liquid added.
- Again, remember to measure from the bottom of the meniscus!

Ring Stand

- The **ring stand** is used to suspend burets, beakers, flasks, crucibles, etc. above other containers or, in some cases, 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 the beaker.

Clay Triangle

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

Test Tube 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.

Beaker Tongs

- **Beaker Tongs** are for grabbing things that should not be touched by hand. Beaker tongs are coated in rubber and have a wide circular grip. They often do not close completely.

General 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.

Forceps

- **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.

Rubber Spatulas

- **Spatulas** are used for both scooping and scraping chemicals out of different glassware or its original container onto a weigh boat 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 weigh boat so that it can be weighed on a balance.

Digital Thermometer

- A **digital thermometer** measure the temperature of liquids. It is often made of a thermocouple made of different metals Digital thermometers display the temperature digitally.

Glass Thermometer

A **glass laboratory thermometer** is used for measuring the temperature of liquids. A glass thermometer has a red liquid (usually alcohol) that is used to measure the temperature of a liquid.

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 striker.
- Utmost safety is required when using a Bunsen burner.

Balance

- A balance is used to weigh chemicals. The chemicals are always in some form of container and never placed directly on the balance. It is important not to move a balance because they have been calibrated for the exact position they are in. Some balances have plastic housing with small doors to keep air currents from affecting the measurement. Close these doors whenever the balance is in use.
- 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 a metal ring that is usually coated in rubber. The 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.