1. Beaker

Primary Use: To contain and roughly measure liquids.

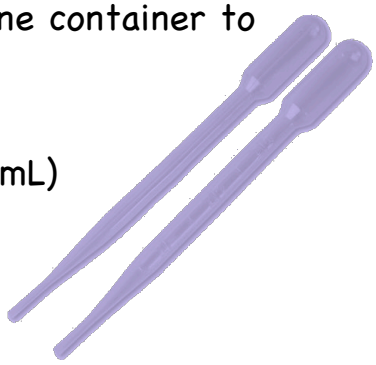
Units of Measurement: Volume – milliliters (mL)
(Can you find these units on the apparatus?)

Give it a Try:

- **NOTE: Beakers come in a variety of sizes.**
- **NOTE: Check measurements by bending so that you are at eye level with the apparatus (keep beaker level on the table).**

1. Use the 250 mL beaker to measure 100 mL of "red liquid".
2. Use the 50 mL beaker to measure 30 mL of "blue liquid."
3. Pour ALL colored liquids back into their original containers and rinse beakers with tap water before moving to the next station.

2. Disposable Pipet



Primary Use:
To transfer small amounts of liquid from one container to another (dropper)

Units of Measurement: Volume – milliliters (mL)
(Most often, we will not use these to measure.)

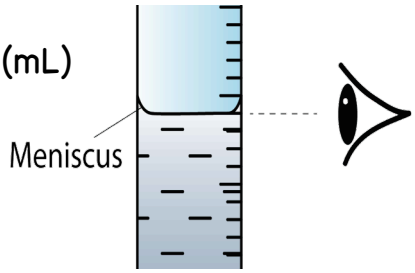
Give it a Try:

1. Place the pipet in the container of "green liquid".
2. Squeeze the bulb at the top of the pipet to suction in the liquid and then release.
3. Holding the pipet straight up and down, carefully transfer the liquid in a stream to the empty transfer container by gently squeezing the bulb until the pipet is empty.
4. Repeat steps 1-3, but this time, transfer ONLY 10 DROPS into the transfer container.
5. Pour ALL colored liquid back into its original container and rinse the transfer container with tap water before moving to the next station.

3. Graduated Cylinder

Primary Use: To **accurately** measure quantities of liquid substances.

Units of Measurement: Volume – milliliters (mL)
(Can you find these units on the apparatus?)



Give it a Try:

- **NOTE: Graduated cylinders come in a variety of sizes.**
- **NOTE: Check measurements by bending so that you are at eye level with the apparatus (keep cylinder level on the table).**
- **NOTE: When measuring liquids in a graduated cylinder, a MENISCUS (curvature) forms. Accurate measurements are read at the bottom of the meniscus.**

1. Using a 10 mL graduated cylinder, measure 5 mL of "yellow liquid". (HINT: it may be easier to use a disposable pipet to transfer small amounts of liquid (stream and drops) rather than dumping it.) MEASURE AT THE MENISCUS!
2. Using a 50 mL graduated cylinder, measure 25 mL of "yellow liquid". (HINT: it may be helpful to add the last few drops to the 25 mL line using a disposable pipet.) MEASURE AT THE MENISCUS!

4. Volumetric Flask

Primary Use:

To **accurately** prepare specific concentrations of chemical solutions.

Units of Measurement: Volume – milliliters (mL)
(Can you find these units on the apparatus?)

Give it a Try:

1. View the filled volumetric flask at your station.
2. Notice that the volume capacity marking is located on the top of the long neck of the container.

5. Erlenmeyer Flask

Primary Use:

To contain and roughly measure liquids.
(Named after German Chemist Emil Erlenmeyer who created it in 1860.)

Units of Measurement: Volume – milliliters (mL)

(Can you find these units on the apparatus?)

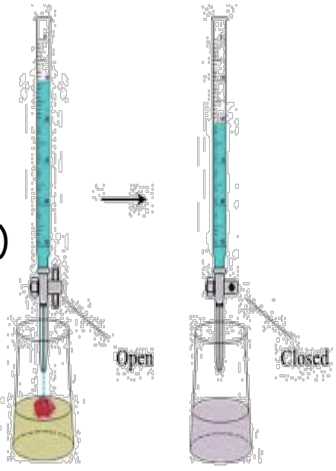
Give it a Try:

1. View the filled Erlenmeyer flask at your station.
2. Read the volume measurement of the liquid in the flask. Be sure you are reading this at eye level!

6. Burette

Primary Use:

To dispense **precise** and **small** amounts of one chemical into another until the exact end point of the reaction is reached.



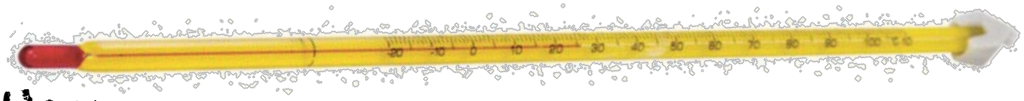
Units of Measurement: Volume – milliliters (mL)

(Can you find these units on the apparatus?)

Give it a Try:

1. Observe the "parts of a burette" diagram to the right.
2. Be sure an empty container (beaker) is placed directly under the burette.
3. Try to measure precisely 10 mL of liquid into the beaker.
    a. Note the volume level at which the burette originally reads.
    b. Open the stopcock slightly so that liquid begins to flow.
    c. Close the stopcock completely when the burette reads 10 mL less than the original reading.
4. Pour the liquid down the drain, rinse the container, and replace it under the burette

7. Thermometer



Primary Use:

To measure the temperature of a substance.

Units of Measurement: Temperature – Celsius (°C)

(Can you find these units on the apparatus?)

Give it a Try:

1. Use the standard thermometer to read the temperature of the container of liquid. Be sure you best estimate the value of the temperature reading if it is in between two lines.
2. Use the digital thermometer to read the temperature of the same container of liquid.

8. Electronic Balance

Primary Use:

To measure the mass (amount of matter in an object) of an object. [NOTE: Mass is NOT the same as weight)

Units of Measurement: Mass – grams (g)

(Can you find these units on the apparatus?)

Give it a Try:

1. (If the balance is not already on, press the power button and wait until the screen reads 0.00 g.) Press the "zero" or "tare" button and wait until the screen reads 0.00 g.
2. Place your pen/pencil on the center plate of the electronic balance and wait for the mass reading to hold steady. You just found the amount of matter in your writing utensil!

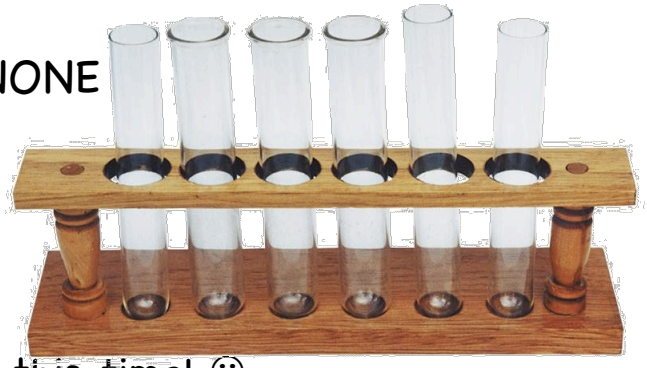
- **NOTE: You just performed the most basic mass reading using the balance. We will continue to perform other more complex readings in future lab experiments.**

10. Test Tubes and Rack

Primary Use:

- Test Tubes: Use to contain and react chemicals
- Rack: Use to support test tubes

Units of Measurement: NONE



Give it a Try:

Just observe this time! ☺

11. Well/Spot Plate

Primary Use:

Plastic or porcelain plate with small indentations for performing reactions.

Units of Measurement: NONE

Give it a Try:

Just observe this time! ☺

12. Iron Ring & Ring Stand

Primary Use:

- Metal stand with rod used to elevate glassware for heating and filtering.

Units of Measurement: NONE

Give it a Try:

1. Loosen the iron ring clamp and slide to reposition the ring on the stand. Tighten the clamp to secure the system.

13. Funnel

Primary Use:

Glass or plastic used to transfer liquid from one container to another. Also used to filter solids from liquids.

Units of Measurement: NONE

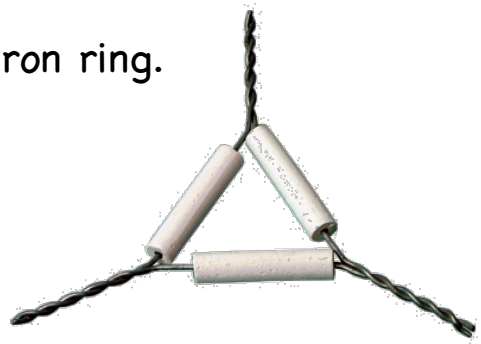
Give it a Try:

Just observe this time! ☺ We will come back to the funnel during station #13.

14. Clay Triangle

Primary Use:

Used to support a funnel in an iron ring.



Units of Measurement: NONE

Give it a Try:

4. If no one is at stations #11 and #12, try placing the clay triangle on the iron ring. (Come back when no one is there ☺)
5. Next, place the funnel so that it is supported in the clay triangle on the iron ring.
6. Disassemble this set-up and place the clay triangle and funnel back at their respective stations.

15. Wire Gauze

Primary Use:

Used on top of the iron ring to spread the flame of a Bunsen burner and to support another container.

Units of Measurement: NONE

Give it a Try:

1. If no one is at stations #11, try placing the wire gauze on the iron ring. (Come back when no one is there ☺)
2. (If you would like, you may obtain a beaker to place on top of the wire gauze to see how it acts as a table top for heating.)
3. Disassemble this set-up and place the wire gauze back at its station.

16. Evaporating Dish & Watch Glass

Primary Use:

Evaporating Dish: Used to evaporate liquid solutions.
Watch Glass: Used to cover the evaporating dish (or beaker)

Units of Measurement: NONE

Give it a Try:

1. Place the watch glass on the evaporating dish so that the concave side is downwards and the convex side is facing up.

17. Tongs

Primary Use:

To pick up, move, and hold lab apparatuses, specifically those that have been heated to high temperatures.

Units of Measurement: NONE

Give it a Try:

- **NOTE: Tongs can be a little tricky to use, especially when handling glassware. We will practice these techniques when necessary.**

1. For now, use the tongs to try to pick up and move your pencil/pen.

18. Bunsen Burner

Primary Use:

To heat solids and liquids contained in beakers, test tubes, evaporating dishes, etc.

Units of Measurement: NONE

Give it a Try:

You may look, but don't touch just yet! This apparatus has many controls to it… COMING SOON -> We will learn to light the Bunsen burners in our next lab! ☺

19. Striker

Primary Use:

To light the Bunsen burner.

Units of Measurement: NONE

Give it a Try:

You may look, but don't touch just yet! This apparatus has many controls to it… COMING SOON -> We will learn to light the Bunsen burners in our next lab! ☺

9. Weigh Boat/Dish

Primary Use:

To hold (powdered) solid substances on the electronic balance when determining the mass of the sample

Units of Measurement: NONE

Give it a Try:

1. If no one is at #8, press "zero" or "tare" and wait for the screen to read 0.00g.
2. Place the weigh dish on the balance and wait for a steady mass reading.
3. Press "zero" or "tare" and wait for the screen to read 0.00g again (the weigh dish is still on the balance). This just cancelled out the mass of the dish!
4. Now place your pen/pencil in the weigh dish and wait for a steady mass reading. Did you get the same mass you did in #8? You should!