JHS Chemistry Department

Lab Basics Discovery Activity

Online resources:

Lab Equipment images Lab equipment online quiz site

Directions: for each of the following items match the correct picture of the item and then find the location of that item in your classroom.

Use the location key

A = located at lab station
B = Located in large storage cabinet at side front of classroom
C = Located in bottom storage cabinets/under hoods at the back of the classroom
D = Located in back overhead cabinets
E = Located in side overhead cabinets

1. Beakers D
2. Eye dropper/ dropper pipette B
3. Test tube holder A
4. Test tube clamp/utility clamp A
5. Quad beam balance A
6. Glass stirring B rod and
7. scoopula or spatula A
8. Evaporating dish B
9. Test tube brush B or A
10. Ring stand A
11. Iron ring clamp A
12. Goggles D
13. Funnel B
14. Erlenmeyer flask D
15. Crucible tongs A
16. Test tube rack A
17. Watch glass B
18. Striker A
19. Graduated cylinders D
20. Wire gauze/ pad A
21. Crucible and cover B
22. Wash bottle D
23. clay triangle A
24. Mortar and pestle D
25. Test Tubes B
26. Thermometer B
27. Hot hand A OR B
28. Bunsen burner A
29. Forceps B
30. Beaker tongs A
31. Volumetric flask E
32. Graduated cylinder A
33. Hot plate C

JHS Regents Chemistry Laboratory
Equipment Discovery Sheet
Match the names and descriptions of the lab equipment you have found

Funnel – Used to transfer liquids into small mouthed containers

Watchglass – Used as a cover to prevent heated materials from spattering out of the container. Also used as a holding plate for hot or flammable materials.

Beaker – Used to hold liquids (not used for measuring volume, except for rough estimates)

Forceps – used carefully manipulate lab materials (without your fingers) like tweezers.

Graduated Cylinder – Used for measuring the volume of liquids

Goggles – Used to protect eyes

Wash Bottle – Used to dispense H_2O for rinsing and washing.

Mortar and Pestle – Used to grind solids into a fine powder.

Bunsen Burner – Used to produce a flame for heating materials

Wire Gauze – Used as support over a ring stand for materials being heated

Test tube Clamp – Used for grabbing hot test tubes

Iron ring/ Ring Clamp – Attached to a ring stand to hold items

Volumetric Flask – Used to create known concentrations of a solution of a certain volume

Erlenmeyer Flask – Used to hold liquids, sloped sides allows for spill free mixing and easy decanting (not used for measuring volume, except for rough estimates)

Test tubes – Used for holding, mixing, heating, small amounts of liquids

Scoopula or spatuala – Used to transfer dry solids, particularly from original container to scale

Crucible Tongs – Used to move items (especially crucible) that have been heated

Crucible and cover – Used for heating solids to extreme temperatures

Ring Stand – Used to hold items above a flame for heating

Thermometer – Used to measure temperature.

Quadruple beam balance- weigh small items to a hundredth-gram precision.

Evaporating dish- heat liquids at a very high temperature, to the point of evaporation, which purifies solutions by removing solvents.

Clay Triangle- an open-centered triangle rimmed with flame resistant material. Allows direct contact of the open flame to the crucible, which usually contains a substance that melts at fairly high temperatures.

Test tube holder- used to hold/support test tubes containing chemicals waiting for further operations.

Test tube rack- Since a test tube has a rounded bottom, it cannot stand by itself; the rack is a convenient and necessary piece of laboratory equipment for the storage of test tubes.

Beaker Tongs – used to transport a beaker without having to have the beaker come in contact with the hands this is to prevent possible burns or prevent possible injuries by dangerous chemicals.

Eye dropper/Dropper Pipette - to deliver small and exact volumes of liquids; extremely useful in chemical laboratories.

Glass stirring rod - used to stir solutions or mixtures.

Test tube brush - used for cleaning the bottom and inner side of the test tubes

Striker - single handed flint and steel tool used to create sparks to light the Bunsen Burner.

Graduated Cylinder - used to measure the volume of a liquid. Graduated cylinders are generally more accurate and precise than laboratory flasks and beakers.

Hot Hand – a chemist's "hot pot holder" , they are used to pick up hot glassware.

Hot plate - is an adjustable heating source. A hot plate or heating mantle should always be used in place of a Bunsen burner or other open-flame source to heat a flammable liquid.

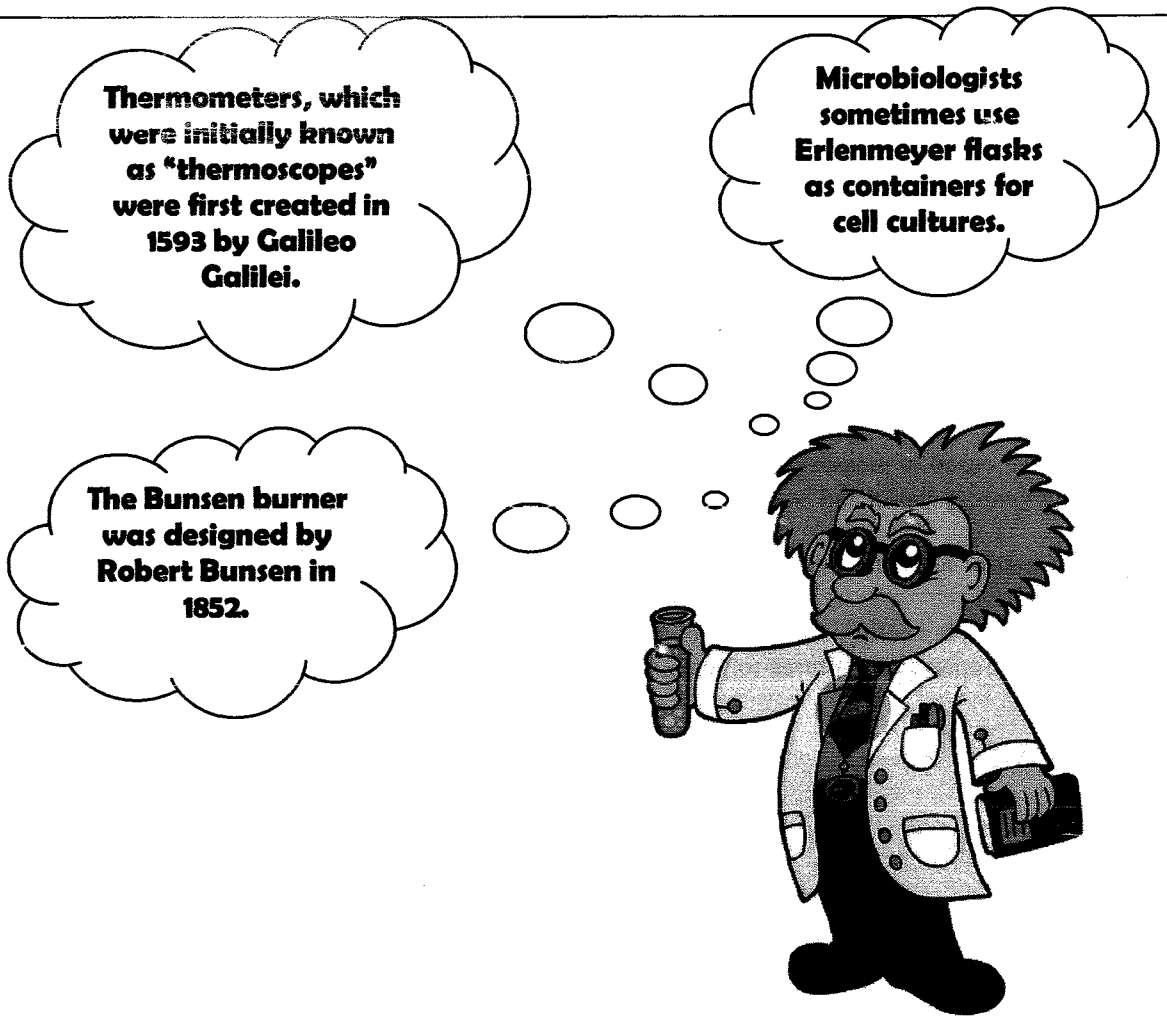
JHS Regents Chemistry Department
Laboratory Instruments

Introduction: The Chemistry laboratory is used to provide you with hands-on experience about the concepts learned in lecture. Because there are many different pieces of lab equipment, it is necessary to become familiar with the uses of these tools and know that for the simplest of jobs there is the appropriate tool.

Objective: To identify different pieces of lab equipment.
To formulate an understanding of the uses of each piece of equipment.

CAUTION:
- Handle all glassware gently.
- Follow instructions exactly.

Signed:_____
Dated:_____



Procedure:
1. For each piece of equipment at your station predict the purpose of each piece of laboratory equipment and complete the tables below. Use the diagrams provided as a reference.
2. Answer the questions that follow.

Data:

Table 1 – Equipment used to *hold and/or transfer liquids*:

Match the description on the right to the correct lab equipment.

Equipment	Function
F Beaker	A. Used for holding, mixing, and sometimes heating small amounts of liquids.
D Graduated Cylinder	B. Used to dispense water (H_2O) for rinsing and washing
E Funnel	C. Used to hold liquids, sloped sides allows for free mixing and easy decanting (not used for measuring volume, except for rough estimates).
A Test-tube	D. Used for measuring the volume of liquids
C Erlenmeyer Flask	E. Used to transfer liquids into small containers
B Wash Bottle	F. Used to heat liquids or mixtures (not used for measuring volume, except for rough estimates)

Activity: Following the directions below, complete the task.

1. Using the wash bottle, place 10 mL of H_2O into each of the following containers:
   a. test tube b. beaker c. graduated cylinder

Questions:

1. Based on the activity, which glassware was most accurate in measuring 10 mL of H_2O? Explain why.
   graduated cylinder marked to most precise #
2. Using the data in Table 1, list the items that can be heated
   beaker, test tube, erlenmeyer flask
   How did you know these items can be heated?
   made of pyrex (heating glass)

Table 2 - Equipment Used To *Heat Materials* in the Lab:

Match the description on the right to the correct lab equipment.

Equipment	Function
D Bunsen Burner with Hose	A. Used as support over a ring stand to heat a crucible
B Ring Stand	B. Used as support over a ring stand for a beaker or flask being heated
A Wire Gauze	C. Used to heat and evaporate off excess water from a mixture
G Ring Clamp	D. Used to produce a flame for heating materials
E Clay Triangle	E. Used to hold items above a flame for heating
F Hot Plate	F. Used to produce a hot surface for heating materials
H Crucible & Cover	G. Attached to a ring stand to hold items
C Evaporating Dish	H. Small container used for heating solids to extreme temperatures

Table 2 Activity:

1. Assemble the following items into a heating apparatus: ring stand, ring clamp, wire gauze, burner, and beaker. Have your teacher approve your setup.

Teacher's Initials for Setup: U

Questions:

1. When using a Bunsen burner and ring clamp, always use the "Three Finger Rule" (the clamp should always be approximately three finger lengths away from the Bunsen burner). Explain why this rule exists.

hottest part of the flame location

2. Place the clay triangle on the ring clamp. Now, without touching the crucible, put the cover on the crucible and put the crucible and cover into the clay triangle of your heating apparatus. Identify the equipment used for this simple task.

crucible tongs

3. When heating is involved in an experiment, why is it so important to be able to move and arrange glassware without actually touching the glassware?

ALL materials are HOT!

Table 3: Locate the following lab tools. With your partner, discuss and predict the function of each item.

Equipment	**Predict the Function…**
 Goggles	protect eyes!
Test Tube Clamp	hold test tube above flame
Spatula / Scoopula	Scoop chemicals
Crucible Tongs	move heated crucible or evaporating dish
Test Tube Holder	hold test tube (MOVEABLE!)
Test Tube Rack	hold multiple test tubes
Thermometer	measure temperature
Mortar and Pestle	crush chemicals

Questions:

1. Without touching the test tube, put it in the test tube rack. What instrument did you use to accomplish this task?

test tube holder/tongs

2. Define the following terms:
   - Qualitative Observation: describe physical properties / observable properties of matter

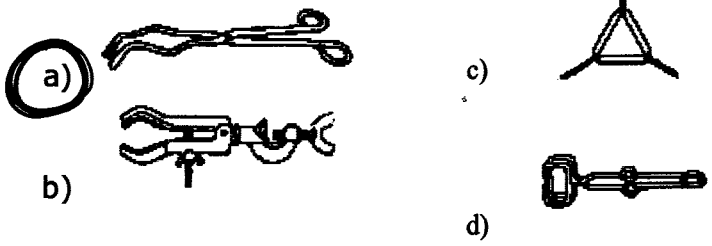
- Quantitative Observation: measured/numerical observations of matter

3. Make a **qualitative** observation about the safety goggles. plastic
4. Which apparatus listed in Table 3 is used to make a **quantitative** observation?

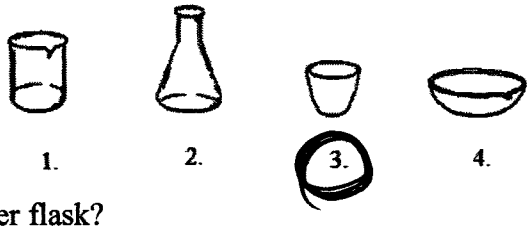
thermometer

Conclusion Questions:

1. List 4 items that could be used to measure out 25 milliliters of hydrochloric acid for an experiment.
   - graduated cylinder
   - beaker
   - volumetric flask
   - * buret * not tested now!!
2. Which piece of laboratory equipment should be used to remove a heated crucible from a ring stand?



3. Which activity is considered a proper laboratory technique?
   a) heating the contents of an open test tube held vertically over a flame
   b) heating the contents of a test tube that has been closed with a stopper
   c) goggles are optional during laboratory experiments
   d) goggles should be worn during all laboratory experiments
4. Which diagram represents a crucible



4. Which diagram represents an Erlenmeyer flask?