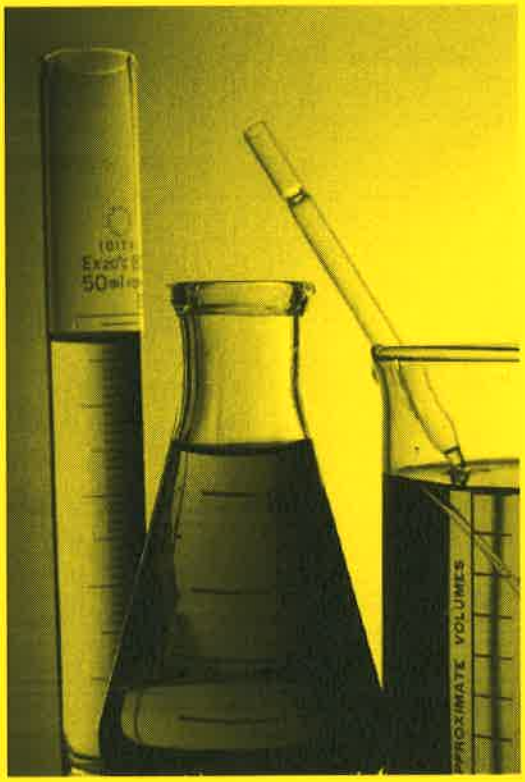
UNIT ONE:



Measurement and Tools of the Chemist

Unit One:

Measurement and Tools of the Chemist

Name:_____ Date: _____

LAB SAFETY

PURPOSE:

PART A:

The drawing on the next page depicts a jumble of safe and unsafe procedures in the school laboratory. Answer the following questions in your lab notebook, in complete sentences, based on this illustration and the safety guidelines information.

1. List three unsafe activities shown in the laboratory drawing.
2. Explain why each of these activities make the lab environment unsafe
3. List three correct procedures.
4. Explain why these procedures make the lab environment safe.
5. Name two safety guidelines that are not listed in this picture.
6. Explain how these safety guidelines make the lab environment safe.

PART B:

Determine if each of these statements are true or false in regards to the lab environment. Write each statement in your lab notebook with your determination of true or false next to it. If the statement is true, explain why. If the statement is false, explain why.

1. The laboratory is a good setting for practical jokes.
2. It is okay to drink water in the laboratory.
3. Spilled chemicals should be wiped up immediately.
4. It is unnecessary to report minor laboratory accidents to the teacher.
5. Performing experiments not assigned by your teacher is a good creative procedure.
6. No chemicals should ever be tasted.
7. Goggles must be worn at all times in the lab.
8. Only teachers need to know the location of the fire extinguisher.
9. Students are allowed in the chemical storage area.
10. Acids should be added to water slowly while stirring.

PART C:

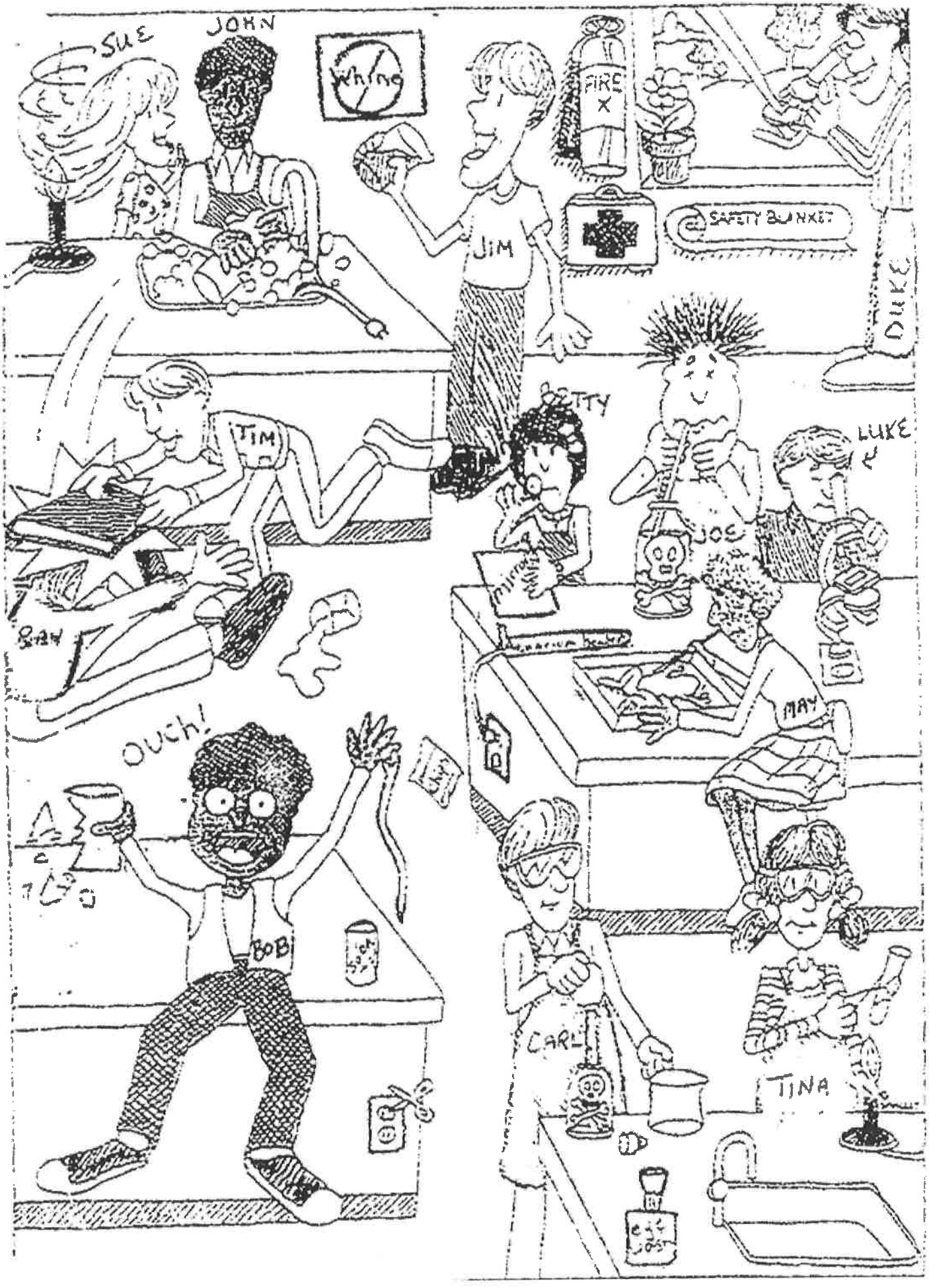
Describe in full sentences how you would respond to each of the scenarios listed. Write your response for each in your lab notebook.

1. You clothing is on fire
2. You have a foreign particle in your eye.
3. Your lab partners have broken a beaker.
4. You have been cut by broken glass.
5. You have spilled a chemical.
6. There is an unknown, unlabeled chemical on your lab bench.

PART D:

On a new page in your lab notebook, draw a diagram of our lab classroom. In your diagram, label the following items as they are found in the classroom-

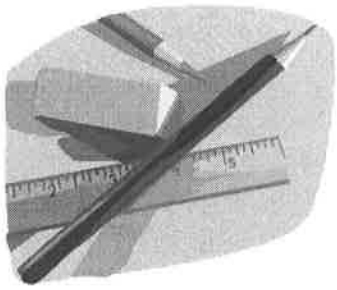
Goggles	Sinks	Glassware Storage	Fire Extinguisher
Safety Shower	Eyewash Station	Chemical Storage	Fire Blanket
Evacuation Drill Exit	Emergency Window Exit	Electrical Outlets	Gas Jets


SUE
JOHN
FIRE
SAFETY BLANKET
JIM
DUKE
TIM
TTY
LUKE
JOE
MAY
OUCH!
BOB
CARL
TINA

Name:_____ Date: _____

MAKING METRIC MEASUREMENTS

PURPOSE:



INTRODUCTION:

"As of 1992, The United States is now the only industrialized country in the world that does not use the metric system as its predominant system of measurement. Most Americans think that our involvement with metric measurement is relatively new. In fact, the United States has been increasing its use of metric units for many years, and the pace has accelerated in the past three decades. In the early 1800's, the U.S. Coast and Geodetic Survey (the government's surveying and map-making agency) used meter and kilogram standards brought from France. In 1866, Congress authorized the use of the metric system in this country and supplied each state with a set of standard metric weights and measurements." - United States Department of Commerce

SAFETY: WRITE DOWN ANY SAFETY PROCEDURES RELATED TO THIS LAB IN YOUR LAB NOTEBOOK

MATERIALS: MAKE A LIST OF ALL MATERIALS IN USED IN YOUR LAB NOTEBOOK

PROCEDURE: AT EACH STATION, RECORD THE OBJECT AND USE TABLE D TO DO THE FOLLOWING:

1. Label the Quantity. (choose a word from the last column of Table D that is being measured).
2. Name the unit from Table D that should be used to measure this object.
3. Record the symbol of the unit.
4. Measure the object (if you can). Your measurement should be a number WITH A UNIT!

OBSERVATIONS: RECORD ALL DATA IN A TABLE IN YOUR LAB NOTEBOOK

Object	Quantity	Name of Unit	Symbol	Measurement with units

QUESTIONS: ANSWER THE FOLLOWING QUESTIONS IN YOUR LAB NOTEBOOK.

1. Measure the thickness of your notebook using centimeters.
   a. Please measure (or convert your first measurement) your notebook in millimeters.
   b. Convert your measurements into micrometers.
2. Devise a method to measure the thickness of ONE piece of paper and record it below. Show your work. Should you use cm or nm?
3. What does the prefix "kilo" mean? Why is it not used for measuring the thickness of a piece of paper?
4. What does the prefix "nano" mean? In what way has it been used in today's culture and society? Is this use scientifically "correct"?
5. Which prefix with meter would you use to measure your house?
6. Which prefix with gram could help you measure the mass of a drop of water?
7. What is the SI unit for heat? Temperature? Are heat and temperature the same?
8. How did the measuring devices used today limit your precision
9. If the actual thickness of a piece of paper is .05 nm, calculate the percent error of your measured value from Activity 2.

Name:_____ Date: _____

DETERMINING DENSITY

PURPOSE:

SAFETY:

Make a list of all safety procedures related to this lab.

MATERIALS:

Make a list of all materials that will be used in this experiment.

PROCEDURE:

Your task is to write out a procedure to determine the density of 4 solids and 2 liquids. These items will be given to you. Record each of these items and your procedure in your lab notebook in the format provided below for you.

Solid 1:	Procedure:
Solid 2:	Procedure:
Solid 3:	Procedure:
Solid 4:	Procedure:
Liquid 1:	Procedure:
Liquid 2:	Procedure:

DATA COLLECTION:

On a new page in your lab notebook, make a data table to collect your data in for each of the six different samples. Make sure to include a column for calculating the density of your substance and another column for the answer.

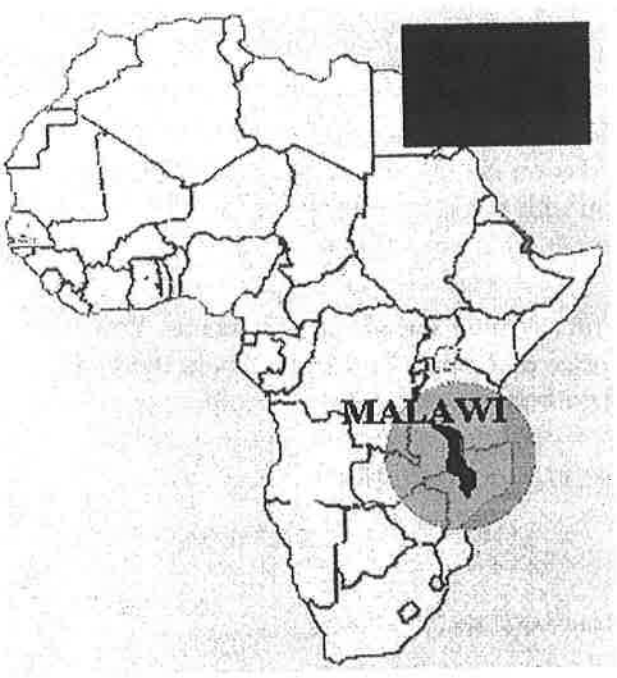
Calculate the density of each object in the table you created above. Record all data using correct signifigant figures.

QUESTIONS:

Copy and complete the following questions in your lab notebook.

1. Explain how an increase in temperature would affect the density of a typical solid.
2. At 20 degrees Celcius, a sample of copper occupying a volume of 8.50 cm3 has a mass of 75.6 grams. What is the density of the copper?
3. At 20 degrees Celcius, a sample of silver is 10.5 g/cm3. What mass of silver would occupy a volume of 24.0 cm3 at 20 degrees celcius.
4. Calculate the percent error for the density of cooper that you measure if the accepted value is 8.960 g/cm3.

WELCOME TO MALAWI!



It is the year 2015. You have graduated high school and like many of your peers are trying to figure out what to do with your life. You have thought about college, the military and even trade school. You just can't decide. You do know that you really want to do something worthwhile and help needy people. After thinking and talking to your counselors, you have decided to join the Peace Corp for a few months until you decide on a future direction.

You are excited to learn that you first assignment will take you to the small country of Malawi in southeastern Africa, near Mozambique. You vaguely recall hearing the name Malawi while waking an episode of "Where in the World is Carmen San Diego? You get the necessary paperwork finished, get the appropriate battery of shots and hop on a plane to Africa.

Once in Africa, you board a bus for the small down of Zomba locate in Malawi. Upon arrival, you ask where you can find food. The airplane food wasn't the greatest and the bus didn't have anything to eat. Your Peace Corp supervisor hands you a brochure and a handful of what appears to be pebbles and beds. He then points you towards the town's market. Brushing through the brochure you realize that buying food here is going to be a little more difficult than anticipated. Apparently these people use an old system of money that does not operate in increments of ten. Attached is a copy of the flyer your supervisor gave you to explain the money system.

Malawi Currency System

We use ivory coins and brass coins. These include:

- An uban of ivory, an ubic of ivory, an uber of ivory and a lumbar of ivory
- An artock of brass, a ballock of brass, an olum of brass and a tarman of brass.

Equivalencies to remember:

- An artock of brass is equal to an uban of ivory and either of these can buy a jal of most fruits.
- The amount of an ubic of ivory is twice the value of an uban
- An uber of ovory is twice the value of an ubic
- The lumbar of ivory is equal to the value of three uber
- A ballock of brass is as great as two artocks.
- A olum of brass is as great at four artocks.
- A tarman is equal to the value of three olum.

There are also smaller counts that those listed above. These are the values of the lesser coins:

- A san is half an artock of brass therefore a san could usually buy half a jal of most fruits.
- A soon is half a san
- A leah is half a soon
- A gulgag of ivory is equal to three san of brass

American equivlancies

- A Jal is a basket whose volume is about the same as a half of a gallon.
- The current exchange rate is $1.00 for 2 uban.