Name: _____ Class _____
Date: _____ Metric Measurement Lab

Metric Measurement Lab

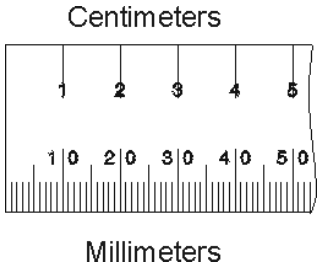
Objectives:

- You will learn to make measurements using the metric system.
- These measurements will encompass mastering the metric ruler, gram scale, and the graduated cylinder, and thermometer.
- You will demonstrate your ability to convert the original measurements to lower and higher values by moving the decimal point the correct number of places in the proper direction.

Materials:

- meter stick
- metric ruler
- graduated cylinders, beaker
- coins
- book
- electronic balance/scale
- thermometer

Procedures and Data:



1. **Linear Measure**

Use the metric rule **OR** meter stick to measure the items listed below. Place your measurements in the spaces below. Above each column write the name of the unit that is abbreviated below it. Circle the unit you used to measure with for each item. You will need to convert for the other units.

Diameter of Penny	_____**m.**	_____**cm.**	_____**mm.**	_____**km.**
Height of lab counter	_____**m.**	_____**cm.**	_____**mm.**	_____**km.**
Width of the Textbook	_____**m.**	_____**cm.**	_____**mm.**	_____**km.**
Length of the Room	_____**m.**	_____**cm**	_____**mm.**	_____**km.**

1a. Did you use the same unit to measure each item? Explain why you selected the units you did.

2. Mass/Weight

Use the electronic balance/scale to mass the following materials. Place your measurements in the spaces below. Be sure to check the unit on the scale to verify that you are measuring in grams (g) not ounces (oz).
Write the name of the unit above the columns below.

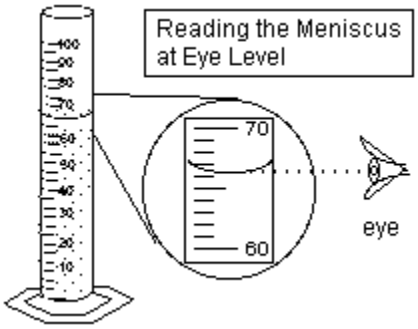
Mass of coin	**_____g**	**_____mg**	**_____kg**
Mass of dollar	**_____g**	**_____mg**	**_____kg**
Mass of empty 10 ml graduated cylinder	**_____g**	**_____mg**	**_____kg**
Mass of graduated cylinder with 10 ml water	**_____g**	**_____mg**	**_____kg**
Mass of 10 ml water	**_____g**	**_____mg**	**_____kg**

2a. What is the difference between weight and mass?

2b. Why are they used synonymously on Earth?

3. Volume (of liquids) (1ml = 1cm^3)

Use the glassware provided to measure the volume of the following containers. Place your measurements in the below. In the last column of the chart write which glassware you used to measure the liquid with. (10 ml graduated cylinder, 50 ml graduated cylinder, 50 ml beaker, beaker, 100 ml graduated cylinder)



space

100 ml

Volume of the purple liquid	**_____L**	**_____cl**	**_____ml**	
Volume of water	**_____L**	**_____cl**	**_____ml**	
Total Volume of bottle	**_____L**	**_____cl**	**_____ml**	

3a. Do all of the glassware measure with the same degree of accuracy? Explain

3b. What determines which glassware you measure with?

3c. What is a meniscus? Why is it necessary to know about it when measuring liquids?

4. Temperature

Use the thermometer to measure the temperature of the following items. Write the name of the unit measure above the column that contains its abbreviation. Circle the temperature/s which you were able to measure directly.

Ice water	_____°F	_____°C
Boiling water	_____°F	_____°C
Room temperature	_____°F	_____°C

4a. Is there a formula to convert between °F and °C?

4b. What is human body temperature?

Summary:

1. What is the metric unit used for measuring length? _____.
2. The metric prefix denoting 1000x is _____.
3. If you are changing m to cm. what direction do you move the decimal point? _____
4. How many times larger is a centigram than a milligram? _____.
5. What is the metric value for mass? _____
6. What is the metric value for length? _____
7. What is the prefix value for 100X? _____
8. What is the prefix value for 1/100? _____
9. If we are moving from a large value to a small value, we move the decimal point to the _____.
10. If we are moving the decimal point to the right we are moving from a _____ value to a _____ value.
11. Would kg, ml, or cm signify a measurement of weight? _____
12. Would volume be measured with a meter stick, a graduated cylinder, or a balance scale? _____
13. What is the smallest unit of measurement shown on a meter stick? _____
14. Would you measure the height of the ceiling using m, mm, or cm^3? ____
15. Convert 500 mL to liters. _____
16. Convert 5g to mg. _____
17. If an object is 100 mm in length, how many cm is it? _____
18. 20 mL of pure water weighs how much? _____
19. If you were to fill a graduated cylinder to 250 mL, then drop an object in that raises the water level to 300 mL, what is the volume of the object, in cubic centimeters? _____