








BASIS header:

## Lab Equipment and Measurement

### EQUIPMENT IDENTIFICATION AND USE

Equipment	Name	Purpose
		
		
		
		
		
		

Equipment	Name	Purpose
		
		
		
		
		
		
		

## EQUIPMENT QUESTIONS

1. What does a balance measure?

2. List three (3) pieces of lab equipment designed to measure volume.

a.

b.

c.

3. What does a thermometer measure?

4. Which piece of laboratory equipment should you use for the following tasks?

a. Heating water without using an open flame \_\_\_\_\_.

b. Measuring exactly 43 mL of water \_\_\_\_\_.

c. Weighing out 120 grams of sodium chloride \_\_\_\_\_.

d. Protecting your eyes from chemicals, flying objects, etc. \_\_\_\_\_.

e. Holding a beaker full of hot liquid \_\_\_\_\_.

f. Pouring liquid into containers with small openings \_\_\_\_\_.

g. Measuring out very small amounts of liquid \_\_\_\_\_.

h. Holding a test tube \_\_\_\_\_.

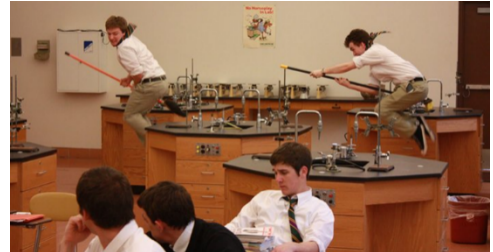
j. Hold several test tubes \_\_\_\_\_.

LAB SAFETY

Rule #1:



Rule #2:



Rule #3:





COMPARE THE FOLLOWING USING <, >, or =:

56 cg \_\_\_\_\_ 6 g

36 dm \_\_\_\_\_ 3.6 cm

5 km \_\_\_\_\_ 508 m

1500 mL \_\_\_\_\_ 15 L

7 g \_\_\_\_\_ 698 mg

63 cm \_\_\_\_\_ 6 m

**HINT! Convert one of the values to the same units as the other value *before* comparing!!!**

### LENGTH

\_\_\_\_\_ is the measurement of \_\_\_\_\_ - how far one thing is from another.

The metric base unit for length is the \_\_\_\_\_ (\_\_\_\_\_).

WRITE THE CORRECT ABBREVIATION FOR EACH METRIC UNIT OF LENGTH:

1. Kilometer \_\_\_\_\_

5. Dekameter \_\_\_\_\_

2. Meter \_\_\_\_\_

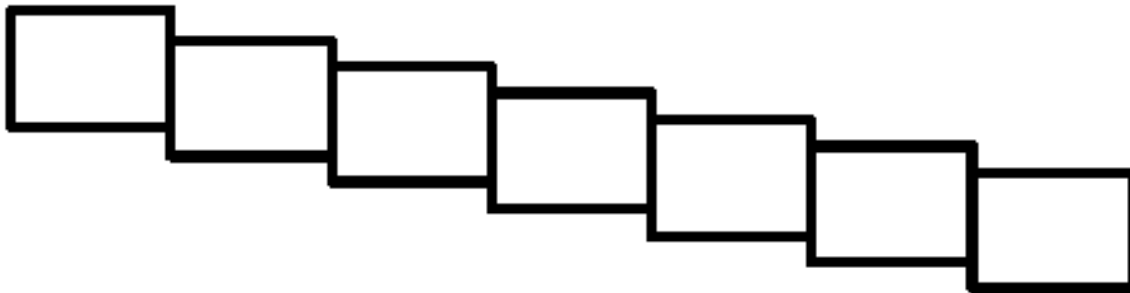
6. Centimeter \_\_\_\_\_

3. Millimeter \_\_\_\_\_

7. Hectometer \_\_\_\_\_

4. Decimeter \_\_\_\_\_

FILL IN THE STAIR-STEPS FOR LENGTH:



WHAT DOES EACH UNIT REPRESENT?

1. mm =

4. km =

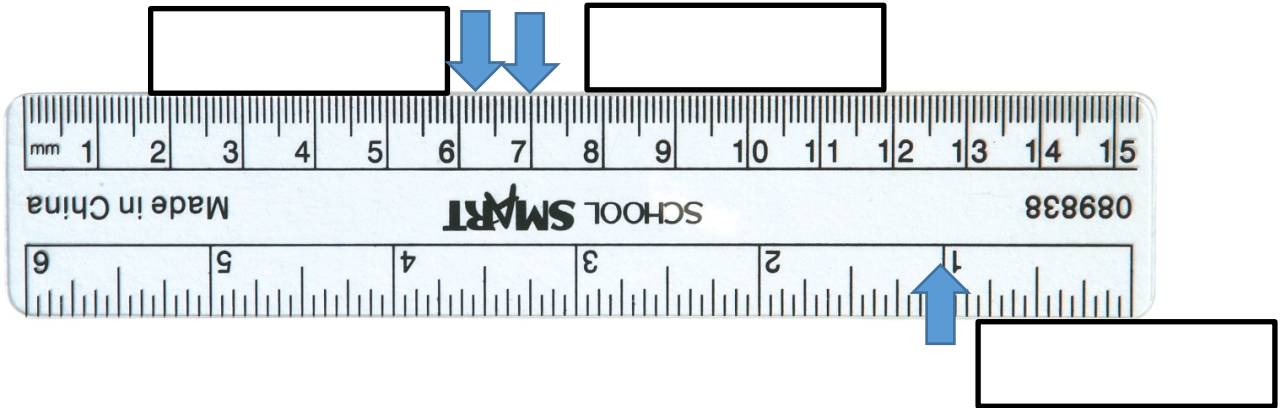
7. hm =

2. cm =

5. dm =

3. m =

6. dam =



HOW MUCH DO EACH OF THESE EQUAL?

1) 1 m = \_\_\_\_\_ cm

2) 1 cm = \_\_\_\_\_ mm

3) 1 km = \_\_\_\_\_ m

WHICH MEASUREMENT IS THE LARGEST? CIRCLE YOUR ANSWER FOR EACH PAIR.

1) 14 mm or 1 cm

4) 145 m or 145 km

2) 334 m or 1 km

5) 30 mm or 3.4 cm

3) 1 m or 990 cm

6) 10 km or 1000 cm

**HINT! Convert one of the values to the same units as the other value *before* comparing!!!**

### VOLUME

\_\_\_\_\_ is the measurement of the space an object takes up.

The metric base unit for volume is \_\_\_\_\_ (\_\_\_\_\_).

WRITE THE CORRECT ABBREVIATION FOR EACH METRIC UNIT OF VOLUME:

1. Kiloliter \_\_\_\_\_

5. Dekaliter \_\_\_\_\_

2. Liter \_\_\_\_\_

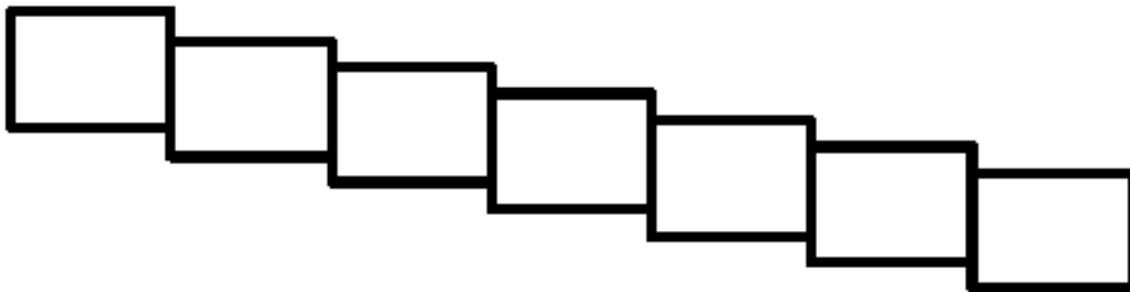
6. Centiliter \_\_\_\_\_

3. Milliliter \_\_\_\_\_

7. Hectoliter \_\_\_\_\_

4. Deciliter \_\_\_\_\_

FILL IN THE STAIR-STEPS FOR VOLUME:



WHAT DOES EACH UNIT REPRESENT?

1. mL =

4. kL =

7. hL =

2. cL =

5. dL =

3. L =

6. daL =

HOW MUCH DO EACH OF THESE EQUAL?

1) 1L = \_\_\_\_\_ cL

2) 1 cL = \_\_\_\_\_ mL

3) 1 kL = \_\_\_\_\_ L

WHICH MEASUREMENT IS THE LARGEST? CIRCLE YOUR ANSWER FOR EACH PAIR.

1) 14 mL or 16 cL

4) 148 L or 148 kL

2) 26 L or 17 kL

5) 300 mL or 3.4 cL

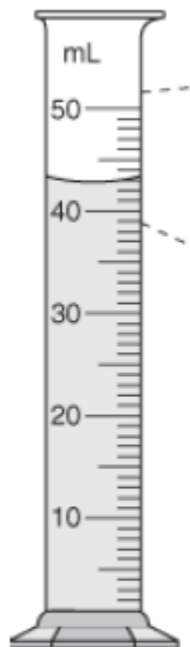
3) 11 L or 1000 cL

6) 1000 kL or 10 cL

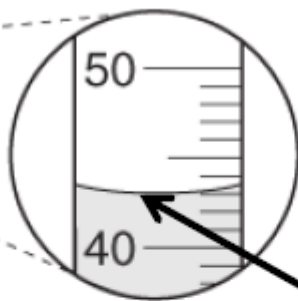
**HINT! Convert one of the values to the same units as the other value *before* comparing!!!**



HOW TO READ MEASUREMENTS OF VOLUME ON A GRADUATED CYLINDER:



Graduated cylinder



Close-up view

Read the measurement based on the

\_\_\_\_\_ of the  
\_\_\_\_\_, or curve.

To get an \_\_\_\_\_  
measurement, make sure you are  
\_\_\_\_\_ with the  
level of the water.



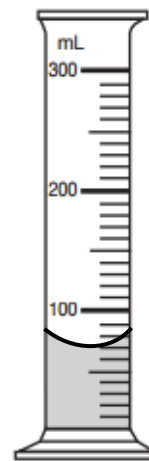
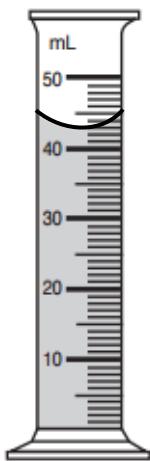
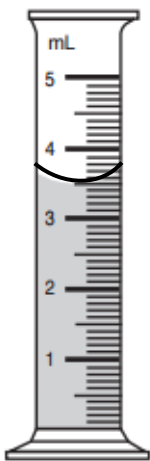
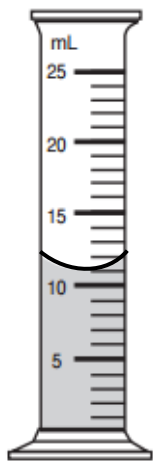
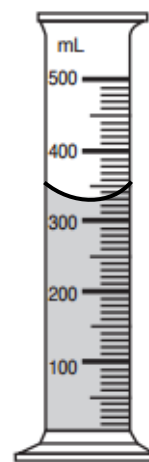
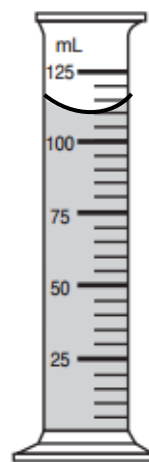
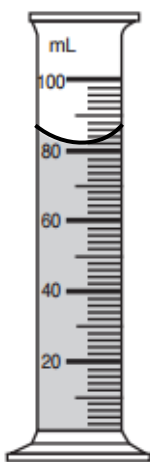
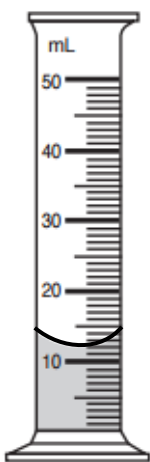
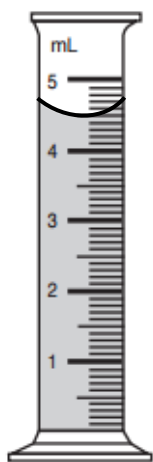
**What causes the meniscus?**

A concave meniscus occurs when the molecules of the liquid \_\_\_\_\_ the molecules of the container.

The \_\_\_\_\_ attracts the water on the sides.

This is due to a property of water called \_\_\_\_\_.

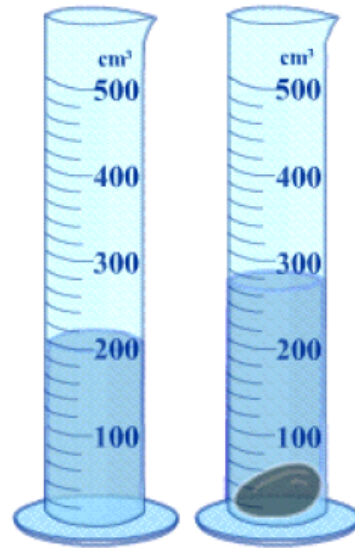
READ THE MENISCUS IN THE FOLLOWING EXAMPLES AND WRITE YOUR MEASUREMENTS BELOW:



MEASURING THE VOLUME OF A SOLID IRREGULAR OBJECT:

We can measure the volume of an irregular object using \_\_\_\_\_.

\_\_\_\_\_ (amount of H<sub>2</sub>O with object)  
\_\_\_\_\_ (amount of H<sub>2</sub>O without object)  
\_\_\_\_\_ (difference = volume)



The measure of how much the water raises equals the

\_\_\_\_\_ of the  
\_\_\_\_\_.

MASS

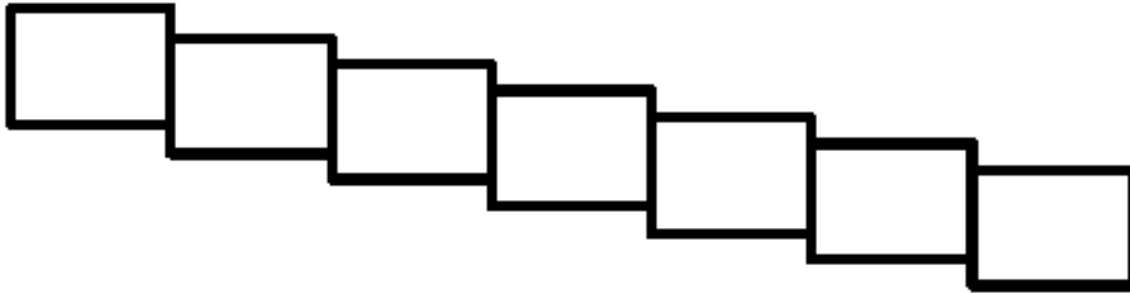
\_\_\_\_\_ is the measure of the amount of \_\_\_\_\_ (how much “stuff”) is in an object.

The metric base unit for mass is \_\_\_\_\_ (\_\_\_\_\_).

WRITE THE CORRECT ABBREVIATION FOR EACH METRIC UNIT OF MASS:

- |                    |                    |
|--------------------|--------------------|
| 1. Kilogram _____  | 5. Dekagram _____  |
| 2. Gram _____      | 6. Centigram _____ |
| 3. Milligram _____ | 7. Hectogram _____ |
| 4. Decigram _____  |                    |

FILL IN THE STAIR-STEPS FOR MASS:



WHAT DOES EACH UNIT REPRESENT?

1. mg =

4. kg =

7. hg =

2. cg =

5. dg =

3. g =

6. dag =

HOW MUCH DO EACH OF THESE EQUAL?

1) 1 g = \_\_\_\_\_ hg

2) 1 mg = \_\_\_\_\_ cg

3) 1 g = \_\_\_\_\_ kg

WHICH MEASUREMENT IS THE LARGEST? CIRCLE YOUR ANSWER FOR EACH PAIR.

1) 12 mg or 3 cg

4) 12 g or 122 kg

2) 210 g or 2 kg

5) 13 mg or 6.2 cg

3) 1 g or 998 mg

6) 15 kg or 1500 cg

**HINT! Convert one of the values to the same units as the other value *before* comparing!!!**