

PHYSICAL SCIENCE LAB #2
Length, Mass, and Volume Lab

Length Lab

Name _____

1. What does each unit represent?

- (a) mm = _____ (b) m = _____
(c) cm = _____ (d) km = _____

2. How much does each one equal?

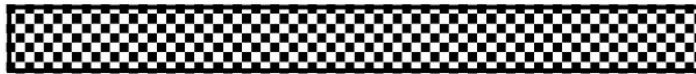
- (a) 1 m = _____ cm (b) 1 cm = _____ mm (c) 1 km = _____ m

3. Which measurement is the largest? Circle your answer for each pair.

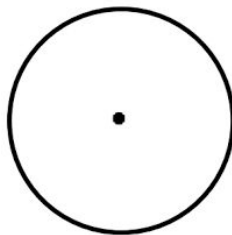
- (a) 14 mm or 1 cm (d) 145 m or 145 km
(b) 334 m or 1 km (e) 3.4 cm or 30 mm
(c) 1 m or 990 cm (f) 10 km or 1000 cm

4. Use a metric ruler or meter stick to find each measurement.

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- (a) Length of the line in centimeters _____
(b) Length of the line to the nearest centimeter _____



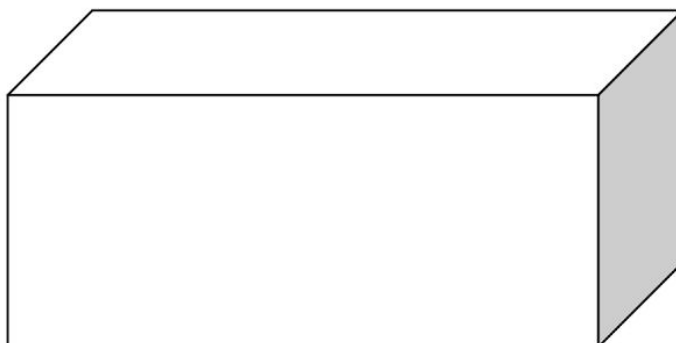
- (c) Height of the rectangle to the nearest millimeter _____
(d) Width of the rectangle to the nearest millimeter _____



- (e) Radius of the circle to the nearest millimeter _____
(f) Diameter of the circle in centimeters _____
(g) Diameter of the circle to the nearest centimeter _____

HINT: If it says “nearest”, you need to round your answer so you don’t have a decimal point. If not, you should have one decimal point in your answer.

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(h) Volume of the box in cubic centimeters

$$\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

(Measure to the nearest centimeter before multiplying.)

5. Find the length of an unsharpened pencil (including eraser) in millimeters. _____
6. What is your height in centimeters? _____ What is your height in meters? _____
7. Find the distance between the two index cards in the hallway in meters. _____
8. Use your shoe and a metric ruler to complete this section. Keep your shoes on for this one!
 - (a) What is the length of your shoe to the nearest centimeter? _____
 - (b) How many shoes would it take (heel to toe) to make 1 meter? _____
 - (c) How many shoes would it take to make 1 kilometer? _____
9. Use ten pennies and a metric ruler to complete this section.
 - (a) How tall is a stack of ten pennies in centimeters? _____
 - (b) How tall would a stack of 100 pennies be in centimeters? _____
 - (c) How tall would a stack of 1000 pennies be in centimeters? _____
10. Circle the BEST metric unit for each.
 - (a) The length of an eyelash mm cm m km
 - (b) The height of a flagpole mm cm m km
 - (c) The length of a strand of spaghetti mm cm m km
 - (d) The distance from Chicago, IL, to Peoria, IL. mm cm m km

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Mix & Match Mass

Name _____

Choose items from the container on your table that will be closest to the targeted mass. You may use a single item or mix and match items to reach the targeted mass.

Have your teacher check your estimates before you find the actual mass!

| Targeted Mass | Item(s) | Actual Mass |
|---------------|---------|-------------|
| 1 gram | | |
| 5 grams | | |
| 10 grams | | |
| 20 grams | | |
| 50 grams | | |
| 100 grams | | |
| 200 grams | | |
| 400 grams | | |

Circle the BEST metric unit for each.

(1) Your mass: mg g kg

(2) Amount of spices in a batch of cookies: mg g kg

(3) Mass of 10 pennies: mg g kg

Mass Challenge: Use the equipment provided and your knowledge of the metric system to answer the question. Be sure to explain your procedure - how you found your answer!

What is the mass of 100 milliliters of water? _____

Procedure:

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Volume Lab

Name _____

Part A: Count your drops!

Take a guess - How many drops of water will it take to equal 1 milliliter? _____ drops

Follow the directions to find the number of drops in 1 milliliter of water, then answer the questions. You will need a small graduated cylinder (25 ml), a beaker of water, and an eyedropper for this section.

- (1) Fill a small graduated cylinder with 10 ml of water.
- (2) Count the number of drops it takes to raise the water to 11 ml. Record the number in the chart.
- (3) Leave the water in the graduated cylinder and count the number of drops it takes to raise the water to 12 ml. Record the number in the chart.
- (4) Leave the water in the graduated cylinder and count the number of drops it takes to raise the water to 13 ml. Record the number in the chart.
- (5) Calculate your average and round to the nearest tenth.

| # of drops to 11 ml | # of drops to 12 ml | # of drops to 13 ml | Average |
|---------------------|---------------------|---------------------|---------|
| | | | |

Based on your average, how close were you to your guess? _____

Based on your average, how many drops would it take to make 1 liter? _____

Part B: Water Displacement

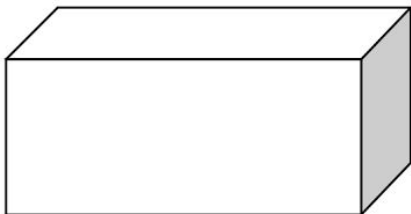
Follow the directions to find the volume of three marbles using water displacement.

- (1) Add 20 ml of water to a 100 ml graduated cylinder. Record this amount in the chart.
- (2) Add three marbles to the cylinder and measure the volume. Record this amount in the chart.
- (3) Find the difference between the two measurements and record in the chart. The difference between the two measurements will be the volume of the three marbles.

| Volume of water before adding marbles | Volume of water after adding marbles | Difference in volume | Volume of 3 marbles |
|---------------------------------------|--------------------------------------|----------------------|---------------------|
| | | | |

Part C: Volume by Formula

Use the formula to find the volume of the box. Measure to the nearest centimeter (no decimals) before calculating your answer.



Volume = length x width x height

_____ x _____ x _____ =