**Length Lab**

**/26**

**Pre-Questions (1pt ea)**

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 (b) 145 m or 145 km (c) 334 m or 1 km (d) 3.4 cm or 30 mm

(d) 1 m or 990 cm (e) 10 km or 1000 cm (f) 85 cm or .86 m (g) 1 km or 999 m

4. 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

**Data Collection**

5. Use a meter stick to find each measurement.

(a) Length of the table in meters \_\_\_\_\_\_\_\_ \_\_\_\_\_

(b) Width of the table in centimeters \_\_\_\_\_\_\_\_ \_\_\_\_\_

(c) Height of the table in millimeters \_\_\_\_\_\_\_\_ \_\_\_\_\_

(d) Height of tallest person in your group in centimeters \_\_\_\_\_\_\_\_ \_\_\_\_\_

6. Find the length of an unsharpened pencil (including eraser) in millimeters. \_\_\_\_\_\_\_\_ \_\_\_\_\_

7. Use your shoe and a meter stick 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? \_\_\_\_\_\_\_\_ \_\_\_\_\_

**Mass Lab**

**/19**

**Problem**

What is the proper way to use a triple-beam balance to measure the mass of different objects?



**Materials**

* Triple-beam balance
* 100-mL graduated cylinder
* 3 different small, solid objects

**Procedure**

Before you measure the mass of any object, be sure that the riders on the balance beams are moved all the way to the left and the pointer rests on zero. If necessary, slowly turn the adjustment knob until the pointer rests on zero. This is called zeroing the balance.

**Part 1 Measuring Mass Directly**

1. Find the mass of three random objects of your choice from the front of the room.
2. Zero out the balance.
3. Place the objects on the triple beam balance
4. Find the mass.

**Data Table 1**

/6

|  |  |
| --- | --- |
| **Object** | **Mass [g]** |
|  |  |
|  |  |
|  |  |

**Part 2 Finding Mass by Difference**

1. Find the mass of an empty graduated cylinder. Record the mass in Data Table 2 below.
2. Fill the graduated cylinder with 20 mL of water.
3. Find the mass of the graduated cylinder and water. Record the mass in Data Table 2.
4. Calculate the mass of the water by subtracting the two measurements.
5. Record the calculated mass of the water in Data Table 2.

**Data Table 2**

**/3**

|  |  |  |
| --- | --- | --- |
| **Mass of Empty graduated cylinder (g)** | **Mass of graduated cylinder with 20 mL Water (g)** | **Mass of Water (g)** |
|  |  |  |

**Analyze and Conclude /10**

1. Which rider on the balance should always be moved first when finding the mass of an object? Why?
2. What does it mean when the pointer of the balance reads “zero”?
3. Suppose you did not zero the balance before finding the mass of an object. How might that affect your measurement?
4. In this lab, you found the mass of 20 mL of water. How would you attempt to calculate the mass of 1 mL of water without using the balance?
5. Describe how you could find the mass of a certain quantity of milk that you poured into a drinking glass.

**Volume Lab**

**/14**

**Data Collection Part A: Volume by Formula**

Use the formula to find the volume of the box. Measure to the nearest centimeter **(no decimals)** before calculating your answer. (The width is the same number as the height)

**/4**

****

Same Length

**Data Collection Part B: Water Displacement**

Follow the directions to find the volume of the marble using water displacement.

(1) Add 20 ml of water to a 100 ml graduated cylinder. Record this amount in the chart.

(2) Add the marbles to the cylinder and measure the new 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 marble.

**/4**

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

**Questions Part C: Density (Density = Mass/Volume)**

1. Billboa Baggans gave you the block from part A. What would its density be if its mass was 60 g? (Density = Mass ÷ Volume)
2. Will this block sink or float when placed in water? (Hint: Density of Water = 1 g/ml. If it’s more dense, it sinks).
3. How does density differ from volume?