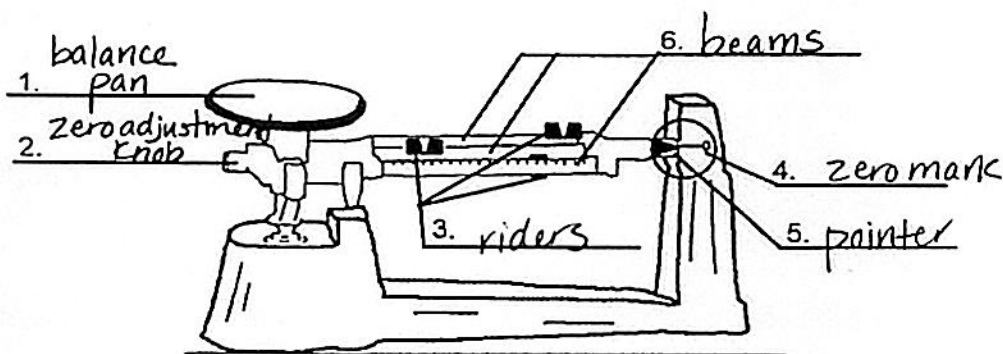


Metric System Review Sheet

1. Define:

- a. Matter: Anything that has mass or takes up space.
- b. Mass: The amount of matter something is made of.
- c. Volume: The amount of space an object takes up.
- d. Meniscus: Where you read the liquid volume in the graduated cylinder
- e. Density: Amount of mass in a specific amount of volume.
How closely packed the particles in an object are.

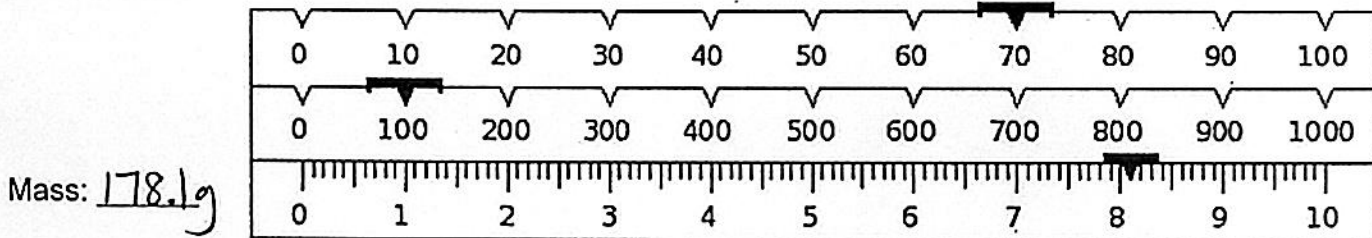
2. Label the parts of the triple beam balance:



3. What is the basic SI unit for mass?

gram (g)

4. Describe how we read the mass of an object on a triple beam balance.



5. What is the basic SI unit for length?

meter (m)

6. What two tools are used to measure length?

metric ruler or meter stick,

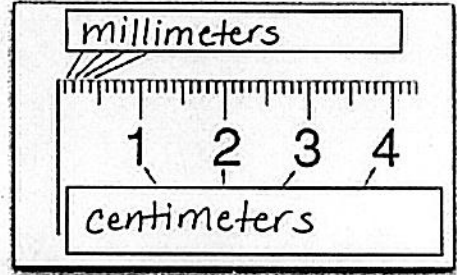
7. What are the numbered lines on a metric ruler? What are the tiny lines?

centimeters millimeters

8. How can you convert between these two units?

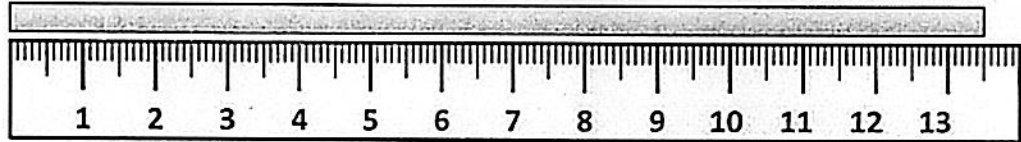
cm \rightarrow mm (multiply by 10)

mm \rightarrow cm (divide by 10)

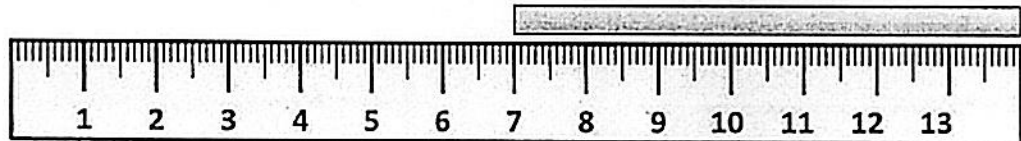


9. What are the lengths of the bars in centimeters to the nearest tenth?

a. 13.5cm



b. 7.0cm



c. 1.5cm



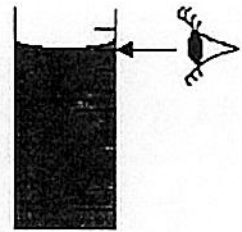
10. What tool do we use to determine the volume of a liquid? What units do we use?

graduated cylinder

mL

11. How do we read the volume of a liquid in a graduated cylinder?

- make sure the graduated cylinder is on a flat surface.
- read at eye level
- read the liquid at the meniscus.



12. Determine the volume in the following cylinders:



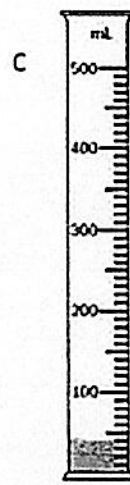
Graduation - 1 mL

Volume - 37 mL



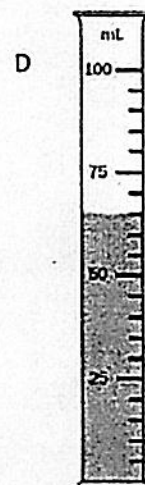
1 mL

37 mL



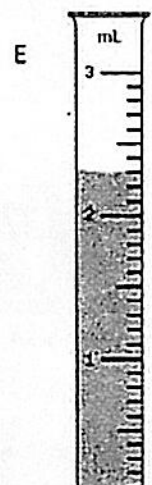
10 mL

40 mL



5 mL

1.5 mL



0.1 mL

2.2 mL

13. What method do we use to determine the volume of regular objects? What units do we use?

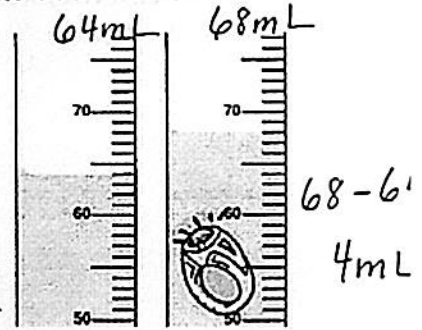
$$\text{Volume} = \text{length} \times \text{width} \times \text{height}$$

$$\text{cm}^3$$

14. What method do we use to find the volume of irregular solids? What units do we use?

Note: 1 mL = 1 cm³

Water displacement / mL



Ring's volume: 4 mL

15. Write out the steps you need to take in order to find the volume of an irregular solid in a graduated cylinder.

- read the initial volume of the liquid only
- read the final volume of the liquid + the object
- subtract the initial volume from the final volume to find the volume of the object.

16. What is the density formula? What does the density triangle look like?

$$D = \frac{m}{V}$$

$$\text{Density} = \frac{\text{mass}}{\text{Volume}}$$



I ♥ density

17. What is the density of water?

1.0 g/mL or 1.0 g/cm³

18. If an object has a density that is greater than the density of water, what will happen to the object when it is placed in the water?

It will sink.

19. If an object has a density that is less than the density of water, what will happen to the object when it is placed in the water?

It will float.

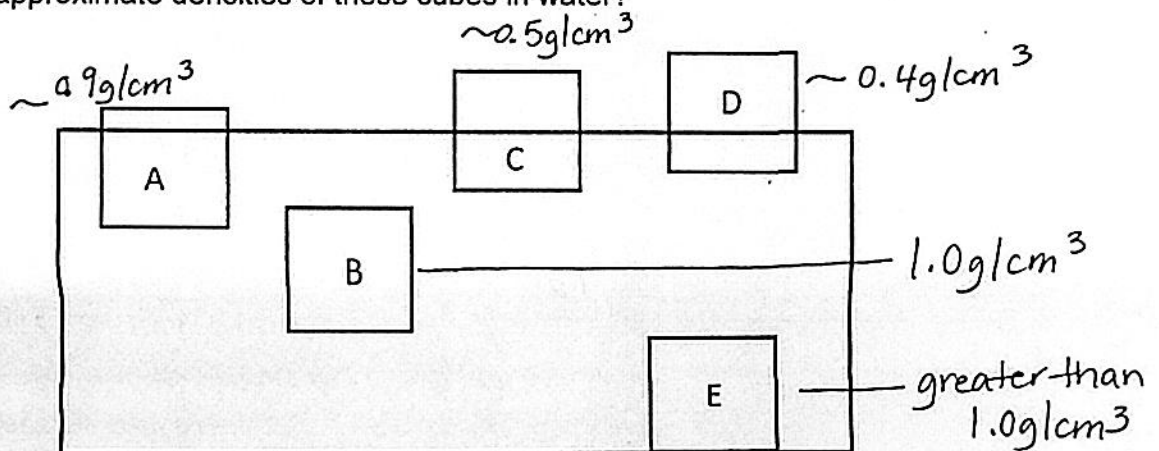
20. If an object has a density that is the same as the density of water, what will happen to the object when it is placed in the water?

It will suspend.

21. Describe what happens to the density of a material if the material is cut into smaller pieces. How does the density of the pieces compare to the density of the original material? Explain.

The density does not change. The density of the pieces are the same as the density of the original material.

22. What are the approximate densities of these cubes in water?



Density Practice Problems:

1. A foam square has a mass of 62 g and a volume of 72 cm³. What is the density?

Formula:	$d = \frac{m}{V}$
Substitution:	$d = \frac{62g}{72cm^3}$
Final Answer with Units:	$d = 0.861$ rounded $0.9g/cm^3$

2. A wooden block has a mass of 986 g and a density of 16 g/cm³. What is the volume?

Formula:	$V = \frac{m}{d}$
Substitution:	$V = \frac{986g}{16g/cm^3}$
Final Answer with Units:	$61.6cm^3$

3. A soda has a volume of 560 mL and a density of 3.2 g/mL. What is the mass?

Formula:	$m = d \times v$
Substitution:	$m = 3.2g/mL \times 560mL$
Final Answer with Units:	$1,792.0g$