

Name: \_\_\_\_\_ Block: \_\_\_\_\_ Date: \_\_\_\_\_

## STUDY GUIDE: Introduction to Science and Measurement

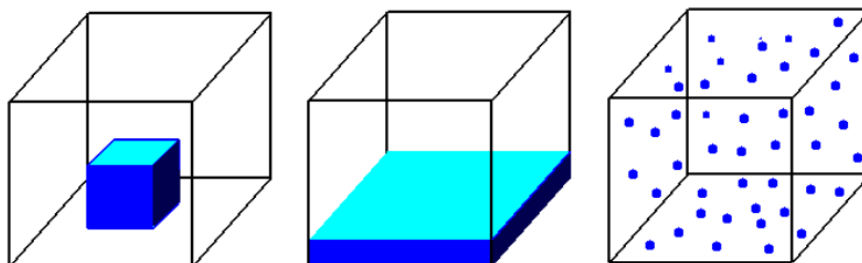
1. Match the vocabulary word with the definition

mass	Particles are packed closely together and hold a rigid structure. It keeps its own form (it does not take the shape of the container it is in)
density	Particles can slide past each other but remain close. It takes the shape of its container, beginning from the bottom.
volume	Particles are spread away from each other and can move freely. It takes the whole shape of a container in all directions.
solid	The amount of matter in a particular space
liquid	The amount of matter in an object
gas	The amount of space an object takes up

2. List 4 characteristics of matter:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

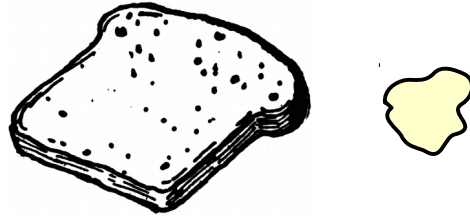
3. Label each as a liquid, gas or solid:



**Q 4-6: Write what is the same and what is different between the two:**

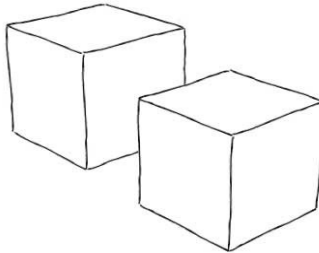
4. A slice of white bread and a squished ball of white bread:

\_\_\_\_\_ Mass  
\_\_\_\_\_ Volume  
\_\_\_\_\_ Density



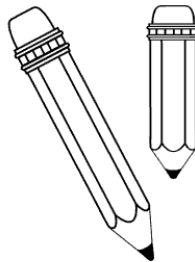
5. A density cube made of copper and a density cube made of pine:

\_\_\_\_\_ Mass  
\_\_\_\_\_ Volume  
\_\_\_\_\_ Density



6. Two pencils of different lengths:

\_\_\_\_\_ Mass  
\_\_\_\_\_ Volume  
\_\_\_\_\_ Density



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7. To measure volume, what unit would you use?

- a) grams
- b)  $\text{cm}^3$
- c) lbs
- d)  $\text{g}/\text{cm}^3$

8. Which of the following is a measurement of mass?

- a) 23 cm
- b) 2 feet 2 inches
- c) 10.5 grams
- d) 7.2 liters

9. A graduated cylinder is used to measure\_\_\_\_\_.

- a) Weight
- b) Mass
- c) Volume
- d) Density

10. Using the centimeter side of the ruler, make a line that is 5 millimeters (mm) long. Label the line.

11. Make a line that is 9.7 centimeters long. Label the line.

12. Make a line that is 0.8 centimeters long. Label the line.

13. Using centimeters, measure these lines. Write down the measurement with labels.

A. 

B. 

C. 

D. 

14. Convert millimeters to centimeters:

7 mm = \_\_\_\_\_ cm

4 mm = \_\_\_\_\_ cm

9 mm = \_\_\_\_\_ cm

1 mm = \_\_\_\_\_ cm

8 mm = \_\_\_\_\_ cm

15 mm = \_\_\_\_\_ cm

15. Convert millimeters to centimeters.

0.1 cm = \_\_\_\_\_ mm

0.3cm = \_\_\_\_\_ mm

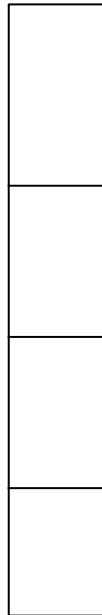
0.8 cm = \_\_\_\_\_ mm

0.9 cm = \_\_\_\_\_ mm

0.7 cm = \_\_\_\_\_ mm

15 cm = \_\_\_\_\_ mm

16. You have four liquids of different densities. Write how they will stack up in a straw if layered by density, put the letter of the liquid where it would be in the straw:



	<u>Density</u>
Liquid A	1.42 g/cm <sup>3</sup>
Liquid B	0.79 g/cm <sup>3</sup>
Liquid C	1.01 g/cm <sup>3</sup>
Liquid D	0.98 g/cm <sup>3</sup>

17. Corn syrup is more dense than water. What will happen if you pour a cup of corn syrup into a cup of water? Why?

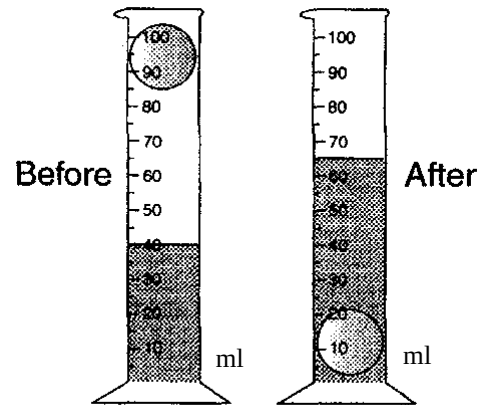
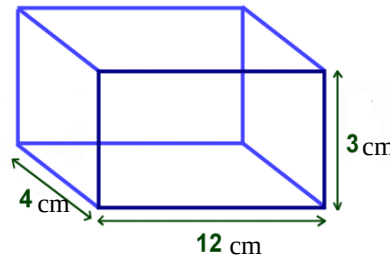
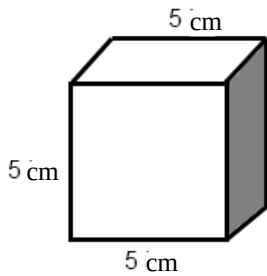
18. Vegetable oil is less dense than water. What will happen if you pour a cup of vegetable oil into a cup of water? Why?

19. Is an ice cube a solid, liquid or gas? Explain your answer with at least two sentences.

20. If a substance has a large mass and a small volume, what can you conclude about it?

- a) it is very dense
- b) it will float on water
- c) it is made out of rock or metal
- d) it has a low density

21. Find the volume of each:



V = \_\_\_\_\_

V = \_\_\_\_\_

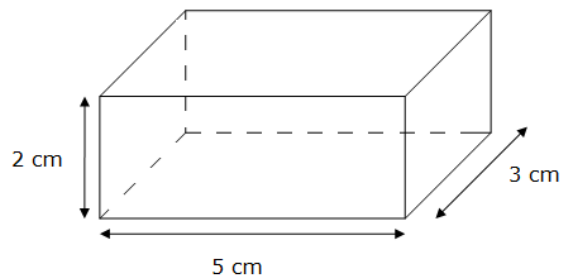
V = \_\_\_\_\_

22. What is the equation for calculating density?

**Challenge Questions:**

23. Calculate the density of a block that has a volume of  $60\text{cm}^3$  and a mass of 10g:

24. Calculate the density of this box, it has a mass of 30g:



25. A furniture maker wants to determine if two pieces of wood are of the same type. He knows that the two woods have different densities. The first piece is 30 X 14 X 2.5 centimeters and weighs 350 grams. The second is 15 X 15 x 10 centimeters and weighs 900 grams. Are they different types of wood? Include your calculations in your answer.