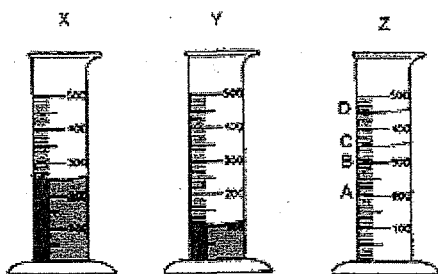


Name \_\_\_\_\_

# Density Review

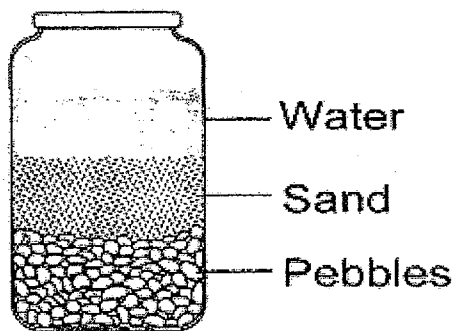
1. The diagram below shows 3 graduated cylinders. The contents of cylinders X and Y are poured into cylinder Z.



Which letter represents the amount of liquid that will be in container Z?

- 1) A    2) B    3) C    4) D

2. A sample of water and sediment was taken from the river. The sand and pebbles were allowed to settle in a jar for three hours, as shown below.



Which of these best explains why the pebbles are below the sand?

- 1) Pebbles are more dense than sand particles.
- 2) The temperature of the water is high enough to melt some sand.
- 3) Sand particles dissolve more in water than pebbles.
- 4) The sand particles trapped enough air to make them float.

3. The density of a substance is equal to

- 1) mass ÷ volume      2) volume ÷ mass  
3) mass × volume    4) volume + mass

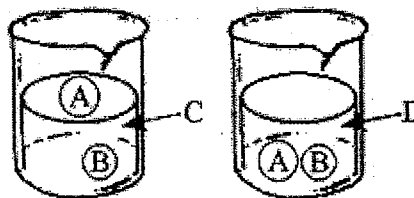
4. The data table below shows the masses and volumes of three objects (A, B, and C).

A	B	C
Mass = 4g	Mass = 6 g	Mass = 8 g
Volume = 2 cm <sup>3</sup>	Volume = 6 cm <sup>3</sup>	Volume = 4 cm <sup>3</sup>

The formula for calculating an object's density is:  $\text{Density} = \frac{\text{Mass}}{\text{Volume}}$

Which statement about the densities of these three objects is correct?

- 1) B is more dense than A.
  - 2) A is more dense than C.
  - 3) B and C have equal densities.
  - 4) A and C have equal densities.
5. Two objects A and B were placed in two vials with different liquids C and D in them. This diagram shows what happened to each object when placed in the vial.



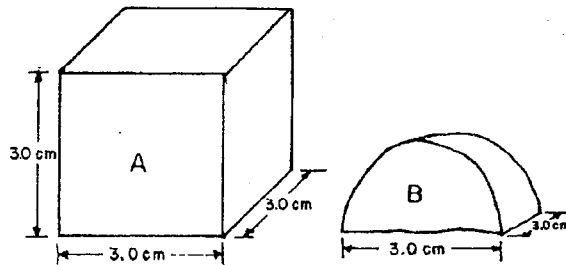
Which of the following choices has the objects and liquids in increasing density?

- 1) D, C, A, B
  - 2) D, C, B, A
  - 3) D, A, C, B
  - 4) not enough information
6. Which block represented in the diagram has the greatest density?



- 1) A    2) B    3) C    4) D

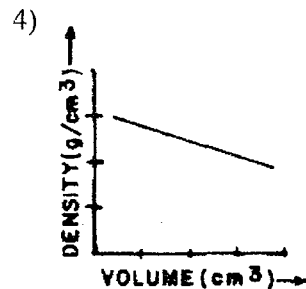
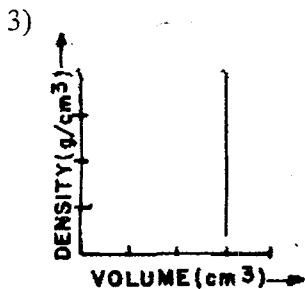
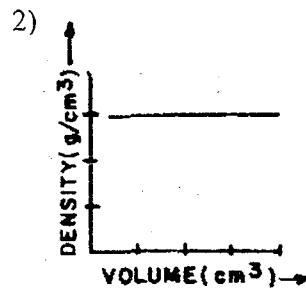
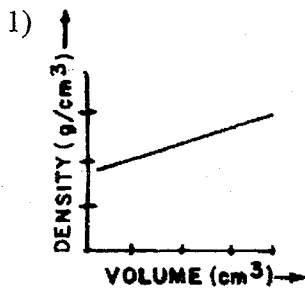
Base your answers to questions 7 and 8 on the diagrams below. The diagrams represent two different samples of the same type of solid material, both at sea level atmospheric pressure and both at the same temperature.



7. Because sample *A* and sample *B* are of the same uniform material, what conclusion could be made about their densities?

- 1) The density of *A* is greater than *B* because of *A*'s larger volume.
- 2) The density of *A* is greater than *B* because of *A*'s larger mass.
- 3) The densities of *A* and *B* are equal despite their different sizes and shapes.
- 4) The density of *B* is greater than *A* because *B* has been weathered.

8. The material in sample *A* and *B* will expand when heated. Which graph best represents the relationship between the volume and the density of the material when it is heated?



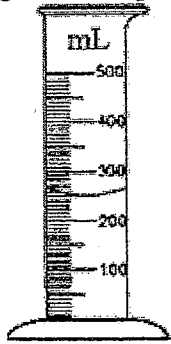
9. Compared to the density of liquid water, the density of an ice cube is

- 1) always less
- 2) always greater
- 3) always the same
- 4) sometimes less and sometimes greater

10. As air on the surface of Earth warms, the density of the air

- 1) decreases
- 2) increases
- 3) remains the same

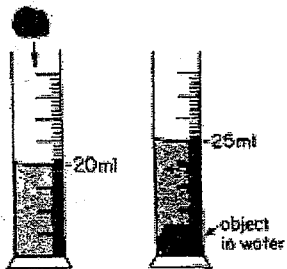
11. The graduated cylinder shown below contains 500 grams of liquid.



What is the density of the liquid?

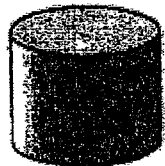
- 1) 2.50 g/ml
- 2) 2.00 g/ml
- 3) 0.5 g/ml
- 4) 4.00 g/ml

12. The diagram below represents a solid object weighing 50 grams being placed in water. What is the density of this object?



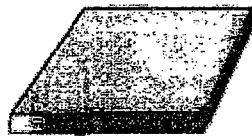
- 1) 0.1 g/ml
- 2) 5.0 g/ml
- 3) 10 g/ml
- 4) 25 g/ml

13. The diagrams below represent two solid objects A and B, with different densities.



Object A

(Density = 0.8 g/cm<sup>3</sup>)



Object B

(Density = 1.2 g/cm<sup>3</sup>)

What will happen when the objects are placed in a container of water (water temperature = 4°C)?

- 1) Both objects will sink.
- 2) Both objects will float.
- 3) Object A will float and object B will sink.
- 4) Object B will float and object A will sink.

14. A student collected the data shown below to determine experimentally the density of distilled water.

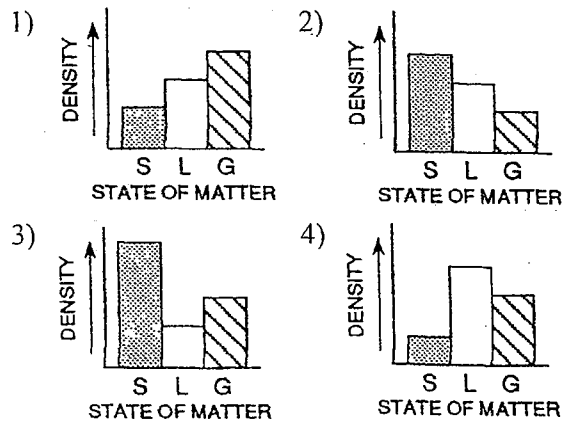
Mass of graduated cylinder + distilled H <sub>2</sub> O sample .....	163 g
Mass of empty graduated cylinder ...	141 g
Mass of distilled H <sub>2</sub> O sample .....	g
Volume of distilled H <sub>2</sub> O sample .....	25.3 mL

Based on the experimental data collected, what is the density of the distilled water?

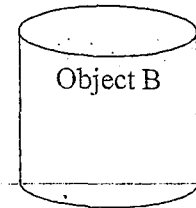
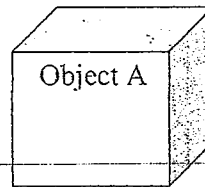
- 1) 1.0 g/mL
- 2) 0.253 g/mL
- 3) 0.87 g/mL
- 4) 1.15 g/mL

15. Which graph best represents the relationship between the density of a substance and its state of matter (phase) for most earth materials, *excluding* water?

[Key: S = solid, L = liquid, G = gas]



16. Base your answer to the following question on the descriptions and drawings of Object A and Object B below. Both objects have the same volume. Object B has more mass than Object A.



Which object has the greater density?  
Explain your reasoning.

## Density Column

Density is a physical property of matter that can be calculated if the mass and volume are known. The formula for density is:  $D=m/v$ . In the examples on this page, mass is in grams. Liquid volume is in milliliters and the volume of the solid objects is in cubic centimeters.

The following list contains information for four liquids and two solid objects. Complete the density table below by determining the density of each object.

- a yellow liquid with a mass of 15g and a volume of 3.3ml
- a green liquid with a mass of 4g and a volume of .5ml
- a red liquid with a mass of 31g and a volume of 9.3ml
- an orange liquid with a mass of 6g and a volume of 6ml
- a blue cube with a mass of 43g and a volume of 36.5ml
- a pink star with a mass of 4g and a volume of 6ml

Object	Mass (g)	Volume (mL or cm <sup>3</sup> )	Density (g/mL or g/cm <sup>3</sup> )
yellow liquid			
green liquid			
red liquid			
orange liquid			
blue cube			
pink star			

1. Which liquid is the most dense? \_\_\_\_\_
2. Which liquid is the least dense? \_\_\_\_\_
3. Which object will settle to the bottom? \_\_\_\_\_

Use colored pencils to sketch the liquid layers in the container on the right. Add the two solid objects at the appropriate locations.

