

Base your answers to questions 1 through 4 on the diagrams below, and your knowledge of Earth science. The diagrams represent five substances, *A* through *E*, at the same temperature. Some mass, volume, and density values are indicated for each substance. Substance *C* is a liquid in a graduated cylinder. [Note that 1 cubic centimeter = 1 milliliter. Objects are not drawn to scale.]



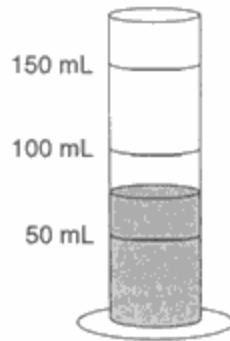
Mass = 8.0 g
Volume = 2.0 cm³
Density = 4.0 g/cm³

A



Mass = 9.0 g
Volume = 5.0 cm³
Density = ? g/cm³

B



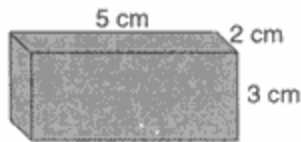
Mass of liquid = ? g
Volume of liquid = ? mL
Density of liquid = 1.2 g/mL

C



Mass = 0.8 g
Volume = ? cm³
Density = 0.4 g/cm³

D



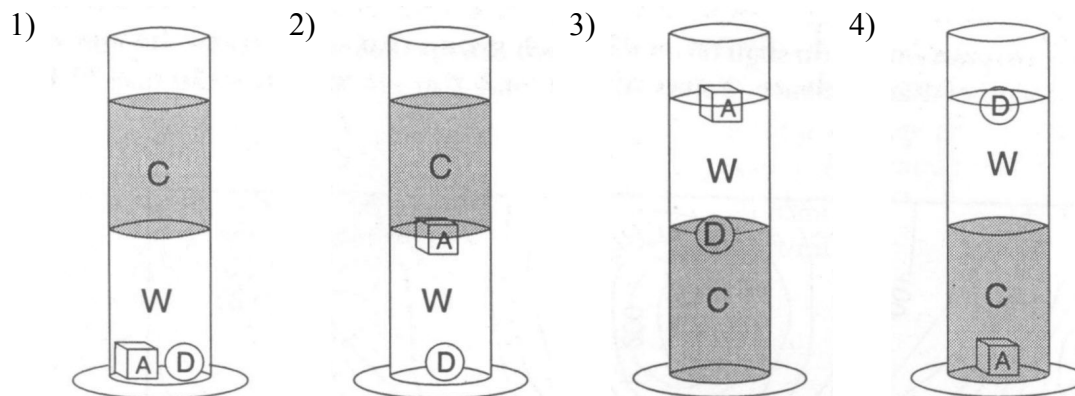
Mass = 54.0 g
Volume = ? cm³
Density = ? g/cm³

E

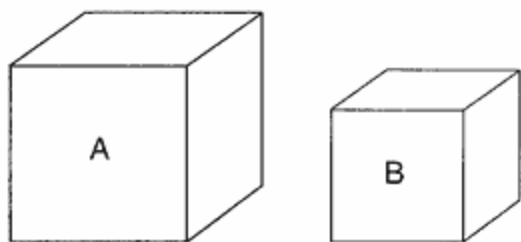
1. What is the volume of liquid *C*?
1) 25.0 mL 2) 50.0 mL 3) 75.0 mL 4) 125.0 mL
2. What is the volume of object *D*?
1) 1.0 cm³ 2) 2.0 cm³ 3) 7.0 cm³ 4) 16.0 cm³
3. Which two substances could be made of the same material?
1) *A* and *B* 2) *B* and *E* 3) *C* and *D* 4) *A* and *E*

BDE #34 - Density

4. Water (*W*) was added to the graduated cylinder containing liquid *C*. Objects *A* and *D* were then dropped into the cylinder. Which diagram most accurately shows the resulting arrangement of these substances?



Base your answers to questions 5 through 7 on the diagrams below, which represent two different solid, uniform materials cut into cubes *A* and *B*.



Mass of *A* = 320 g Density of *B* = 3 g/cm³
 Volume of *A* = 64 cm³ Volume of *B* = 27 cm³

(Not drawn to scale)

5. What is the mass of cube *B*?

- 1) 9 g 2) 27 g 3) 3 g 4) 81 g

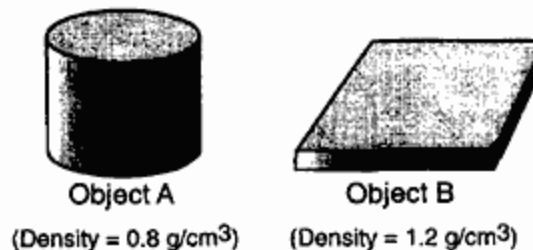
6. Assume cube *B* was broken into many irregularly shaped pieces. Compared to the density of the entire cube, the density of one of the pieces would be

- 1) less 2) greater
 3) the same

7. What is the density of cube *A*?

- 1) 0.2 g/cm³ 2) 5.0 g/cm³
 3) 12.8 g/cm³ 4) 64.0 g/cm³

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



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.

BDE #34 - Density

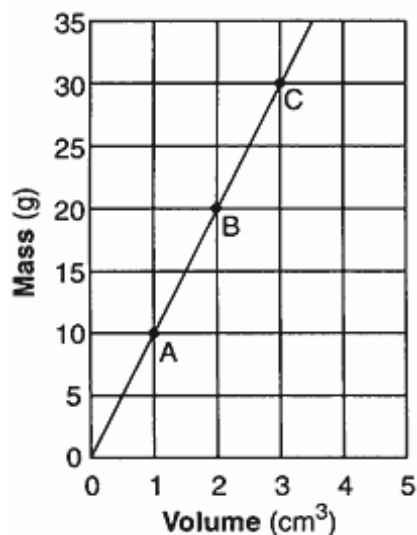
9. The cartoon below presents a humorous look at science.



The correct explanation of why ice floats is that, compared to liquid water, solid ice

- 1) has less mass 2) has more mass 3) is less dense 4) is more dense

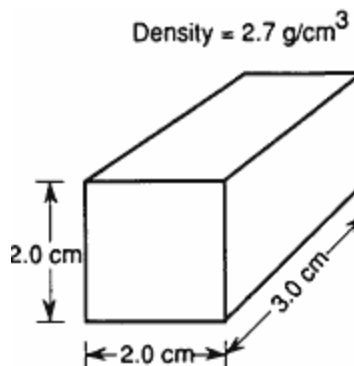
10. The graph below shows the relationship between mass and volume for three samples, A, B, and C, of a given material.



What is the density of this material?

- 1) 1.0 g/cm³ 2) 5.0 g/cm³
 3) 10.0 g/cm³ 4) 20.0 g/cm³

Base your answers to questions 11 and 12 on the diagram below, which represents a solid material of uniform composition.



11. The mass of this piece of material is approximately

- 1) 0.23 g 2) 4.4 g
 3) 9.3 g 4) 32 g

12. If this material is heated and expands, the density of the material will

- 1) decrease 2) increase
 3) remain the same