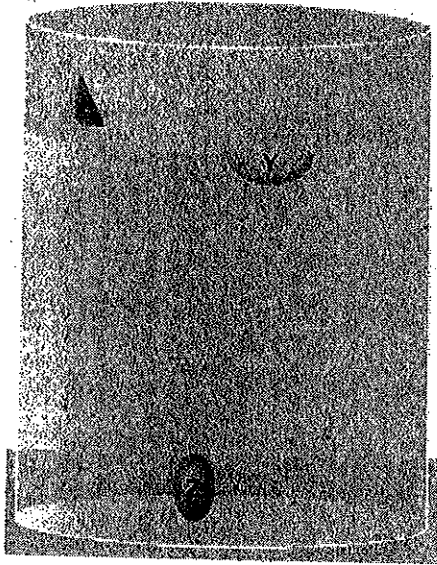


DENSITY LABORATORY

1. Based on the diagram below, rank the three objects from least dense to most dense.

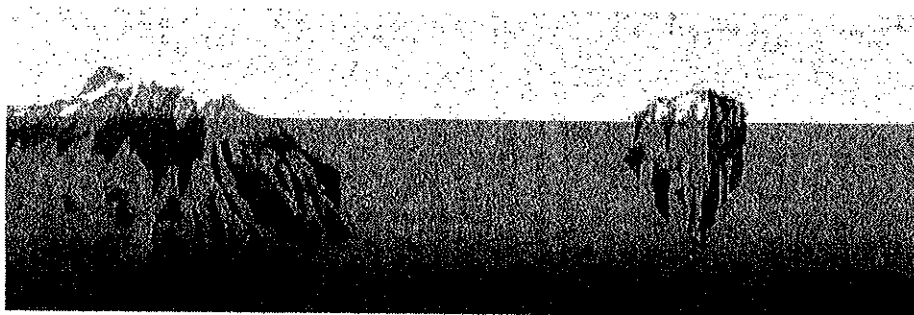


- A. Object X, object Z, object Y.
 - B. Object Z, object Y, object X.
 - C. Object X, object Y, object Z.
 - D. Object Y, object Z, object X.
2. Fill in the blank: An object is most likely to sink in water if _____.
- A. it has a large mass
 - B. it has a large volume
 - C. it has a high density
 - D. it has a low density
3. A ball has a mass of 33.6 grams and a volume of 14.0 cubic centimeters (cc). What is its density?
- A. 0.42 g/cc
 - B. 2.4 g/cc
 - C. 19.6 g/cc
 - D. 470.4 g/cc

4. Three balls were measured and placed in a liquid. Based on the following data, what could be the density of the liquid?

Object	Float? (yes or no)	Mass	Volume
Ball X	No	25.0 g	24.0 cc
Ball Y	Yes	82.0 g	96.0 cc
Ball Z	No	14.2 g	14.8 cc

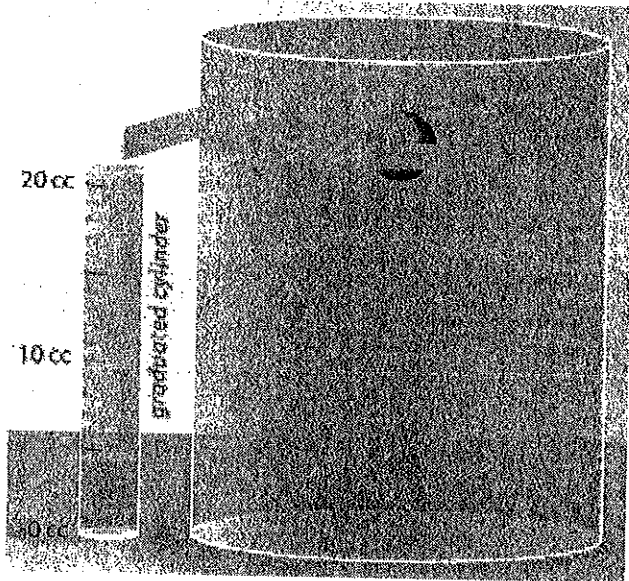
- A. 1.1 g/mL
 - B. 1.0 g/mL
 - C. 0.9 g/mL
 - D. 0.8 g/mL
5. "That's just the tip of the iceberg" is a popular expression you may have heard. It means that what you can see is only a small part of the overall problem. As the diagram shows, most of an iceberg is actually out of sight, below the water level. Based on this diagram, what is the most likely density of the iceberg? (Assume a density of 1.03 g/mL for seawater.)



- A. 0.88 g/cc
- B. 1.23 g/cc
- C. 0.23 g/cc
- D. 4.14 g/cc

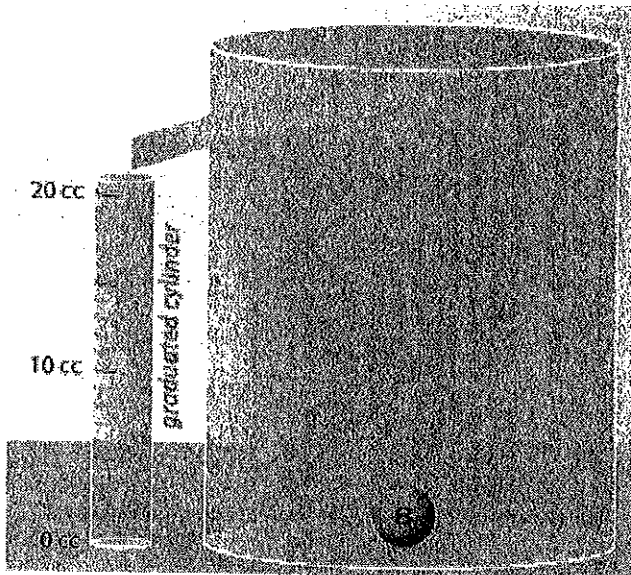
WATER DISPLACEMENT

1. An object floats in a beaker as shown. Assuming that the graduated cylinder was empty when the object was placed in the beaker and that the beaker was full to the level of the spout, what must be true?



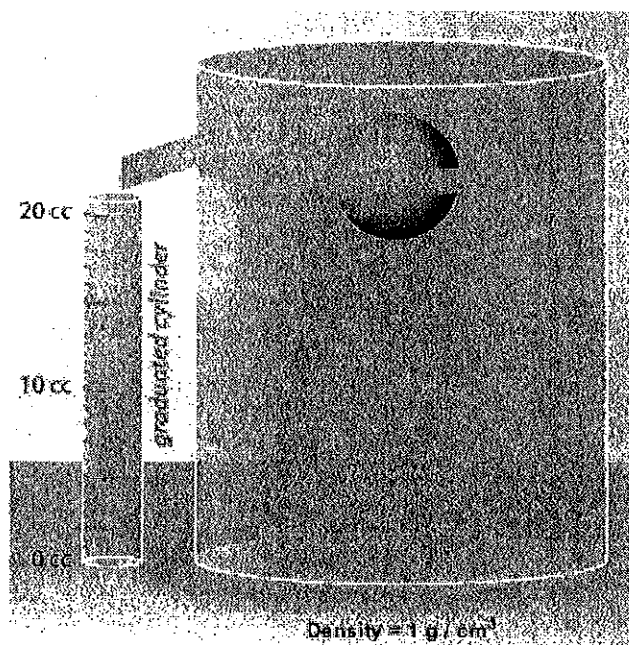
- A. The volume of the water in the graduated cylinder is equal to the volume of the object.
- B. The volume of the water in the graduated cylinder is greater than the volume of the object.
- C. The mass of the water in the graduated cylinder is equal to the

2. An object sits at the bottom of a beaker as shown. Assuming that the graduated cylinder was empty when the object was placed in the beaker and that the beaker was full to the level of the spout, what must be true?



- A. The volume of the water in the graduated cylinder is equal to the volume of the object.
- B. The volume of the water in the graduated cylinder is greater than the volume of the object.
- C. The mass of the water in the graduated cylinder is equal to the mass of the object.
- D. The mass of the water in the graduated cylinder is greater than the mass of the object.

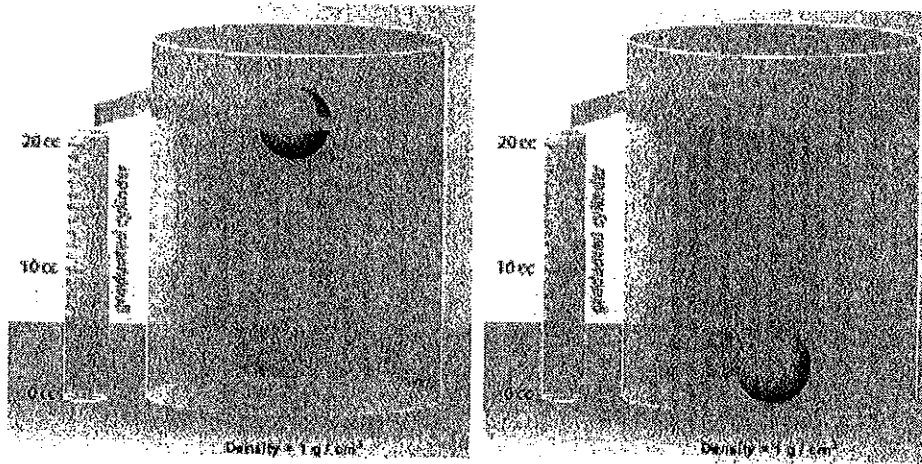
3. An object floats in a beaker as shown. When it was put into the beaker, it displaced an amount of water into the graduated cylinder at the left. Given that the liquid in the beaker is water (density = 1 g/cm^3), what is the mass of the object?



- A. 1 g
- B. 5 g
- C. 10 g
- D. 31.4 g

4. The two objects shown in the beakers below are exactly the same size

(same volume). Given liquid in the beakers is water (density = 1 g/cm^3), what is the density of the floating object?



- A. 0.5 g/cm^3
- B. 0.6 g/cm^3
- C. 1 g/cm^3
- D. 6 g/cm^3

5. Imagine a washtub about half full of water. A toy boat containing a rock floats in the water. Imagine that you lift the rock out of the toy boat and set it aside (NOT in the tub). Would the water level in the tub become higher or lower or would it remain the same as it was when the rock was in the boat?

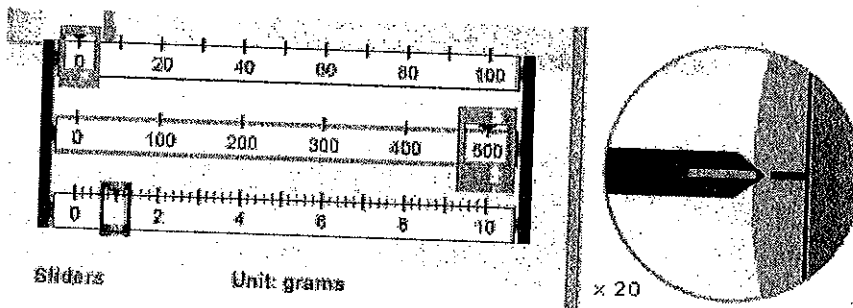
- A. It would become higher.
- B. It would become lower.
- C. It would remain the same.
- D. It could either become higher or remain the same depending on the density of the rock.

TRIPLE BEAM BALANCE

1. Which unit is used to measure mass in the metric system?

- A. Pound
- B. Slug
- C. Ounce
- D. Gram

2. Based on the image, what is the mass of the object being measured?



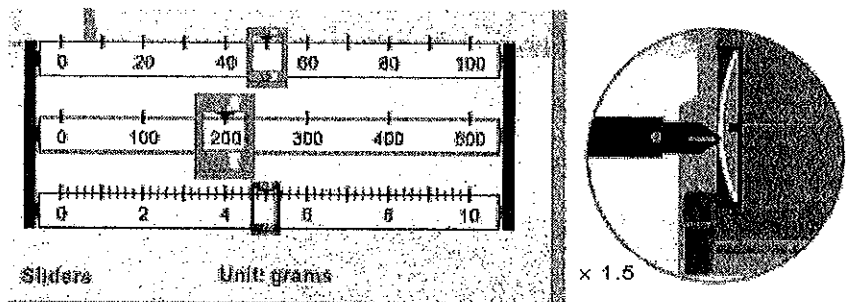
- A. 500.1 grams
- B. 501.0 grams
- C. 510 grams

3. You are determining the mass of an object using a triple beam balance.

When the pointer is lined up with the zero mark, the riders show values of 300 grams, 20 grams, and 8.0 grams. What is the mass of the object?

- A. 272.0 grams
- B. 328.0 grams
- C. 439.0 grams
- D. 48000 grams

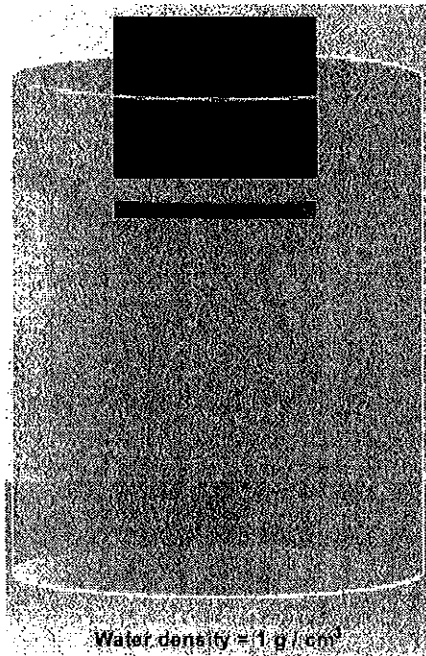
4. Based on the image, what can you infer about the mass of the object being measured?



- A. The mass is exactly 255.0 grams.
 - B. The mass is slightly less than 255.0 grams.
 - C. The mass is slightly more than 255.0 grams.
 - D. The mass is not exactly 255.0 grams, but it is impossible to tell whether the mass is greater than or less than 255.0 grams.
5. You place a mass of 250 grams on the measurement tray of a triple beam balance and then set the rider on the 500 gram beam to the 200 gram mark (the other riders are set to 0 grams). Which of the following statements is true?
- A. The pointer will be above the zero mark.
 - B. The pointer will be below the zero mark.
 - C. The pointer will be lined up with the zero mark.
 - D. The pointer will move up and down once per second.

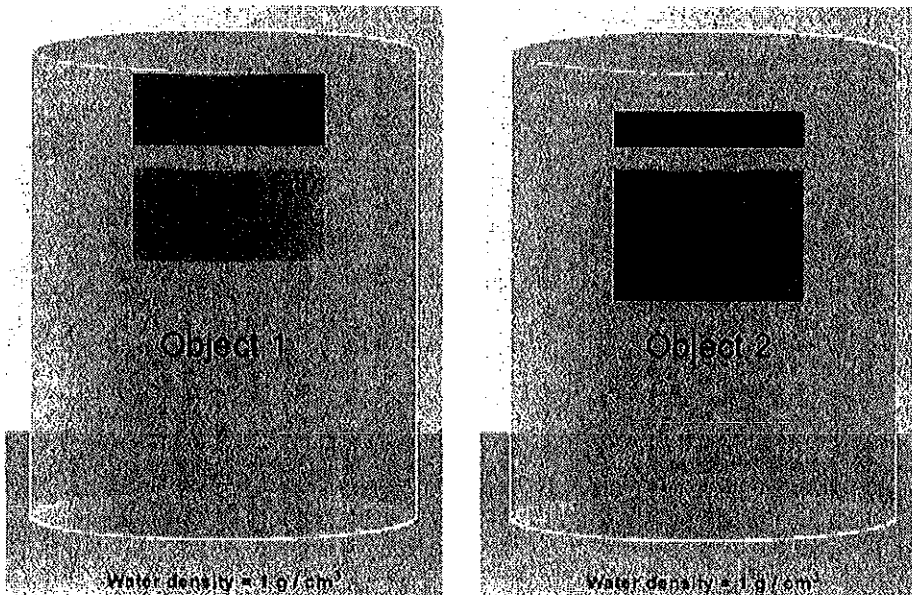
SLICE AND DICE

1. Which of the following statements about the density of the blue object is true?



- A. The blue object has a density less than 1 g/cm³.
 - B. The blue object has a density of exactly 1 g/cm³.
 - C. The blue object has a density greater than 1 g/cm³.
 - D. None of the conclusions above is certain.
2. A block of foam has a mass of 10 g, a volume of 60 cm³, and a length of 30 cm. What is the density of the foam? (If necessary, round your answer to three decimal places.)
- A. 0.167 g/cm³
 - B. 0.333 g/cm³
 - C. 0.5 g/cm³
 - D. 2 g/cm³
3. Two objects, labeled **A** and **B**, are the same size. **Object A** has a density of 1.21 g/cm³. **Object B** has a density of 1.37 g/cm³. Both are placed in a beaker of water. Which will float higher in the water?
- A. Object A
 - B. Object B
 - C. It is impossible to tell with the information given.
 - D. Neither. They will both sink.

4. A block with a volume of 12 cm^3 has a density of 3 g/cm^3 . The block is cut into two pieces. One piece has a volume of 8 cm^3 , and the other piece has a volume of 4 cm^3 . What are the densities of the two pieces?
- A. The larger piece has a density of 2 g/cm^3 and the smaller piece has a density of 1 g/cm^3 .
 - B. The smaller piece has a density of 2 g/cm^3 and the larger piece has a density of 1 g/cm^3 .
 - C. The two blocks both have densities of 1.5 g/cm^3 .
 - D. The two blocks both have densities of 3 g/cm^3 .
5. **Object 1** and **Object 2** float in beakers of water as shown below. Which of the following statements about the objects must be true?



- A. The density of **Object 1** is less than 1 g/cm^3 . The density of **Object 2** is greater than 1 g/cm^3 .
- B. The densities of both objects are greater than 1 g/cm^3 .
- C. The density of **Object 1** is greater than the density of **Object 2**.
- D. The density of **Object 2** is greater than the density of **Object 1**.