1. Base your answer(s) to the following question(s) on the *Earth Science Reference Tables*, the diagrams below, and your knowledge of Earth science. The diagrams represent four different mineral samples with different shapes and masses. Diagrams are not drawn to scale.
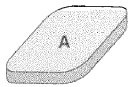
| Mass = 12.0 g | Mass = 16.0 g | Mass = 20.0 g | Mass = 24.0 g |
| Volume = 4.0 cm³ | Volume = 4.0 cm³ | Volume = 4.0 cm³ | Volume = 4.0 cm³ |

Which instrument was most likely used to find the volume of each sample?

A. graduated cylinder

B. balance

C. thermometer

D. psychrometer

2. A second sample of mineral *A* has a mass of 48 grams. What is the volume of this sample?

A. $24.0\,\text{cm}^3$ **B.** $16.0\,\text{cm}^3$

C. $12.0\,\text{cm}^3$ **D.** $4.0\,\text{cm}^3$

3. Which graph best represents the density of each sample?
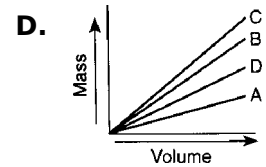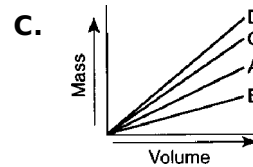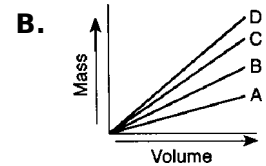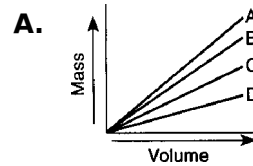
4. A student examined a patch of mud and recorded several statements about footprints in the mud. Which statement is most likely an inference?

   A. There are five footprints in the mud

   B. The depth of the deepest footprint is 3 centimeters

   C. The footprints were made by a dog

   D. The footprints are oriented in an east-west direction

5. Science investigators initially use classification systems to

   A. extend their powers of observation

   B. make more accurate inferences

   C. organize their observations in a meaningful way

   D. make direct comparisons with standard units of measurement

6. Which action can be performed most accurately using only the human senses?

   A. tearing a sheet of paper into squares whose sides measure 1 centimeter

   B. adding 10 grams of salt into a cup of water

   C. measuring the air pressure in the room

   D. counting 28 shells from a beach

7. Base your answer(s) to the following question(s) on the *Earth Science Reference Tables* and on your knowledge of Earth science.

   The diagram below represents a solid object with a density of 3 grams per cubic centimeter.
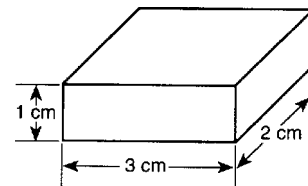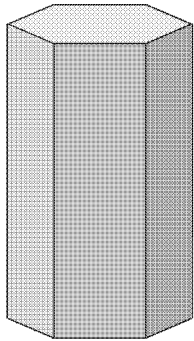

   1 cm
   2 cm
   3 cm
   (Not drawn to scale)

   What is the mass of this object?

   A. 0.5 g   B. 2 g

   C. 18 g   D. 36 g

8. A student measured the mass and volume of the mineral crystal below and recorded the data shown. The student used these data to calculate the density of the crystal.


Data

Mass = 80 g

Volume = 32 cm^3

Density = ?

What will be the student's percent error using the recorded data if the actual density of the crystal is 2.7 grams per cubic centimeter?

A. 0.4%   **B.** 5.0%

C. 7.4%   **D.** 8.0%

9. Base your answer(s) to the following question(s) on the 2001 edition of the Earth Science Reference Tables, the diagrams below, and your knowledge of Earth science. The diagrams represent two different solid, uniform materials cut into cubes A and B.
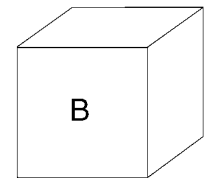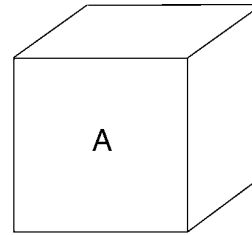
Mass of A = 320 g   Density of B = 3 g/cm^3

Volume of A = 64 cm^3 Volume of B = 27 cm^3

(Not drawn to scale)

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
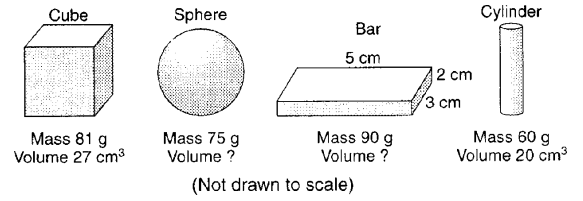
A. less   **B.** greater
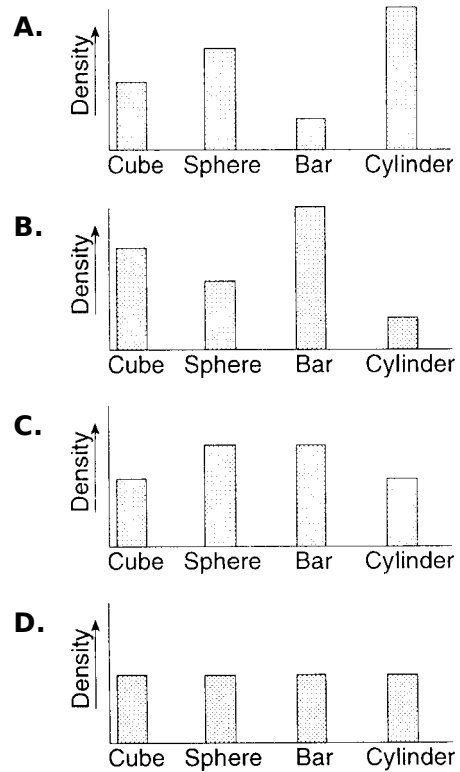
C. the same

10. What is the mass of cube B?

A. 3 g   **B.** 9 g   **C.** 27 g   **D.** 81 g

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

   A. 0.2 g/cm³   **B.** 5.0 g/cm³

   C. 12.8 g/cm³   **D.** 64.0 g/cm³

12. Base your answer(s) to the following question(s) on the Earth Science Reference Tables, the diagrams below, and your knowledge of Earth science. The diagrams represent four solid objects made of the same uniform material. The volumes of the sphere and the bar are not given.

Cube — Mass 81 g, Volume 27 cm³
Sphere — Mass 75 g, Volume ?
Bar — 5 cm, 2 cm, 3 cm — Mass 90 g, Volume ?
Cylinder — Mass 60 g, Volume 20 cm³
(Not drawn to scale)

Which graph best represents the relative densities of the objects?

A.

B.

C.

D.

13. The sphere was dropped into water in a graduated cylinder as shown.

Before   After
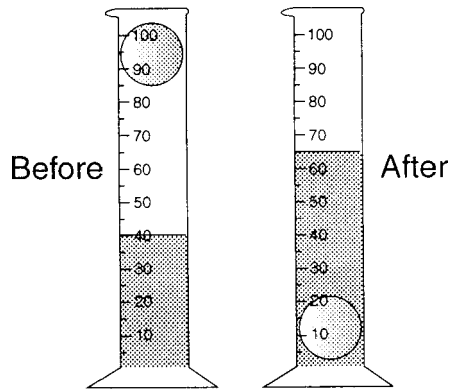
What is the volume of the sphere?

A. 15 mL   **B.** 25 mL

C. 40 mL   **D.** 65 mL

14. A student measures and records the temperature of water in a beaker for 8 minutes as shown.

	Start							Finish
Time	0 min	1 min	2 min	3 min	4 min	5 min	6 min	7 min	8 min
Temperature	90°C	83°C	78°C	73°C	68°C	64°C	60°C	57°C	54°C

What is the average rate of cooling for the water in the beaker during the 8-minute time interval?

A. 3.2 C°/min   **B.** 3.6 C°/min

C. 4.5 C°/min   **D.** 4.0 C°/min

15. The accompanying graph shows the relationship between mass and volume for three samples, *A*, *B*, and *C*, of a given material.
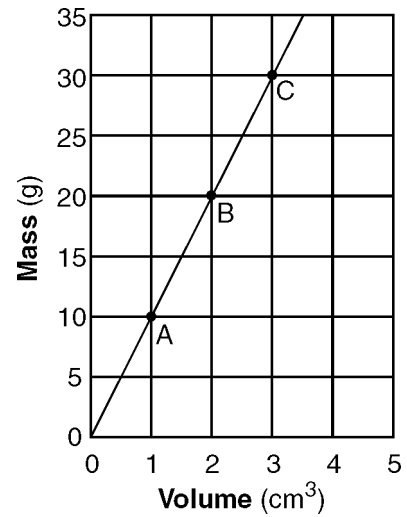
What is the density of this material?

A. $1.0 \, g/cm^3$ **B.** $5.0 \, g/cm^3$

C. $10.0 \, g/cm^3$ **D.** $20.0 \, g/cm^3$

16. Base your answer(s) to the following question(s) on the information about a laboratory procedure, diagram, and data table below.

Hot water at 90°C is poured into cup A. Cool water at 20°C is poured into cup B. Styrofoam covers are placed on the cups. An aluminum bar and a thermometer are placed through holes in each cover. Points X and Y are locations on the aluminum bar. The data table shows temperature readings taken every minute for 20 minutes.
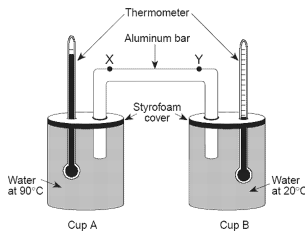
| Minute | Temperature of Water (°C) | |
	Cup A	Cup B
0	90	20
1	88	20
2	86	20
3	85	21
4	83	21
5	82	22
6	81	22
7	80	22
8	79	22
9	78	23
10	77	23
11	76	23
12	75	23
13	74	23
14	73	23
15	72	24
16	71	24
17	70	24
18	69	24
19	68	25
20	67	25

The rate of temperature change for the water in cup A for the first 10 minutes was approximately

A. 0.77 C°/min   **B.** 1.3 C°/min

C. 7.7 C°/min   **D.** 13.0 C°/min

Review   9/25/2017

1.
Answer: A

2.
Answer: B

3.
Answer: B

4.
Answer: C

5.
Answer: C

6.
Answer: D

7.
Answer: C

8.
Answer: C

9.
Answer: C

10.
Answer: D

11.
Answer: B

12.
Answer: D

13.
Answer: B

14.
Answer: C

15.
Answer: C

16.
Answer: B