Name: _____ Foundations

Date: _____ Period: _____ Earth Science

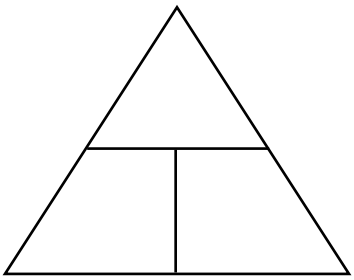
# Packet: Density

CLASS NOTES

- Density - _____

  _____

  - The ratio between mass and volume
  - Units: g/ml or $g/cm^3$
  - Formula: density = $\frac{\text{mass}}{\text{volume}}$



- Problem: Charlie finds a goldish rock and thinks he is a millionaire. How can he figure it out?
  - Mass = _____
  - Volume = _____

$$\text{density} = \frac{\text{mass}}{\text{volume}}$$

- So is Charlie a millionaire? _____
  - Pyrite = 5.0 g/ml
  - Gold = 19.3 g/ml

# Packet: Density

- All substances are most dense in the solid phase… EXCEPT _____
    - How can we tell that solid water [ice] is less dense that liquid water? _____
      _____

- Every substance can be identified using density
    - Example: Gold = 19.3 $g/cm^3$
- Density of a substance remains the same [constant] unless temperature and/or pressure change
    - If temperature _____, density will _____
    - If pressure _____, density will _____

# Packet: Density

## PART I QUESTIONS: MULTIPLE CHOICE

1. If you were to cut an aluminum bar in half the density of each half would be
    a. less than the original sample
    b. the same as the original sample
    c. greater than the original sample

2. In which phase [state] do most Earth materials have their greatest density?
    a. gaseous
    b. liquid
    c. solid

3. If a material is heated and expands, the density of the material will
    a. decrease
    b. increase
    c. remain the same

4. The volume of an irregular object could best be determined by
    a. placing it in a beaker of water
    b. calculating the circumference
    c. comparing it to a known standard for mass
    d. counting the number of flat surfaces

5. What is the density of a rock which has a mass of 35 grams and a volume of 7 $cm^3$?
    a. 42.0 $g/cm^3$
    b. 0.2 $g/cm^3$
    c. 28.0 $g/cm^3$
    d. 5.0 $g/cm^3$

6. What is the approximate volume of a cube where all sides are equal to 2.5 cm?
    a. 2.5 $cm^3$
    b. 6.3 $cm^3$
    c. 15.6 $cm^3$
    d. 39.1 $cm^3$

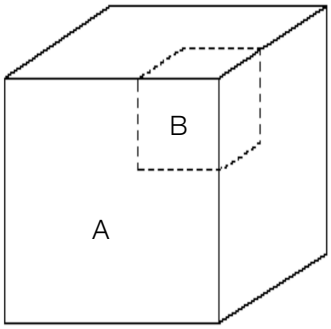
7. What is the density of a mineral which has a mass of 100 grams and a volume of 25 $cm^3$?
    a. 0.25 $g/cm^3$
    b. 2.5 $g/cm^3$
    c. 4.0 $g/cm^3$
    d. 2,500 $g/cm^3$

8. What is the density of a piece of lead that has a mass of 253.1 grams and a volume of 22.4 $cm^3$?
    a. 3.4 $g/cm^3$
    b. 9.5 $g/cm^3$
    c. 11.3 $g/cm^3$
    d. 15.8 $g/cm^3$

9. An empty 250-milliliter beaker has a mass of 60 grams. When 100 milliliters of oil is added to the beaker, the total mass is 140 grams. The density of the oil is approximately
    a. 1.7 g/ml
    b. 1.4 g/ml
    c. 0.8 g/ml
    d. 0.6 g/ml

10. What is the mass of a piece of platinum that has a density of of 21.4 g/cm$^3$ and a volume of 0.4 cm$^3$?
    a. 8.6 g
    b. 21.8 g
    c. 53.5 g
    d. 115.8 g

Base your answers to questions 11 through 13 on your knowledge of Earth science. Object A is a solid cube of uniform material having a mass of 65 grams and a volume of 25 cm$^3$. Cube B is a part of cube A.




11. The density of cube A is
    a. 2.6 g/cm$^3$
    b. 0.38 g/cm$^3$
    c. 3.8 g/cm$^3$
    d. 0.26 g/cm$^3$

12. The density of cube B is
    a. 2.6 g/cm$^3$
    b. 0.38 g/cm$^3$
    c. 3.8 g/cm$^3$
    d. 0.26 g/cm$^3$

13. The mass of cube B is measured in order to calculate its density. The cube has water on it while its mass is being measured. How would the calculated value for density compare with actual density?
    a. The calculated density value would be greater than the actual density.
    b. The calculated density value would be the same as the actual density.
    c. The calculated density value would be less than the actual density.