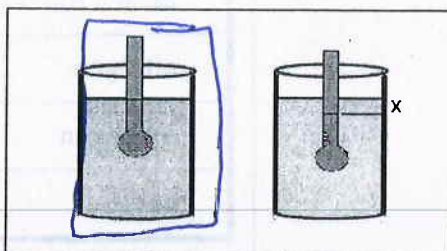


Circle The Correct Term

- The density of a kilogram of iron is less than/ more than/ Same as the density of 1 gram of iron. (+1)
- Archimede's principle/ Pascal's Principle explains the relationship between density and buoyancy. (+1)
- In the picture bellow circle the liquid that is more dense



- A person standing on his or her toes and the same person standing flat footed exert the same amount/ different amounts of pressure on the ground. (+1)
- A fish with a mass of 5 kg and swimming at a depth of 5m experiences the same/more/less buoyant force as a fish with the same mass swimming at a depth of 10m. (+1)

Fill in the blank

- Density is a physical property. (+1)
- Density depends on Mass & Volume. (+2)
- Name a unit of force: Newton. (+1)
- A cork is able to float in water because It is less dense than water. (+2)
- Which element in figure 1 occupies the most volume?

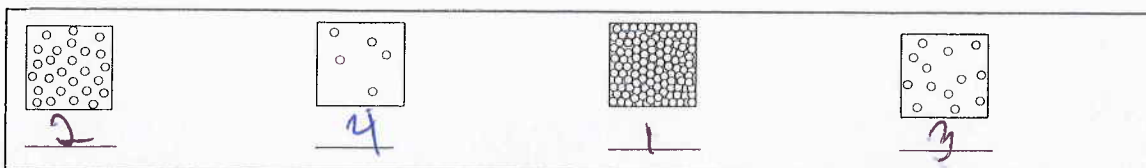
Aluminum

Densities of Some Common Elements

Element	Density (g/cm <sup>3</sup> )
aluminum	2.70
iron	7.87
lead	11.30
silver	10.50

Figure 1

- Number the following images in order from least dense (1) to most dense (4).



- 12) According to the table, Hydrogen is the name of the gas that would be the best choice to fill a balloon that would float in air.

Densities of Some Common Gases

Gas	Density (g/cm <sup>3</sup> )
air	0.00119
carbon dioxide	0.00198
nitrogen	0.00125
hydrogen	0.00008
oxygen	0.00133

- 13) A balloon filled with air floats on the surface of a pond. What would happen if the balloon was filled with sand and then placed on the pond's surface? The balloon would Sink.
- 14) A box sinks when placed in water. In order to make the box float you would change its density.
- 15) There are 3 identical 1-L bottles. One is filled with water, another is filled with air and the third bottles is filled with soil. The Volume is the same about all three bottles?  
(mass, weight, density, volume)
- The density of a piece of ice with a volume of 3 cm<sup>3</sup> is same as the density of a piece of ice with a volume of 6 cm<sup>3</sup>.  
(twice, half, the same as)

Define:

- 16) Mass (include what mass is measured in?)

The amount of matter an object is made up of measured in grams.

- 17) The Density of Water at room temperature:

1 g/cm<sup>3</sup>

- 18) Pressure:

The measurement of force per unit area.

- 19) Density (include formula)

mass per unit volume measured in g/cm<sup>3</sup>

$$d = \frac{m}{V}$$

20) Buoyant force: Upward force of a fluid on an object.

21) Atmospheric Pressure: (include units)  
measured in pascals → Force of air per unit area

22) Fluid A description of gasses + liquids

23) Archimede's Principle: (extra credit)  
The buoyant force is equal to the weight of the fluid the object displaces

Complete the following on a separate sheet of paper:

**Problem (SHOW ALL WORK FOR CREDIT) NO work NO credit!**

(Answer on a separate sheet of paper and **BOX** your answer)

- A) A 100-cm<sup>3</sup> beaker has a mass of 23 g when it is empty and 98 g when it is full of oil. What is the density of the oil?  
 $V = 100 \text{ cm}^3$   
 $M = 98 - 23 = 75 \text{ g}$   
 $F \& D \text{ Equ} = D = \frac{M}{V}$   
 work:  $D = \frac{75 \text{ g}}{100 \text{ cm}^3} = 0.75 \text{ g/cm}^3$
- B) The density of copper is 8.96 g/cm<sup>3</sup>. What is the volume of a 10-g sample of copper?  
 $D = 8.96 \text{ g/cm}^3$   
 $M = 10 \text{ g}$   
 $F \text{ ind: } V = \frac{M}{D} = \frac{10}{8.96} = 1.12 \text{ cm}^3$
- C) The density of air is 0.00119 g/cm<sup>3</sup>. Calculate the mass of air in a room that measures 5 cm × 4 cm × 3 cm  
 $D = 0.00119 \text{ g/cm}^3$   
 $V = 5 \times 4 \times 3 = 60 \text{ cm}^3$   
 $F \text{ ind: } M = D \times V = 60 \times 0.00119 = 0.0714 \text{ g}$
- D) The mass of an empty 50-mL beaker is 26.3 g. The mass of the beaker and a sample of sodium chloride is 27.5 g. What is the mass of the sodium chloride?  
 $M = 27.5 \text{ g} - 26.3 \text{ g} = 1.2 \text{ g}$
- E) Andrea has two boxes. Box 1 measures 5 cm × 10 cm × 3 cm and has a density of 5 g/cm<sup>3</sup>. Box 2 measures 6 cm × 10 cm × 2 cm and has a density of 6 g/cm<sup>3</sup>. Which box has the greater mass?

Box 1  
 $V = 150 \text{ cm}^3$   
 $d = 5 \text{ g/cm}^3$   
 $m = V \times d = 150 \times 5 = 750 \text{ g}$

Box 2  
 $V = 120 \text{ cm}^3$   
 $d = 6 \text{ g/cm}^3$   
 $m = V \times d = 120 \times 6 = 720 \text{ g}$

**Box 1 has the greater mass**

ON your Own!

Short Answer (answer on a separate sheet of paper)

24. EXTRA CREDIT: There is a legend that tells how Archimedes discovered his principle when he stepped into a full tub of water. What is the relationship between stepping into a full tub of water and Archimedes' principle?
25. Tadi has a 500-mL plastic bottle. He fills it completely with water, so there are no visible air bubbles. Tadi predicts that the bottle filled with water will not sink to the bottom when he places it in a bathtub filled with water because the water inside the bottle has the same density as the water in the tub. Do you agree with Tadi? Explain. (5 sentences)
26. An observer noticed a large oil tanker parked at an oil terminal for two days. On the second day, more of the hull of the ship was visible. Was the tanker picking up oil from the terminal or delivering oil to the terminal? Explain your answer.   
*DAY 1* *DAY 2* *oil tanker hull*
27. Diana has two boxes that are the same size. One box is filled with ping pong balls and the other is filled with an equal number of golf balls. Compare the densities of the two boxes.
28. What is the difference in the motion of an object when balanced forces act on the object and when unbalanced forces act on the object?
29. Many watches used by divers advertise that they are "water resistant to 200 meters." Why do you think these watches are not water resistant at any depth?
30. A diver wearing all her equipment has a mass of 70 kg. The mass of the water she displaces is 78 kg. Will the diver sink or float?