Name: _____   Archimedes' Principle Worksheet   Date: _____
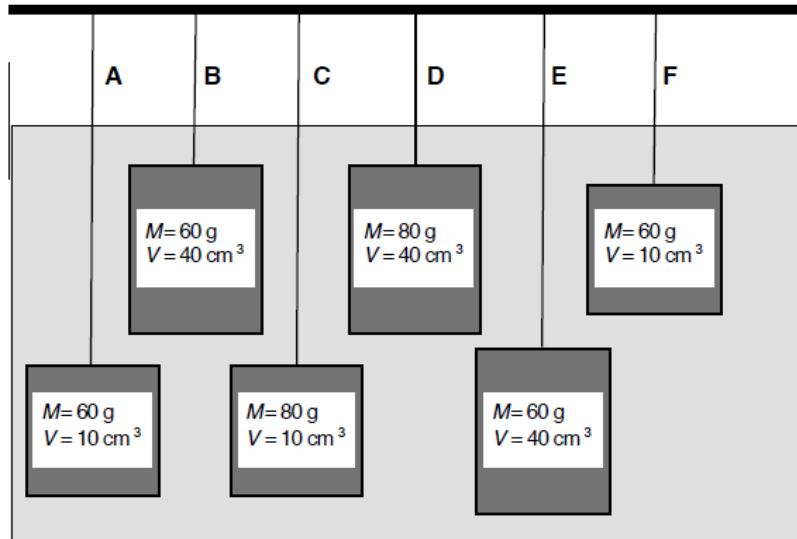
1. Noah and Maura are both learning about Archimedes' principle in Ms. Sanniti's science class. After observing a couple of ice cubes float in a glass of water, Noah asks Maura if the water level in the glass will change when the ice cubes have melted. Explain why the volume of water remains the same using Archimedes' principle.

_____
_____
_____

2. Six objects are placed in a tub of water as shown below.

	A	B	C	D	E	F

A: $M = 60$ g, $V = 40$ cm^3
C: $M = 80$ g, $V = 40$ cm^3
F: $M = 60$ g, $V = 10$ cm^3
(lower row) $M = 60$ g, $V = 10$ cm^3; $M = 80$ g, $V = 10$ cm^3; $M = 60$ g, $V = 40$ cm^3

A. Which object will displace the most water and why?

_____
_____
_____

B. Calculate the weight (Fg) of each of the objects.

C. Calculate the weight of the water displaced for each of the objects (Fb). Remember the density of water is 1g/ml.

D. Which objects would float to the surface, if allowed, and why?

_____
_____
_____

3. Consider a balloon filled with 1L or 1000 cm^3 of water in a container of water. Note: 1mL = 1cm^3
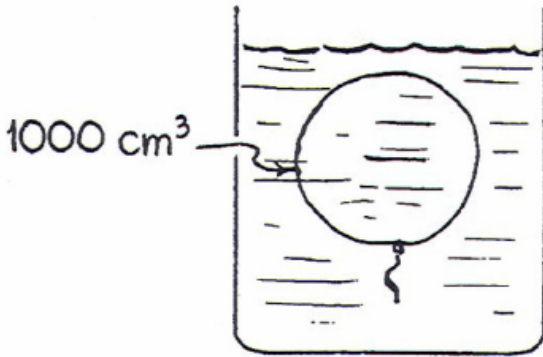   (You will not need to know this for the future)

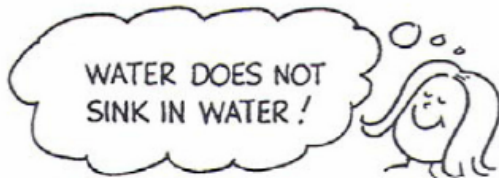A) What is the mass of 1L of water?

$1000\ cm^3$

B) What is the weight of 1L of water?

C) What is the weight of the water displaced in the container?

Figure 1

D) What is the buoyant force acting on the balloon?

WATER DOES NOT SINK IN WATER !

E) Draw force arrows for Fg and Fb. What is the resultant force acting on the balloon?

4. Assume the balloon is replaced by a 0.5 Kg piece of wood that has exactly the same volume (1000cm^3 or 1000mL), as shown in Figure 2.
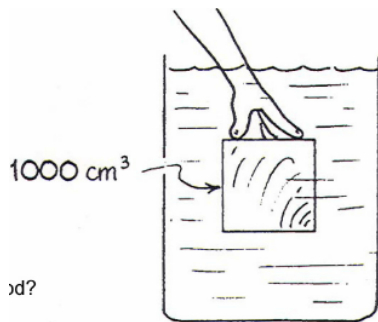
A) What is the volume of water displaced by the piece of wood?

$1000\ cm^3$

B) What is the mass of water displaced by the piece of wood?

od?

C) What is the weight of water displaced by the piece of wood?

Figure 2

D) What is weight of the piece of wood?

E) Will the wood float or sink? Explain your answer.