## Archimedes' Principle

## calculating THe Buoyant force worksHeet \#1

1. A block of aluminum measures $4.0 \mathrm{~cm} \times 5.0 \mathrm{~cm} \times 2.0 \mathrm{~cm}$ is completely submerged in a tank of water.
a. What volume of water does it displace?
b. What is the mass of the displaced water? (Remember the density of water is $1 \mathrm{~g} / \mathrm{mL}$ )
c. What is the weight of the displaced water?
d. How large of a buoyant force acts on the block?
e. The mass of the aluminum block is 108 g . What is the weight of the aluminum block?
f. If you release the metal block, will it sink, or will it float to the surface? Explain your reasoning.
2. A swimmer is floating on her back and soaking up the rays. If she has a mass of 45 kg , and her body displaces 5000 mL of water, what is the buoyant force acting on her?
3. An small object has a mass of 36 g and a volume of $8 \mathrm{~cm}^{3}$. Will this object sink or float. Justify your answer with calculations.
4. Gareth dropped his can of Dr. Pepper into his pool. Luckily, the can floated and he was able to grab it without jumping in and ruining his hair. The can of Dr. Pepper has a mass of 0.416 Kg , and the buoyant force acting on the can is 45 N . What is the volume of water it displaces?
