# Archimedes's Principle Activity #2

Objective: Determine the relationship between a submerged object's weight and the buoyant force acting on that object.

Procedure:

1. Tie a string underneath the triple beam balance where the pan is connected to the top.
2. Tie the other end of the string to a film canister. The string needs to be long enough to almost reach the floor. It should not be touching the ground.
3. Fill the film canister with pennies and let it hang freely by the string. Record its mass from the triple beam balance.
4. Place a beaker of saltwater on the floor and let the canister hang into the beaker. It should not be touching the bottom or sides, nor should any of it be sticking out above the water. It must be completely submerged.
5. Measure the mass of the canister while submerged in saltwater.
6. Repeat steps 3 through 5 seven more times by removing two pennies from the canister each time. (Note: if you get to a point where the canister is floating out of the saltwater, add enough pennies to make it sink again. The mass is what is important, not the number of pennies.

Data:

| Mass in Air (kg) | Weight in Air (N) | Mass in Saltwater (kg) | Weight in Saltwater (N) |
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Calculations:

Calculate the buoyant force for each trial.

B.F. = Weight in air – Weight in water

Questions:

1. What happened to the buoyant force acting on the object as the mass of the canister changed? Explain the reason for your answer.

2. Was the buoyant force for this activity greater or less than the buoyant force for Activity #1? Explain your answer.

3. Compare the weight of 1.0 $m^3$ of salt water to 1.0 $m^3$ of fresh water.