MICROGRAVITY AND THE AEL (D4515 Post Visit Activities)

Objectives

The students will be able to:

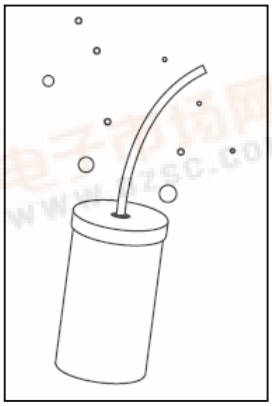
1) **Be familiar with the character of scientific knowledge and how it is achieved.** **GPS S5CS7**
2) **Use appropriate tools to collect and analyze data and solve problems.** **GPS S5CS2**
3) **use ideas of system, model, change, and scale in exploring scientific and technological matters.** **GPS S5CS4**

Post Visit Activity

FLOAT OR SINK: Neutral Buoyancy

Astronauts simulate microgravity for space suit training in a deep swimming pool (the Sonny Carter Training Facility/Neutral Buoyancy Laboratory: http://spaceflight.nasa.gov/shuttle/support/training/nbl/). Their space suits are specially weighted to produce neutral buoyancy.

Use the two activities below to investigate neutral buoyancy.



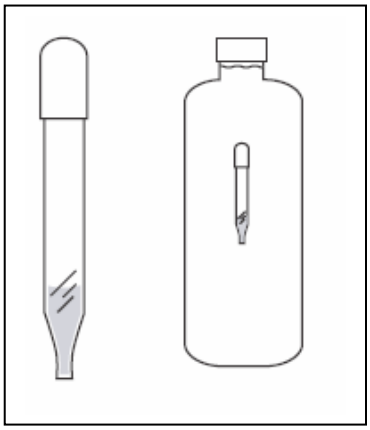
Dive, Dive, Dive!

Materials:
Plastic film canister (submarine)
Aquarium tubing
Pennies
Hot glue (adult supervision required)
Scissors
Large water container

1. With adult supervision, use the scissors to punch two holes in the base of the canister and a hole in the lid.
2. Have an adult hot glue one end of the aquarium tube into the hole in the lid.
3. Add several pennies to the canister and check to see if the canister floats in the water. If not, take a penny out and test the canister again.
4. Place the lid on the canister and put your submarine into the water.
5. Suck the air out of the tube and observe.
What happened? Why?

6. Blow air into the canister and observe. What happened? Why?
7. Try to fill the canister with just enough air so that it can “hover” halfway from the bottom to the surface. Then your canister will be neutrally buoyant, or seemingly weightless.

Diver, Stand Your Mark



Materials:
2-liter plastic soda bottle
water
eyedropper (diver)

1. Fill the bottle with water.
2. Fill the eyedropper about 2/3 full of water.
3. Insert the partially filled eyedropper into the bottle and cap the bottle.
4. Squeeze the bottle's sides and observe the diver.

What happened? Why?

5. Let go of the bottle and observe.

What happened? Why?

6. Try to make the diver "hover"midway in the bottle so that it will be neutrally buoyant..

*Note: The diver may not dive if filled with too much water. Adjust the amount of water in the diver for success.

1) After completing the visit, the students may engage in a discussion of the following:
   - Discoveries about technologies, ideas and career options that may benefit the individual student.
   - How teamwork enhanced the experience, hampered progress and how it related to the real world of work.
   - Information learned specific to microgravity and space flight as well as how microgravity research can benefit everyday life.

Resources:

http://scifiles.larc.nasa.gov/docs/guides/guide3c_01.pdf
http://www..nasa.gov
http://www.grc.nasa.gov
http://www.zeta.grc.nasa.bov
http://spacecrystal.nasa.gov
http://spaceresearch.nasa.gov
http://microgravity.msfc.nasa.gov