HU-GK 12 Program 10-25-07

Activity:

Title: "The Blob"

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DCPS Standards:

(ChaLC Goal) **:**

8.4.2., 8.4.4.
Investigate density and buoyancy through lab activity

Goals:

1) The students will understand the concepts of density and the effect it was on objects at different weights

2) The students will understand some basic concepts of buoyancy

Objectives:

1) Given information on density the students will demonstrate that more dense objects will separated to the bottom of a less dense object.

2) Given information on density, the students will be able to discuss concepts in buoyancy.

Background:

Density is a measure of the amount of matter packed into a unit volume. The density of an object is equal to its mass divided by its volume, which is measured in grams per cubic centimeter. Buoyant force is the upward force pushing on an object in a fluid. If an object is floating in any liquid, the buoyant force is balancing the weight. Density and buoyancy work interchangeably, because whether or not a boat floats depends on both the density of the boat and the density of the water. A good story to tell the kids is about the Greek scientist Archimedes. Archimedes was the first scientist to discover how to measure volume of an object that had

irregular shape. He had a task of measuring the density of King Hiero's crown, which had an irregular shape. King Hiero was under the impression that the goldsmith that was hired to make his crown did not use all the gold that was given to him to make the crown. He could not be sure because there was no way to measure the volume of an object with irregular shape. If you can measure volume you can measure density. Therefore, the King put Archimedes to the task of finding a way to measure the crown. Archimedes could not melt down the crown to measure the density. He was struggling to figure out a way to accomplish his task until he was taking a bath and realized that the water level would rise as soon as he gets into the bath. Archimedes applied this notion to the King's crown and found that when you put the crown in water, it displaces the water in an amount. With this information Archimedes knew that the density of the crown would be less if a cheaper metal was used. Archimedes found this to be true and the goldsmith was put to death. This is an excellent example of a story that the teacher could share with the kids that gives them knowledge of science history as well as a real life example of this knowledge put to work.

Prerequisite Knowledge:

N/A

Materials:

1) Corn starch
2) Glycerin
3) Water
4) Vegetable oil
5) 4 beakers

6) 3 graduated cylinders
7) Food coloring

Set up:

Before the students start the lab, the teacher should prepare by putting all liquids being used into individual graduated cylinders or beakers. You should have 3 different beakers and add 500 mL of each different liquid to each. Add a different color of food coloring to each liquid.

Procedure:

1) Hypothesize what will happen when each liquid is added together.
2) Add 150 mL of each liquid into 3 different graduated cylinders.
3) Add each liquid slowly to one 500 mL beaker
4) Record what happened based on your hypothesis.
5) With the remainder of each separated liquid drop a penny into each liquid and record the results. Give an explanation why the penny fell to the bottom or stayed afloat.