

Lesson 15:

Topic/skill: Submarines in Warfare

Standards:

- *MST Standard 4—Science*-Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.
- *MST Standard 5- Technology*-Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.
- Language Arts Standards 1*- Students will read, write, listen, and speak for information and understanding.

Objectives:

1. Students will be able to use appropriate vocabulary to make conclusions about density, air/water pressure, and displacement, through the scientific exploration.

Materials:

- 5 two-liter soda bottles without labels
- 5 pipettes
- water
- paper

Advanced Preparations:

- Gather the above materials.
- Research density, Cartesian divers, and water pressure.

<http://science.howstuffworks.com/submarine.htm>

<http://home.houston.rr.com/molerat/cart.htm>

Activating Prior Knowledge:

- Remind the students of lessons in previous units dealing with density, having the students define the term and discuss what types of objects float and which sink.

Procedure:

1. Divide the students into five groups.
2. Provide them with a label-less, half-filled soda bottle and a half-filled pipette, and allow them to explore the materials, squeeze the bottle, etc.
3. Have the students list their actions, discoveries, and hypotheses as for what may have caused the observed activity on a sheet of paper.
4. Discuss the discoveries as a class.
5. Review the terms learned through the lesson: Cartesian divers, water pressure, and displacement.
6. Have the students write a paragraph summary of what they learned in this lesson.

Modifications:

The teacher will fill the pipette with colored water so that the student with CP can better observe what happens to it as the bottle is manipulated. The student will be provided with thick paper and pencil grip to make brief notes about his/her observations. The student will also be able to verbalize these discussions. The teacher will provide him/her with notes summarizing class discussion and findings after class.

Assessment:

The teacher will informally assess the students as they explore the given materials and make predictions. The teacher will also read the students' paragraphs discussing their discoveries with appropriate vocabulary.