

“Under Pressure” Lab Activity

Differentiated 598

Unit essential questions:

- How does pressure work under water?
- What types of pressures are exerted in the deepest depths of the sea?
- How must marine organisms adapt in order to live “under pressure?”

Standards:

New York State Science Standards

Standard 6: Magnitude and Scale

Key Idea 3:

The grouping of magnitudes of size, time, frequency, and pressures or other units of measurement into a series of relative order provides a useful way to deal with the immense range and the changes in scale that affect behavior and design of systems.

- observe that things in nature and things that people make have very different sizes, weights, and ages
- recognize that almost anything has limits on how big or small it can be

Common Core English Language Arts Standards- Science and Technical Subjects- Grade 6-8

Integration of knowledge and ideas

CCSS.ELA-Literacy.RST.6-8.9

Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

Subtopic: Motion and forces

Lesson question: What is pressure?

Lesson objective:

- Students will explain why there is greater water pressure at greater depths.
- Students will demonstrate what water pressure is.

Assessment:

- Student will demonstrate the concept of pressure by conducting an experiment.
- A worksheet with questions will be collected from each student.

Opening: A class of 14 students will be split into two groups according to what activity they chose to complete.

Procedure:

1. Teacher will begin by giving students a paper with four questions on it. They are to answer the questions using their iPad to find information. The questions are

the following: What does it mean to be “under pressure?” What does it feel like? As the depth of an ocean increases, why might pressure increase? Why would that be important for deep sea researchers?

2. When students finish they are to share their answers with each other and with the teacher. The students will then be split into groups of 3 and 4.
3. Teacher will explain the activity to both groups of students. After explaining the steps thoroughly, each group will be asked to follow the directions on the paper that is given to them. (See procedure page).
4. Students are to work as a team and follow the procedures carefully. All students will be taking their own notes.
5. At the end teacher will ask students about their findings.
6. Teacher will explain that the lower hole will release water with more force because of the pressure from the overlying water. The upper hole has less water above it, and therefore less pressure.
7. Teacher will make sure the students understand the pressure is from the force of gravity on the water. When the lid is put on the bottle, water only flows out the lower hole because pressure is less at the upper hole, allowing air to enter there.

Tiered by: Student choice

2. different tiers

Activity 1: Under Pressure water activity- Students who were interested in learning about water pressure chose this activity. Students are in grades 4&5 learning at a 6th grade level.

Activity 2: Ocean in a Bottle Activity

Closure: Teacher will ask students how we can relate the experiment to a body of water. (The deeper underwater you go, the greater the *pressure* is). worked with the Students will be encouraged to complete the “further investigation” question with their group. Teacher will ask any questions students have.

Materials:

- Two-liter clear soda bottle

- Water (to fill the bottle)
- Masking tape or duct tape (cut into two-three inch pieces)
- 2 empty Tubs
- Scissors
- Ruler