

Student Designed Modification of Sea Perch

Overview

This lesson plan is a follow-up activity to completion of Sea Perch. Students are encouraged to design a modification to their Sea Perch while incorporating a business angle of writing a persuasive letter to local businesses.

Grades: 7th-12th

Time: 1-2 periods for modification, 2 periods for letter

Objective

After completing the building of a submersible ROV, students will use their experience and ingenuity to create a beneficial modification through the standard design process. The project will culminate in a persuasive business letter that will motivate local merchants, corporations and others to support this design project to its completion as a prototype.

- Students will brainstorm ideas for various modifications.
- Students will choose their “dream” modification (modification of choice) with stated objective in mind.
- Student will design and draw to scale a prototype of Sea Perch plus its modification to present to other student. Students provide feedback to modification plan using a rubric.
- Students will web search for availability of appropriate parts and equipment needed, including cost.
- Incorporate ideas, design, costs, materials and equipment needed etc. into a formal business letter to look for funding for project.
- Teaches students to think like the various marine engineers and scientists who make their careers through the use of ROVs like the Sea Perch.

Skills Attained

- Develop investigative questions and design
- Familiarity with data collection devices
- Prepare to-scale technical drawings
- Classroom presentation
- How to critique each others’ design
- Use of internet for needed information, save web addresses, collect information and save.
- Prepare a formal business letter

National Science Education Standards

Content Standard A - Science as an Inquiry

- Ability necessary to do scientific inquiry
- Crosses disciplines and grade levels

Content Standard E – Science and Technology

- Abilities of technological design
- Understandings about science and technology

Submitted by Sue Morash, Rex Roettger and Jim Forsyth

Content Standard F – Science and Personal Perspectives

- Science and technology in local, national, and global challenges

Content Standard G – History and Nature of Science

- Science as a human endeavor
- Nature of scientific knowledge

Motivation

Ownership: their modification needs to be solid “to peers and to prospective financial investors”

Possible Interdisciplinary Links

- Language Arts – persuasive business letter
- Math – scale drawing
- Art – poster/background for scale drawing to give audience a feel for modification use
- Science
 - o Probes
 - o Robotic Arm
 - o Light Source
 - o Plankton net
 - o Temperature
 - o Pressure
 - o Conductivity

Lesson

Scenario

You work for a company that constructs ROV's. Your boss just told you that you have to design a vehicle for the next field testing season. The company does not have a very large budget, so you cannot build a new ROV for this project. You need to alter the design of your existing Sea Perch ROV that you used last year so it can be used in your upcoming field season.

Materials:

Sea Perch

Paper

Various PVC parts

Collection of materials from the classroom and that the students have brought in from home

Procedure

- 1 Students will recognize an existing problem/condition underwater that they would like to investigate.
- 2 Students will identify what equipment would be needed to add to Sea Perch in order to collect data or analyze the identified problem/condition.
- 3 Students will plan out – to scale – what the modification design will look like,
- 4 Students will show/demonstrate their designs to other students.
- 5 Students will critique each others design.
- 6 Students will search the Internet for needed information, save web addresses, collect information and save.
- 7 Students will organize information on modification and put it into the form of a formal business letter.

Assessment

Rubric:

- Rough draft of drawing completed on time
- Scale drawing accurate
- Modification clearly explained
- Presentation
- Rough draft letter (paragraphs clearly explained)
- Final draft letter