

◆ Assembling the SeaPerch Structural System ◆

Grade Level: 7th-12th

Length of Lesson: 1-2 days

Goals:

- Students will identify various types of simple and complex structures in the world
- Students will be introduced to the SeaPerch ROV structural system
- Students will begin construction of their SeaPerch ROV structural frame

National Science Standards:

- ETS1.A: Defining and Delimiting an Engineering Problem
- ETS1.B: Developing Possible Solutions

Materials:

- PowerPoint 2: SeaPerch Structural System
- SeaPerch kits and equipment (one for every 2-5 students)
- SeaPerch Construction Manual

Lesson: LAUNCH

Present the SeaPerch Structural System PowerPoint slides 1-4. On slide 4, ask the students “What happened?” in each of the pictures. Discuss various structures around the world, both simple and complex, such as bridges, towers, buildings, etc. Discuss how structures fail, and what can be done to strengthen them.

Lesson: INVESTIGATE

Hand out the SeaPerch Construction Manual. Focus the students on the first section, “Assembly of Subsystem One: The Vehicle Frame.” Show the SeaPerch Structural System PowerPoint slides 5-8. These slides show how students are to measure and cut their PVC pipe pieces for their ROV. If a group has a modified ROV structure, they will need to figure out the length of each pipe piece. The pipe fits into the $\frac{3}{4}$ ” connector.

Review any and all safety precautions before continuing to Lesson: PRACTICE. The teacher/coach should demonstrate the safe use of all tools.

SeaPerch Build Lesson 2: Assembling the SeaPerch Structural System

Lesson: PRACTICE

Students will follow the construction manual to safely measure, mark, and cut their PVC pipe for the ROV structural frame. The ends of the pipes may need to be slightly sanded in order to remove burrs or rough places. After the students have finished, the teacher should check each group to ensure that their PVC pipes have been cut correctly.

Explain to the students that for today, they have all been structural engineers. However, for the rest of the build, they will split up their expertise so that each group member has a specific job. The members will be as follows:

Structural Engineer
Mechanical Engineer
Electrical Engineer
Project Manager

Lesson: COMPLETE

During the next class period, show the students the rest of the **SeaPerch Structural System PowerPoint** (PowerPoint 2) slides. Assist the structural engineer students in completing the SeaPerch ROV structure, while the other group members work on their respective systems.

