

# SeaPerch Build Lesson: Structural System Assembly

*Legacy SeaPerch Resource*

[www.seaperch.org](http://www.seaperch.org)

**Grade Level: 7<sup>th</sup> – 12<sup>th</sup> grade**

**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

## **Common Core Academic Standards:**

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

## **Materials:**

- SeaPerch Structural System Power Point
- 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 section corresponding with the vehicle frame assembly.
- Show the SeaPerch Structural System PowerPoint slides 5-8. These slides show how students are to measure and cut the PVC pipe pieces needed for their ROV design.
- 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.

## 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

