SeaPerch Build Lesson: Assembling the Mechanical System

Legacy SeaPerch Resource *www.seaperch.org*

Grade Level: 7th – 12th grade

Length of Lesson: 1 day

Goals:

- Students will take apart and study the parts of a motor
- Students will create the mechanical system for their SeaPerch ROV

Common Core Academic Standards:

- PS3.A: Definitions of Energy
- PS3.B: Conservation of Energy and Energy Transfer

Materials:

- Old DC motor (does not need to be in working condition)
- SeaPerch kits (one for each 2-5 students)
- SeaPerch Construction Manual
- Ohmmeter / Digital Multimeter

Lesson: LAUNCH

Let students carefully take apart one or more old DC motors. Point out the different components of the motor and have them identify each part (see below). Discuss how motors work and the energy transfer that occurs.

a. Armature

b. Permanent magnet

c. Brushes

d. Casing

Show students this short video of how an electric motor works. This will show students how electric energy is turned into motion (spinning) using an electromagnet.

How does an electric motor work? (DC Motor):
https://www.youtube.com/watch?v=CWulQ1ZSE3c

Lesson: INVESTIGATE

Have the students take out their SeaPerch Construction Manuals. Focus the students' attention on the "Assembly of Mechanical System" section of the manual.

Show the students the motors they will be using for their SeaPerch ROVs. Explain the process for the mechanical system, including waterproofing the motor with wax and creating the CAT5 cable. Before students begin work on their mechanical systems, the teacher should demonstrate the proper use of a soldering iron.

Lesson: PRACTICE

- While the other students are working on the other SeaPerch systems, help the mechanical engineers to create their mechanical system for their ROV.

- Students should inspect their CAT5 cable and conduct a continuity test with an Ohmmeter / digital multimeter, as well as testing the functionality of the motors after waxing.