

## ◆ Assembling the SeaPerch Mechanical System ◆

**Grade Level:** 7<sup>th</sup>-12<sup>th</sup>

**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

**National Science 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
- Ohm meter

**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 transfers that occur.

- a. Armature
- b. Permanent magnet
- c. Brushes
- d. Casing

**Lesson: INVESTIGATE**

Have the students take out their SeaPerch Construction Manuals that they should have received during the structural systems build. Focus the students' attention on section two, "Assembly of Mechanical System."

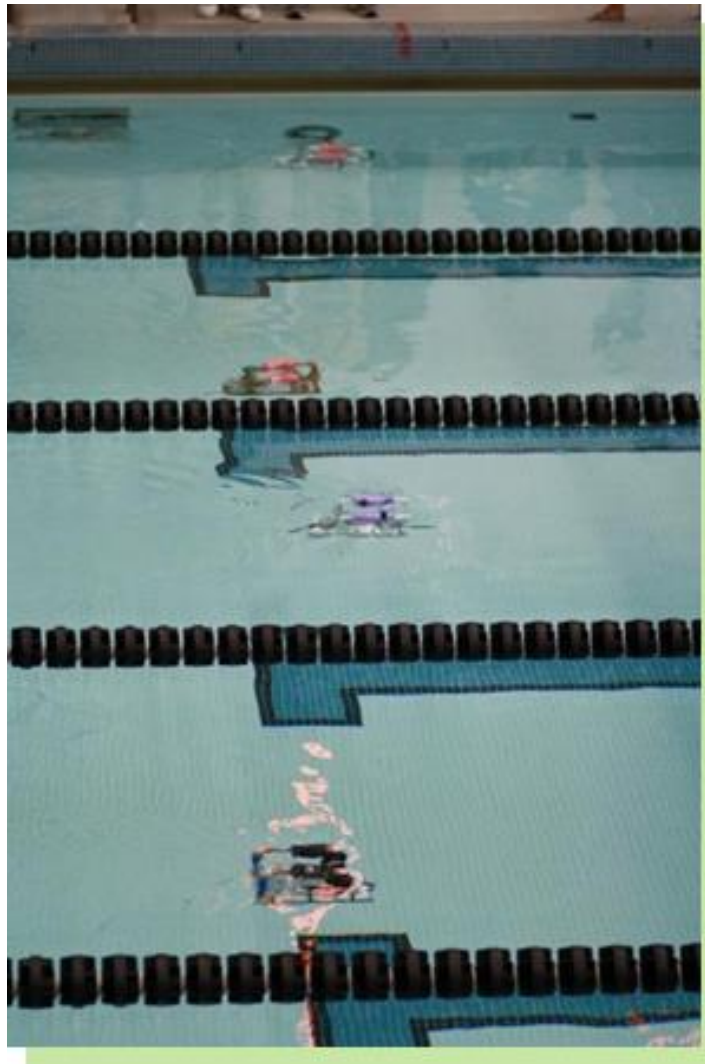
Show the students the motors they will be using for their SeaPerch ROVs. Explain the process for the mechanical system, including waterproofing the motor with wax and creating the CAT5 cable.

### SeaPerch Build Lesson 3: Assembling the SeaPerch Mechanical System

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 Ohm meter, as well as testing the functionality of the motors after waxing.



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