# Competition Classes Overview

SeaPerch Challenge 2022 www.seaperch.org

The 2022 International SeaPerch Challenge will include three (3) competition classes. These classes are updated from past years so please review the below chart carefully. **Please note, stock classes are limited to PVC, CPVC, and PEX pipe for the ROV frame and may not include 3D printed frames.** All classes may include 3D printed attachments or non-frame parts.

| Rules | Middle School Stock Class | High School Stock Class | Open Class |
|---|---|---|---|
| **BUDGET*** | | | |
| The total cost of modifications to the final ROV must be $25 or less | X | X | |
| The cost of modifications may exceed $25 | | | X |
| **MATERIALS** | | | |
| Frame built using only PVC, CPVC, PEX pipe and fittings. | X | X | |
| Frame may include 3D printed or additive manufactured parts as well as other materials. | | | X |
| Frame parts may be made using CNC machinery. | | | X |
| Attachments and non-frame parts( i.e., hook, gripper, propeller shroud) may be made from various materials to include 3D printed or additive manufactured parts. | X | X | X |
| **POWER SUPPLY** | | | |
| Must design for and utilize a 12-volt power source | X | X | X |
| May utilize a second power source (no more than 12-volts) to power auxiliary equipment | X | X | X |
| **MOTORS** | | | |
| Must include waterproofed motors | X | X | X |
| Must use ONLY stock SeaPerch motors (Jameco Electronics 232022) for propulsion** | X | X | X |
| Additional non-stock motors may be used for non-propulsion uses | X | X | X |
| May include more than 3 thrusters (i.e., motor and propeller assembly) | | | X |

| Rules | Middle School Stock Class | High School Stock Class | Open Class |
|---|---|---|---|
| **CONTROLLERS** | | | |
| Must only use simple on/off switches for thruster controls | **X** | **X** | |
| May use power conditioning or pulse-width modulation (PWM) controls for thruster controls | | | **X** |
| May use microcontrollers such as Arduino or Raspberry Pi for thruster controls | | | **X** |
| May use PWM, microcontrollers, or other devices for non-thruster controls | **X** | **X** | **X** |
| May use a fixed or variable resistor to reduce voltage | **X** | **X** | **X** |
| **STRUCTURE/SIZE** | | | |
| Must fit through 18” diameter hoop | **X** | **X** | **X** |
| **COMPETITION CRITERIA** | | | |
| ROV must not be modified after compliance check (except for buoyancy) | **X** | **X** | **X** |
| The same ROV must be used for both pool events | **X** | **X** | **X** |
| Team may include a student in 8$^{th}$ grade or below | **X** | | **X** |
| Team may include a student in 9$^{th}$ grade or above | | **X** | **X** |

*Budget Guidelines include:

- Donated material will be assessed at what the cost would be to procure the material.
- Spare parts and tools are not included in this budget.
- Materials used on earlier prototypes are not included in this budget. Only materials and supplies used on the competition ROV and controllers that are not part of the standard SeaPerch ROV kit should be included.
- Proof of budget compliance must be made available to the judges upon request.
- 3D printed parts will be costed out at $0.05 per gram.

** Thrusters used for propulsion are thrusters that directly exert force against the water causing the ROV to move in any direction.