General Competition Rules
(Rules based on the SeaPerch National Challenge rules)

1. On competition day there will be three competition events: two pool events and one poster presentation. All events will comprise three classes: elementary, middle, and high school, with each class competing in two in-water events and the poster presentation.

2. For each of the classes, awards will be given for the first three finishers in each pool event and in the poster presentation competition in each of the three classes.

3. Three overall awards will also be presented, one in each of the three classes (elementary, middle, and high school) for the best combined scores from all three events.

4. A state champion award will be presented to the highest combined score across all stock class competitors.

5. Only two team members are allowed on the pool deck during a competition.

6. All team members must wear shoes with rubber soles on the pool deck.

7. Each SeaPerch ROV must be presented for a compliance check during check-in upon arrival prior the team competing in the pool events. Once the team has passed the compliance check-in no more modifications may be made to the SeaPerch, only emergency repairs.

8. In the event that a vehicle is inadvertently interfered with during a competition, or a malfunction of a vehicle's parts (i.e., the motor) occurs that is beyond the design and construction, the lead pool judge will have the sole authority to provide the team time to fix their vehicle and to allow them to compete later in the round. Malfunctions will be evaluated on a case-by-case basis.

The 12V power system will be available for all that wish to use it. It is designed to work with the alligator clips in the SeaPerch kit. Each lane will have its own power connection.

Vehicle Design Rules (Based on National SeaPerch Stock Class rules)
Teams are encouraged to think outside the box and change the shape and configuration of the SeaPerch ROV.

Teams must use the same SeaPerch for each event (Obstacle Course and Finesse).

Vehicles shall consist of the parts and components contained within the equivalent of one SeaPerch kit, with the following exceptions:

- Teams have a budget of $20.00 to modify the SeaPerch. It is the actual value of the modifications that must be $20 or less. Donated material should be assessed at what the cost would be to procure the material. The $20 limit is for costs of the materials utilized on the final competition vehicle. Reasonable spare parts are not included in this budget.
- Hooks and attachments MAY NOT be added/removed depending on the competition round.
- Additional motors may be utilized for actuation or other non-propulsion uses. Motors may be found at Jameco P/N 232022.
- Teams may only utilize stock SeaPerch motors in thrusters (Jameco P/N 232022).
- Teams may not add additional thrusters to the SeaPerch. A thruster is defined as a means of propulsion for the SeaPerch, normally but not limited to a motor and propeller assembly.
- Teams will design for and utilize a 12-volt power source. Over charging or stacking batteries is not allowed.
- The vehicle may be worked upon by the teams during the competition.
- The vehicle cannot be dragged via the tether.
- No dimension shall be larger than 22" (minimum obstacle diameter)

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**Challenges and Disputes**

Sportsmanship is expected at all times. Should a protest or dispute occur during the competition it is the intent to resolve the grievance at the time it occurs, and the ruling by the Head Judge shall be final.

A team that wishes to have an issue considered shall send the student team captain and one additional student member (2) to the lead judge with the inquiry or question. The lead judge will make the decision on the issue, and this decision is final. The same issue may not be brought to the judge a second time by any member of the team. Adults may not approach the lead judge on the pool deck regarding any perceived issues.

Teams may not question the legality of other competing vehicles; it is the Head Judge's role to determine if vehicles meet the entry and compliance requirements.
Unsportsmanlike conduct is grounds for the disqualification of a team. Team members and advisors are responsible for the conduct of all members and adults accompanying the team.

**Obstacle Course**

An underwater remotely operated vehicle (ROV) must be able to maneuver successfully under its own power. If a vehicle cannot maneuver to the appropriate location to perform its task, the vehicle is of no use.

The submerged obstacle course involves 5 large rings (22" minimum diameter), oriented in any direction, through which the vehicles must travel. Teams must navigate through the obstacle course, surface, then re-submerge and return through the course to the end. Consideration of optimal maneuverability, control and speed should be given when constructing your SeaPerch (thruster placement and orientation, tether attachment, buoyancy and ballast, etc.) and control box.

- Teams will have 15 minutes total to make up to 2 attempts
- Vehicle starts touching the wall of the pool
- Vehicle must surface after driving through the rings, the judge will indicate when to turn around.
- Time stops when vehicle reaches the wall of the pool or after 15 minutes.
- Scores will be based on the fastest time for successfully navigating the obstacle course. If a team uses all 15 minutes then the number of rings cleared will be counted.
- Penalties – Judges will add 2 minutes to the time if a team requests diver assistance. A 1 minute penalty will be added for intentionally using the tether to maneuver the ROV.

*An Obstacle Course scoring rubric can be downloaded at Seaperch.org*
Finesse

While many roles for ROVs require power, most require the ability to perform delicate tasks remotely.

This 2015 National Challenge task will require students to perform multiple independent tasks that will test their ability to operate their SeaPerches with finesse.

The course consists of three stations in which the vehicles will have to maneuver and actuate equipment on the pool floor. The max pool depth for this event is 5’

Scoring: Max points in the shortest amount of time. The clock stops when the team surfaces and touches the wall with the vehicle. Teams may stop the clock at any time, but it will not be restarted. Teams must inform the judges at the time if they wish to stop the clock and lock in their scoring.

**TASK 1 - The Targets**

Ever seen the biathlon? With a SeaPerch?

Teams must hit a series of 5 targets of differing sizes. Each Target must be pushed in until the flag Flies! ~3”

The targets will range in size and therefore difficulty. The inner diameter of the targets is as follows: 1”, 1-1/2”, 2”, 2-3/8”, 3”.

The heights of the target centers will vary from 2” to 6”. Each target center is separated by 4”

Scoring: Each target is worth 1 Point (max 5 Points)
**TASK 2 - The Pipes**

“I pick things up and put them down!” What SeaPerch challenge would be complete without a little lifting?

These light weight pipes with a ring attached must be picked up and put in their corresponding set of pipes to score.

Each rod consists of a 6” length of ½” PVC pipe with a polypropylene rope loop on one end and a small weight in the other. This design allows the rod to stand up when left freestanding in the water. The holder from which operators will have to retrieve the rings is constructed of 1” PVC pipe and will leave at least the top 1” of the rod and the entire loop exposed.

Operators will have to position the rods in one of three Vertical pipe sections with the following inner diameters: 1”, 1 ½”, 2-3/8”.

Scoring: A=1 Point, B=2 Points, C=3 Points. Only one rod scores in each column. (Max 15 Points)

If teams put 2 rods in one column, the highest scoring rod will be scored.
**TASK 3 - The Ladder**

Kids these days don't know what an abacus is so we'll call it a ladder.

The ladder will require teams to actuate grey slides to the side. The Grey slides must be fully within the orange zone to score.

The device is made of 1” PVC pipe with the rungs at different distances apart, starting at 3-1/2” to 7” apart. On 5 of those rungs will be a PVC collar made of 1-1/4” PVC pipe. This collar will be 2” in length. Not all rungs will have collars on them to be actuated and will serve as guard rungs for the collars. These collars will have to be slid from one side of the rung to the other in order to be placed in the brightly painted area on the rung. The direction that the collar needs to be actuated will alternate from collar to collar.

Scoring: Each Slide is worth 1 Point (max 5 Points)

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**Poster and Presentation Judging**

While preparing your poster and presentation, here are some areas to consider:

- The maximum poster size is 48" x 36".
- What did your SeaPerch need to do, and how did your design meet that requirement?
- How long did it take you to build and test your SeaPerch? Describe the process.
- Who did what on your team and why? What skills did the team have and what skills had to be developed?
- Why did your team shape, locate, or angle the foam/weights/motors as you did (initial placement vs. final placement changes)?
- What design changes did you make as a result of the testing and evaluation of your SeaPerch prior to the challenge?
- What was the budget for your vehicle and how was it managed?
- Is each team member prepared to answer questions from the judges?

*The Poster rubric can be downloaded at seaperch.org*