

Greater Philadelphia SeaPerch Challenge

2025-2026 Season



Table of Contents

1.0	Introduction	3
1.1	About the SeaPerch Program	3
1.2	About the Greater Philadelphia SeaPerch Challenge	3
1.3	This Season’s Mission Theme	3
1.4	Key Dates and Deadlines.....	4
2.0	Competition Rules & Regulations	4
2.1	Competition Classes	4
2.2	Class & Design Rules Summary	5
2.3	General Event Rules.....	5
3.0	Competition Components	9
3.1	Technical Design Report (TDR).....	9
3.1.1	TDR Preparation Overview	9
3.1.2	TDR Contents	9
3.2	Team Presentation.....	15
3.2.1	CAD Modeling	15

Version Updates:

1.1: Original document

1.2:

Updated TDR submission date. (Page 4)

Confirmed date of GPSSC pool event. (Page 4)

Updated safety protocols. (Page 7)

Updated point value of Task 1.1 (Page 22)

1.3: Updated guidance on multiple teams per school or community organization.

1.4: Updating Presentation Judging Information (Page 4)

1.5:

Updated “**intent to submit**” guidance on TDR submissions (Page 9)

Updated 3.4.5 Task 4: Sample Water Quality (page 26)

1.0 Introduction

1.1 About the SeaPerch Program

Welcome to the Greater Philadelphia SeaPerch Challenge! SeaPerch is a Remotely Operated Vehicle (ROV) educational program that equips middle and high school students with the resources to construct a simple ROV from a kit. The program teaches basic skills in marine design, naval architecture, and ocean engineering with the objective of developing the next generation of STEM professionals through a fun, challenging, and hands-on experience.

1.2 About the Greater Philadelphia SeaPerch Challenge

The Greater Philadelphia SeaPerch Challenge is the first and longest-running regional SeaPerch competition in the world and part of the broader Greater Philadelphia SeaPerch and SeaGlide Challenge (GPSSC) which includes the sister program of SeaPerch: SeaGlide. See the Greater Philadelphia SeaGlide Overview document for more details.

Registration for the Greater Philadelphia SeaPerch and SeaGlide Challenge is handled by Temple University, College of Science and Technology. Please visit <http://phillynavalstem.com/> for details on the challenge and registration. You can also reach out to gpssc@temple.edu with questions and concerns.

All school and out-of-school-time (OST) programs (including community organizations) participating in the GPSSC are permitted to send a limited number of teams per grade level. Each participating school and OST program may send one team per level. Middle School level includes grades 5-8. High School level includes grades 9-12.

Please note: All OST program teams need to have a 501(c)(3) status that is independent of a school organization. If your OST program does not have a 501(c)(3) status or is not formally affiliated with an organization with an independent 501(c)(3) status, then you must register through your school organization.

1.3 This Season's Mission Theme

The theme for this season is **Storm Response**.

Scenario: A powerful storm has swept through the region, leaving behind damaged infrastructure, disrupted communications, and environmental hazards. ROVs are deployed to demonstrate how coordinated action can be used in recovery, resilience, and discovery during disaster relief efforts.

1.4 Key Dates and Deadlines

(Note: All dates are tentative and subject to change. Please verify all dates on the official GPSSC website.)

Table 1: Key Dates and Deadlines for the Greater Philadelphia and International SeaPerch Challenges. (To be updated)

Date	Event	Notes
February 26, 2026	Team Presentation Scheduling Opens	Link will be provided via email from gpssc@temple.edu
Dec 1, 2025 - Feb 1, 2026	International Challenge "Wild Card" Registration	Optional path to the International competition.
March 11, 2026	Technical Design Report (TDR) Submission Deadline	Submit electronically in PDF format.
March 24-26, 2026 3:00pm – 5:00pm	Team Presentations conducted virtually	Virtual presentations will be conducted via Microsoft Teams. Meeting invite will be provided after teams schedule their presentations at the SignUp Genius Link provided by gpssc@temple.edu
March 27, 2026	Greater Philadelphia SeaPerch and SeaGlide Challenge Event Day	Held at the Kroc Center, 4200 Wissahickon Ave, Philadelphia, PA.
May 30 - 31, 2026	2026 International SeaPerch Challenge	Held at the University of Maryland. Qualifying teams from GPSSC attend.

2.0 Competition Rules & Regulations

2.1 Competition Classes

The Greater Philadelphia SeaPerch Challenge has two divisions (Middle School and High School) and two skill-based classes. Teams must choose one class upon registration.

- **Captain's Class (Stock):** Aims to keep teams on a level playing field with limited modifications and a strict budget.
- **Admiral's Class (Open):** Allows for more advanced engineering solutions and a higher budget.

Promotion Rule: To encourage growth, teams that placed 1st or 2nd overall in the last **two years** are required to compete in the Admiral's Class.

2.2 Class & Design Rules Summary

The following rules differentiate the Captain's and Admiral's classes for the regional competition.

Table 2: Captain's and Admiral's Class Details for the Greater Philadelphia SeaPerch Challenge

Rule / Feature	Captain's Class	Admiral's Class
Vehicle Budget	Total cost of modifications must be \$25.00 or less.	No budget limit.
3D Printing Cost	Parts are costed at \$0.05 per gram.	N/A
Vehicle Construction	Primary structure must use only PVC, CPVC, or PEX pipe.	May use other materials.
Vehicle Size	Must fit through an 18-inch diameter hoop.	Must fit through an 18-inch diameter hoop.
Propulsion Motors	Maximum of 3 stock SeaPerch motors.	May use more than 3 stock motors.
Power Supply	A single 12V battery is allowed. No auxiliary batteries.	May use a second 12V battery for auxiliary equipment.
Battery Specs	All batteries must be 12VDC, 12-amp hour max , and no larger than 6.5" L x 3" W x 4" H.	All batteries must be 12VDC, 12-amp hour max , and no larger than 6.5" L x 3" W x 4" H.
Thruster Controls	Must use only simple on/off switches.	May use advanced electronics like microcontrollers or PWM.

2.3 General Event Rules

Original Work: All competition deliverables, especially the TDR, must be the original work of the student team members.

Compliance: All ROVs must pass two mandatory safety and compliance checks at the Compliance Stations located outside of the pool deck area (Compliance I) and beside the pool deck (Compliance II) upon arrival before competing. Your team cannot proceed to any of the events on the day of the competition unless these requirements are fulfilled. Only two team members are permitted at the Compliance stations at a time. Passing compliance checks does not guarantee the right to compete. Lead judges in the competition area have the final say on safety and compliance issues and may require teams that have already passed the compliance check to fix issues prior to competing. Teams must first complete Compliance I before proceeding to Compliance II. Compliance judges will review your SeaPerch vehicle and determine if each item passes or fails compliance. If an item fails compliance, it is the responsibility of the team to fix the non-compliant item or inform a

member of compliance that the team will not be competing. Please carefully review Section 2.4 Compliance Checklist prior to attending the pool events.

Triage: Teams needing technical assistance for their ROVs may visit the Triage Station located on the pool deck. We ask that students do not crowd the triage area there are considerable safety concerns. Our triage engineers are often hard at work and utilize things like soldering irons, drills, and chemicals and we want to avoid accidents. Triage offers a unique opportunity to work directly with US Navy engineers to solve the technical challenges that could be plaguing your team on competition day. The triage station is equipped with select spare parts and hand tools. Triage engineers are not permitted to build ROV replacement parts. Triage is to be utilized for repairs and not for building the ROV.

One ROV: The team must use the same ROV for both pool events (obstacle and mission). Teams may share spare parts. Teams may not share an ROV or its attachments. Spare parts are allowed; spare ROVs and attachments are not.

Modifications: No parts may be added or removed from the ROV between pool events, though attachments may be repositioned. Attachments and parts may be repositioned (i.e., rotated or swiveled) between the two pool events. Attachments or parts may not be disconnected and relocated; they must remain connected to the same point on the ROV when they are repositioned. Any significant repairs require re-inspection at the Triage Station. The ROV may be worked on or adjusted during competition. This may include adjusting buoyancy by adding or removing buoyancy materials or adding materials like tape or cable ties necessary to secure parts. However, the run timer will continue. Teams may provide an additional battery for auxiliary equipment such as cameras, advanced controllers, sensors, and electromechanical ROV attachments.

Pool Deck Access: A maximum of **two (2) team members** are allowed on the pool deck during a competition run. Advisors are not permitted. One driver and a second person on deck able to control the tether and to operate any secondary controls such as buoyancy control. The second person can also deploy the ROV in the pool, remove it, and any other objects from the pool. In the extraordinarily rare event of all team members except for one becoming incapacitated on the day of the event, an advisor may be permitted to operate the tether of the SeaPerch vehicle on the pool deck ONLY.

ROV Operation: The ROV must move under its own power. Each team should bring their own charged vehicle battery to the pool. Make sure your battery is fully charged. The vehicle MAY be reset by the pool deck by the teams during the competition. Pulling the tether by hand or other means is not permitted unless approved by a judge for detangling. The run timer will continue in this scenario. Divers will assist teams with tangled tethers or inoperable ROVs at the end of the competition run time. Teams may be permitted a repeated attempt at the obstacle or mission course that the incident occurs during a designated redo round, time permitting. The final call on this decision will lie with the Lead Pool Judge and is not

disputable by any team. The ROV MAY be receive repair or maintenance in triage by the teams during the competition.

Code of Conduct: Sportsmanship is expected at all times. Unsportsmanlike conduct is grounds for disqualification. Team members and advisors are responsible for the conduct of all members and adults accompanying the team. 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 lead Judge is final.

A team that wishes to have an issue considered shall send the student team captain and one additional student member to the lead judge for discipline in question, with the inquiry or question. The lead judge will render a 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.

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 with 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.

Teams may not question the legality of other competing vehicles; it is the SeaPerch Compliance Leader's role to determine if vehicles meet the entry and compliance requirements.

The Greater Philadelphia SeaPerch Challenge reserves the right to make judgement calls on the alteration of rules as it deems necessarily and appropriate on the day of the event due to extenuating circumstances outside of its control. These decisions are not common or determined lightly.

Safety:

To ensure the safety of all participants, volunteers, and pool facilities, the following is prohibited or required in the pool and/or on the pool deck:

Absolutely NO fragile or similar brittle materials that could shatter or break apart upon impact (such as glass) are permitted in the pool or on the pool deck (defined as the pool area).

Loose materials such as necklaces, bracelets, strings, rope, or other materials that could become entangled in propellers or pool filtration equipment are also prohibited from the pool area.

The use of chemicals, compressed gases, and chemical reactions for buoyancy, propulsion, or any other function of the ROV is strictly prohibited. This policy is in place to prevent potential hazards, including equipment damage, personal injury, and contamination of the aquatic environment.

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

Teams may not bring anything to the pool deck that requires 110-volt or any other alternating current (AC) power. Laptop computers are allowed if they are battery powered and do not need to be plugged into 110-volt power.

The Greater Philadelphia SeaPerch Challenge is not liable for lost, stolen, or otherwise damaged materials brought poolside.

2.4 Compliance Checklist



SeaPerch Compliance Checklist

School/Organization Name: _____ **Captain or Admiral**

COMPLIANCE I Pass or Fail Judge's Name (Print): _____

Construction

No loose parts that will potentially fall off during competition or handling.	<input type="radio"/> Pass	<input type="radio"/> Fail
All joints are tight. All tie wraps are trimmed and flush as much as possible. Cable must be fastened to the structure and centered with cross-tied wraps	<input type="radio"/> Pass	<input type="radio"/> Fail
All tie wraps are tight on motor housings	<input type="radio"/> Pass	<input type="radio"/> Fail
All propellers are secured to motor shafts and do not spin independently of the shaft	<input type="radio"/> Pass	<input type="radio"/> Fail

Safety

No exposed wires on controller	<input type="radio"/> Pass	<input type="radio"/> Fail
No exposed live wires on SeaPerch or tether	<input type="radio"/> Pass	<input type="radio"/> Fail
No sharp edges	<input type="radio"/> Pass	<input type="radio"/> Fail
Alligator clip covers (supplied with the kit) are installed on electrical contacts as appropriate	<input type="radio"/> Pass	<input type="radio"/> Fail
No chemicals, CO ₂ cartridges, or loose materials / NO GLASS	<input type="radio"/> Pass	<input type="radio"/> Fail

Functional Test

Team demonstrates forward and reverse operation of each propeller to ensure they are in proper working order	<input type="radio"/> Pass	<input type="radio"/> Fail
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Design Compliance

No more than 3 thrusters (motors) are installed (Captain's Class Only)	<input type="radio"/> Pass	<input type="radio"/> Fail	N/A
If design modifications appear to exceed the \$25 allowable limit, the team identifies that they have valid receipts to support the design modifications in their notebook. (Captain's Class Only)	<input type="radio"/> Pass	<input type="radio"/> Fail	N/A
A single 12V battery is used to power (Captain's Only) or additional secondary non-propulsion power does not exceed 12V.	<input type="radio"/> Pass	<input type="radio"/> Fail	
Propulsion motors are standard issue and have not been upgraded	<input type="radio"/> Pass	<input type="radio"/> Fail	
The vehicle fits within an 18" diameter circle	<input type="radio"/> Pass	<input type="radio"/> Fail	

COMPLIANCE II Pass or Fail Judge's Name (Print): _____

Operations

Forward and reverse movement demonstrated	<input type="radio"/> Pass	<input type="radio"/> Fail
Up and down change in position demonstrated	<input type="radio"/> Pass	<input type="radio"/> Fail
Right and left (and/or other maneuverability) demonstration	<input type="radio"/> Pass	<input type="radio"/> Fail

Once Compliance is complete, return this form to the Score Keeper's Table on the Pool Deck

3.0 Competition Components

The competition is composed of four graded categories: the Technical Design Report, a Team Presentation, and two in-pool Vehicle Performance rounds.

3.1 Technical Design Report (TDR)

The TDR is a mandatory written paper documenting your team's design process. It must be submitted as a PDF to seaperchnotebooks@gmail.com by the deadline. Please email seaperchnotebooks@gmail.com with an "intent to submit" prior to the deadline so that we know to keep an eye out for you!

3.1.1 TDR Preparation Overview

- **File Naming:** <SCHOOL NAME>_<MS or HS>_<CAPT or ADM>_SP TDR 2026
(ex. Seaperchville High School_HS_ADM_SP TDR 2025)
- **Formatting:** Papers will be scored on organization and readability (4 points), spelling and grammar (4 points), and adherence to format requirements (6 points). 5-page limit for the main body, with specific font (Times New Roman 12pt), margin (≥ 0.8 "), and footer (Team Name, Page #) requirements. A 10-point penalty will be deducted for not meeting all guidelines.

3.1.2 TDR Contents

The written paper consists of seven mandatory Sections and three mandatory Appendices. Additional sections may be included; however, there is an overall limit of 5 pages for the first 6 section (no limit for References, Acknowledgements, and Appendices). The sections must appear in the order listed below. It is strongly suggested that papers be typed. However, hand-written submissions will be accepted.

1. Abstract (1/2 page – 10 points)

Papers will be scored on organization and readability (4 points), spelling and grammar (4 points), and adherence to format requirements (6 points, see below).

2. Task Overview (1/2 page – 10 points)

In order to design and build a successful ROV, it is imperative to understand the tasks that your team aims to successfully complete. This section should include an overview of the task(s) your SeaPerch will attempt during the SeaPerch Challenge competition. In particular, this section should discuss the characteristics and features of the tasks that affected how you designed your ROV. Avoid directly quoting the course descriptions and instead use your own words to describe what your ROV will do within the mission course.

3. Design Approach (2 pages – 26 points)

Given the tasks, describe your team’s strategy and approach to developing a novel SeaPerch design. Novelty may occur at various levels of the design and modeling process including specific components, collections of components, or even team approaches to the process. Focus attention on the creative aspects of your system and how your team conceived of, refined, and implemented these ideas. Describe your experience in making design decisions and how prospective ideas were considered among the team. Include engineering and scientific terms and concepts to demonstrate the team’s understanding of the challenges of designing and operating an underwater ROV.

4. Experimental Results (1 page– 18 points)

This section should describe the results of your design and modeling efforts. What was your resultant design? How did your modeling efforts impact your team’s subsequent design(s)? Include images, charts, and figures as appropriate to document and demonstrate your results.

5 . Reflection & Next Steps (1 page – 10 points)

This section should describe various activities and/or tests that you plan to accomplish between submitting this report and the day of competition and even beyond if working all virtual. What does your team expect to accomplish with these activities?

6. Acknowledgements (no page limit – 2 points)

Participating in the competition involves identifying resources and support beyond the efforts of individual team members. This support can take many forms, such as technical advice, labor, equipment, facilities, and monetary contributions. Acknowledging those who have supported your efforts is important.

7. References (no page limit – required – 2 points)

As with any technical publication, original ideas and content not generated by the paper’s authors should be properly cited. While there are many citation styles, the American Psychological Association (APA) style guide should be used (<https://apastyle.apa.org/style-grammar-guidelines/references>). Use in-text citations, where appropriate.

Appendix A: Budget (no page limit – required – 4 points)

Include all components included in your SeaPerch design. This information will be used during compliance checks at the SeaPerch Challenge and should reflect the total materials

cost of your ROV beyond the materials provided in the base SeaPerch kit. Add as many rows as necessary to complete this budget. Please include justification for your budgets such as links to websites selling materials that show costs.

If revisions are made to your SeaPerch between the submission of this budget and your compliance check, please bring an updated budget sheet for review at compliance. Any team registered in the Captain's Class must have a total cost of equal to or less than \$25. For teams competing in the Admiral's Class, no cost limit is set. Teams with total costs greater than \$25 will be required to compete in the Admiral's Class.

Table 3: Sample TDR Budget Table

Component	Vendor	How was component used?	Cost (in USD)
TOTAL COST OF SEAPERCH			\$

Appendix B: Fact Sheet (required – 4 points)

A foundational purpose of the SeaPerch Challenge is to showcase and engage the broad SeaPerch community. This fact sheet includes information that introduces teams and their SeaPerches to the community. Submitted team fact sheets will be made available during the SeaPerch Challenge to highlight the various designs included in the competition.

Enter your team's respective information in the Fact Sheet template. You must use the Fact Sheet template to collect points for this component. Information includes:

- Team Name and location
- School/Organization represented
- Image of SeaPerch design
- Competition Class (ie. Middle School / High School & Captain's Class / Admiral's Class)
- Overview of SeaPerch Design: Use this section to provide a high-level explanation of your SeaPerch design
- Number of years your team has participated in the SeaPerch program (this should include years that you have been involved in building a SeaPerch and/or competed in a SeaPerch competition)
- Number of times your team has competed at the International SeaPerch Challenge including your anticipated participation in this year's SeaPerch Challenge (ie. If this is your 1st year, you will put "1st year")

- Complete the statement “Our SeaPerch is unique because...”; highlight what you think makes your design innovative
- Complete the statement “Our biggest takeaway this season is...”; focus on your team’s experience and what you learned from working together on your design
- Roster with first names and grades of students on your team (note: please DO NOT include last names)
- Name(s) and organizational affiliation(s) of mentor(s)
- Team photo

A draft layout is provided on the next page for informational purposes only.

Appendix C: Additional Information (optional)

Examples of additional information are research results, engineering calculations, process photos and drawings, etc.

Writing Skills (8 points)

Report is concise, cohesive, easy to understand and supported by context and graphics with no spelling or grammatical errors.

TEAM NAME

City, State, Country

A large rectangular box with a grey background. The text 'SeaPerch Image' is centered in the upper half, and 'COMPETITION CLASS' is centered in the lower half. A dark blue horizontal bar is at the bottom of the box.

Years participating in SeaPerch:

Times at the International SeaPerch Challenge:

Our SeaPerch is unique because:
(50 words MAX)

Our biggest takeaway this season is:
(50 words MAX)

A rectangular box with a grey background, labeled 'Team Image' in the center.

Team Members:
First Name, Grade #
First Name, Grade #
First Name, Grade #
First Name, Grade #
First Name, Grade #

Mentor(s)
Full Name, Organization
Full Name, Organization

SeaPerch Design Overview:
(100 words MAX)

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3.2 Team Presentation

Teams will give a virtual 10-minute presentation to a panel of judges, followed by a 5-minute Q&A via video teleconference. All presentations will be conducted via video teleconferencing scheduled on or near the week of the event date. It is the responsibility of the team to sign up for a presentation slot once presentation slot sign-ups are released.

Your team will present as a company pitching your ROV design to a U.S. Navy panel for a deep-ocean exploration mission. Following your presentation, a question, answer, and discussion (Q&A) period will allow the judges to assess your team's application of fundamental engineering and naval architecture principles.

3.2.1 CAD Modeling

Although digital modeling is not required, it is highly encouraged. It can be a critical step in the engineering design process and make a significant contribution to your overall presentation score. Digital designs may be presented via images in your Technical Design Report and Presentation.

Some great examples of digital modeling (computer aided design (CAD)) tools to consider are listed below:

- <https://www.autodesk.com/products/fusion-360/education>
- <https://www.sketchup.com/try-sketchup#for-primary-and-secondary-education>
- <https://www.onshape.com/en/education/>
- <https://www.tinkercad.com/>

Many tutorials for these programs exist on YouTube, and it is highly encouraged one or more be reviewed to learn these software. Teams are also more than welcome to utilize other software not listed here.

SeaPerch component CAD part files (in .STL format) are available to teams from a Google Drive shared folder. Teams are welcome to download and utilize these files in the design and digital construction of their vehicle designs. Teams can access this repository at the following link:

https://drive.google.com/drive/folders/1sx3EY4k_mlnwWsXTuypNDzFocMjcR4NS?usp=sharing

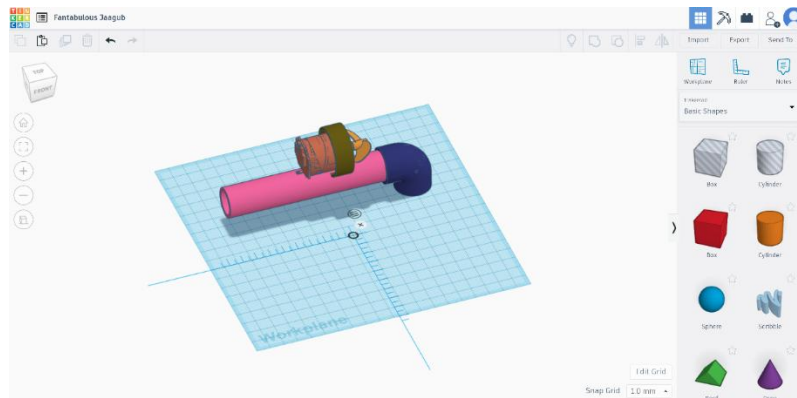


Figure 1: Sample digital SeaPerch CAD design being created in Tinkercad from provided .STL files

3.2.2 Presentation Rules

All teams must include the following in their presentation:

- Company Overview
 - Company name, size, and demographics
 - Mission/Vision statement with an emphasis on naval engineering
 - Organization of the company explained
- Recruiting Methods
 - How did the company recruit new members?
- Design and Manufacturing Process & Engineering Process
 - Identify the steps taken to achieve the design
 - Design research (naval engineering research)
 - Identify technical calculations or testing conducted and design priorities
 - Integrated lessons learned
 - Charts/Drawings/Pictures
 - Identify changes from the basic SeaPerch design
- Application and use of computer technology
- Budget information and implementation
 - Identify costs of additions and modifications to the Sea Perch
 - Explain any trade-offs of the modifications

The format for the presentation should be an on-screen presentation, open to creative interpretation. Teams are encouraged to use technology in their presentations. Physical models, or other items can be used by a team to supplement their presentation and may be displayed and modeled on camera.

Each member present at the time of presentation must participate in giving the presentation. Each team member is required to answer questions from the judges.

Teams will be required to schedule their presentations from the link to be provided prior to the event.

Teams are advised to arrive in their designated presentation room 5-10 minutes prior to their scheduled start time. Teams may be moved from the main room into a judging room during their scheduled presentation time. We recommend teams log in together from a single computer to simplify logistics and prevent delays. Teams who are more than 5 minutes late may not be allowed to present. If at first you enter and do not see someone, be patient. We may be in another room and coming back shortly!

3.2.3 Presentation Rubric

I. PRESENTATION OF THE COMPANY (30%)

Company Information and Objectives

- Company Description
- Mission/Vision statement and purpose that includes naval engineering focus
- Organization/structure of company explained
- Recruiting methods for new company members

Budget Management

- Identified and itemized modifications
- Explained tradeoffs for various modifications

II. KNOWLEDGE OF DESIGN, MANUFACTURING/ENGINEERING PROCESS (35%)

Design Process

- Identified steps to achieve design modifications/alternatives
- Demonstrated design research as part of their process
(naval engineering research)
- Identified technical calculations or testing to optimize/select design
- Modeling efforts were appropriate and met the system & mission requirements
- Practicing and testing was well planned
- Lessons learned from testing were present and specific

Engineering Process and Roles

- Discusses naval engineering field and roles
- Demonstrates knowledge of design process: problem definition, tradeoffs, and testing.
- Identifies naval engineering design considerations.

II. PRESENTATION CONTENT (15%)

Presentation Clarity

- Organization & Flow
- Objectives & Main Points/Summary

Presentation Skills

- Focus on naval engineering
- Fluent, clear, audible delivery. Correct grammar and language use
- Non-verbal skills: Posture; practiced
- Overall confident, direct, and animated.
- Presenters and teamwork (at least 2 presenters and less than 9)

IV. INNOVATIVE DESIGN INTERVIEW Q&A (5 MIN) (20%)

Clarification of System Designs

- Team response to judges questions

3.3 Pool Event: Obstacle Course

The Obstacle Course is a timed event designed to test the speed, maneuverability, and control of your Remotely Operated Vehicle (ROV), with teams ranked by the fastest time. The Obstacle Course includes a set of 5 pre-arranged hoops submerged at a depth of 4 feet from the surface of the water. These are oriented as shown in the following diagram.

3.3.1 Obstacle Course Layout

Five large rings with a **22 to 24-inch minimum diameter** are submerged at a depth of **4 feet**. This is a regional modification; all ROVs must still pass an 18-inch compliance check. This ensures that vehicles qualifying for the International SeaPerch Challenge, which uses 18-inch hoops, are built to the correct standard.

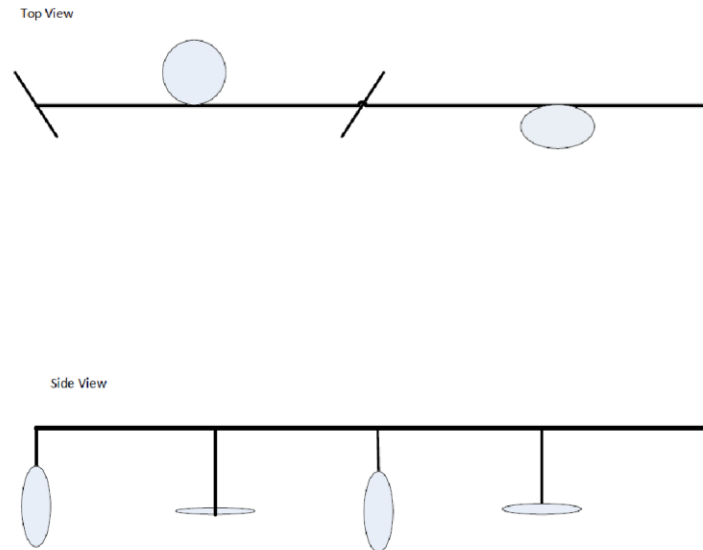


Figure 2: Greater Philadelphia SeaPerch Challenge Obstacle Course Hoop Layout

3.3.2 Obstacle Course Scoring

Scores for this round are primarily based on the **fastest time** to successfully navigate the course in a single run. Times may also be recorded for every hoop your team successfully passes through. This secondary scoring is used to differentiate teams in the event of a tie in time or if a team is unable to complete the full course.

3.3.3 Step-by-Step Procedure

Start of Run: The run begins with the ROV surfaced, under its own power, and positioned within six inches (6") of the starting pool wall. After the lane judge begins the countdown, team members are not allowed to touch the ROV.

Outbound Navigation: The ROV must pass through each of the five obstacle course hoops in sequential order, starting with the hoop closest to the pool wall (Hoop 1) and proceeding to the furthest (Hoop 5). The vehicle must move under its own power at all times. It cannot be dragged or pulled through the course by its tether.

The Turn: After completely clearing the fifth and furthest hoop, the ROV must surface. Surfacing is considered complete when any part of the ROV breaks the surface of the water.

Return Navigation: After surfacing, the ROV must re-submerge and navigate back through the hoops in reverse order (Hoop 5 through Hoop 1).

Skipping Hoops: If your team is unable to pass through a specific hoop, you may skip it and proceed to the next one. Skipping hoops will negatively impact your score for this event and is not advisable if it can be avoided.

Design for Performance: To achieve an optimal time, teams should give careful consideration to their ROV's design for maneuverability, control, and speed. This includes factors such as thruster placement and orientation, tether attachment point, and the balance of buoyancy and ballast.

3.4 Pool Event: Mission (Storm Response)

The Mission Course incorporates a mission that changes annually. Teams must complete tasks related to the mission theme. This course simulates the tasks and environment that a ROV might encounter. This year's theme is "Storm Response" and is based on the following scenario:

A powerful storm swept through, leaving behind damaged infrastructure, disrupted communications, and environmental hazards. Vehicles are deployed to demonstrate how coordinated action can turn disaster into resilience:

Task 1: Inspect the Bridge

Due to floodwaters, the bridge supports could be damaged, creating unseen underwater hazards that need inspection. The ROV must navigate bridge supports, retrieve the red marker float, repair the support beam, and release the green marker float.

Task 2: Survey the Dam

To prevent any further flooding or damage, the dam needs to be surveyed and repaired to identify any cracks or failures. The ROV must move the plug to the hole in the dam, and rotate the cover to close the flood gate.

Task 3: Clear the Debris Field

Floodwaters bring hazardous debris that can obstruct waterways and ecosystems. The debris needs to be cleared to allow for safe navigation and environmental recovery. The ROV must relocate the displaced marine life, and remove the heavy submerged debris.

Task 4: Sample Water Quality

The flooding may have contaminated the water supply and needs to be tested before normal activities can resume. The ROV must retrieve the water sampler and return it to the Surface Vessel.

3.4.1 Course Overview

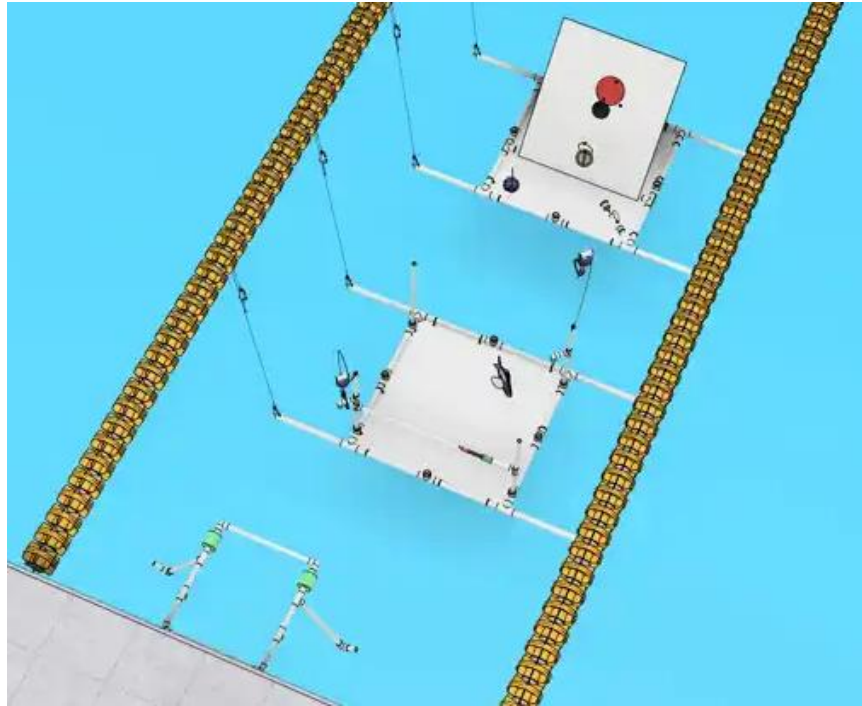


Figure 3: SeaPerch Mission Course for the 2025-2026 season

Your SeaPerch mission run will begin and end with your ROV surfaced inside the boundary of the surface vessel (pictured in Figure 3 near the pool deck bulkhead). The surface vessel also contains the “plug” for Task 2.1 and the final location of the water sampler for Task 4.2. The course consists of a front platform (nearest to the pool deck) and a back platform (farthest from the pool deck).

The ROV may transport multiple objects simultaneously. Objects may be moved between platforms for staging without completing the task. Tasks may be completed in any order, as possible. (For example, it is not possible to complete Task 3.3 prior to completing Task 3.2.)

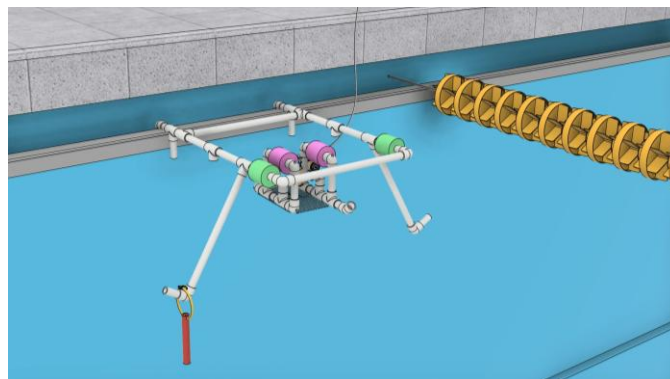


Figure 4: SeaPerch mission course surface vessel configuration at the start of a SeaPerch run

3.4.2 Task 1: Inspect the Bridge

The ROV must navigate bridge supports, retrieve the red marker float, fix the broken pipe, and release the green marker float. At the start of the run, the red marker float will be floating above the back right bridge pillar, the green marker float will be hooked on the front left bridge pillar, and the broken pipe will be uncovered.

All Task 1 elements are located on the Front Platform.

Task 1.1: Retrieve the red marker float, and hook on the back right bridge pillar. (10 points)

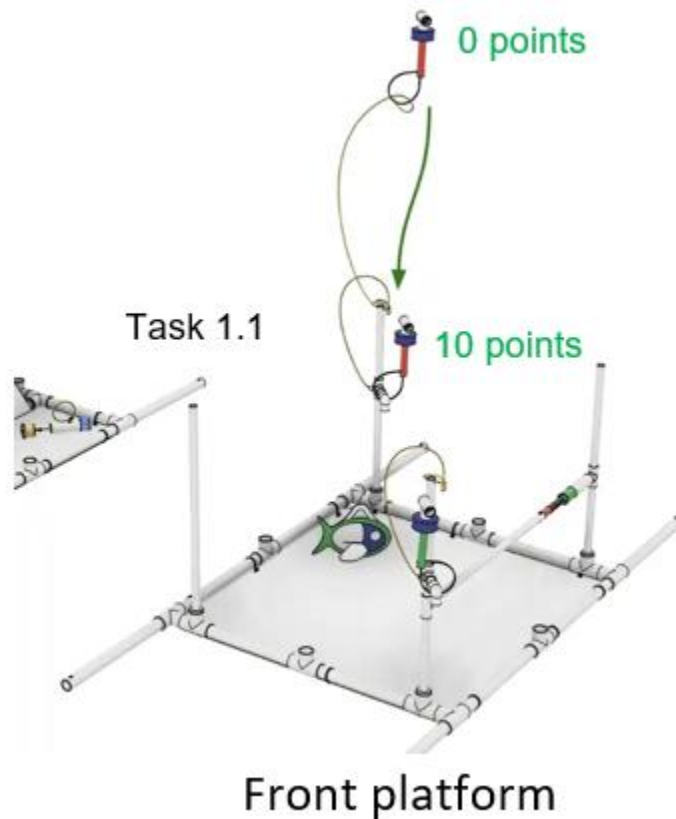


Figure 5: Task 1.1

Task 1.2: Slide the cover pipe to the left to fix the support beam. (2 points if partially slid, 6 additional points if completely slid.)

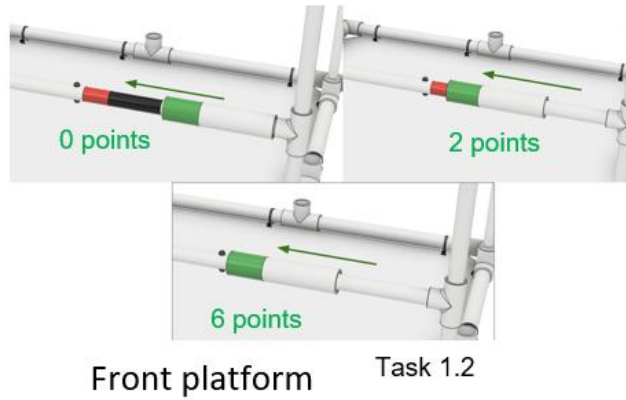


Figure 6: Task 1.2

Task 1.3: Release the green marker float at the front left bridge pillar. (8 points)

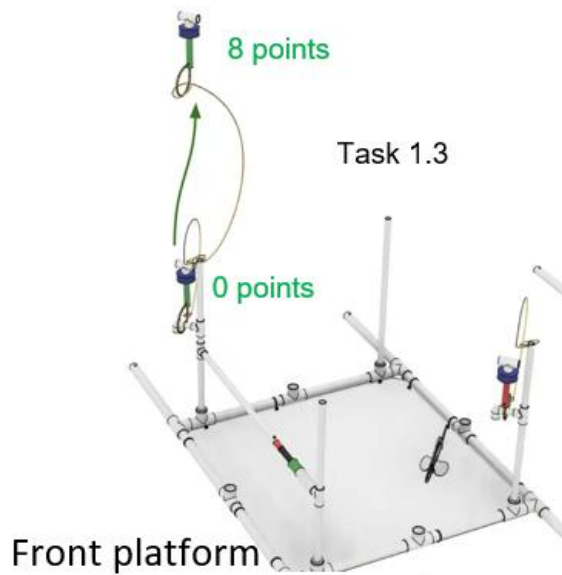


Figure 7: Task 1.3

3.2.3 Task 2: Survey the Dam

The ROV must move the plug to the hole in the dam and rotate the cover to close the flood gate. At the start of the run, the red plug will be located on a hook on the Surface Vessel, and the red flood gate will be located on the slanted dam wall on the Back Platform.

Task 2.1: Lift and place the plug in the hole on the slanted dam wall. (4 points if the plug is removed from the surface vessel, 12 additional points if the plug is inserted into the hole)

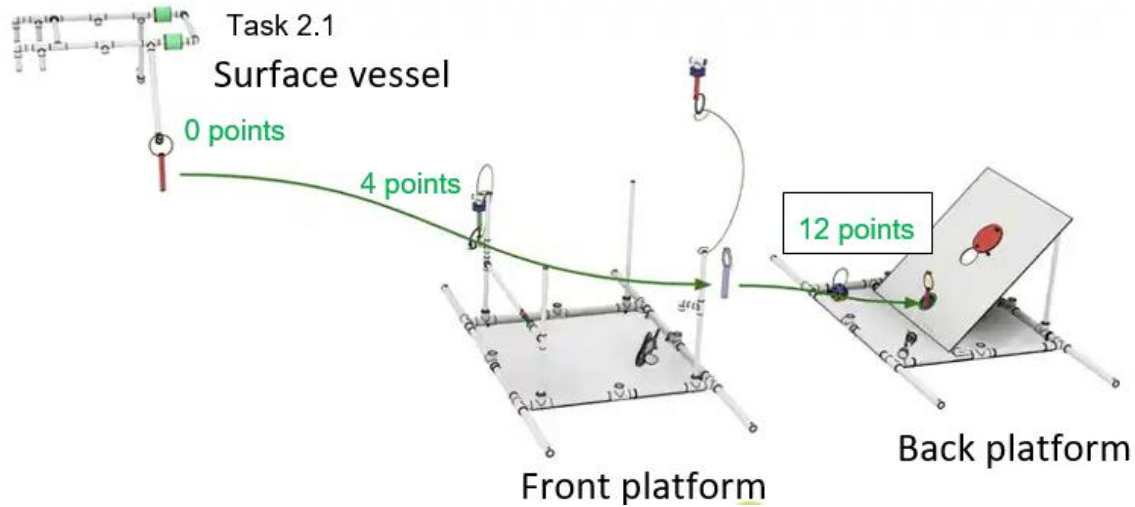


Figure 8: Task 2.1

Task 2.2: Rotate the flood gate cover to close the flood gate. (8 points)

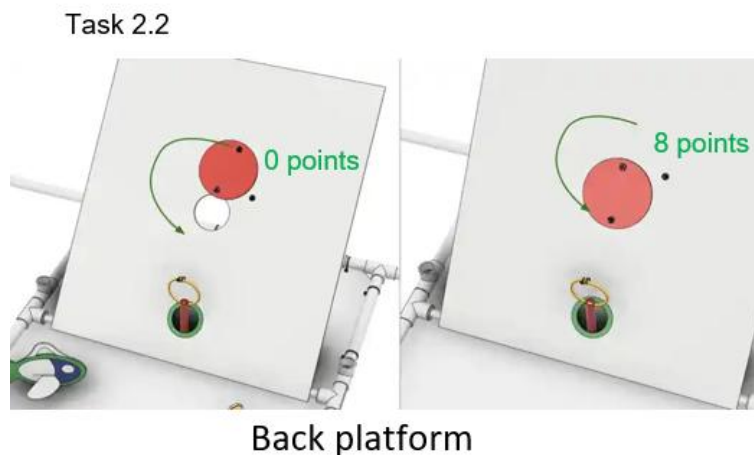


Figure 9: Task 2.2

3.2.4 Task 3: Clear the Debris Field

The ROV must relocate the displaced marine life (SeaPerch fish) and remove the heavy submerged debris (weighted object). At the start of the run, the marine life will be located on the Front Platform, and the debris will be located on the Back Platform.

Task 3.1: Retrieve and place marine life on the Back Platform. (4+8 points)

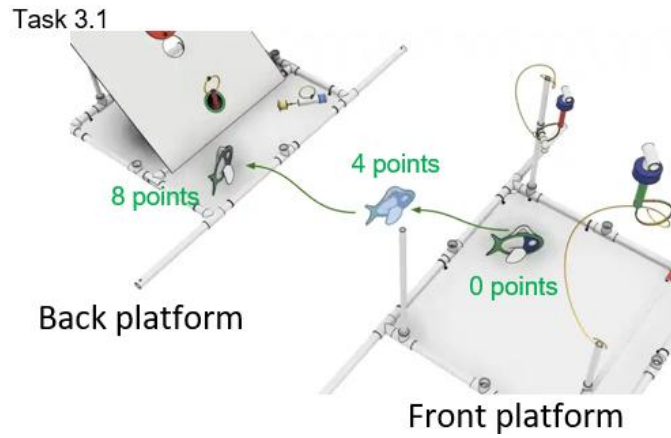


Figure 10: Task 3.1

Task 3.2: Lift heavy piece of submerged debris. (6 points)

Task 3.3: Place heavy piece of submerged debris on a hook on the Surface Vessel. (20 points)

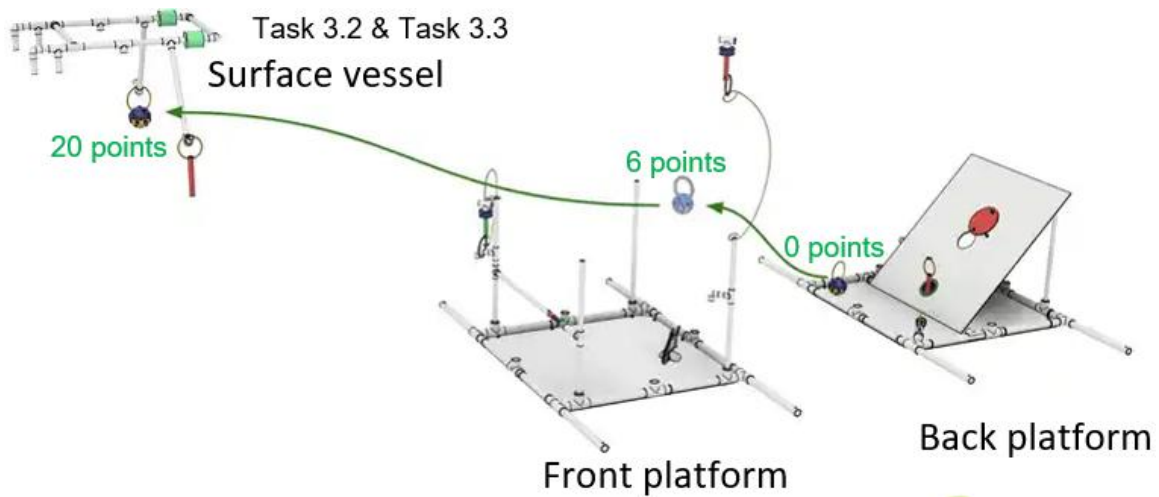


Figure 11: Tasks 3.2 and 3.3

3.4.5 Task 4: Sample Water Quality

The ROV must retrieve the water sampler and return it to the Surface Vessel. At the start of the run, the water sampler will be open and located on the Back Platform.

Task 4.1: Remove water sampler from back platform (4 points)

Note: You will lift and the water sampler should close as depicted in Figure 12.

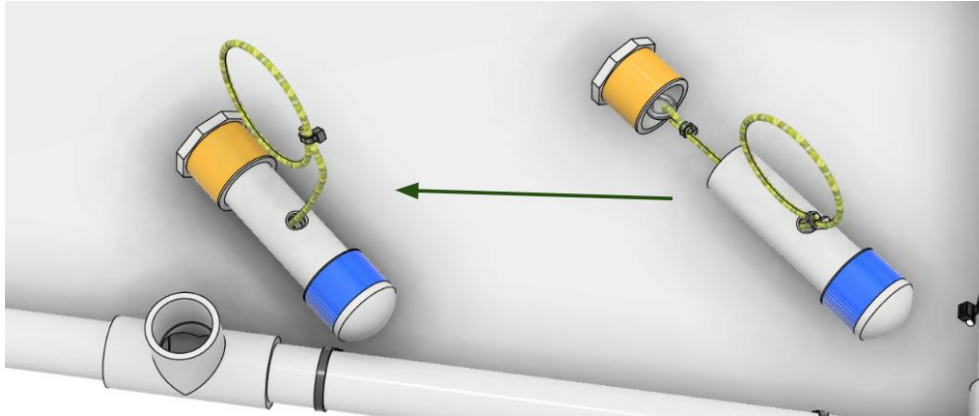


Figure 12: Water sampler lift and close mechanism depicted

Task 4.2: Place water sampler on a hook on the Surface Vessel. (8 points)

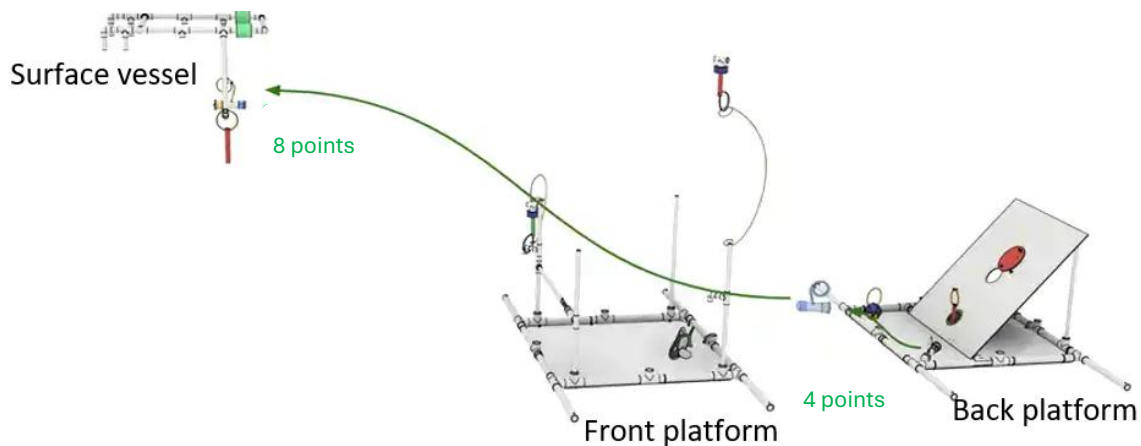


Figure 13: Tasks 4.1 & 4.2

4.0 Competition Scoring, Awards, & Qualification

4.1 Overall Scoring

Each event will be scored in accordance with its rubric. Teams will then be ranked, by their score. Points are not official until verified by the master scorekeeper. Points will be earned

at completion of each task action. If mission tasks are disturbed in subsequent actions, teams will still earn the points for completion. The overall Greater Philadelphia SeaPerch Champion is determined by combining scores from the Technical Design Report, Team Presentation, and Vehicle Performance (a combined score from both the Obstacle and Mission courses). Awards are given for leaders in each score category as well as the overall combined score.

4.1.1 Time Bonus Points

Teams may earn bonus points for successfully completing all tasks in less than 6 minutes. Bonus points are based on adjusted finished time including any time penalties incurred during the run. Bonus points are applied for:

- Finish times less than 4 minutes earn teams 10 points
- Finish times less than 6 minutes earn teams 5 points

4.1.2 Qualifying for the International SeaPerch Competition

Teams may only compete in ONE Regional qualifying competition. Teams may qualify for the International SeaPerch Competition in one of two ways.

1) Wild Card Qualification: Teams may elect to register for a Wild Card spot at <https://seaperch.org> and be chosen by lottery to compete at the International SeaPerch Competition. Teams registered for the Greater Philadelphia SeaPerch Challenge who qualify for a Wild Card spot MUST notify gpssc@temple.edu that they have been awarded a Wild Card spot. Wild Card registration runs December 1, 2025 - February 1, 2026. Teams who qualify via direct qualification at the Greater Philadelphia SeaPerch Challenge would be required to forfeit their Wild Card spot.

2) Direct Qualification: The 1st place overall winners from each division (MS/HS) and class (Captain's/Admiral's) are invited to the International SeaPerch Challenge.

The International SeaPerch Competition is scheduled for May 30-31, 2026 at the University of Maryland.