



Portsmouth Naval Shipyard STEM OUTREACH

Engaging students in science, technology,
engineering, and mathematics

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Thank you for your interest in Portsmouth Naval Shipyard's STEM Outreach program. In this booklet, you will find established programs related to science, technology, engineering, and mathematics (STEM) which the STEM Outreach office has successfully facilitated with schools and community organizations.

We understand how important it is for students to develop connections with the concepts and excitement of STEM fields. We inspire these connections and engagement through problem solving and experiments that are both fun and challenging. These challenges give students the ability to apply what they have learned in classrooms and make the knowledge and methods concrete.

Working with Portsmouth Naval Shipyard is a unique opportunity which demonstrates the vibrancy and potential rewards of STEM fields of study and related careers. Our experienced volunteers are enthusiastic to share their knowledge, time, and skills to engage students in learning.

Please contact the STEM Outreach office with your questions and ideas. We look forward to hearing about how you would like to partner to bring STEM programming to your students.

Respectfully,

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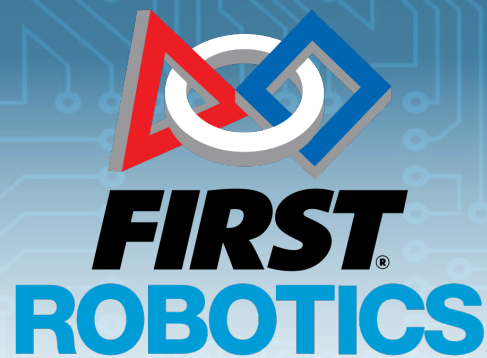
STEM-in-a-Box

"STEM-in-a-Box" is a nickname for STEM-related, hands-on activities that can be done in any classroom. Instructions are broken down like a lesson plan and include critical thinking questions and learning goals.

STEM-in-a-Box activities are scalable to any age group Pre-K through High School. Portsmouth Naval Shipyard employees bring their real-life work experience to life as they lead students through fun and engaging challenges and activities.

"I enjoy watching shipyarders rediscover that what we do is indeed awesome and special. (When they volunteer with STEM programs) I see them get that spark back they had at the beginning."

-Tina Ouellette
Industrial Engineer






"FIRST is more than robots. The robots are a vehicle for students to learn important life skills. Kids often come in not knowing what to expect – of the program nor of themselves. They leave, even after the first season, with a vision, with confidence, and with a sense that they can create their own future."
-Dean Kamen, FIRST Founder

The Portsmouth Naval Shipyard STEM Outreach Program supports FIRST (For Inspiration and Recognition in Science and Technology) and VEX robotics programs by connecting Shipyard employees to serve as coaches, mentors and competition judges.

Many mentors contribute on a weekly basis during competition season, support the team with subject matter expertise on an as needed basis, and volunteer to support competitions on a one-time basis.



<p>Grades PreK-8</p> <p>FIRST LEGO LEAGUE</p> <p>Ages 4-16</p>	<p>Grades 7-12</p> <p>FIRST TECH CHALLENGE</p> <p>Ages 12-18</p>	<p>Grades 9-12</p> <p>FIRST ROBOTICS COMPETITION</p>
 <p>FIRST® LEGO® League introduces STEM to children ages 4-16* through fun, exciting hands-on learning. Participants gain real-world problem-solving experiences through a guided, global robotics program, helping today's students and teachers build a better future together.</p>	 <p>FIRST® Tech Challenge students learn to think like engineers. Teams design, build, and program robots to compete in an alliance format against other teams. Robots are built from a reusable platform, powered by android. technology, and can be coded using a variety of levels of Java-based programming.</p>	 <p>Friendly competition is at the heart of the Challenge, as teams of students ages 9-16 engage in research, problem-solving, coding, and engineering while building and programming a LEGO robot that navigates the missions of a robot game.</p>





SeaPerch is an innovative program which leads students through the building and testing of a small, underwater remotely operated vehicle (ROV). The SeaPerch program provides students with a hands-on learning experience which incorporates robotics, engineering, science, and mathematics.

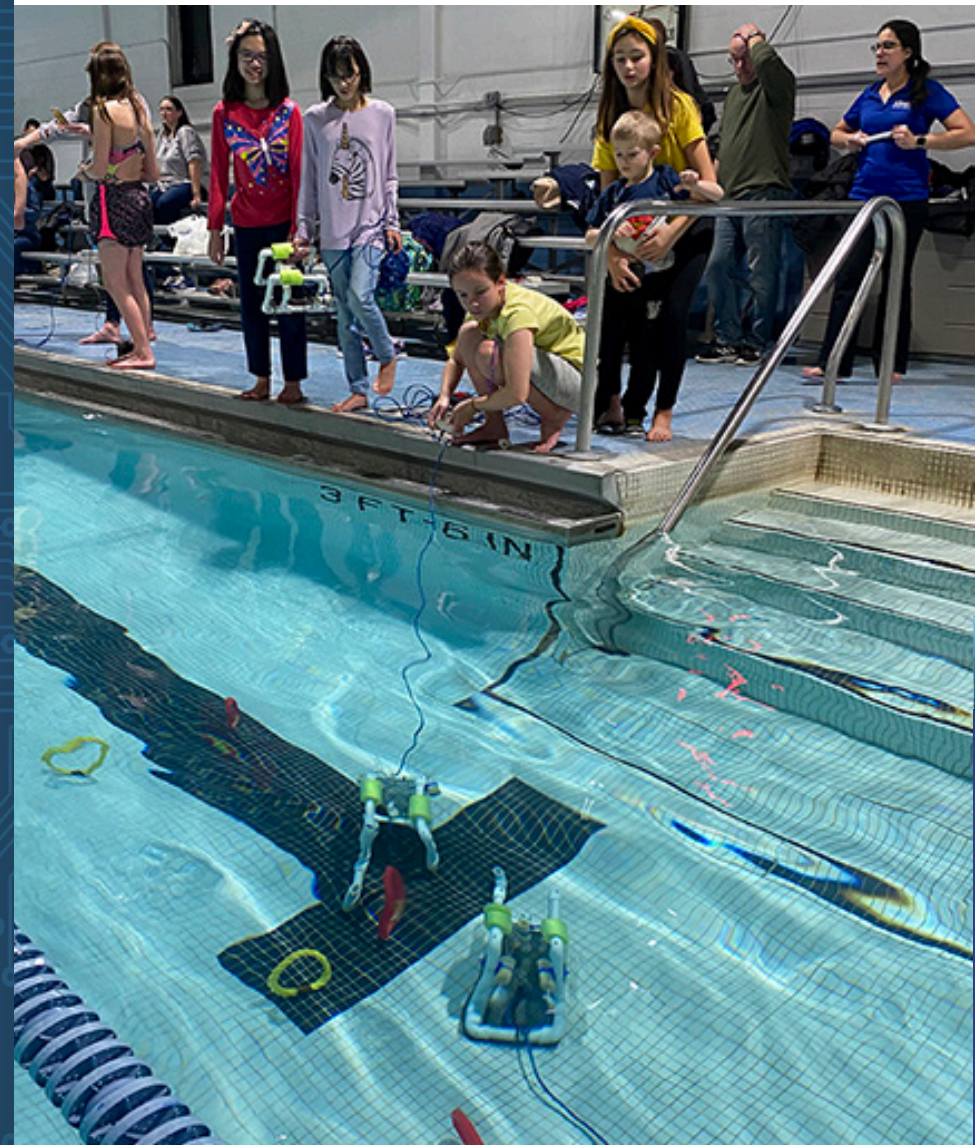
Portsmouth Naval Shipyard volunteers alongside teachers assist students through three units which can be taught in an in-school (as complement to existing curricula) or out-of-school setting.

A final field trip to a pool allows the students to maneuver their ROVs through obstacle courses and recover objects from the bottom of the pool.

“My favorite part of SeaPerch happens at the end of every build. While at the pool, students who have never used a screwdriver are navigating various challenges telling me “I can’t believe I made this and it actually works!”

-Roland Marquis

Refueling Facilities Group Supervisory Engineer



SCHOOL TOURS AND SHIPYARD DEMONSTRATIONS

A tour of Portsmouth Naval Shipyard can be a great opportunity for students to get a glimpse of the daily activities of the shipyard, observe career opportunities that exist in STEM-related fields, and learn about the shipyard's long and fascinating history.

A team of our experienced engineers, technicians, chemists, tradespersons, and Navy personnel lead students through a variety of presentations and hands-on activities.

While traditionally, tours of the shipyard are delivered on base, due to COVID-19, the Shipyard will soon offer a version of the tour brought to your location. The Shipyard now has a mobile unit that will house 24 demonstrations that showcase various trades and STEM activities. The mobile demonstrations are scheduled to be available beginning Spring 2021.

STEM SHOWCASE

A STEM Showcase is a day of workshops and presentations intended to exhibit real-life applications of STEM and a glimpse of careers on the shipyard for high school students. These workshops incorporate hands-on activities to engage and excite students. The event typically occurs during a regular school day at the hosting school. Presenters are experts in their field and are familiar with sharing their knowledge with students.



LENDING LIBRARY

The Portsmouth Naval Shipyard STEM Outreach Lending Library is a resource that is available to Shipyard employees and educators in the local community

- Visit pnsystem.myturn.com to access the site
- Create an account to make a reservation
- Please direct questions to PNS-STEM-Program.fct@navy.mil

The Science, Technology, Engineering and Mathematics (STEM)-Focused kits and activities are designed to help make learning fun and engaging, while also complimenting what students are learning in the classroom and/or remote learning.



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