

United States Naval Academy STEM Center for Education and Outreach

USNA STEM Center

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Summer 2015

STEM

UNITED STATES NAVAL ACADEMY



Remote STEM



Summer STEM
Program



Girls Tech Camp



STEM Educator
Training

www.usna.edu/stem

Remote STEM



On May 2, STEM Center staff traveled to St. Mary's College of Maryland to present a workshop at STEM-ING, an event for middle and high school girls hosted by NAVAIR– Patuxent River. The workshop, *ROV Adventure*, explored ROV applications, engineering design of robotic arms and the science behind ROV sensors. Girls constructed hydraulic actuators, fabricated conductivity meters, and operated SeaPerch ROVs underwater.

**STEM-
ING**



On May 15, STEM Midshipmen 1/C Emily Lamanna, 3/C Bronwyn Harper, 4/C Svetla Walsh and 4/C Diana Vazquez spent the night at the Baltimore National Aquarium's "Sleepover with the Sharks", acting as mentors for a group of middle school girls from Southwest Academy in Baltimore, MD. Sponsored by the STEM Diversity Campaign, this was a culminating event for the students as part of Women Instructing and Nurturing Girls in STEM (WINGS).

**Sleepover
with The
Sharks**



On May 22-23, STEM Center staff traveled to New York City for Fleet Week, a weeklong celebration of the sea services. USNA hosted a booth as part of the Office of Naval Research exhibit, located on the pier of the USS Intrepid Sea, Air & Space Museum. Visitors to the USNA booth investigated STEM topics through hands-on activities including logic puzzles, cryptography, robotics, batteries, electrical circuits, hydraulics, rockets, catapults and gliders.

**Fleet
Week**

Remote STEM



Sisters Academy

In May, MIDN 4/C Paige Monk and MIDN 4/C Lynette Sivells spent 3 weeks at Sister Academy, an all-girls school in New Jersey, as part of an internship sponsored by the Leadership, Development and Research Department and the STEM Center. The midshipmen worked closely with the students, as mentors and role models, utilizing hands-on activities to foster interest in STEM subjects.



Spain

MIDN 1/C Megan Hough traveled to Spain in May to do STEM outreach. Describing her activities, she said: "The students must work as engineers in a real-life scenario with a budget and time constraints to build a bridge that spans a 60 cm gap. They have \$50 in Monopoly money per group to spend on materials such as newspaper, Popsicle sticks and tape. I explain the design process of planning, working as a team, acquiring materials, building and testing. At the end of the class we test the bridges to see how many dictionaries they can hold. The openness of the project allows for innovation and critical thinking which are both hard to teach in a classroom setting."



SWIFT

USNA STEM Center and Oceanography Department co-sponsor an annual Severe Weather In-Field Training (SWIFT) program to teach midshipmen about forecasting, observing and verifying severe convective storms. The SWIFT team also spent a day visiting three schools in Tulsa, OK, to speak to students about weather science and lead hands-on activities to investigate science and engineering concepts. The team was led by professors in the Oceanography Department, Brad Barrett and Gina Henderson.

Office of Admissions and USNA STEM Center present:



Summer STEM Program

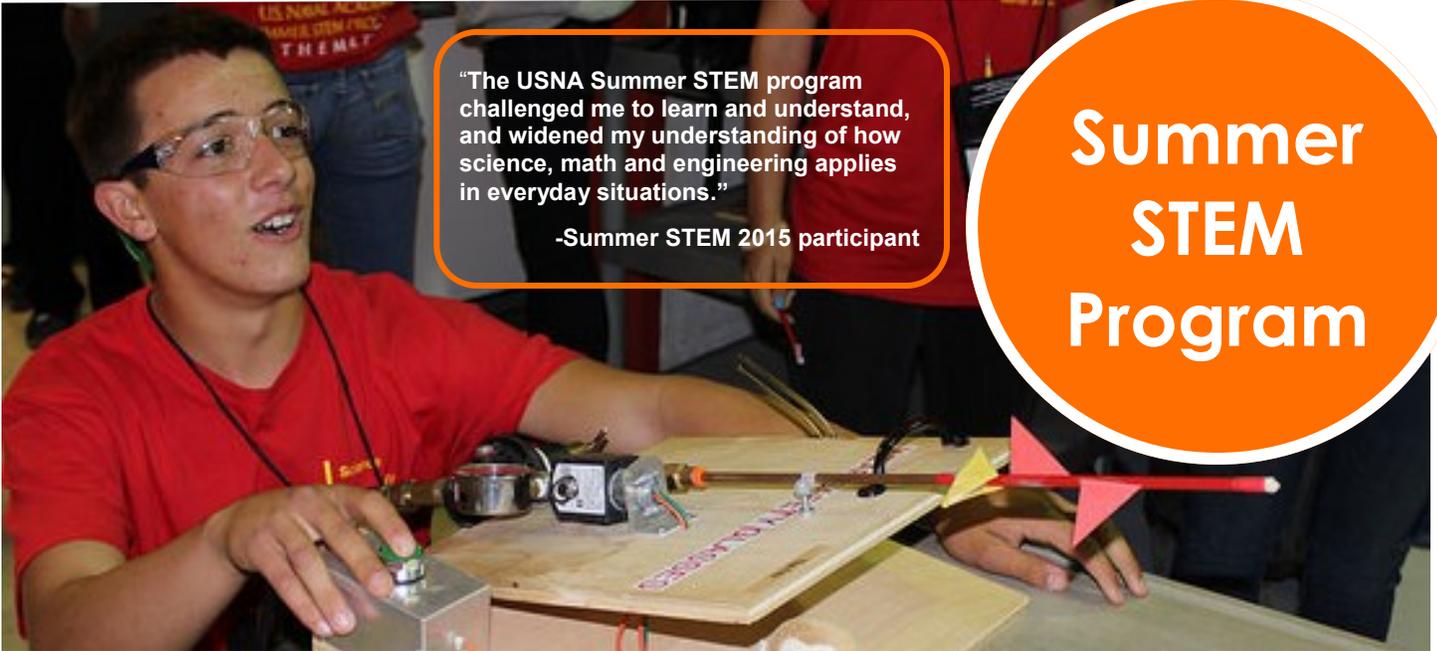


- 650 students
- 9th-11th grade
- 35 faculty & staff
- 95 midshipmen
- 3 week-long sessions

- 24 modules, covering Aerospace Engineering to Weather and Oceanography. New modules: Struck by Math, Alien Exploration, Invent with Arduino, Autonomous Aid
- 16 electives, including Strategy Games, Biometrics, Flight Simulation, Crazy Chemistry, & more
- Engineering design competitions
- Student presentations with real world applications



Faculty Support: Brad Baker, Brad Barrett, Louise Becnel, Meredith Botnick, Chris Brown, Dane Brown, Elena Cimpoiasu, Jennifer da Rosa, Scott Davids, Debra Dillner, Bruce Duncan, Sarah Durkin, Kristina Fritts, Gina Henderson, Rachel Hetlyn, Tom Lusby, Christine Maceo, Paul Mikulski, Aurelia Minut, Angela Moran, Patrick Moran, Mark Murray, Beth Waitkus, Don Needham, Charles Nelson, Janice Rice, Gillian Richards, Jamie Schlessman, Hite Spencer, Cecily Steppe, Louise Wallendorf, & Currie Wooten



“The USNA Summer STEM program challenged me to learn and understand, and widened my understanding of how science, math and engineering applies in everyday situations.”
 -Summer STEM 2015 participant

Summer STEM Program

Modules: 3D Simulation, Alien Exploration, Aquaculture Engineering, Autonomous Aid, Biolooids: Robots in Action, Bioterrorism, Build your Own, Clean Chemistry, Corrosion: a true threat to life and structures, Countdown to Launch, Cyber Attack, Extreme Engineering, Fighting for Freedom, Fluid Force Phenomena, I love my Heart, Invent with Arduino, Making Waves! Exploring Mechanical Waves and Light, Oceaneering, Robosense, Searching for Unobtainium, Spinning Wings- Exploring Helicopter Technology, Struck by Math, Weather and Climate, Weathering the Wind.

“Participating in the STEM program impacted my interest in this field of study because we did cool experiments in the lab. It definitely made me realize that I want to major in something related to STEM.”
 -Summer STEM 2015 participant





Middle school girls experienced life as engineers at the week-long **Girls Tech Camp** held at the Naval Academy in June. The theme for this year's camp was "**Latitude with Attitude**", which entailed exploring the world by land, air, and sea. Engaging projects included land navigation, underwater robotics, soldering and Arduino, astronomy, structural failures and natural disasters.

Girls Tech Camp



Girls Tech Camp

34 students
7th-9th graders
8 high school counselors
Week-long day camp



"STEM was an amazing experience. As a rising 8th grader, it was really an enjoyable experience from all aspects. I hope that STEM will continue for more girls to have a great experience and learn more about the concepts of STEM!"

-Girls Tech camper



Latitude with Attitude



STEM faculty along with high school-age counselors led the camp, which included design challenges and competitions, team building, hands-on activities, tours of labs and research areas, and networking with professional female engineers. The focus is on career awareness and confidence building.

STEM EDUCATOR TRAINING

July



SET Sail

Teachers in Attendance	86
Number of week-long sessions	2
Number of states represented	22
Number of countries represented	6

Each summer, the U.S. Naval Academy's STEM Center for Education and Outreach offers SET Sail, a week-long STEM Educator Training for middle school and high school teachers. The workshop allows teachers the opportunity to discover, explore, and test ideas, as well as learn how science and technology impact real-world research and challenges.

This year, 86 teachers traveled to USNA to attend the two sessions. Many of the teachers came from DoDEA schools in the U.S. and overseas, including Europe and the Pacific.

Offering this program to educators from around the country and world extends the influence of STEM while also exposing teachers, and therefore their students, to the Naval Academy. The faculty that make this program possible include Jennifer da Rosa, Sarah Durkin, Rachel Hetlyn, Angela Moran, Patrick Moran, Mark Murray, and Beth Waitkus.

"As an educator, this training was invaluable in helping me understand how to integrate relevant activities to enhance understanding and, importantly, spark interest in these areas. I will definitely apply what I have gained from this superior experience."

-Lejeune High School teacher



STEM EDUCATOR TRAINING

July



The workshop provided teachers with intense training in **project-based learning**. They investigated diverse topics in all areas of STEM including engineering, math, chemistry, biology, materials science, helicopters, hydraulics, thermodynamics, corrosion, fluids, physics, cybersecurity, programming and more. Participants focused on how to bring **hands-on** activities into all areas of instruction. They explored first-hand the **engineering design** process, by working in teams on several design and build challenges. Teachers also had the opportunity to attend a collaborative workshop, “**Engineering to Explore the Ocean**”, with partner, NOAA, including a SeaPerch build and underwater exploration resources.





Upcoming Events

September

- Best Practices in STEM: Facilitation Workshop for Naval Scientists & Engineers in San Diego, CA, Sept 1-3
- USNA SeaPerch/NOAA Engineering to Explore the Ocean, Educator Workshop in Albuquerque, NM, Sept 11-12
- STEM Educator Training (SET) Sail Workshop at USNA, Sept 26

October

- Mini-STEM for visiting students at USNA, Oct 2
- Remote STEM trip to General Motors in Detroit, MI, Oct 15-16
- Girls Only STEM Day at USNA, Oct 17
- Family STEM Day for faculty & staff at USNA, Oct 24
- USNA SeaPerch/NOAA Engineering to Explore the Ocean, Educator Workshop in Tulsa, OK, Oct 26-27
- Mini-STEM for visiting students at USNA, Oct 30

November

- Maryland STEM Festival, Nov 6-15
- USNA Workshop at West Virginia Science Teacher Association Conference, Nov 6
- Maryland MESA Day at Johns Hopkins University Applied Physics Lab, Nov 18

December

- Maryland MESA Day at Johns Hopkins University Applied Physics Lab, Dec 2
- STEM Educator Training (SET) Sail Workshop in Wiesbaden, Germany, Dec 7-11

* dates subject to change



USNA STEM Center for Education and Outreach

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