



UNITED STATES
AIR FORCE ACADEMY

USAFA K-12 STEM Outreach Program Newsletter

August 2019

Volume 3, Number 2

In This Issue

Updated Tour Offerings

STEM Friday Lessons for
Elementary Students

Real-world Experiences
at AFA Civil Engineering
Camp

USAFA Sponsored STEM
Teacher Bootcamp

USAFA Planetarium
Weekday Shows During
the Summer

Legacy Craftsman Camps

FIRST Robotics
Scholarships

USAFA Planetarium
Shows Dazzle Summer
Audiences

United States Air
Force Academy
and Air Force
STEM Webpages

<https://www.usafa.edu/stem-outreach/>

<http://www.usafa.af.mil/>

<https://afstem.afciviliancareers.com/>

Updated Tour Offerings

The attached brochure describes tours available for school groups during the 2019-20 school year. Tours are conducted on Wednesdays and Thursdays. A 1-10 adult to student ratio is required. Tours begin at 9:30AM. To schedule a tour contact Sandy Lamb @ sandra.lamb.ctr@usafa.edu.

STEM Friday Lessons for Elementary Students

STEM Fridays are free hands-on science, robotics or engineering lessons for elementary students. The USAFA STEM Outreach Coordinator will come to local classrooms with all materials necessary for each lesson. Classroom teachers must be present during the 45 to 60 minute lessons and active in assisting students. Below are the lessons available for the 2019-20 school year.

Solar Cars 45 min

Following a study of renewable and nonrenewable energy sources, 4-5th grade students will enjoy making solar powered cars.

Ozobots 45 min

Ozobots are small robots that are programmable through drawn lines and color codes. This engaging activity helps students learn about coding and programming. They are suitable for K-5th grade students.

Owl Pellet Dissection 45 min

Teams of 3 or 4 will dissect an owl pellet and determine what type of animal the owl digested. This activity complements an ecosystem's unit and is appropriate for 4-5th grades.

Designing Trash Collectors 60 min

Teams will use a variety of materials to clean trash away from an American Bullfrog's habitat. This lesson is appropriate for K-1st grades.

A Slippery Slope: Engineering an Avalanche Protection System 60 min

During this lesson, students work in teams to create an avalanche protection system for a mountain community. This unit would complement a study of forces and be suitable for 3-5th grades.

To Get to the Other Side: Designing Bridges 60 min

This lesson complements 1-3rd grade science units on forces. Students work in groups to create three types of bridges and determine which type is the strongest.

A Slick Solution: Cleaning an Oil Spill 60 min

In this Engineering is Elementary lesson, students create a process for cleaning up an oil spill. The lesson is suitable for 4-5th grade.

Catching the Wind: Designing Windmills 60 min

In this Engineering is Elementary lesson, students work together in teams to design and create blades that work well for windmills. This lesson complements a study of forces and is appropriate for 1-4th grade.



QR Code for USAFA K-12
STEM Outreach page

USAFA K-12 STEM Outreach Mission

The United States Air Force Academy Science, Technology, Engineering, and Math (STEM) Outreach Program mission is to offer a variety of programs and services that effectively engage, inspire, and attract the next generation of STEM talent.

The Sky's the Limit: Engineering Flying Technologies 60 min

In this Engineering is Elementary lesson, students work together in teams to create a flying technology prototype that can hold up to 3 aerial photographers to be used by NASA. This lesson complements a study of forces and is suitable for 3-5th grade.

To the Rescue: Engineering Aid Drop Packages 60 min

In this Engineering is Elementary lesson, students work in teams to create a package that can be successfully air dropped. This lesson is suitable for 4-5th grade.

Animal Adaptations 60 min

Following a quick look at a variety of animal adaptations, students will test a blubber glove and work with tools that simulate bird beak adaptations. This lesson is suitable for 1-3rd grade.

Light or Thermal Energy Lessons 60 min

The STEM Coordinator provides a variety of hands-on activities pertaining to light or thermal energy for 5th grade classrooms.

Real-world Experiences at AFA Civil Engineering Camp



apply through a local SAME post.

96 high school students from around the country spent a week at the Academy working in teams to build a variety of structures. In the pictures below, students are creating concrete barriers. Teams tried to determine the best placement of rebar to create the strongest barrier possible. This camp offers students an incredible insight to the field of civil engineering. Scholarships are available in each state if students



USAFA Sponsored STEM Teacher Bootcamp

110 K-6th grade teachers participated in a cutting edge 3 day STEM Bootcamp at Challenger Learning Center/Legacy Peak Elementary School. This year's program featured a variety of coding & robotics classes, outdoor makerspace, chemistry of batteries, MakeDo kits and lunar activities.



Contact Us

USAFA Office of Research

The Office of Research strives to build a positive relationship with K-12 students and educators and encourage recruitment/growth of future cadets to develop skills implicit to national security and the nation's competitive edge.

Lt Col Chris McClernon
Associate Dean for
Research
719.333.4195

Mr. Rick Rogers
DFRO Deputy Director
719.333.4195

Sandy Lamb
STEM Outreach
Coordinator
719.333.8990
Sandra.Lamb.ctr@usafa.edu

Legacy Craftsman Camps

In June, 82 students attended USAFA's STEM Day Camps. Students were treated to a variety of exciting STEM activities and research center tours. The week ended with a field trip to the Wings Over the Rockies Museum and a parent presentation.



FIRST Robotics Sponsorships

USAFA recommended Department of Defense FIRST Robotics Scholarships for 13 local K-12 teams from school districts 3, 12 and 20. The scholarships cover team registrations and kits for the 2019-2020 season.

USAFA Planetarium Shows Dazzle Summer Audiences

The newly renovated USAFA Planetarium has hosted 18,000 attendees since March. The Planetarium seats 110 and each free public show is usually booked to capacity. Arrive at least 30 minutes ahead of time this summer to ensure a seat. Line up in front of the right side glass doors. On August 21st, a new video will premiere called "60 Minutes to Infinity: A Tour of the Cosmos." Shows will be at 9:30 and 10:45. Reservations are required.

Current Summer Show Schedule through Labor Day:

Monday	12:30 Robots / 1:30 Dream Big
Tuesday	12:30 Experience the Aurora / 1:30 Apollo 11 First Steps Edition
Wednesday	12:30 Black Holes / 1:30 Fighter Pilot
Thursday	12:30 Search for the Edge of the Solar System / Apollo 11 First Steps Edition
Friday	12:30 Robot Explorers / Humpback Whales

If you would like to schedule a school group, shows are provided on Tuesday and Thursday mornings at 9:30AM. The first two videos listed are the most captivating.

Dream Big – exposes students to a variety of engineering fields

Humpback Whales – depicts migration, communication and breaching patterns of these magnificent creatures

IBEX – Search for the Edge of the Solar System – investigates the boundary between our solar system and the rest of the galaxy

Flight Adventures – describes the history of aeronautics and the 4 forces of flight

Robot Explorers – pays tribute to space probes and the discoveries made using them

Experience the Aurora – shares the science behind the Aurora Borealis

Two Small Pieces of Glass – puts you in the middle of a star party

Planetarium shows can be part of a full-day USAFA visit if desired. To schedule a visit, contact Sandy Lamb. To only schedule a Planetarium show go to this link:

<https://www.usafa.edu/academics/facilities/planetarium/planetarium-show-request/>