Portland/South Portland 2017

Summer STEM Academy

Course Offerings

Thanks to a generous grant from Texas Instruments, the Portland and South Portland school departments are again able to collaborate to offer a selection of courses, free of charge, to rising eighth, ninth, and tenth grade students in our districts.

Courses take place at South Portland High School and Portland High School the weeks of June 26-30 and July 5-7 (shortened due to the Fourth of July holiday). Classes run from 9 am – 12 pm in both locations. Students may register for classes in either district provided they can provide transportation if their course is outside their home district. If transportation within district is a barrier to participation, please contact Angela Marzilli (South Portland) at MarzilAn@spsd.org or Pamela Otunnu (Portland) at Otunnp@portlandschools.org.

Please use the following link to register for courses: https://goo.gl/forms/aGjkJ9SraPxO95Bo1

Registration closes on June 16. We will notify families of confirmed registration the week of June 19. Thank you for your interest in the STEM Academy!

Courses Based at South Portland High School

Backyard Birding June 26-30

Our feathered friends have inspired artists, nature lovers, and scientists alike for generations. In this course, students will learn about the science of birds and their role in the environment. Students will participate in hands-on activities including keeping a birding and nature journal or sketchbook, a feather lab, and designing elements of a bird-friendly backyard. Students will also explore new research into bird intelligence, and learn about how scientists are studying birds to better understand the physics of flight, magnetic fields and navigation, and even using pigeons to detect cancer! The week will end with a live bird demonstration.

3-D Printing June 26-30

Dream it, design it, print it! We will explore 3-D printing using Tinkercad and the elements of DEEP (Discover, Empathize, Experiment, Produce) design thinking to create personal projects and meet design challenges. No prior experience is required.

Surgical Techniques June 26-30 or July 5-7

Have you ever wondered what it would be like to be a physician or surgeon? In this course, you will investigate how the body works by participating in a range of hands-on activities, such as dissections and construction of life-sized physiological system maps (skeletal, nervous,

circulatory, immune). You will conduct simulated surgeries, perform biopsies, and learn how to suture. You will also learn about important medical/surgical breakthroughs and famous medical marvels throughout history.

CSI **July 5-7**

Have you ever wondered how crime scene investigators and forensic scientists process the evidence found at "the scene of the crime" and use it to solve a mystery? In this course you will investigate blood spatter patterns, use handwriting, paper analysis, and ink chromatography to spot forgeries, and solve a final mystery by utilizing multiple branches of forensic science.

Courses Based at Portland High School

Digital Mapping June 26-30 or July 5-7

In our increasingly digital society, location based apps are becoming commonplace. Humans are not only using digital tools to find the bus station or a good place to get a cup of coffee, but are also attributing new meanings to spaces based on digital universes such as Pokemon Go.

In this summer learning opportunity, campers will examine both the real and virtual data related to human use of spaces. We will begin this camp by reviewing various mapping techniques that have been used throughout history. We will also look at some of the ways contemporary mapping data is being used to help inform communities. Campers will use concepts of slow learning, Visual Thinking Strategies, and take a look at the work of the Pulitzer Prize winning journalist Paul Salopek as he tracks the course of human migration in contemporary society. Campers will examine and document these ideas while investigating how humans develop and attribute meaning to certain spaces.

Campers will spend time in the field investigating Portland, collecting location based data using GPS devices. Back in the classroom, we will examine latitudinal and longitudinal coordinates, geotagged photos, and more, experimenting with visually pleasing and useful ways to present location based data. Campers will examine their own digital footprints, reviewing what has been collected and mapped in relation to the places they have visited and may frequent. We hope to be able to focus on student generated topics, such as mapping where the most trash can be found, preparing data in a visually pleasing way in order to ask the city to install solar trash cans. Campers will use the information they collect to define their own idea about what makes a smarter community.

Coding with Scratch, Mbots, and Arduino June 26-30 or July 5-7

Students will program their own interactive stories, games, animations, and robots using Scratch. Scratch is a project of the MIT Media lab and is free. Students will begin by learning the scratch software and then advance to the MakeBlock mBot, a programmable robot. Students will begin by programing the robot using MakeBlock's Scratch 2-based software and advance to programing it as an Arduino device. All of the creations can be shared in the Scratch online community. Students will be able to continue to create and collaborate after the course is over.

The Physics of Amusement Parks June 26-30 or July 5-7

An amusement park is a large hands-on physics laboratory, full of acceleration and rotation, free-falling bodies and vector additions. Newton's laws are experienced with eyes, hands, and body. In our society, physics is becoming more and more important, especially in tourism and

entertainment.

In this summer learning opportunity, learners will focus on the role of physics in the design of an amusement park and its attractions. Students will use not only physics but engineering and design principles to design their own rides and attractions. We will begin by looking at basic physics concept but we will look at them from the lens of "How does this directly impact the things I enjoy doing?" and we will build up from the physics of everyday tools to designing and testing new attractions.

Learners will also get hands-on experience with different probes, motion sensors, and other programs available to describe motion, forces, momentum, and rotation. Depending on the direction of the course and student interest, there is the possibility of a culminating project where students will collect real data about an attraction at FunTown.

Drone-On **July 5-7**

This course will be the opposite of dull, it will literally take flight. Teams will work to build a small arial drone from a scratch. You will learn to fly your drone through an obstacle course as well as to use it to collect data. Uses for drone technology are constantly expanding into civilian and commercial applications; in fact the University of Maine at Augusta has recently begun to offer a drone certification course. This course will provide and opportunity to explore a technology that could lead to a career in a rapidly expanding field.