UCSD Student TECH 2020

Robotics Technology for Grades 5-6 Sponsored by the San Diego Supercomputer Center, University of California, San Diego

Programming Sphero Robotic to Explore an Exciting Mini Amusement Park

Monday- Friday, July 29-July 2, 2020 (four days)

Class meets on the campus of UC San Diego from 8:30 am - 3:00 pm

Course Overview:

How to program a Sphero Mini robotic ball to navigate through a mini amusement park made just for Sphero Mini devices. Use Sphero Edu block programming language to write, save, and run navigational programs that control the Sphero as it goes on mini amusement park rides. Add extra fun movements such as spins, twirls and jumps—even make the Sphero Mini light up!

This course focuses on how to program a robotic ball called a Sphero Mini so students can make it move, jump, spin, and dance. Learn how to navigate the Sphero Mini through a funfilled course that includes rides and thrills in a mini amusement park. Save your code so that the Sphero Mini will be able to race through the park at lightening speeds. Exciting rides include the roller coaster, bumper cars, and merry-go-round. Use your programming skills to command the Sphero Mini to win the arcade games and to navigate through the fun house. No prior coding skills needed.

What you can expect from this workshop:

- An introduction to using the Sphero Mini robotic ball
- How to orient the ball and move it using mathematical calculations
- Practice programming ball in specific angular directions
- A working understanding computer navigational principles
- Learn orientation skills using a 360 degree range
- Share a video of the Sphero Mini following your programming instructions to get through the mini amusement park

Class Structure and Learning Goals:

Each day includes follow-along instruction on how to use the Sphero Mini robotic ball and ample time for students to work individually or in teams so they can apply the concepts they learn in the class to their own navigational program. Students wrap up each day with a group reflection on what they have learned and share what they would like to learn the next day.

Prerequisites:

- Must be a current student in grades 5-6
- Have an interest in learning how to make robots move

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- Eager to ask questions, share ideas, and help others in the class
- No programming experience needed

Each day will consist of instruction and ample time for students to work on their own projects.

Topics to be covered each day include:

Day 1:

- Presentation of Sphero Mini robotic features and capabilities
- Introduction to programming fundamentals
- How to navigate in relation to a 360 degree plane
- Practice moving, spinning, jumping and lighting up the Sphero Mini
- Practice programming directional angular movements

Day 2:

- Try out the mini amusement park rides
- Compose code that work for each ride
- Compare code with other students
- Identify pieces of code that can be repeated

Day 3:

- Practice playing the Sphero Mini arcade games
- Practice navigating through the fun house
- Write code for playing the arcade games
- Write code for navigating through the fun house

Day 4:

- Practice code pieces in the mini amusement park
- Help others to adjust their programs
- Accept help from others on how to improve your program

Day 5:

- Revisions of final navigational programs
- Presentation and filming of all final mini amusement park tours
- Post and share final Sphero Mini amusement park tours

About Sphero Mini and the Sphero Education Site

Sphero Mini is the small version of the Sphero robotic device. The Sphero Mini is part of STEAM-based instruction that encompasses the areas of Science, Technology, Engineering, Art, and Mathematics. Sphero skills combine computer programming, robotic hardware, and collaborative learning to promote creativity and innovation in a fun and engaging way.

Instructor: Ruth Maas, retired computer science teacher, Steele Canyon High School

About Ruth Maas

Ruth Maas taught middle and high school computer science for nearly a decade. She has presented at numerous technology workshops and conferences. She teaches online courses San Diego Supercomputer Center StudentTECH Workshop 2020

in technology including topics such as artificial intelligence, the impact of social media on society, and computer programming.

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