



Sphero City

In this activity, students will design and construct their own "Sphero City". Students will be challenged to build roads, buildings, houses, etc. for Sphero to navigate through. Once the city is designed, students can drive Sphero through or even create a coded program!

Materials

- Sphero Bolt Robot or Sphero SPRK + Robot
- Device to control Sphero (iPad, cellphone, etc.)
- Sphero Play or Sphero Edu App
- Internet access
- Household/classroom items to construct the city

Student Objectives

- Students will be able to construct a city
- Students will be able to research different types of cities to design
- Students will collaborate with peers to move Sphero through the city
- Students will learn programming skills to drive their Sphero robots

Teacher Technology Skills Needed

- Understanding of the Sphero Robots
- Understanding of Sphero Play/Sphero Edu App
- Understanding of how to push out content digitally to students
- Skills for driving and controlling the Sphero Bolt/SPRK+

Standards

NGSS Standards:

- 3-5-ETS1 - Engineering Design
- 3-5-ETS1-2 - Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
- MS-ETS1-1 - Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
- MS-ETS1-2 - Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.



Procedure

1. Start the lesson by sharing with students that they will be creating a city for Sphero to drive through.
2. Students can choose to design their own unique Sphero City or they can make a city from history.
3. Once students have made this decision, they will be ready to take on the challenge of building the city.
4. Students can begin drawing a plan or diagram for the city and conduct research on the city as needed. Students will set up their cities using household/classroom objects (paper, books, blocks, Legos, etc.). This is an opportunity for students to get creative!
5. Once the maze has been assembled, students will use the Sphero to move through the city. This will be done by using the Sphero Play App on Tilt or Drive mode. The Sphero Edu App could also be used to add code to move the Sphero.
6. Students will need to ensure that their Sphero robot can fit in the space provided. In addition, when coding Sphero, students will need to consider how far it will be traveling, turns that need to be made, etc.
7. This can continue until Sphero has been successfully navigated throughout the entire city.
8. This lesson will conclude by having a discussion about what worked, didn't work, and what improvements need to be made to the city as well as key concepts and findings while using the Sphero robot.

Extension Activity

- Task students with the challenge of having Sphero make stops along the way. For example, Sphero can travel to the library or the coffee shop. This will require additional design and programming elements.
- Challenge students by having them share their cities with their peers. Student can even create "checkpoints" or quiz questions along the way for their peers to answer as they move Sphero throughout the city.