Build a Home for Sphero

In this activity, students will design a special home for their Sphero robots. The purpose of the home is to "protect" their robots and to keep it inside without breaking through the materials. Students will use home/classroom items to build a space for Sphero to fit inside. From there, students will try to drive the Sphero and the goal is for the house to stay up.

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 materials to build a home for Sphero

Student Objectives

- Students will learn the basics of motion and force
- Students will be able to identify effective materials to use for creating a sturdy house for Sphero
- Students will collaborate with peers to build a home for Sphero and share observations
- 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-PS2-1 Motion and Stability: Forces and Interactions- Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.
- 3-PS2-2 Motion and Stability: Forces and Interactions
- Make observations and/or measurements of an object’s motion to provide evidence that a pattern can be used to predict future motion.
- 3SL1: Participate and engage effectively in a range of collaborative discussions with diverse peers and adults, expressing ideas clearly, and building on those of others.

- 3SL4: Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.

Procedure

1. Start the lesson by reviewing key motion and force concepts.
2. A review of building strategies can also be done at this point in the lesson. Students can explore different building styles as well as different materials that will effectively protect their Sphero.
3. Once students have completed the lesson overview, they will be ready to take on the building challenge! Students will be using household/classroom objects (paper, books, blocks, cardboard, recycled objects, etc.) to build their “home” for Sphero. This is an opportunity for students to get creative with their designs.
4. Once the house has been assembled, students will place the Sphero Bolt or Sphero SPRK+ inside of the house.
5. Next, students will use the Sphero Play App on Tilt or Drive mode. The Sphero Edu App could also be used to add code to move the Sphero. The goal is for the house to stay in place when the Sphero tries to move through it.
6. Students will use trial and error to keep the house up. During this process, students can document the effectiveness of each material and driving speed/settings.
7. This can continue until the house effectively stays up around the Sphero.
8. This lesson will conclude by having a group discussion about which materials were most effective in holding up the house for Sphero as well as key concepts and findings while using the Sphero robot.

Extension Activity

- Task students with the challenge of designing an additional space for Sphero. Since a house has already been created, perhaps a store, school, building, etc. can be built to protect the Sphero robot. This is going to be a great way to add another creative element to their design process.
- Challenge students by having them create a story to go along with this activity. These stories can be written by hand or done digitally. Once they are created, students can share them out with their peers and have one another read them.