



Bowling Alley Math

In this activity, students will engage in a Sphero Mini bowling activity with a math twist!

Students will set up the bowling pins and use the Sphero to knock the pins down. Students will determine how many pins are left and they will subtract that number from the original number of pins. Additional "pins" or objects can be added on to make this activity more advanced. In addition, students can apply different math strategies such as addition, multiplication, and division to take this activity to the next level!

Materials

- Sphero Mini Robot
- Activity Kit Bowling Pins
- Device to control Sphero Mini (iPad, cellphone, etc.)
- Sphero Play App
- Space to record math problems (paper/pencil or online platform)
- Internet access
- Household/classroom objects to create additional "pins"

Student Objectives

- Students will learn the basics of math operation skills: Addition, Subtraction, Multiplication, and Division
- Students will be able to identify and measure the number of pins based on the operation used
- Students will collaborate with peers to play the bowling game and answer their math questions
- Students will learn programming skills to drive their Sphero Mini robots

Teacher Technology Skills Needed

- Understanding of the Sphero Mini
- Understanding of Sphero Play App
- Skills for driving and controlling the Sphero Mini

Standards

NGSS Standards:

- NY-3.OA.1- Interpret products of whole numbers.
- NY-3.OA.4- Determine the unknown whole number in a multiplication or division equation relating three whole numbers.
- NY-3.OA.5- Apply properties of operations as strategies to multiply and divide.



- NY-3.NBT.2- Fluently add and subtract within 1,000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Procedure

1. Start the lesson by reviewing key math operations with students: Addition, subtraction, multiplication, and division.
2. Once students have an overview of each operation, they will be ready to take on the bowling activity. Students will set up the provided bowling pins (or additional created pins). They can also create a bowling lane, using the Activity Kit rails.
3. We will start off with a subtraction activity. Students will record the starting number of pins (ex: 6).
4. Next, students will use the Sphero Mini to knock down the pins. This will be done by using the Sphero Play App on Slingshot mode and aim it towards the pins.
5. Students will then subtract the number of pins knocked down from the original number (ex: $6-3=3$). They can then share their findings and responses with their peers. This can be done verbally or via an LMS platform.
6. This can continue until all pins are knocked down and can be done with a greater number of pins depending on the level(s) of the students you are working with.
7. This process can be repeated for other operations and will follow a similar path
 - a. Addition: Start with a few pins, knock some down, then add the two numbers together.
 - b. Multiplication: Start with a few pins, knock some down, multiply the two numbers.
 - c. Division: Start with a few pins, knock some down, determine if the two numbers can be divided, if so... divide the numbers!
8. This lesson will conclude by having a group discussion about numbers and operations as well as key concepts and findings while using the Sphero Mini robot.

Extension Activity

- Task students with the challenge of designing additional pins. This can be done using classroom or household objects. The additional pins will be used to add difficulty to the activities and allow for more challenging math activities.
- Challenge students by having them create accompanying word problems to go along with the activity. These word problems can be written by hand or done digitally. Once they are created, students can share them out with their peers and have one another solve them.