Multi-directional Robot Bowling
Student Guide

Multi-directional Bowling Challenge!

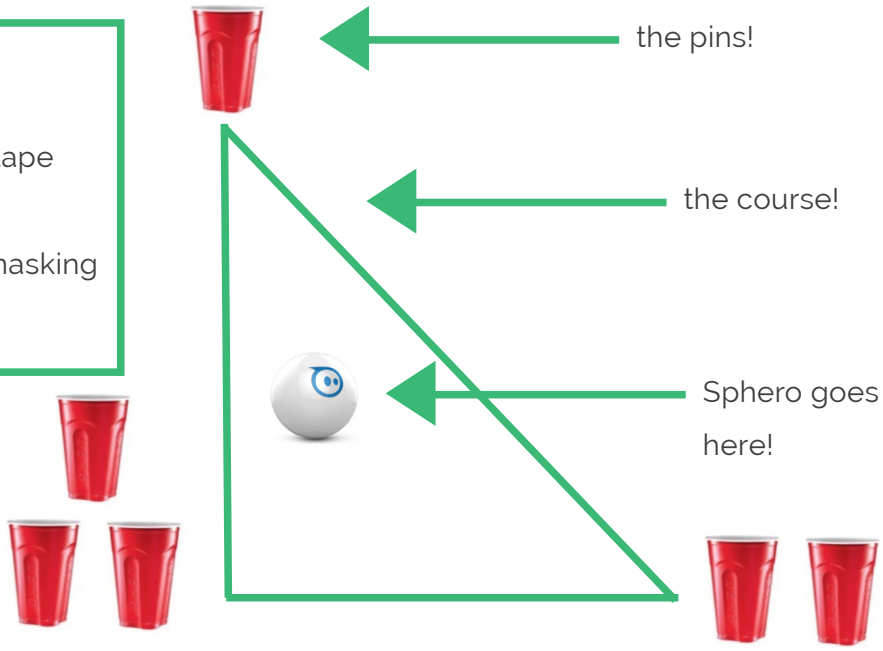
Welcome to the future of bowling with Sphero!

This bowling challenge is a little different than your standard 10-pin game. Use the materials provided by your teacher to create a bowling course with pins at three different locations.

Develop a strategy to knock them over and create a program that will help Sphero to autonomously (without manually driving it) make contact with as many pins as possible.

You will need to:

- 1 Sphero
- A ruler
- A measuring tape
- A protractor
- Electrical or masking tape



The Rules:

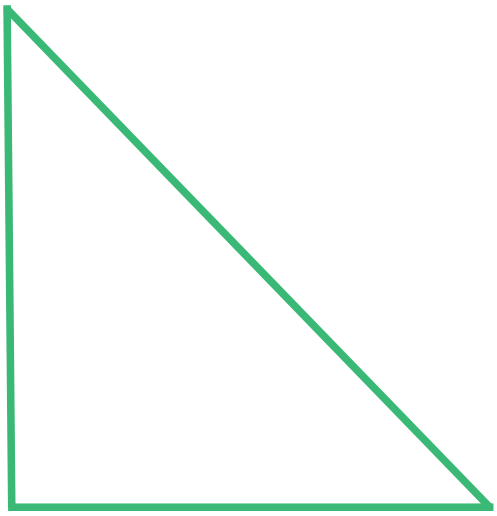
1. Your course should be an exact **14:1 scale** of the image on this worksheet.
2. Sphero should begin the game at the exact **center** of the course.
3. You will have **1 minute** for Sphero to make contact with or knock down as many pins as possible.
4. Your program must run **autonomously**. You cannot touch Sphero or control its movements manually with a smart device during the game.

Step 1: Create a course for your game.

1. Accurately measure the size and shape of the triangular course.

Make sure to note exact measurements for each line and each angle.

Label this image with your measurements.



2. Find the precise middle of the triangle.

Add lines and measurements to the diagram to show how you determined this intersection.

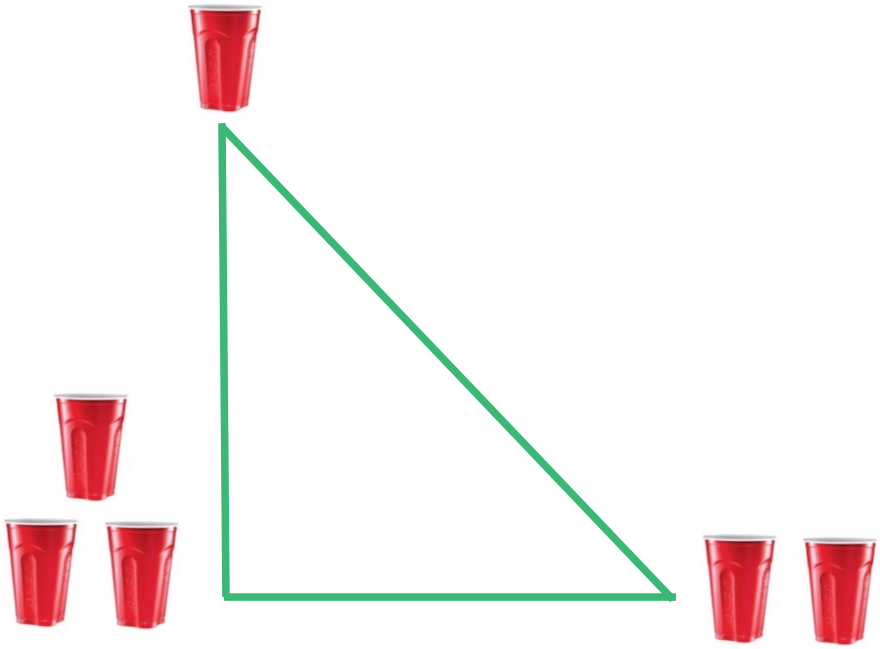
3. Use the material provided by your teacher to create a life-size bowling course for Sphero.

This can be completed on a smooth flat surface, such as the floor of your classroom, using masking tape or electrical tape.

The bowling course should be created as an exact 14:1 scale of the drawing.

Measure carefully!

NOTE: Do not create the course on top of a table or desk, unless there is a strong barrier to prevent it from falling. Sphero will roll quite a bit while you are testing your program and it may be damaged in a fall.



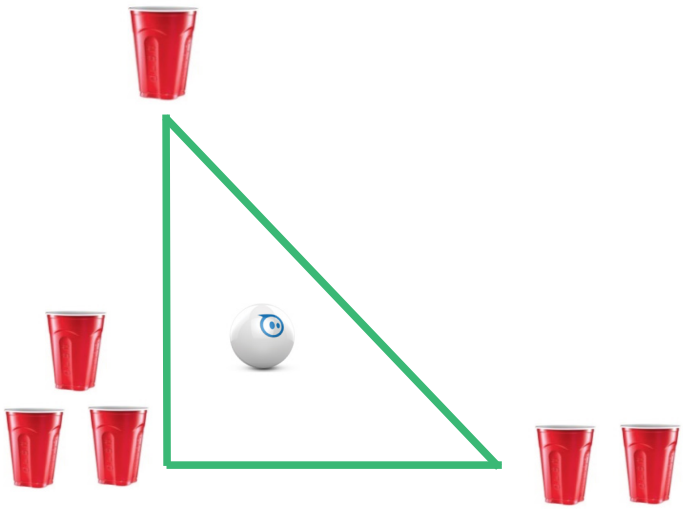
4. When the course is complete, add the pins and mark the exact center of the triangle. This is where Sphero will begin the game.

Step 2: Plan your strategy.

1. You will now need to determine how to program your Sphero so that it makes contact with (or knocks over) as many pins as possible.

Working with a partner, think about the course and brainstorm as many ideas as possible.

List your ideas here.
(Try to think of at least 3 different strategies.)

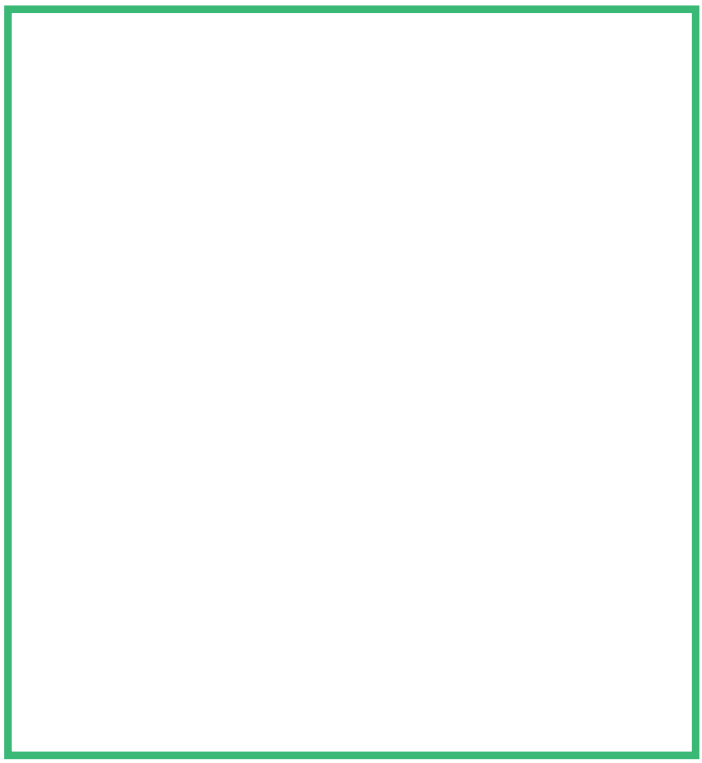


2. Select one strategy to develop and test. Which one have you selected and why?

3. Write the lines of code you are planning to achieve this strategy.

Step 3: Create and test your solution.

1. Create the code and write it here. Write any notes about your program in the space beside it.



2. Test your code and document the results of your testing. Complete several trials to make sure your strategy and code work consistently.

Trial	Settings	Results (Pins Knocked Over)
1		
2		
3		
4		
5		

Step 4: Evaluate your program.

1. Did your program work as expected?

Describe something that worked well and something that did not work well, or did not work as expected.

Worked Well	Did Not Work Well or As Expected

2. Describe any changes you made to your program to make it more effective.

Make sure to note how many pins you were able to knock down with your final program.