

DRAW 3: PERIMETER

OVERALL TIME 1- to 2-hour lesson

GROUPS Three to four kids

PROGRAMMING LEVEL Draw: Manual Movement, Distance, Direction, Speed, and Color

CONTENT THEME Math

OBJECTIVE

- I can calculate the perimeter of multiple shapes using an equation.
- I can use the Sphero BOLT's sensors to gather data.
- I can create and execute a Draw program.

OVERVIEW

This lesson introduces you to the sensor data in the Draw Canvas. Use this data to calculate the perimeter of a square, rectangle, triangle, and rectangle with unknown side length.

MATERIALS

- Sphero BOLT
- Writing utensil

EXPLORATION: PERIMETER

Perimeter is the path around a two-dimensional shape. We will be using the Sphero Edu app's sensor data to calculate an approximate perimeter of three different shapes.

SKILLS BUILDING: SQUARE PERIMETER

Think about these questions on your own or with a partner before watching the video below.

► <https://youtu.be/K0tU3an6Bcw>

- What is a perimeter?
- How do you calculate a perimeter?
- Which sensor data do you think could help you measure the perimeter of a shape that the Sphero BOLT draws?

Follow the instructions in the video above to draw a square. Make sure it is two blocks by two blocks.

Use the location graph in the sensor data to calculate the perimeter of this square. (Remember that perimeter is the sum of all sides).

- What unit of measure does the location graph show?

Draw a representation of the same square on the Draw 3_Perimeter.pdf handout (https://sphero-media-sphero-prod.s3.amazonaws.com/cwist/picturesteps/c4/6f/Draw%203_Perimeter.pdf). Be sure to label the sides of your square.

Use the location sensor data from the graph to measure each side of the square. Remember that a square has four equal sides. Now calculate the perimeter of this square using the blank equation on the handout. *How big is your square?*

SKILLS BUILDING: PROPERTIES OF A RECTANGLE

Start a new Draw program and name it "Rectangle."

A rectangle has four straight sides like a square, but can have one pair of opposite sides that are longer than the other pair.

Draw a rectangle and have your partner check your rectangle for accuracy. Make it three squares by five squares. Run the program so your Sphero BOLT makes a rectangle.

Watch the sensor data. *How is it the same and different from the square?*

Now, just like you did with the square, draw your rectangle on the handout. Use the location data to help you calculate the perimeter of your rectangle. Show your work on the handout.



EXPLORATION: PROPERTIES OF A TRIANGLE

Start a new Draw program and name it "Triangle."

A triangle has 3 straight sides and 3 points (or vertices).

Draw a triangle and be sure to have your partner check your triangle for accuracy. Run the program so your Sphero BOLT makes a triangle.

Watch the sensor data. *How is it the same and different from the square and rectangle?*

Now, just like you did with the square and rectangle, draw your triangle on the handout. Use the location data to help you approximate the perimeter of your rectangle. Show your work on the handout.



CHALLENGE: DIFFERENT SHAPES

Draw a shape with 6 sides in the draw canvas and calculate the perimeter of the shape the Sphero BOLT makes.

What is the name of a shape with six sides?

REFLECTION

Reflect on what you learned with the Sphero BOLT:

- *How do you calculate the perimeter of a shape?*
- *When would you need to calculate the perimeter of a shape in real life?*