



## OoR Tech – Sphero SPRK Session Briefs

rev 20180123

Grade Range: All (split into pre/new readers+ and readers+)

Prerequisite: Block Based Programming

Before starting OoR Tech SPRK sessions, we highly recommend all students have some block based programming experience.

Suggested starting points are (from code.org):

Pre / New-Readers: <http://thefoos.com/webgl/>

Readers: <https://studio.code.org/s/mc/stage/1/puzzle/1>

Note: Pre / New Readers are generally considered to be grade 2 and under.

Readers are generally considered to be grade 3+. Feel free to adjust according to school baseline.

### **SPRK Intro – All grades:**

35-60mins

Intro day - students are introduced to SPRK+ robots. A simple program shows them various sensors the robot uses to interact with the world around it. Students are shown the Sphero EDU app and walked through the basics of how the UI works and how to use it.

Pre/New Readers: shown the drive panel and create their first draw based program

Readers: shown drive panel and create their first block based program

From here we split into dedicated session groups:

Pre / New Readers+ Sessions

or

Readers+ Sessions

## **Pre/New Reader+ Sessions**

### **SPRK In Water – Pre / New-Readers +:**

25-30mins

Water day – students will use SPRK robots in a water table as an interactive class on how things float. The core reasoning behind why items float or sink will be introduced (density and displacement). Students will be asked to compare the reduced traction of the robot running in water vs the robot running on the ground (friction). A materials ability to hold water out may also be explored (permeability) time permitting.

### **SPRK Program Canvas Intro – New Readers+ with assistance:**

30-40mins

First Program Day – Students will be shown the program canvas and how to create a new program, name it and then add a two roll commands and delay command to make the robot roll away from them at a set heading, speed and duration and then roll back.

### **SPRK Jumps – Pre / New Readers+**

30-60mins

Jumping SPRK – Students have fun learning to aim SPRK and practising their driving skills by trying to jump the robot over a few jump ramps. Taking turns watching peers will be encouraged as students will, one by one, practice getting their SPRK over the ramps. Students not driving their SPRK can watch the effect of the ramp angle vs how far SPRK goes in the air as a means to explore real world examples of projectile motion and trajectory.

### **SPRK Paints – Pre / New Readers+**

30-60mins

Painting with SPRK – Students learn about abstract expressionist painter Jackson Pollock and his famous “drip paintings”. The session promotes team building and collaborative work skills by having students create a “Jackson Pollock type” art piece by taking turns dipping a robot in paint and driving it around a canvas. When all students have had a turn the art is complete.

## Reader+ Sessions

### **SPRK Makes Shapes, Part 1 - Readers+:**

60-75mins

Loops intro / refresher and intro to variables – students will be challenged to create a square with the robot by using a loop and a variable. Concepts of program flow will be explored. Some basic math will be used to modify a variable that will be used to control the direction of the robot. Conditional loops may be explored time permitting.

### **SPRK Makes Shapes, Part 2 - Readers+:**

55-60mins

Explore loops and variables further – students will build upon the "square" program (created in Part 1) to create a new "polygon" program. A second variable will be added to control the robots heading change (previously set statically to increment by 90 degrees). We will explore how various regular polygons can be created by changing the value of our new variable.

### **SPRK becomes a compass, Part 1 – Readers+:**

55-60mins

Intro to If Then Else statements – students will build a "compass" program that will use the If Then statements to have SPRK speak the direction it is pointing. SPRK aim function will be used to calibrate the robot's orientation system to a regular compass. Part 1 will have the students start by aiming the system and developing a program to have the robot speak out when it is pointing north.

### **SPRK becomes a compass, Part 2 – Readers+:**

60mins

Further explore If Then Else statements – students will build upon the "compass" program they created in Part 1 by adding additional If Then Else statements to have the robot speak out when it is pointing East, South and West (North handled in part 1).