



Sphero Activity Mat 1

Teaching Guide

Designed to work with the Sphero 2.0, SPRK, SPRK+, Sphero Mini and the Sphero Edu platform, the Sphero Activity Mat 1 is a wonderful resource for use in the classroom that will develop key coding skills, linking to everyday curriculum outcomes. Supported by a multitude of great activities.

In use, simply open up the Sphero Edu app, connect your Sphero to your device, roll out the mat and students from ages 4 right up to 16+ will be ready to go and create their own algorithms, problem solve and debug using the Draw, Block or Text projects, while Sphero navigates through each engaging activity.

Measuring 1220mm x 2010mm, the Sphero Activity Mat 1 is a robust vinyl floor mat. Its wipe clean, tough wearing surface is designed for classroom use.

Sphero Activity Mat 1 is best used with a group of students and at least two Spheros.

Sphero Activity Mat 1

Australian Curriculum Links

BY USING SPHERO ACTIVITY MAT 1 IN YOUR CLASSROOM, YOU COULD POTENTIALLY COVER THE FOLLOWING CONTENT DESCRIPTIONS FROM THE AUSTRALIAN CURRICULUM

Curriculum Area	F-2	3-4	5-6	7-8	9-10
Digital Technologies	Follow, describe and represent a sequence of steps and decisions (algorithms) needed to solve simple problems (ACTDIP004)	<p>Define simple problems, and describe and follow a sequence of steps and decisions (algorithms) needed to solve them (ACTDIP010)</p> <p>Implement simple digital solutions as visual programs with algorithms involving branching (decisions) and user input (ACTDIP011)</p>	<p>Design, modify and follow simple algorithms involving sequences of steps, branching, and iteration (repetition) (ACTDIP019)</p> <p>Implement digital solutions as simple visual programs involving branching, iteration (repetition), and user input (ACTDIP020)</p>	<p>Design algorithms represented diagrammatically and in English, and trace algorithms to predict output for a given input and to identify errors (ACTDIP029)</p> <p>Implement and modify programs with user interfaces involving branching, iteration and functions in a general-purpose programming language (ACTDIP030)</p>	<p>Design algorithms represented diagrammatically and in structured English and validate algorithms and programs through tracing and test cases (ACTDIP040)</p> <p>Implement modular programs, applying selected algorithms and data structures including using an object-oriented programming language (ACTDIP041)</p>
Mathematics	<p>F</p> <p>Sort, describe and name familiar two-dimensional shapes and three-dimensional objects in the environment (ACMMG009)</p> <p>Yr 1</p> <p>Recognise and classify familiar two-dimensional shapes and three-dimensional objects using obvious features (ACMMG022)</p> <p>Measure and compare the lengths and capacities of pairs of objects using uniform informal units (ACMMG019)</p> <p>Yr 2</p> <p>Describe and draw two-dimensional shapes, with and without digital technologies (ACMMG042)</p> <p>Identify and describe half and quarter turns (ACMMG046)</p>	<p>Yr 3</p> <p>Measure, order and compare objects using familiar metric units of length, mass and capacity (ACMMG061)</p> <p>Identify angles as measures of turn and compare angle sizes in everyday situations (ACMMG064)</p> <p>Yr 4</p> <p>Compare and describe two dimensional shapes that result from combining and splitting common shapes, with and without the use of digital technologies (ACMMG088)</p> <p>Compare angles and classify them as equal to, greater than, or less than, a right angle (ACMMG089)</p>	<p>Yr 5</p> <p>Calculate perimeter and area of rectangles using familiar metric units (ACMMG109)</p> <p>Describe translations, reflections and rotations of two-dimensional shapes. Identify line and rotational symmetries (ACMMG114)</p> <p>Estimate, measure and compare angles using degrees. Construct angles using a protractor (ACMMG112)</p> <p>Yr 6</p> <p>Connect decimal representations to the metric system (ACMMG135)</p> <p>Solve problems involving the comparison of lengths and areas using appropriate units (ACMMG137)</p> <p>Investigate, with and without digital technologies, angles on a straight line, angles at a point and vertically opposite angles. Use results to find unknown angles (ACMMG141)</p>	<p>Yr 7</p> <p>Compare, order, add and subtract integers (ACMNA280)</p> <p>Establish the formulas for areas of rectangles, triangles and parallelograms, and use these in problem-solving (ACMMG159)</p> <p>Yr 8</p> <p>Carry out the four operations with rational numbers and integers, using efficient mental and written strategies and appropriate digital technologies (ACMNA183)</p>	<p>Yr 9</p> <p>Calculate areas of composite shapes (ACMMG216)</p>

Sphero Activity Mat 1

Racetrack Challenge

Challenge: To send Sphero around the racetrack.

Sphero Edu Program: Block or Text project

Grades: 3 to 10

Duration: Up To 1 Hour

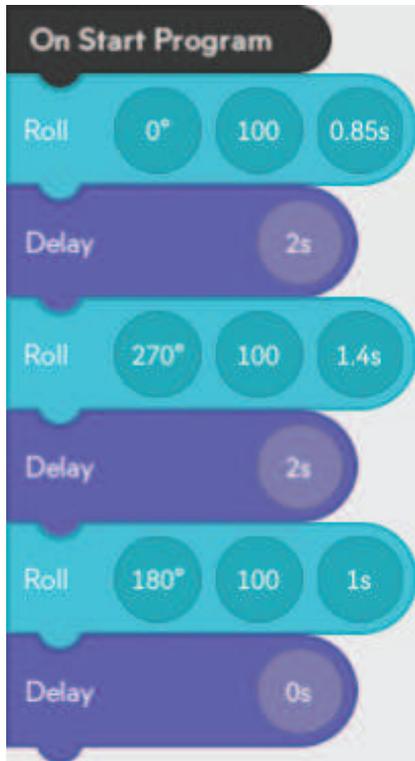
Activity:

Roll out the Sphero Activity Mat 1. Make sure that it is placed on a flat surface and that you leave plenty of space around it for students to solve challenges on the mat.

Divide students into pairs or groups of 3. Students can work together to program the Sphero around the Green Racetrack Challenge on the outside of the mat.

Ensure that the Sphero is fully charged and that Bluetooth is turned on on your device. Hold the Sphero close to your device and access the Sphero Edu app. The Sphero will connect automatically. Create a either a new Block or Text program.

Students will have to take account of headings, angles, speed, distance and time while programming the Sphero around the track.



The example program opposite gives students the first few instructions to complete the racetrack (slight modifications of speed or duration maybe needed). They will have to complete the rest of the racetrack on their own.

While completing the racetrack take images and videos as evidence that you have completed it. It's always good to share your successes!

You can extend this activity by:

1. Complete the racetrack backwards from the finish to the start.
2. Give students a speed limit (e.g. no more than 80).
3. Give students a time limit to get to the finish (e.g. beat the clock).
4. Race 2 spheros against each other.

Sphero Activity Mat 1

Circles Challenge 1

Challenge: To answer mathematical questions

Sphero Edu Program: Drive, Block or Text project

Grades: P to 10

Duration: Variable

Activity:

Roll out the Sphero Activity Mat 1. Make sure that it is placed on a flat surface and that you leave plenty of space around it for students to solve challenges on the mat.

Divide students into pairs or groups of 3. Students can work together to drive or program the Sphero around the numbered circles.

Ensure that the Sphero is fully charged and that Bluetooth is turned on on your device. Hold the Sphero close to your device and access the Sphero Edu app. The Sphero will connect automatically. Create either a new Block or Text program or use the Drive function to roll your Sphero around.

Students will answer mathematics questions by programming or driving Sphero to move to one of the numbers.

The teacher may ask '5+6' or 'square root of 81' or any mathematics questions for the students to answer.

You can extend this activity by asking students to answer multiple questions at once changing the colour at each answer and adding a delay, e.g.

Question 1 - Sphero Colour Red - '10-2' wait 5 seconds

Question 2 - Sphero Colour Blue - '7+2' and so on so the sphero moves around the mat to complete a sequence.

Sphero Activity Mat 1

Gates Challenge

Challenge: Send Sphero around the course performing several actions as it goes through each gate

Sphero Edu Program: Block or Text project

Grades: 3 to 10

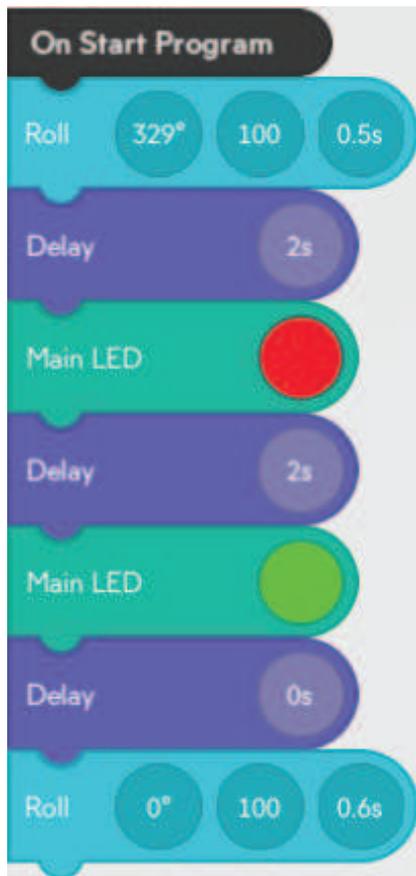
Duration: Up To 1 Hour

Activity:

Roll out the Sphero Activity Mat 1. Make sure that it is placed on a flat surface and that you leave plenty of space around it for students to solve challenges on the mat.

Divide students into pairs or groups of 3. Students can work together to drive or program the Sphero around the numbered circles.

Ensure that the Sphero is fully charged and that Bluetooth is turned on on your device. Hold the Sphero close to your device and access the Sphero Edu app. The Sphero will connect automatically. Create a either a new Block or Text program.



Beginning at 'START HERE' and finishing at 'FINISH HERE' students have to follow the instructions at each gate.

The example program opposite gives students the first few instructions to complete the challenge (slight modifications of heading, speed or duration maybe needed). They will have to complete the rest of the course on their own.

While completing the gates challenge take images and videos as evidence that you have completed it. It's always good to share your successes!

To further extend the challenge you can do 2 things.

1. Complete the Gates Challenge backwards from the Finish to the Start.

2. Devise your own instructions at each gate. You and your peers could program the Sphero to change to different colours in time with music at Gate 1 or program the Sphero to recite a short poem at Gate 4. Be as creative as possible!