Overview:

Sphero Edu provides a toolset that is unbounded in its potential. It's not our role to limit young minds and place them on an established path, but to knock down the barriers and let them forge their own. We believe that sometimes the best lessons are the ones we teach ourselves. While coding and 21st century skills are necessary, our program also goes beyond code by incorporating robotics and technology with collaborative STEAM activities, nurturing students' imaginations in ways no other education program can.

Our cross-platform apps are approachable for all skill levels and allow users to progress with ease, enabling us to reach as many minds as possible and provide ongoing challenges. Think outside the bot and inspire your future.

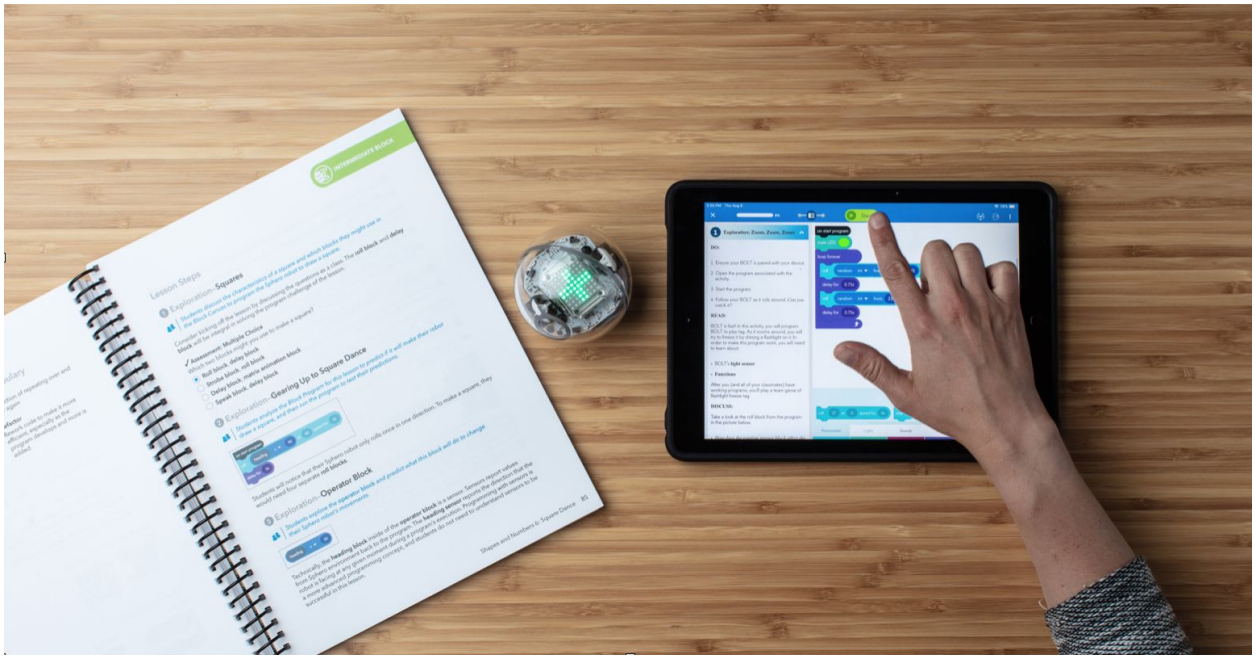
Below are sample pathways for students from second grade through high school. It shows how the Sphero Edu ecosystem can be used to learn computational thinking skills, engineering design, computer programming all with a strong cross curricular connection to Science.

Throughout the users' journey they will progress through three types of hardware and content:

BOLT + Computer Science Foundations: 3rd-6th

CSF with Sphero BOLT teaches STEAM principles through computer science over three 24-lesson courses. Each cross-curricular lesson builds on the previous one and allows teachers and students to grow together. By the end of Course 1, students will demonstrate proficiency with the Draw Canvas

and know how to use block programs to manipulate lights and sounds and create loops and conditionals. By the end of Course 2, students will demonstrate a mastery of block programming by manipulating sensors, loops, conditionals, variables, and functions. They will also understand block to text transitions. And by Course 3, students will be able to develop complex programs with the Block Canvas and rewrite simple block programs in JavaScript.



Sample Lessons with Objectives & Standards:

CSF Course 1: Nature 2 - Pollination

Summary: Overview What's all the buzz about? This Sphero robot is a busy bee today in your classroom. Let's see how you can program it to pollinate flowers and return to its hive ready to make honey.

Objectives:

(1) I can calibrate distance as related to the Draw Canvas.

(2) I can program Sphero to change colors.

NGSS Standards: 3-LS1-1, 3-5-ETS1-1, 3-5-ETS1-2, 3-5-ETS1-3, MS-ETS1-1, MS-ETS1-1

CSF Course 1: Nature 7 - What a Seed Needs

Summary: Water, warmth, sunlight… imagine you're just a little seed in the big big world, where resources aren't always plentiful! Let's play a seed survival game to see if you're one of the lucky seeds. First, you'll have to learn about new control blocks and comparators so you can fix the program.

Objectives:

(1) I can use if/then blocks with comparators to control when blocks in my program are executed.
(2) I can read code carefully to find and debug my errors.
NGSS Standards: 3-LS1-1, 3-5-ETS1-1, 3-5-ETS1-2, 3-5-ETS1-3, MS-ETS1-1, MS-ETS1-1

Course 2: Empathy 7: Good Vibes

Summary: Did you know that one of every five students reports being bullied? In this lesson, you'll see how quickly bullying can bring down classroom community, and how to put an end to it. Everyone has a voice in raising awareness of bullying. Whether you are a student, educator, or parent, it's important to remember to spread kindness, not cruelty.
Objectives:
(1) I can use IR communications to make my Sphero BOLT respond to another BOLT.
(2) I can use IR communications to send messages to other Sphero BOLTS.
(3) I can program BOLT with a positive and negative response using lights, sound, and movement blocks.
NGSS Standards: 3-5-ETS1-1, 3-5-ETS1-2, 3-5-ETS1-3, MS-ETS1-1, MS-ETS1-2,

Course 3: Navigation 5: Sphero Compass

Summary: Fix this Sphero BOLT compass and you'll never be lost. But, first you'll need to learn all about JavaScript punctuation!
Objectives:
(1) I can use my knowledge of JavaScript punctuation to fix code on the Text Canvas.
(2) I can use a compass precisely for a real-world purpose, like orienteering.
NGSS Standards: 3-5-ETS1-1, 3-5-ETS1-2, 3-5-ETS1-3, MS-ETS1-1, MS-ETS1-2

RVR + littleBits: 6th-8th

RVR is Sphero's revolutionary take on the programmable robot. It's drivable right out of the box, packed with a diverse suite of sensors, and built for customization. This tank-style robot is a hackable mobile platform for beginners, educators, students, and tech hobbyists. Build the robot of your dreams and then program it with the Sphero Edu app. Pair RVR with Sphero littleBits, which is a hands-on learning system of electronic building blocks that allows students to create with technology through the engineering design process. Our snap-together Bits are easy to use and simple to understand, and pair perfectly with RVR to expand and go beyond programming.

Lesson 1: [RVR + BOLT IR]

Summary: Using the built-in infrared sensors in RVR and BOLT, program one robot to follow RVR as it rolls around the room.

Objectives:

(1) I can understand conditional statements and see the impacts of the programming with conditionals
(2) I can use BOLT and RVRs infrared technology to communicate from one robot to the next.
(3) I can analyze data from tests to determine similarities and differences among several design solutions.

Standards: MS-ETS1-1, MS-ETS1-2, MS-ETS1-3

Lesson 2: [littleBits Trailblazer with RVR]

Summary: RVR is ready for adventure! But things keep getting in its way. Good thing you have a way to help it clear its path. Using RVR and littleBits STEAM Student Set, you'll create a maze with obstacles, use RVR to program through the maze, and build a trailblazing invention with littleBits keep RVR from hitting any of the obstacles.

Objectives:

(1) I can develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved
(2) I can develop a program that complements a specific design solution to navigate a maze.

Standards: MS-ETS1-1, MS-ETS1-2, MS-ETS1-3, MS-ETS1-4

Lesson 3: littleBits Sample collector OR Box mover:

Students will be asked to create a simulation of Amazon's automated fulfilment robots using a Sphero RVR, Sphero BOLT, various littleBits bits, and other craft supplies. As part of the challenge, students will also need to account for Amazon's safety system that stops all robots when a human presence is detected (using IR) and restarts from where they left off when the IR message is no longer detectable.

Objectives:

(1) Students will learn how a semi-autonomous program can be created for Sphero RVR using block-based programming.
(2) Students will troubleshoot issues that may arise when introducing the IR interruptions.
(3) Students will design and engineer a forklift using select littleBits bits that will raise and lower shipping boxes at designated locations
(4) Students will communicate effectively within their team and within the whole group in order to successfully complete the simulation
(5) Students will coordinate efforts in order to ensure each team's work will work in conjunction with one another

NGSS Standards: MS-ETS1-1, MS-ETS1-2, MS-ETS1-3, MS-ETS1-4

RVR + 3rd Party Hardware: 9+

Driving RVR is just the beginning. RVR's extremely hackable platform, featuring a 4-pin UART and an onboard power source, allows you to connect and run third-party hardware like a Raspberry Pi, BBC micro:bit, or Arduino. Build the robot of your dreams and then program it with the Sphero Edu app.

Example Lessons:

1) BOLT + RVR Raspberry Pi: You'll use your RVR with a Raspberry Pi connected, as well as a BOLT bot (or few) to follow your RVR (per instruction from an asynchronous python script).

2) Ultra Sonic RVR, *autonomously drives and avoids collisions, Raspberry Pi*
This project turns RVR into an autonomously driving robot that avoids collisions with walls and other objects 💥. In this tutorial, we'll attach HC-SR04 sensors to the front of the RVR that will send out waves and time how long the waves take to return (after bouncing off of an object in front of the RVR). When the time to return dips below a certain point, we'll turn the RVR to avoid the obstacle.

3) Arduino Weather BOT: *Temperature and humidity, science lesson, programming in C++*
Turn your RVR into your very own WeatherBot! While it can't *control* the weather, it *can* measure and show the current temperature on an alphanumeric display, and also set its (RVR's) LEDs to a color that corresponds to the temperature

4) SparkFun Kit + Camera: *Raspberry Pi: Fully autonomous driving RV*
The SparkFun Advanced Autonomous Kit for Sphero RVR provides all the functionality of the basic kit with the addition of time-of-flight distance sensing in the front and rear. Based around Raspberry Pi's small yet powerful Zero W model, the kit provides distance sensing, global positioning, and vision to the Sphero RVR.