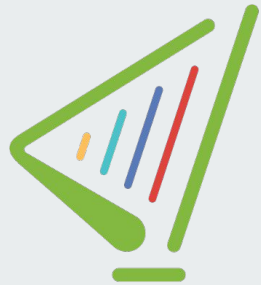





Teacher Webinar

May 2022



**CODING
IRELAND**

Agenda

1. Introduction
2. Robotics in the Classroom
3. Coding School Awards
4. Open teacher chat 

Introduction

- Meet once a month online. We will send invites to all teachers on the list.
- Coding Ireland present a new coding/STEM topic each month.
- Open teacher chat at the end to discuss common issues and ideas.
- Help each other to become better at teaching coding & STEM.
- Webinar is being recorded for teachers that can't make it.

Robotics in the Classroom



What is a robot?



A **robot** is simply a machine, and more particularly a machine that is programmable by a computer.

Robots can be humanoid in form or they can be a vacuum cleaner. They can be very complex in what they do or just perform a basic task.

Robotics on the other hand, is the design, construction, and operation of robots.

What is a robot?



When we're teaching students about robots and robotics in the classroom, we'll normally be using some simple scaled down robots that let us teach the students about the key concepts and how we can build and program them.



Programming Robotics



What are the considerations as a teacher?

- Extra technology & equipment needed (beyond PC/laptop)
- Setup
- Charged/powering
- Taken care of
- Fixed if not working

All of this is extra time that needs to be considered. The time needed becomes less as you and the students become more familiar with the equipment.



Programming Robotics

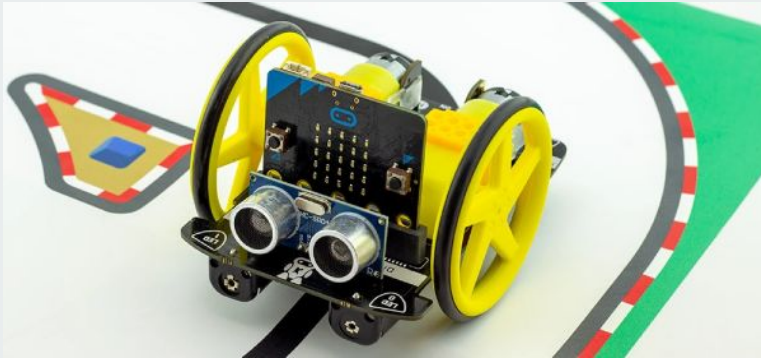
What robotic kits should you use?

There's lots of different classroom robotics kits that are available to use. There's hundreds to choose from and the list is getting bigger all the time as new kits are developed.

We'll go through some of our favourites later but to use them they all have basically the same process:

1. Learn what it is
2. Build it
3. Program it
4. Run it

Programming Robotics



Learn it

This is a robot car called the Move Motor made by a company called Kitronik. It has motors, line following sensors, a distance sensor and LEDs that you can program. To program it, you need a micro:bit which slots into it and acts as its brain.

Programming Robotics



Build it

Robotic kits designed for learning will always come with some instructions which should guide you and your students through the steps to put it together.

This robot car is well designed and really quite simple to build. All we need to do is power it with some AA batteries, click on the wheels and then slot in the microbit which we'll program.

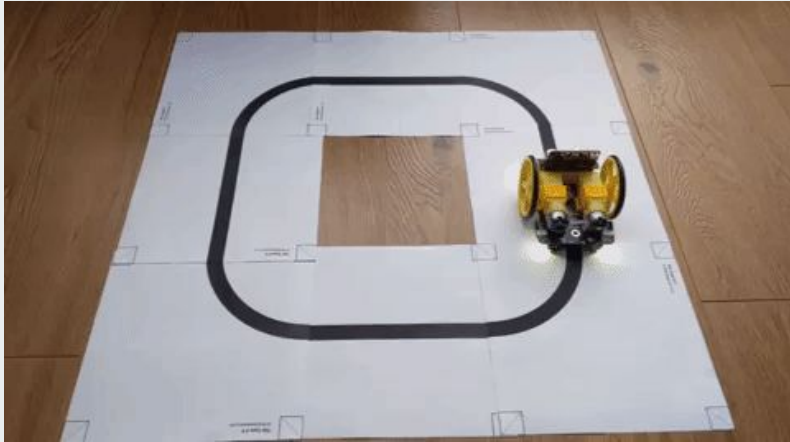
Programming Robotics



Program it

There are many different ways we could program this car, we could use the sonar distance sensors on the front, we could program it to drive around a predetermined pattern, we could even use a second microbit to act as a remote control or we could use the line sensors to program it to follow a track.

Programming Robotics



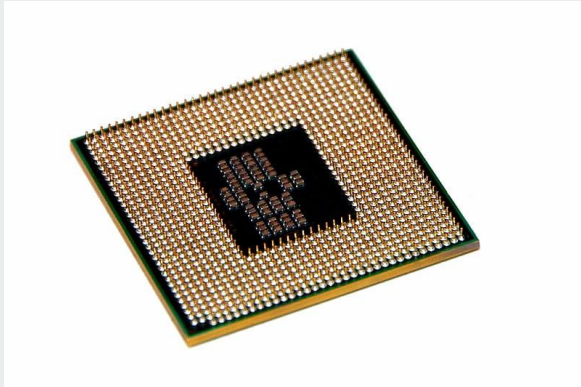
Run it

Once the code is written we want to run it and observe the robot car to see if it successfully does what we wanted, which is to detect and follow the track.

If it doesn't do what we wanted then we analyse what went wrong and then try and fix it in the code.

So generally that's what programming robotics entails, learning about it, building it, programming it and then running it.

Common robotics parts



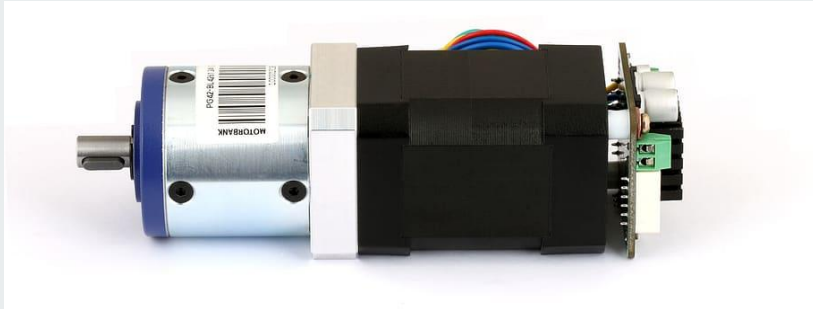
Microprocessor

A microprocessor is the central unit of a computer system that performs arithmetic and logic operations.

It's often known simply as a processor, a central processing unit, or as a logic chip.

It's essentially the engine or the brain of the computer that goes into motion when the computer is switched on.

Common robotics parts



Motors

Motors are the devices which make the robot movable.

Motors convert electrical energy into physical motion. The vast majority of them produce either rotational or linear motion.

The most common use would be to power a wheel where you would program the motor to spin a particular direction at a particular speed.

Common robotics parts



Servos

A servo motor rotates parts of a robot with high efficiency and with great precision.

The output shaft of this motor can be moved to a particular angle, position and velocity that a regular motor does not have.

A servo motor utilises a regular motor and couples it with a sensor for positional feedback.



Common robotics parts



Inputs (sensors)

Robots often need to have sensors so they can interpret and interact with the outside world. There are lots of different sensors that robots can have, some of the most common are:

- Sonar
- Accelerometer
- Light Sensor
- Sound Sensor
- Compass
- Thermometer
- Line Sensor

What we recommend



Microbits

We recommend using kits that are compatible with microbits for these reasons:

1. Easy to program (blocks, JavaScript & Python)
2. Very versatile
3. Huge amount of kits & accessories
4. Relatively inexpensive

What is a Microbit?

A Microbit is tiny programmable computer, designed especially for learning and teaching coding.

It has a processor inside it (like the brain of the computer) and has the following:

- an accelerometer (for sensing movement).
- a compass (for sensing direction).
- a microphone.
- a speaker.
- Bluetooth and USB port for connectivity.
- a display consisting of 25 LEDs lights.
- two programmable buttons.
- and can be powered by either USB or an external battery pack.



Some Example Kits

Coding School Awards



Coding School Awards



The Coding School Awards are designed to recognise the efforts and achievements of Irish schools in teaching coding & STEM to their students.

They aim to highlight the work of teachers and schools in bringing these important subjects into the classroom and presenting new opportunities for students to learn about, use and program technology.

Coding School Awards



To qualify for an award, schools must demonstrate the levels of teacher training and classroom hours dedicated to coding & STEM for the category(s) they are applying for.

CATEGORY	AWARD	QUALIFYING CRITERIA	
		TEACHERS TRAINED IN CODING	CLASS CODING HOURS PER YEAR
Coding School For schools using basic coding languages such as Scratch and other block based languages.	Silver	1+	5+
	Gold	3+	10+
	Platinum	3+	30+
Robotics School For schools programming robots, circuits, sensors and cars.	Silver	1+	5+
	Gold	3+	10+
	Platinum	3+	30+
Web Design School For schools using web programming languages such as HTML, CSS and JavaScript.	Silver	1+	5+
	Gold	3+	10+
	Platinum	3+	30+
Programming School For schools using advanced programming languages such as Python, C, Java etc.	Silver	1+	5+
	Gold	3+	10+
	Platinum	3+	30+

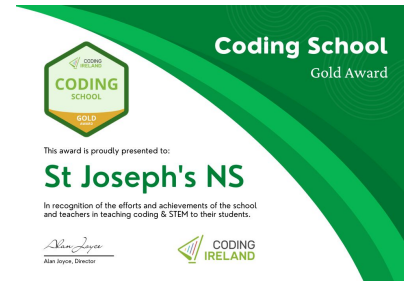


Coding School Awards



For each category that a school qualifies for, they will receive:

1. An award flag
2. A certificate
3. A digital badge



Teacher chat ☕