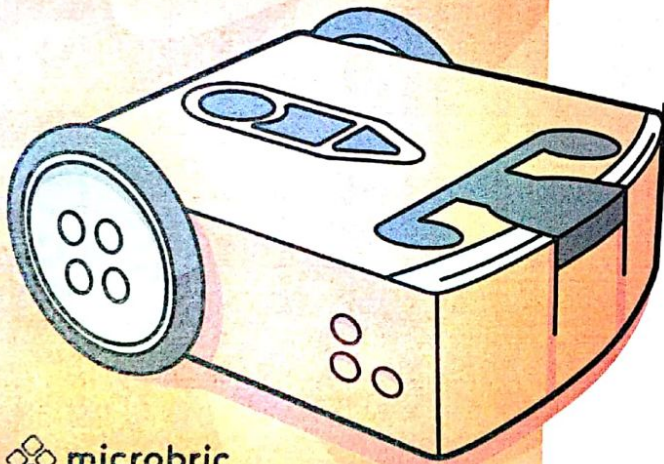


Congratulations on
successfully completing
this professional
development training!



 micro:bit



Barco dea
EdBlocks
EdScratch
edblocksapp.com
edscratchapp.com

This certifies that

Has completed training course

Completing professional development hours of

Provided by

Date completed

Authorizing signature

Don't stop now! There's lots to learn
and share with your students.

Discover more at www.meetedison.com

Edison Features and Benefits

- Edison is a complete STEAM teaching resource for coding and robotics education.
- Edison is affordable at less than US\$50 per unit and just US\$33 each for a full class set.
- Easy-to-use with no coding experience required, Edison is compact and durable.
- Ideal for students from K-12 and perfect for schools to use across multiple classes.
- Edison's transparent top allows you to see the robot's electronic components, enabling better understanding of the science and engineering elements in play.
- Edison is easy to use with seven pre-programmed robot activities set by barcodes, including remote control driving with most standard TV or DVD remote controls. Teach Edison to avoid obstacles, follow a line or torch or even sumo wrestle.
- Edison is modular and easily expandable with LEGO bricks which can be attached to the top and bottom of the Edison robot. LEGO pegs can also be attached to the sides. Multiple Edison robots can also be attached together.
- Thanks to built-in sensors, lights and sounds plus autonomous behaviour capabilities, true robotics education is possible with Edison. Edison can:
 - Respond to light and sound
 - Follow lines and avoid obstacles
 - Read pre-set barcode programs
 - Communicate with other Edison robots
- Program Edison with any of our three free web-based programming languages – no software to purchase or install:
 - **EdBlocks** – A drag-and-drop block-based language developed using open source base code from MIT and Google, perfect for introducing anyone to programming.
 - **EdWare** – A hybrid graphical robot programming language combines the ease of drag-and-drop graphical icons with increased functionality from text-based entry.
 - **EdPy** – Based on the popular computer programming language, Python, EdPy makes text-based programming fun while taking students to a more advanced level of coding.
- There are loads of free resources available from www.meetedison.com including over thirty lesson plans, teacher's guides, three activity books and an EdMat.
- Edison is programmed via an EdComm programming cable (included) which plugs into your headphone jack. This allows Edison to be programmed from devices that don't have USB ports, such as iPads. You can even hear your program download into Edison!
- Edison takes 4 'AAA' batteries (not included).

Edison social

Looking for us online?

You can find our official channels below:



FACEBOOK

MeetEdison



PINTEREST

MeetEdison



TWITTER

MeetEdison



INSTAGRAM

Meet_Edison



LINKEDIN

Meet-Edison



YOUTUBE

Microbric

Sensors and inputs

Obstacle detection: Left and right infrared obstacle detection sensors

Remote control capability: Edison can be programmed to learn codes enabling it to respond to commands from most standard TV/DVD remote controls

Infrared data comms: Transmit and receive data between two or more Edison robots

Line tracker: Single line tracking sensor, which doubles as a barcode reader and programming port, enabling Edison to follow dark coloured lines

Light sensors: Left and right visible light level sensors

Sound sensor: Single sound sensor to detect loud sounds, such as claps

Outputs

Drive: Differential drive system with two wheels that can drive forwards and in reverse

Infrared data comms: Transmit and receive data between two or more Edison robots

Sound: Single small speaker capable of a range of frequencies

Lights: Left and right red LED lights

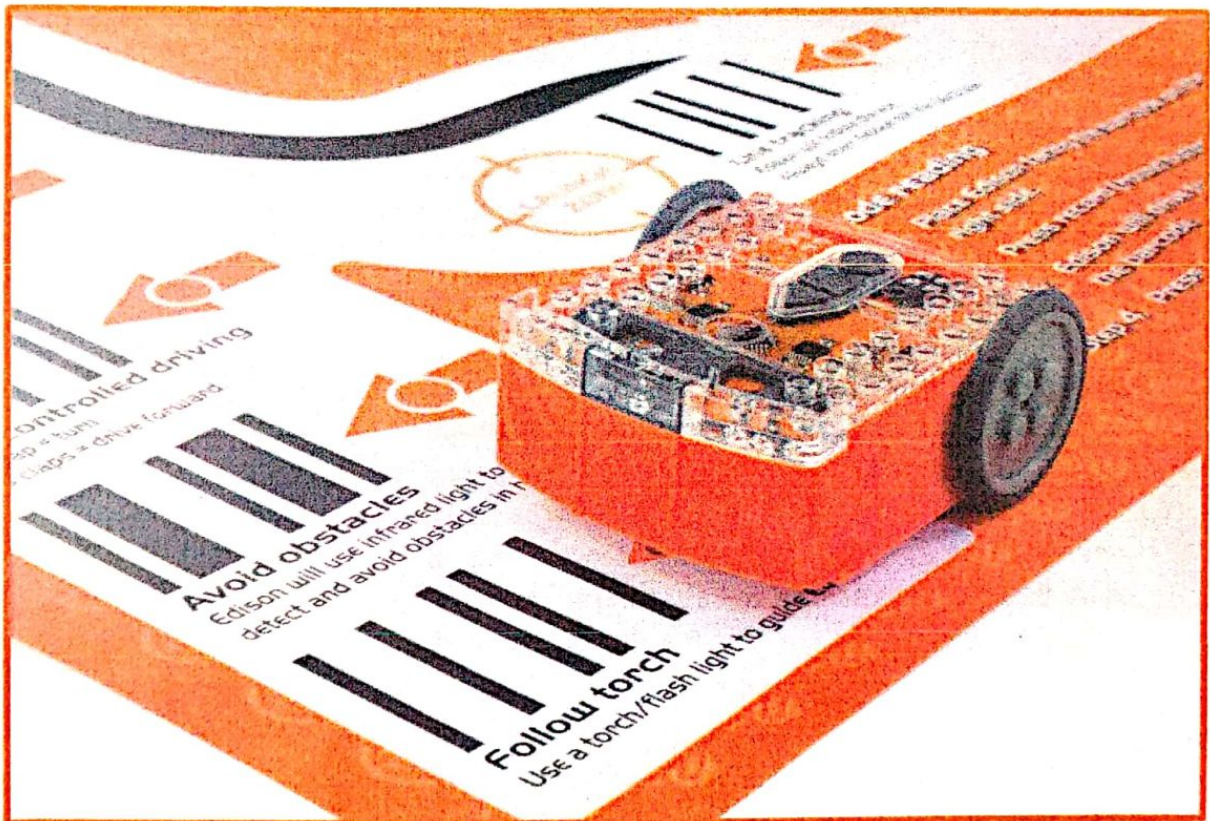
Requirements

Battery: 4 x AAA (UM 4) – Not included



Your EdVenture into robotics

Barcodes and Edison



www.meetedison.com



The Barcodes and Edison EdBook by Brenton O'Brien is licensed under a Creative

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Introduction

Edison is your new robot buddy who will teach you about electronics, programming and robotics in a fun, hands-on way.

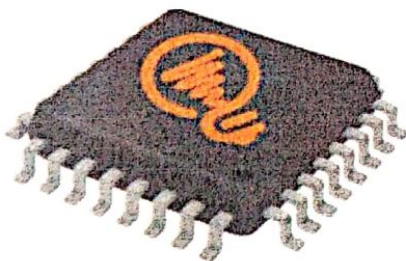
Edison is equipped with all the sensors, outputs and motors needed to introduce you to the amazing world of robotics.

That's great, but what is robotics? Well, that's not an easy question to answer. Edison's creator, Brenton O'Brien says that *"a robot is a machine that can behave autonomously."* This means that a robot can 'think' in a way. A robot can make decisions on its own and act on those decisions. Many other people have different definitions, but we like this one as it's nice, simple and applies to what you're about to learn.



This is the Edison robot

Robotics wouldn't be possible without electronics. Your Edison robot has its own electronics which you can see through the transparent top. There are resistors, capacitors, transistors, motors and more. The most important electronic part is Edison's microcontroller.



Edison's microcontroller

The microcontroller is like Edison's brain. It's where all the robot's 'thinking' happens. Edison's microcontroller is very similar to the processor chip inside a computer, only much smaller. Just like a processor chip in a computer, Edison's microcontroller contains programs. These programs are what allow Edison to 'think' and make decisions.

Record 1press = download
3presses = record barcode

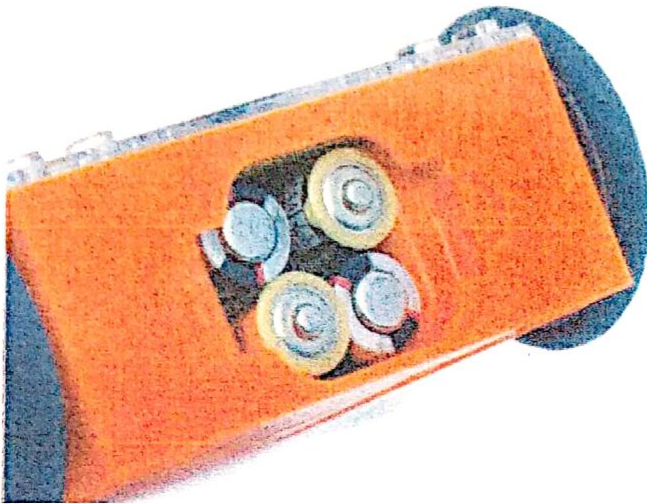
Edison comes with pre-loaded programs that are activated by driving the robot over special barcodes. Here is a sample barcode that activates Edison's line tracking program.



A barcode that activates Edison's line tracking program

Getting started

Let's get Edison ready to go!



First, open the battery compartment and remove the EdComm programming cable. Next, insert 4 'AAA' batteries. Refer to the image and be sure that the batteries are in the correct way. Clip the battery cover back on.

Ensure the batteries are in the right way

Turn Edison on by sliding the power switch to the 'on' position. Edison will make a chirping beep, and the robot's red LED lights will start flashing when the robot is powered on.



Push the switch towards the 'on' symbol

Edison is ready to go!

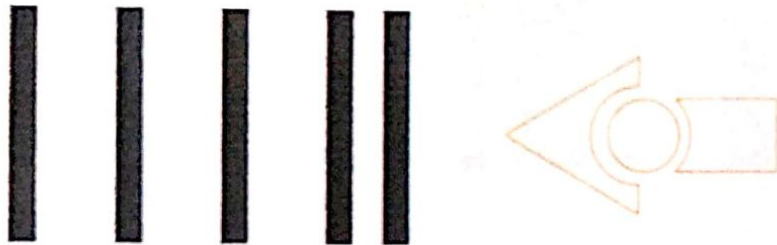
EdVenture 1 – Clap controlled driving

Edison is equipped with a sound sensor and can detect loud sounds, like clapping.

This barcode activates Edison's 'Clap controlled driving' program. The program 'listens' for a loud sound, like a clap. When Edison detects a loud sound, the robot responds by turning to the right. If the robot detects two claps, it will drive forward, then stop.

Read the barcode

1. Place Edison above the arrow on the right side, facing the barcode
2. Press the record (round) button 3 times
3. Wait while Edison drives forward and scans the barcode



Barcode - Clap controlled driving

What to do

To run the program, place Edison down on a flat surface and press the play (triangle) button.

Now, with your hands close to Edison, clap your hands one time. The robot will turn right. Now clap your hands twice. Edison will drive forward about 30cm.

Next, try tapping Edison with your finger, first one time, then two times.



EdFact

Sound sensors just like the one in your Edison are used in modern cars to detect when the engine fires each cylinder. This information is fed to the car's computer to ensure that the firing is occurring at just the right time. If the engine is firing too late, it can cause damage to the engine. Ensuring that the firing is happening at just the right time also ensures the most economical fuel consumption.

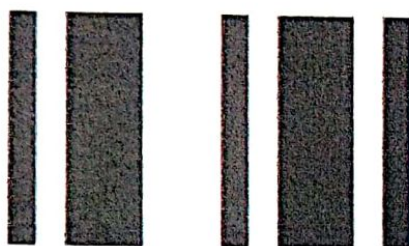
EdVenture 2 – Avoid obstacles

Edison can 'see' invisible light, called infrared light, and use it to detect obstacles.

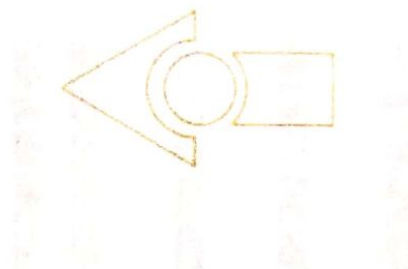
This barcode activates Edison's 'Avoid obstacles' program. This program drives Edison forward. Then, when an obstacle is detected, the robot reverses and then turns on the spot away from the obstacle. Then Edison will continue to drive forward.

Read the barcode

1. Place Edison above the arrow on the right side, facing the barcode
2. Press the record (round) button 3 times
3. Wait while Edison drives forward and scans the barcode



Barcode – Avoid obstacles

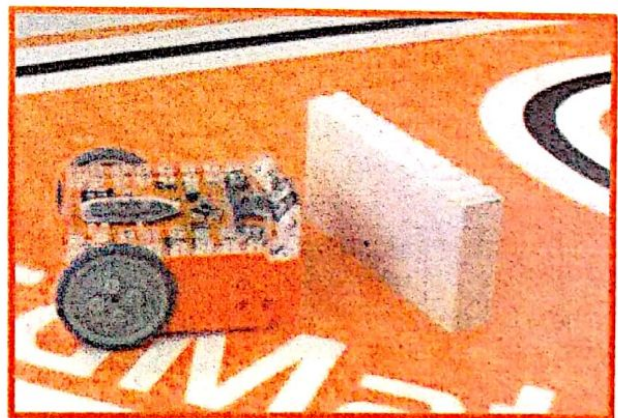


What to do

Assemble some objects to be obstacles for Edison to avoid. The obstacles need to be at least the same height as Edison (3.5cm/1.5in) and opaque (not see-through) but not too dark (not black).

To run the program, press the play (triangle) button. Watch Edison approach an obstacle, then turn away to avoid colliding with it.

Next, why not build a maze and see if Edison can escape from it?



EdFact

Edison's obstacle detection system uses infrared (or 'IR') light, which is invisible to us because it has a longer wavelength than the human eye can see. Your remote control uses this same IR light to tell the TV to change the channel!

Edison emits IR from two light emitting diodes (LEDs), one on the left and one on the right. In between the two LEDs is an IR sensor. The sensor detects when IR is reflected from an obstacle. If the IR is reflected from the left LED, then the obstacle is on the left. If the IR is reflected from the right LED, then the obstacle is on the right.

Is Edison not behaving? Does the robot bump into obstacles or turn when the object is still really far away?

EdVenture 3 - Follow a torch

Edison loves light! When you run this program, the robot will drive towards the brightest light source – even if that means falling off the table. Look out, Edison!

This barcode activates Edison's 'Follow a torch' program. (In American English, a torch is known as a flashlight.) The program uses Edison's light sensors and motors to make the robot follow the brightest source of light it can detect.

Read the barcode

1. Place Edison above the arrow on the right side, facing the barcode
2. Press the record (round) button 3 times
3. Wait while Edison drives forward and scans the barcode



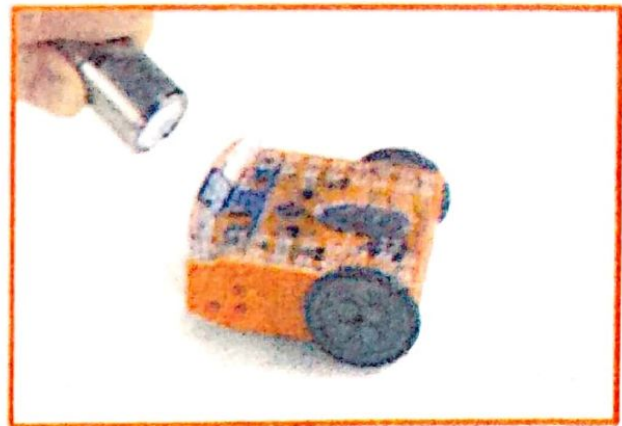
Barcode - Follow a torch

What to do

You will need a torch/flashlight and a flat surface away from any other really bright sources of light, such as sunlight.

To run the program, press the play (triangle) button and aim your torch at Edison. Once the robot 'sees' the bright source of light, it will drive towards it.

You can control how Edison drives by moving the torch. *Does this behaviour remind you of anything?*



EdFact

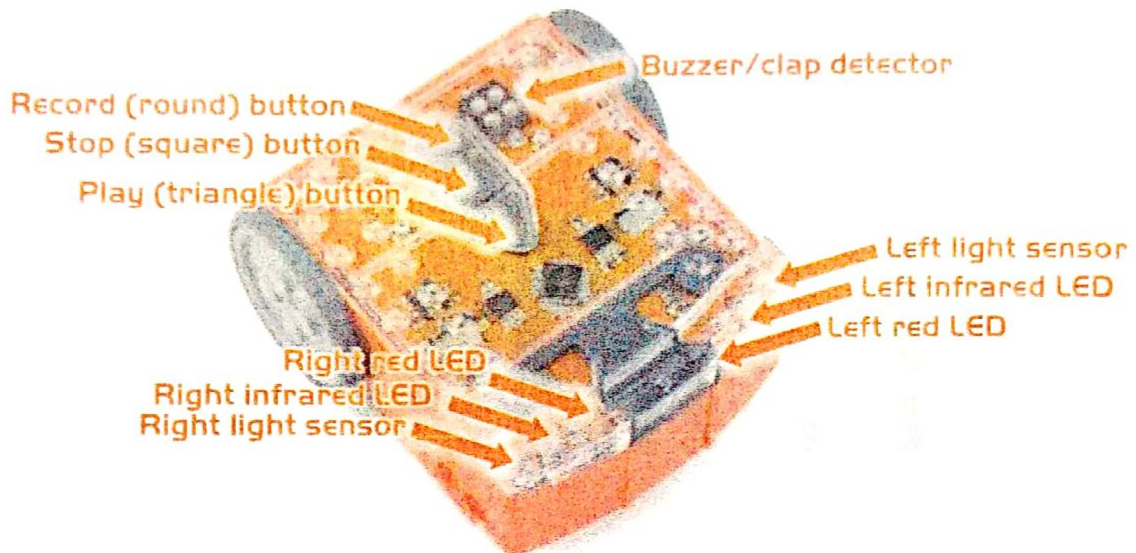
This is one of Edison's most interesting programs because it mimics the behaviour we see in some flying insect. Have you ever seen moths on a hot summer night swarming around a bright light? This type of behaviour is called 'phototropism' and is also found in plants that grow towards the sun.

This program is also very interesting because Edison is behaving autonomously. This means that Edison is 'thinking' and responding to changes in the environment without any help. *Does Edison's ability to behave autonomously mean that Edison is alive?*

Get to know Edison

To use your Edison, you're going to need to know where all of the robot's sensors are and what the three buttons do. Have a look at the images below. You may need to come back and have another look as you go through the EdVentures in this book.

This is the top of the Edison robot



Play (triangle) button – Press to start a program
 Stop (square) button – Press to stop a program
 Record (round) button – 1 press = download a program from a programming app
 3 presses = read a barcode

Flip Edison over and look at the bottom of the robot. This is where Edison's power switch and line tracking sensor are located.

There is one more part that came with Edison: the EdComm cable. The EdComm cable is used to download programs to Edison. It connects into the headphone socket on your computer or tablet.



This is the bottom of the Edison robot



EdComm programming cable

You won't need the EdComm cable to use the barcodes, but keep in some place safe! You will need this programming cable when you use Edison with the programming apps.

EdVenture 4 – Line tracking

Line tracking is a very popular robotics activity because it's fun to watch the robot go around and around a track. How does it work? Is it magic? Is it magnetic?

This barcode activates Edison's '*Line tracking*' program. The program uses Edison's line tracking sensor and motors to follow the edge of a black line.

Read the barcode

1. Place Edison above the arrow on the right side, facing the barcode
2. Press the record (round) button 3 times
3. Wait while Edison drives forward and scans the barcode

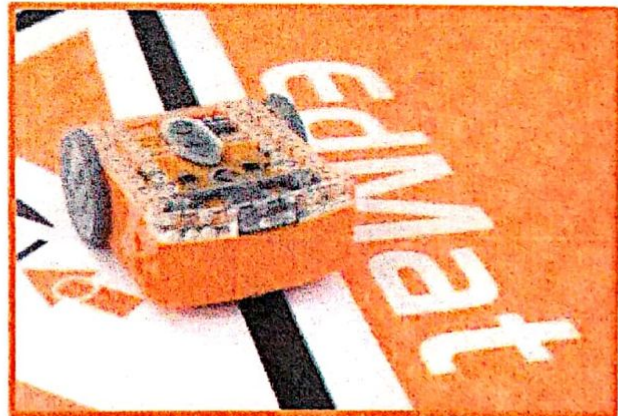


Barcode – Line tracking

What to do

The first thing you need is a line. You can print the small track on the next page, print the large A1 (84cm x 59cm) EdMat from meetiedison.com/edmat/ or make your own line using black electrical tape on a white table (the line must be 1.5cm/0.6in thick).

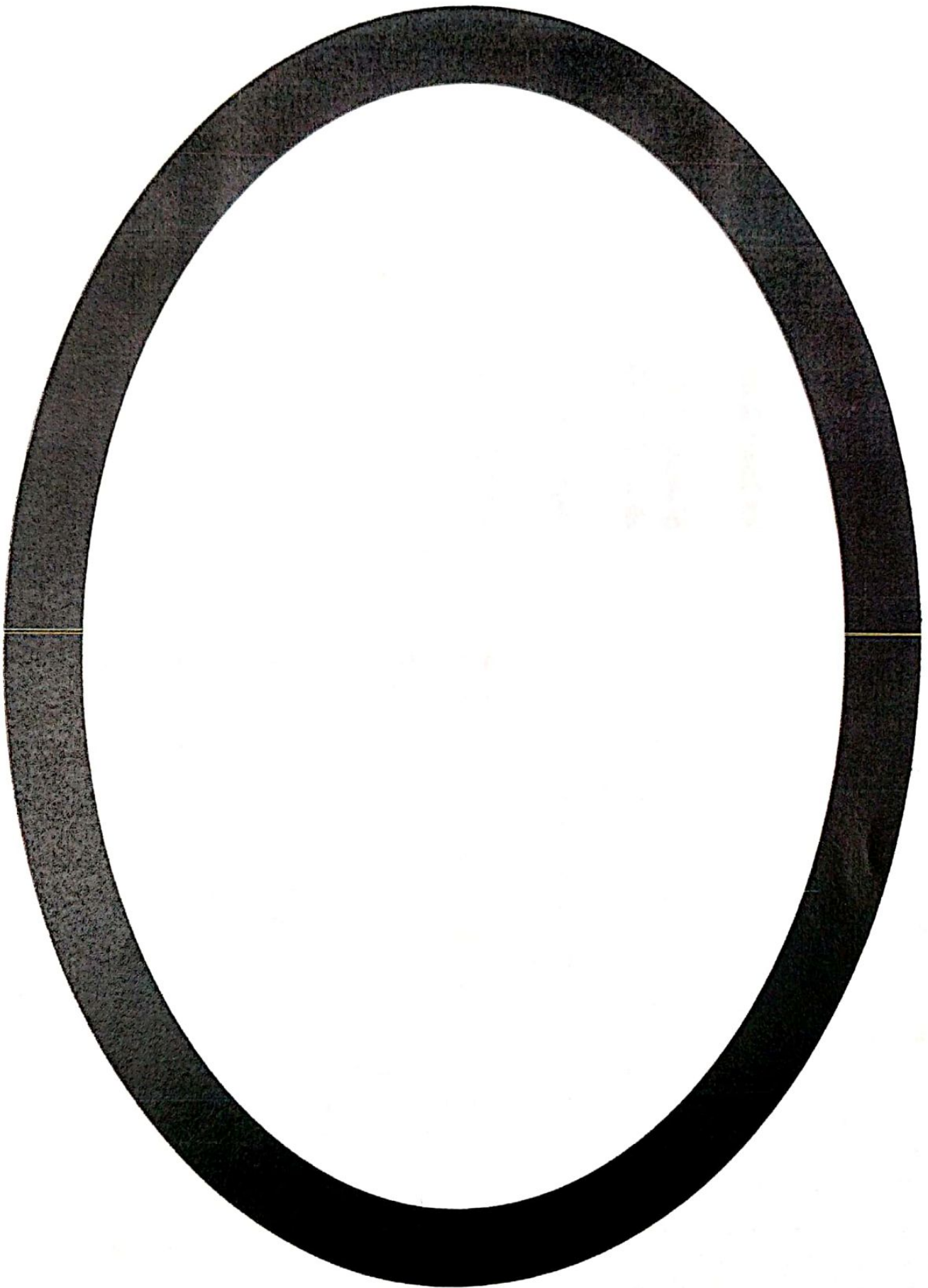
To run the program, place Edison to one side of your line. Make sure that the line tracking sensor is on **white**. Don't place the sensor directly on the line. Then, press the play (triangle) button and watch Edison find and follow the line.



EdFact

Edison's line tracking sensor is made up of two parts: a red LED light and a light sensor. The red LED shines light beneath the robot. The light sensor then measures the amount of light that is reflected back. If the surface is white, it reflects lots of light, and the light sensor gets a high light reading. If the surface is black, it does not reflect much light, and the light sensor gets a low light reading.

When Edison runs the '*Line tracking*' program, the robot is in a constant state of dissatisfaction. When Edison is off the line, it turns right to get on the line. But when Edison is on the line, it turns left to get off the line. This results in Edison 'waddling' on the



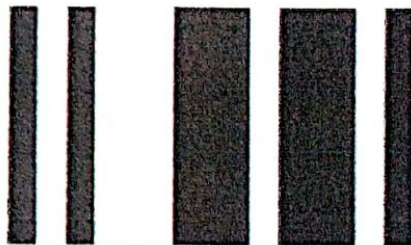
EdVenture 5 – Bounce in borders

Ever heard of Dromophobia? Well, it's a fear of crossing the street, and we're going to give a version of it to Edison! Cue evil laugh...*Muwahaha!!!*

This barcode activates Edison's '*Bounce in borders*' program. The program uses Edison's line tracking sensor and motors to stop the robot from crossing a black line.

Read the barcode

1. Place Edison above the arrow on the right side, facing the barcode
2. Press the record (round) button 3 times
3. Wait while Edison drives forward and scans the barcode



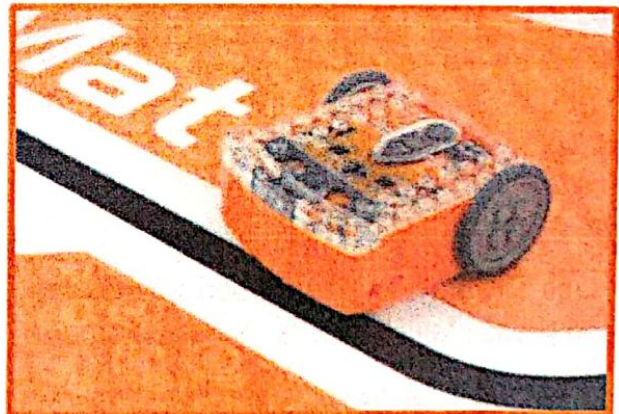
Barcode – Bounce in borders



What to do

The first thing you need is a shape with a dark border. You can print the small track on the last page, print the large A1 (84cm x 59cm) EdMat from meetedison.com/edmat/ or make your own shape using black electrical tape on a white table (the line must be 1.5cm/0.6in thick).

To run the program, place Edison inside the borders. Make sure that the line tracking sensor is on **white**. Don't place the sensor directly on the line. Then, press the play (triangle) button. Edison will drive forward until the line tracking sensor detects the line, then reverse back, turn, and continue driving.



EdFact

The '*Line tracking*' and '*Bounce in borders*' programs are fun, but there's a serious use for them too. Warehouses that use robots to move items around use lines or markers on the ground to guide the robots to their destination. These robots in Amazon's warehouse are using barcode markings on the floor to navigate.

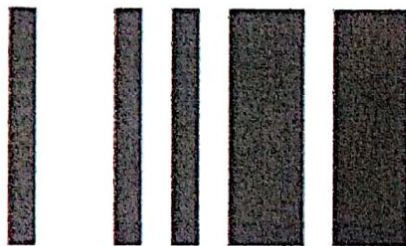
EdVenture 6 – Sumo wrestle

Bring on the robot wars!

This barcode activates Edison's 'Sumo wrestle' program. The program brings together the 'Bounce in borders' program to keep the robot in the ring plus a version of obstacle detection to locate and attack the opponent.

Read the barcode

1. Place Edison above the arrow on the right side, facing the barcode
2. Press the record (round) button 3 times
3. Wait while Edison drives forward and scans the barcode



Barcode – Sumo wrestle

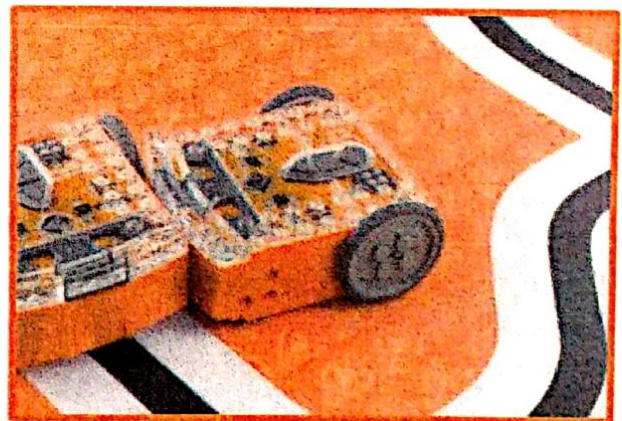
What to do

Print the large A1 (84cm x 59cm) EdMat from meetiedison.com/edmat/ or create your own sumo wrestle ring using black electrical tape on a white surface. The ring should be at least 40cm (16in) in diameter.

Place at least two Edison robots inside the ring and press play on both at the same time.

Each Edison will slowly drive forward, staying inside the ring and 'looking' for the opponent. If a robot detects an opponent, that Edison will charge forward at full speed until it detects the edge of the ring. The robot then reverses back victorious and continues to look for another opponent.

Battles don't always go to plan, however. There are so many variables, such as the angle of the opponent, the proximity of the edge of the ring and just plain bad luck! *Keep up the good fight, Edison!*



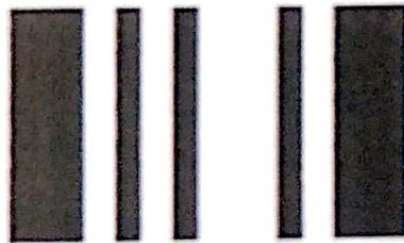
EdVenture 7 - Remote control driving

So you really want to control your Edison? Here's your chance to control Edison like a remote control car. And you can do it with your TV remote control!

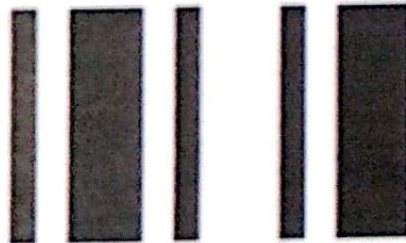
These barcodes allow Edison to learn commands from your TV or DVD remote control.

Read the barcode

1. Place Edison above the arrow on the right side, facing the barcode
2. Press the record (round) button 3 times
3. Wait while Edison drives forward and scans the barcode
4. Press a button on your TV/DVD remote that you want to match to that barcode's action



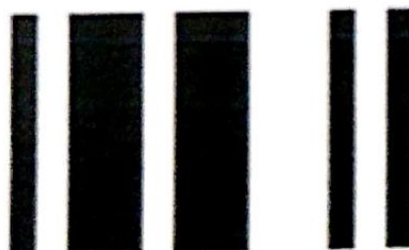
Barcode - IR learn drive forward



Barcode - IR learn drive backward



Barcode - IR learn spin left



Barcode - IR learn spin right

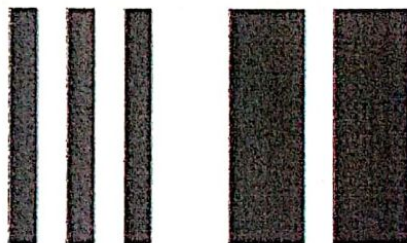




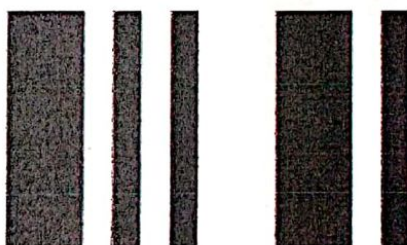
Barcode – IR learn turn left



Barcode – IR learn turn right



Barcode – IR learn play beep



Barcode – IR learn play tune

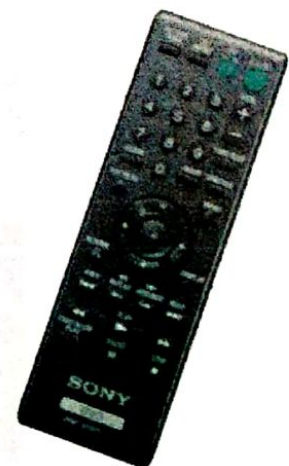


What to do

Teach Edison each barcode one by one. Use buttons on your remote control that align with the action Edison will perform. For example, use an 'up' arrow (like 'volume up') for 'drive forward'. You can make changes whenever you want by rescanning the barcode and pairing a different button, so play around with which buttons suit you the best.

Now go driving!

Edison is compatible with around 75% of TV and DVD remote controls. If one of your remotes doesn't happen to work, try another one. If none of your remotes work, then you can purchase an inexpensive 'universal remote' and set it to be a Sony DVD remote control, which works well with Edison.



Calibrate obstacle detection

You can regulate the sensitivity of Edison's obstacle detection system. By making the obstacle detection system more sensitive, Edison can detect obstacles further away. By making the system less sensitive, Edison will only detect very close obstacles. Follow the instructions on this sheet to adjust your Edison's obstacle detection system.

Read the barcode

1. Place Edison above the arrow on the right side, facing the barcode
2. Press the record (round) button 3 times
3. Wait while Edison drives forward and scans the barcode



Barcode – Calibrate obstacle detection

Set maximum sensitivity

After scanning the barcode, set Edison down on a table or desk and remove any obstacles in front of Edison. Then press the play (triangle) button. Edison is now in calibration mode.

The left sensitivity is calibrated first.

1. Repeatedly press the play (triangle) button, which increases sensitivity, until the red LED on the left is flickering.
2. Repeatedly press the record (round) button, which decreases the sensitivity, until the LED completely stops flickering.
3. Press the stop (square) button to switch over to calibrate the right side.
4. Repeatedly press the play (triangle) button until the right red LED is flickering.
5. Repeatedly press the record (round) button until the LED completely stops flickering.
6. Press the stop button to complete the calibration.

Custom sensitivity

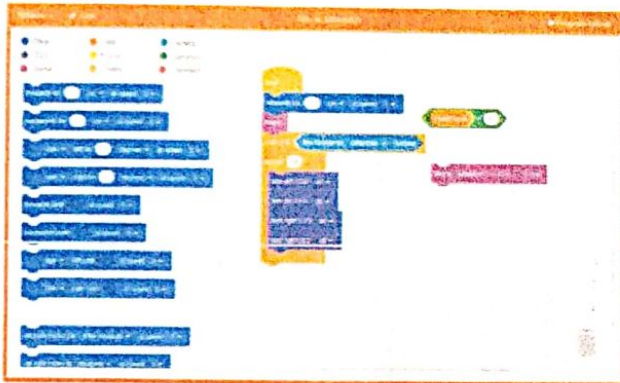
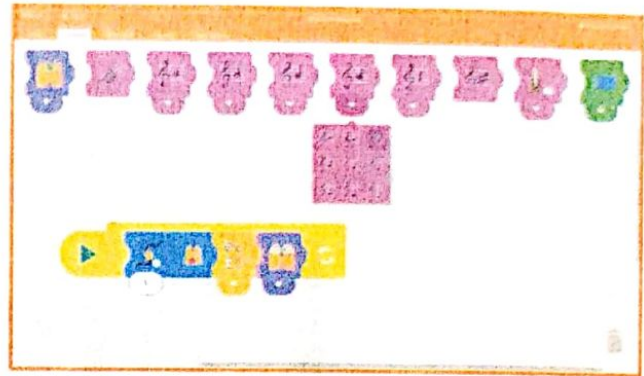
It is possible to set the distance that obstacles are detected. To do this, scan the 'calibrate obstacle detection' barcode, place an obstacle in front of Edison at the distance you want Edison to detect obstacles, press the play button and then repeat steps 1 through 6 to set the sensitivity.

What's next?

Now that you've learned all about Edison's abilities, sensors and controls, you are ready to move on to programming! Go to www.meetedison.com to see the different coding languages you can use with your Edison robot.

EdBlocks

EdBlocks is a drag-and-drop, fully graphical horizontal programming language for the Edison robot. EdBlocks is a perfect introduction to programming and a fun way to start your coding journey.

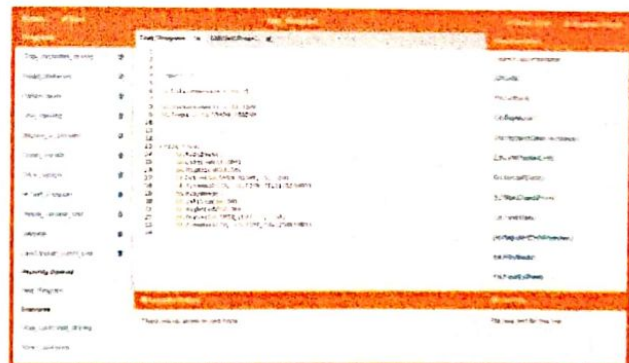


EdScratch

EdScratch is a vertical block-based programming language for the Edison robot based on Scratch. EdScratch combines the ease of drag-and-drop programming with powerful functionality and flexibility.

EdPy

EdPy is a python-like text-based programming language for the Edison robot. EdPy lets you unlock even more of Edison's abilities while learning text-based programming.



Don't forget!

You can also download the free EdMat activity mat in colour or black and white. The EdMat is A1 size (59cm x 84cm) and can be printed at your local print shop for a small fee.

Download from: meetedison.com/edmat/

UI-2.1 Let's explore the EdScratch environment

One of the best things about Edison is that you can make your own programs for your robot! To write a program for Edison, we need to use some special **software**.



Jargon buster

All computers have two main parts: hardware and software.

Hardware is the physical parts of a computer (or robot).

Software is the set of programs and applications that make hardware, like a computer or a robot, run.

The software we will use with Edison is a robot **programming language**.



Jargon buster

A **programming language** is a set of rules and instructions used to write computer programs. EdScratch is a programming language specially designed for programming Edison robots.

The programming language we will use is called EdScratch. Let's learn a bit about the EdScratch programming language.

Task 1: Check out EdScratch

You can access EdScratch online.

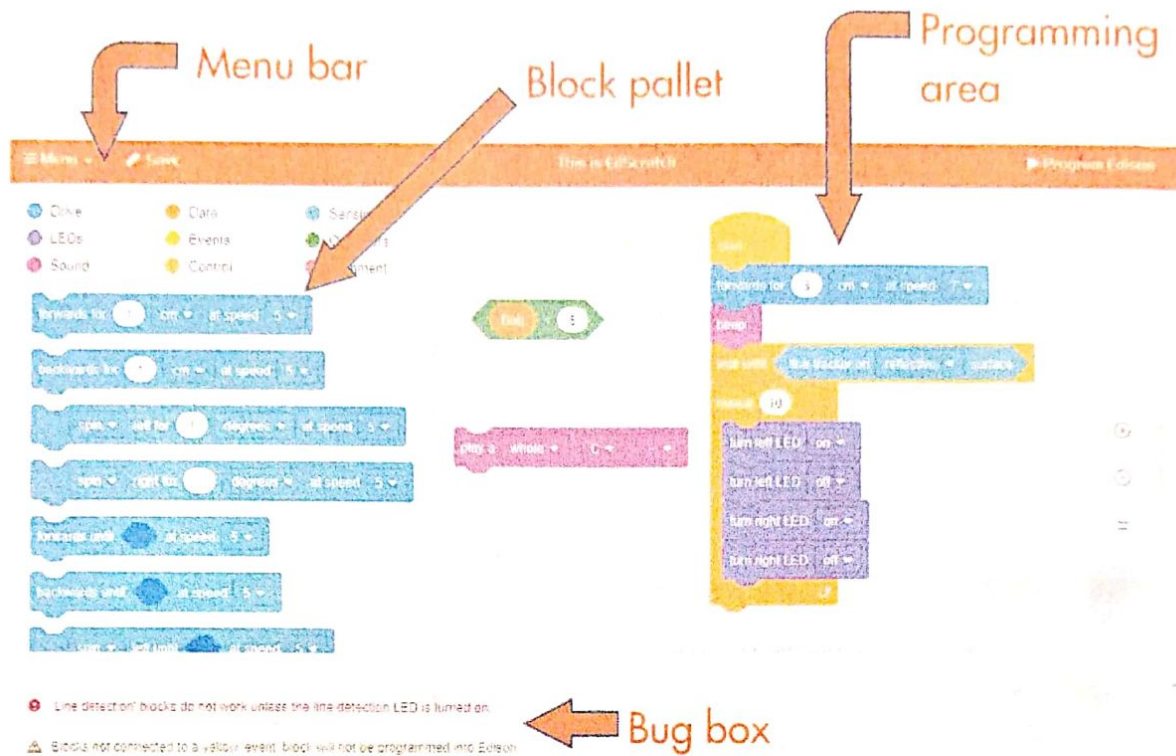


Use this link

Go to www.edscratchapp.com

Whenever you want to program Edison using EdScratch, you will always need to go to the EdScratch app.

Here is what the EdScratch environment looks like:



The EdScratch programming environment has four main parts:

Block pallet

All of the blocks you can use are in the **block pallet**. To use a block, select it from the block pallet, and drag it into the programming area.

Programming area

The large area where you can connect blocks together into programs is called the **programming area**. Drag and drop blocks from the block pallet into this area to use them in your program.

Menu bar

Options such as 'Save' and 'Load' are accessed from the **menu bar**. The menu bar also has the 'Program Edison' button.

Bug box

Below the block pallet and programming area is the **bug box**. Warning messages will show up in the bug box.

Look at EdScratch on your computer. Find each of the four main parts of the EdScratch environment.

Task 2: Load and download the test program

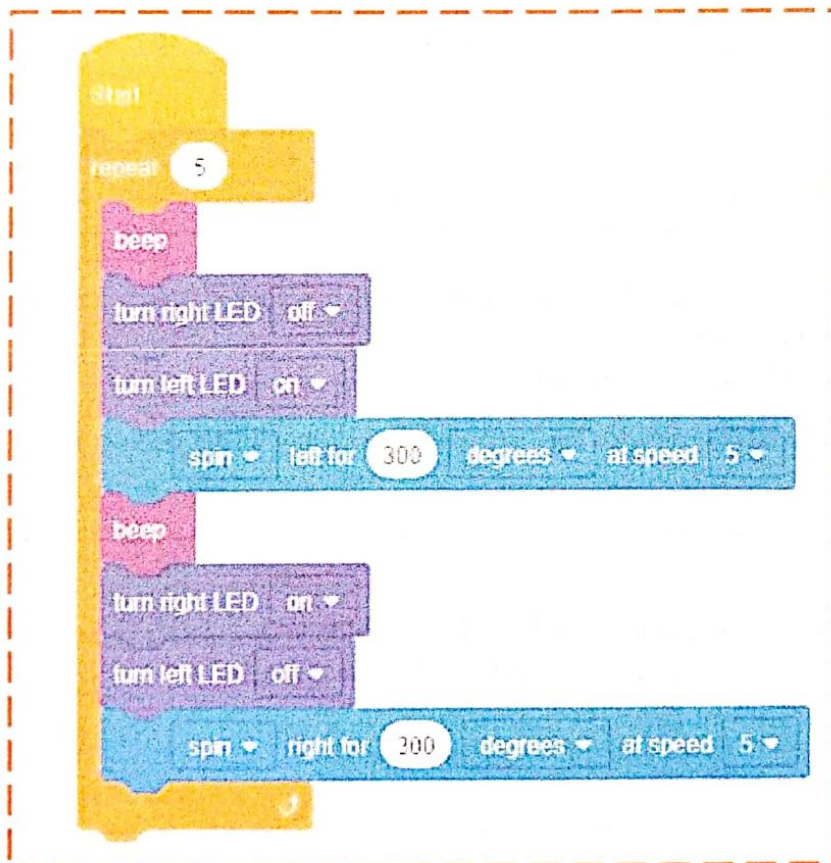
EdScratch has some demo programs already written. Try loading and downloading the demo program called **Test_program**.

Load the Test_program demo program

To load the demo **Test_program**, follow these steps:

1. In EdScratch, go to the menu bar and select the menu drop-down. Find and select the option called **Load Demos**. This will open a pop-up window with all of the demo programs.
2. Find and select the program called **Test_program**. The program will load in the programming area.

Here is what the **Test_program** looks like:

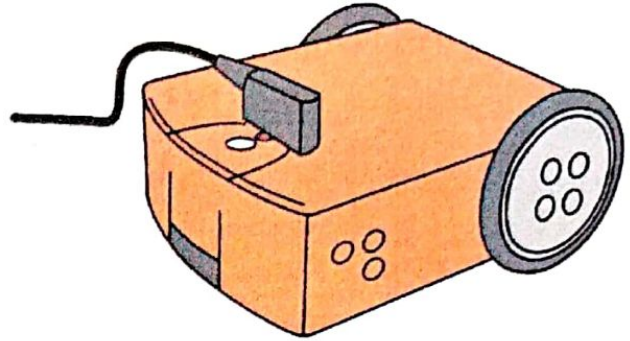


Once the program loads in the programming area, you can download it to your Edison robot.

Download Test program to Edison

Whenever you want to download a program from EdScratch to Edison, you need to follow these steps:

1. Connect Edison to your computer using the EdComm cable.
2. Make sure the volume is turned up all the way on the computer.
3. Press the record (round) button on Edison **one time**.
4. Go to the menu bar in EdScratch and click on the **Program Edison** button.
5. A pop-up window will open. Once the program is ready, a button called **Program Edison** will appear at the bottom of the pop-up window.
6. Click on the **Program Edison** button in the pop-up window.



Why is that?

Edison cannot understand the blocks in EdScratch the way they look on your computer screen. The blocks need to be changed into a format that Edison can understand before the program can be downloaded. This can take a bit of time.

That's why it can take a little while for the **Program Edison** button in the pop-up window to appear.

You will hear the program downloading to Edison. Once it is done downloading, Edison will make the 'success' beep. Don't unplug Edison until you hear the beep!



Why is that?

Edison will let you know if the program downloads correctly by making the 'success' beep. This is the same sound you hear when you first turn Edison on.

There's another sound Edison might make if a program does not download correctly. We call this the 'fail' sound. It means something went wrong when the program tried to download. If Edison makes this sound, try starting your download again.

After you hear Edison make the 'success' beep, unplug the robot from the EdComm cable. Press the play (triangle) button **one time** to run the program.

Name _____

Try it out!

Load the **Test_program** demo program in EdScratch. Download and run the program with your Edison robot. Then answer the following questions.

1. Which part of the EdScratch environment is the **Program Edison** button located in?

2. How many warning messages are there in the bug box when you load the **Test_program**?

3. What does the robot do when you run the **Test_program**? Describe what happens.

U1-2.2 Let's explore warning messages

Some programming languages have special features to make it easier to use that language. One example of this is the bug box in EdScratch.

Sometimes when we write a program for Edison in EdScratch, something isn't quite right. When this happens, a warning message will show up in the bug box.



Don't forget

The **bug box** is located below the block pallet and the programming area in EdScratch.

There are two types of warning messages: yellow warning messages and red warning messages.



Why is that?



Yellow warning messages are caution messages. This is EdScratch saying "Heads up! This might not work the way you want it to work." You can download a program even if there are yellow messages in the bug box.



Red warning messages are like 'stop' messages. These messages are EdScratch saying "Sorry! This program won't make sense to Edison." If there are any red warning messages in the bug box, you will not be able to download the program to Edison.

Whenever you write programs for Edison, it is a good idea to check the bug box before you try to download the program. The warning messages can help you fix up your program!

Try it out!

In EdScratch, find and load the demo program called **Warning_messages_demo**.



Don't forget

To get to EdScratch go to www.edscratchapp.com

Go to the menu bar and select the menu drop-down. Find and select the option called Load Demos. This will open a pop-up window with all of the demo programs. Find and load the program called **Warning_messages_demo**.

Name _____

Once the program loads in EdScratch, answer the following questions.

1. Try downloading this program to your Edison robot. What happens? Does it work? Why or why not?

2. Read the red message in the bug box. Look at the program. Can you fix the problem? Describe what you did to fix the red message.

3. Read the yellow message in the bug box. Look at the program. If you download the program while that yellow message is there, which blocks will not be programmed into Edison?

U2-2.1 Let's explore Edison's outputs

What do computers do? Computers **process** information. This means that computers take information from somewhere and do something with that information. For example, you can give a computer two numbers and tell it to add them together. The computer can then add those numbers and show you the result.

This cycle of information coming in, the computer doing something with the information and then creating some result is called the **input-process-output cycle**.



Jargon buster

Inputs are the information and instructions that you give a computer.

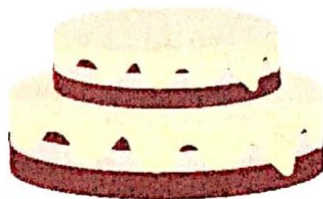
A **process** is what the computer does with a computer program full of information and instructions. This is sometimes called 'running' the program.

Outputs are the results you get from a computer. What the computer displays, or how the robot behaves, are the outputs you get based on the information and instructions you gave the computer.

We call this process of **inputs** going into a computer, that computer **processing** the information, and then generating some type of **output** the **input-process-output cycle**.

The input-process-output cycle isn't only used in computers. You can see this cycle in action in your daily life too.

Baking a cake is a good example. You **input** ingredients into a pan and put that pan into the oven. The **process** of baking then happens in the oven. After a while, the **output** of a cake is ready!



Inputs, outputs and Edison

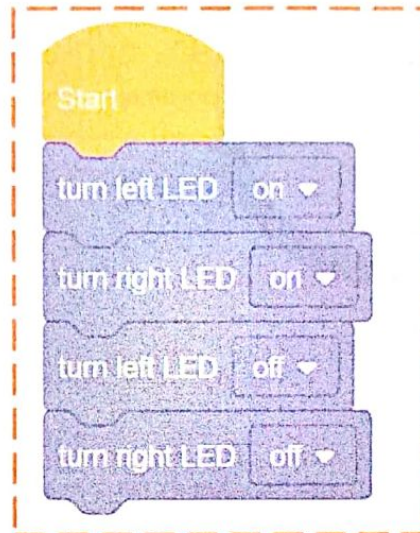
When you write a program for your Edison robot, you are telling the robot what you want it to do by giving it inputs. Edison's microchip then processes the information to tell the robot what to output.

Your Edison robot has three main types of outputs: outputs using the motors, outputs using the LEDs and outputs using sounds. In EdScratch, the blocks related to Edison's main outputs are organised into three different categories: **Drive**, **LEDs** and **Sound**.

Task 2: Make Edison blink

Some of Edison's outputs, like turning a LED on or off, happen very quickly. In fact, this can happen so fast, it can be really hard to see.

Try writing the following program in EdScratch:



Download it and run it with your robot. Can you see Edison blink?

Because the robot flashes its LEDs when it is in standby mode, it will be really hard to see this program in action.



Why is that?

Edison moves through each EdScratch block one at a time, but the robot is able to process each block very quickly. Computers can process information very fast – that's one of the things that makes them so useful!

If you want Edison to pause after it completes one block before going onto the next block, you have to tell it that.

One of the EdScratch block categories is the **Control** category. The blocks in the **Control** category allow you to control the flow of your program. One of the blocks in this category is the **wait** block:

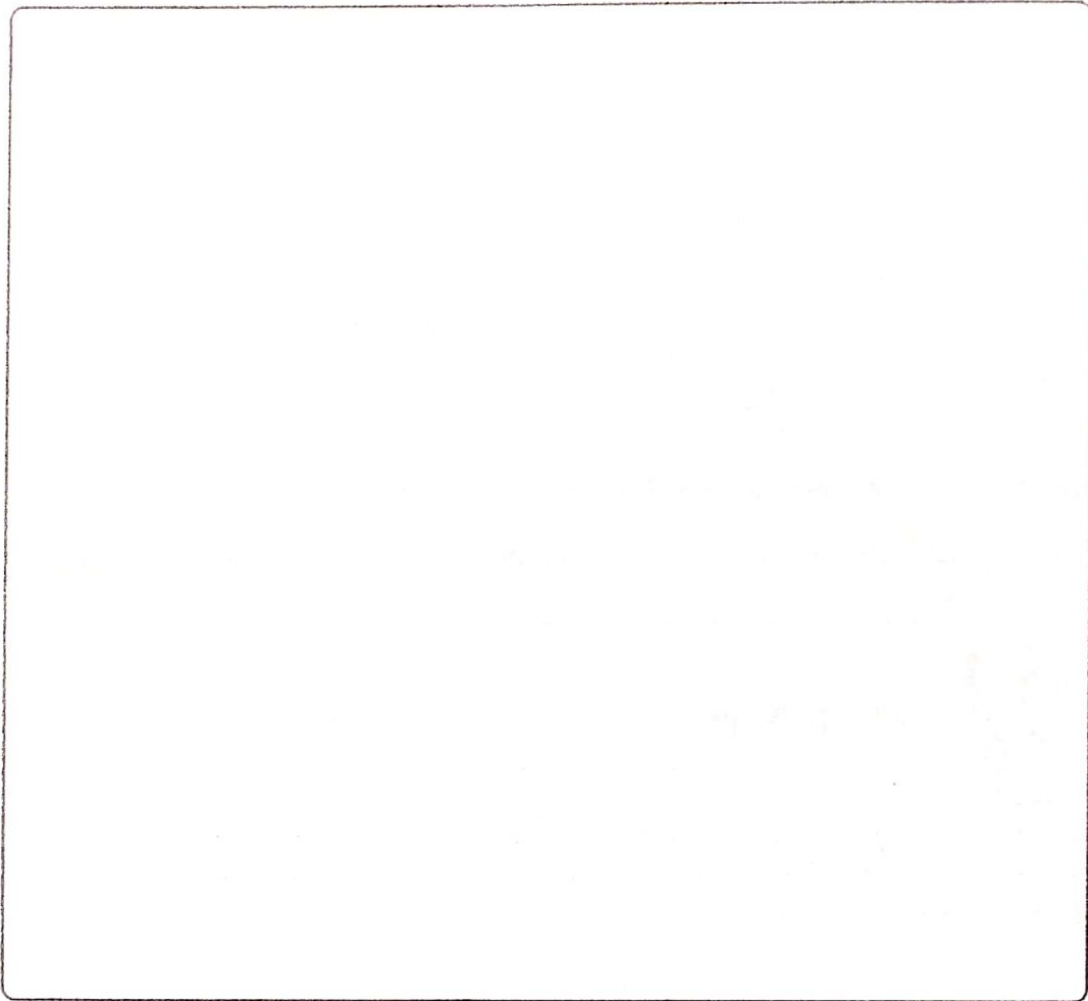


Name _____

This block tells Edison to wait the amount of time you specify before moving on to the next block. Let's try using this block in a program.

Modify the 'blink' program from before but use this new control block to make the program work better. You want a program where it's very easy to see Edison 'blink'. Experiment using at least one **wait** block. Test using **wait** blocks in different places in your program to see what works best.

3. What does your program look like? Which blocks does it use, in which order? Write your program below. Be sure to include the input parameters you used.

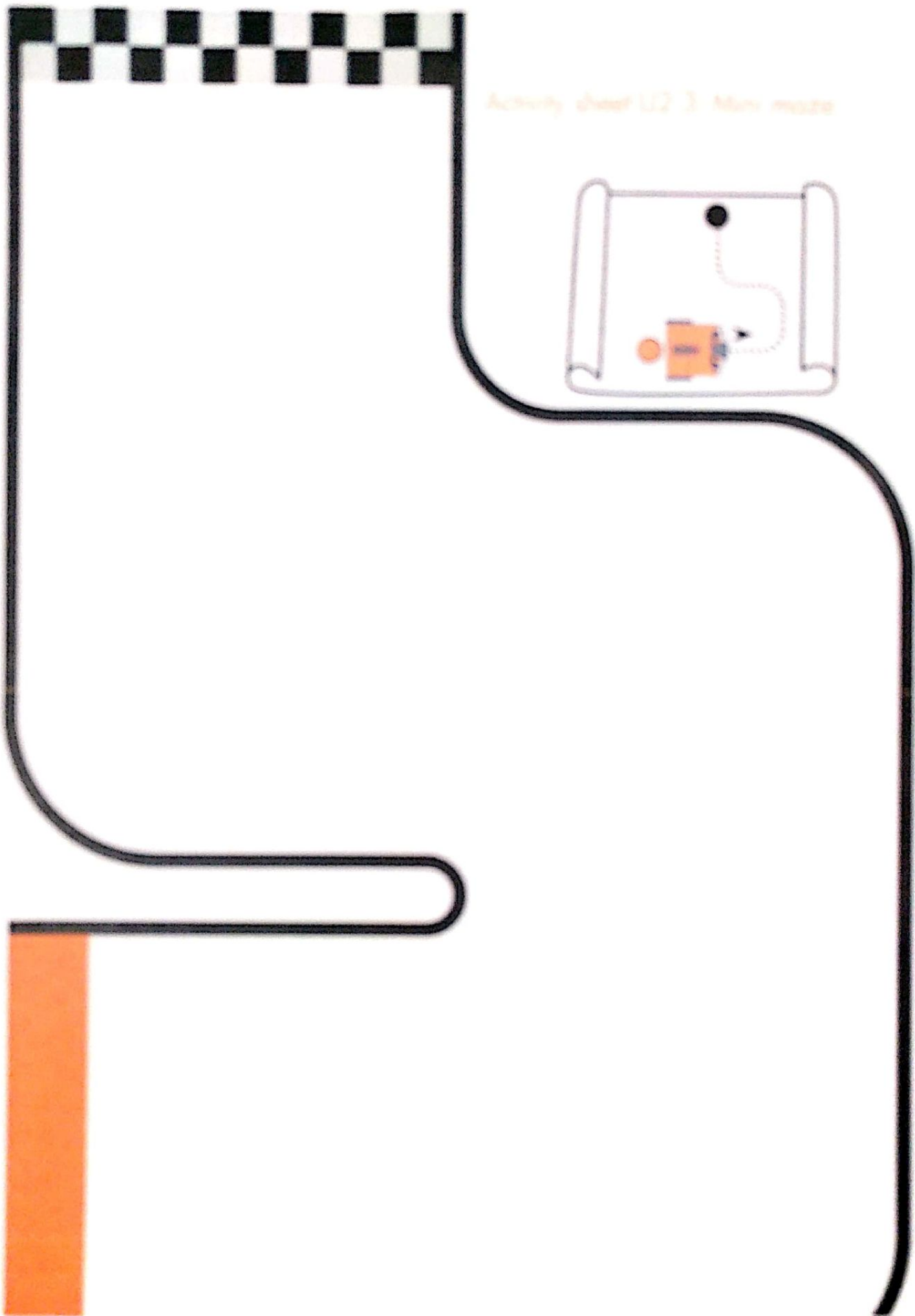
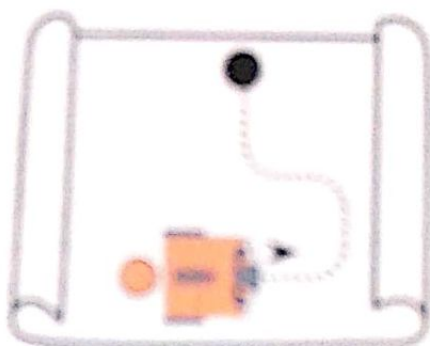


Mini challenge!

When a person blinks, what happens? Their eyes start open and then...

Look at your blink program. Can you adjust your program to make it more like a blink?

Activity sheet 112 3 Mini maze



U2-2.1a Challenge up: Drive the maze safely

You can write programs for Edison which tell your robot to use multiple types of outputs.



Don't forget

Your Edison robot has three main types of outputs: outputs using the motors, outputs using the LEDs and outputs using sounds. In EdScratch, the blocks related to Edison's main outputs are organised into three different categories: **Drive**, **LEDs** and **Sound**.

For this activity, you will need to write a program telling Edison to drive the maze on activity sheet U2-3. This time, however, Edison needs to be a very safe driver. On the road, drivers use their indicator lights and horn to alert other drivers. Edison can do these things too!

Drive the maze starting at the outline and driving forwards to the finish line. Your program should end after Edison crosses the finish line.

Your program needs to tell Edison to pause and use the LED lights to 'indicate' before making each turn in the maze. Make sure other drivers would be able to see the LEDs indicate!



Hint!

If you are going to turn left, which LED should you use to indicate? What about when you turn right?

Your program should also use the 'beep' block at least one time somewhere in the program.



Hint!

Pretend the 'beep' block is like a horn in a car. Where in your program might it make sense for Edison to beep?

Edison robot training feedback

Thank you for choosing to learn about Edison robots as part of your Professional Development Training. This survey should take approximately 5 minutes to complete. Please answer the questions as objectively as you can, the information you provide will be used for improvement of our program and products.



Please print clearly and complete all questions on both pages. All information provided to us will remain confidential.

About you

What is your first name?

.....

What is your last name?

.....

Email address

.....

Which year levels do you teach?

- Foundations (preschool, kindergarten)
- Years 1-2
- Years 3-5
- Years 6-8
- Years 9-12
- Other:

Which best describes your role?

.....

- Primary Education general studies teacher
- Primary Education speciality teacher
- Middle School general studies teacher
- Middle School speciality teacher
- High School general studies teacher
- High School speciality teacher
- STEM speciality teacher
- Other

.....

What is your school or organisation's name?

.....

Which country and state are you from?

.....

Continue on next page →

About your experience

Do you think this training was worthwhile?

Yes No

Why did you attend this particular training session?

- My school supported it for me.
- I have a requirement to teach computer science and/or robotics.
- I am interested in computer science and/or STEM topics.
- This training included a free robot.
- I needed the professional development hours.
- Other

Which best describes your current feelings about using Edison robots?

- Edison is impossible. I give up.
- I feel that I've got the basics, but I'm still struggling.
- I need a little practice but I think I can use Edison on my own.
- I feel confident in using Edison but there is room to expand.
- I am an Edison mastermind.

Following this training, I am going to:

- Start using my school's existing set of Edison robots more effectively.
- Order a class set of Edison robots to implement in my classroom.
- Start looking at funding or other budget options to help me get Edison in my classroom.
- Investigate Edison further before I make a choice.
- Continue to explore other robotics options and classroom tools before I make a choice.
- Use my free Edison to teach. I think one Edison should be enough.
- Nothing – Edison is not my cup of tea.
- Other:

Your opinion

How likely are you to recommend Edison robots as classroom tools?

1 2 3 4 5

What do you like or dislike about Edison?

.....
.....
.....

What was the most valuable part of this workshop for you?

.....
.....
.....

What could we improve about this training?

.....
.....
.....

Is there anything else you want to tell us?

.....
.....
.....

Disclaimer

- I have received my free Edison robot and I understand that by doing so, my email address and name will be provided to Microbric Pty Ltd (makers of Edison robots). Microbric will keep this information secure and will not share it with third parties. Microbric will use my information to communicate product information, updates and product-related announcements via email. I can unsubscribe from these emails at any time.