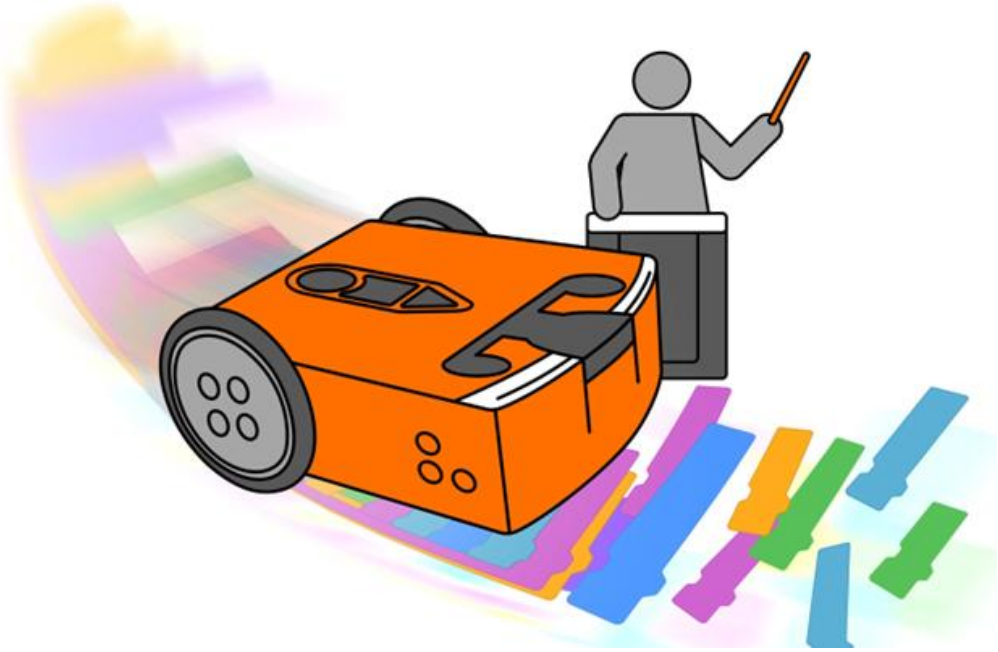

EdScratch

Teacher's guide to getting started

The *Getting started with Edison and EdScratch* set by Kat Kennewell, Emma Grace and Emma Dewar is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

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Document number: 3.1.4.5.1.1.2

Contents

About this guide **3**
Creative Commons licence attribution details 3
Before you start 4
Let's get started 4
Getting to know Edison – Edison V3's buttons 4
Edison V3's sensors and outputs 5
Programming Edison V3 in the EdScratch language **6**
EdScratch for Windows, Chromebook, Mac, Linux, and Android 7
EdScratch for iPad 7
Using the 'getting started' student sheets **8**
Question 1: What is an Edison robot? **9**
Overview 9
Delivery recommendations 9
Tips and tricks 9
Question 2: How do you use EdScratch with Edison? **9**
Overview 9
Delivery recommendations 9
Tips and tricks 9
What's next? **10**

Document number: 3.1.4.5.1.1.2

About this guide

This 'getting started' guide and the matched student activity sheets set is designed for new users of Edison and EdScratch. This guide offers teachers and instructors a quick-start overview for using Edison robots with the EdScratch programming language, available at https://www.edscratchapp.com/

The information contained here will help you run a wide range of EdScratch activities using Edison, including the *Getting started with Edison* student activity sheets that go along with this guide, the EdScratch *Hour of Code* activities[1] and the full EdScratch lesson plans[2].

Don't forget! You don't need to be an expert on Edison or EdScratch to use the robots successfully!

You can start learning along with your students, using any of the Edison lesson plans or activities to guide you. The student sheets for all EdScratch activities have been designed to allow students to work through the different parts of each lesson independently, discovering key computer science learning objectives and practicing new skills along the way. Complementary teaching guides offer further information about each activity to help make using the lessons easy and fun. Check out meetedison.com[3] for the complete range of EdScratch lessons, stand-alone activities, and teaching guides

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The *Getting started with Edison and EdScratch* set is comprised of the student sheets and this guide. This set was developed using resources from the EdScratch Lesson Activities Collection[4] and is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License[5].

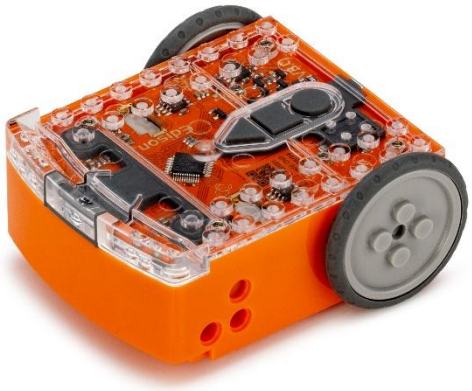
Developed and written by: Kat Kennewell, Adriana O'Brien and Emma Grace
Illustrations by: Emma Dewar and Jin Peng

[1] https://meetedison.com/hour-of-code-edison-robot-activities/
[2] https://meetedison.com/robot-programming-software/edscratch/#EdScratch-resources
[3] https://meetedison.com/
[4] https://meetedison.com/robot-programming-software/edscratch/#EdScratch-resources
[5] http://creativecommons.org/licenses/by-sa/4.0/

Before you start

This guide shows the basics for getting set up to use Edison with EdScratch. Additional details, including information about Edison's other programming languages, can be found in the free *Getting started with Edison guide* available at https://meetedison.com/teaching-resources/Edison-V3-robot/Getting-started-with-Edison-V3.pdf

Let's get started



Each Edison robot is packaged in a small orange box. Unroll the cardboard inside to take out Edison.

Edison V3 is designed to work with LEGO bricks on four sides. It features removable wheels and a skid, enabling projects involving multiple Edison robots or using the robot's motors for other creations.

To power up Edison V3, press the triangle button. This action triggers a chirping sound, and the red LED lights will begin flashing.

Look at the Edison V3 box for instructions and a barcode to kickstart your first adventure.

Getting to know Edison – Edison V3's buttons

Edison V3's top has a key pad which includes three buttons. The shape of the buttons and the number of presses will determine Edison's behavior.

Play button (triangle button)

- 1 press = turn on (when off)
- 1 press = run program

Record button (round button)

- 1 press = download program via screen flasher
- 3 presses = scan barcode

Stop button (square button)

- 1 press = stop program
- press 3 seconds = turn off

Edison V3's sensors and outputs

Sensors

Obstacle Detection: Edison V3 utilizes two infrared (IR) LEDs placed at its front left and right, along with an IR receiver module. This receiver not only detects obstacles but also functions as the core for IR data communications and remote-control reception.

Remote Control: Thanks to the IR receiver module, Edison V3 can learn and interpret IR codes from the EdRemote remote control and most standard TV remote controls.

Infrared Data Communications: Through the IR receiver module, Edison can communicate with other Edison robots.

Line Tracker: This system involves a red LED and a phototransistor, which together act as the line tracking sensor. They not only follow lines but also decode special barcodes, triggering pre-installed programs.

Light Sensors: Positioned at the front left and right sides, two phototransistors help Edison sense changes in light.

Sound Sensor: Edison is equipped with a cool sound sensor called a piezo transducer. It not only acts as a speaker to play sounds but can also pick up sounds like claps.

Outputs

Drive: Edison moves using a differential two-wheel drive system powered by its 3-volt motors on the right and left sides. These motors come with wheel encoders, providing precise movement resolution.

Infrared Data Communications: Two IR LEDs, used for obstacle detection, also serve as components for Edison's IR data communications.

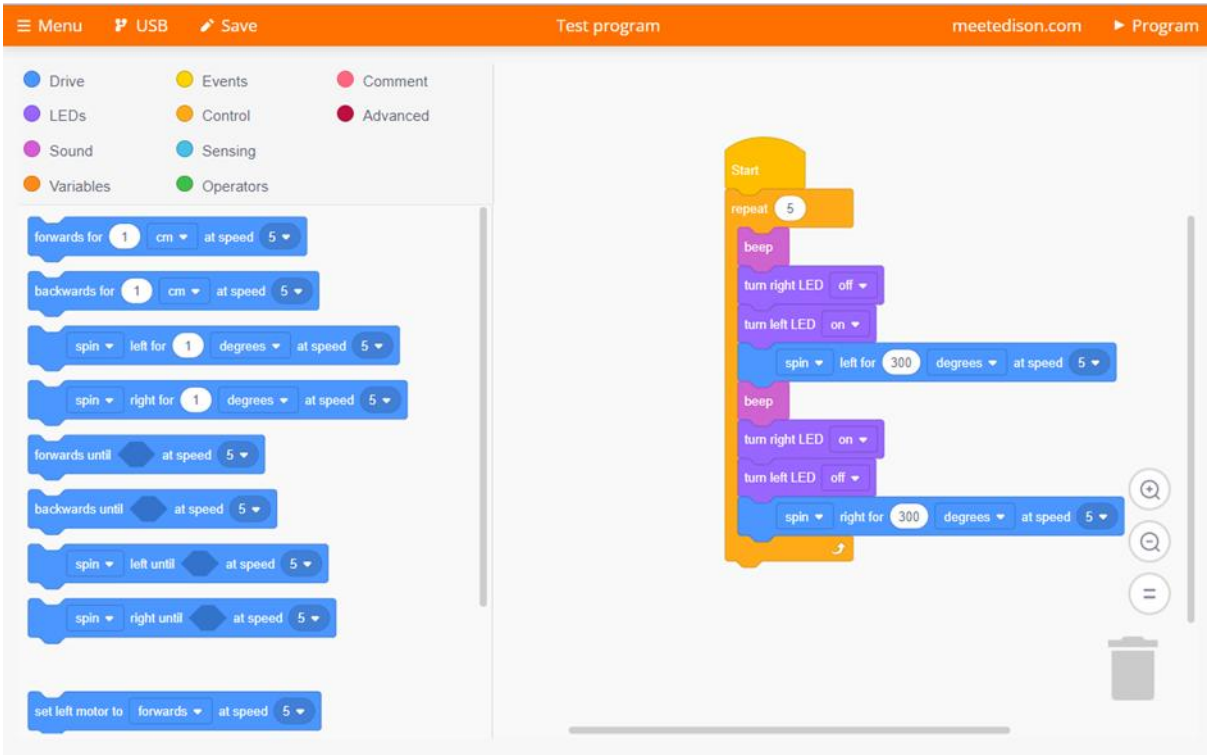
Sound: The same piezo transducer that functions as a speaker and detects claps also manages Edison's sound outputs.

You can find more information about the Edison robot's inputs, outputs, and sensors at https://meetedison.com/edison-robots-sensors/

Programming Edison V3 in the EdScratch language

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.

The EdScratch programming language app is at this URL:
https://www.edscratchapp.com/



EdScratch for Windows, Chromebook, Mac, Linux, and Android

Running a test program is a great way to get started using EdScratch. Follow these steps to test EdScratch on your computer:

1. Open the EdScratch app at edscratchapp.com using one of the following browsers: Chrome, Edge, or Opera.
2. When EdScratch opens click ‘Menu’ and select ‘Load Demos.’ Select the program called ‘Test_Program’ which will load in the programming environment.
3. Plug the Edison V3 robot’s USB cable in to the computer’s USB-A port.
4. From the EdScratch app, press the ‘Program’ button (top right corner).
5. A popup window will appear asking to connect to Edison V3. Select ‘Edison V3 – Paired’ and click ‘connect’.
6. The program will download to Edison V3 and you will hear the ‘success’ sound (the same tune Edison plays when you turn Edison on).
7. Disconnect Edison from the USB port and press the triangle button on Edison to run the program.

EdScratch for iPad

If you are using an iPad to program your Edison, follow these steps to test EdScratch on your iPad:

1. Open the EdScratch app at edscratchapp.com using one of the following browsers: Chrome, Edge, or Opera.
2. When EdScratch opens, you will see the programming environment. Click ‘Menu’ and select ‘Load Demos.’ Select the program called ‘Test_Program’ which will load in the programming environment.
3. Press the ‘Program’ button in the app (top right corner) and the screen flasher download box appears.
4. Place your Edison V3 over the outline and press Edison V3’s round button one time, both LEDs will come on.
5. Press ‘download program’ in the download box, and the program will start downloading to Edison V3.
6. When the program has downloaded to Edison V3 you will hear the ‘success’ sound (the same tune Edison plays when you turn Edison on).
7. Press the triangle button on Edison to run the program.

Using the ‘getting started’ student sheets

If your students are new to Edison or EdScratch it is a good idea to introduce them to the basics of the robot and programming language before jumping into a programming activity. The ‘Getting started with Edison’ student sheets are a hands-on introduction to Edison and EdScratch. You can use these student sheets to help guide a teacher-led introduction or allow students to work through the different parts of the lesson independently.

The ‘Getting started with Edison’ lesson is arranged as four questions for investigation. Each of the questions is included in this guide along with relevant supporting information for that part of the lesson. Supporting information is divided into the following sections:

Overview
General information about the section and key learning objectives covered.

Delivery recommendations
Suggestions for how you can cover the lesson section if you want to run the lesson in a more facilitator-led capacity.

Tips and tricks
Helpful hints and ways to overcome common issues students may encounter.

Supplies you will need

- Full set of Edison V3 robots
- Full set of programming devices
- Print-outs or digital copies of the student sheets

Question 1: What is an Edison robot?

Overview

- New to Edison robots? Time to 'meet Edison' and learn more about the robot's key features.

Delivery recommendations

- Recommended time: 5 minutes

Tips and tricks

- A great way to see Edison robots in action straight away is to run some of Edison's pre-set programs using the special Edison robot barcodes[6]. Using barcodes with Edison robots is one of the most unique and fun ways to kick-start your Edison adventure no matter your coding experience!

Question 2: How do you use EdScratch with Edison?

Overview

This part of the lesson draws attention to the hardware-software connection that exists in all computer systems, then introduces the online application EdScratch to students, including the names of the main areas inside the programming environment. Students then practice downloading a program from EdScratch to their Edison robot.

Delivery recommendations

- Recommended time: 10 minutes

Tips and tricks

- Encourage students to refer back to the diagram of Edison's parts if they forget where sensors are or what buttons do as they work through this or future lessons.

- Take the time to get students comfortable with the download process:
    - While a program is downloading to Edison, Edison makes a whirring sound.

[6] https://meetedison.com/barcodes/

    - Once the program downloads successfully, Edison will make a chirping beep. Remind students not to unplug the USB cable until after they hear the success sound beep.
- When many students are downloading programs at the same time, you may experience slower internet speeds. This can result in the app taking longer to create the 'program Edison' pop-up box button and for the programs to download into Edison. Remind students to listen for the success sound before unplugging their USB cable. The success sound is the signal that the program has fully downloaded.

What's next?

Once you and your students are set up with Edison and EdScratch, you are ready to try all sorts of EdScratch activities using Edison. Here are some options to get you started:

- Consisting of the Student Set and accompanying Teacher's Guide, *The EdScratch Lesson Activities Collection*[7] includes activities perfect for progressing through EdScratch using Edison robots.
- Make your Hour of Code a tangible, hands-on experience with Hour of Code Edison robot activities[8].
- Try out some cross-curricular STEAM stand-alone educational activities[9].

[7] https://meetedison.com/robot-programming-software/edscratch/#EdScratch-resources
[8] https://meetedison.com/hour-of-code-edison-robot-activities/
[9] https://meetedison.com/educational-activities/