Edison and EdScratch

Teacher's guide to getting started

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

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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 set up your Edison robots and the programming devices (such as laptops, tablets or Chromebooks) that you will be using with EdScratch. Once you have the robots and programming devices set up, you will be ready to run a wide range of EdScratch activities using Edison, including the *Let's get started with Edison and EdScratch* 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!

Once the robots and programming devices are set up, 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 Plans Set[4] and is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License[5].

Developed and written by: Kat Kennewell
Illustrations by: 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

Before using Edison with your students, you will need to set up the programming devices, (i.e. the computers, laptops, Chromebooks or tablets) you will be using with the EdScratch app and get the Edison robots ready.

This guide shows the basics and troubleshooting help 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/content/Get-started-with-Edison-guide-English.pdf

Get Edison ready

To get Edison ready for use, you need to:

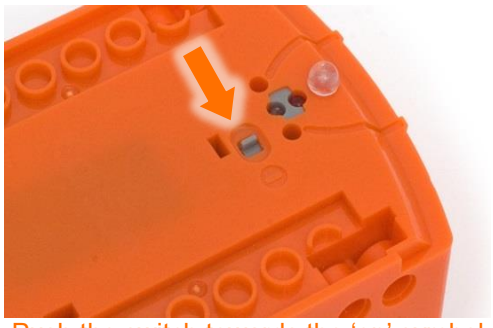
1. Open the battery compartment at the back of Edison and remove the EdComm programming cable.
2. Insert 4 'AAA' batteries. Please refer to the picture to ensure that the batteries are inserted correctly. Be sure to reclose the battery case by clipping the battery cover back on.

Ensure the batteries are in the right way.

Please note: Low or flat batteries can cause a range of issues with Edison. For this reason, always use fresh, fully charged batteries in your robots.

Choosing batteries: If using disposable batteries with Edison, only ever use alkaline batteries. (These are the most common standard AAA batteries you will find in just about any shop.) If you are using rechargeable batteries with Edison, only use nickel metal hydride (NiMH) rechargeable batteries. Never use lithium rechargeable, heavy-duty disposable, super heavy-duty disposable or carbon zinc batteries.

3. To turn Edison on, flip the robot over. Slide the power switch to the 'on' position, as shown in the picture. This will turn Edison on, and the red LED lights will start flashing.



Push the switch towards the 'on' symbol.

Please note: While Edison will turn off automatically if not used after five minutes, we recommend you turn the robots off manually when not in use.

Set up your programming devices for EdScratch

The best way to set up your programming devices is to run a test program in EdScratch. Follow these six steps to test EdScratch on your device:

1. Load the EdScratch app by opening www.edscratchapp.com in a browser (we strongly recommend Google Chrome[6]). Launch the programming app by pushing the orange 'Launch EdScratch' button. Make sure you allow pop-ups for www.edscratchapp.com.

2. Once the app opens, you will see the programming environment. Open 'Menu' from the menu bar and select 'Load Demos'. A list of demo programs will open in a pop-up window. Select the program called 'Test_program' which will load in the programming environment.

3. Adjust your device's volume to maximum or 100%. Plug the EdComm programming cable into the audio jack of your device.

   NOTE: many devices have built-in safety settings that reduce the volume when an audio device is connected to the headphone jack. Always double-check the volume settings after plugging in the EdComm cable to your device.

4. Turn your Edison robot on. Connect the EdComm cable to the bottom of the robot, near the power switch. Press the round (record) button one time.

5. In the EdScratch app, press the 'Program Edison' button. Follow the instructions on the pop-up and then press the 'Program Edison' button on the pop-up to download the program into Edison.

   NOTE: if the '*There seems to be a network issue accessing the compiler*' warning message pops up at this point, see 'Troubleshooting 1: Check the connectivity status' section below.

6. While the program is downloading, you will hear a whirring sound, a bit like a dial-up modem. When the download is done, you will hear one of two sounds: the 'success' sound (the same chirping beep Edison makes when you first turn the robot on) or the 'fail' sound (a descending beeping sound)[7].

SUCCESS: If the robot makes the 'success' sound, unplug it from the EdComm cable, then press the triangle (play) button on Edison one time to run the program. If the program runs successfully in the Edison robot, your programming device is ready to use! There's nothing further you need to do to set-up your device.

FAIL: If the robot fails to download the program, or the program does not play in the robot, work through the 'Troubleshooting' section that follows.

[6] EdScratch is compatible with Chrome, Safari, Microsoft Edge and Firefox. To ensure optimal performance, however, it is strongly recommended that you use EdScratch with Chrome.
[7] You can hear recordings of both the success and fail sounds at https://meetedison.com/edison-robot-support/trouble-shooting/#success-fail-sounds

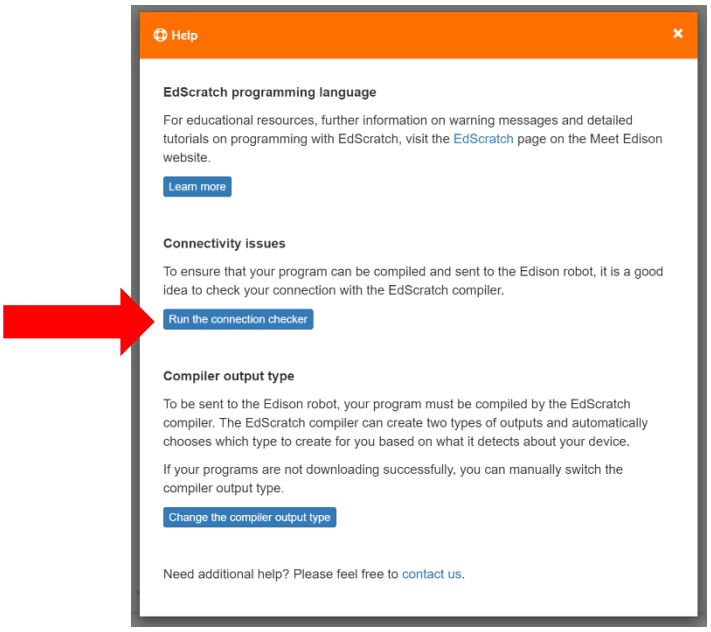
Troubleshooting

Depending on the type of programming devices you are using and your network, there are a few things you will need to do to troubleshoot your devices and get them working with the EdScratch app.

Troubleshooting 1: Check the connectivity status

If you see the '*There seems to be a network issue accessing the compiler*' warning message after pressing the 'Program Edison' button in the EdScratch app or if the program failed to download successfully, you will need to check the app's connectivity status.

To work, the EdScratch app needs to access the compiler (which is what coverts the EdScratch programs into a format that can be sent to the Edison robot). Inside the EdScratch app at www.edscratchapp.com, open 'Menu' in the upper left-hand corner and select 'Help'. This will open a pop-up which includes the option to 'Run the connection checker'. Click this button to check your connection.



If the connection test result shows 'NO SERVER FOUND' then you may be behind a firewall, common at schools, which is blocking access to the compiler. You will need the network administrator to unblock ports 80, 8080, 443 and 8443 and white list these addresses:

- https://www.edscratchapp.com
- https://api.edisonrobotics.net
- 52.8.213.196
- 13.210.175.93
- 52.79.71.19

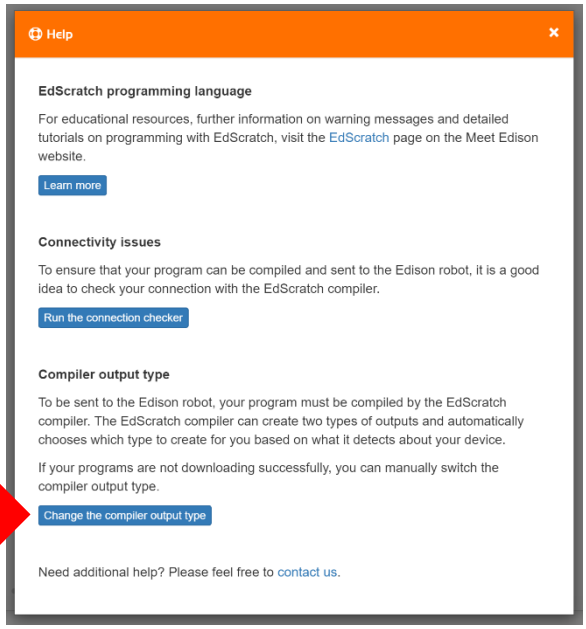
SUCCESS: Once the connection checker shows you are connected, try downloading and running a test program again. If the program downloads and runs successfully in the Edison robot, your programming device is ready to use! There's nothing further you need to do to set-up your device.

FAIL: If the connection checker shows you are connected, but you are still not able to program Edison, move on to 'Troubleshooting 2: Switch the compiler output type'.

Troubleshooting 2: Switch the compiler output type

To be sent to the Edison robot, your program must be compiled by the EdScratch compiler. The EdScratch compiler can create two types of outputs and automatically chooses which type to create for you based on the type of device it detects you are using (such as an Apple tablet or a Windows laptop).

If your programs are not downloading successfully, you can manually switch the compiler output type. Inside the EdScratch app at www.edscratchapp.com, open 'Menu' in the upper left-hand corner and select 'Help'. This will open a pop-up which includes the option to 'Change the compiler output type'. Click this button to check what device and settings are being detected.



If the device being detected is not accurate, or if your programs are not downloading successfully, you can manually switch the compiler output type. Use the following information to select the output best suited to your device:

Long pulse compiler output

This output type works well on devices with low output volume, including some tablets. If you are using a Mac computer, an iPad tablet or a Windows or Android tablet, the long pulse compiler output should work best for your device.

Short pulse compiler output

This output type works well on devices with sound enhancement software, including most Windows desktop and laptop computers. If you are using a Windows desktop or laptop computer, the short pulse compiler output should work best for your device.

SUCCESS: Once you have changed the compiler output, try downloading and running a test program again. If the program downloads and runs successfully in the Edison robot, your programming device is ready to use! There's nothing further you need to do to set-up your device.

FAIL: If you are still not able to program Edison after changing the compiler output type, check the device-specific troubleshooting advice that follows.

Windows computers – troubleshooting

If you are running a laptop or desktop with a Windows operating system and are still unable to program Edison after running the set-up steps above, try these additional troubleshooting steps.

Disable sound enhancements

If you are using desktops or laptops running Windows operating systems and both the short pulse (recommended) and long pulse compiler output types are failing, you will need to disable sound enhancements.

Please go to https://meetedison.com/edison-robot-support/trouble-shooting/#soundenhancements to find step-by-step video guides showing you how to disable sound enhancements for standard Window's sound enhancements software as well as the most common third-party software programs.

Once you have sound enhancements disabled, use the long pulse compiler output option.

Check for a volume 'hard lock'

Some devices, especially in Europe, have a hard lock on volume whenever an audio device is detected. This means that the device is 'locked' to only deliver a maximum volume of approximately 75% of the device max volume when an audio device is detected. To correct this, go into the device's settings and disable the hard lock to enable the device to emit true full volume, even with an audio device plugged in.

Mac computers – troubleshooting

If you are running a Mac laptop or desktop and are still unable to program Edison after running the set-up steps above, try this additional troubleshooting step.

Check the volume settings

Some Macs experience audio clipping errors when attempting to program Edison. If you experience these issues, please try dropping your volume from 100% to between 50% and 90% instead.

Tablets – troubleshooting

If you are running an Apple, Android or Windows tablet and are still unable to program Edison after running the set-up steps above, try this additional troubleshooting step.

Check the volume settings

Many devices have built-in safety settings that reduce the volume when an audio device is connected using the headphone jack. Please check that your volume is

turned all the way up to 100% after plugging in the EdComm programming cable to your device.

Some devices, especially in Europe, have a hard lock on volume whenever an audio device is detected. This means that the device is 'locked' to only deliver a maximum volume of approximately 75% of the device max volume when an audio device is detected. To correct this, go into the device's settings and disable the hard lock, to enable the device to emit true full volume, even with an audio device plugged in.

Please note: most mobile phones do not have the audio output to program Edison using EdScratch. We do not recommend using mobile phones as programming devices with Edison.

Chromebooks – troubleshooting

If you are running a Chromebook and still unable to program Edison after running the set-up steps above, try this additional troubleshooting step.

Disable sound enhancements

Some Chromebooks, including some Dell Chromebooks, have low audio output but also have sound enhancements. If you are using a Chromebook and both the short pulse (recommended) and long pulse compiler output types are failing, you will need to disable sound enhancements.

Sound enhancements are common on Windows machines and we have step-by-step video guides at https://meetedison.com/edison-robot-support/trouble-shooting/#soundenhancements showing you how to disable sound enhancements for standard Window's sound enhancements as well as the most common third-party software programs. Depending on the manufacturer, your Chromebook may have similar sound enhancement software.

Once you have sound enhancements disabled, use the long pulse compiler output option.

Still not working?
You can find additional troubleshooting guidance on our website at https://meetedison.com/edison-robot-support/trouble-shooting/ or you can contact us for support at https://meetedison.com/edison-robot-support/contact-us/

Our team of friendly Technical Support Officers will do their best to help you out!

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 'Let's get started with Edison and EdScratch' 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.

There are two parts of the 'Let's get started with Edison and EdScratch' lesson. Each section is arranged as a question for investigation. Both questions are 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 robots[8] and EdComm programming cables
- Full set of prepared programming devices
- 4x AAA batteries per robot
- Print-outs or digital copies of the student sheets

[8]This activity assumes Version 2.0 Edison robots. If you have Version 1 Edison robots, you will need to adjust the activity to have the robot turn using seconds as the input parameter rather than degrees. Learn more at https://meetedison.com/meet-edscratch-edison-robots-scratch-language/#V1-EdScratch

Question 1: What is an Edison robot?

Overview

New to Edison robots? Time to 'meet Edison' and learn 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[9]. 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

- Remind students that some devices, especially tablets, automatically lower the volume when they detect a device has been connected to the audio jack. Make sure the volume on the computer or tablet is still turned all the way up after the EdComm cable is plugged in.
- Introduce students to the sounds Edison makes during the download process:
    - While a program is downloading to Edison, Edison makes a whirring sound, similar to an old dial-up modem.

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

    - Once the program downloads successfully, Edison will make a chirping beep.
    - If the program fails while downloading, Edison will make a 'fail sound'.
    - You can hear what the success and fail noises sound like at https://meetedison.com/edison-robot-support/trouble-shooting
- Make sure students do not unplug the EdComm cable until after they hear the 'success' sound.
- When many students are downloading programs at the same time, you may experience slower internet speeds, causing the program to take longer to create the 'Program Edison' button in the pop-up box and for the program to download to Edison. Remind students to listen for the success sound before unplugging the EdComm cable to ensure they wait until the program fully downloads.

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 Plans Set*[10] includes a complete curriculum for teaching computational thinking and computer science using EdScratch and the Edison robot.
- Make your Hour of Code a tangible, hands-on experience with Hour of Code Edison robot activities[11].
- Try out some cross-curricular STEAM stand-alone educational activities[12].

[10] https://meetedison.com/robot-programming-software/edscratch/#EdScratch-resources
[11] https://meetedison.com/hour-of-code-edison-robot-activities/
[12] https://meetedison.com/educational-activities/