Getting started with Edison
Guide to setting up for success

Contents

Welcome!

You are now the proud owner of an Edison robot. Edison is the perfect tool to help teach you about electronics, programming and robotics in a fun and engaging way.

This guide will help you to get the most out of Edison, including all of the robot's built-in sensors, outputs and motors. Remember, Edison is a tool designed to introduce you to the amazing world of robotics. Proper care and maintenance are important to help keep your Edison in the best shape possible.

Setting up Edison

Each Edison robot arrives in a small orange box. Open the box and remove Edison by unrolling the interior cardboard. You will then need to complete some quick set up on both Edison and the computing device you are planning to use to program Edison.

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. The EdComm cable is used to download programs to Edison. It connects into the headphone socket on your computer or tablet. Please remove this from the battery compartment but keep it somewhere safe!
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.

Special note—Edison and batteries:

- Low or flat batteries can cause issues with Edison. For this reason, please be sure to use fresh, fully charged batteries.
- Only use regular disposable alkaline batteries or nickel metal hydride (NiMH) rechargeable batteries. Never use super heavy duty or heavy-duty batteries.
- Be sure that the batteries are inserted correctly to avoid damaging Edison.

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 robot off manually when not in use.

Get your programming devices ready

Edison can be programmed using a range of different computers and tablets. Different computing devices require slightly different initial setup. Please find your device type listed below.

> ### *Special note—managed networks:*
>
> If you are using computing devices on a network with a managed firewall, common at schools, please ensure that the URL of the programming application you are using has been added to your proxy white-list (e.g. www.edblocksapp.com for the EdBlocks app). Contact your network administrator for assistance in this instance.

Setting up Windows computers

Step 1: disable sound enhancements

The most critical set-up item with Windows machines is disabling any sound enhancements. Sound enhancements, sometimes called 'audio enhancements' are audio enhancement software packages designed to improve how your computer's specific hardware sounds. Windows machines often have these sound enhancements automatically enabled, which can cause problems when using Edison. You will find step-by-step video guides showing you how to disable sound enhancements for standard Window's sound enhancements as well as the most common third-party software programs on our website at https://meetedison.com/edison-robot-support/trouble-shooting/#soundenhancements

If your school or organisation uses an image to control the network computers' settings, we recommend you speak to your network administrator about having sound enhancements disabled on the image.

Step 2: check the volume

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.

Step 3: check your browser

Ensure you have a compatible web browser installed. We recommend running all of the programming applications using Chrome for best results.

Setting up Mac computers

Step 1: check the volume

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.

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 set to the correct volume level after plugging in the EdComm programming cable to your device.

Step 2: check your browser

Ensure you have a compatible web browser installed. We recommend running all of the programming applications using Chrome for best results.

Setting up tablets

Step 1: check the volume

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.

Step 2: check your browser

Ensure you have a compatible web browser installed. We recommend running all of the programming applications using Chrome for best results.
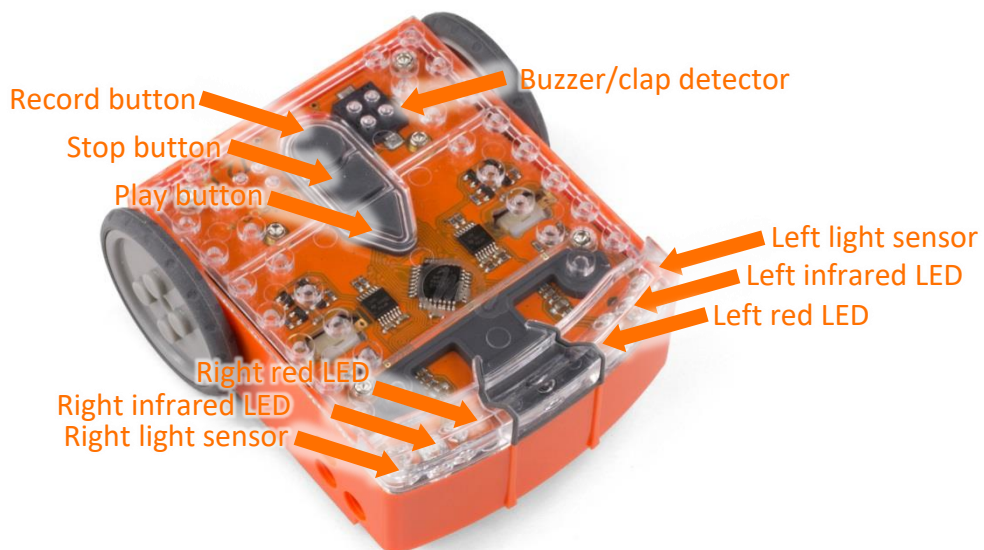
Meet Edison

Your Edison robot is LEGO brick compatible on four of its sides, has a removable skid and two removable wheels and includes a range of built-in sensors. Familiarity with your robot will allow you to create an incredible range of robotics and coding projects.

The top of Edison is transparent so you can see the electronics inside.

Edison's sensors, buttons and switches

To use Edison, you're going to need to know where all of Edison's sensors are located and become familiar with the robot's three buttons.

Record button
Stop button
Play button
Buzzer/clap detector
Left light sensor
Left infrared LED
Left red LED
Right red LED
Right infrared LED
Right light sensor

Top view: Edison's sensors and buttons.

Default settings of Edison's three buttons:

- Record button – 1 press = download program; 3 presses = scan barcode
- Stop button – 1 press = stop program
- Play button – 1 press = run program

Turn the Edison robot over to see where the power switch, removable skid, and line tracking sensor are located on the bottom.

Edison's line tracking sensor is made up of two parts: a red LED light and a light sensor.

The line tracking sensor also reads special barcodes that activate pre-installed programs.

Removable skid

Line tracking sensor

Power switch

Location of Edison's power switch, skid, and line tracking sensor.

Connecting Edison to a computer or tablet

You also need to know how to connect Edison to a computer or tablet using the EdComm cable to be able to download programs.

To connect Edison, plug the audio jack end of the EdComm cable into the headphone socket on your computer or tablet. The other end of the EdComm cable connects to your Edison robot as shown.

The EdComm programming cable.
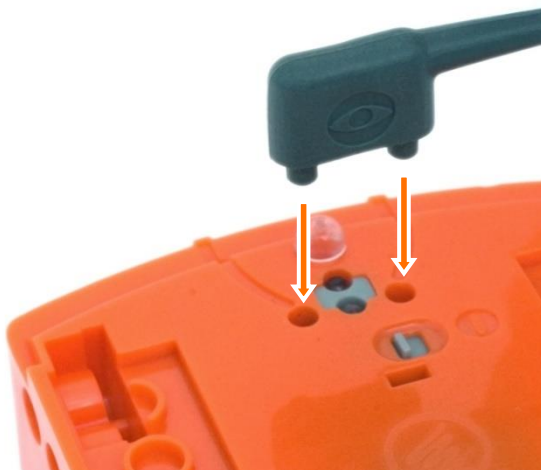
How to attach the EdComm programming cable to Edison.

Programming Edison

Edison can be programmed using pre-set barcodes and via a range of programming languages through our free web apps.

Edison will let you know if you have successfully programmed the robot or not by playing one of two sets of sounds.

While your program is downloading, Edison will make sounds similar to an old dial-up modem. This is the sound of the program being downloaded into Edison.

Once the program has finished downloading, or Edison has finished scanning a barcode, Edison will make one of two sets of beeps:

- the 'success sound' set of beeps, indicating Edison has successfully received the program, or
- the 'fail sound' set of beeps, indicating the program failed to download correctly.

The 'success sound' is the same sound you hear when you first turn the robot on. You can hear recordings of both the 'success sound' and the 'fail sound' at https://meetedison.com/edison-robot-support/trouble-shooting/#success-fail-sounds

Barcodes

Edison comes with several pre-set programs already loaded into the robot's memory. These programs are activated when Edison scans one of the pre-set barcodes. The barcodes tell Edison to run the correct pre-set program when the triangle button is pressed.

All of the barcodes are available in the free-to-download EdBook 1: *You're a Controller* available at https://meetedison.com/activity-books/barcodes-and-edison/

Tips for using barcodes:

- Make sure the removable skid is in Edison. When the skid is out, Edison sits with the line sensor right on the ground, and cannot properly detect the barcodes.
- Never use shiny paper or glossy laminate on pages with Edison's barcodes. The resulting reflection can cause problems with Edison not properly scanning the barcodes. Only use low-shine paper and matte-finish laminate.
- Avoid running Edison over barcodes in very bright light, such as sunlight, as this can interfere with the robot's ability to scan the barcodes correctly.

There are eight types of pre-programmed barcodes that you can use with Edison:

- Clap controlled driving – Make Edison turn or drive by clapping your hands.
- Avoid obstacles – Activate Edison's obstacle detection beam, enabling Edison to detect and avoid certain obstacles.
- Follow torch – Activate Edison's visible light sensors and use them to control Edison's driving behaviour towards the brightest light source.
- Line tracking – Activate Edison's reflected light line-tracking sensor and use it to control Edison's driving behaviour to follow the edge of a black line.
- Bounce in borders – Activate Edison's reflected light line-tracking sensor and use it to control Edison's driving behaviour to stay within a black border.
- Sumo wrestle – Activate this barcode in two or more Edison's, and put them into a black border. Watch them wrestle it out by detecting each other and charging forward at full speed!
- Remote control driving – Program Edison to respond to a range of commands using your TV or DVD remote.
- Obstacle detection calibration – Adjust Edison's obstacle detection to set the distance at which Edison can detect obstacles.

EdBlocks

EdBlocks is a fully graphical robot programming language that is super easy to use. A drag-and-drop block-based system, EdBlocks is intuitive and fun, even for younger users. Perfect for introducing anyone to programming, EdBlocks requires no prior coding knowledge to get started.
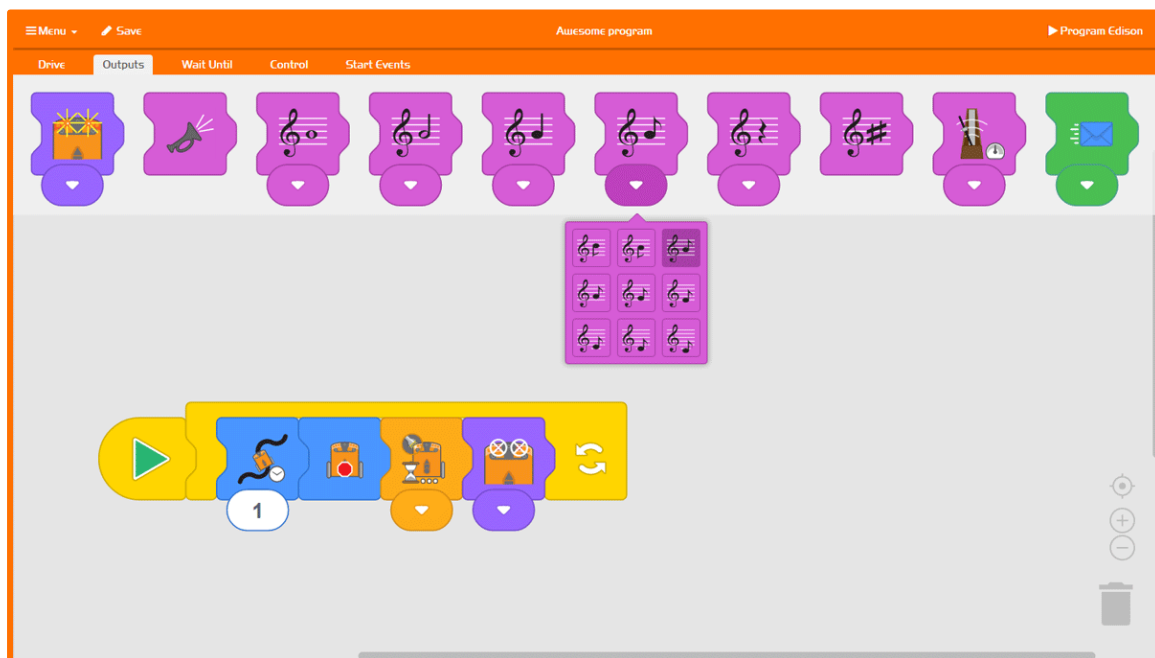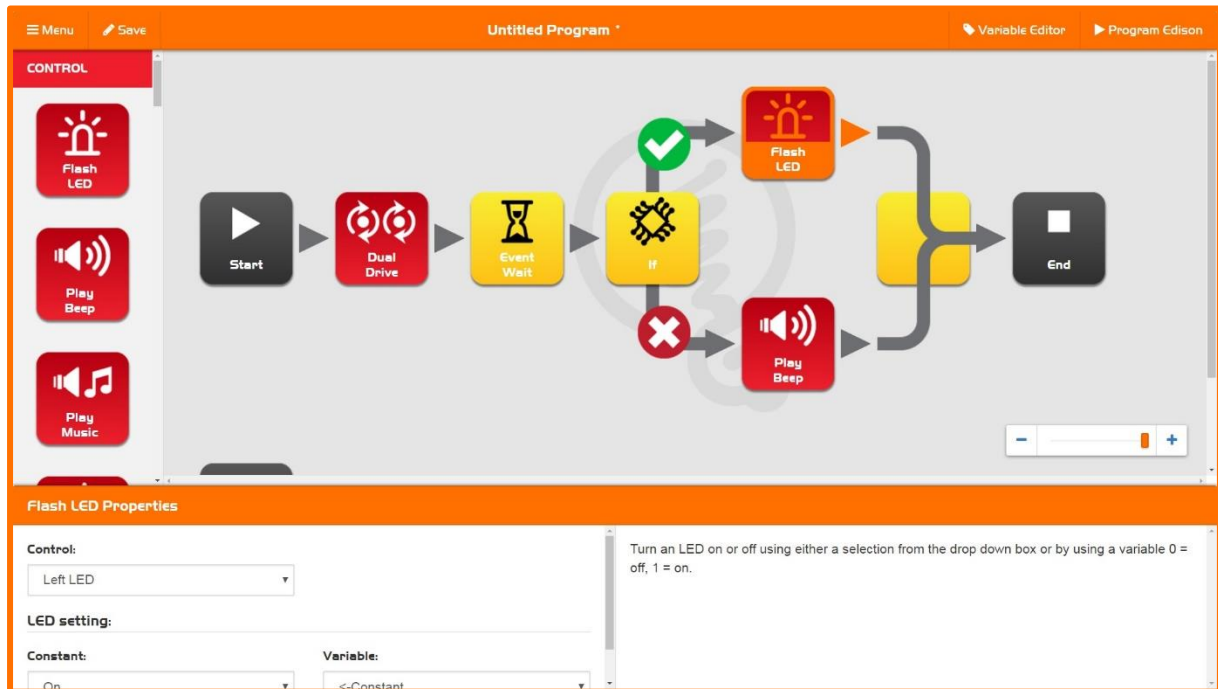

EdBlocks Resources

- EdBlocks programming language app - https://www.edblocksapp.com/
- Getting started with EdBlocks video - https://youtu.be/p_oGnbO2awA
- Teacher's guide to EdBlocks lesson activities and student worksheets - https://meetedison.com/content/EdBlocks-teachers-guide-complete.pdf
- Student worksheet set: 23 lesson activity worksheets - https://meetedison.com/content/EdBlocks-lesson-activities-complete-set.pdf
- Block guide - https://meetedison.com/content/EdBlocks-block-guide.pdf

EdWare

EdWare is a hybrid graphical robot programming language. EdWare combines the ease of drag-and-drop graphical icons with increased functionality from text-based entry. The result is a robot programming language that is easy to learn and offers a robust next-step in coding education.
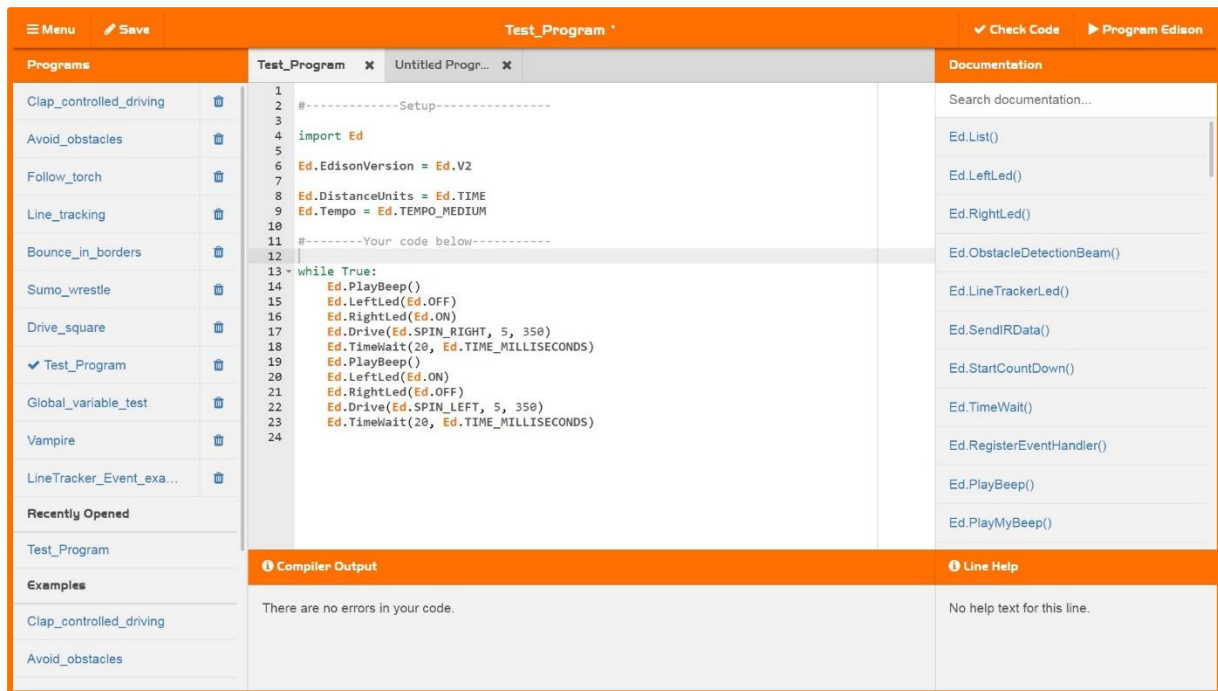

EdWare Resources

- EdWare programming language app - http://edwareapp.com/
- Teacher's guide to EdWare: 10 lesson plans - https://meetedison.com/wp-content/uploads/2015/04/Your-EdVenture-into-Robotics-10-Lesson-Plans.pdf
- Student worksheet set: 36 worksheets with 5 activity sheets - https://meetedison.com/wp-content/uploads/2015/04/Your-EdVenture-into-Robotics-10-Lesson-Plans-worksheets.pdf
- EdBook 2: *You're a Programmer* - https://meetedison.com/wp-content/uploads/2015/04/EdBook2-Your-EdVenture-into-Robotics-You-re-a-Programmer.pdf
- EdWare tutorial videos (set of 7) - https://www.youtube.com/watch?v=l8UuANc-COM&list=PLT_zuaMZ7LC8wRn0MOwsrQRp41BVdptzz

EdPy

EdPy is a highly versatile text-based programming language. EdPy is based on Python, a popular computer programming language renowned for being easy-to-learn with high readability. EdPy makes text-based programming fun by letting students see their code come to life in their Edison robot. With EdPy, students are learning the core of a real programming language and can take their exploration of robotics and coding to a more advanced level.

EdPy Resources

- EdPy programming language app - http://www.edpyapp.com/
- Teacher's guide to EdPy student worksheets and lesson plans - https://meetedison.com/content/EdPy-teachers-guide-complete.pdf
- Student worksheet set: 38 worksheets with 9 activity sheets - https://meetedison.com/content/EdPy-student-worksheets-complete.pdf
- EdPy documentation help text offline guide - https://meetedison.com/content/EdPy-app-documentation-guide.pdf
- EdPy tutorial videos (set of 10) - https://www.youtube.com/watch?v=kk1syvXTvSg&list=PLT_zuaMZ7LC8fRYiFzUoJHRNWHhN3jW16

Teaching with Edison

Edison is a complete STEM teaching resource for coding and robotics education which grows with students.

Children as young as four years old can begin to explore STEM using Edison's pre-set barcodes and remote-control operation of Edison. Older children can expand their coding and robotics knowledge as they work through the progressive coding languages available for the Edison robot.

Students age (years old)	Recommended programming type
4-6	Barcodes and remote controls
7-12	EdBlocks
11-13	EdWare
13-16	EdPy

What to teach first

No matter what age your students are when the first use Edison, we highly recommend you spend the time to get your students familiar with Edison. When students are familiar with Edison's sensor placements and capabilities, the three buttons and how to download programs, they are far more successful with everything that comes next.

We also recommend using the barcodes as an early activity with students of any age. Seeing their Edison come to life and perform a range of actions engages and motivates students to learn more. EdBook 1 is a great place to start as it contains all the barcodes you will need along with instructions and fun facts.

Teaching the programming languages

All of the programming languages for Edison can be accessed through free-to-use web applications – no extra software is required.

Lesson plans, including student worksheets and teacher's guides, are available for free online:

- **EdBlocks:** best suited to students aged 8 to 12 years old. No prior experience with programming or robotics is assumed or required. https://meetedison.com/robot-programming-software/edblocks/#edblocks-resources
- **EdWare:** best suited to students aged 11 and older. A basic understanding of programming fundamentals may be helpful. https://meetedison.com/robot-programming-software/edware/#edware-resources
- **EdPy:** best suited to students aged 13 to 16 years old. A basic understanding of programming fundamentals may be helpful. https://meetedison.com/robot-programming-software/edpy/#edpy-resources

Troubleshooting

Edison robots are designed to be easy to use straight out of the box but powerful enough to grow with students on their robotics and coding journeys. Like any computing device, issues can occasionally arise with Edison.

Where to start

If you do encounter an issue, always start by checking Edison's batteries. Remember, low or flat batteries can cause a range of issues with Edison.

Next, make sure the programming device you are using is properly set up as detailed in this guide. Also, check that your device's volume is turned all the way up.

Low or flat batteries and programming devices not properly set up are the most common causes behind problems using Edison.

Line tracking

If you are having trouble with a line tracking program, check the following common issues:

- Only use non-glossy paper and, if laminating the paper, only use a matte-finish laminate.
- Edison will be best able to follow a line if that line is a very dark colour (such as black), approximately 1.5cm (0.6 inches) wide and located on a white background.
- Always start the robot on the white background, never on the line itself.
- Avoid running line tracking programs in very bright light, such as sunlight, as this can negatively affect the program.
- All of the Edison programming languages except for EdBlocks and the barcodes require the line tracking sensor to be turned on to work. Double check your program to ensure you have the line tracking sensor turned on.

Obstacle detection

If you are having trouble with an obstacle detection program, check the following common issues:

- Ensure that your Edison robot's obstacle detection is properly calibrated using the barcode and instructions available in EdBook 1.
- Edison will be best able to detect obstacles which are opaque but not too dark (e.g. not black) and at least as tall as Edison.
- Avoid running obstacle detection programs in very bright light, such as sunlight, as this can negatively affect the program.

- All of the Edison programming languages except for EdBlocks and the barcodes require the obstacle detection sensor to be turned on to work.
- Double check your program to ensure you have the obstacle detection sensor turned on.

Where to get help

Ongoing support with your Edison robot is also available through the following:

- Online troubleshooting guide at https://meetedison.com/edison-robot-support/trouble-shooting/
- A range of support topics, with step-by-step guidance, are detailed at https://meetedison.com/edison-robot-support/
- The official Edison robot online forum at https://meetedison.com/forum/
- You can also contact the technical support team by completing a help request form at https://meetedison.com/edison-robot-support/contact-us/

Looking for more ideas?

The wonderful members of the Edison community love to share their ideas and designs. Check out the amazing resources available across our social media platforms:

- Facebook: @MeetEdison
- Twitter: @meetedison
- Instagram: @meet_edison
- YouTube: https://www.youtube.com/user/microbric
- Pinterest: https://au.pinterest.com/meetedison/boards/
- Forum: https://meetedison.com/forum/

We also feature some of our team's top picks of the latest Edison creations from around the globe in our newsletter. Be sure to sign up: https://meetedison.com/keep-up-with-edison/

Have something that you want to share? Tag us or send us an email at social@microbric.com – we love seeing your projects, photos and videos!

Checklist: setting up for success with your Edison robot

These critical steps and quick references will help you to set up your Edison robot for success each and every time!

Edison basics

	Batteries: Use fresh, full batteries. Only use regular disposable alkaline batteries or nickel metal hydride (NiMH) rechargeable batteries. Never use super heavy duty or heavy-duty batteries. Make sure the batteries are inserted correctly.
	EdComm cable: The cable initially comes in the battery compartment of Edison. Be sure to push the cable fully into the audio jack on your programming device.
	Paper: Do not use glossy paper and only ever use matte-finish lamination. This is especially important for barcodes and line tracking.
	Disable sound enhancements: Turn off sound enhancements on any Windows computer before programming with Edison.
	Set volume to maximum: Confirm your device's volume is all the way up when programming Edison. Double-check the volume after you plug in the EdComm cable.
	Avoid sunlight: Sunlight confuses Edison's sensors. Avoid using the robot in bright, direct sunlight.

Sensors and programs

	Barcodes: Print barcodes on non-glossy paper and only use a matte-finish lamination if laminating. Make sure Edison's skid is in before reading barcodes.
	Line tracking programs: Always start Edison on the white surface, never on the black surface.
	Detecting lines: Use dark (e.g. black) lines approximately 1.5cm (0.6 inches) wide on a very reflective (e.g. white) background.
	Obstacle detection calibration: Adjust Edison's obstacle detection with the obstacle detection barcode. See EdBook 1 for detailed instructions.
	Detecting obstacles: Choose obstacles that are opaque but not too dark (e.g. not black) and at least as tall as Edison.

Programming languages

	Barcodes: Appropriate for ages 4+. No prior experience with programming or robotics is assumed or required. https://meetedison.com/robot-activities/youre-a-controller/
	EdBlocks: Best suited to students aged 7 to 12 years old. No prior experience with programming or robotics is assumed or required. www.edblocksapp.com
	EdWare: Best suited to students aged 11 to 13. A basic understanding of programming fundamentals may be helpful. www.edwareapp.com
	EdPy: Best suited to students aged 13 to 16 years old. A basic understanding of programming fundamentals may be helpful. www.edpyapp.com