Edison's musical talents

Outputs using sounds are one of your Edison robot's three main types of outputs. In EdScratch, the blocks related to sound outputs are in the Sound category.

Did you know?

Edison has a special bit of tech which you can see just to the left side of the round button. This is a buzzer and a sound sensor all in one. It can detect noise but it can also make noise, like beeps or musical notes.

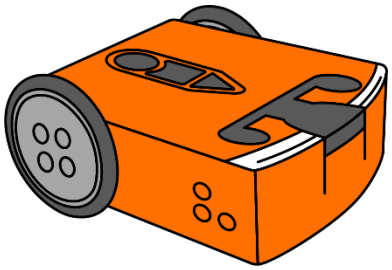
To program Edison to play music, there are a few things we need to learn:

- ☐ Part 1: What is an Edison robot?
- ☐ Part 2: How do you use EdScratch with Edison?
- ☐ Part 3: Play a tune
- ☐ Part 4: Move to the music
- ☐ Part 5: Dance along!
- ☐ Part 6: Challenge: You are the conductor

Have you used Edison robots and EdScratch before? Jump straight in at part 3!

Part 1: What is an Edison robot?

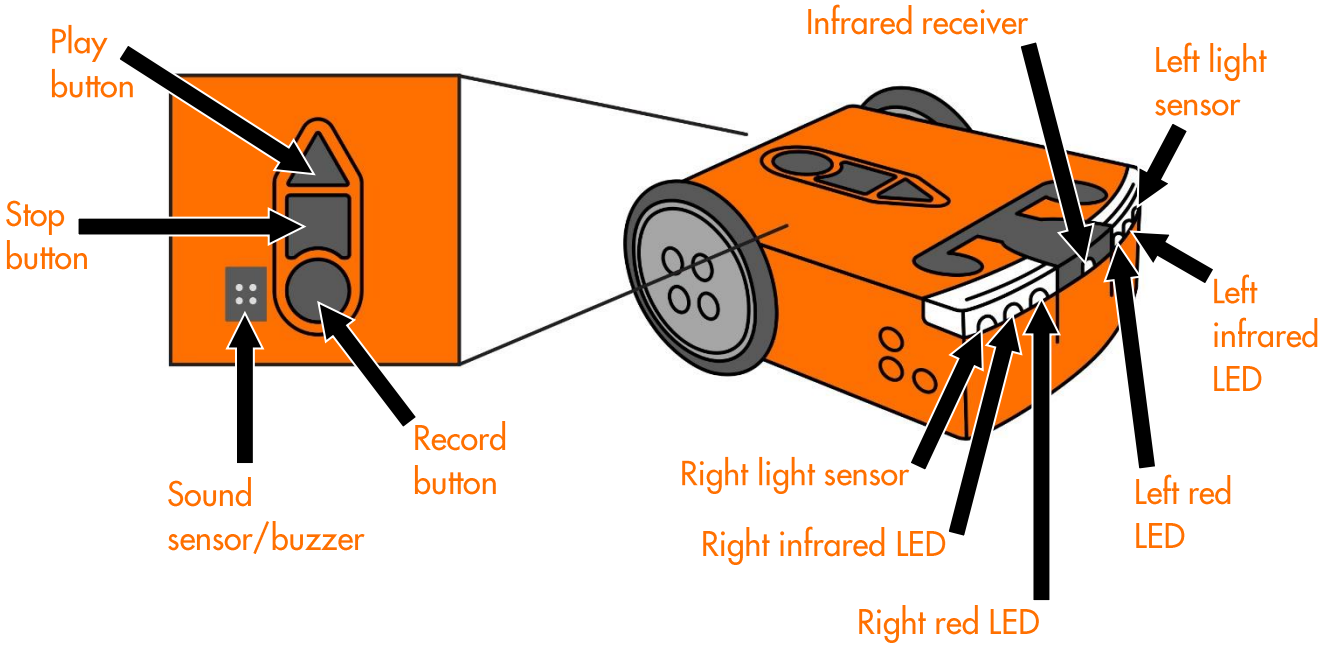
This is Edison, the programmable robot.



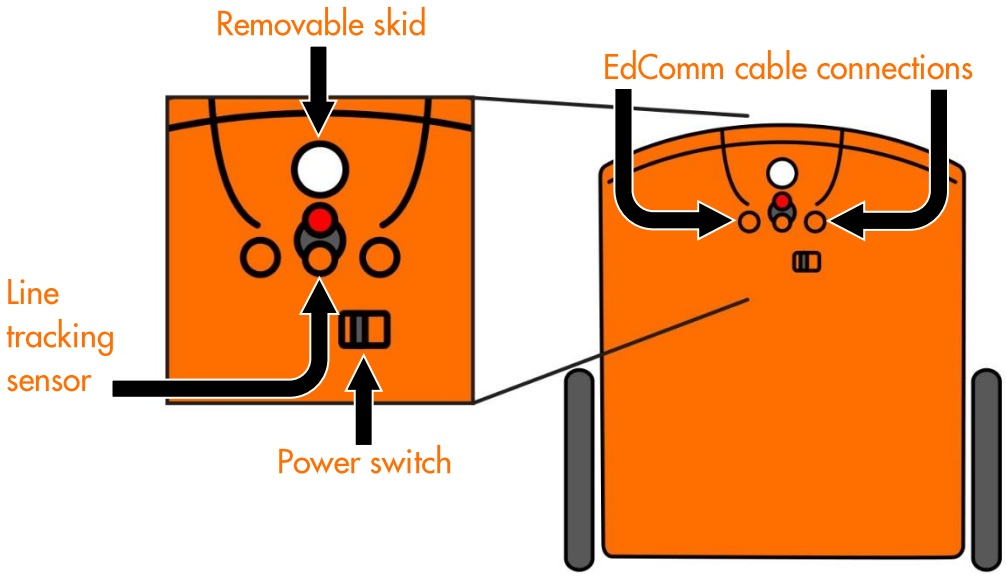
There's a lot we can do with our Edison robots. We can program the robot to do things like drive using its motors, flash its LED lights or make sounds. Edison also has different sensors which we can use to get the robot to behave in different ways.

Edison uses sensors and motors to interact with the world. The robot also has three buttons, a power switch and several removable parts. Knowing where Edison's parts are and what they do will help you use Edison.

Have a look at the top of your Edison robot. Try to find all of the parts labelled in the picture on your Edison robot.

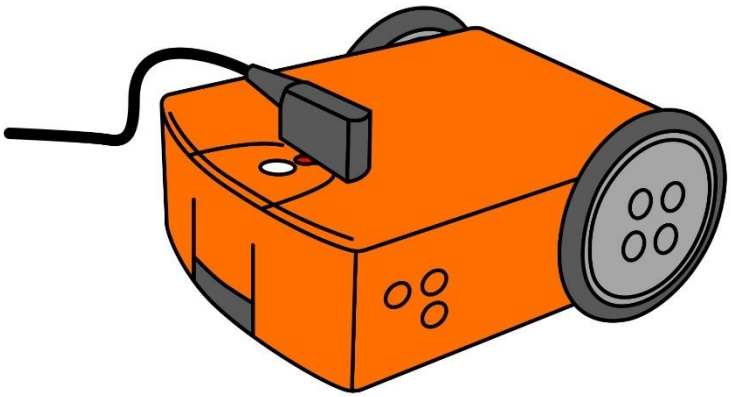


Flip Edison over. Look at the picture and try to find all of the parts labelled in the picture on the bottom of your Edison robot.



There is one other component which we will use a lot with the Edison robot called the EdComm cable.

You will use the EdComm cable to download your programs to Edison from your programming device, like your computer. The EdComm cable has a connection for Edison on one end, and the other end connects to the headphone socket on your computer.



For practice, try connecting the EdComm cable to Edison.

Why is that?

The top of Edison is made of clear plastic. This way you can see the electronic components that make Edison work. One of the most important parts is the black-coloured square that sits just above the tip of the 'play' (triangle) button. Can you see it?

This is the robot's microchip. The microchip is basically a tiny computer, which is sometimes called a micro-computer. It contains the central processing unit (CPU). That's basically Edison's brain!

Part 2: How do you use EdScratch with Edison?

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.

Check out EdScratch

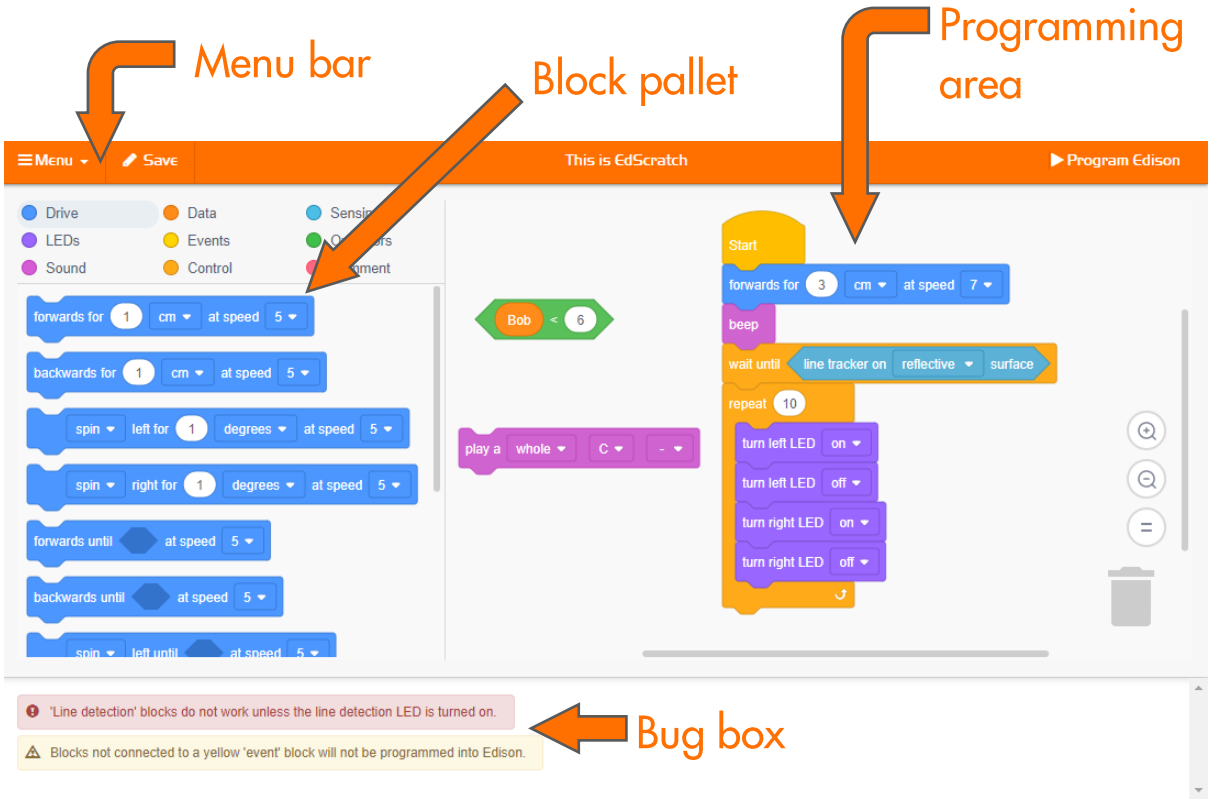
You can access EdScratch online.

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

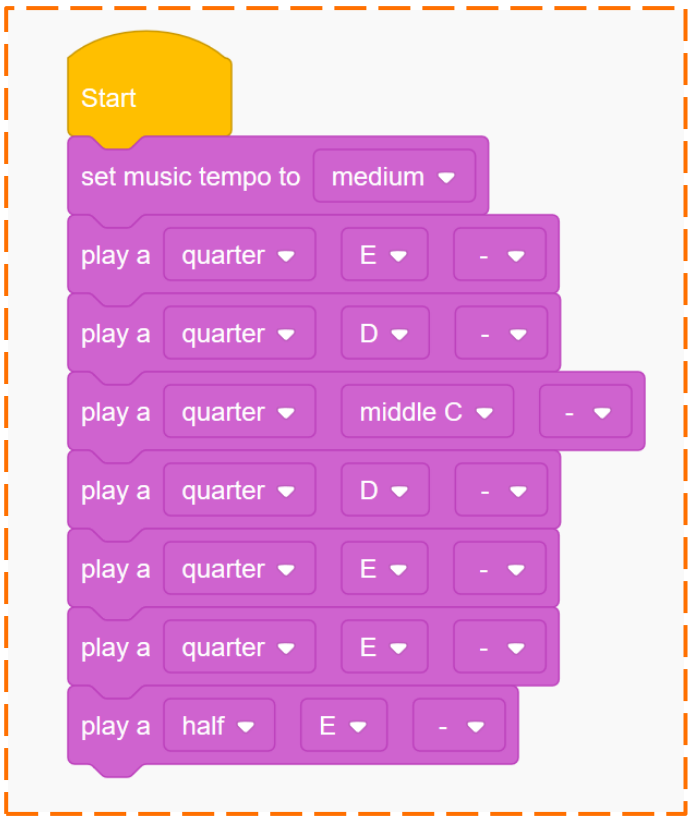
Below the block pallet and programming area is the bug box. Warning messages will show up in the bug box.

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

Part 3: Play a tune

Have a look at the Sound category in EdScratch. There are not many blocks in this category, so you might think there is not a lot you can do with Edison and sounds. By using the sound blocks in different sequential orders and with different input parameters, however, you can play whole songs!

In EdScratch, write the following program:



Download the program to your Edison robot and run it. This program is the first part of a song you might know. Do you recognise the tune?

The first block in the program is the set music tempo block. Try clicking on the drop-down menu in the set music tempo block to see the input parameter options for the block. Choose a different input parameter for the block, then download the adjusted program to Edison. Run your new program in your robot.

1. Which new input parameter did you select for the set music tempo block?

   _____

2. What happened when you played the new program? What changed compared to the original program?

3. What does the set music tempo block do?

4. If you put the set music tempo block at the end of this program instead of the beginning, what would happen? *Hint:* Remember that Edison will read each EdScratch block one at a time from the top of the program in sequence.

Hint!

Not sure what would happen if you make a change to a program? One of the best ways to find out is to make the change, download the adjusted program and test it out using Edison!

You can always experiment in coding!

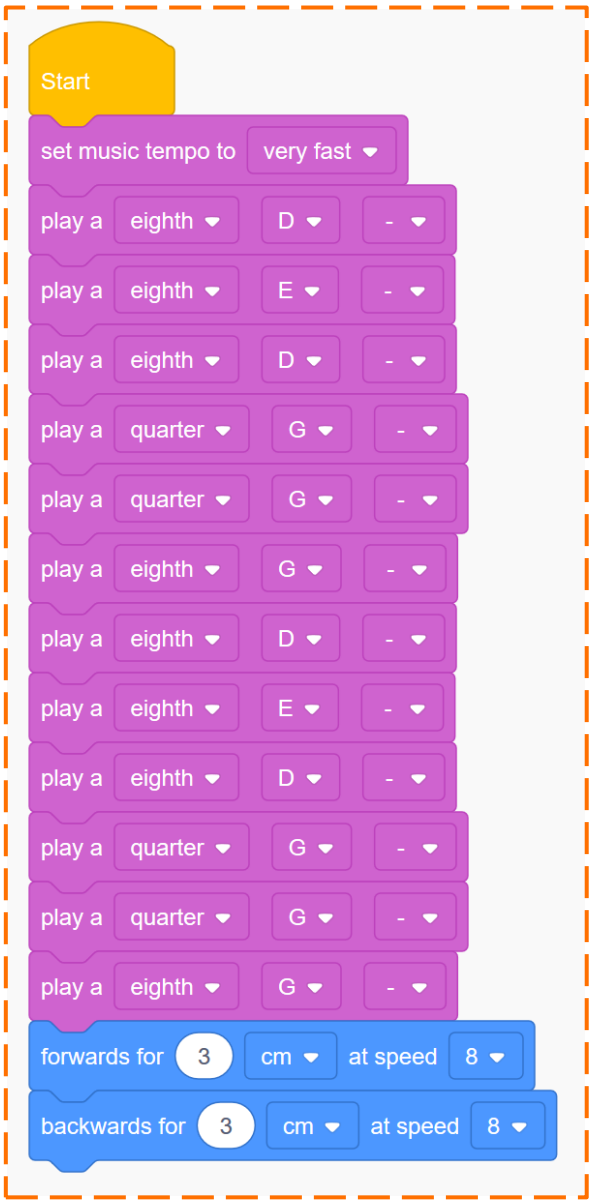
Use this link

Want to hear Edison play more of this song?

Open the program using this link: https://www.edscratchapp.com?share=Eb12x3Dm

Part 4: Move to the music

Look at this EdScratch program:



This program has the music for the first part of the song *The Hokey-Pokey*. This is a great song to dance along to – the song tells you just what moves to do!

In EdScratch, write the Hokey-Pokey dance program. Download the program to your Edison robot and play it.

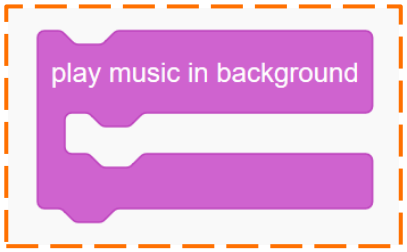
1. Did your Edison robot move along with the music? Why do you think this is the case?

_____

_____

_____

Edison can play a musical note while doing something else, like driving, but you have to tell the robot that is what you want it to do. There is a special block in the Sound category in EdScratch you need to use to do this. Here is what it looks like:



The play music in background block is a grouping block. Other blocks can sit inside this grouping block.

Why is that?

The shape of a block in EdScratch can give you a hint about what that block is used for in programs. Look at the play music in background block. See how it has a shape a bit like a mouth? Other blocks can sit inside the opening of this block's 'mouth'.

Any block that sits inside the play music in background block will be affected by this grouping block. Remember, Edison will follow each EdScratch block one at a time. The robot will see the grouping block first and know that any blocks inside that block get the 'play music in background' affect.

Add a play music in background block to your Hokey-Pokey dance program. Think about where in the program this block needs to go.

Download the adjusted program to your Edison robot and play it. Edison should now start playing the song and move at the same time!

Edison's dance moves need a bit of work, however.

Hint!

Remember that if something isn't quite right in a program, a warning message will show up in the bug box. These messages can help you work out what should be inside the grouping block and what should not!

Part 5: Dance along

Add more dance moves to your Hokey-Pokey dance program. You could get Edison to follow the steps in the Hokey-Pokey song lyrics or make up your own dance!

Can you get Edison to dance in time to the music?

1. What types of blocks could you try using to get Edison to dance to the music?

_____

_____

Part 6: Challenge: You are the conductor

What is your favourite song? Is there a theme song to a TV show or a movie you love to hear?

For this activity, the song choice is up to you!

What to do

You are the conductor, and you need to get Edison to play the song of your choice. Write a program for Edison so that the robot plays your song. Test out different tempos to see which works best.

If you want, you can also program the robot to move or dance to your song.

Once you have your program ready, run it in Edison to have the robot perform your musical masterpiece!

Hint!

Which block tells Edison to play music in the background?