

U3-1.1 Let's explore repeating steps

To get a computer, like the Edison robot, to do what you want it to do you need to give very specific instructions. You need to write code that says exactly which actions you want to happen in exactly which order you want each action to happen.



Don't forget

When you write a program for your Edison robot in EdScratch, you are telling the robot what to do and in what order to do each thing. Each EdScratch block is one action you are telling the robot to take. The order you connect the blocks in your program tells the robot in what sequence to do each action. Edison will do the actions one at a time, starting with the top block.

Task 1: Drive in a square

Write a program for Edison using EdScratch so that your robot can drive in a square. Your program should only use blocks from the **Drive** category to control the motor outputs. Download your program and use activity sheet U3-1 to test your program. Make sure your program has Edison end in the exact same spot it started.

1. How many blocks do you have in your program not counting the **start** block?

Sample student answer: 8

2. Look at the blocks in your program. What do you notice? Is there a pattern to the blocks?

Sample student answer: There is a pattern to the blocks. Only two block types are being used

with the same input parameters, and they repeat four times.

Task 2: Use a loop to drive a square

To get Edison to drive a square, you need to program the robot to drive each side of the square and turn at each corner of the square. You might have noticed that this makes a pattern in the code: drive the side, turn, drive the side, turn, drive the side, turn, drive the side, and turn one last time, back to the starting position.

Lots of programs have repetition, where a bit of code is used over and over. Repeating stuff is one thing that computers are really good at doing. Unlike a person, a computer **doesn't get** bored doing the same thing exactly the same way again and again.

Imagine you wanted to get Edison to do the same thing 100 times. Would you want to write out that program using 100 repeating blocks? Would you find that boring to write? Do you think you would be able to write the whole program without making a mistake?

There is an easier and more efficient way to get a computer to repeat commands multiple times. You can get the code to repeat by using something called a **loop**.



Jargon buster

A **loop** is a special piece of code that tells a computer to repeat something multiple times. Loops are a type of **control structure** because loops control other bits of code in a program.

In coding, using loops lets us repeat other bits of code multiple times without having to write each command over and over. In EdScratch, loop blocks are in the **Control** category in the block pallet. One of the loop blocks in EdScratch is the **repeat** block:



There are different types of loops. The **repeat** block is a **definite loop**.



Jargon buster

A **definite loop** is a type of loop which will repeat for a set number of times. The **repeat** block in EdScratch is an example of a definite loop. You tell the loop how many times to **repeat** using **this block's input parameter**.

Like all loop blocks in EdScratch, the **repeat** block wraps around other blocks.



Why is that?

Look at the shape of the **repeat** 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 repeat** block is inside this loop. All blocks inside the loop will be repeated.

Remember, Edison will follow each EdScratch block one at a time. The robot will see the loop block first and know that any blocks inside that loop need to be repeated as many times as the **repeat block's input parameter says**. **The robot will then do the action of each block inside the loop in order**. When it gets to the bottom of the blocks in the loop, it will move back to the top of the loop and start again!

Try using a **repeat** block to make a program for Edison to drive a square. You should be able to write a program for Edison which uses only three blocks after the **start** block, including one **repeat** block. Download your program and use activity sheet U3-1 to test your program. Make sure your program has Edison end in the exact same spot where it started.

3. What value do you need to have in the input parameter in the **repeat** block to get Edison to drive a square?

Sample student answer: 4

4. Why do you need to have that be the value?

Sample student answer: The value needs to be 4 because a square has four sides and four corners. So, the code needs to drive each side and turn each corner a total of 4 times.

Activity sheet U3-1: Drive a square

