Name _____

Challenge up: Doodle-bot challenge

You can program Edison to drive in patterns which make many different shapes. If you attach a pen to your robot, you will be able to get Edison to draw those shapes too!

What to do

Attach a pen to an Edison robot. You can use EdCreate parts or any other materials you like.

Write a program in EdScratch so that when you run the program, your robot will draw a shape. Once you have built your pen attachment and programmed your robot, try running the program to see your shape!

Write about what you experienced in this challenge. What problems did you encounter? What did you do to overcome those problems? How did you attach the pen? What shape did you try to draw? Did it work?

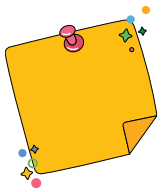
Name _____

Let's explore loops and sequence

Loops are a very useful control structure in coding. Loops can help make programs more efficient by letting you repeat commands without needing to write the same blocks of code multiple times.

When you use loops in programs, you still need to think carefully about sequence. This is especially true when you make programs which have some code inside of a loop and some code outside of the loop.

Let's try making a program that will let Edison drive a quadrilateral. Your program will need to have some of the code inside of a loop, but some of the code will need to be outside of the loop.



Don't forget

Sequence means going in order, step-by-step.

Try it out

A quadrilateral is a four-sided shape. Squares are quadrilaterals, but not all quadrilaterals are squares. Look at the quadrilateral on page 86. This quadrilateral has four sides and four angles, but they are not all the same.

You need to write a program for Edison using EdScratch so that your robot can drive the shape of the quadrilateral. Your program should use blocks from the **Drive** category to generate the motor outputs you need. Your program also needs to use a loop from the **Control** category.

You need to work out the best place to start Edison on the activity sheet. Be sure your program also has Edison end in the exact same spot where it started.

Write your program in EdScratch. Then download your program and use the activity sheet on page 86 to test it out.

Hint

Think about the sequence of actions you want Edison to take. Remember, when you make an EdScratch program for Edison, the robot will start with the top block and do each action in order, one-by-one.

You still want to make your program as efficient as possible, so try to use as few blocks of code as you can.

Make a drawing of the quadrilateral. Where on the quadrilateral did you start Edison? Mark where you started Edison, including which direction you had the robot drive. **Take a photo of your drawing and add it to the image box below**

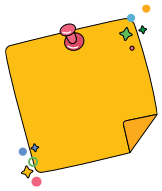
Look at your start point and your program. How did using this start point affect the sequence of your program?

Name _____

Let's explore forever loops

Loops let us repeat steps in a program without having to write the same code over and over. When you want a program to do the same thing many times, using a loop is easier than having to write each command again and again. This makes our code more efficient because you can tell the computer to do the same thing using much less code.

In many programs with repeating commands, you know how many times you want the program to loop. If you want to get your robot to drive in a square, for example, you know you need to have Edison drive and turn four times. In that program, you can use a definite loop which repeats four times.



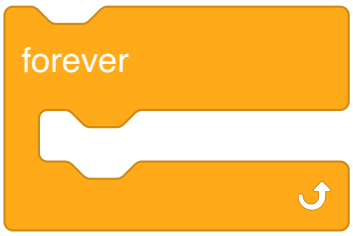
Don't forget

There are different types of loops.
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.

To use a definite loop, you need to know how many times the loop needs to repeat. What if you don't know that? Or, what if you want to make a program that loops forever?

To have something repeat forever in EdScratch, you need to use a special loop block in the Control category in the block pallet called the **forever** block.

The **forever** block is an **indefinite loop:**



Jargon buster

An **indefinite loop** is a type of loop which will repeat for an undefined number of times. The **forever** block in EdScratch is an example of an indefinite loop. This loop block tells Edison to keep repeating the code blocks inside this loop forever.

You can think of the **forever** block in EdScratch as working the same way as the **repeat** block does, but with the input parameter for the number of loops set to infinity!

The shape of a block in EdScratch can give you some clues about how you use it in the language. Look at the shape of the **forever** block. Just like all the other loop blocks in EdScratch, the forever block wraps around other blocks. All the blocks that sit inside the loop block will be repeated.

If you write a program using a **forever** block, do you think you will you be able to add commands for Edison to do after the loop? Why or why not?

Name _____

Try it out

Let's turn Edison into an egg timer! Use the forever block to write a program so that Edison will wait a certain number of seconds and then sound an alarm forever.

Hint

You can always stop a program by pushing the stop (square) button on your Edison robot.

Think about the sequence of things that need to happen for the egg timer program to work.
What needs to be inside the loop? What needs to be outside of the loop?
Download and test your program with your robot.

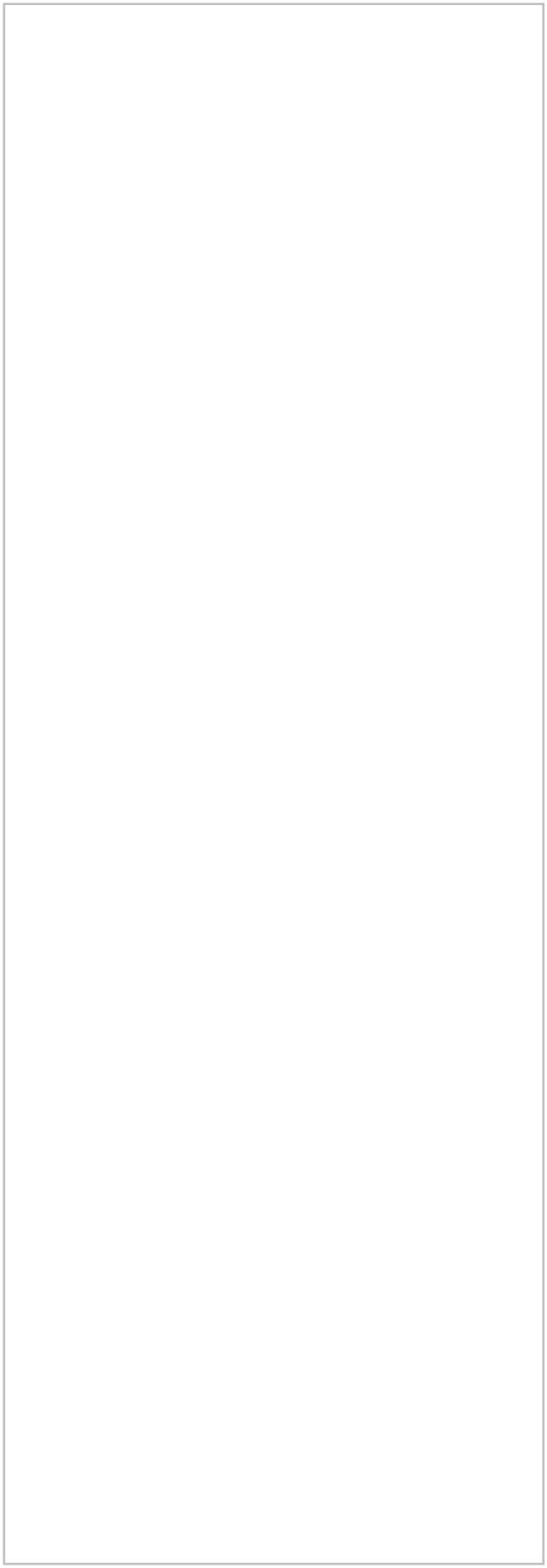
What does your program look like? Which blocks does it use, in which order?
Write your program below. Be sure to include the input parameters you used.

Challenge up: Earworm

An earworm is a song that gets stuck in your head for what feels like forever. In this activity, you need to give Edison an earworm by programming the robot with a tune and a **forever** block!

What to do

Program Edison to play a song or tune over and over using a **forever** loop block. Write your program in EdScratch, then download it and test it with your robot. **Write your program in the left box on the next page or add a photo in the right box.**



Name _____

Activity sheet: Drive a quadrilateral