Edison the maze racer

Let's get the Edison robot to race along a Euler Path shape.

To do this, there are a few things we need to learn:

☐ What is a Euler Path?
☐ What is an input?
☐ What is an output?

Is this your first time using Edison robots or EdBlocks?
Start with the activity *Getting started with Edison* first!
Ask your teacher for a copy.

What is a Euler Path?

Have you ever tried to draw shapes or letters without lifting your pencil? Some shapes you will need to go back over a line that you have already drawn, but others you can draw without ever backtracking. The shapes that you can draw without backtracking are called Euler path shapes. If your drawing begins and ends at the same place, it is also known as a Euler circuit.

Why do we care about a Euler path or circuit?

A Euler path will always be the most optimal path through something. For example, if there was gardener who had a garden plot that was shaped like this:
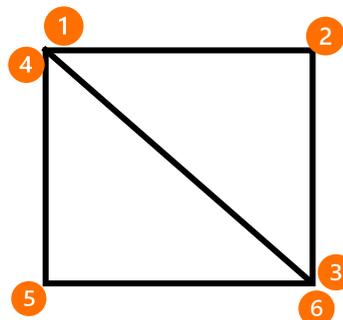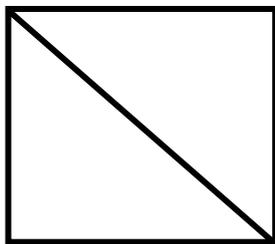
You could use a Euler path to show the best route the gardener could take so that they could water all their plants with the fewest number of steps possible (walking the least).

How can you get Edison to drive a Euler Path?

For Edison to drive a Euler path, you will need to input the instructions as code, for Edison to process and turn into outputs.

What is an input?

You can tell Edison how to drive by giving the robot inputs.

Inputs are the information and instructions that you give a computer. When you write a program for your Edison robot, you are telling the robot what you want it to do by giving it code blocks. These blocks are the inputs!

You have to give the robot the inputs in the sequence you want the robot to perform each action.

Sequence means following steps one-by-one. Edison reads code from left to right, starting at block one. Edison then moves along the blocks one block at a time.

Start!

Block 1   Block 2   Block 3   Block 4   Block 5
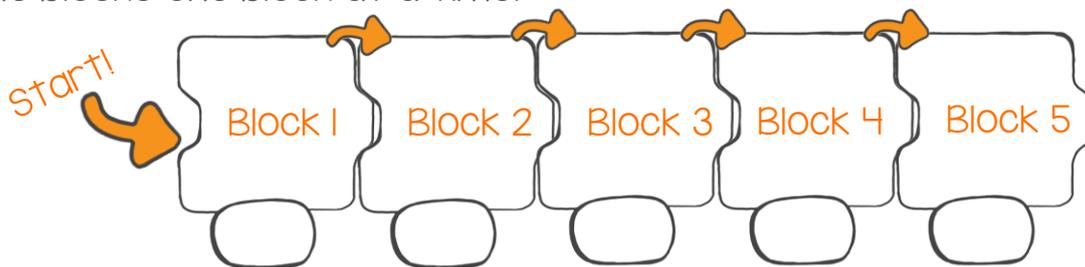
You can give Edison all the inputs the robot will need to drive any Euler path by using just these three blocks:
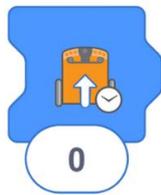
Drive forward   Turn left   Turn right

What are the numbers inside the blocks? These are input parameters.

Input parameters are things you can change inside a code block. The input parameters are important pieces of information needed in an input command.

In EdBlocks, the drive blocks use 'seconds' as the input parameter. This input parameter tells Edison how long to drive for.

For example, if you want Edison to drive forward, you would choose the 'drive forward' block. You then need to enter an input parameter of a number of seconds. This tells Edison how many seconds to drive forward for.

What is an output?

Once you make your program and download it to your Edison, the robot outputs your code as its actions. In other words, how the robot behaves when running your program are the outputs you get based on the inputs you gave in your program.

Task 1: Solve the first Euler Maze

Let's try giving the robot the inputs it needs to drive through a Euler Maze.

Take a look at the activity sheets. Each has a different maze. Choose one of the activity sheets to use.

2.1. Which maze number did you choose?

_____

Using the 'Drive' blocks, write a program for Edison so that the robot can solve the Euler Maze. You will have to test different values to use as your input parameters.

Try it!

Open the EdBlocks app at www.edblocksapp.com and write your program.

Download the program to your Edison robot. If you have the EdSketch Pen Holder attached so your Edison will be drawing, you will need to position your Edison so that the wheel the Pen Holder is attached to is just outside the maze and the pen is inside. When your EdSketch (Pen marker and Penholder) and Edison are in position, press the triangle button. Make sure your Edison drives within the maze and does not repeat an area.

If you don't have an EdSketch kit, don't worry you can build your own Pen Holder using either EdCreate or any Lego compatible bricks you may have.

Did something not work the way you expected? That's okay! Think about what went wrong when you played your program. Look at that part of your code. Can you find and fix the problem?
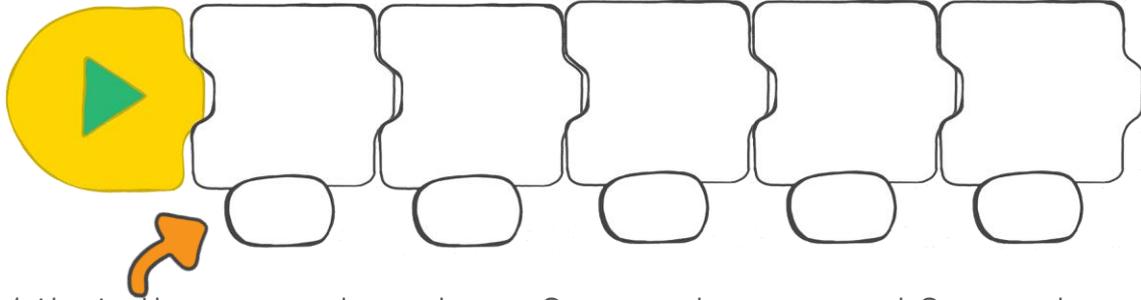
ook at the activity sheets. Each has a different maze. Choose one of the activity sheets to use

Tip: Is Edison moving too fast? Try changing the speed setting to 'slow' using the 'set drive speed' block.

2. What does your successful program look like? Which blocks does it use, in which order? Write your program below:

Write in the correct number of seconds you used for each input parameter. If you need more blocks, just flip this page over and draw them on the back!

3. Look at the number of seconds used in each block of your program. What do you notice about the input parameters you used? How could this help you plan out a program for a different maze? What inputs helped you make turns or drive straight?

_____

_____

_____

Task 2: Create your own shape!

This time you need to program Edison to drive a different maze. Either choose another shape from the activity set or make your own. Your shape will need to be traceable for Edison like the maze in task one. Then program Edison to drive the pattern, remembering you do not want to backtrack.

4. Did you manage to draw a Euler path shape? How do you know?

_____

_____

Try it!

Write your program in EdBlocks and then download the program to your Edison robot.

Remember, if you have the EdSketch attached you will need to position your Edison so that the wheel it is attached to is just outside the maze and the pen is inside. When your EdSketch and Edison are in position, press the triangle button. Make sure your Edison drives within the maze and does not repeat an area.

If something doesn't work the way you expected, remember it's okay! Think about what went wrong when you played your program. Look at that part of your code. Can you find and fix the problem?

5. What does your successful program look like? Which blocks and input parameters does it use, in which order? Write your program below:
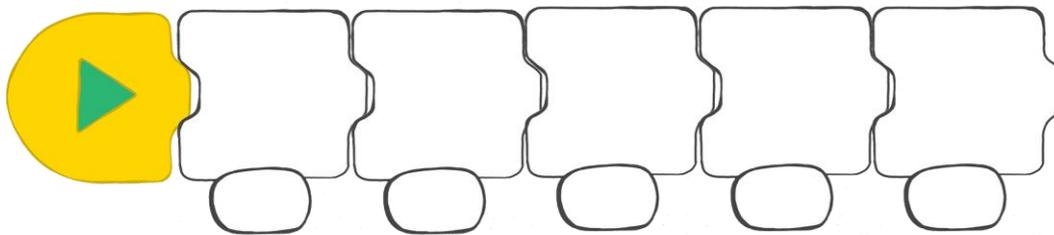
Tip: Need more blocks? Just flip this page over and draw them on the back!

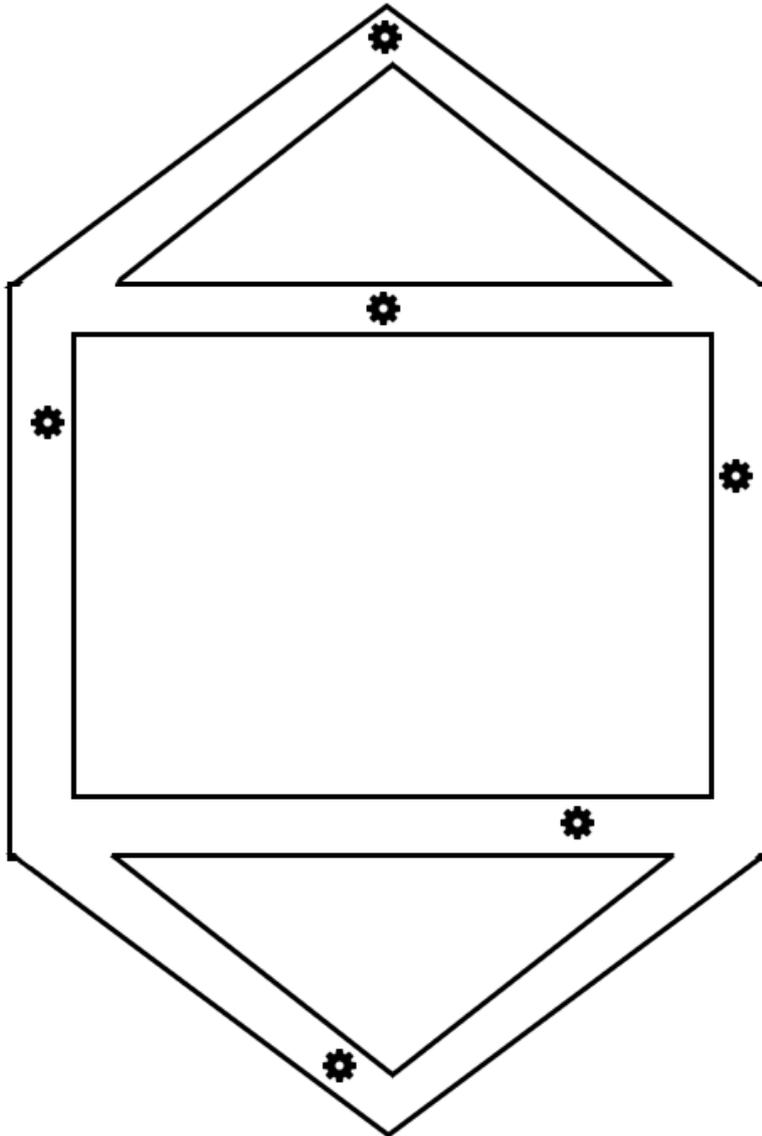6. Compare your two programs. Are there any patterns you notice that are similar in both? What are they?

_____

_____

_____

_____

Activity Sheet 1:

Can you help Edison pick up all the gears? Remember, you can only go down a path once, so choose wisely!
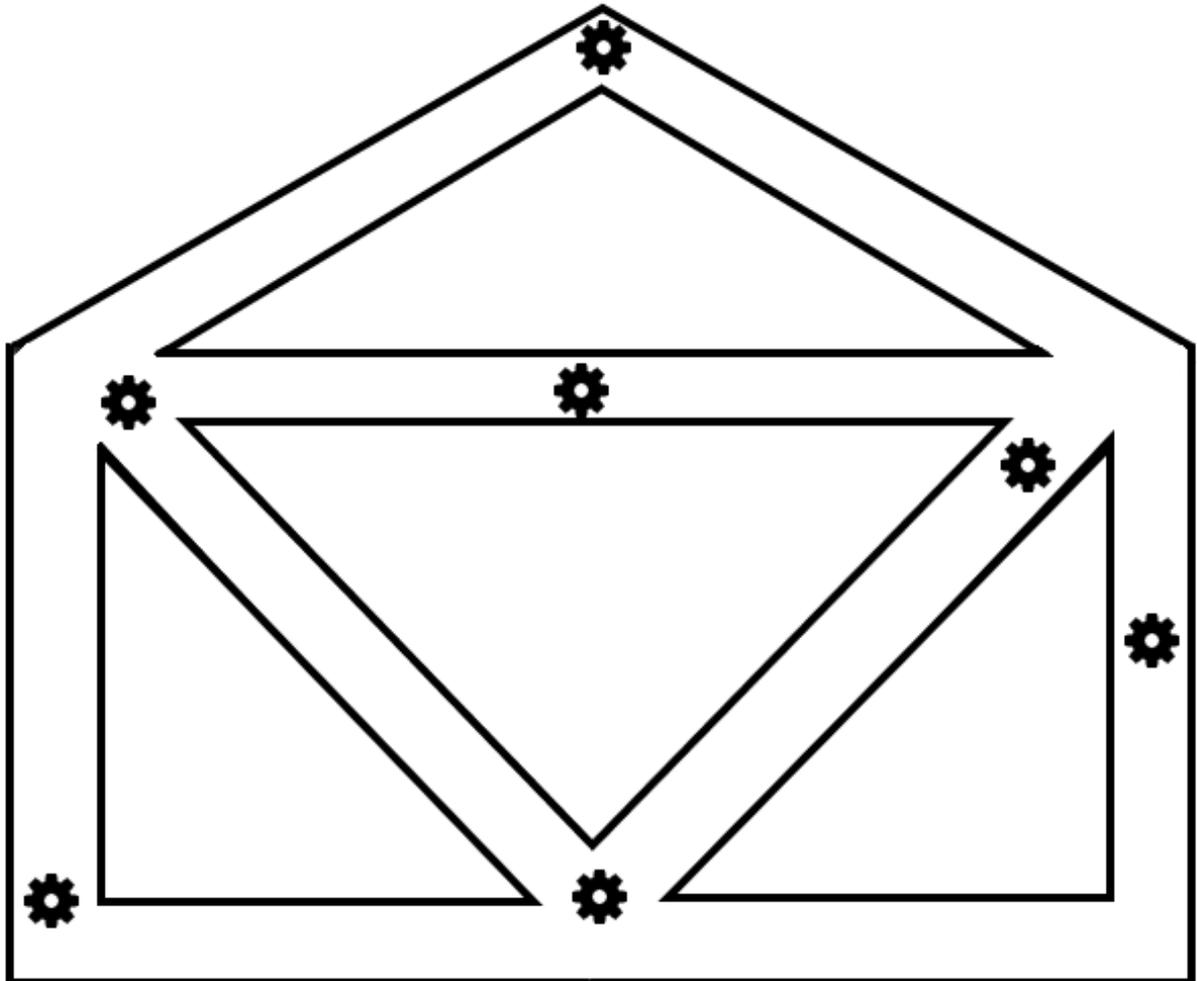

Notes (What has/hasn't worked):

Activity Sheet 2:
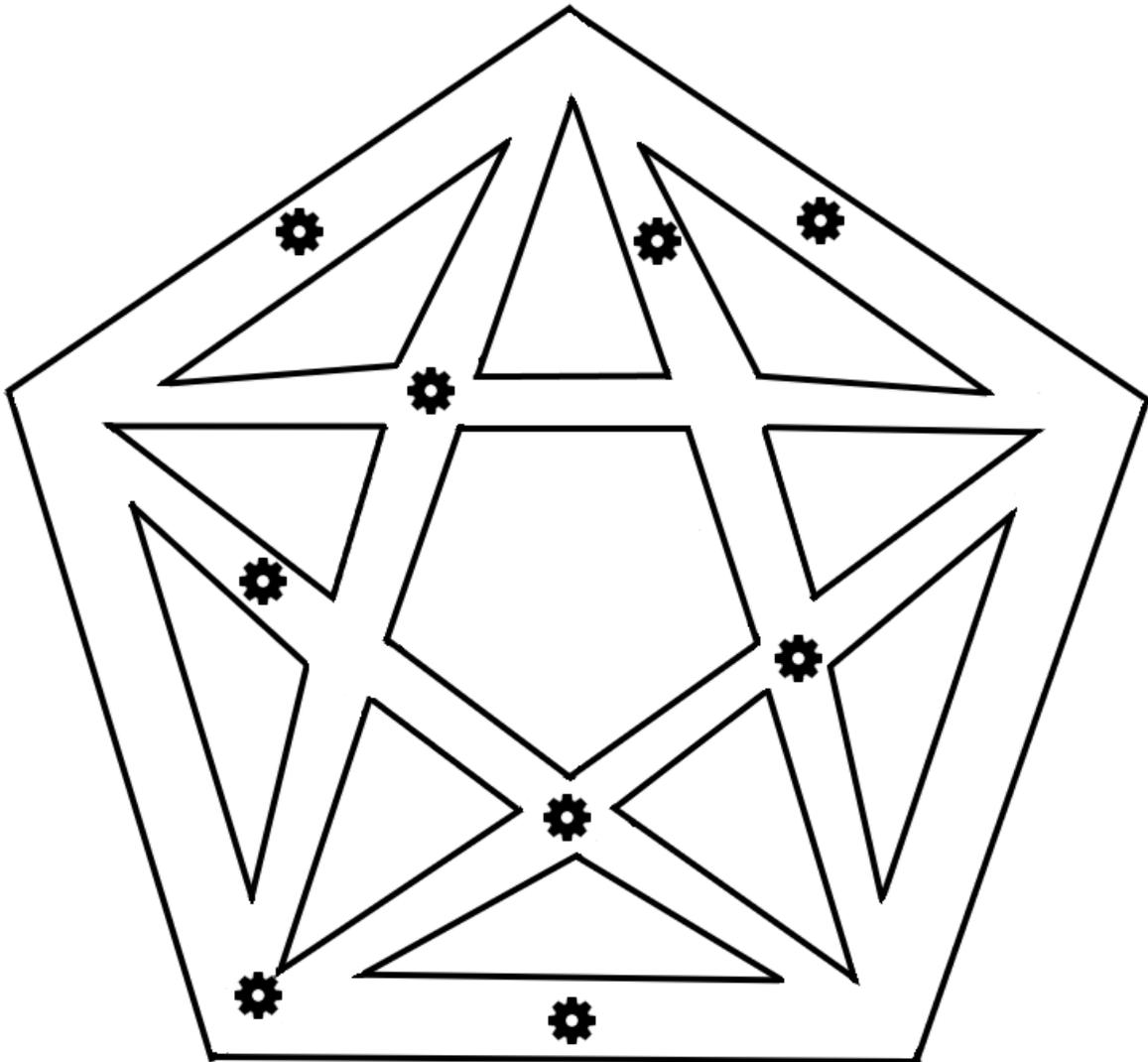
Can you help Edison pick up all the gears? Remember, you can only go down a path once, so choose wisely!

Notes (What has/hasn't worked):

Activity Sheet 3:

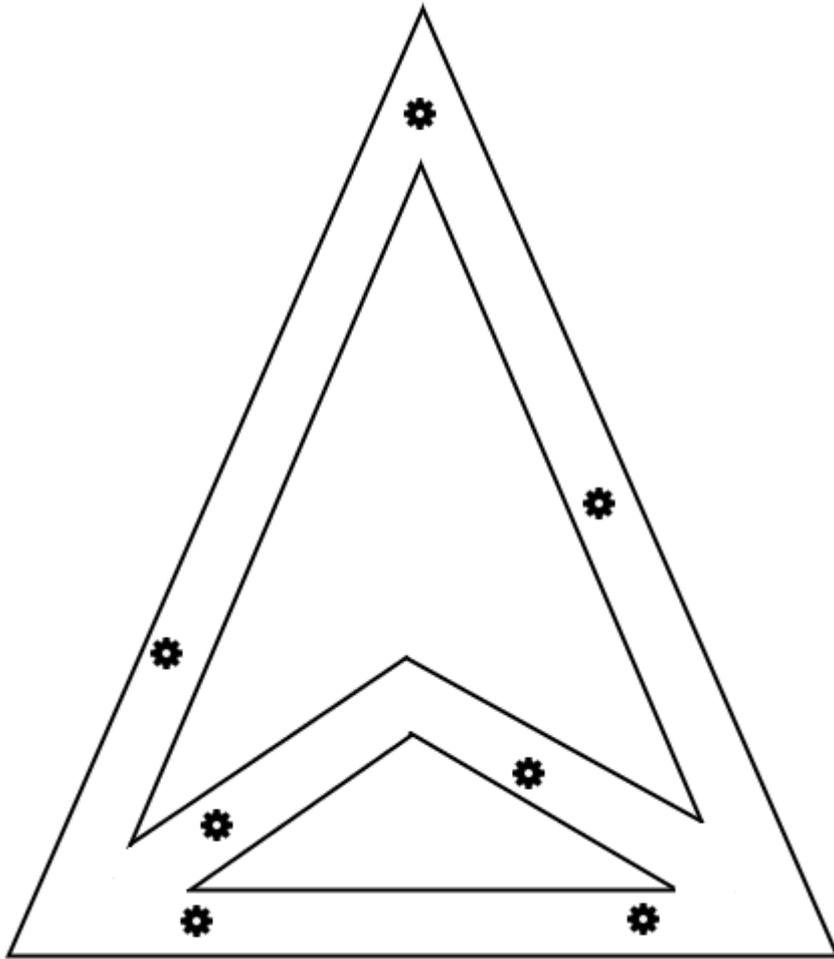Can you help Edison pick up all the gears? Remember, you can only go down a path once, so choose wisely!

Notes (What has/hasn't worked):

Activity Sheet 4:

Can you help Edison pick up all the gears? Remember, you can only go down a path once, so choose wisely!

Notes (What has/hasn't worked):

Activity Sheet 5:

Can you help Edison pick up all the gears? Remember, you can only go down a path once, so choose wisely!

Notes (What has/hasn't worked):