forward EDUCATION

Climate Action Kit Workshop

Useful Classroom Slides for Educators

How to use this slide deck

Create your own copy

Copy this slide deck over to your personal Google Drive

Edit the slides

Edit or modify the deck using the template slides as needed for your workshop.

Run your workshop!

Use the slides to run a Climate Action Kit workshop in your classroom!

How it Works

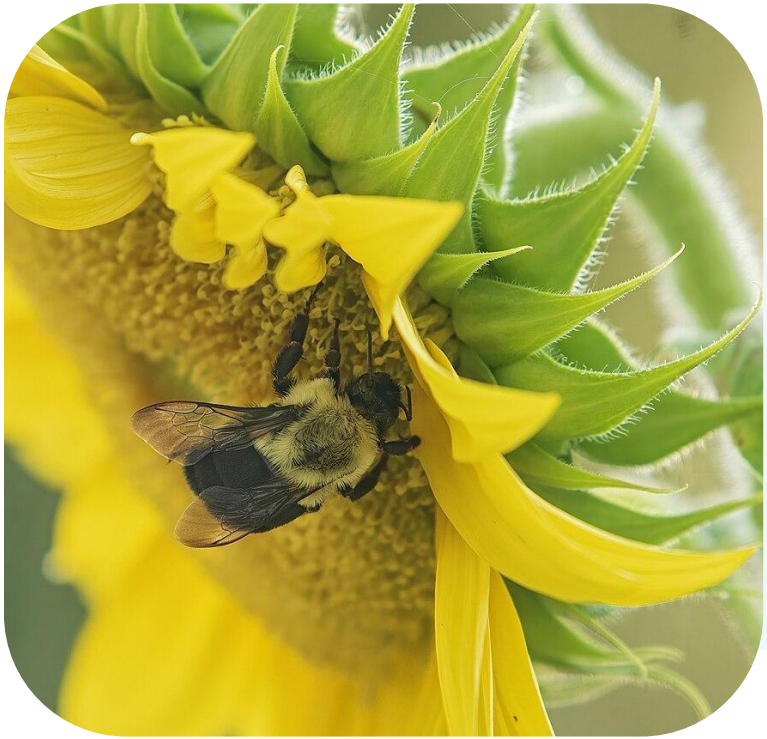
Use these slides for explaining to students what the Climate Action Kit is and how the workshop will work.

Meet the
Climate Action Kit.

What is the Climate Action Kit?

With the Climate Action Kit, you'll discover how we as humans affect the climate around us and all the opportunities we have to use technology to take climate action.

Using the parts in the kit and a micro:bit, you'll build and code working prototypes of real-life climate action technology!

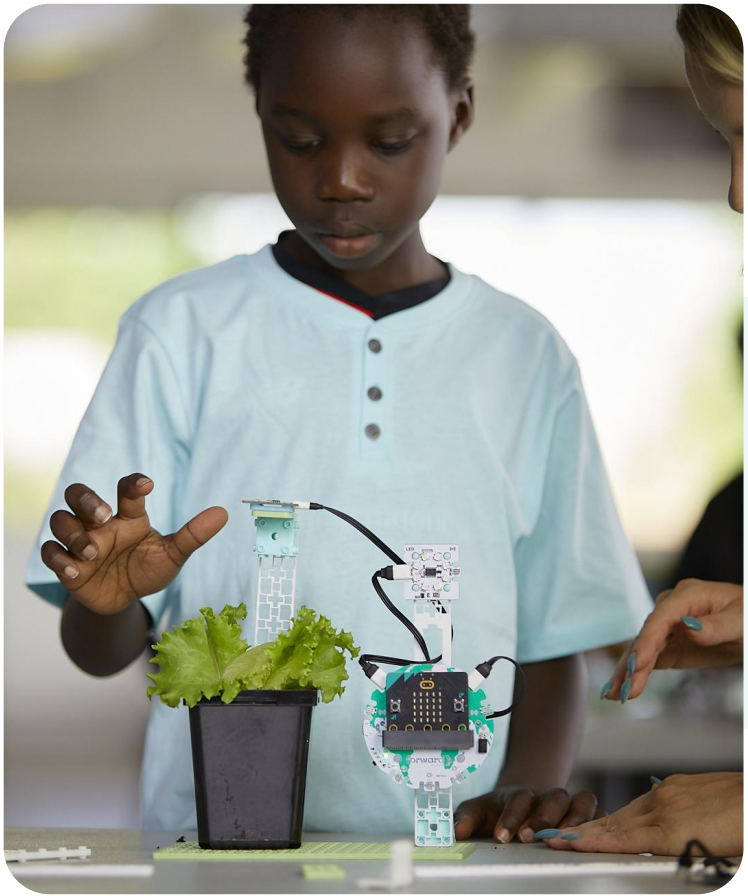


Lesson Structure:

Big Idea

Lesson Topic

The Big Idea section of the Climate Action Kit Lesson is where you'll be introduced to the lesson topic and climate action opportunity we're learning about.



Lesson Structure:

Take Action

Project Prototypes inspired by real-life technology

The Take Action section of the Climate Action Kit Lesson is where you'll build and code a prototype project inspired by real-life technology!

Take Action: Coding Options

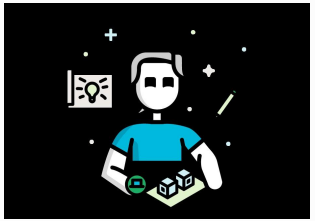
Based on your coding experience, you can choose different experience options for coding your project.

USE

'Use' the provided code to understand how it works.

MODIFY

'Modify' parts of the provided code to build on your project.



CREATE

'Create' a code program of your own from scratch.

Climate Action Kit Workshop Learning Objectives.

Learning Objective #1

Description of learning objective goes here.

Learning Objective #2

Description of learning objective goes here.

Learning Objective #3

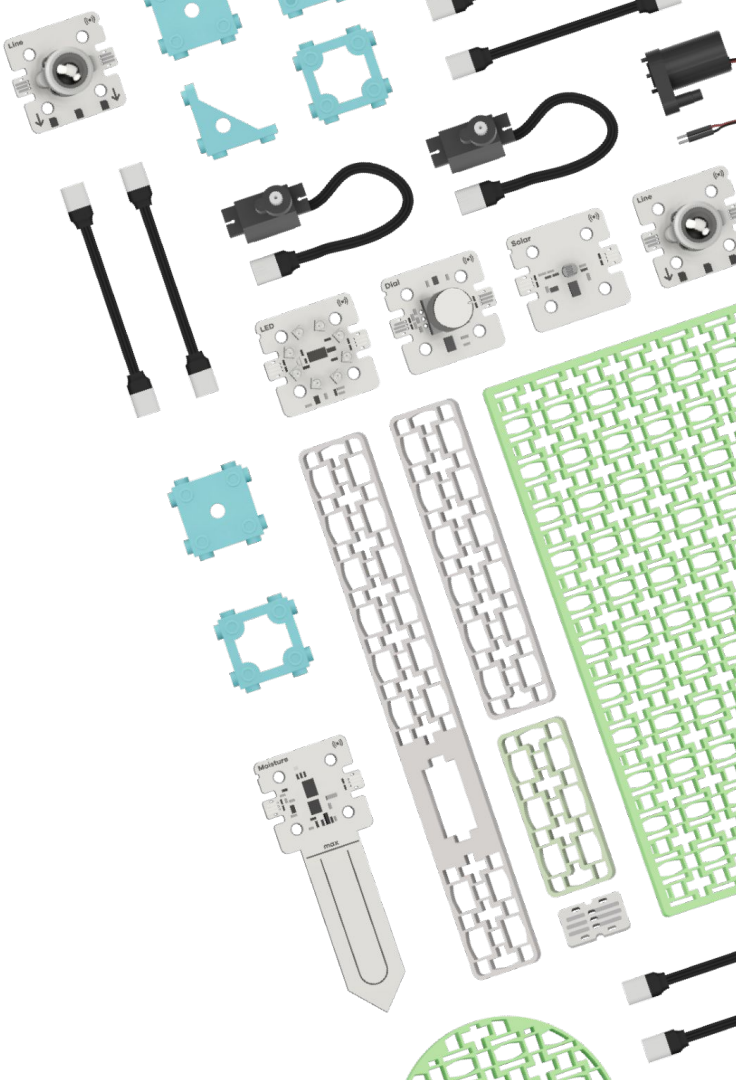
Description of learning objective goes here.

Blank Slides

Use these slides for creating your own lesson slide deck.

forward EDUCATION

Title Slide



Lesson Title

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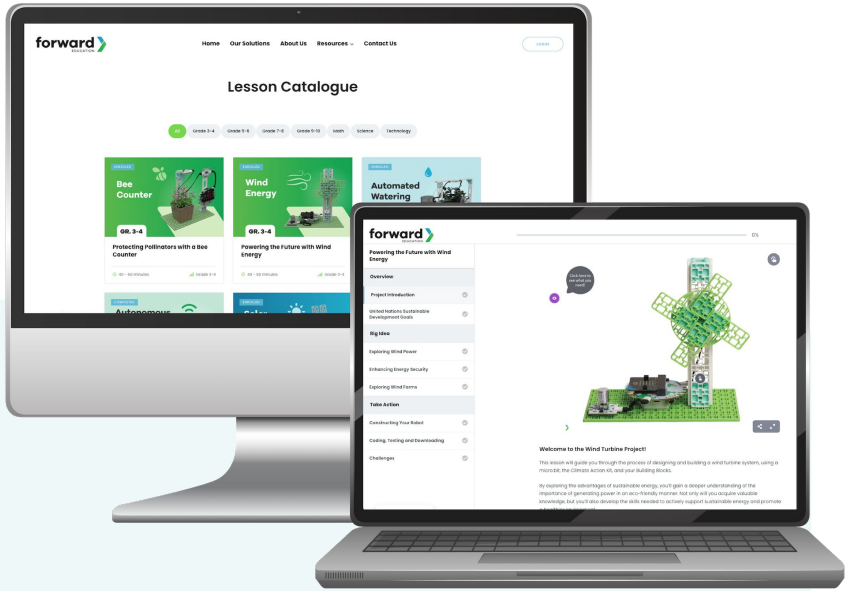
Topic Title with coloured accents

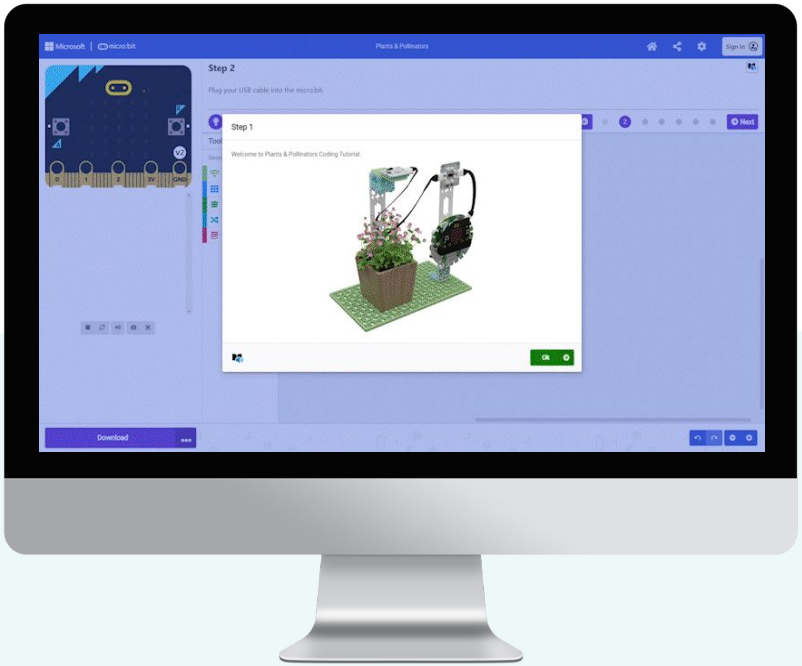


Subtitle goes here

1.
List item #1 description.

2.
List item #2 description.

3.
List item #3 description.



Step-by-step coding tutorials means no experience required

Designed to support new learners

Every lesson lets students learn at their own pace through easy to follow building instructions and step-by-step coding tutorials. This supports differentiated learning for the best classroom outcomes.

Built for empowering Climate Action.

Say some more details here if you need more space to articulate things. Say some more details here if you need. Say some more details here if you need more space to articulate things. Say some more details here if you need.

Lesson Content

Slide

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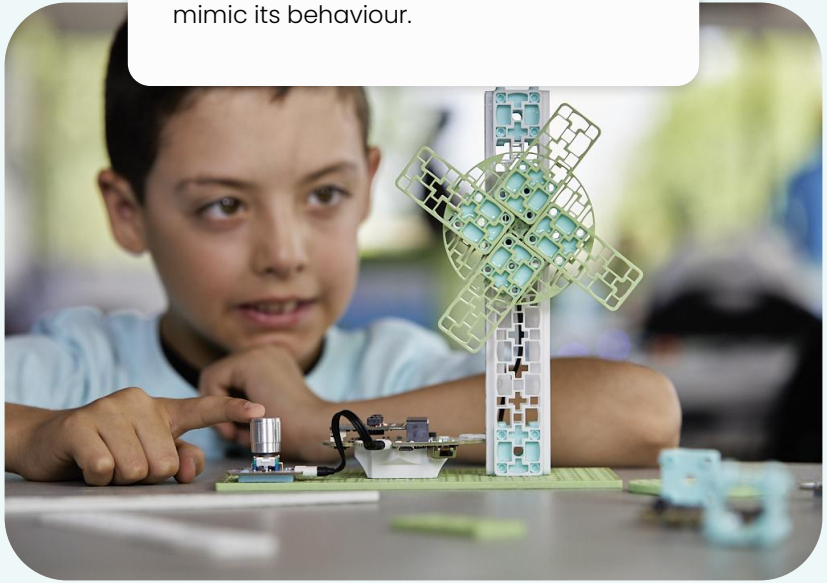
Connection to Real-World Careers

Adjust content to align with your project of choice.

Prototype Wind Turbine

Our prototype contains the same parts as a real-life wind turbine and aims to mimic its behaviour.



Wind Turbine Technician

Wind turbine technicians inspect, diagnose, adjust, repair, and maintain wind turbine equipment.

Hardware Explanation Slides

Use these slides for helping students understand the various hardware parts of the Climate Action Kit.

Kit Contents:

Robotic Components

- 1 x Breakout Board with Battery
- 1 x Moisture Sensor
- 1 x Touch Sensor
- 1 x Solar Sensor
- 1 x Sonar Sensor
- 1 x Line Sensor with Ball & Caster
- 1 x Rotary Dial
- 1 x LED Light
- 2 x Continuous Servo Motors
- 1 x Positional Servo Motor
- 1 x Water Pump & Tubing

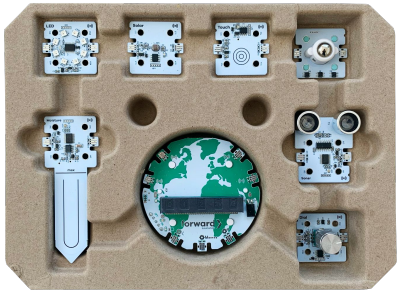
Building Blocks

- 1 x Base Plate
- 4 x Long Frame Building Blocks
- 6 x Medium Frame Building Blocks
- 4 x Small Frame Building Blocks
- 4 x Thin Frame Building Blocks
- 2 x Circle Building Blocks
- 4 x Cube Connectors
- 8 x Corner Connectors
- 4 x Back-to-Back Connectors
- 8 x Component Backing Connectors

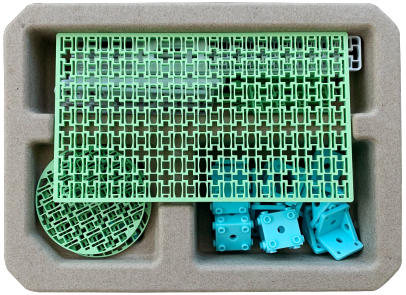
Additional Parts

- 2 x Long Cable Connectors
- 5 x Short Cable Connectors
- 2 x Cable Extenders
- 2 x Wheels
- 1 x USB Cable
- 1 x Building Block Removal Tool
- 1 x Package of Butterfly Clips

Kit Tray Contents:



Robotic Components



Building Blocks

Additional Parts

Breakout Board
Important Info

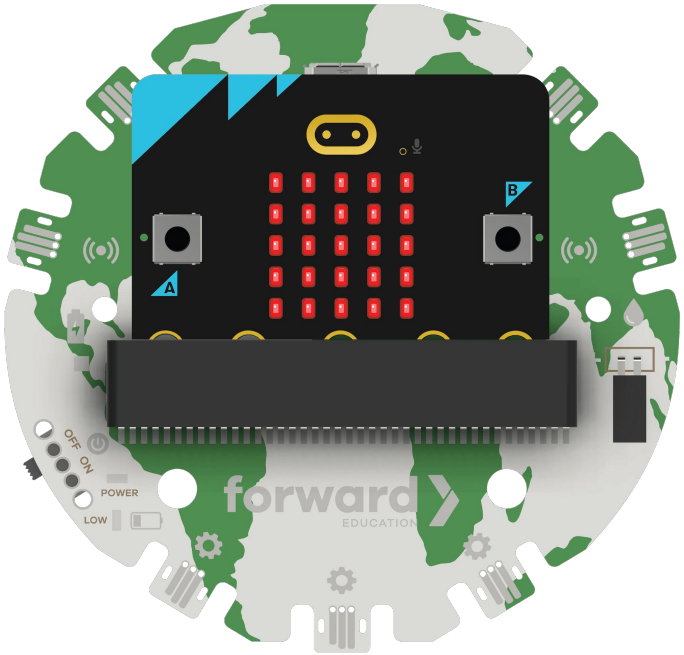
The Breakout Board assembly acts as the brain, spine and heart of our projects. The micro:bit holds the code that tells our project what to do, the Breakout Board transmits that code out to the components, and the battery powers everything!

Reversible Cables

Cables are reversible and can be plugged in any direction.

Rechargeable Battery

The Breakout Board contains a rechargeable battery for powering projects.



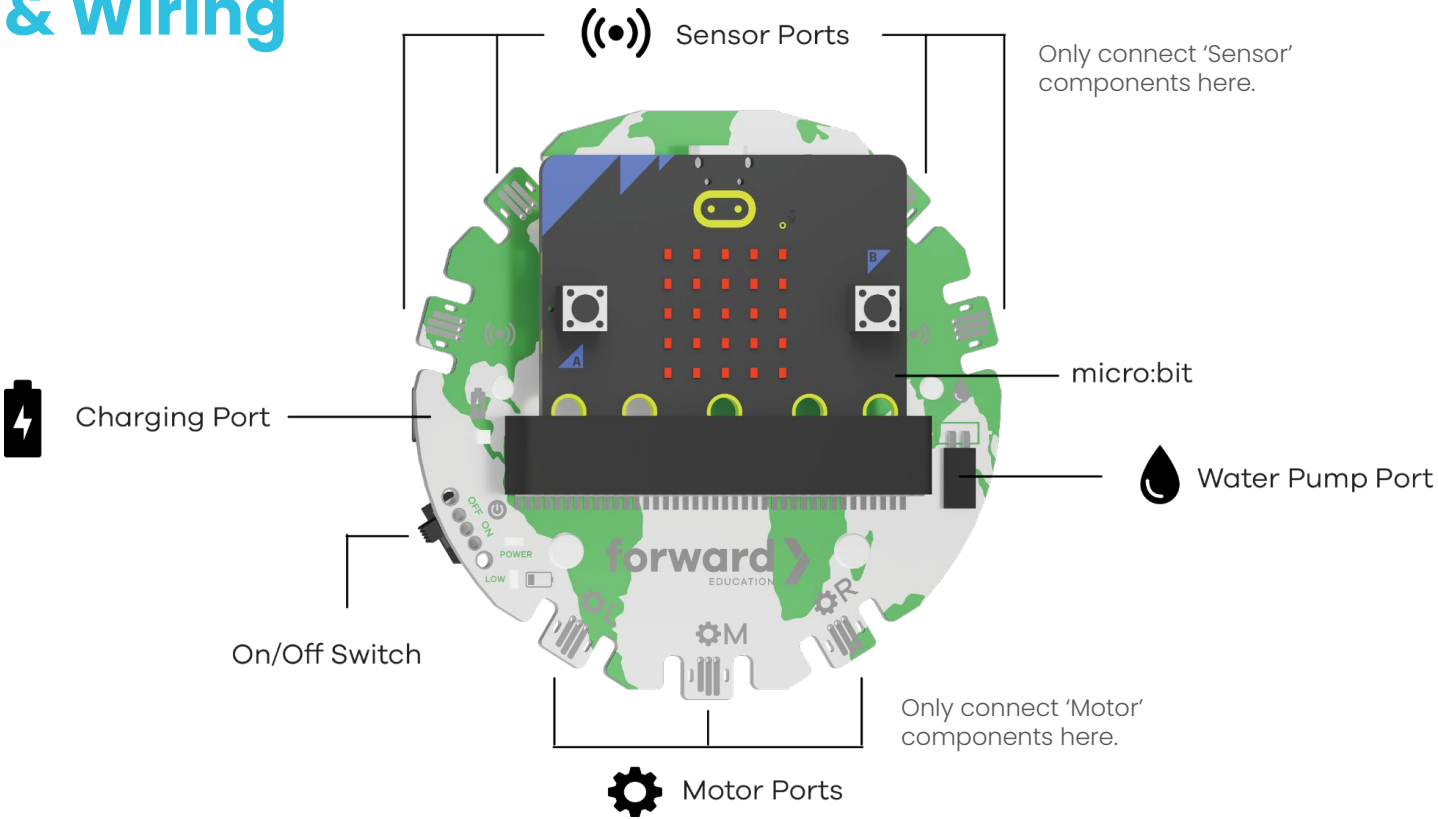
Daisy-Chain

The sensors can be linked together in any order without any change to the code.

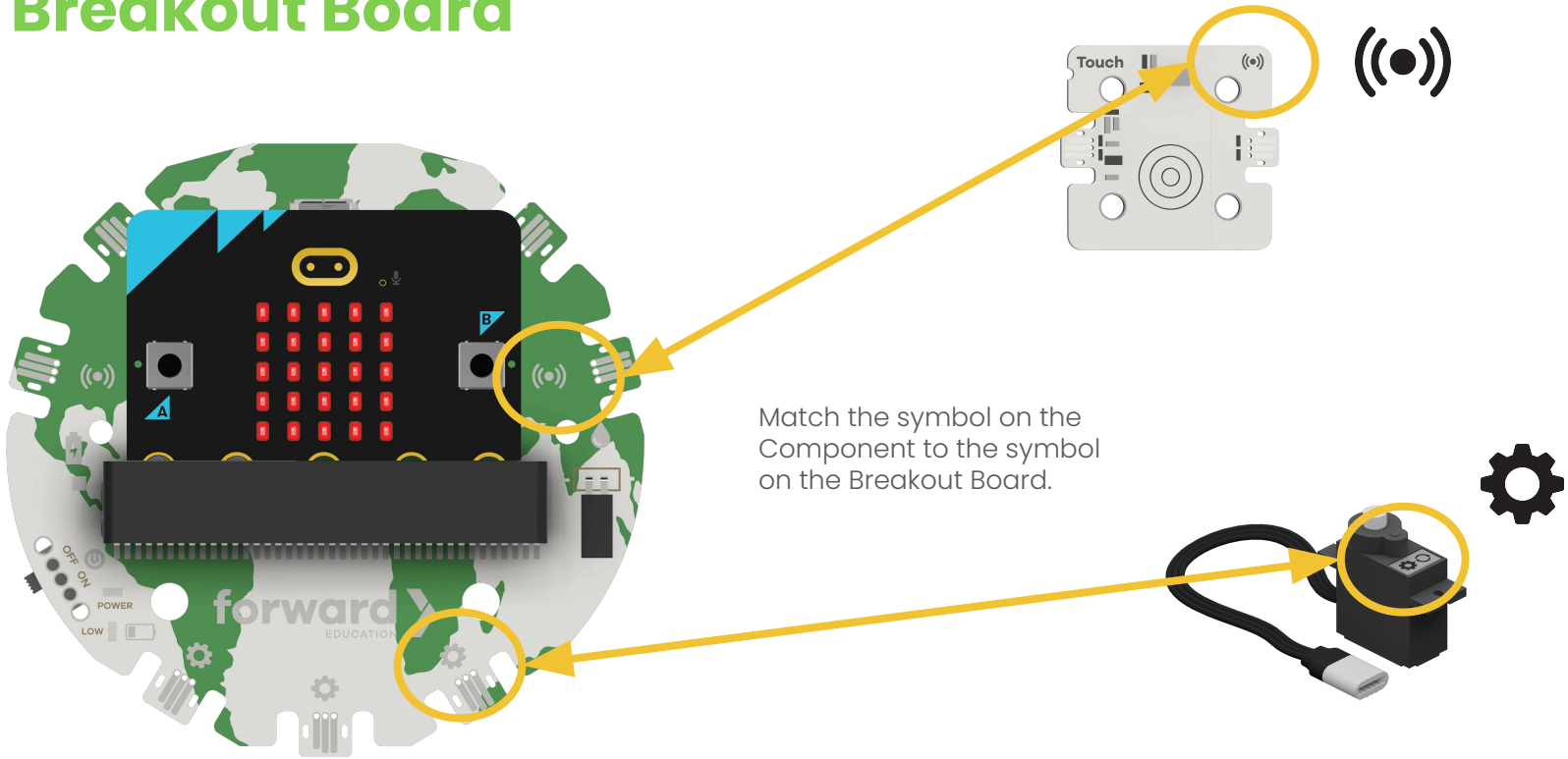
micro:bit

The micro:bit is inserted into the edge connector slot on the Breakout Board, facing outward.

Breakout Board
Ports & Wiring



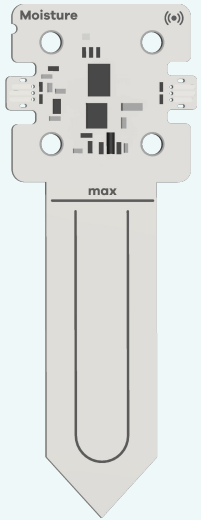
Connecting Components to the Breakout Board

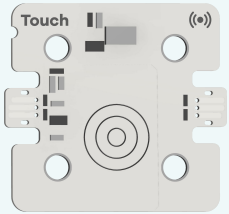


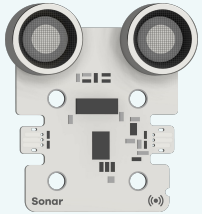
Match the symbol on the Component to the symbol on the Breakout Board.

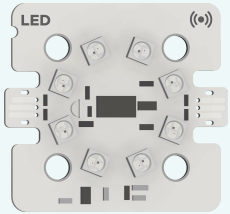
Smart Robotic Components

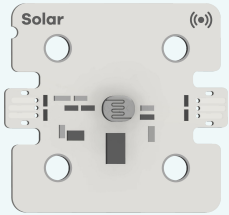
Input/Output Sensors and Motors

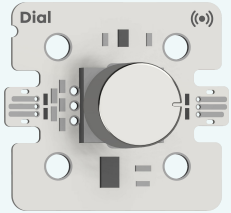


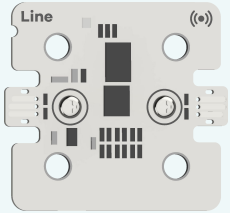


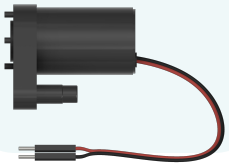






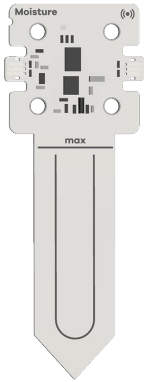






Smart Robotic Components

Explanations



Moisture Sensor

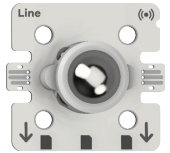
Measures the percentage of moisture present in a medium such as soil.

Rotary Dial

Detects the input of a dial turn or button push.

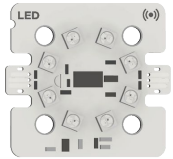
Sonar Sensor

Uses ultrasonic frequency to measure the proximity of an object.



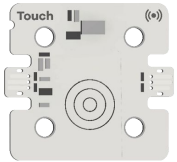
Line Sensor

Contains 3 x infrared sensors that can be used to follow a line. Also contains a ball and caster to act as a third wheel in mobile projects.



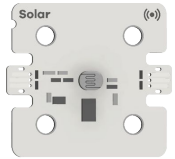
LED Light

Contains eight independent multi-colour LEDs.



Touch Sensor

Detects the action of a touch or hold.



Solar Sensor

Measures the percentage of light present.

Smart Robotic Components

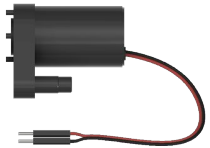
Explanations

Servo Motor (Continuous)

The Continuous Servo Motor allows for continuous movement, such as driving or spinning. This movement is measured in percentage (%) of power.

Servo Motor (Positional)

The Positional Servo Motor allows for positional movements, such as turning to a specific direction. This movement is measured in degrees (°), up to 270°.



Water Pump

This is a submersible Water Pump that will displace water from one vessel to another. After you've connected the water tubing, insert the black Water Pump into the water, and place the end of the tubing into an empty vessel.

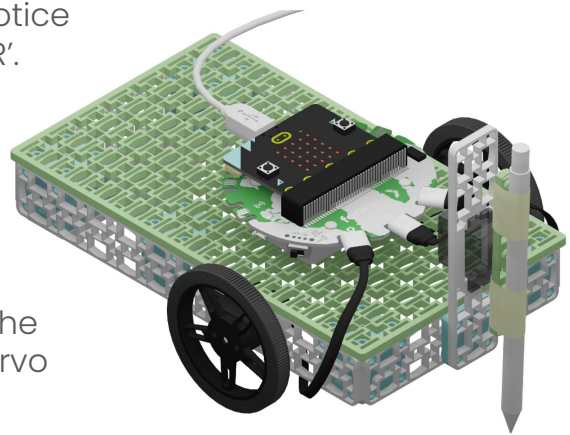
Important things to know about
Servo Motors

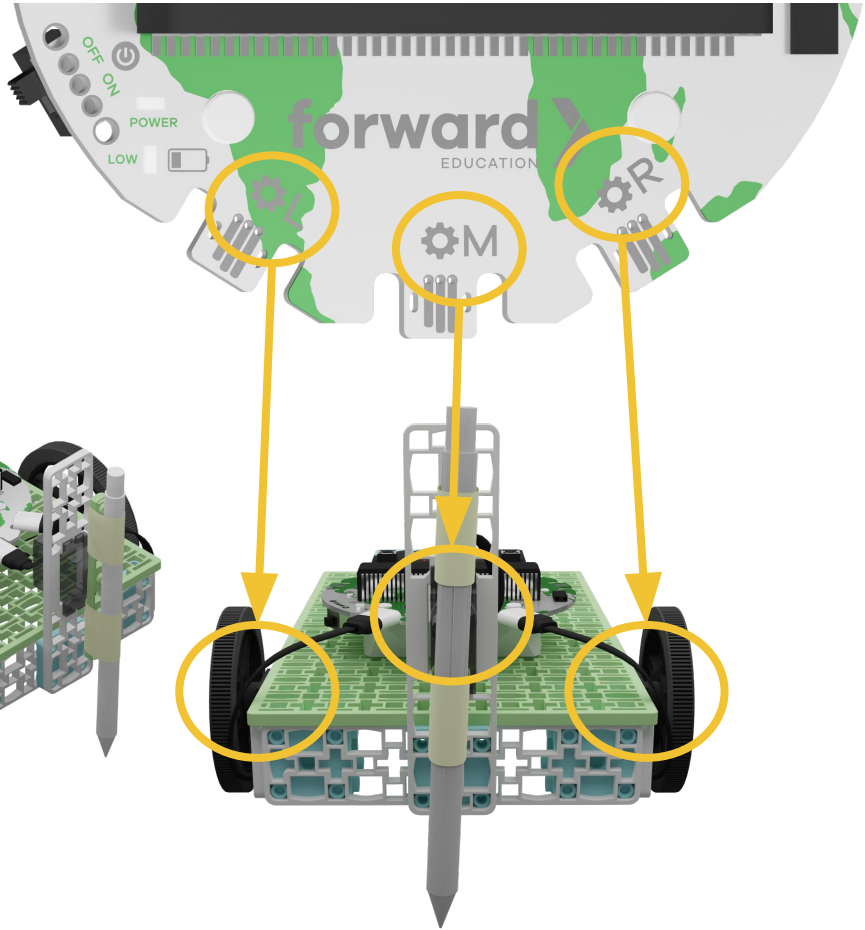
Look carefully at the Motor ports on the Breakout Board. You'll notice they're labelled 'L', 'M', and 'R'.

This stands for:
L = Left
M = Middle
R = Right

The ports correspond with the physical location of your Servo Motors in your project build.

This is especially important in vehicle projects.



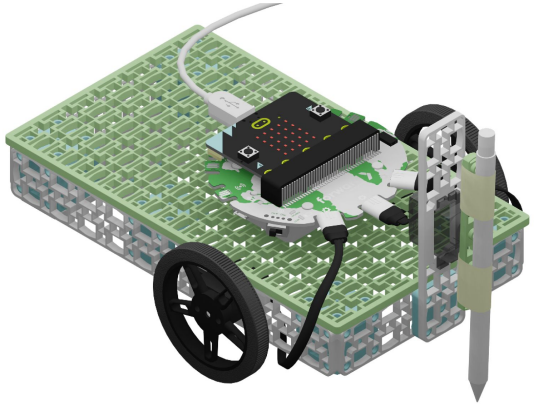


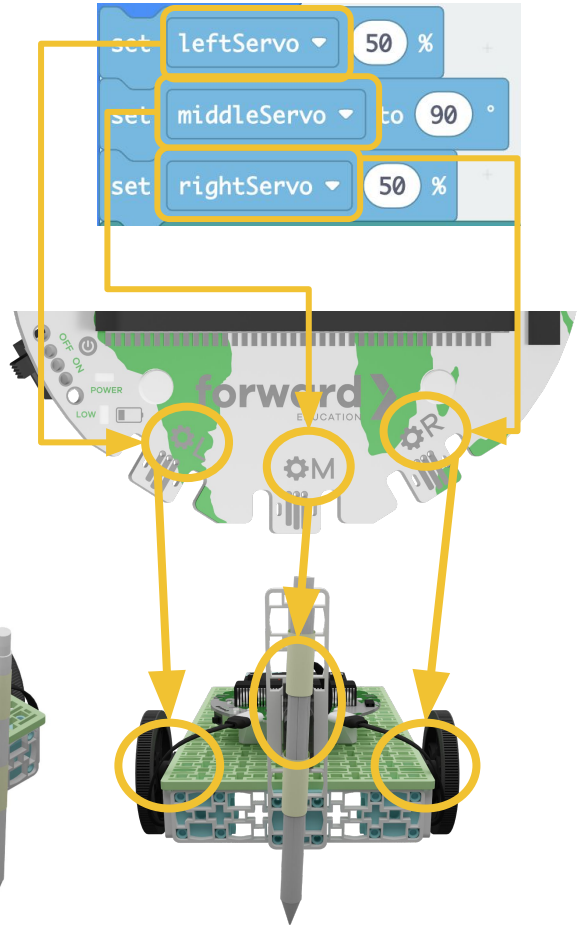
Important things to know about Servo Motors

In MakeCode, you'll need to ensure you're programming the correct Servo Motor in your code.

This way, your code will be sent to the correct physical location where your Servo Motor is connected.

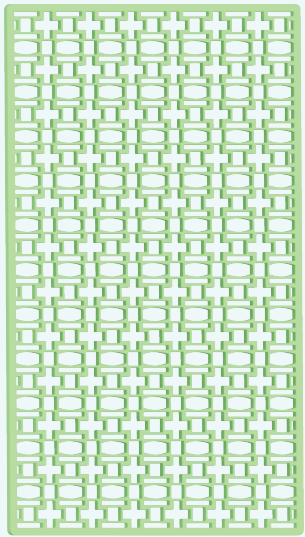
Always double check that your code block position = physical port location where your Servo Motor is connected on the Breakout Board.

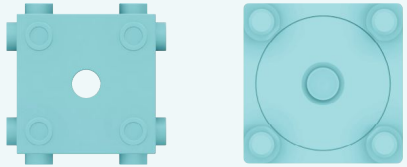


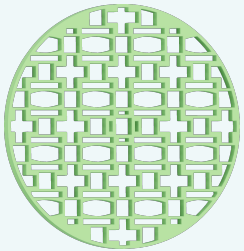


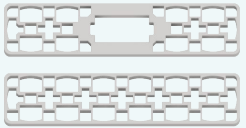
Building Blocks

Easy to build and compatible with LEGO®



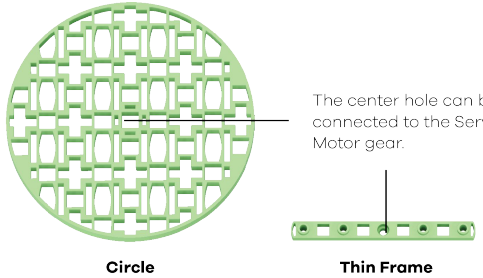


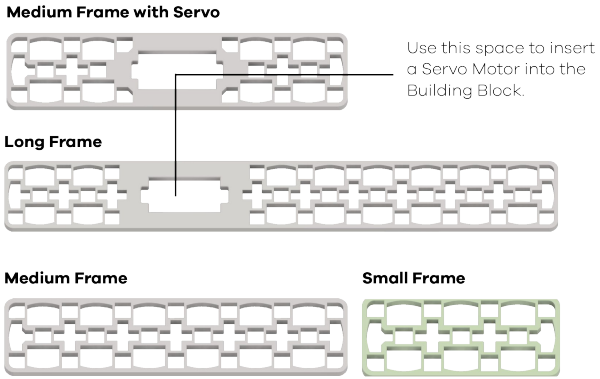


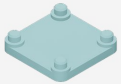


Building Blocks

Explanations

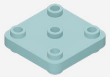






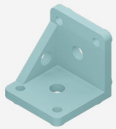
Component Backing Connector

This piece is attached to the back of the Smart Sensors and allows you to connect them to the other Building Blocks.



Back-to-Back Connector

Use this piece to attach two Building Blocks together.



Corner Connector

Cube Connector

Additional Parts

Explanations

Screwdriver

Water Tubing

Butterfly Clips

Butterfly Clips can be used to attach paper, cardboard, or other craft supplies to Climate Action Kit projects.

Wheels

Wheels can be attached onto the Servo Motors. You can use the provided screws and screwdriver to attach the wheels securely to the Servo Motors.

Cable Extender

The Cable Extender is used to connect two cable connectors together to increase the length.

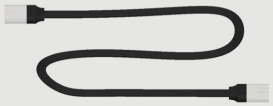
USB Cable

The USB cable is used to charge the Breakout Board. The USB cable is also used to download MakeCode programs to the micro:bit.

Cable Connectors

Cable Connectors are used to connect various Smart Components and Servo Motors to the Breakout Board. Cable Connectors are reversible, so you can't wire them wrong!

Short Cable Connector



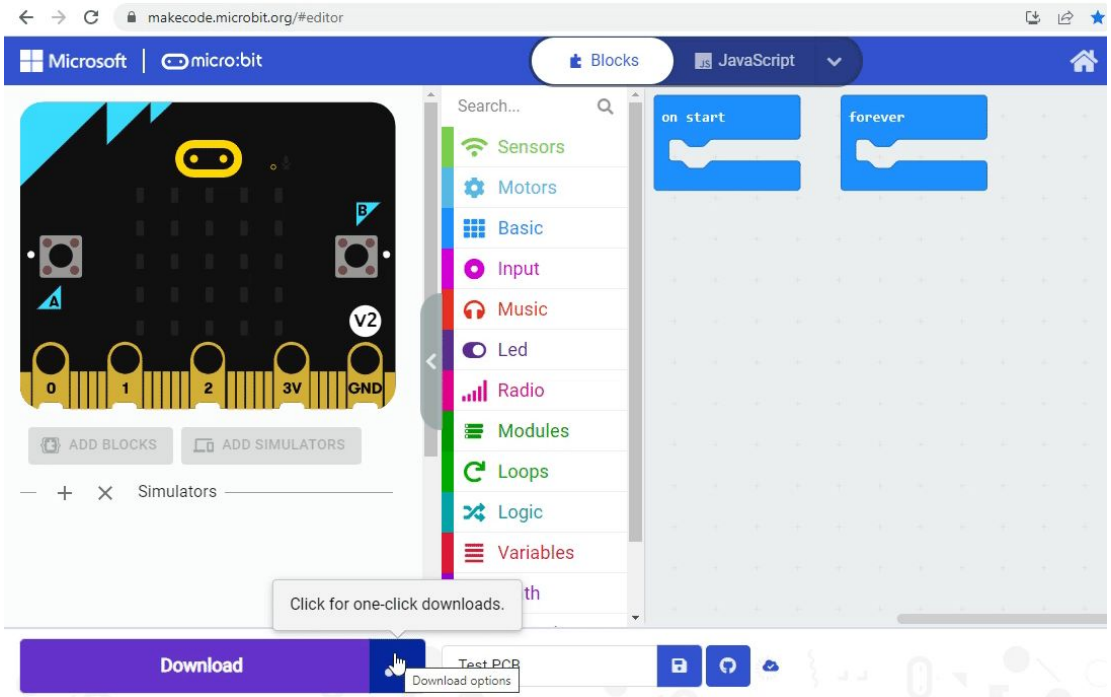
Long Cable Connector

MakeCode Explanation Slides

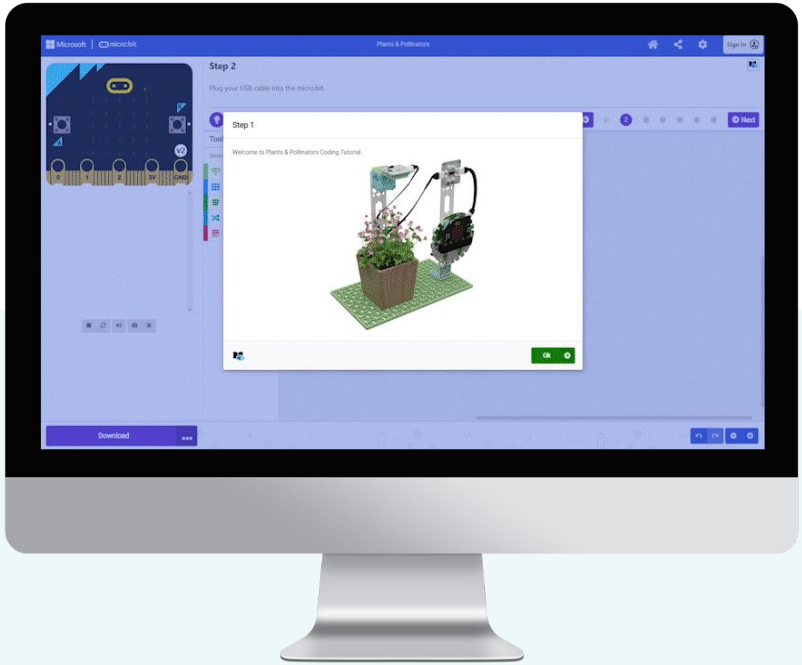
Use these slides for explaining Microsoft Makecode and navigating Tutorials.

Pairing your micro:bit

For the best experience, pair your micro:bit right away by following the on-screen instructions.

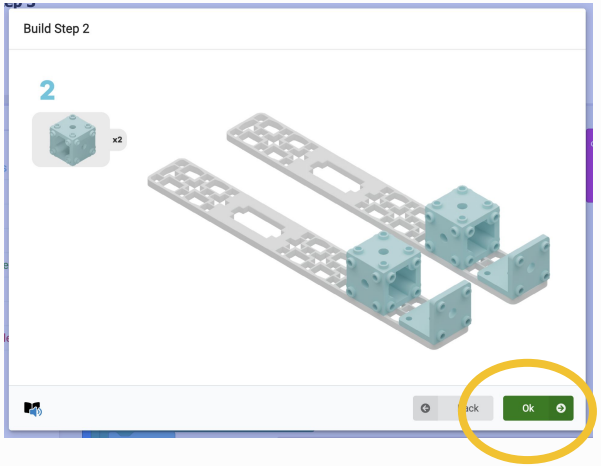


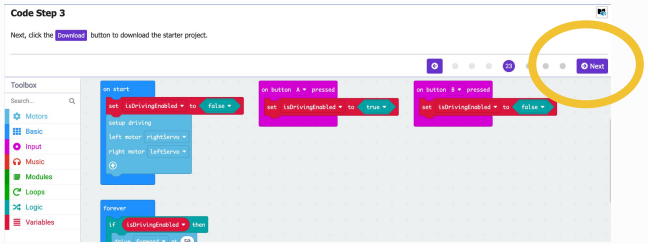
Step-by-step building & coding tutorial



Follow the tutorial to build & code your Climate Action Kit project.

Carefully read through each tutorial step!





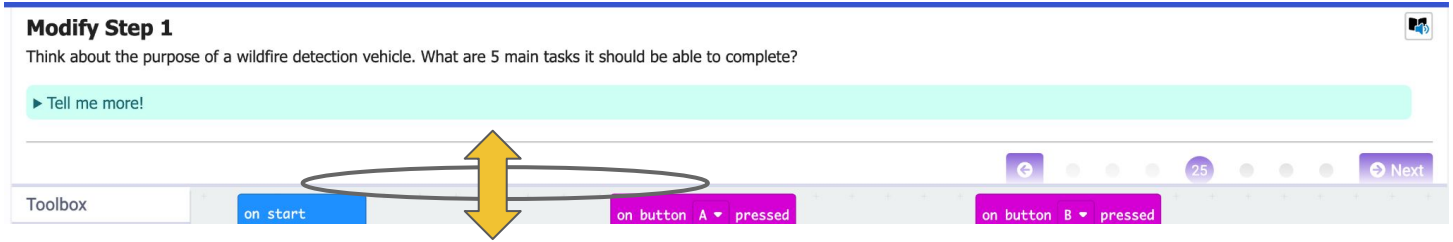
Look for the navigation buttons!

Click ‘Ok’, ‘Next’ or ‘Done’ to advance the tutorial.

Each tutorial will contain a variety of different sections including building, pairing your micro:bit, inquiry questions, challenges and more.

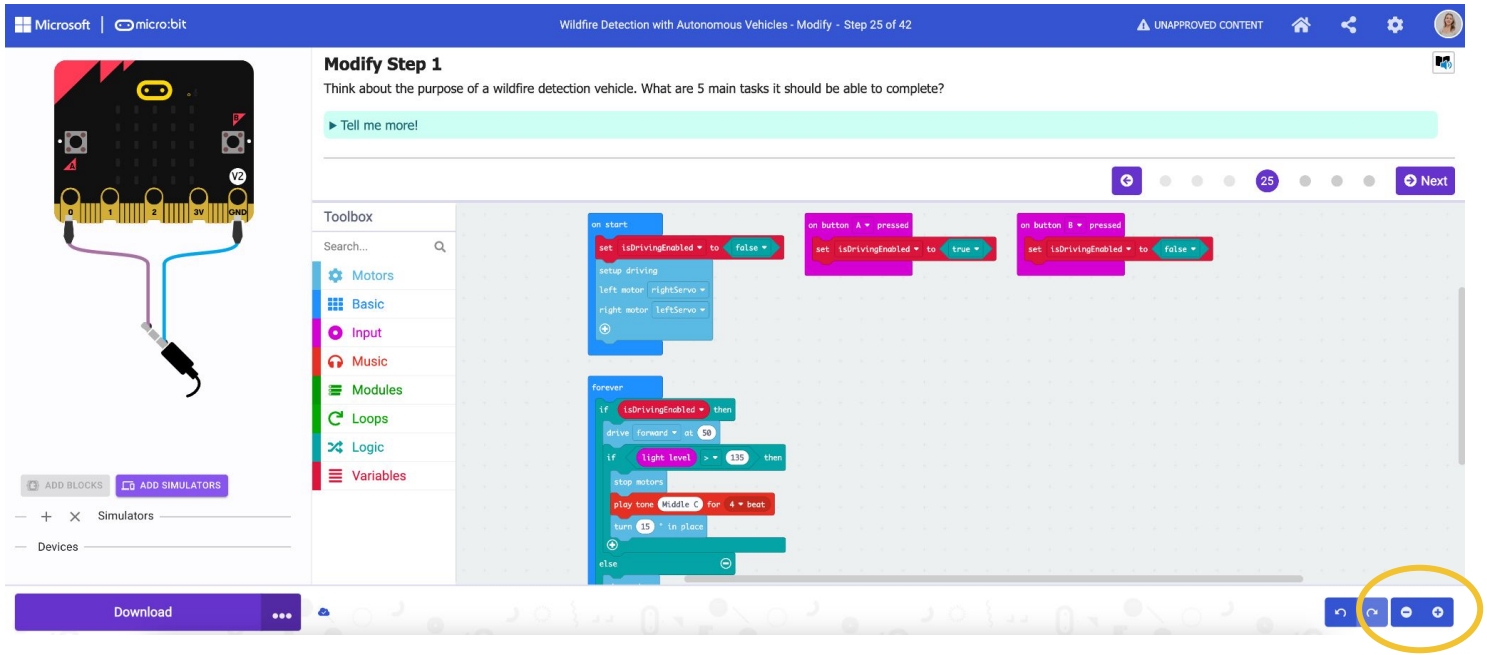
Click through each tutorial step once you have completed it to move onto the next step.

Tips & Tricks



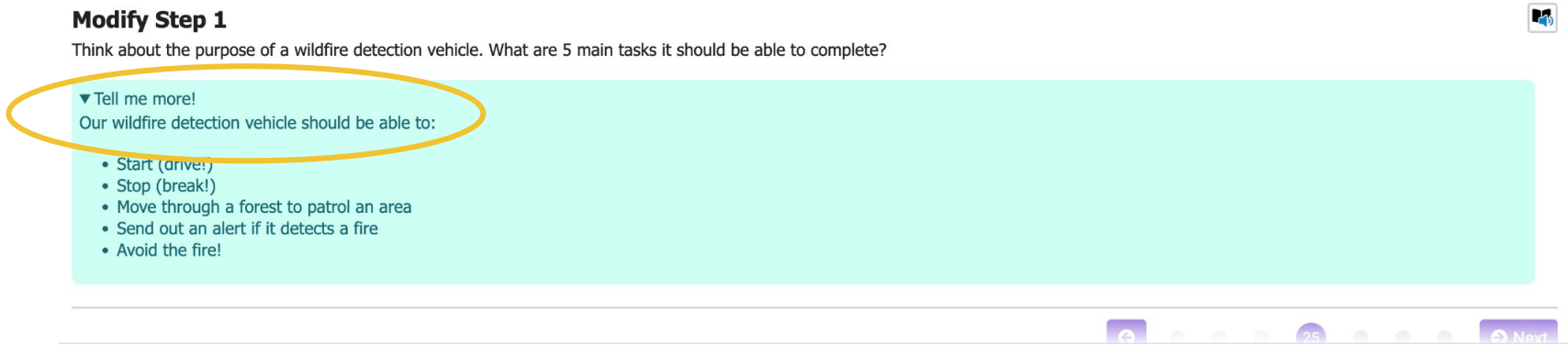
Use your cursor to resize the tutorial step window if content is hidden.

Tips & Tricks



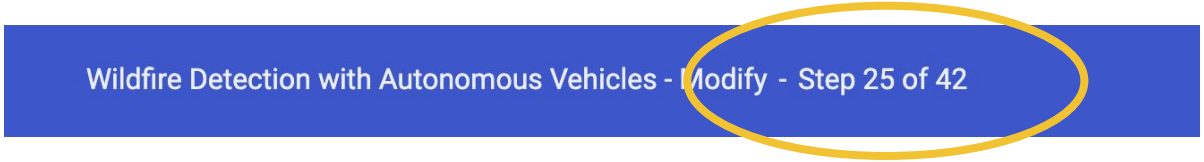
Use the zoom in & zoom out buttons to change the view of your coding workspace.

Tips & Tricks



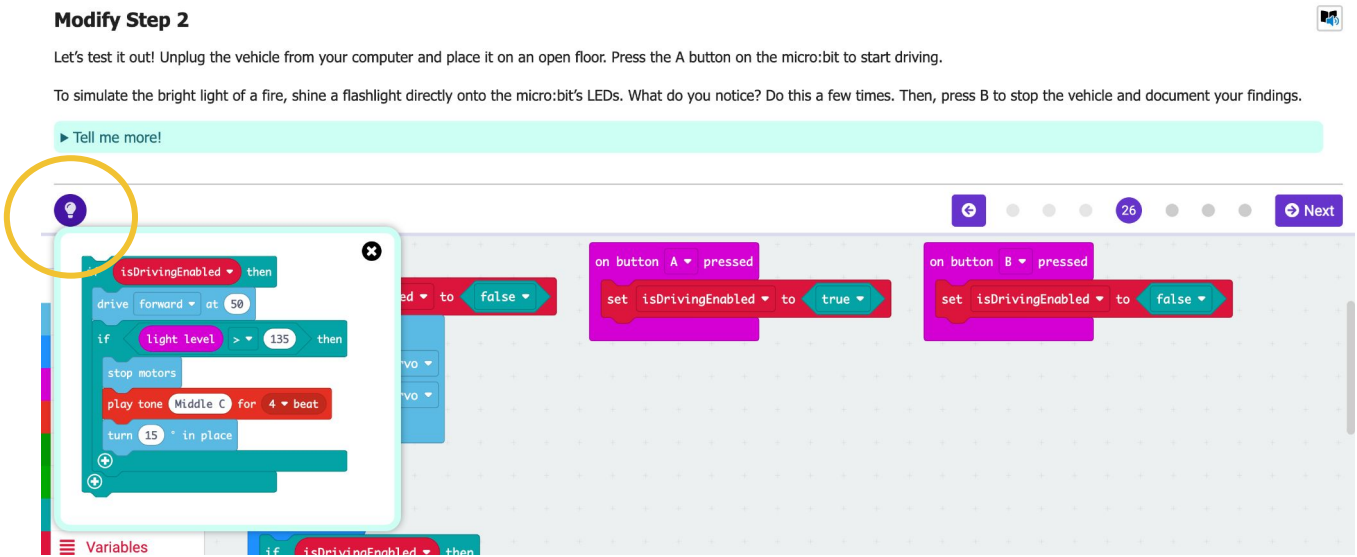
Click the “Tell me more!” dropdown for more information on that tutorial step.

Tips & Tricks

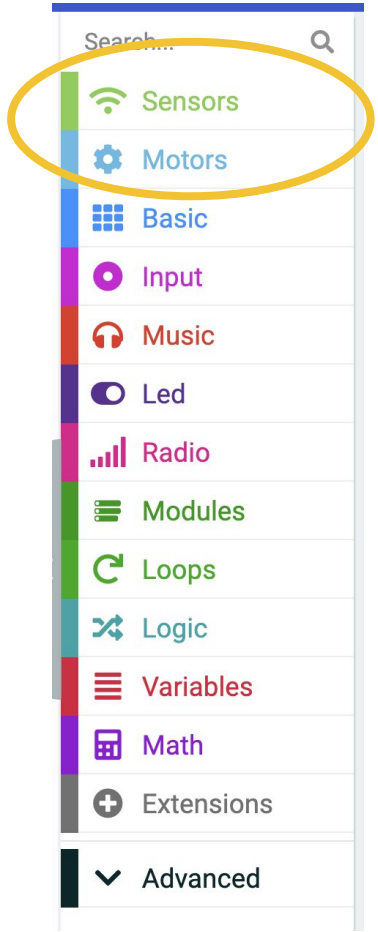


Refer to the Tutorial title bar to know how many steps you've completed in the tutorial.

Tips & Tricks



If you get stuck, use the "Hint" lightbulb button to reveal a preview of what your code *should* look like.

Coding Blocks

The Sensors and Motors drawer contain all of the various code blocks you'll need for programming the robotic components and motors in the Climate Action Kit.