UNICEF LEARNING PIONEERS PROGRAMME
INNOVATION CAMP 2025

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Tinkering with Tech and AI

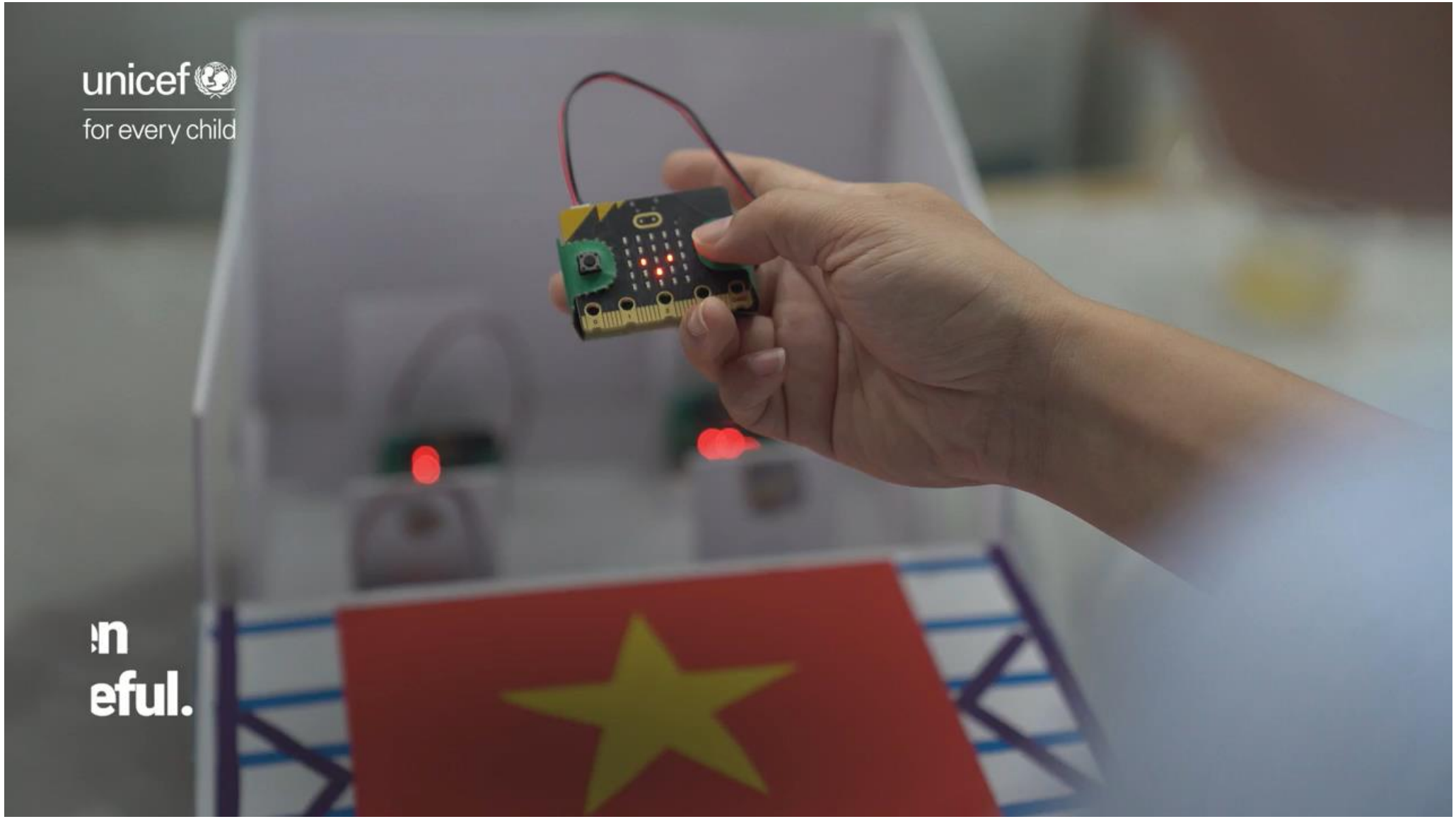
Creating Pathways for Future Innovators

In collaboration with:

Ministry for Foreign Affairs of Finland (**MFA**)

arm

UNICEF Global Learning Innovation Hub | Innovation Camp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eful.

We aim to explore scalable opportunities to **bridge the digital and AI divide** and build more effective learning models around technology.

This is about changing how we learn! By making **STEAM subjects** fun and engaging, especially for **girls**, we are preparing children to thrive in the age of AI.

Powered by **strategic partnerships** and **collaboration** that unlock networks and fuel the transformation of education systems.

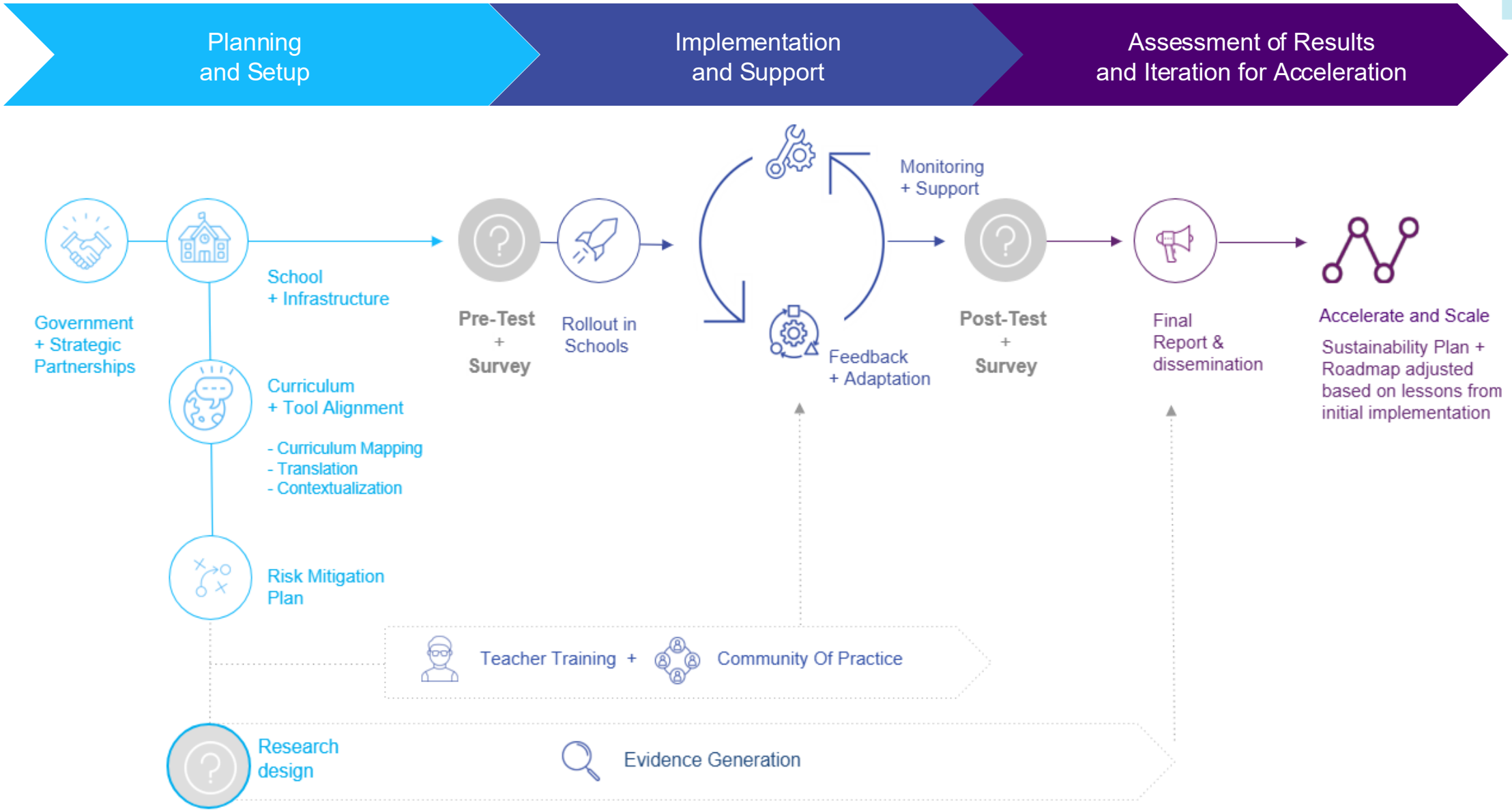
Tinkering with Tech & AI

A Safe and Playful Approach to prepare children for the AI age

Hands-on learning about technology **equips children for the future:**

- As well as developing **21st century skills**, it boosts confidence and learner agency.
- Integrates **AI literacy**, machine learning and the ethics and safety of AI use
- Students design, modify and test projects to address issues they face using real world data, promoting understanding of technology use to **solve real-world problems**.
- Understanding social impacts of technology design helps students see themselves as potential stakeholders in technology's future development.
- Uses **design thinking, hands-on learning, and innovation.**
- Strengthened focus on gender-responsive teaching and learning.

Tinkering with Tech: Modeling for Scale



Tinkering with Tech & AI

Flexible delivery modality taking into account country needs

- **Device agnostic**: Microbits, Raspberry Pi, Arduino, robotic kits
- **Grade levels**: countries to identify ideal Grade levels aligned with their curriculum learning objectives
- **Teaching delivery**: either integrated into subject lessons, or as extra-curricular activity, e.g. as part of school clubs
- **Frequency of teaching**: once or twice a week depending on the country and teaching delivery
- **Rollout duration**: Minimum 3 months to full school-year
- **Community of Practice set-up**: platform agnostic, important is to have mechanism for communication and to seek support
- **Learning materials:** can be mapped to the curriculum and contextualized

Tinkering with Tech & AI

Adaptable content

The lessons in Tinkering with Tech and AI have been designed to be **flexible, and adaptable**. They can **be customized to every country's** needs and preference by grade level, age range, and complexity of concept.

The content includes a balanced mix of **design thinking lessons, device-specific lessons, and AI-focused lessons** that can be sequenced and combined in different ways to create engaging, hands-on learning journeys for learners and teachers.

Benefits/Outputs:

How are students, teachers, stakeholders benefitting?

Students:

- Build **future-ready skills** — communication, critical thinking, creativity, collaboration.
- Gain agency over their learning through **hands-on problem solving** and **human-centered design**.
- Spark **interest in STEAM, especially for girls**, by tinkering with AI as real-world innovators.
- Opportunity to **showcase their ideas globally** and connect with other young changemakers.

Teachers:

- Receive **practical, immersive training** in human-centered design and learner-centered approaches.
- Strengthen **21st century and digital skills,** fostering more **equitable classrooms**.
- Access **Communities of Practice** for peer learning, support and collaboration.
- Empowered to **integrate innovation and digital transformation** into daily teaching.

Governments:

- Advance **digital transformation** with an inclusive, scalable model that builds national capacity.
- **Position the country as a leader** in AI literacy, 21st century skills, and STEAM education.
- **Engage a motivated generation** of students driving positive action and sustainability.
- Attract **visibility and potential donor interest** through a strong national use case.

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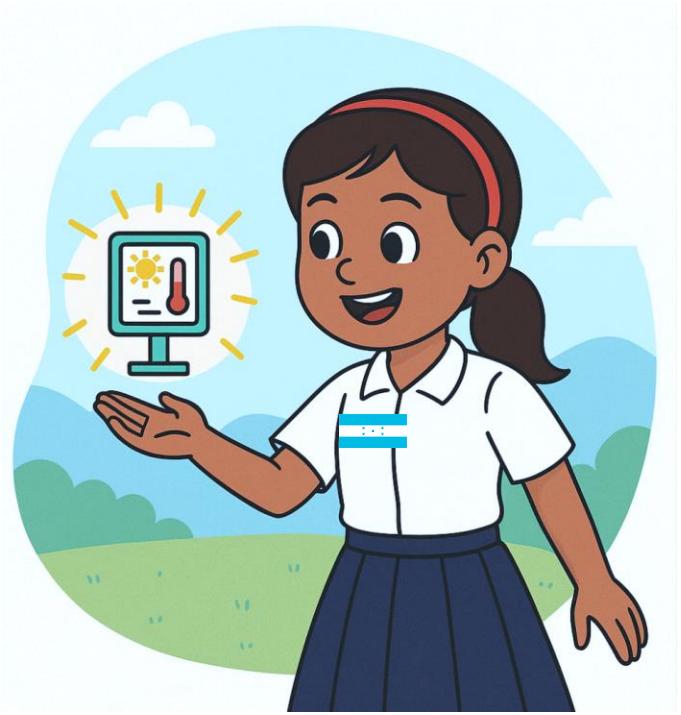
Tinkering with Tech hands-on demo

Tinkering with Tech

Educación
Gobierno de la República

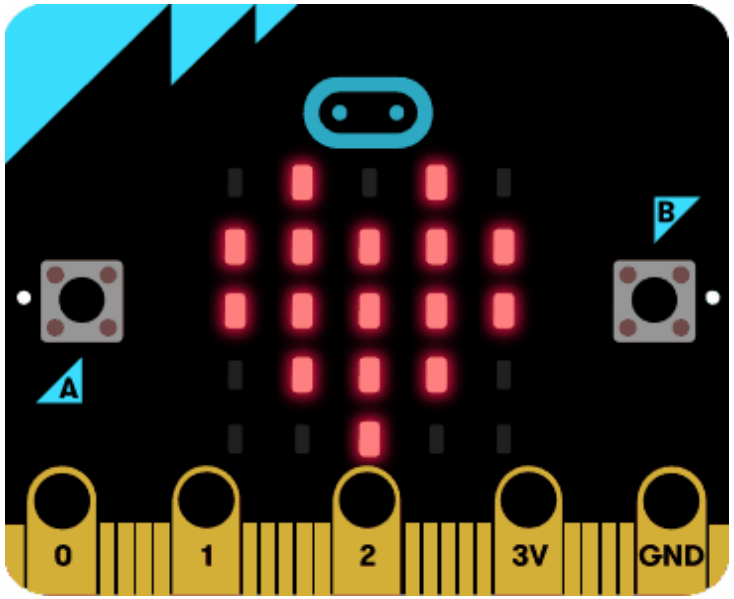
micro:bit

unicef
para cada infancia



Tinkering with Tech is a programme where we will learn how to **create solutions for real-world problems using technology** in a practical way. We will use the micro:bit and Design Thinking as tools to generate innovation.

The micro:bit



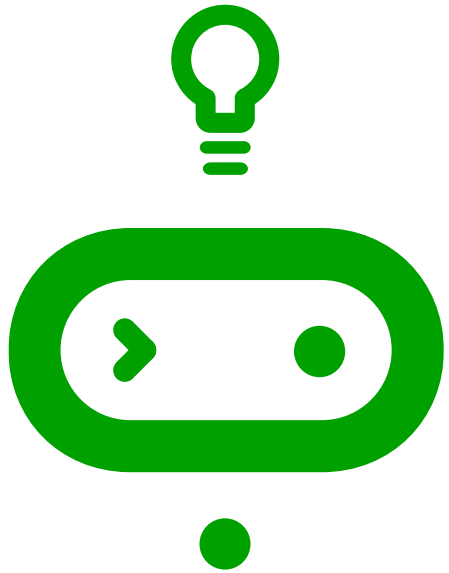
To explore digital creativity in the classroom, we will use the **micro:bit, a pocket-sized device** full of sensors and functions, which will help bring a practical approach to turn our ideas into prototypes in an accessible, functional, and fun way.

Design Thinking

We will use Desing Thinking to reflect on the challenges we observe in the world around us and to develop solutions to address them by following 6 steps

The great challenge

In the coming weeks we are going to generate solutions for Climate Change using technology.



Tinkering with Tech

Introducing the BBC micro:bit

Small device, big impact

59.5

million

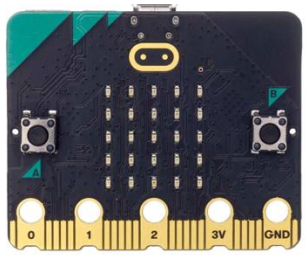
students have learnt with micro:bit

60+

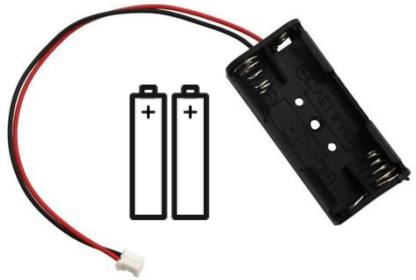
countries learning with micro:bit

Introducing the micro:bit: What is it?

- A pocket-sized **computer** and a **programmable** device.
- You tell it what to do by writing instructions in **code**.
- You can unplug your micro:bit, attach a **battery pack** and the code still works.
- Enables children to **make things with technology and their imagination.**



The tiny computer

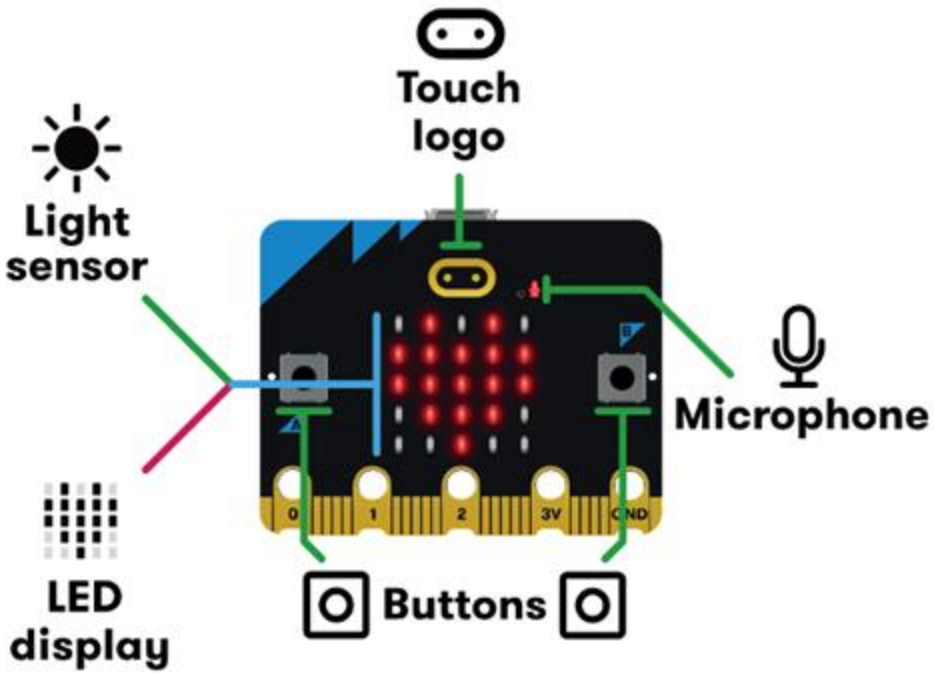


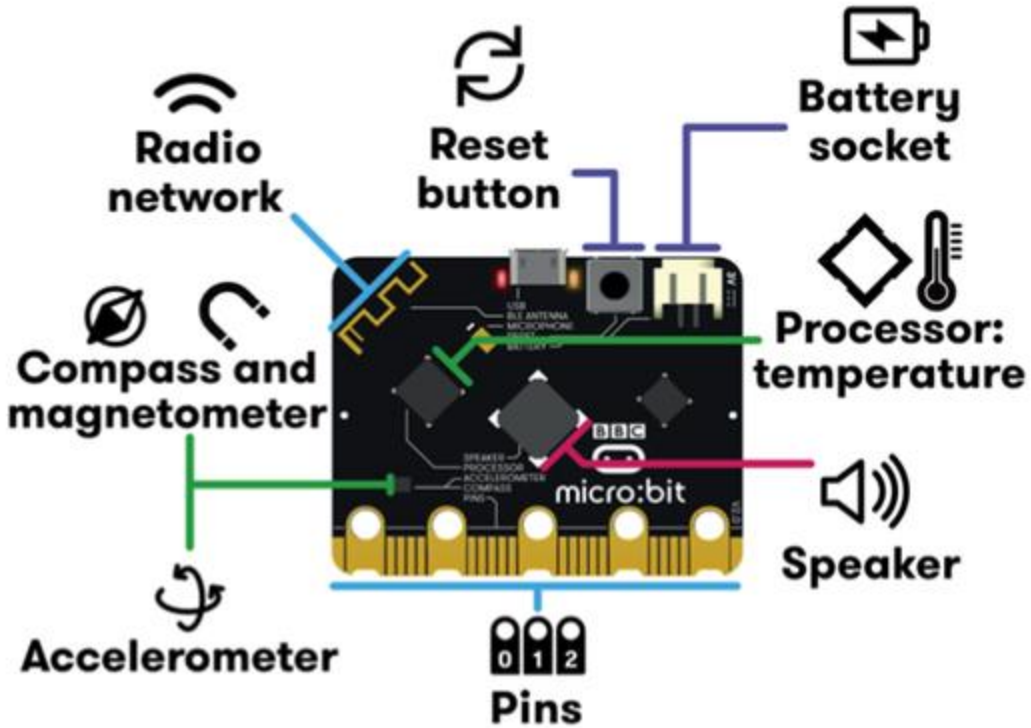
A battery pack and 2 AAA batteries

A USB data lead

A USB-C to microUSB cable (may be packaged separately)

micro:bit


Touch logo
Light sensor
Microphone
LED display
Buttons
0
1
2
3V
GND


Radio network
Reset button
Battery socket
Compass and magnetometer
Processor: temperature
Speaker
Accelerometer
Pins
micro:bit
BBC
0
1
2

Exploring – buttons & accelerometer

Buttons

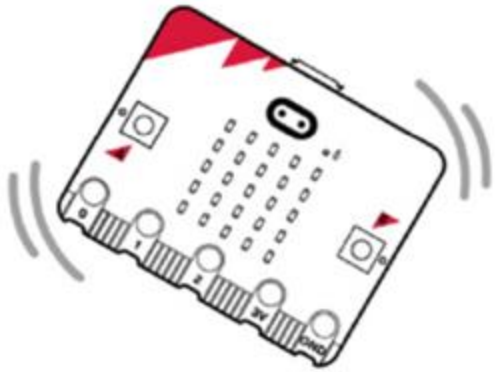
Buttons are a very common input device. The micro:bit has two buttons which can be programmed – buttons A and B.

Example: Press button A to make the micro:bit show an image on the LED display.

Accelerometer

The micro:bit's accelerometer detects when it's tilted left or right, backwards or forwards, and up or down, as well as when it's shaken or falling.

Example: Shake the micro:bit to roll a virtual dice.

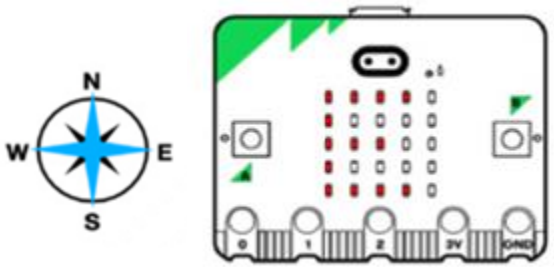


Exploring – compass & magnetometer

Compass

The micro:bit can use its built-in compass to detect the direction it's facing and give the bearing in degrees from magnetic North.

Example: Turn the micro:bit into a compass that shows which way it's facing.



Magnetometer

The compass can also be used to measure the strength of the Earth's magnetic field and other magnetic fields. In MakeCode it measures magnetic field strength in microTeslas.

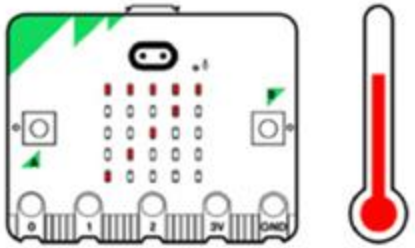
Example: You could program the micro:bit to make the LEDs light up when a magnet is close by.

Exploring – temperature & light sensors

Temperature sensor

The micro:bit has a temperature sensor inside its processor which can give an approximation of the air temperature.

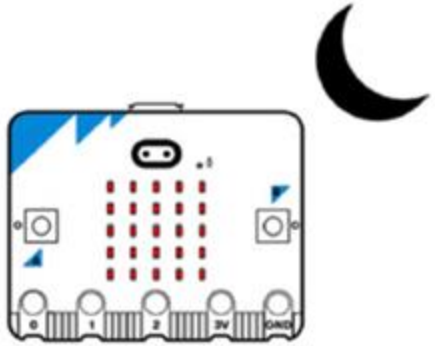
Example: Program the micro:bit to make a thermometer to measure the temperature around you.



Light sensor

The micro:bit can be programmed to use its LED display as a light sensor. It measures light strength from 0 (no light) to 255 (very bright light).

Example: Turn the micro:bit into a night light by making the LED display turn on automatically when the light level is low.

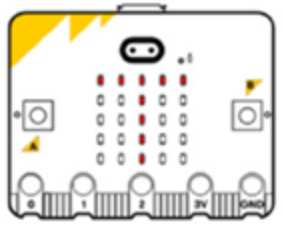


Exploring – LED display & radio

LED display

An LED, or light-emitting diode, is an output device that emits light. The micro:bit has a display of 25 LEDs that can be programmed to show text, numbers and simple pictures.

Example: Turn the micro:bit into a name tag by having it scroll your name on the LED display.



Radio

The micro:bit can send (output) and receive (input) text and numbers by radio.

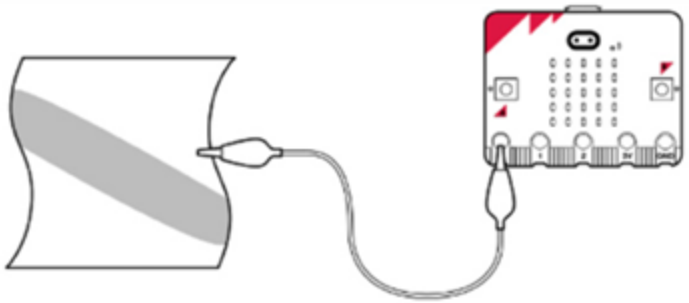
Example: Send a message to a nearby micro:bit.

Exploring - pins

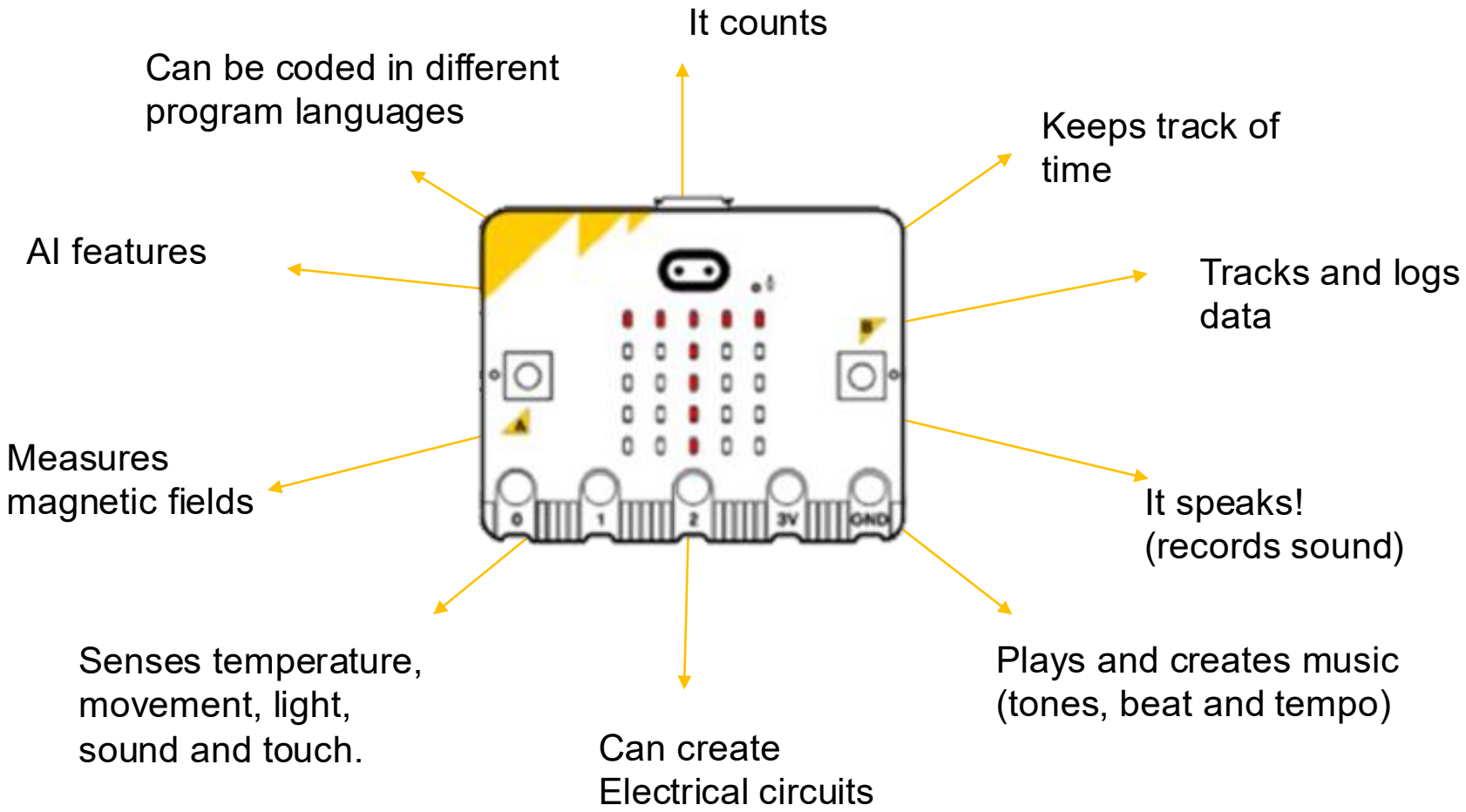
On the bottom edge of the micro:bit there are 25 gold strips, called pins. These pins allow you and your students to really get creative. You can create circuits, connect external things like buzzers and motors, and make fun projects.

There are five large pins: 0, 1, 2, 3V and GND. The pins 0, 1, and 2 can be used as touch pins. 3V pin supplies power. GND (ground) is used to complete electrical circuits.

Example: Make an aluminium-foil touch pad by connecting it to the pins using alligator/ crocodile clips. This could be used as a more accessible button.



What else can do?



Examples of projects from around the world

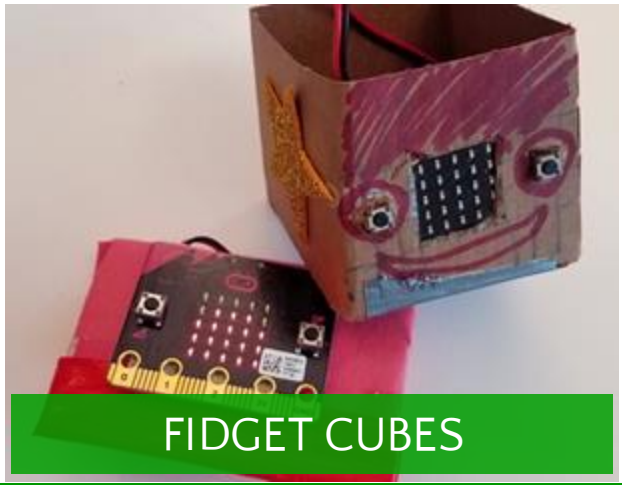
STEP COUNTERS

SOIL MOISTURE

SMART HOME

GOOD POSTURE

MEASURING HUMIDITY



FIDGET CUBES

ANTI KIDNAPPING

INTERACTIVE ART

Dr. Lorna Gibson is Head of Professional Development at the Micro:bit Educational Foundation.

She leads initiatives to support teachers in building their skills and confidence with micro:bit—designing and delivering training and professional learning that helps educators bring interactive computing, coding, and digital creativity into the classroom. Lorna is part of the Foundation's Education Team, working globally to enable more equitable access to technology-rich learning.

Bláthnaid Walsh-Heron is part of the Education team at the Micro:bit Educational Foundation, creating materials that help non-specialist teachers bring physical computing and digital skills into their classroom. A former teacher, she's passionate about supporting educators and inspiring students to build their best digital futures.

ADDITIONAL SLIDES

21st-century skills

The program seeks to develop a rich range of 21st-century skills.

COMPUTATIONAL SKILLS

Reading code | Writing code | Adapting code | Experimenting to understand | Building prototypes | Testing | Evaluating

CITIZENSHIP

Understanding world issues | Making a difference in the world around them | Motivating others | Showing leadership | Expressing opinions | Developing empathy

COMMUNICATION

Active listening | Giving and receiving feedback | Presenting | Discussing | Asking questions

CRITICAL THINKING

Planning | Researching | Decision-making | Questioning | Prioritising | Observing | Problem-solving | Reflecting

COLLABORATION

Working with others | Compromising | Exploring iterations | Experimenting

CREATIVITY

Generating ideas | Building connections | Exploring iterations | Experimenting

ADAPTABILITY

Developing resilience | Embracing feedback | Ability to pivot | Making connections

Tinkering with Tech and AI- curriculum and lesson flow*

*this is flexible and can be adapted

Lesson		Lesson Components	Topic
1	Getting creative and making a difference	1: Introduce grand challenge (identify concept of a problem area) 2: Introduce **design thinking** with student workbooks	Design Thinking
2	Introducing the grand challenge	1:Identifying problem areas and selecting problem for to address; 2: Look at examples of problems and projects developed from other countries, **especially from all female teams**	Design Thinking
3	Unpacking Design Thinking	1: Description of design thinking process and its stages	Design Thinking
4	First steps with the micro:bit (or other device)	1: Introduce the micro:bit (accelerometer, thermometer & light sensor); 2: First code on the micro:bit (thermometer); 3: More coding and exploring (night light & tilt alarm)	Device-specific
5	Exploring more features with micro:bit (or other device)	1: Introduce further features (compass, magnetometer & pins); 2: Compass North 3: Conductivity tester, door alarm & magnet	Device-specific
6	Making and discovering with micro:bit (or other device)	1: Radio 2: Hot or cold game 3: Prototyping task	Device-specific
7	What is AI?	1: Define AI 2: Identify if something uses AI 3. AI or Not	AI
8	Can machines learn?	1: What is a dataset? 2: Understanding Predictions	AI

Tinkering with Tech and AI- curriculum and lesson flow*

*this is flexible and can be adapted

Lesson		Lesson Components	Topic
9	Understanding AI bias	1: Understand AI bias, **including Gender bias;** 2: Understand how AI bias impacts training of AI models; 3: Reflect on ways to reduce AI bias, specifically **Gender responsiveness**	AI
10	How do machines learn?	1: What is an algorithm? 2: How a machine uses an algorithm to produce an output	AI
11	How do machines create?	1: Differentiate between predictive AI and Generative AI	AI
12	Understanding AI bias	1: Deeper understanding of AI bias, **including Gender bias** 2: Understand how AI bias impacts training of AI models	AI
13	What is creativity?	1: Understand what is creativity; 2: Practice using our own creativity	Design Thinking/ AI
14	Writing clear instructions when using AI creatively	1:Understand how AI can be applied to be creative 2: Identify what "good" instruction looks like for AI	AI
15	Ethics of AI	1: Identifying basic ethical principles of AI; 2: Collaborative creation of AI guidelines	AI
16	Empathise	1: Introduction; 2: Preparation and making teams; 3: Research;	Design Thinking

Tinkering with Tech and AI- curriculum and lesson flow*

*this is flexible and can be adapted

Lesson		Lesson Components	Topic
17	Research	1: More time for undertaking and collating research	Design Thinking
18	Define	1: Introduction; 2: Gather, order, synthesise data; 3: Write a problem statement	Design Thinking
19	Communicating research & outputs	1: More time to write up and communicate research, and to work on problem statements	Design Thinking
20	Ideate	1: Introduction; 2: Generate ideas; 3: Synthesise and prioritize ideas;	Design Thinking
21	Ideas development	1: More time to work in ideas, facilitate sharing with the class	Design Thinking
22	Prototype	1: Introduction; 2: Build prototypes (including with AI)	Design Thinking/AI
23	More time for prototyping	1: Working in a range of visual formats and media to design, construct and communicate ideas	Design Thinking
24	Test	1: Introduction; 2: Planning; 3: Run testing activity; 4: Review feedback	Design Thinking/ AI/ Device-specific
25.	More time for testing	More time for preparation, testing activities and capturing notes to share	Design Thinking
26	Reflect and present	Students present their projects and build	Design Thinking/ AI/ Device-specific

What success looks like

Key indicators of success:

- Broad multi-stakeholder engagement in countries: Government, teachers, parents, students, other local players
- Tangible improvements in skills acquisition for students, particularly girls
- Empowered teachers creating engaging, inclusive, gender-responsive learning environments for children
- Traction: expanded implementation in supported countries
- Replicable programme model with more countries interested
- Identification of funding models for sustainability of expanded implementation.
- Strengthened legacy partnership (e.g., Arm & UNICEF).

Success is defined by strong collaboration and alignment between partners, resulting in a shared vision and long-term strategic impact for all children.