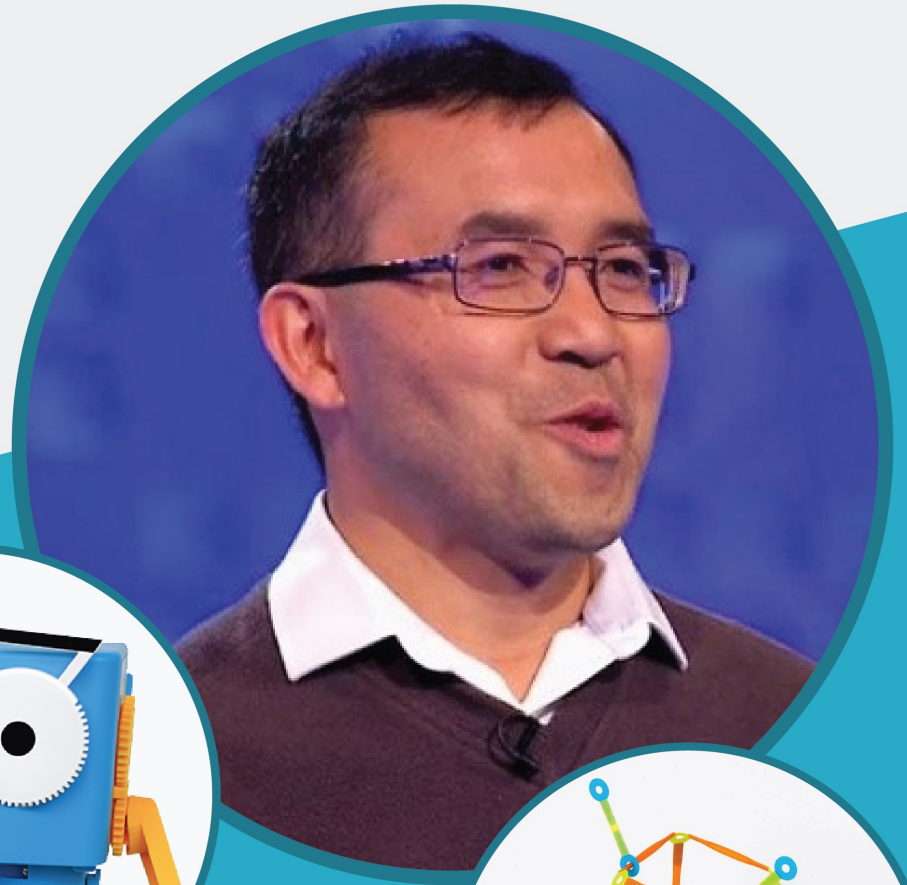
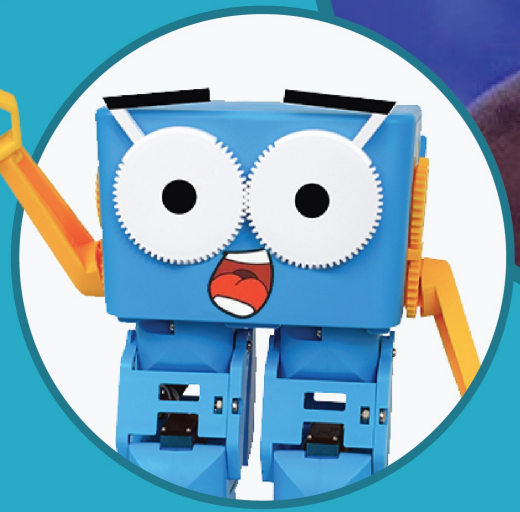
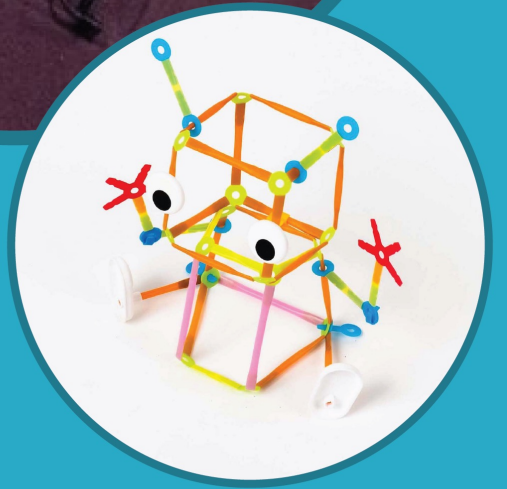
ROBOTICAL and Strawbees®

BUILDING THE FUTURE

with Allen Tsui







AN HOUR OF CODE™ EVENT

Wed, December 6th 3.30pm GMT

Introductions

Natalya Ratner

Marketing Director, Robotical

Allen Tsui

Subject Lead for Primary Computing, Willow Brook Primary school

Sarah walker

Uk Partnership Manager, Strawbees

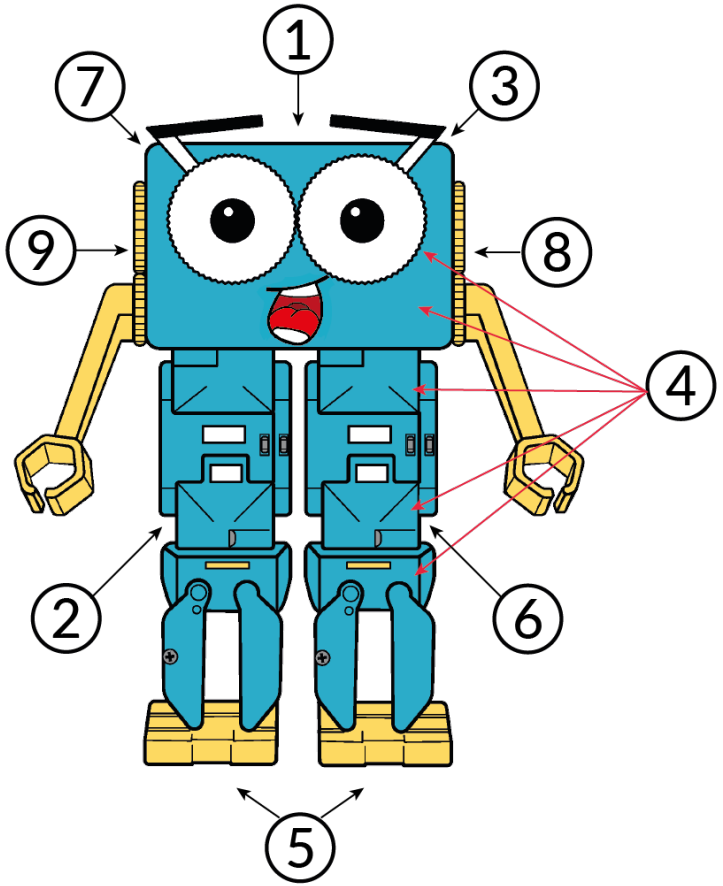
Housekeeping and Agenda

- This session is **approx. 60 minutes** long - if we have time, we'll do Q&A at the end
- Let us know where you're joining from in the chat ☺
- If you want to ask a question at any time (and please do!), type it into the Q&A (box with '?' in it), we'll try to answer as many as possible
- Stay till the end for the giveaway!

(Rough) Agenda:

- Who is Marty the Robot (5 mins)
- What is Strawbees (5 mins)
- Coding Club fun with Allen and Willow Brook Primary School (40-45 mins)

Who is Marty the Robot?



1 - Humanoid Form
Marty has a personality and is full of character!

2 - Unique Walking Mechanism
Walk, turn, dance, sidestep, kick a ball, wiggle

3 - Range of Expressions
Marty's eyebrows move to express emotions

4 - Motors with Position Sensors
Nine metal-geared smart servo motors (in legs, arms & eyes)

5 - Foot Sensors
Infrared (IR) Sensor & Color Sensor for screenless coding

6 - Quality Moulded Plastic Parts
Classroom-ready, robust and built to last

7 - Acceleration & Tilt Sensor
Found in the control board in Marty's head

8 - Rechargeable Battery
With run time of 2-3 hours when fully charged

9 - Speaker
Marty speaks and plays sounds

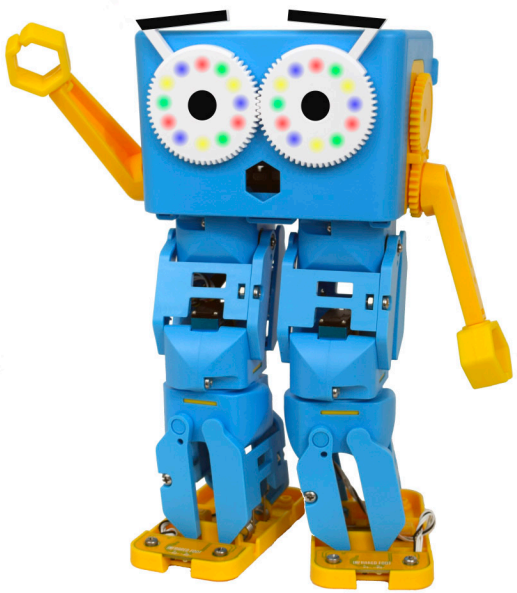
Programming Languages

Marty supports progression from screen-free programming and block-based coding, to text-based programming language Python and more.

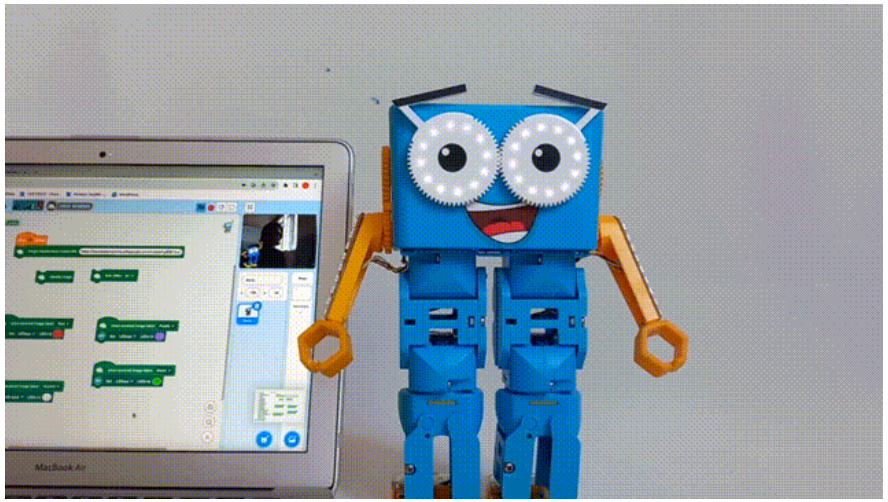
Connectivity & Compatibility

Program Marty from PC, or any Android and iOS devices, using our app. Connect using Bluetooth, WiFi, USB, or I2C for custom add-ons.

Marty's Newest Features



All Martys now come with Disco eyes



Teach AI and machine learning in primary

Improved sound and speech functionality – over +40 languages!

Value for the Whole School

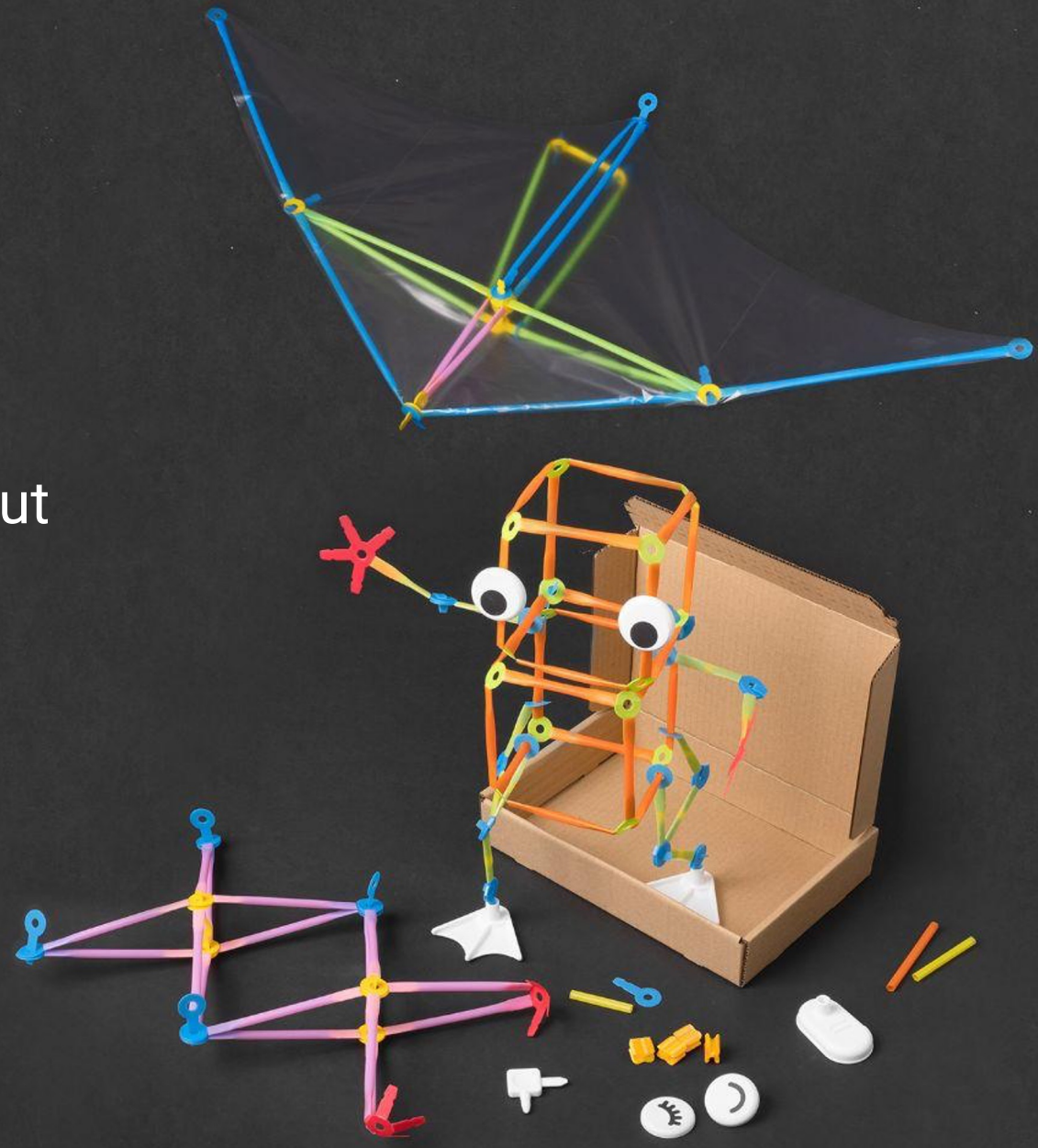
LEARNING PROGRESSION *with* MARTY THE ROBOT

CODING ENVIRONMENT	RECEPTION /YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7-9
Unplugged	✓	✓					
Remote Control		✓	✓				
MartyBlocks Jr			✓	✓			
MartyBlocks					✓	✓	✓
Python							✓

WHAT IS STRAWBEES?

Strawbees is a creative way of learning STEM using hands-on pedagogy.

A hands-on tool which educates learners about building and coding whilst having fun.



STEM CLASSROOM

- Building Solution
- Kit for 30 Learners
- Pocketful of Ideas
- Strawbees Classroom
- Storage Solution

STEM CLASSROOM ROBOTICS WITH MICRO:BIT

Building and Robotics Solution

Kit for 30 Learners

Ages 8 +

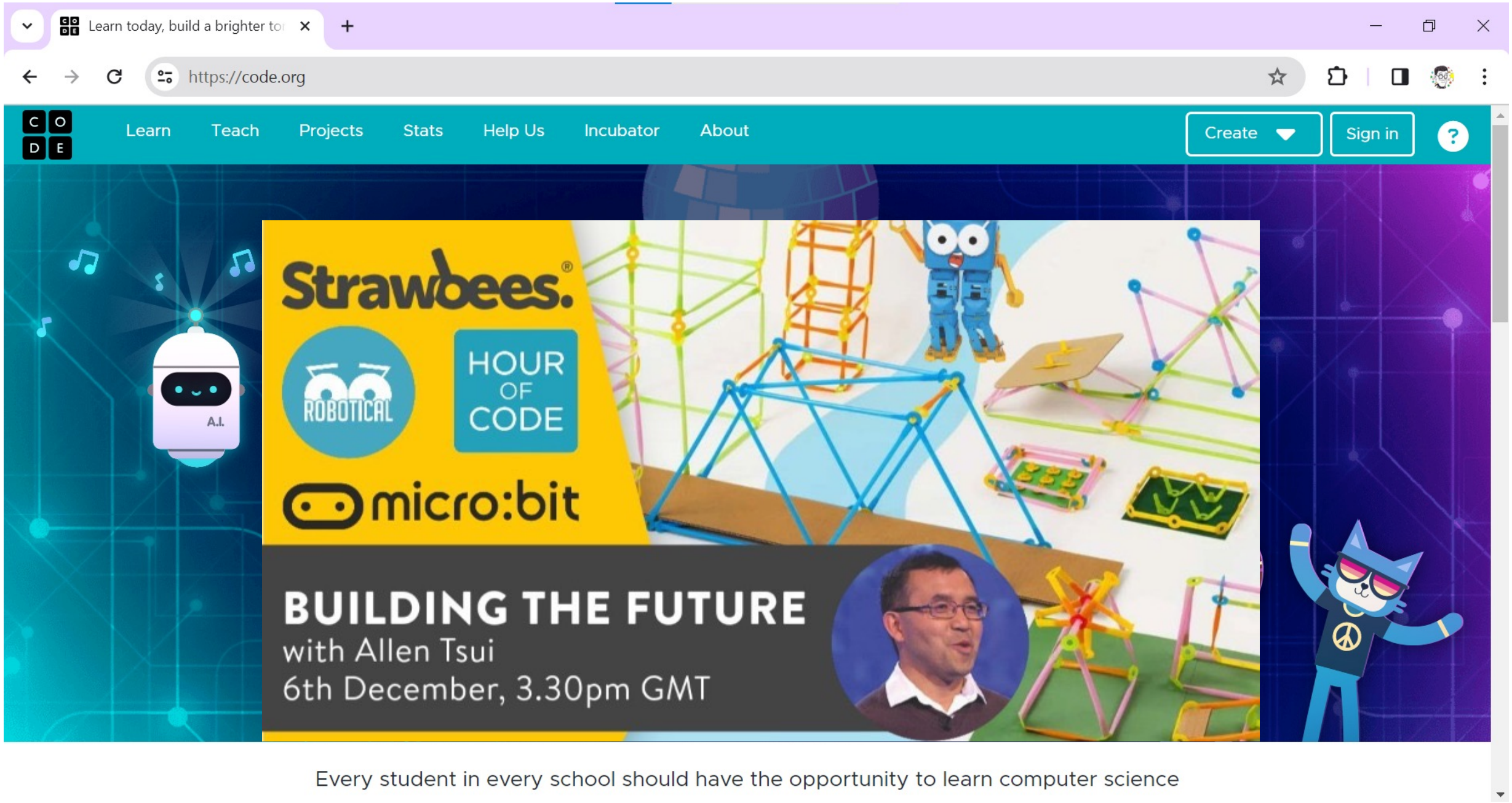
Pocketful of Ideas

Strawbees Classroom

Storage Solution

Strawbees. CLASSROOM

Code.org @WillowBrookGST



Every student in every school should have the opportunity to learn computer science

Micro:bit the next gen

Reminder from the BBC Claim your Micro:bit by 18 December 2023

Register for your free BBC micro:bits now!

The BBC micro:bit is a pocket-sized computer which helps you teach children how to get creative with coding and tech. At BBC Education, we've just launched our exciting new campaign **BBC micro:bit – the next gen** in partnership with the Micro:bit Educational Foundation and Nominet.

We are donating a FREE classroom set of 30 BBC micro:bits to every UK primary school that registers. Not only that, but we're supporting teachers with training webinars, virtual courses and a host of free classroom resources in all 4 nations. You can find all the info here:

https://microbit.org

Please register for your school's FREE micro:bits now, because time is running out – registration closes on 18th December 2023.

Programming targets from the Primary National Curriculum for schools in England since 2014

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Give instructions to my friend and follow their instructions to move around.	Give instructions to my friend using forward, backward and turn and physically follow instructions.	Break an open ended problem up into smaller parts.	Use logical thinking to solve an open ended problem by breaking it up into smaller parts.	Decompose a problem into smaller parts to design an algorithm for a specific outcome and use this to write a program.	Deconstruct a problem into smaller parts, recognising similarities to solutions used before.
Describe what happens when I press buttons on a robot.	Tell the order I need to do things to make something happen and talk about this as an algorithm.	Put programming commands into a sequence to achieve a specific outcome.	Use and efficient procedure to simplify a program.	Refine a procedure using repeat commands to improve a program.	Explain and program each of the steps in my algorithm.
Press buttons in the correct order to make a robot do what I want.	Program a robot or software to do a particular task.	Keep testing my program and recognise when I need to be debug it.	Know to keep testing a program while putting it together.	Use variables to increase programming possibilities.	Evaluate the effectiveness and efficiency of my algorithm while continually testing the programming of the algorithm.
Describe what actions I will need to do to make something happen and begin to use the word algorithm.	Look at my friend's program and say what will happen.	Use repeat commands.	Recognise that an algorithm will help sequence more complex programs.	Change an input to a program to achieve a different output.	Recognise when using a variable is needed to achieve a required output.
Begin to predict what will happen for a short sequence of instructions.	Use programming software to make objects move.	Describe the algorithm needed for a simple task.	Use a variety of tools to create a program.	Use 'if' and 'then' commands to select an action.	Use a variable and operators to stop a program.
Begin to use software or apps to create movement and patterns on a screen.	Watch a program execute and spot where it goes wrong so that I can debug it.	Detect a problem in an algorithm which could result in unsuccessful programming.	Recognise that algorithms will help in other learning such as Maths, Science as well as Design & Technology.	Use logical reasoning to detect and debug mistakes in a program.	Use different inputs (including sensors) to control a device or onscreen action and predict what will happen.
Use the word debug when I correct mistakes when I program.			Use a sensor to detect a change which can select an action within my program.	Use logical thinking, imagination and creativity to extend a program.	Use logical reasoning to detect and correct errors in algorithms and programs.
				Talk about how a computer model can provide information about a physical system.	

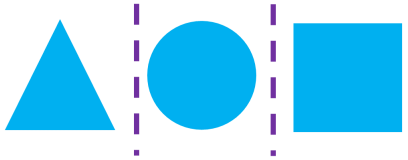
ARE targets achievable with @RoboticalLtd

Other resources

Computational Thinking

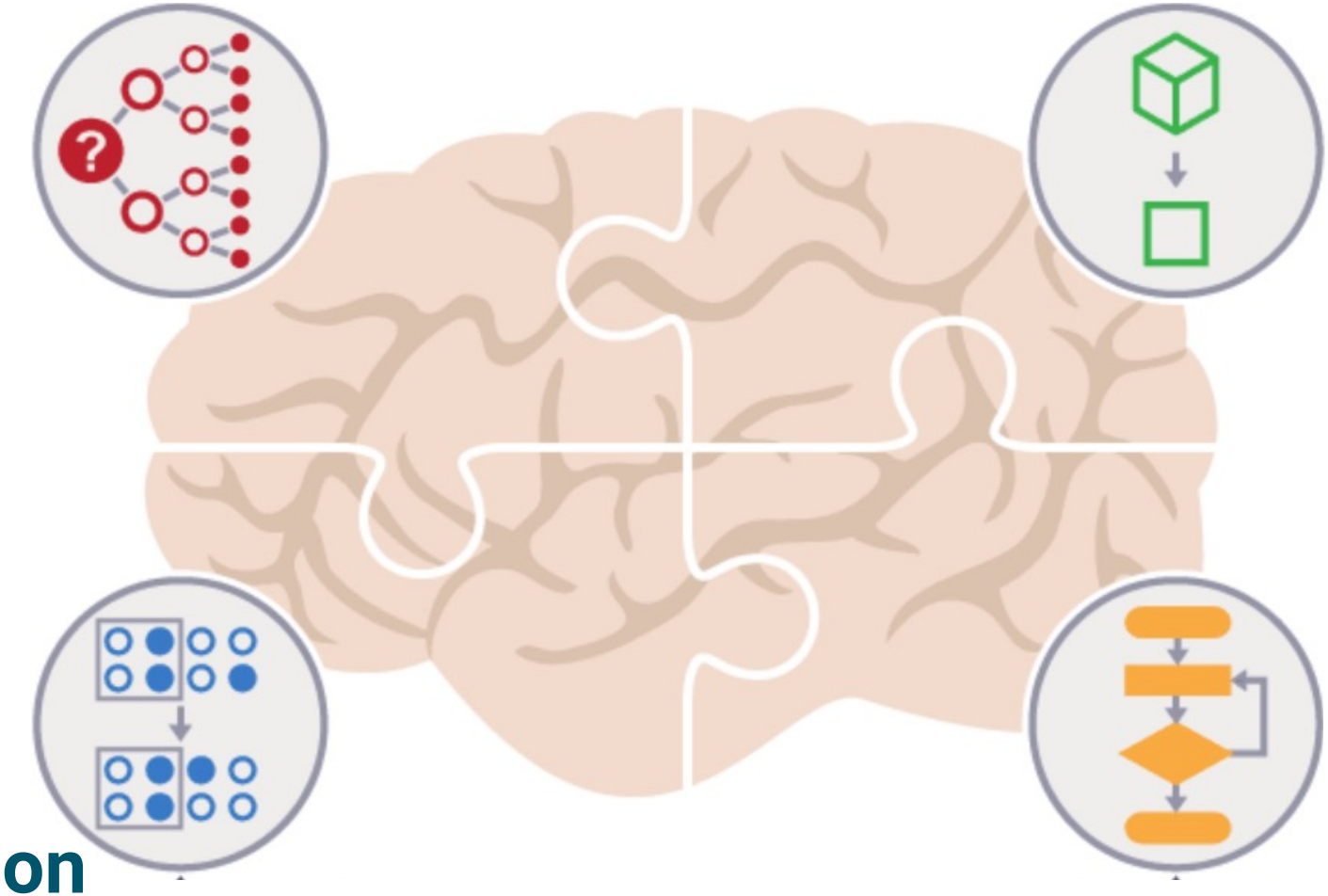
1 Break the idea down into smaller parts.

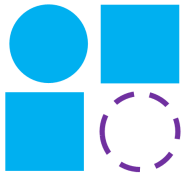
decomposition



3 Focus on the important or key parts of the idea.

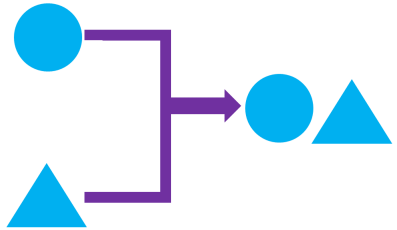
abstraction





pattern recognition

2 Spotting similarities which could help.

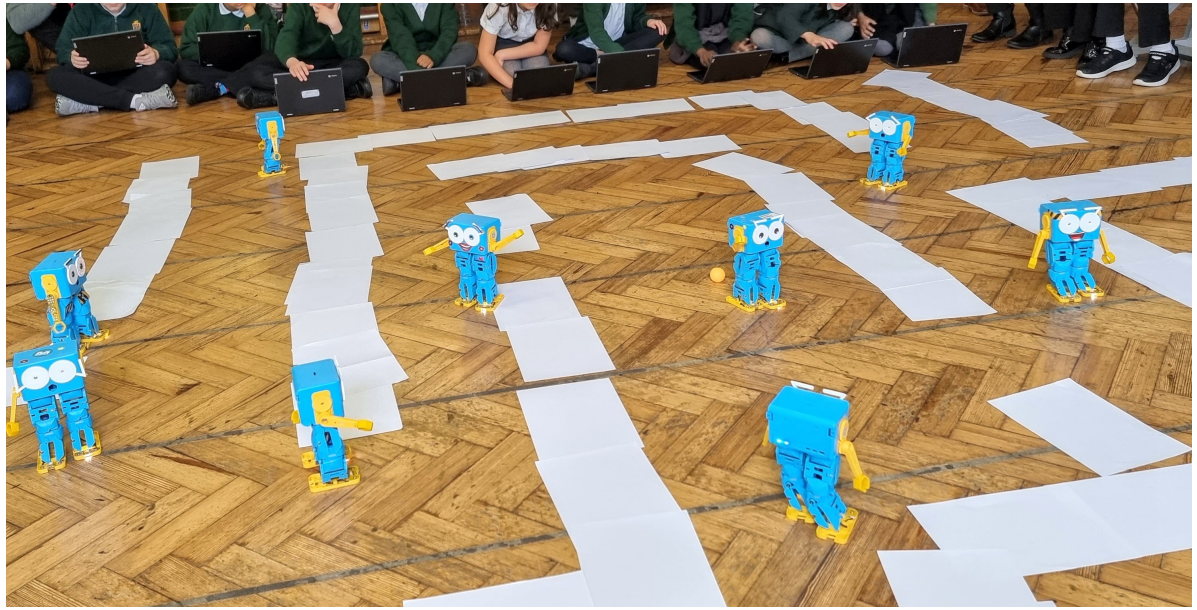


algorithm

4 Write instructions for the technology to work.

source: https://www.bbc.co.uk/bitesize/guides/zp92mp3/revision/1 (visited 4 June 2022)

Marty from @RoboticalLtd @WillowBrookGST



Photos: @TsuiAllen working @WillowBrookGST, 2022 and 2023

Article in ASE Primary Science Journal issue 176 (Jan/Feb 2023) pp 21-23

Home Tools PS 176 Tsui FINAL.... × Sign In
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PS 176 Tsui FINAL.pdf

LEARNING FROM LOCKDOWN

Raising the limits on learning with technological tangibles

Allen Tsui showcases how children as young as 4 can learn to code

Type here to search

Marty from Robotical @ISTEofficial, 2023

Miss Jami Shields on

https://twitter.com/MissJShields1/status/1673440604548677633

← **Post**

Miss Jami Shields
@MissJShields1

@TsuiAllen it was amazing to hear your poster session!! I loved helping to talk to people about @RoboticalLtd and Marty at the @ISTEofficial #ISTELive #ShieldsScribbles

10:18 PM · Jun 26, 2023 · **587** Views

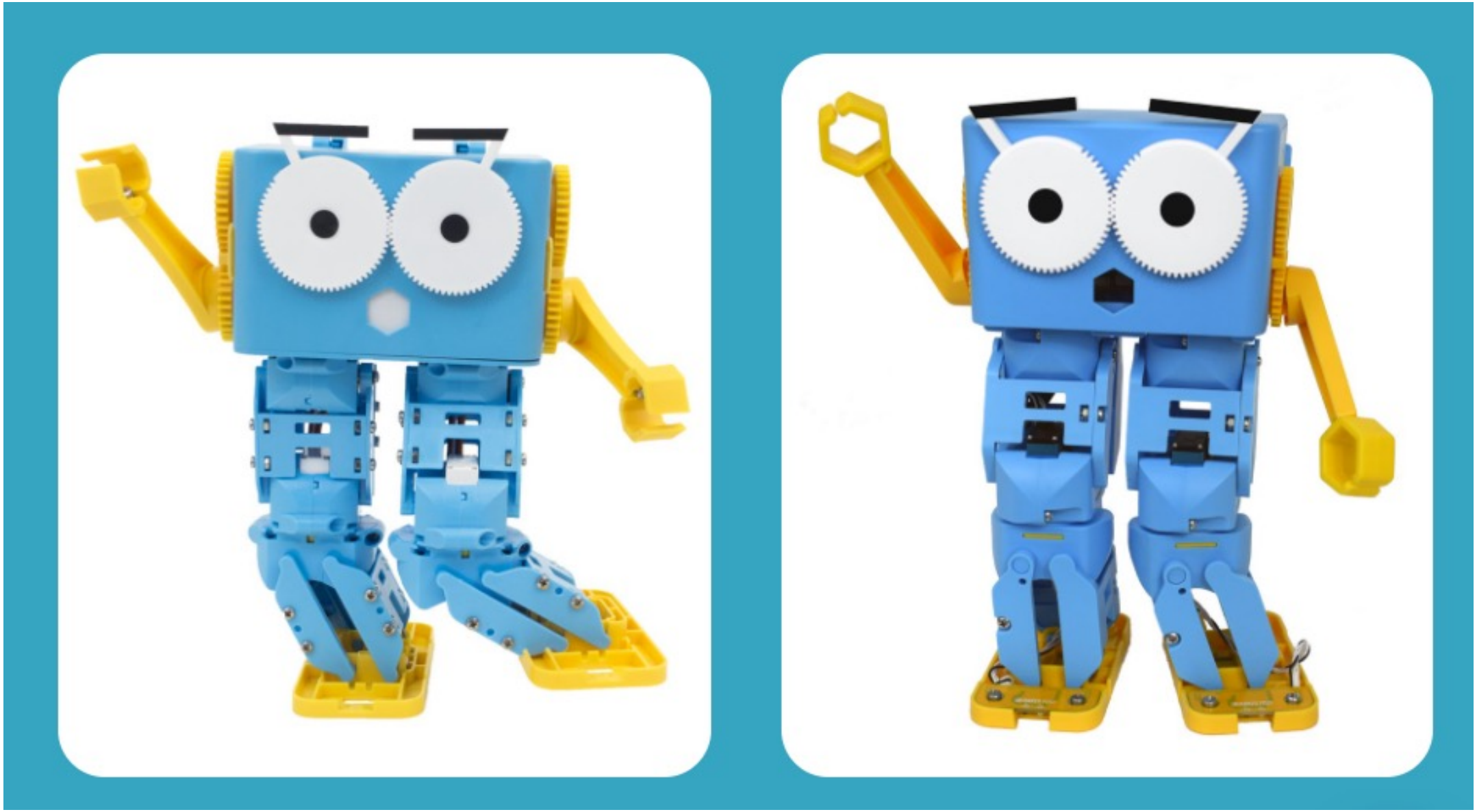
Humanoid

Type of robot design which has a body shaped like a person with a head, chest and two arms. This type of robot design also has legs and able to move with a walking style motion.

Marty the robot from Twitter: @RoboticalLtd has two ways of being programmed. Marty has a sensor in its foot which allows it to read or recognise colours. Using the coloured cards it can move forward, backward, go left or right as well as stop and dance.

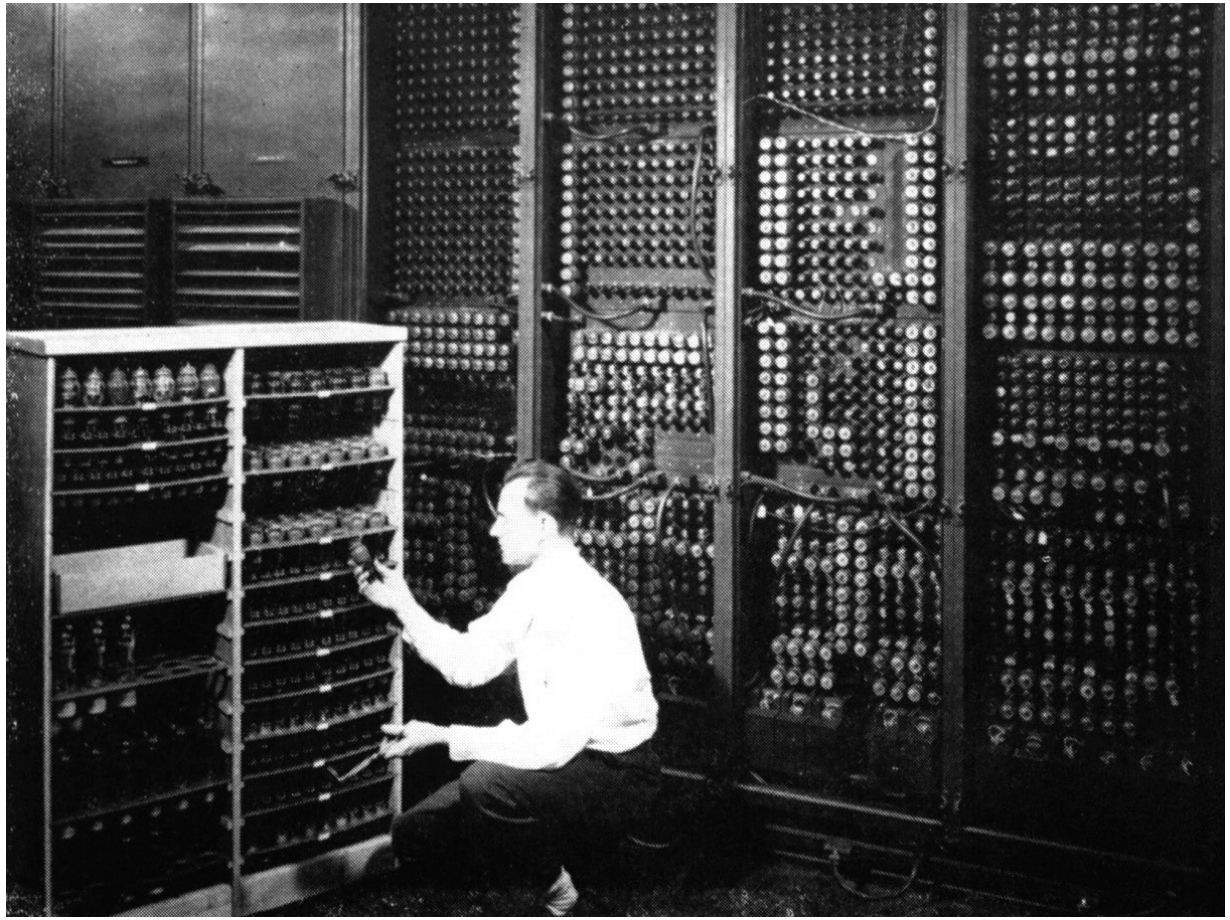
Marty can also be connected to an Android or Apple device which can be used as a controller. The Android or Apple app also includes “Marty Blocks” with versions which work in the same or similar way to Scratch Jr and Scratch.

Where are the robots? Are they already here?

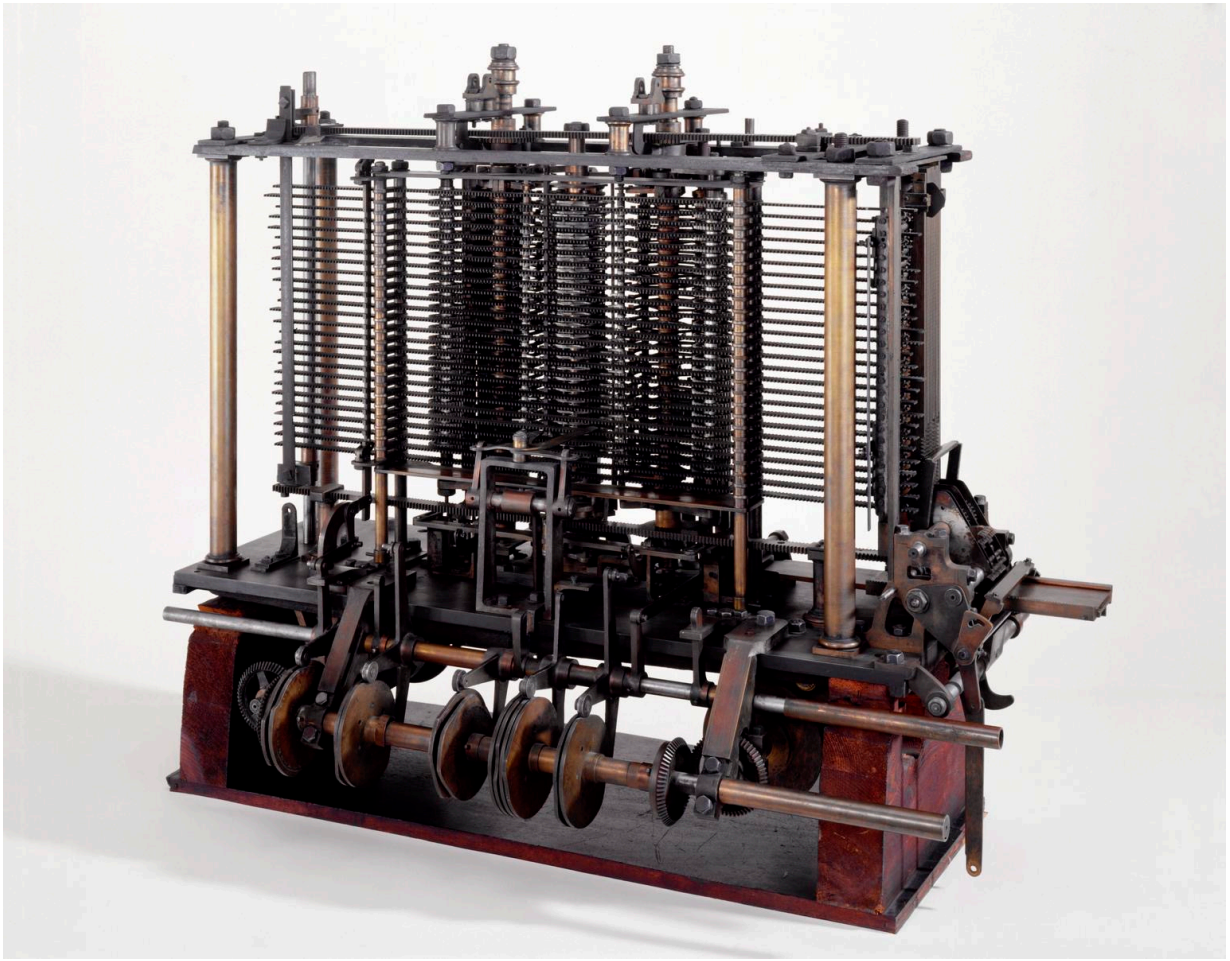


Marty version 1 (2017) and version 2 (2022)

How long has the idea of robots been around?



US Government ENIAC (Electronic Numerical Integrator and Computer) 1945

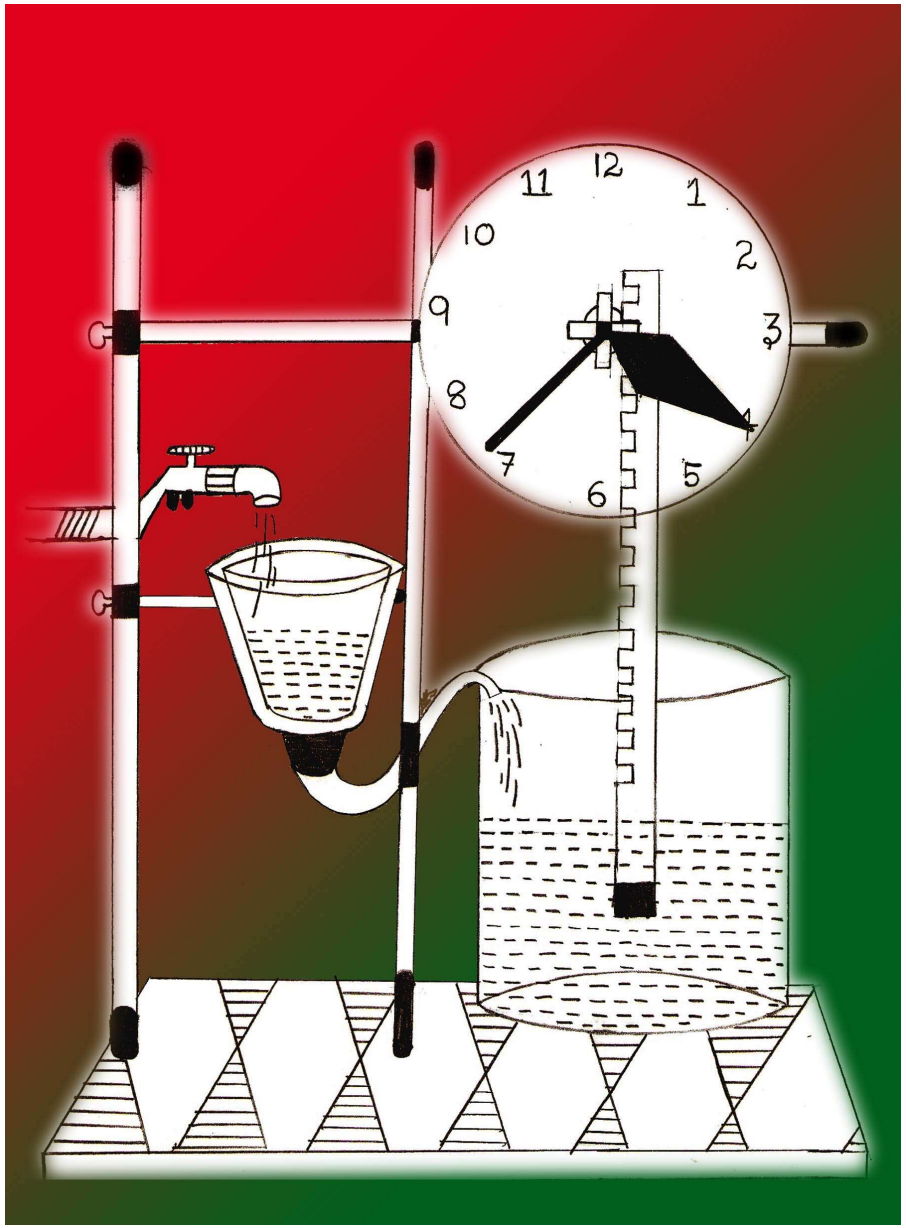


Babbage's Analytical Engine, 1834-1871. (Trial model)

How long has the idea of robots been around?

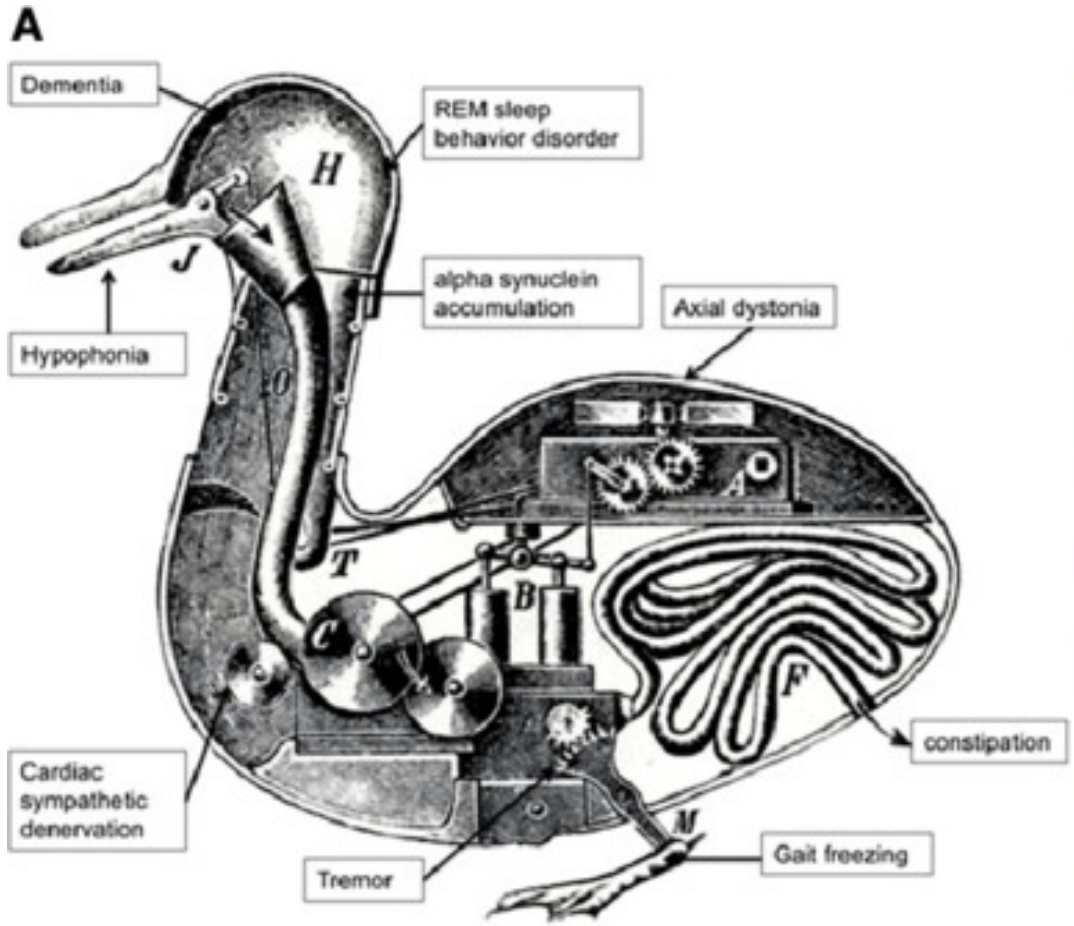
Archytas wooden mechanical pigeon (around 400 BCE)

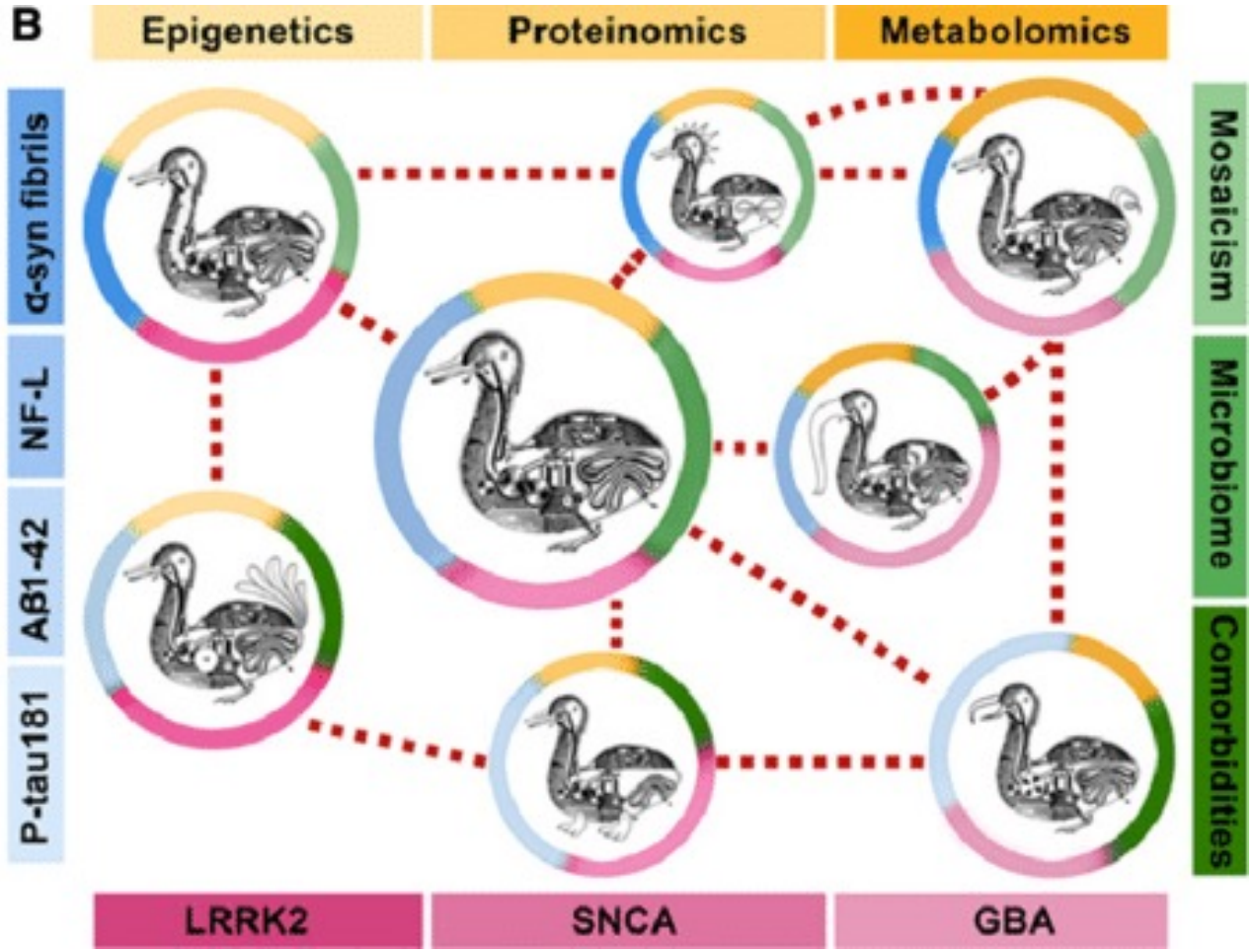
How long has the idea of robots been around?



Egyptian Water Clock (4th Century BCE)

How long has the idea of robots been around?





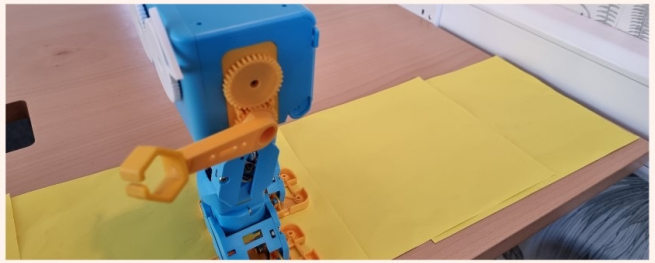
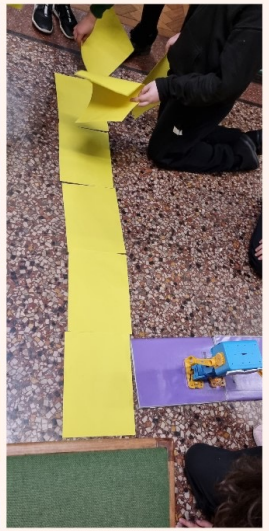
Jacques de Vaucanson (1738) Mechanical duck. Designed to turn grain into duck poo.

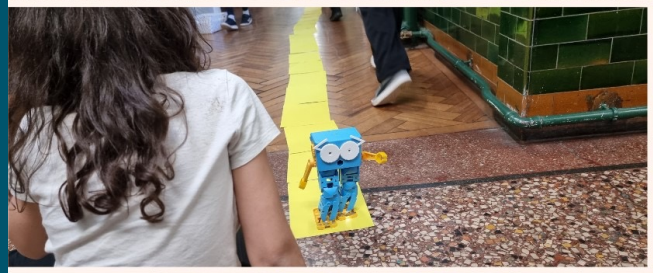
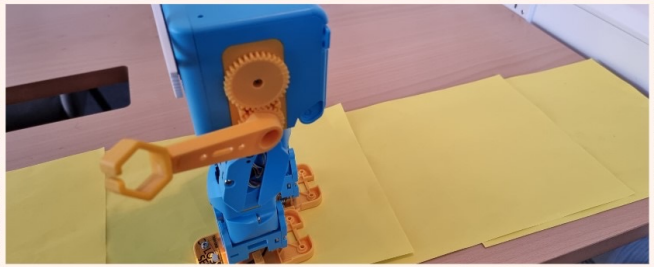
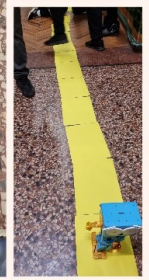
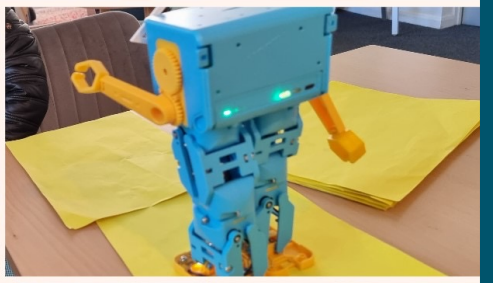
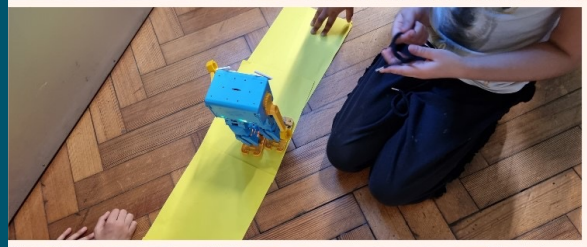
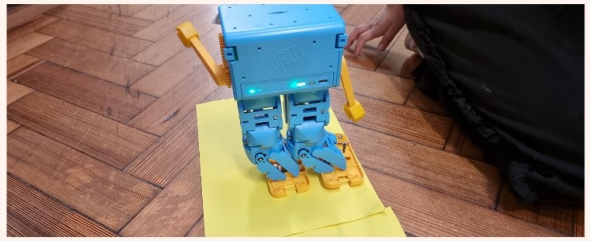
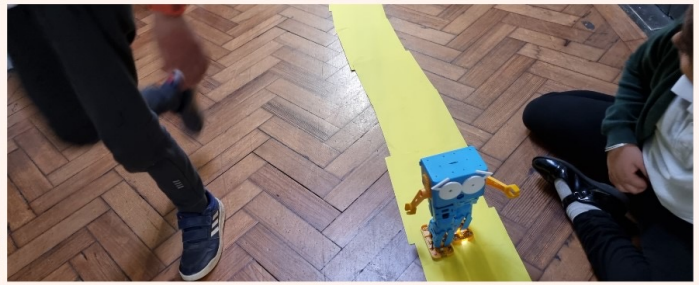
How long has the idea of robots been around?

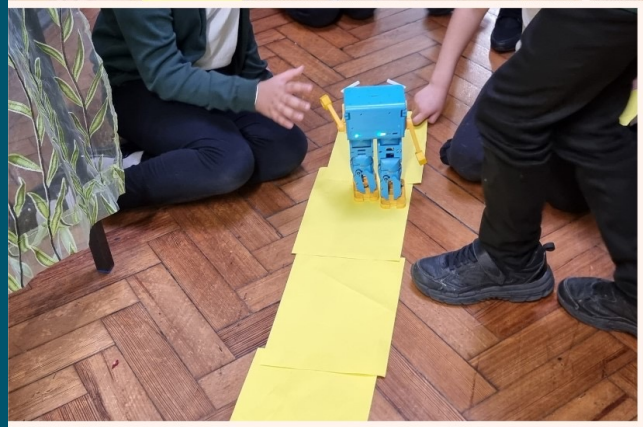
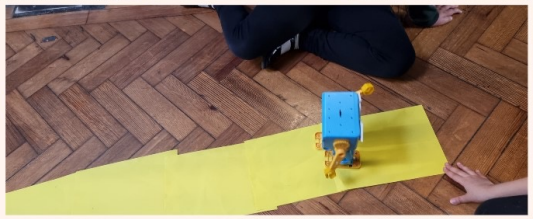
Daleks first appeared in 1963

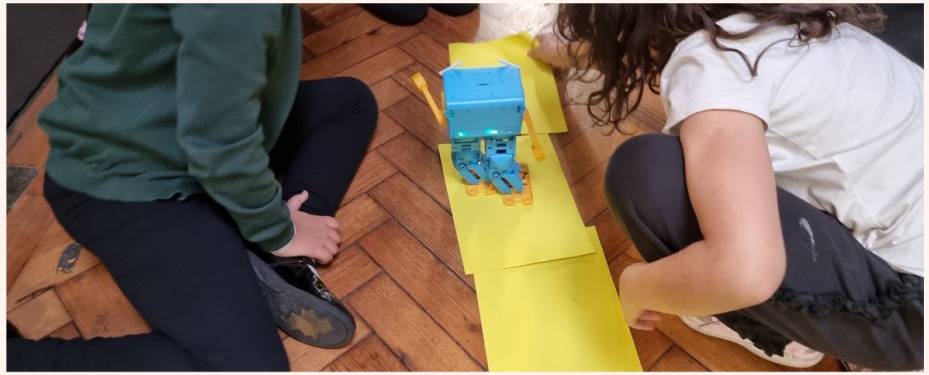
February 1938: BBC TV showed a programme “Universal Robots” based on the book by Karel Čapek's Rossum

Marty from Robotical Ltd, Hour of Code: 17 March 2022

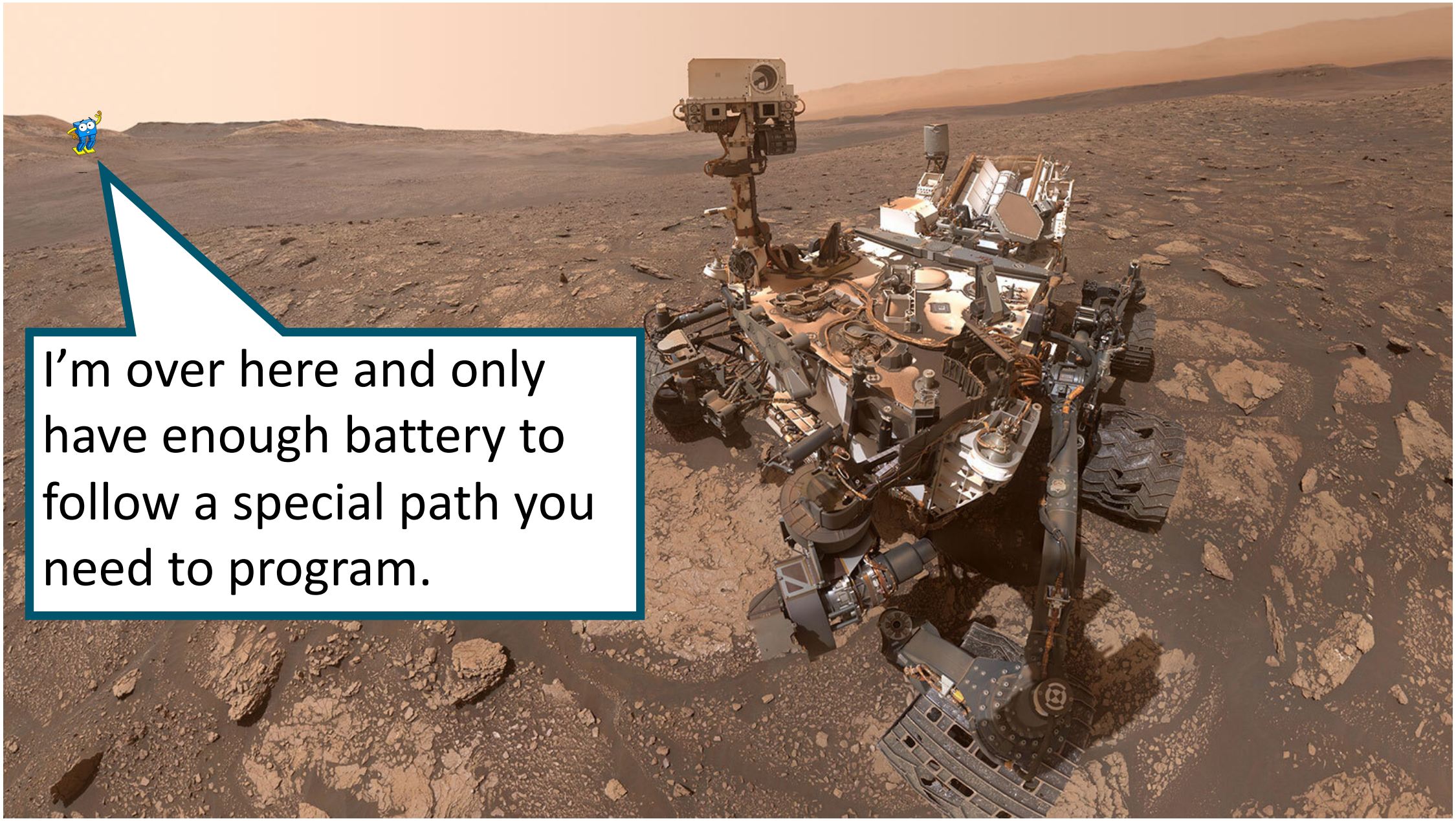





Where are the robots? Are they already here?

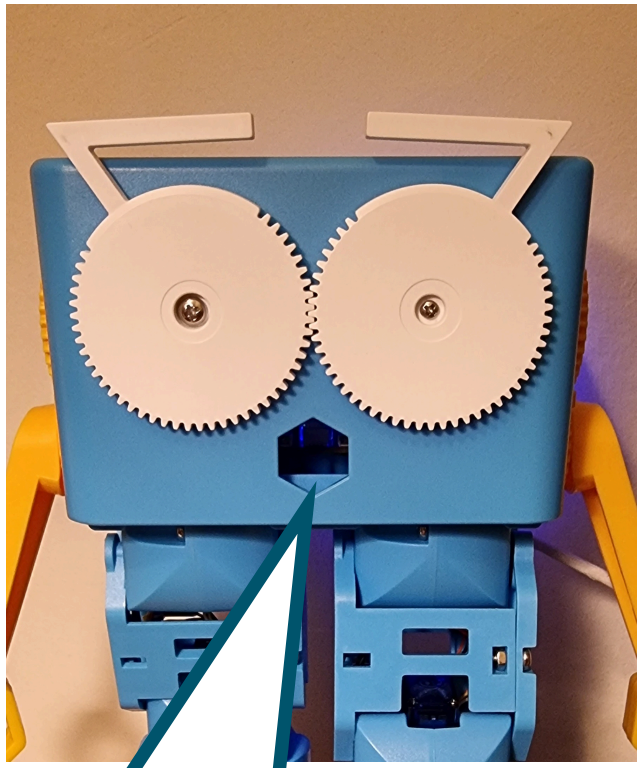
Robot that is able to operate on the pavement roll pavement. (Photo courtesy of Serve Robotics, 2022)

Marty Mission on Mars Challenge



Selfie from the Mars Curiosity robot, 25 October 2020. Source: https://mars.nasa.gov/news/8796/nasas-curiosity-takes-selfie-with-mary-anning-on-the-red-planet/

Marty Mission on Mars Challenge



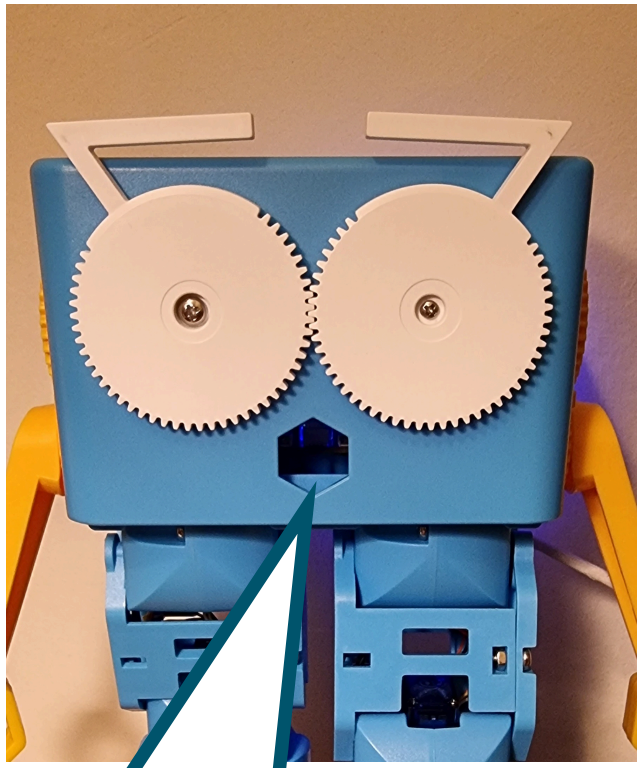
You can only use these blocks in MartyBlocksJr

Makes me move forward.

Makes me move backward.

Makes me move to the right.

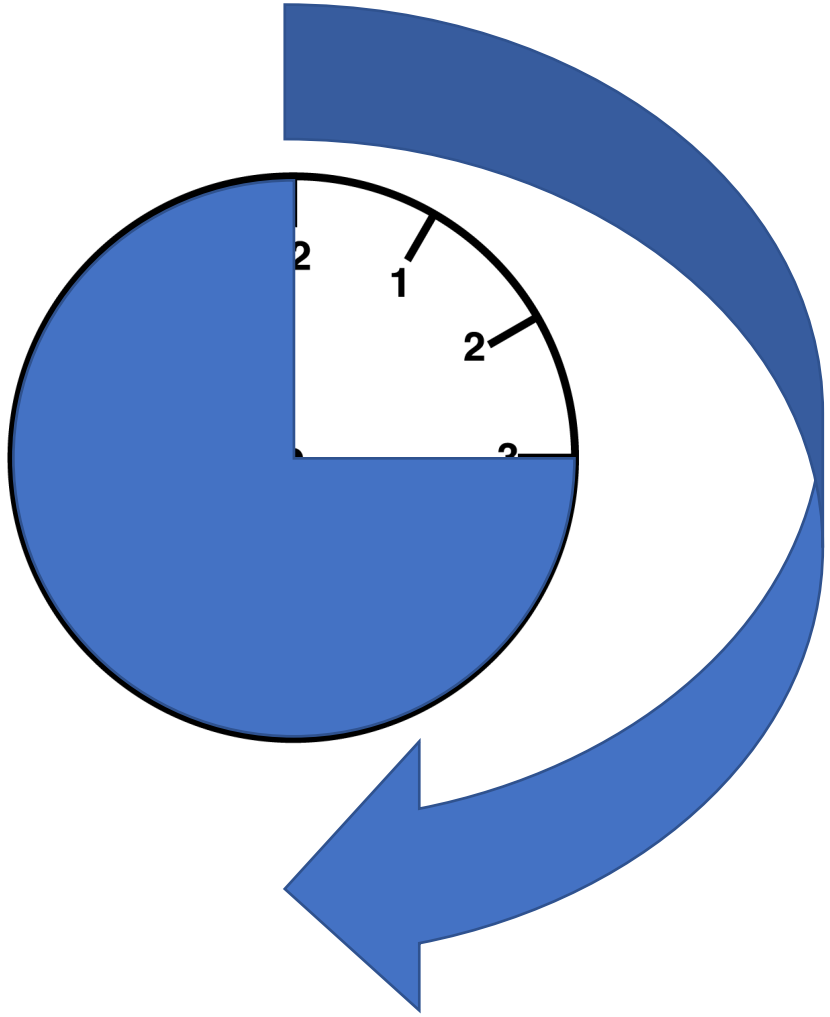
Makes me move to the left.

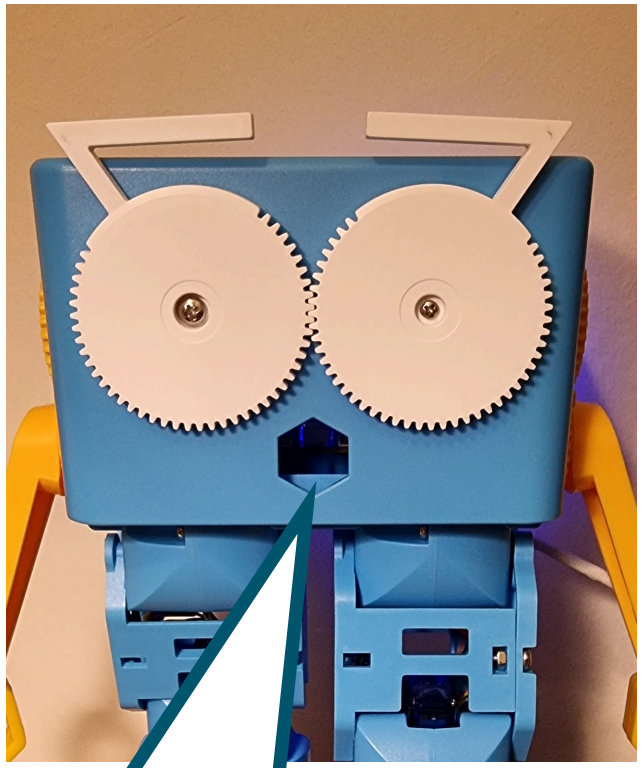


I can turn too but that uses up more battery…

Turn clockwise like this…

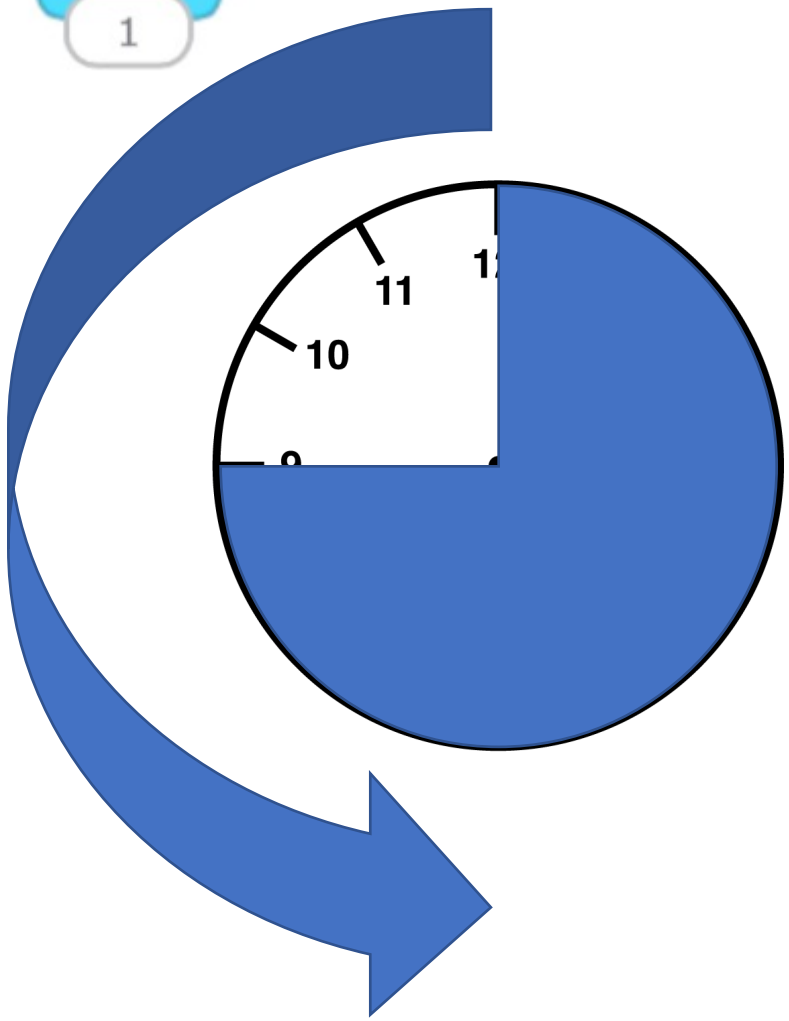
Turn	Size of turn
3	quarter turn
6	half turn
9	three quarter turn
12	whole turn





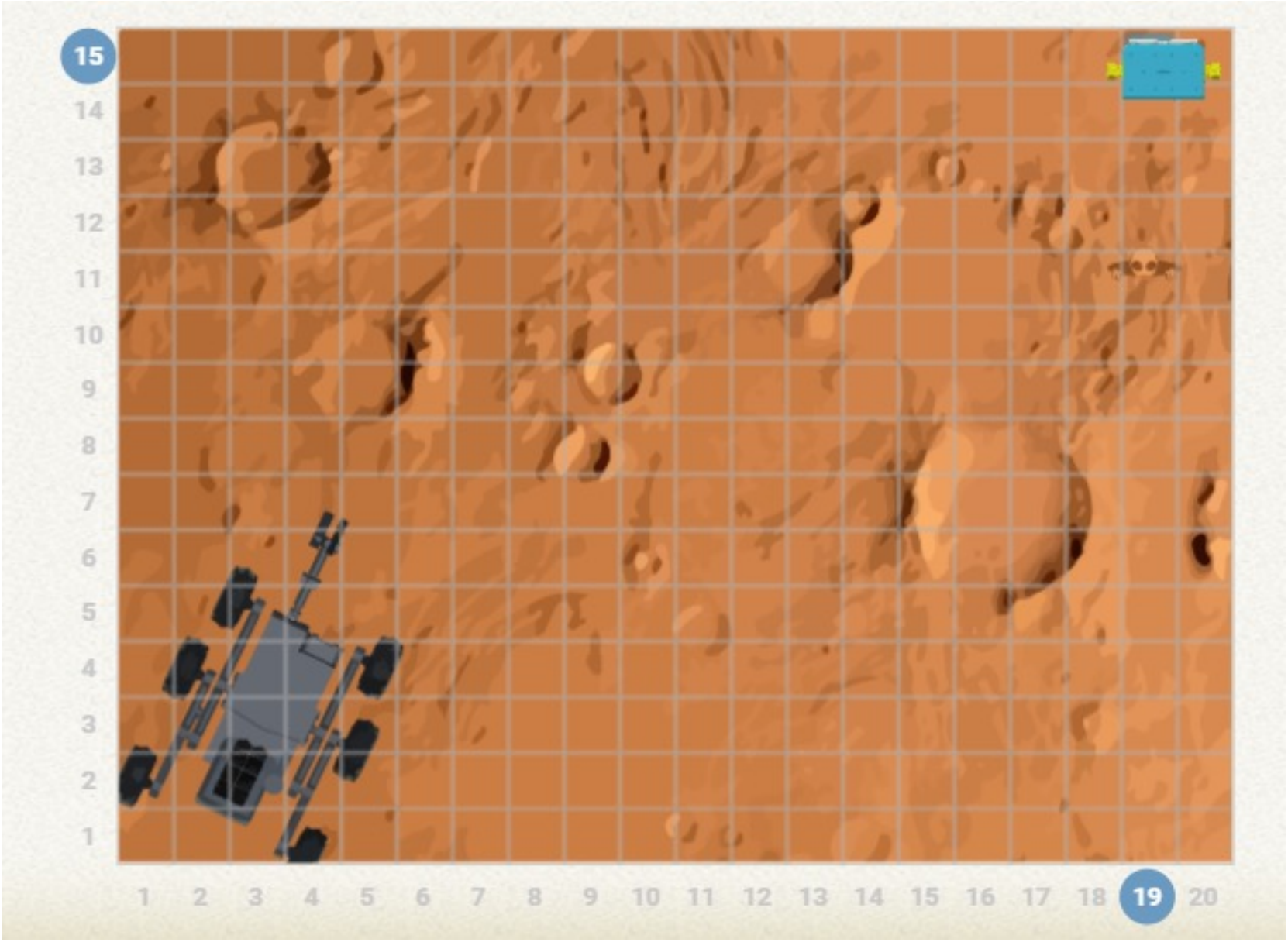
I can turn too but that uses up more battery…

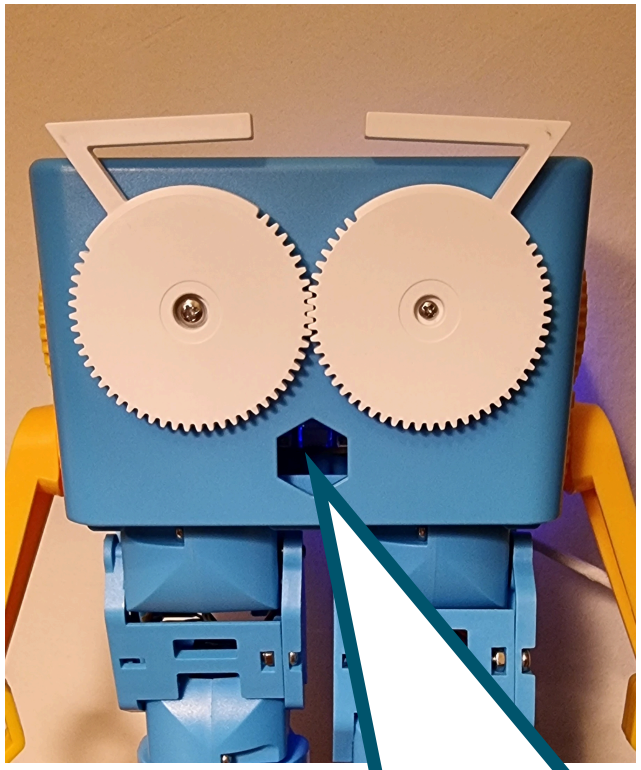
Turn anti-clockwise like this…



Turn	Size of turn
3	quarter turn
6	half turn
9	three quarter turn
12	whole turn

Marty Mission on Mars Challenge

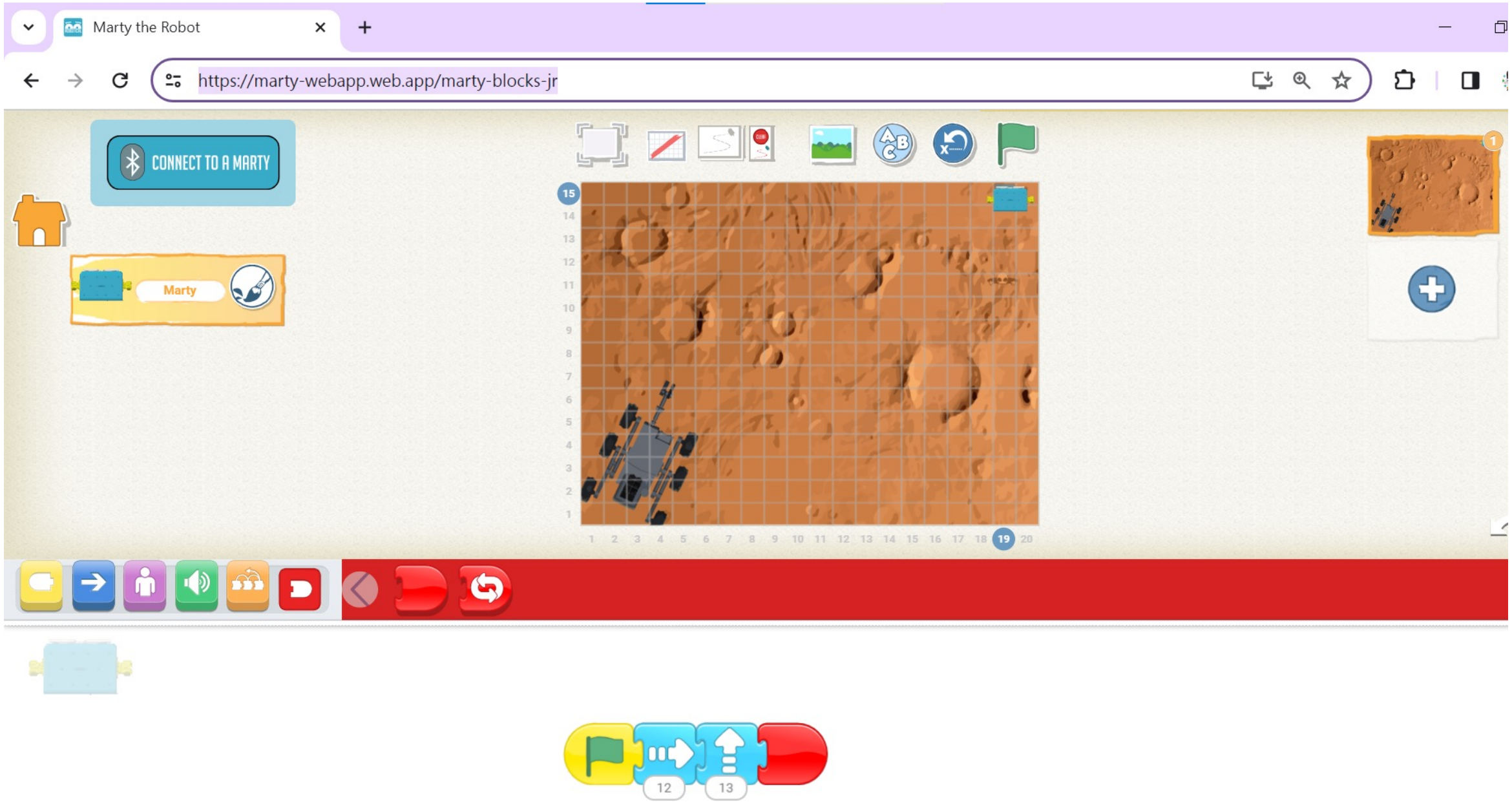




Remember to avoid the hills and the holes.

Marty is stuck on Mars. Can you help it get back to Earth?

Marty Mission on Mars Challenge

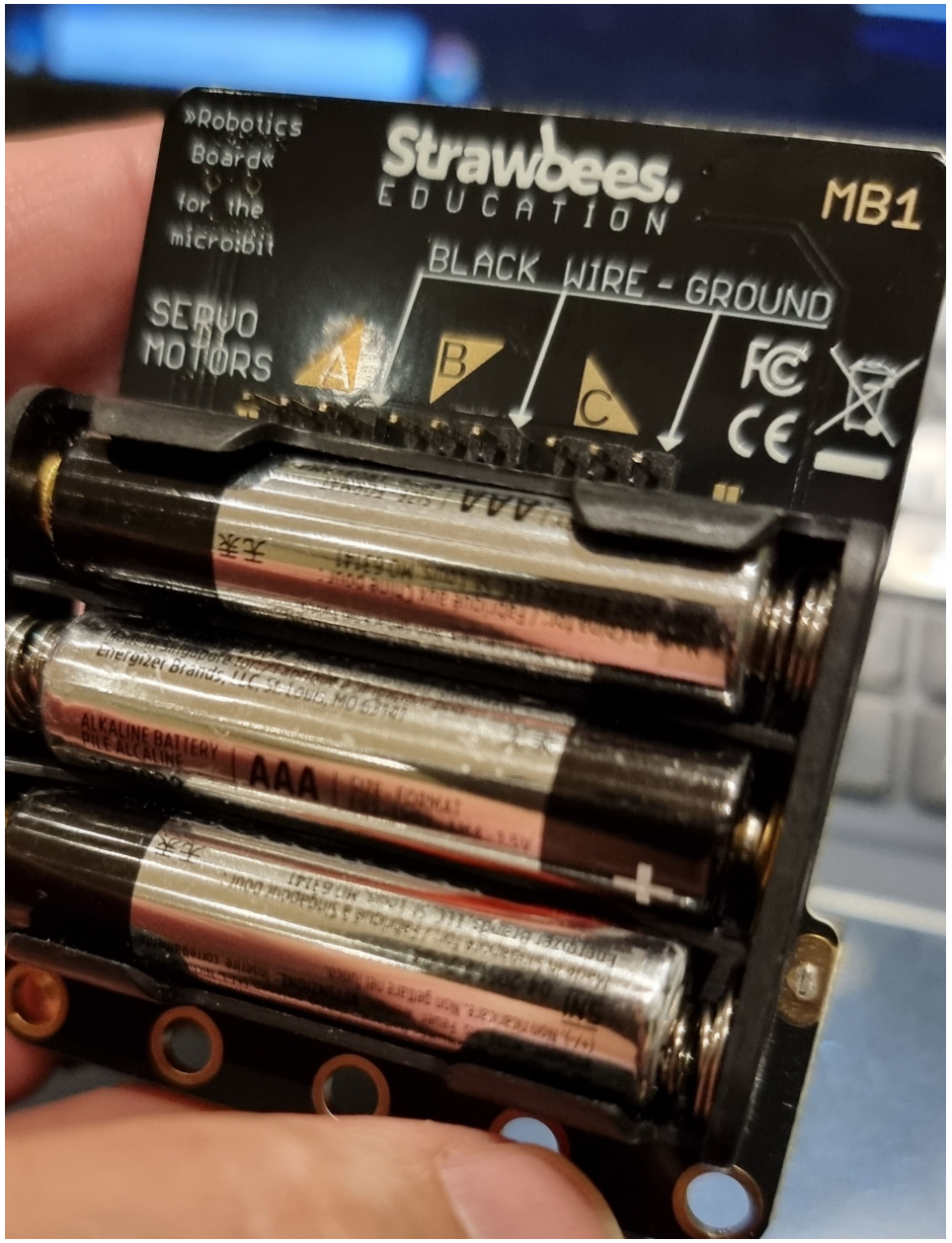


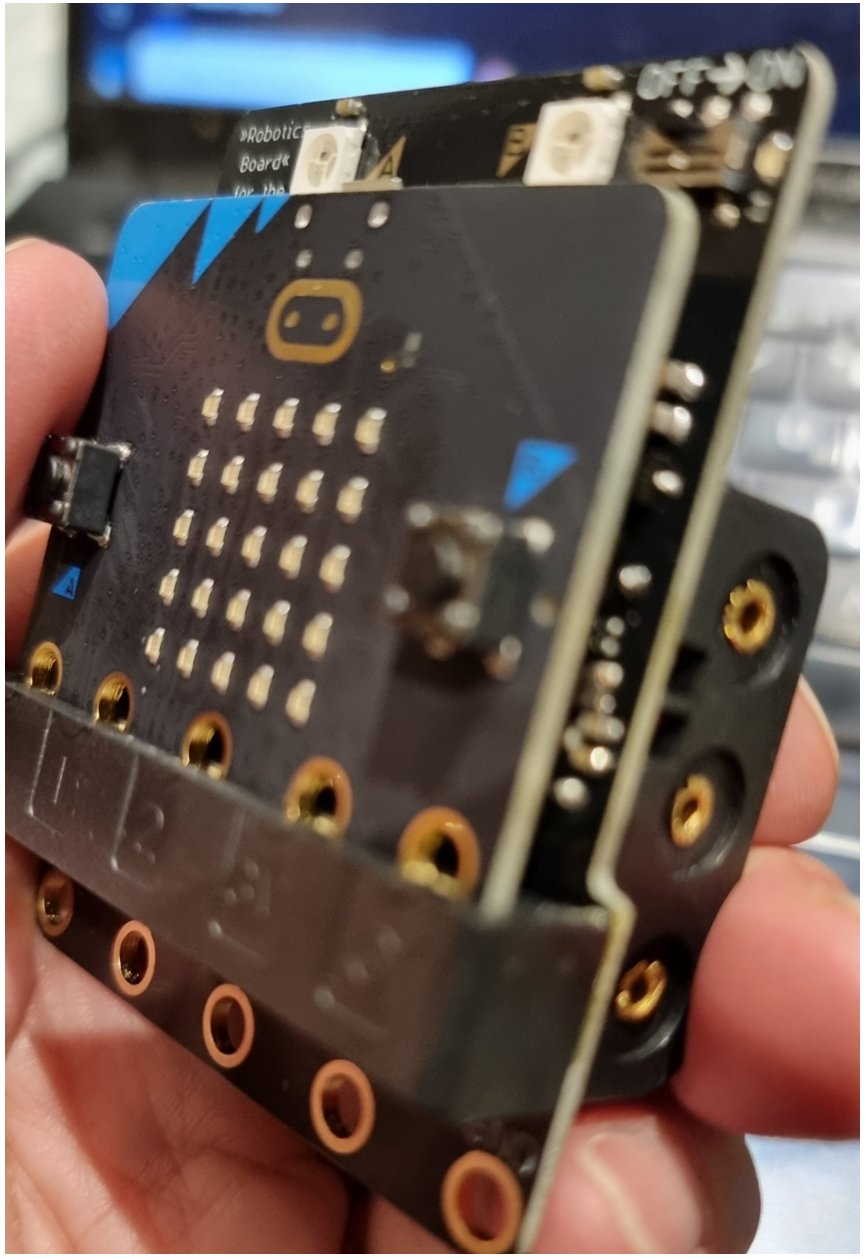
The best efforts will be uploaded before the end of the lesson to Marty live to see if the program actually works.

Programming targets from the Primary National Curriculum for schools in England since 2014

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Give instructions to my friend and follow their instructions to move around.	Give instructions to my friend using forward, backward and turn and physically follow instructions.	Break an open ended problem up into smaller parts.	Use logical thinking to solve an open ended problem by breaking it up into smaller parts.	Decompose a problem into smaller parts to design an algorithm for a specific outcome and use this to write a program.	Deconstruct a problem into smaller parts, recognising similarities to solutions used before.
Describe what happens when I press buttons on a robot.	Tell the order I need to do things to make something happen and talk about this as an algorithm.	Put programming commands into a sequence to achieve a specific outcome.	Use and efficient procedure to simplify a program.	Refine a procedure using repeat commands to improve a program.	Explain and program each of the steps in my algorithm.
Press buttons in the correct order to make a robot do what I want.	Program a robot or software to do a particular task.	Keep testing my program and recognise when I need to be debug it.	Know to keep testing a program while putting it together.	Use variables to increase programming possibilities.	Evaluate the effectiveness and efficiency of my algorithm while continually testing the programming of the algorithm.
Describe what actions I will need to do to make something happen and begin to use the word algorithm.	Look at my friend's program and say what will happen.	Use repeat commands.	Recognise that an algorithm will help sequence more complex programs.	Change an input to a program to achieve a different output.	Recognise when using a variable is needed to achieve a required output.
Begin to predict what will happen for a short sequence of instructions.	Use programming software to make objects move.	Describe the algorithm needed for a simple task.	Use a variety of tools to create a program.	Use 'if' and 'then' commands to select an action.	Use a variable and operators to stop a program.
Begin to use software or apps to create movement and patterns on a screen.	Watch a program execute and spot where it goes wrong so that I can debug it.	Detect a problem in an algorithm which could result in unsuccessful programming.	Recognise that algorithms will help in other learning such as Maths, Science as well as Design & Technology.	Use logical reasoning to detect and debug mistakes in a program.	Use different inputs (including sensors) to control a device or onscreen action and predict what will happen.
Use the word debug when I correct mistakes when I program.			Use a sensor to detect a change which can select an action within my program.	Use logical thinking, imagination and creativity to extend a program.	Use logical reasoning to detect and correct errors in algorithms and programs.
				Talk about how a computer model can provide information about a physical system.	

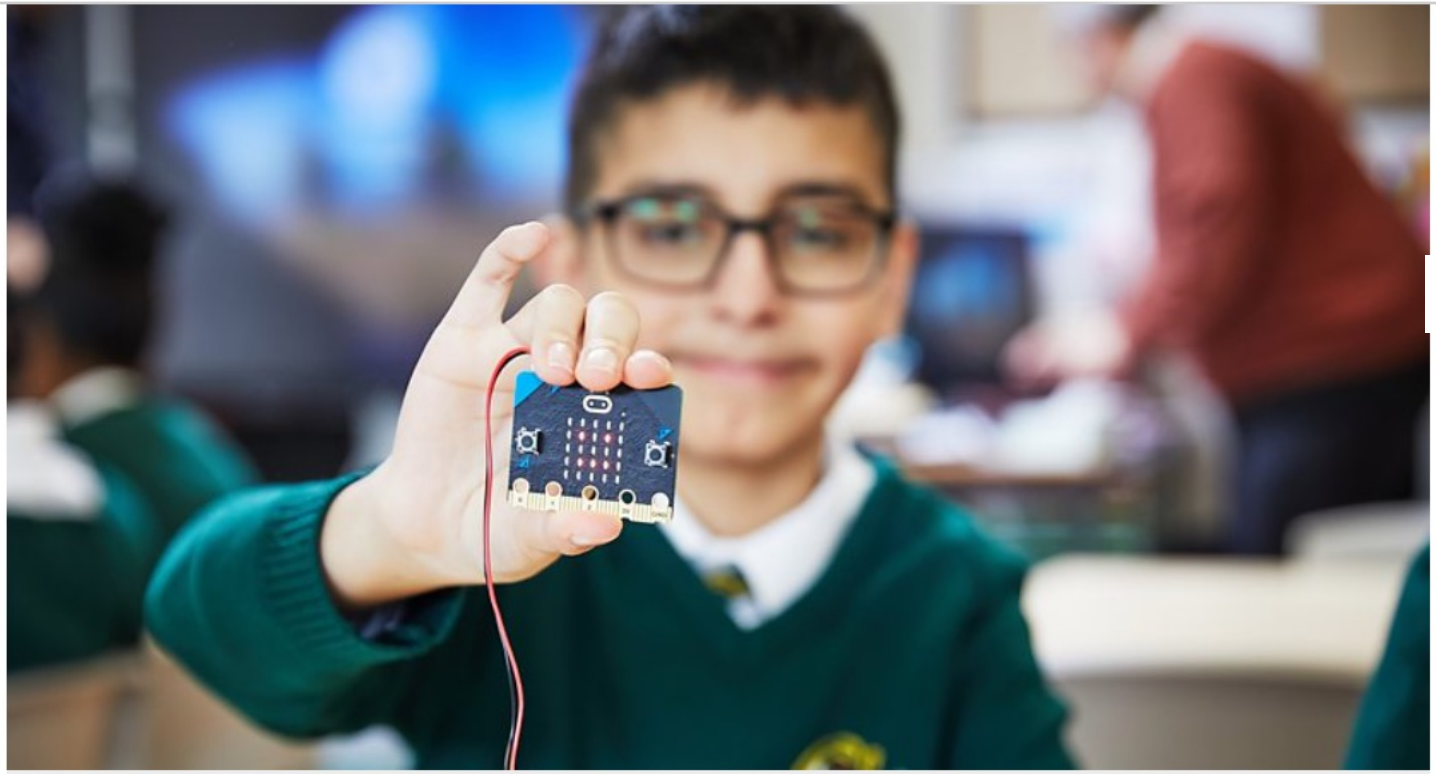
Strawbees Robotics Board for the Micro:bit





Robot being used by Police in Hawaii to help take temperatures of people to see if they might be ill from Covid-19. (January 2022)

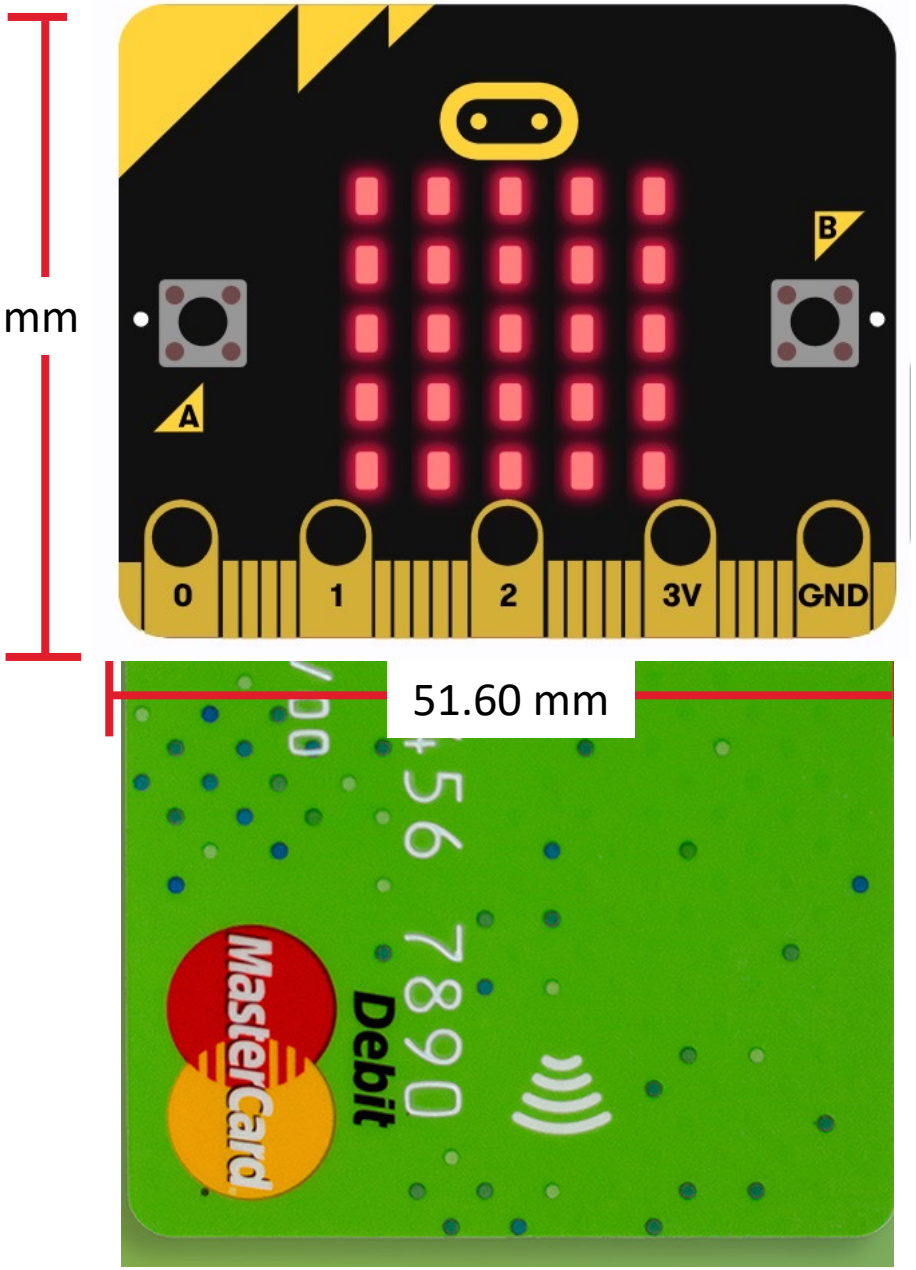
Brief history of the BBC Micro:bit



A primary school child holds a micro:bit displaying a smiley face

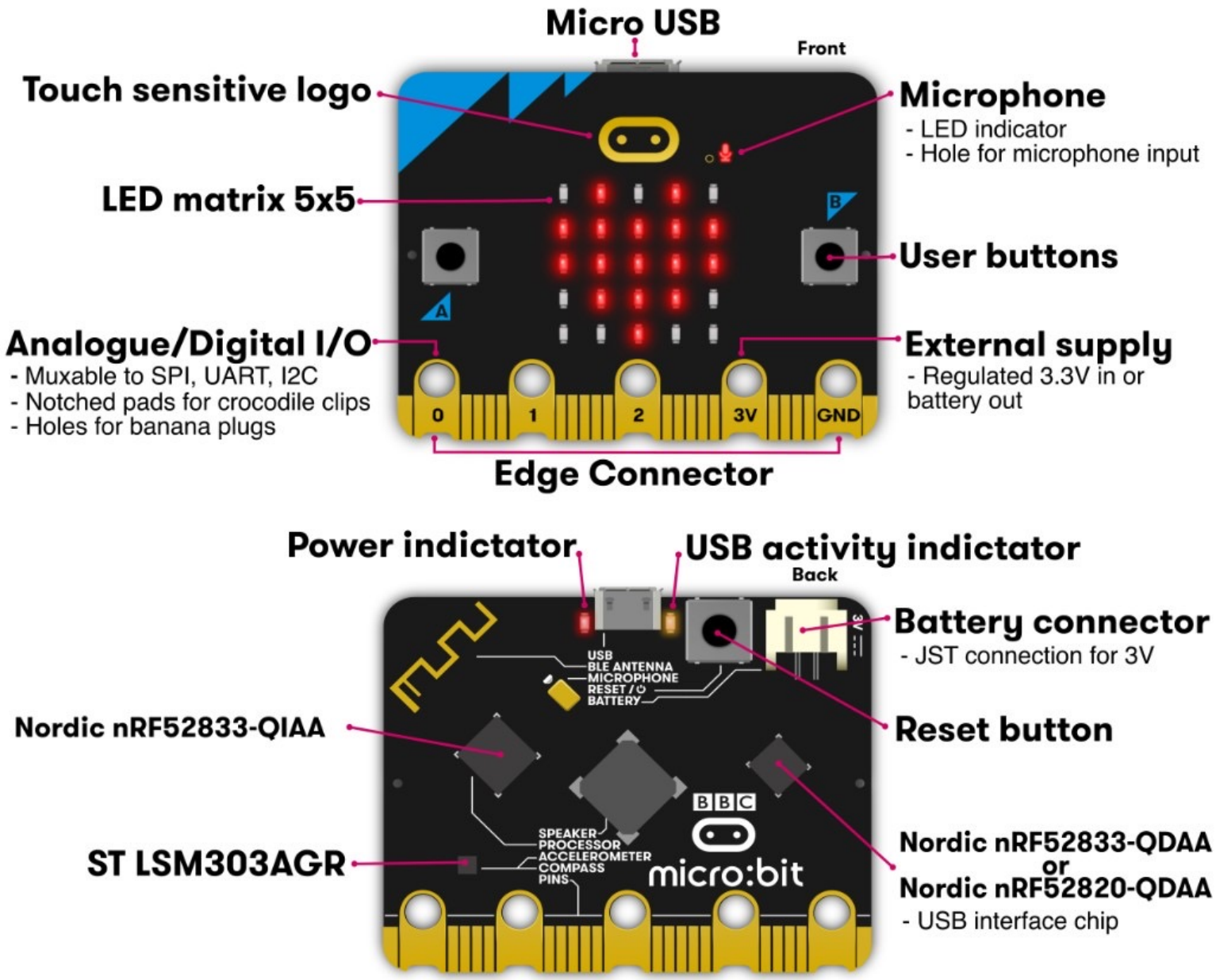
The history of the micro:bit

The first micro:bit was invented by the BBC and partners and launched in 2015, honouring the BBC's legacy of computing that stretches back to the original BBC Micro computer of the 1980s. Our original campaign aimed to put a BBC micro:bit in the hands of every Year 7 child in the country and we reached 98% of our target audience.

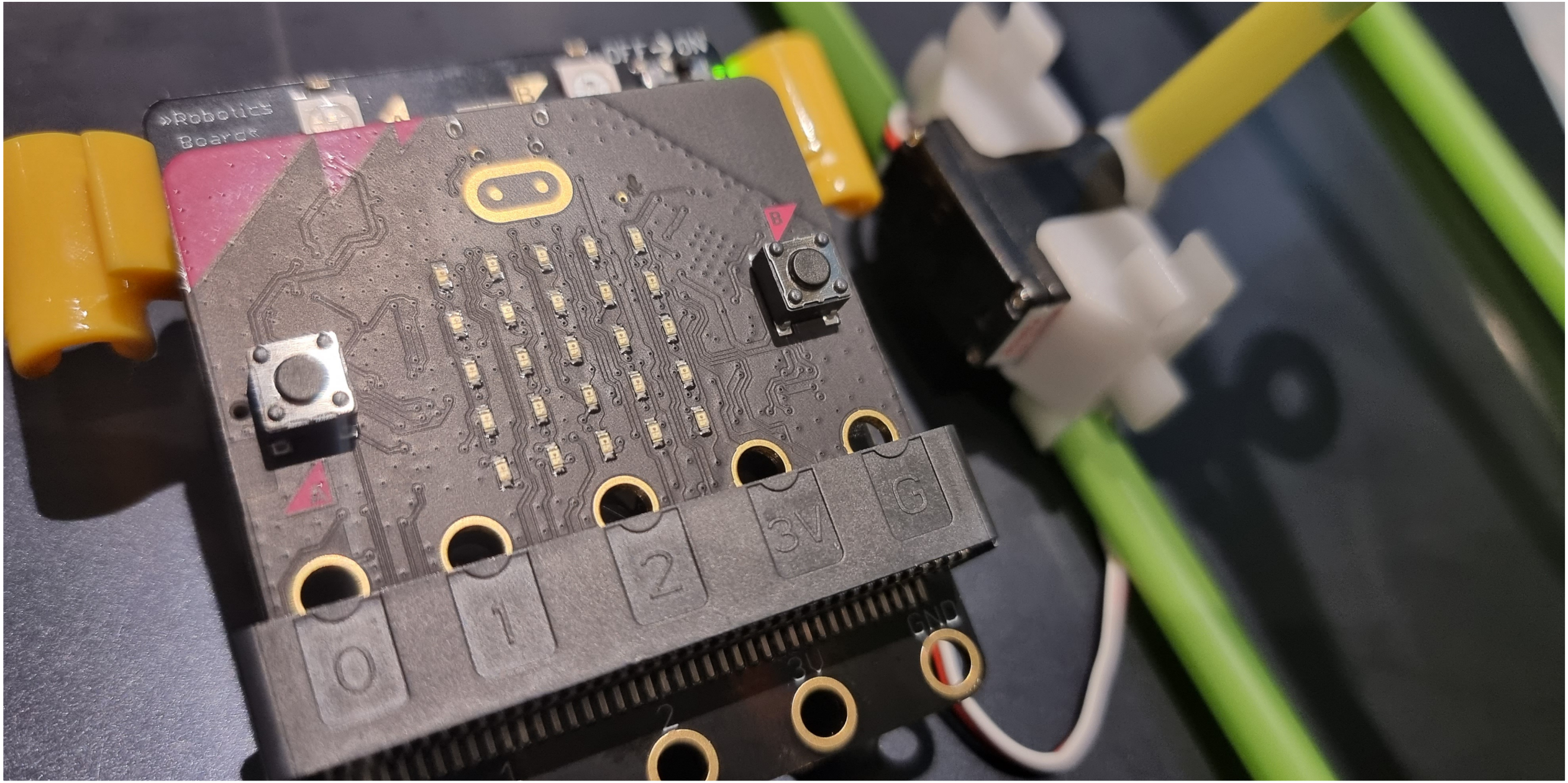


https://www.bbc.co.uk/teach/microbit/what-is-the-microbit/zfjg8p3 (last visited 3 December 2023)

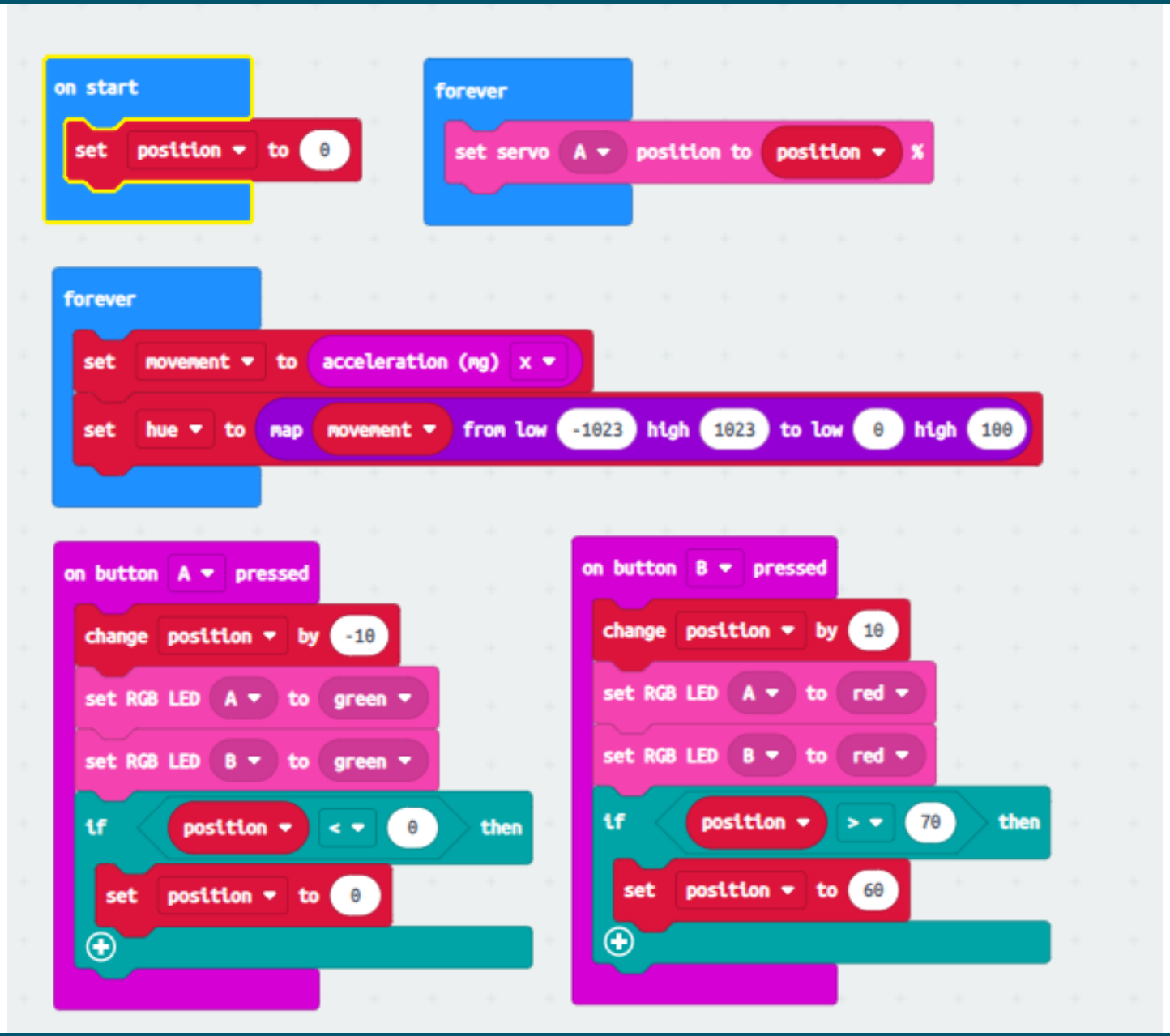
BBC Micro:bit technical details



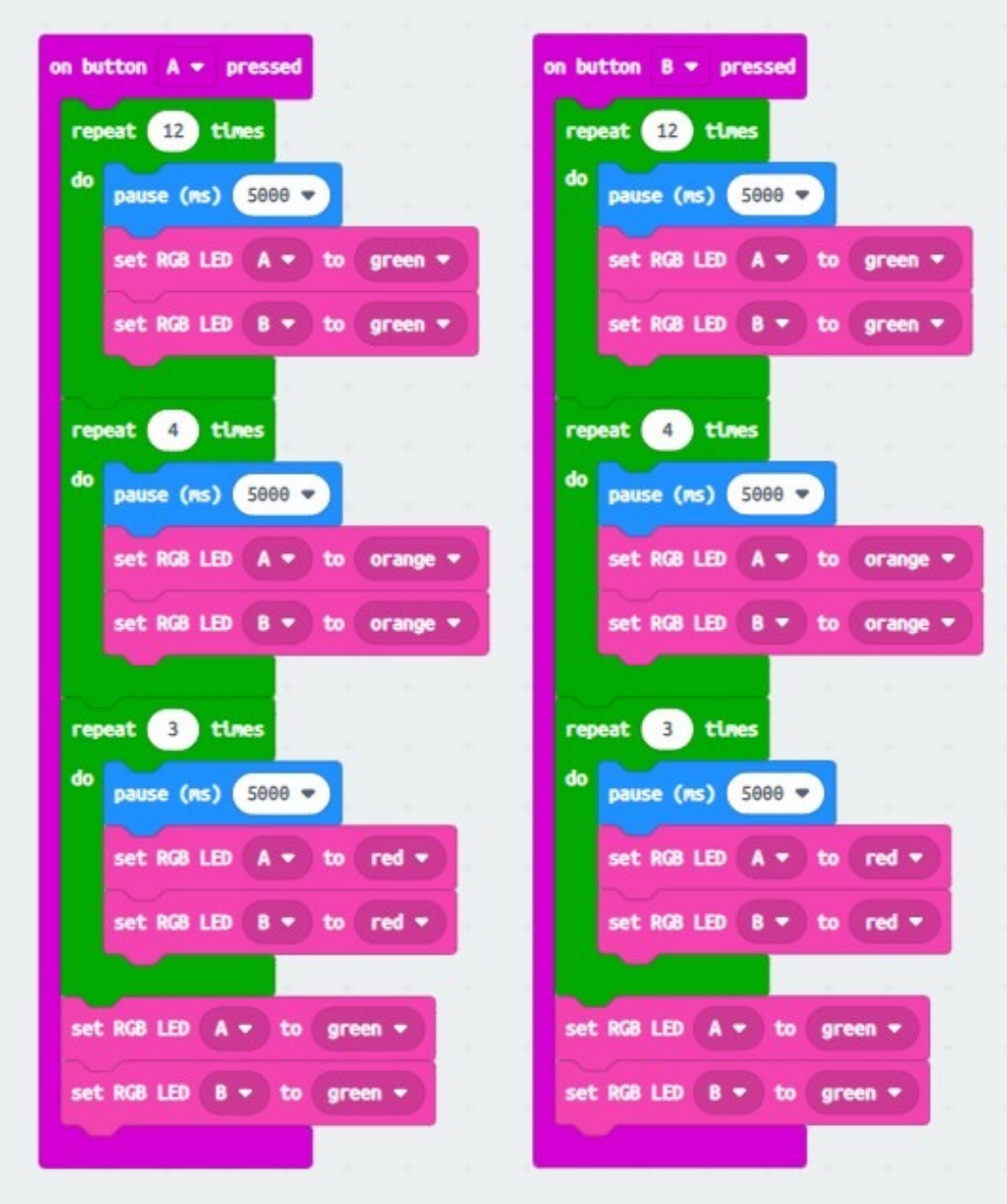
BBC Micro:bit and the Strawbees Robotics Board



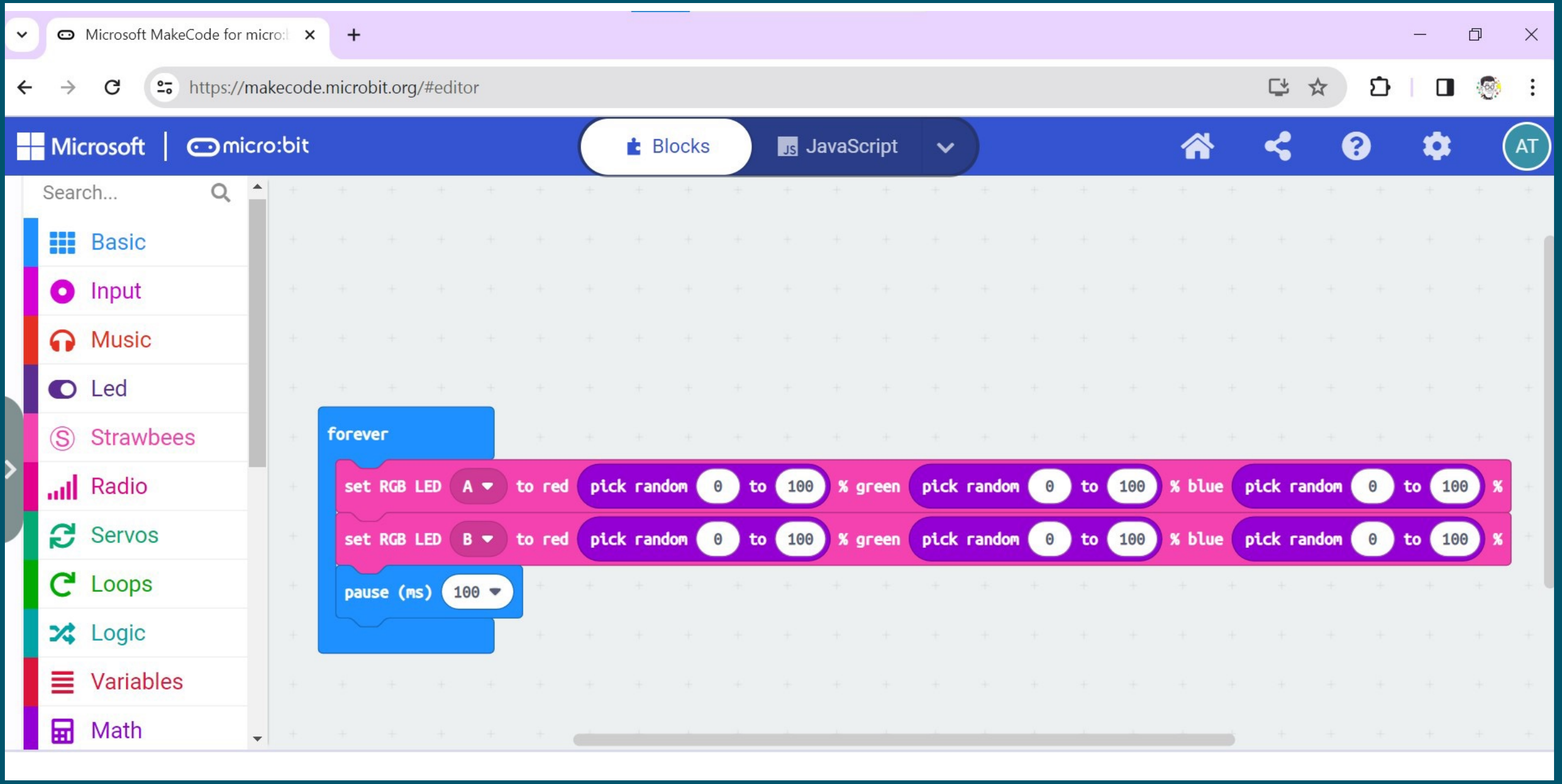
BBC Micro:bit and the Strawbees Robotics Board Crane controller



Strawbees Robotics Board Pedestrian lights controller



Strawbees Robotics Board Festive Disco Lights



Strawbees®

ROBOTICAL

HOUR OF CODE

micro:bit

BUILDING THE FUTURE

with Allen Tsui

6th December, 3.30pm GMT