Projects 1.00 Wheeled Robots

Tutor Notes

The Wheeled Robots projects offer a fun way for students to get into digital making. We often start with this series as a way to teach the fundamentals of digital making and coding through a series of engaging projects. On completion, students will have learnt a whole range of skills around the basics of microcontroller electronics, coding and physical design.

Learning Outcomes

Each project adds new microbit making and coding skills as follows:

| Project	New Making Skills	New Coding Skills
Project 1.01 - Build a Basic Robot	motor control differential drive	on start and forever sequencing blocks loops pause adding extensions
Project 1.02 - Add Lights to your Robot	leds digital outputs	writing to pins
Project 1.03 - Add Crash Sensors to your Robot	buttons digital inputs	reading from pins random music
Project 1.04 - Build a Line Following Robot	TODO	
Project 1.05 - Build an Obstacle Avoiding Robot		
Project 1.06 - Build a Remote Control Robot		radio if...else if...else boolean expressions
Project 1.07 - Add a Speed Control to your Remote	potentiometer analogue inputs	variables map

Learning Paths

Each project will take 1-2 hours depending on student experience and how many of the challenges they tackle. You can select which projects to do based on the time available. The diagram below shows the dependencies between projects so that you can choose an appropriate path. You must start with project 1.01, but you can stop at any point and the robot will have reached a state of completeness for the students.

```
                                        Start
                                          │
                                          ▼
                         Project 1.01 - Build a Basic Robot
                                          │
                    ┌─────────────────────┼─────────────────────┐
                    ▼                     │                     │
   Project 1.02 - Add Lights to your Robot│                     │
                    │                     │                     │
                    ▼                     │                     │
Project 1.03 - Add Crash Sensors to your Robot                  │
                    │                     │                     │
                    ▼                     ▼                     │
          Project 1.04 - Build a Line Following Robot           │
                    │                                           │
                    ▼                                           │
          Project 1.05 - Build an Obstacle Avoiding Robot       │
                    │                                           │
                    ▼                                           ▼
               Project 1.06 - Build a Remote Control Robot
                                          │
                                          ▼
               Project 1.07 - Add a Speed Control to your Remote
```
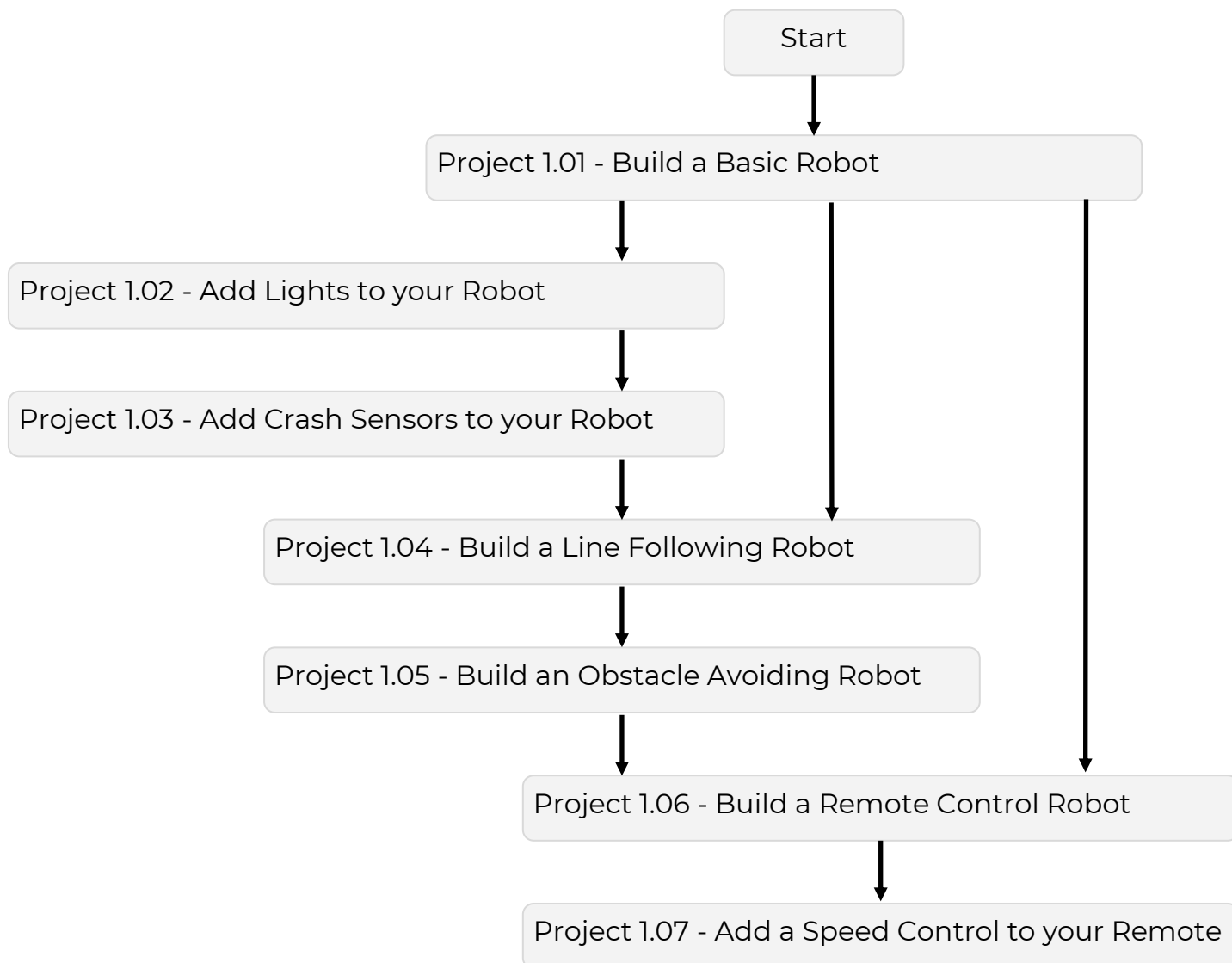
Coding the XXX

Subheading

https://makecode.microbit.org/
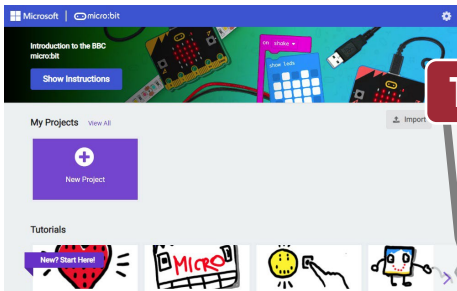
1 Go to the Makecode website
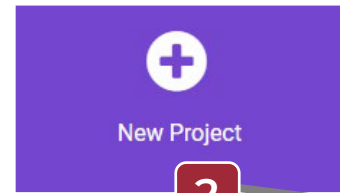
2 Click on New Project

New Project

Create a Project 🤩🤩🤩

Give your project a name.

robot-controller

> Code options

Create ✓

3 Give the project a name (whatever name you want!)

Your challenge!

Text

Solutions

Controller

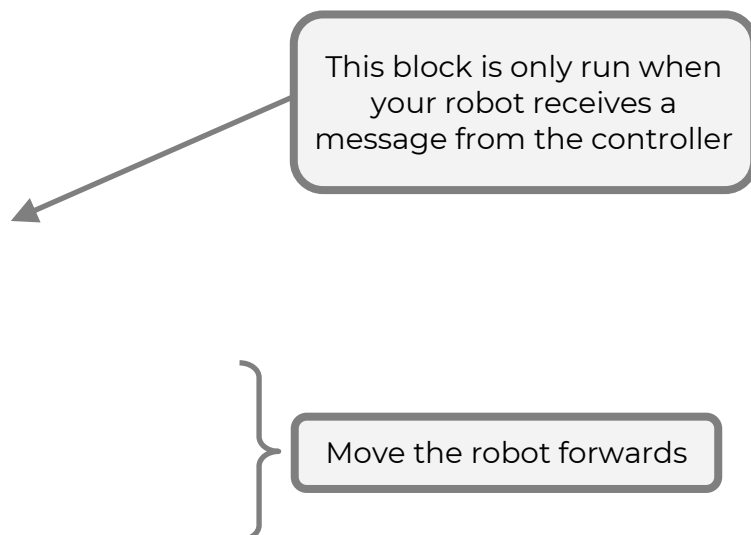Input

light level

compass heading (°)

temperature (°C)

sound level

on loud ▼ sound

on logo pressed ▼

Download •••

This block is only run when your robot receives a message from the controller

Move the robot forwards

Advanced

Advanced

Extensions

$f_{(x)}$ Functions

Extensions

github:lewfer/microbit-ext-remote-controller 🔍

Controller

Remote

Radio

Radio

Basic

Music

New Project

Logic

Text

Create a Project 😍😍

Give your project a name.

controller

❯ Code options

Create ✓

Remote

Robotics

Servos

Motors

Settings

Variables

Variables

Make a Variable...

on start

radio set group 11

Pins

New variable name:

Ok ✓