PDST

Professional Development Service for Teachers | An tSeirbhís um Fhorbairt Ghairmiúil do Mhúinteoirí

An Roinn Oideachais agus Scileanna
Department of Education and Skills

Advanced Micro:bit Workshop

LEAVING CERTIFICATE
COMPUTER SCIENCE

PDST
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Session 1 Part A
Radio Communication
&
Serial Data Transfer.

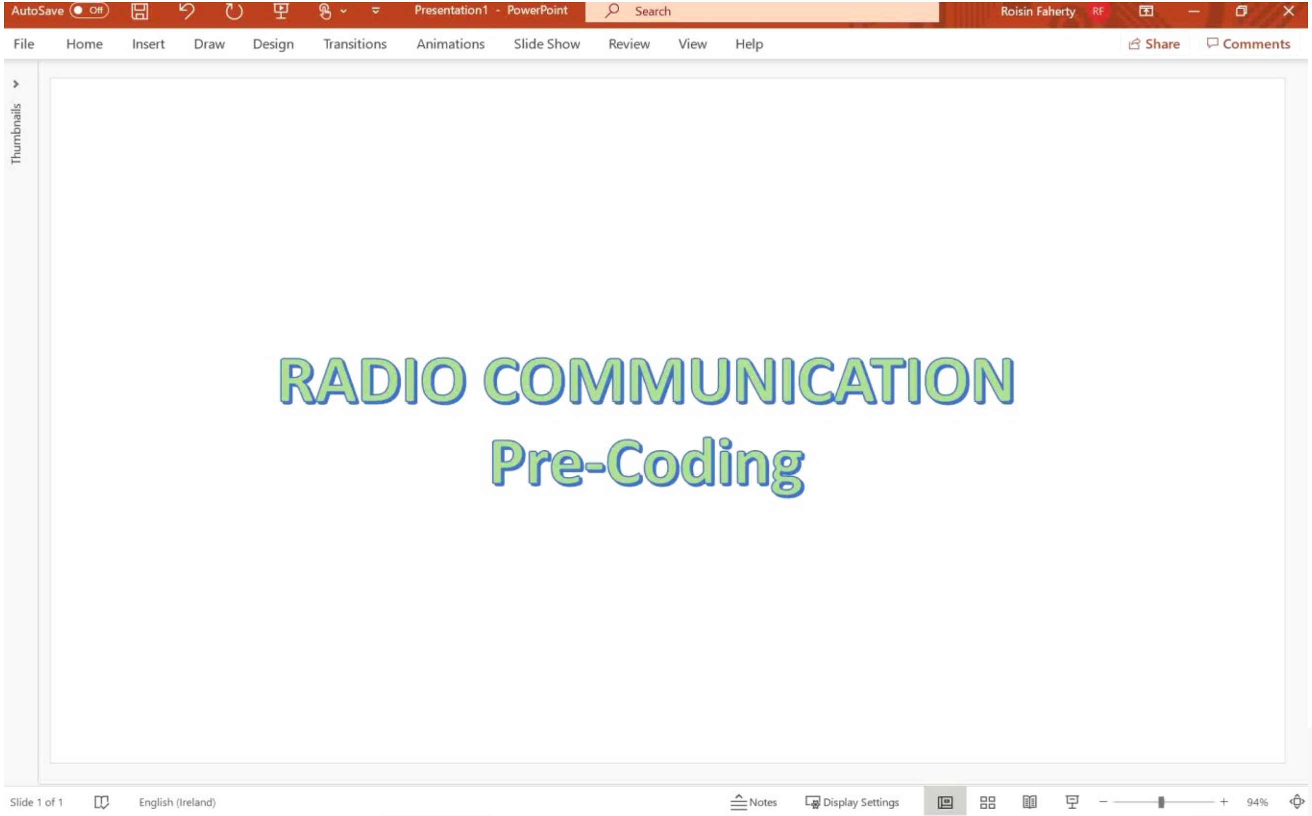
Radio Communication & Serial Data Transfer

Aims of this section:

- To discuss how the radio communication on the micro:bit works.
- To illustrate the code for this using temperature data.
- Show how the received data can be graphed and downloaded as a CSV file.
- To use these ideas to complete a task on radio communication involving the viewing of received data and downloading this data to a CSV file.

Radio Communication

Pre- Coding (Design)



RADIO COMMUNICATION

Pre-Coding

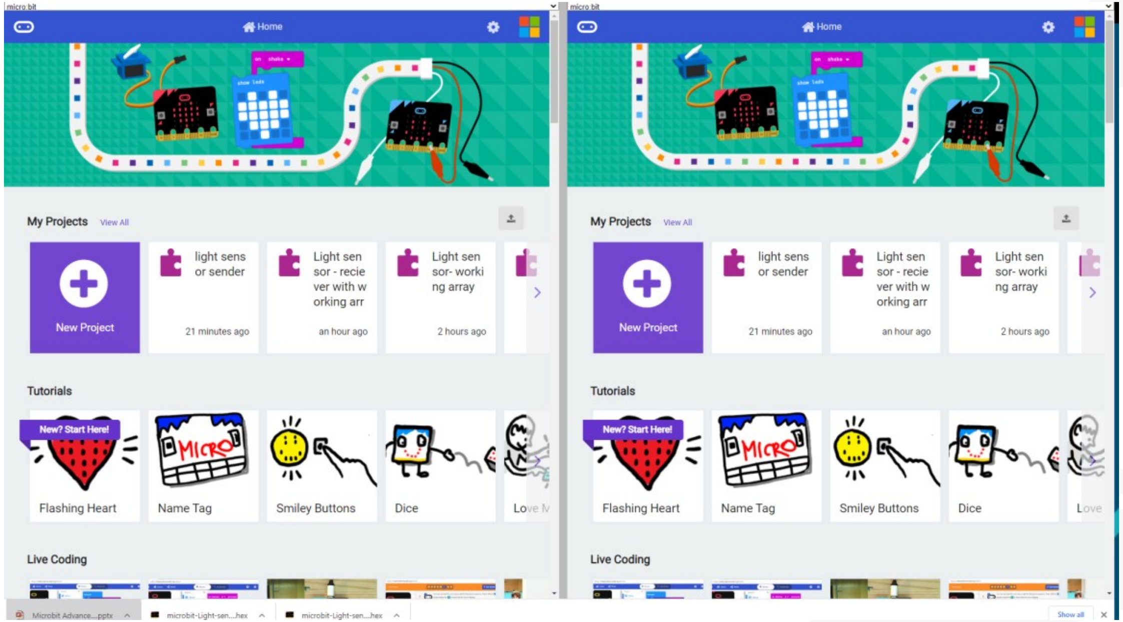
Radio Communication

Next Step is to code this on the micro:bit.

Click the link below:

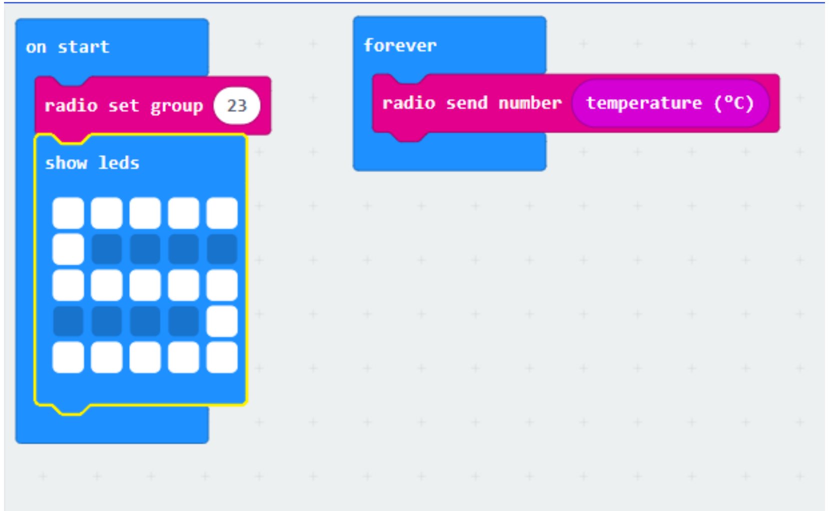
Make Code Multi Editor
OR
https://makecode.com/multi#

We will work through an example.



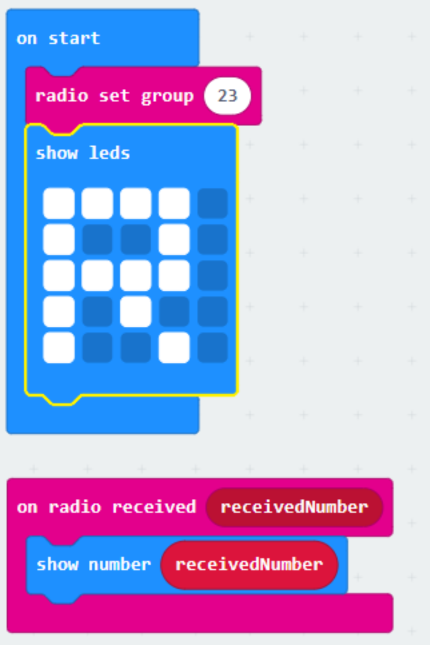
Radio Communication

SENDER CODE:



```
on start
    radio set group 23
    show leds
forever
    radio send number temperature (°C)
```

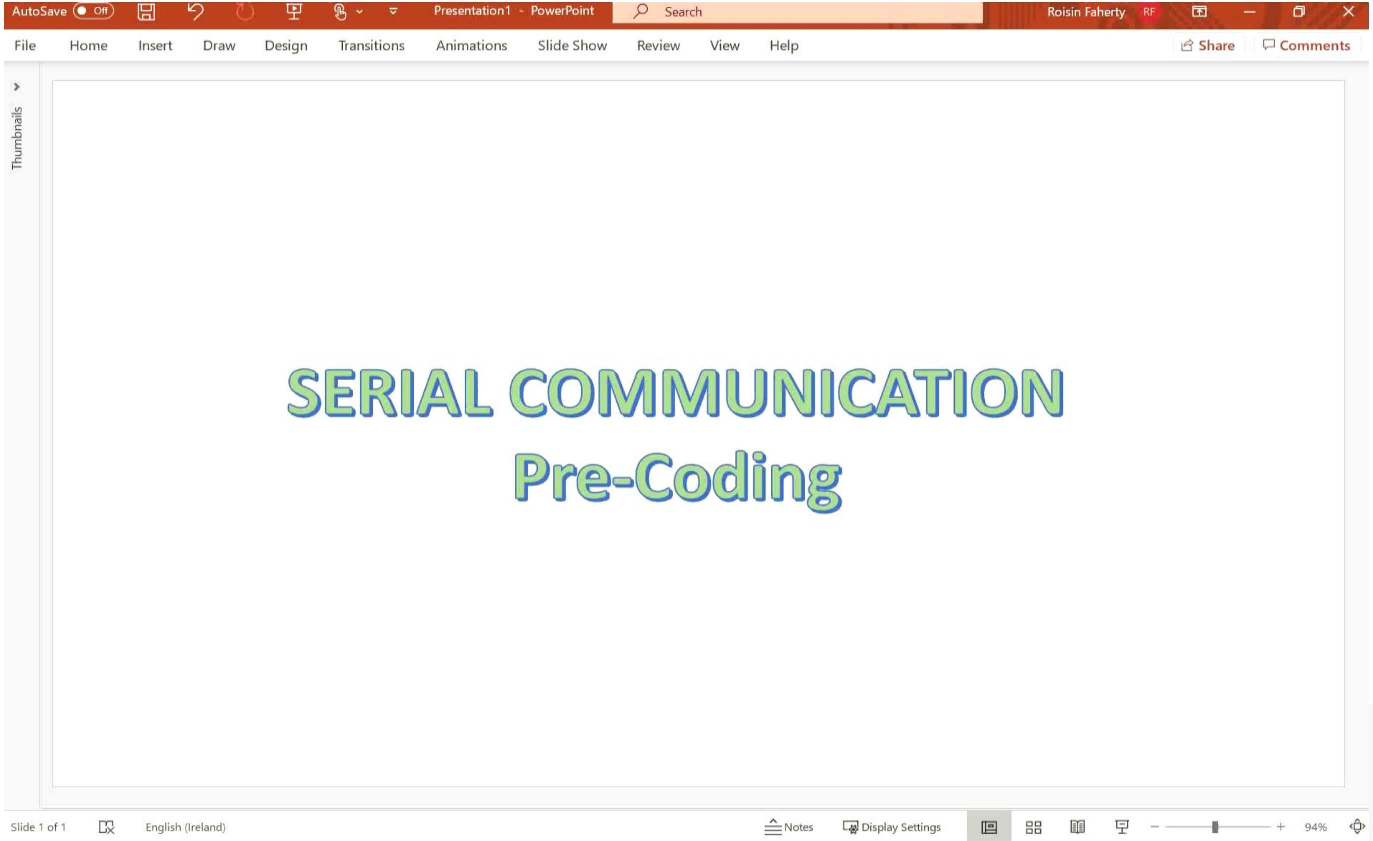
RECIEVER CODE:



```
on start
    radio set group 23
    show leds
on radio received receivedNumber
    show number receivedNumber
```

Serial Communication

Pre-Coding (Design)



SERIAL COMMUNICATION

Pre-Coding

Serial Communication

Next Step is to code this on the micro:bit.

Go To:

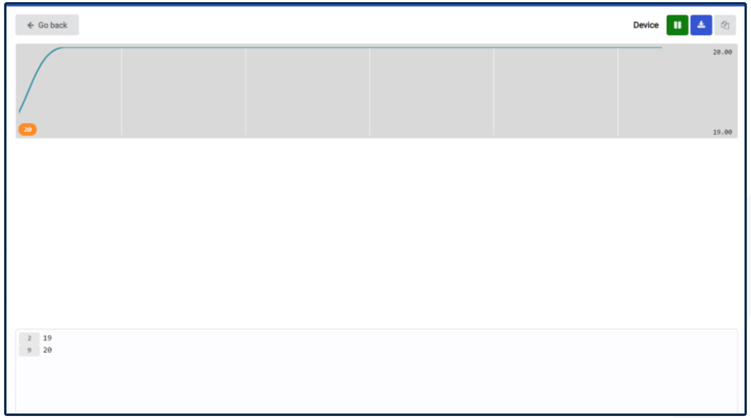
https://makecode.com/

Or

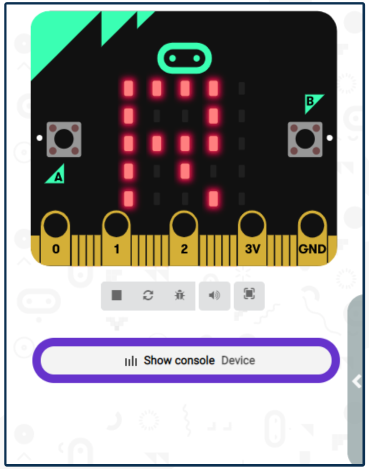
Download the offline micro:bit from the Microsoft site (more stable) at

https://makecode.microbit.org/offline-app

We will work through an example.



```
2  19
9  20
```



Group Task

TASKS

For this and all tasks today you will need:

Person to share screen for the coding and complete the code for the group.

A person to record the group Task Reflection.

A person who, on return to the main room, is going to report how the group got on.

Learning Activity Instructions

<u>Based on the samples covered your task is to:</u>

Part 1:

- Send light level via radio signal from one microbit to another.
- If the light level received is below 128 then get the receiver micro:bit to display that it is dark otherwise display it is bright. Consider the design of your display.
- Test to ensure this works on the virtual micro:bits.

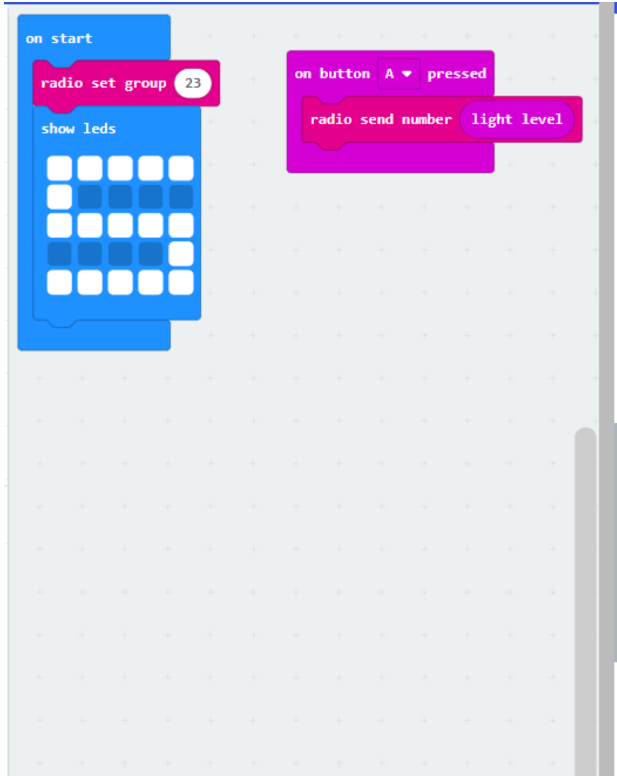
Part 2:

- Open the receiver code in the normal micro:bit environment or in the offline version.
- Now update the code so that the received data is sent across the serial port.
- Don’t forget to plug in and pair your device, then download the code!
- View the live data on the simulator and download the .csv file of data.
- Complete the group task Reflection Document.

TASK Solution Code

Part 1.

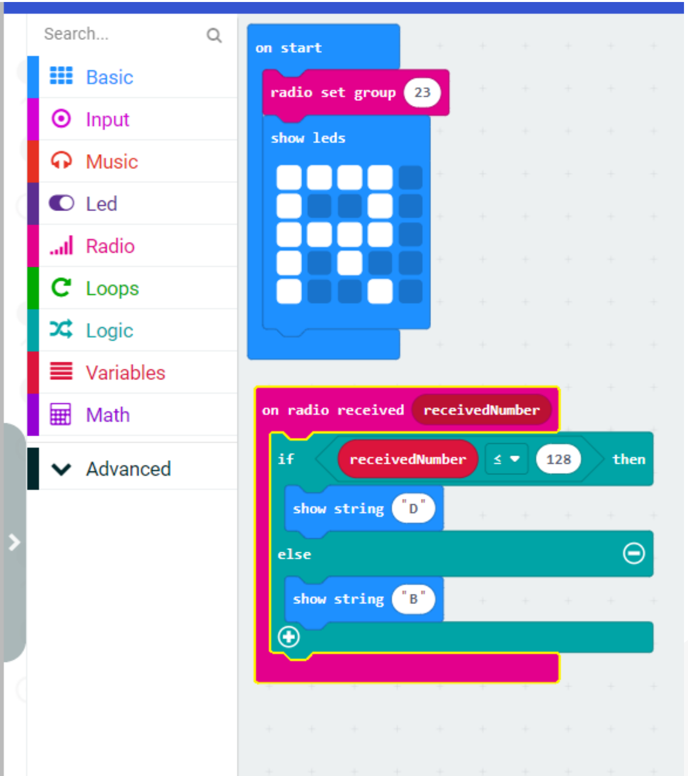
SENDER



```
on start
    radio set group 23
    show leds
        # # # # #
        # . . . .
        # # # # #
        . . . . #
        # # # # #

on button A pressed
    radio send number light level
```

RECIEVER

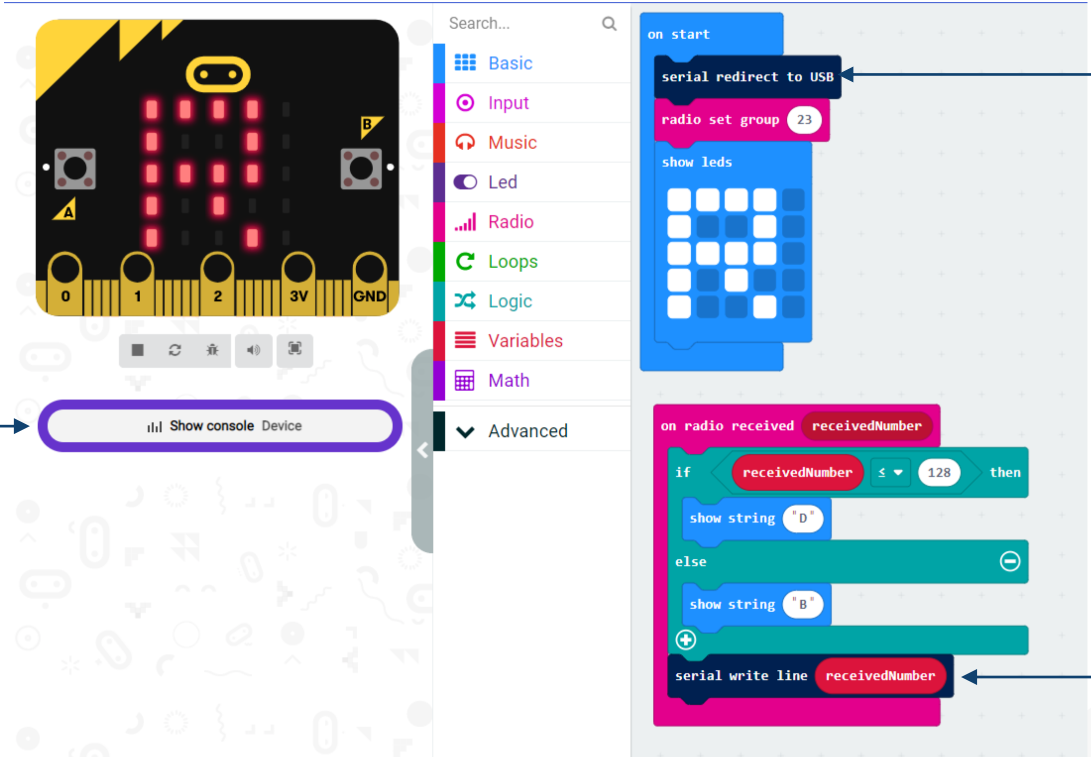


```
on start
    radio set group 23
    show leds
        # # # # .
        # . . # .
        # # # # .
        # . # . .
        # . . # .

on radio received receivedNumber
    if receivedNumber ≤ 128 then
        show string "D"
    else
        show string "B"
```

TASK Solution Code

Part 2.



```
on start
    serial redirect to USB
    radio set group 23
    show leds
        # # # # .
        # . . # .
        # # # # .
        # . # . .
        # . . # .

on radio received receivedNumber
    if receivedNumber ≤ 128 then
        show string "D"
    else
        show string "B"
    serial write line receivedNumber
```

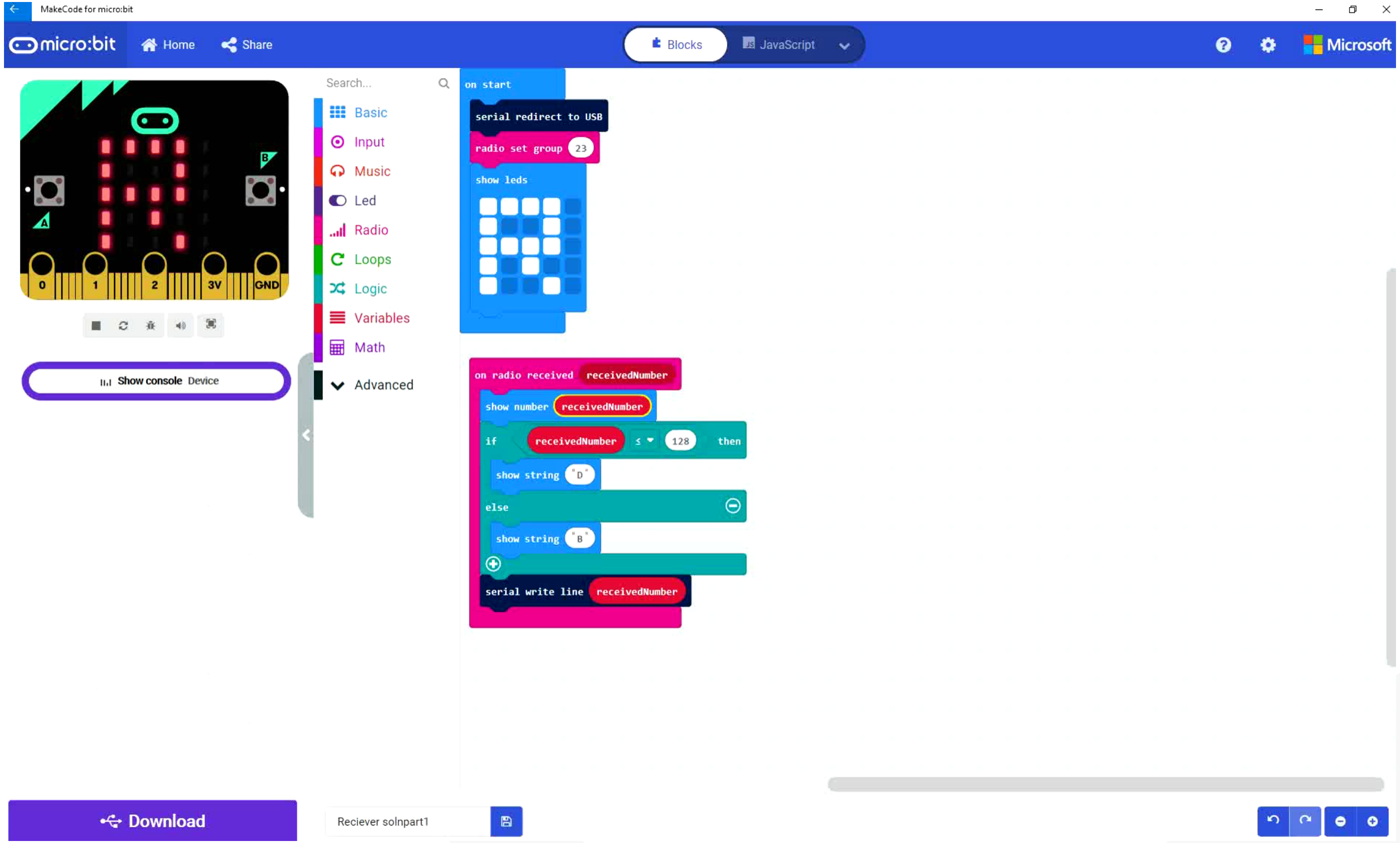
Added code to allow transmission via USB.

This takes a few minutes to display but then allows us to track the live data.

Added code to allow send the data.

TASK Solution Code

Visual of data tracking.



```
on start
    serial redirect to USB
    radio set group 23
    show leds
        # # # # .
        # . . # .
        # # # # .
        # . # . .
        # . . # .

on radio received receivedNumber
    show number receivedNumber
    if receivedNumber ≤ 128 then
        show string "D"
    else
        show string "B"
    serial write line receivedNumber
```

Reciever solnpart1

Reflection

Stretch break