



Micro:bats

Micro:bits and Sonar

We'll be using three different components for this project:

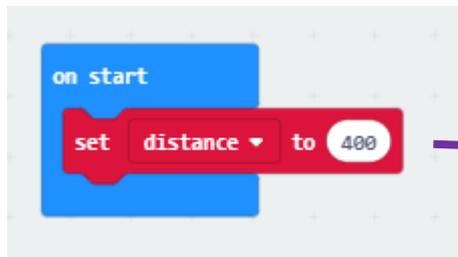
- **Micro:bit**
- **Sensor:bit**
- **Sonar:bit**

...to make these bat goggles



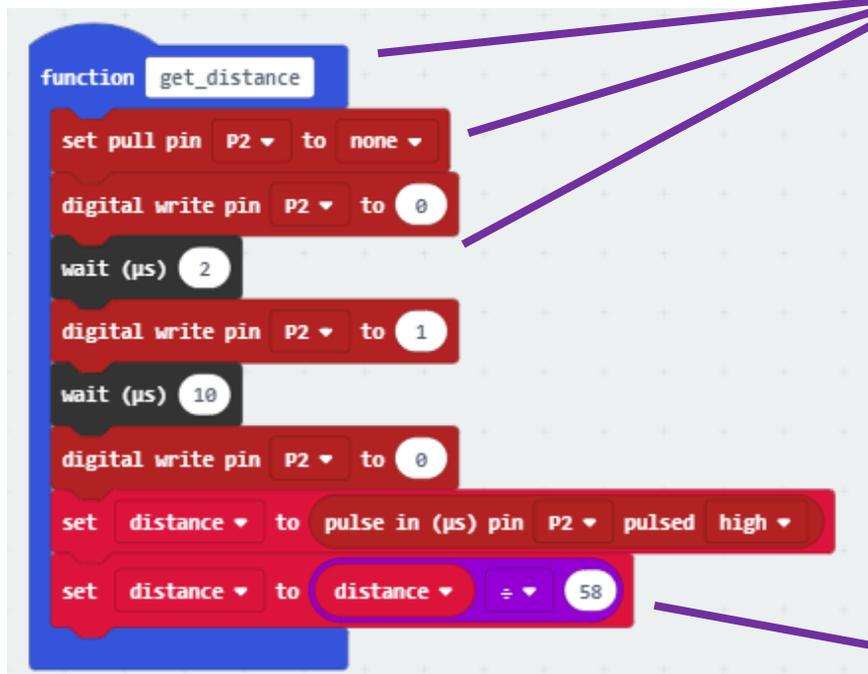
Coding Steps:

1. To set the initial distance reading on the micro:bit:



Tip: You'll need to make a new variable called 'distance'

2. To code the micro:bit to power up the sonar:bit, and then to take distance measurements using the sonar:



Function, Pins and Control blocks are found in 'Advanced' settings

This sum converts the distance measurements into centimetres

3. To code the micro:bit to play different sounds through its speaker (sensor:bit) depending on the distance measurements from the sonar:

```
forever
  call function get_distance
  if distance < 20 then
    play tone Middle G for 1/2 beat
    rest(ms) 1/2 beat
  else if distance < 50 then
    play tone Middle E for 1 beat
    rest(ms) 1 beat
  else if distance < 80 then
    play tone Middle C for 1 beat
    rest(ms) 4 beat
  else
    rest(ms) 1 beat
  pause (ms) 100
```

Challenges:

1. Can you make the micro:bit play different notes for the different distance measurements?
2. Can you add more distance measurements? (See code on next page for solution)

Micro:bits are available to borrow for free from Leeds Libraries!

Project contact: mark.kirkby@leeds.gov.uk

Full code with additional distance measurements:

```
on start
  set distance to 400

function get_distance
  set pull pin P2 to none
  digital write pin P2 to 0
  wait (µs) 2
  digital write pin P2 to 1
  wait (µs) 10
  digital write pin P2 to 0
  set distance to pulse in (µs) pin P2 pulsed high
  set distance to distance ÷ 58
```

```
forever
  call get_distance
  if distance < 5 then
    play tone High G for 1/16 beat
    rest(ms) 1/16 beat
  else if distance < 15 then
    play tone High E for 1/8 beat
    rest(ms) 1/8 beat
  else if distance < 30 then
    play tone High C for 1/8 beat
    rest(ms) 1/4 beat
  else if distance < 60 then
    play tone Middle G for 1/4 beat
    rest(ms) 1/2 beat
  else if distance < 100 then
    play tone Middle E for 1/4 beat
    rest(ms) 1/2 beat
  else
    play tone Middle C for 1/2 beat
    rest(ms) 1 beat
  pause (ms) 100
```