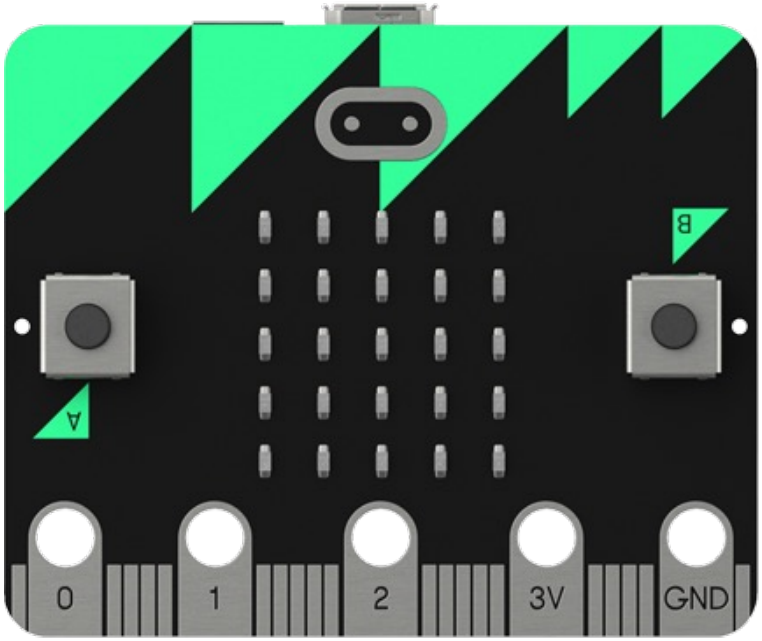
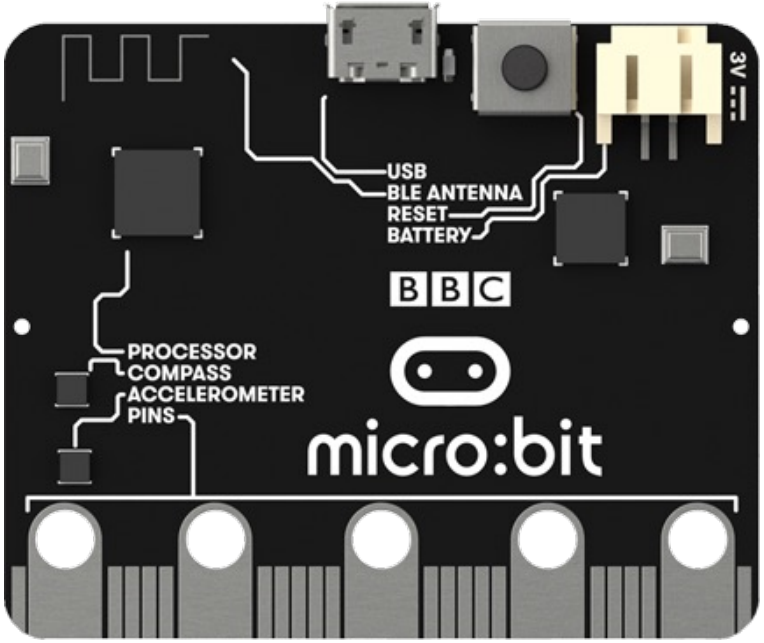
BBC Micro:bit





BBC micro:bit

Lesson 3

Iteration and Selection

Iteration

We use iteration to prevent typing the same code out many times and to make our code more efficient.

This example program uses a while loop to repeat the “Computer” “Science” “Rocks” message forever.

The code that you want to repeat has to be indented after the `while True:` statement.

```
from microbit import *

while True:
    display.scroll("Computer")
    display.scroll("Science")
    display.scroll("Rocks")
    sleep(1000)
```

Try the code out for yourself.

Activity 3.1

Create a program that displays your name and repeats it at 2 second intervals. Use the example code to help you.

Place a screenshot of your code here.

```
from microbit import *

while True:
    display.scroll("Computer")
    display.scroll("Science")
    display.scroll("Rocks")
    sleep(1000)
```

Selection

With selection the path through a program can be changed depending of the result of a condition.

The conditions are written using if statements.

This example program uses an if statement to check if either of the buttons on the micro:bit have been pressed. If button a is pressed a tick is displayed, if button b is pressed a cross is displayed.

```
from microbit import *

while True:
    if button_a.is_pressed():
        display.show(Image.YES)
    elif button_b.is_pressed():
        display.show(Image.NO)
```

Try the code out for yourself.

Built In Images

Here is a list of the built in images in Micro Python:

```
Image.HEART
Image.HEART_SMALL
Image.HAPPY
Image.SMILE
Image.SAD
Image.CONFUSED
Image.ANGRY
Image.ASLEEP
Image.SURPRISED
Image.SILLY
Image.FABULOUS
Image.MEH
Image.YES
Image.NO
Image.TRIANGLE
```

```
Image.TRIANGLE_LEFT
Image.CHESSBOARD
Image.DIAMOND
Image.DIAMOND_SMALL
Image.SQUARE
Image.SQUARE_SMALL
Image.RABBIT
Image.COW
Image.MUSIC_CROTCHET
Image.MUSIC_QUAVER
Image.MUSIC_QUAVERS
Image.PITCHFORK
Image.XMAS
Image.PACMAN
```

```
Image.TARGET
Image.TSHIRT
Image.ROLLERSKATE
Image.DUCK
Image.HOUSE
Image.TORTOISE
Image.BUTTERFLY
Image.STICKFIGURE
Image.GHOST
Image.SWORD
Image.GIRAFFE
Image.SKULL
Image.UMBRELLA
Image.SNAKE
```

`Image.CLOCK12` (clock at 12 o' clock, others from 1–11)
`Image.ARROW_N` (arrow pointing north, others replace N with NE, E, SE, S, SW, W, NW)

Activity 3.2

Change the example program to display different images when each of the buttons are pressed. Use the example code to help you.

Place a screenshot of your code here.

```
from microbit import *

while True:
    if button_a.is_pressed():
        display.show(Image.YES)
    elif button_b.is_pressed():
        display.show(Image.NO)
```

Activity 3.3

Create a program that will play two different animations, one when button a is pressed and one when button b is pressed.

```
from microbit import *

faces = [Image.HAPPY,Image.SAD,Image.ANGRY]

while True:
    if button_a.is_pressed():
        display.show(faces, loop=True, delay=100)
```

Use this code as a starting point.

Place a screenshot of your code here.

Random

The random module in Python can be used to generate random numbers or select random items from a list.

This example program displays a random name from the list when the micro:bit is shaken.

```
from microbit import *
import random

names = ["Alex","Lois","James","Eloise","Bryn","Sally"]

while True:
    if button_a.is_pressed():
        display.scroll(random.choice(names))
```

Try it out for yourself (you can change the names).

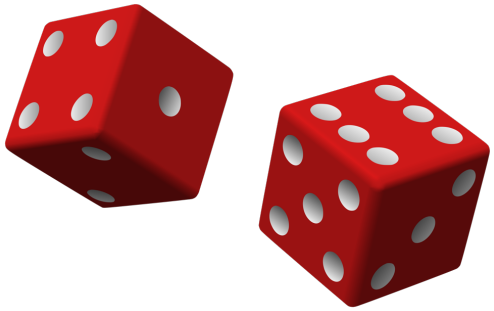
Activity 3.4

Using the example program as a starting point create a program that turns the micro:bit into an electronic dice (when shaken it should output a number between 1 and 6).

```
from microbit import *
import random

names = ["Alex","Lois","James","Eloise","Bryn","Sally"]

while True:
    if button_a.is_pressed():
        display.scroll(random.choice(names))
```



Place a screenshot of your code here.