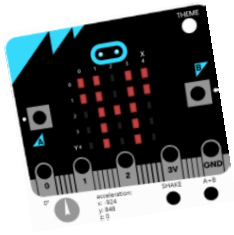
KS3 Computer Science

Micro: Bit

Programming Booklet

Pupil

Teacher



Contents

NOTE: Improved response space is for formative feedback given during lessons. Formal feedback will be given in assessment at the end of the unit, therefore, this space will only be used as and when necessary.

Self-Audit

	Highlight your starting point in Green. *You will update this matrix as you progress through the unit of work, highlighting newly achieved levels of understanding/application in Yellow.*			
Topic	**Not Familiar**	**Challenge 1**	**Challenge 2**	**Challenge 3**
Inputs	I am not familiar with these	I can identify which blocks these are in a program.	I can explain what these are and give an example of how they are used in a program (expected)	I can decide when these are needed and build a program that uses them, without any help.
Outputs	I am not familiar with these	I can identify which blocks these are in a program.	I can explain what these are and give an example of how they are used in a program (expected)	I can decide when these are needed and build a program that uses them, without any help.
Variables	I am not familiar with these	I can identify which blocks these are in a program.	I can explain what these are and give an example of how they are used in a program (expected)	I can decide when these are needed and build a program that uses them, without any help.
Constants	I am not familiar with these	I can identify which blocks these are in a program.	I can explain what these are and give an example of how they are used in a program (expected)	I can decide when these are needed and build a program that uses them, without any help.
Selection	I am not familiar with this	I can identify which blocks these are in a program.	I can explain what this is and give an example of how it is used in a program	I can decide when this is needed and build a program that uses it, without any help. (expected)
Two-Way Selection	I am not familiar with this	I can identify which blocks these are in a program.	I can explain what this is and give an example of how it is used in a program (expected)	I can decide when this is needed and build a program that uses it, without any help.
Sequence	I am not familiar with this	I have used this to create a program using a tutorial or demonstration	I can explain what this is and give an example of how it is used in a program	I can independently put code in the correct order so that a program works properly. (expected)
Iteration	I am not familiar with this	I can identify which blocks these are in a program.	I can explain what this is and give an example of how it is used in a program (expected)	I can decide when this is needed and build a program that uses it, without any help.
What is your average starting point?			**What is your END point?** *(Complete after final assessment)*	

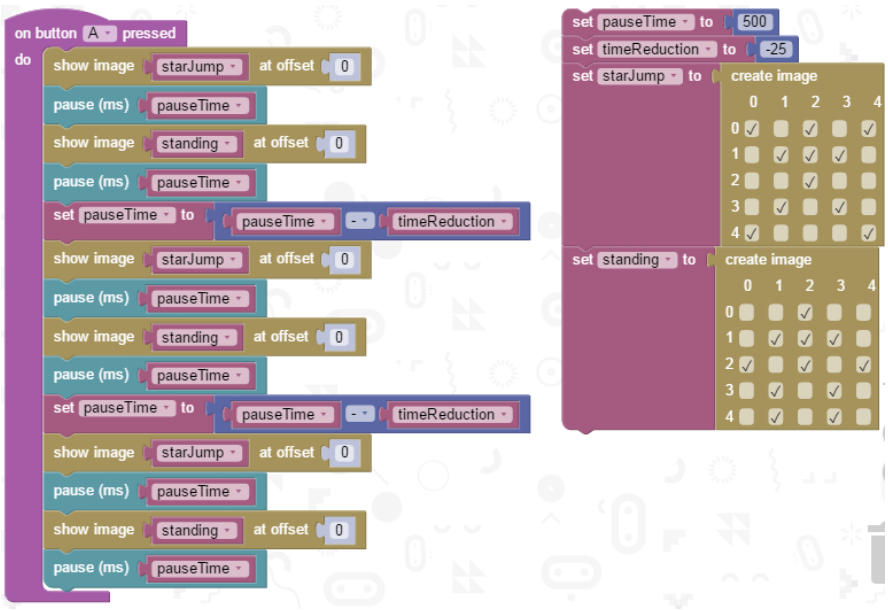
Inputs / Outputs / Variables / Constants

Post your starting point and progress to: **padlet.com/Mr_hughes/9_variables_8…**

Finish the address by adding your class letter

Challenge 1 (Level …)

From the program given, state where each of the programming structures given below, have been used.

Input:	
Output:	
Variable:	
Constant:	

Challenge 2 (Level …)

Explain how each of the programming structures given below, might be used in a program.

Input:	
Output:	
Variable:	
Constant:	

Challenge 3 (Level …)

Go to: www.microbit.co.uk

Create a new block editor program that stores the value of 100. The program should also store the value of 20.
The program should display the result of the first value minus the second value.
The program should then display the result of, the previous *result* minus the second value.
This should continue until at 0.

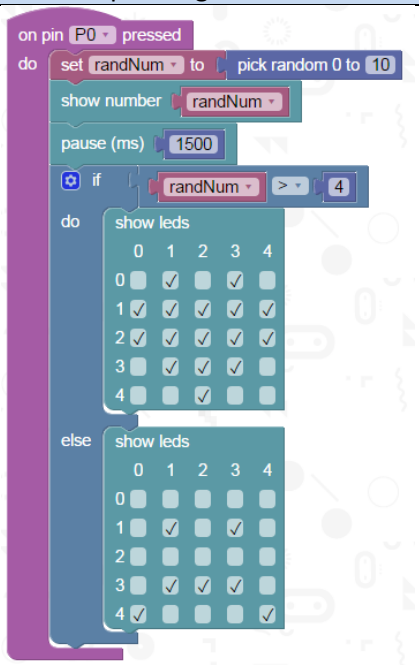
Inputs / Outputs / Variables / Constants – Improved Response Space

Selection

Post your starting point and progress to: **padlet.com/Mr_hughes/9_selection_8…**

Challenge 1

In the box below, draw a line pointing to the block which is using 'selection'



Challenge 2

Why is selection used in a program?	

Challenge 3

Go to: www.microbit.co.uk
Create a new block editor program independently.

Your program needs to allow the user to shake the MicroBit to display a random number, this number can be between 0 and 100.

The program needs to check if the random number matches a number of your choice.

If the random number is a match the MicroBit should Output a message/image to the user; if the numbers do not match the MicroBit should Output a different message/image to the user and allow them to try again.~~minus the second value.~~

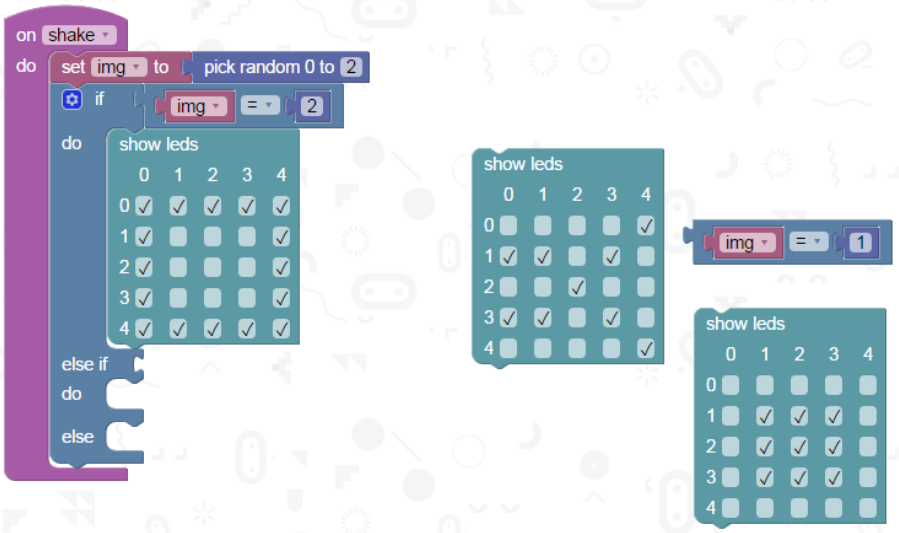
~~This should continue until at 0.~~

Selection – Improved Response Space

Two-Way Selection

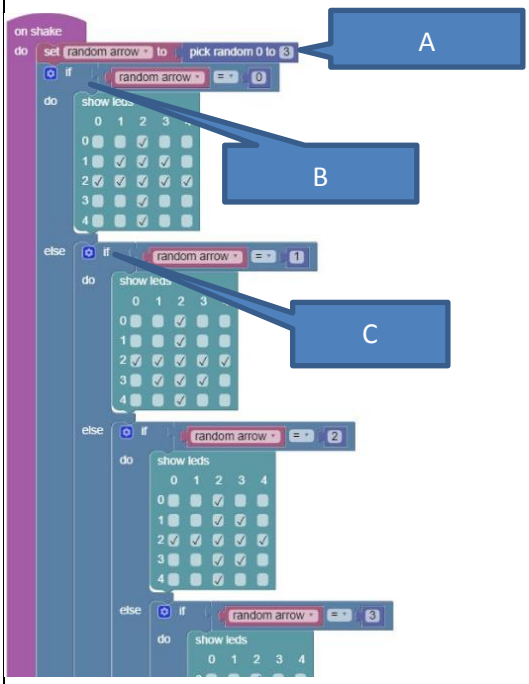
Post your starting point and progress to: **padlet.com/Mr_hughes/9_2waySelection_8…**

Challenge 1



1. Open the MicroBit Website www.microbit.co.uk and click on ‘create code’
2. Select ‘new project’ from the ‘block editor’ section
3. Create the code as shown to the left.
4. Draw a line to the part of the IF DO block that makes it ‘two way’ selection

Challenge 2

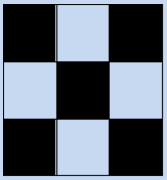


1. **Explain** what is happening in the program. **What** is happening at each label?
   a. –
   b. –
   c. –
2. **Why** are ELSE IF statements relevant within computer programming?
3. Give one real life example of else-if statements being used and explain how the program might work.

Challenge 3

Go to: www.microbit.co.uk

You need to create a program using the MicroBit to produce a DICE. You will need multi-way selection. When the MicroBit is shaken, a random number should be selected by the program and stored. For each number, the ‘die’ image should be displayed i.e. if a number 5 is selected, you should see the image shown to the right:



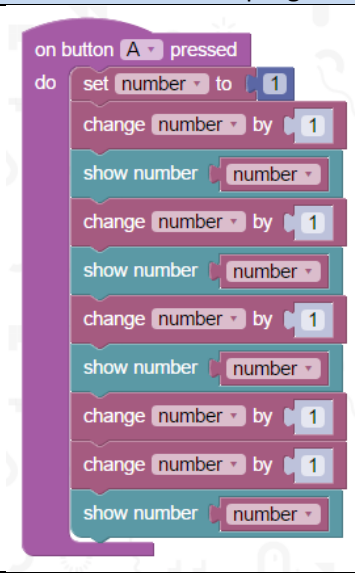
Two-Way Selection– Improved Response Space

Sequence

Post your starting point and progress to: **padlet.com/Mr_hughes/9_sequence_8…**

Challenge 1

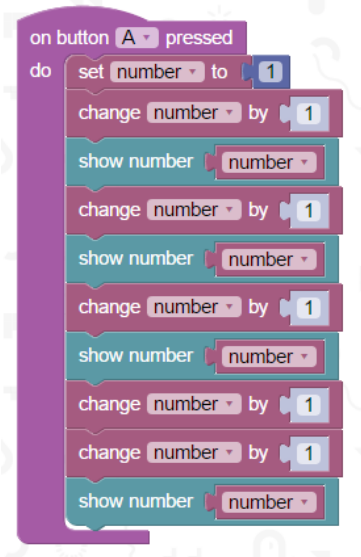
The program below ***should*** start at 1 and then count upward to 5 (1,2,3,4,5).



Create the program.
What ***does*** the program do?

Challenge 2

Some of the instructions are not in the correct 'sequence' (order).
The program ***should*** count from 1 to 5. Explain what the correct 'sequence' of instructions should be.
You may wish to create the program so that you can move around the blocks to get it working.



What is meant by the terms 'sequence' and 'logic error' in programming?

Challenge 3

Go to: www.microbit.co.uk

Upload the file "brokenSequence" from *computer > RM Shared > ICT > KS3 > MicroBit > 4_Sequence*

1. This program should begin when the MicroBit is shaken.
2. It should set 'X' to 7, then set 'guess' to a random number between 0 and 10.
3. It should then check to see **IF** X is equal to the random number, showing X and then a tick if true.
4. If this is not true, then it should show a cross.

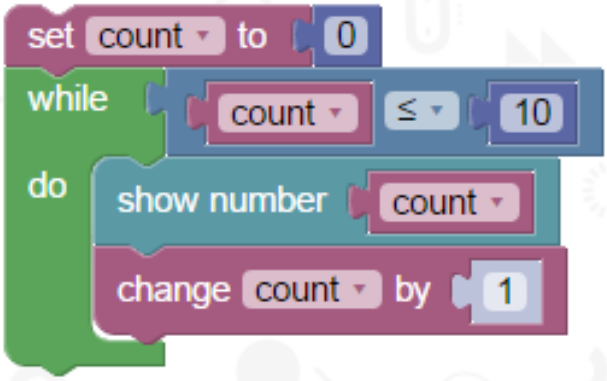
Sequence – Improved Response Space

Iteration Part 1

Post your starting point and progress to: **padlet.com/Mr_hughes/9_iteration_8…**

Challenge 1

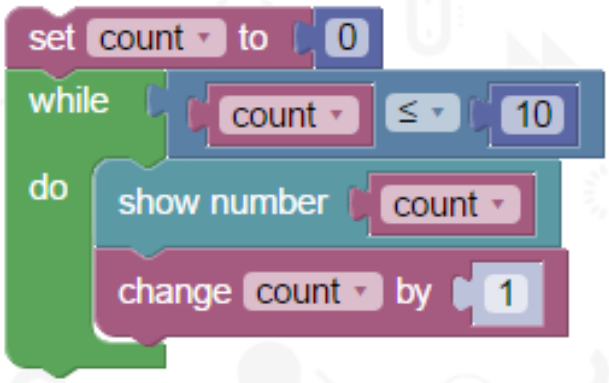
The program below ***should*** start at 1 and then count upward to 10



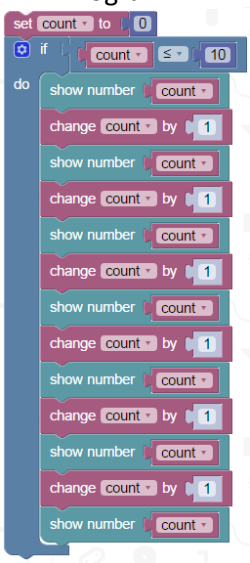
Draw a line pointing to the block which makes the code repeat.

Challenge 2

Program 1



Program 2



Both programs shown below do the same thing.

1. How many times does program 1 check to see if *count* is less than or equal to 10?	
2. How many times does program 2 check this?	
3. Will program 1 allow count to increase above 10?	
4. Will program 2 allow count to increase above 10?	
5. How many lines of code are there in program 1 compared to program 2?	
6. Program 1 uses **'iteration'** which is also known as **'looping'**. This is better than program 2. **Why?**	

Challenge 3

1. Make sure that you have created the program from challenge 1. This will count from 0 up to 10.
2. Now, use a while loop at the end of the challenge 1 code, to count backward from 10 down to 0.
3. Post your program to the padlet page given above.

Iteration Part 1 – Improved Response Space

Iteration Part 2

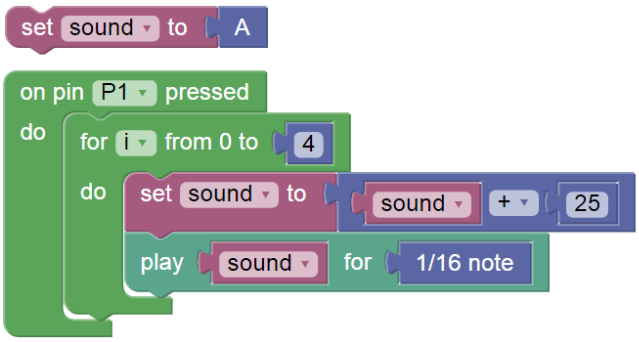
Post your starting point and progress to: **padlet.com/Mr_hughes/9_iteration2_8…**

Challenge 1

Create and run the program shown (if you need to).

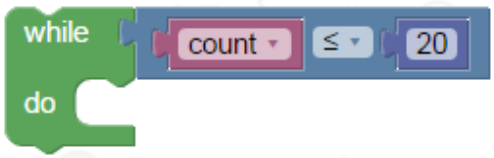
Draw a line pointing to the block which makes the code repeat.

How many times will the 'do' section of the code, be repeated?

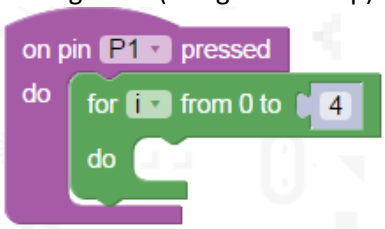


Challenge 2

Program 1 (using a while loop)



Program 2 (using a FOR loop)

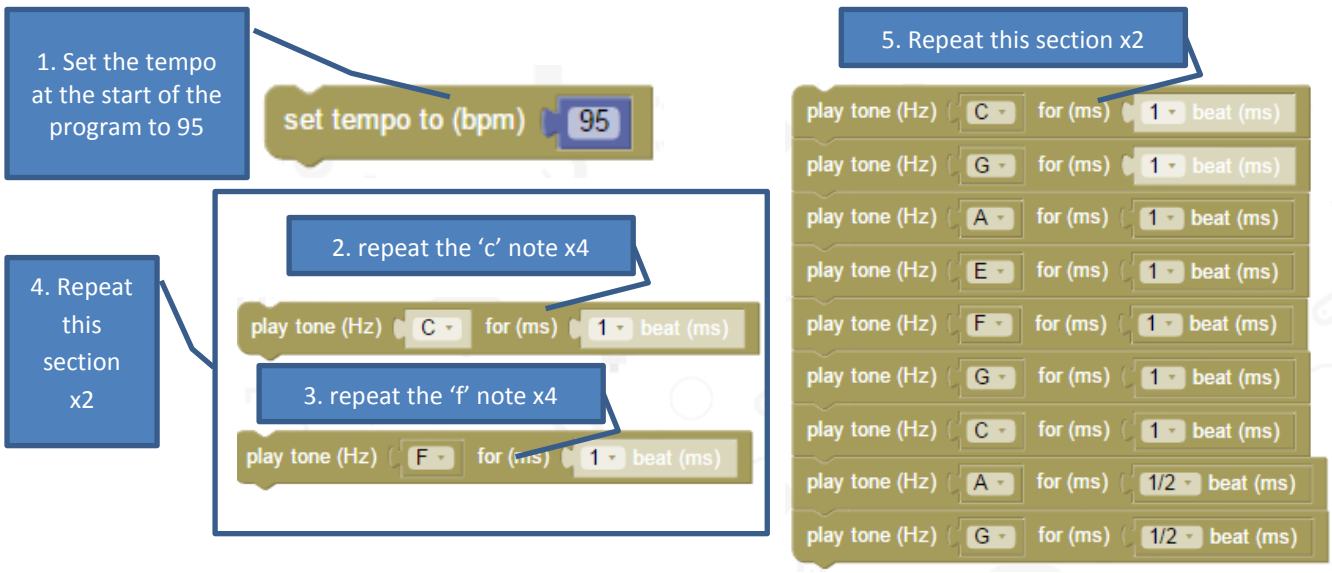


Both programs shown use loops.

1. Which one of the loops (for or while) will repeat a specific amount of times?	
2. Which type of loop (for or while) might you use, if you *don't* know how many loops will be needed, but you *do* have an end point?	
3. When should you use a FOR loop?	

Challenge 3

The notes for the classic song by Oasis "don't look back in anger" are shown below. Some notes and sections need repeating, as shown. Use an appropriate loop to make the parts of the code repeat the appropriate amount of times (you can use headphones to test your results).



Iteration Part 2 – Improved Response Space

Homework

All homework is to be posted to the padlet page: **padlet.com/mr_hughes/homework_8...**

Finish the address by adding your class letter

Topic	Task	Due Date
Inputs / Variables / Outputs	Complete the tutorial below and post a print-screen of it working, to the padlet page given at the top of this page: https://www.microbit.co.uk/blocks/lessons/guess-the-number/challenges	
Selection	Complete the tutorial below and post a print-screen of it working, to the padlet page given at the top of this page: https://www.microbit.co.uk/blocks/lessons/magic-8/challenges	
Two-Way Selection	Complete the tutorial below and post a print-screen of it working, to the padlet page given at the top of this page: https://www.microbit.co.uk/blocks/lessons/truth-or-dare/challenges	
Sequence	Create the program https://www.microbit.co.uk/blocks/lessons/compass/activity and move some blocks around to put the code out of sequence. In the next lesson, a partner will have to try to re-sequence your code. Post your response to the padlet page.	
Iteration Part 1	Complete the tutorial below and post a print-screen of it working, to the padlet page given at the top of this page: **https://www.microbit.co.uk/blocks/lessons/digi-yoyo**	
Iteration Part 2	Complete the tutorial below and post a print-screen of it working, to the padlet page given at the top of this page: **https://www.microbit.co.uk/blocks/lessons/looper**	