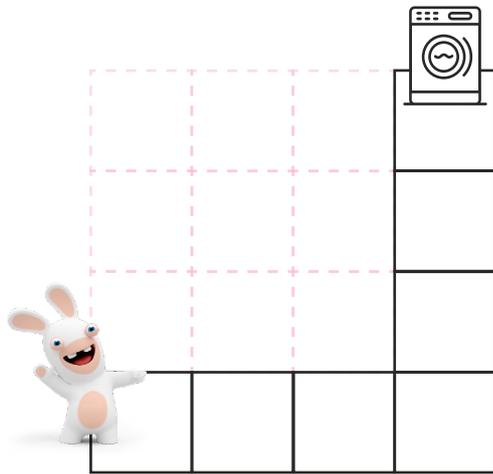
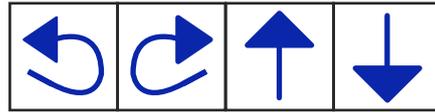
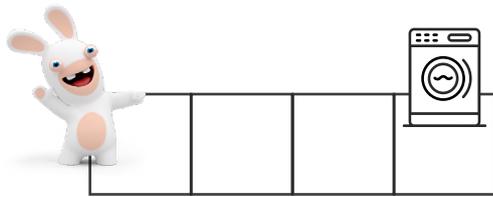
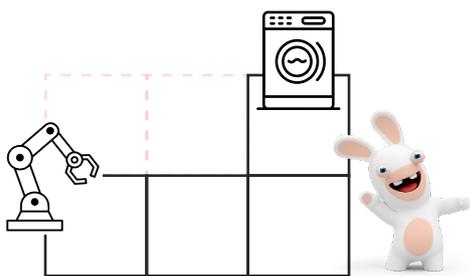


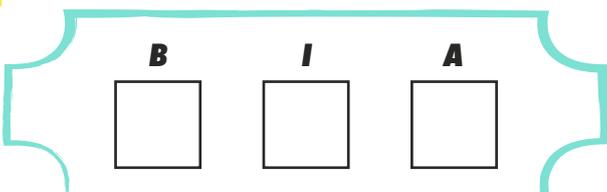
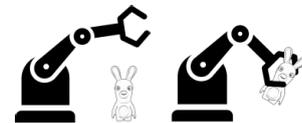
Uh oh, those pesky Rabbids need rescuing again — use the mind control helmet to send them back to Earth using the washing machine. Choose the right instructions to move them in front of the washing machine. The first instruction has been added for you.



You could use three right commands instead of one turn left – why is it better to use one turn left?



You can also use robots to catch Rabbids, use these instructions in addition to the arrows at the top of this worksheet to send the Rabbid back to Earth.





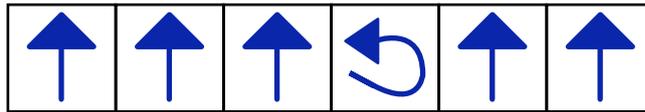
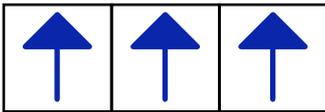
This worksheet is designed to be used prior to students beginning level 1 of the Rabbids Coding game. It covers concepts used in levels 1 - 10.

SEQUENCE
CONCEPTS COVERED:
Sequence

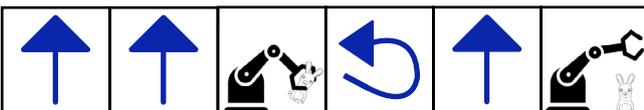
National Curriculum learning objectives covered in this session

Activity	Level	Equipment List: (One Per Student)
✗ Debugs programs that accomplish specific goals	1,2,4	Printed Worksheets Pen or Pencil
✗ Solves problems by decomposing them into smaller parts	1,2,4	
✗ Uses logical reasoning to explain how some simple algorithms work	1,2,4	
✗ Detects errors in algorithms	1,2,4	
✗ Corrects errors in algorithms	1,2,4	
✗ Designs a range of systems and content that accomplish given goals	1,2,4	
✗ Uses sequence in programs	1,2,3,4	

Mark Scheme

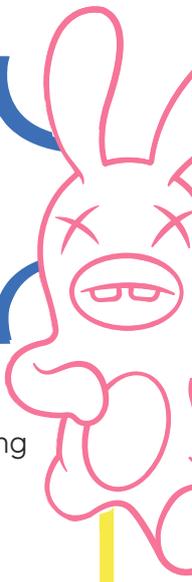


You could use three turn right commands instead of one turn left—why is it better to use one turn left? Using the single turn left command makes the program shorter and it is always best to keep the program as short as possible.



Extend the Learning!

Have your students use the Rabbids Coding app from either the Apple App Store or Google Play. They can test out the algorithms they have written as these are the same as the first three levels in the app.



Your code is starting to get quite long and confusing, there must be a way of making your code shorter and more precise. Have a look at level 6 again - if you had an easy way of telling the vacuum robot to repeat some of the instructions you would not need to write as many.

In programming we call the process of repeating sets of instructions a loop or iteration.

The first step to using a loop in your program is to work out which instructions are being repeated. Use a coloured pencil or highlighter to colour in the instructions that are being repeated in my code for level 6:



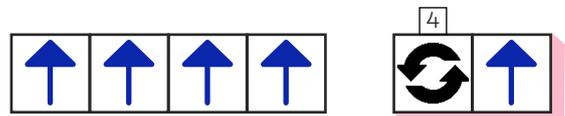
How do we go from some repeated sets of instruction blocks to using a loop?

This block will repeat any instructions inside it the number of times entered into the small box above.

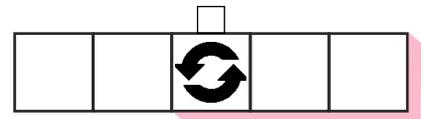
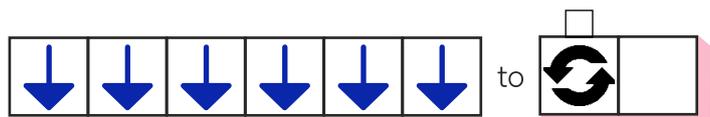
Let's introduce a new instruction block



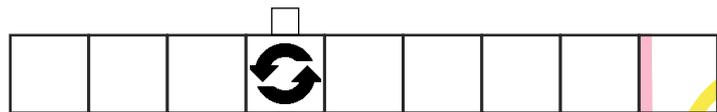
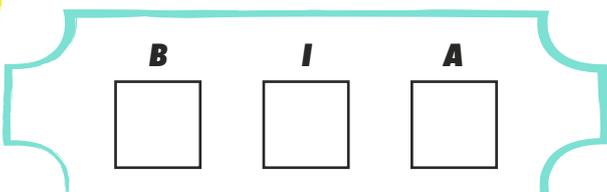
So we could shorten this set of instruction blocks



Have a go at shortening these sets of instructions by using a loop:



Now see if you can shorten my level 6 instructions at the top of the page:





This worksheet is designed to be used prior to students beginning level 11 of the Rabbids Coding game. It covers concepts used in levels 11 - 17.

REPETITION 1

CONCEPTS COVERED:

Sequence & Repetition

National Curriculum learning objectives covered in this session

Activity	Level	Equipment List: (One Per Student)
✗ Designs programs that accomplish specific goals	1,2,3,4	Advanced
✗ Solves problems by decomposing them into smaller parts	1,2,3,4	Beginner
✗ Uses logical reasoning to explain how some simple algorithms work	1,2,3,4	Beginner
✗ Detects errors in algorithms	2,3,4	Beginner
✗ Corrects errors in algorithms	2,3,4	Beginner
✗ Designs a range of systems and content that accomplish given goals	2,3,4	Beginner
✗ Uses sequence in programs	3,4	Intermediate
✗ Uses repetition in programs	1,2,3,4	Advanced

Equipment List:

(One Per Student)

Printed Worksheets

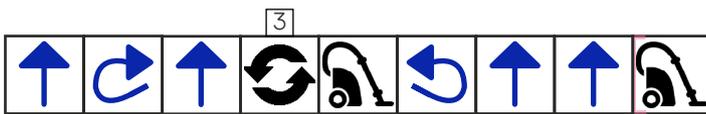
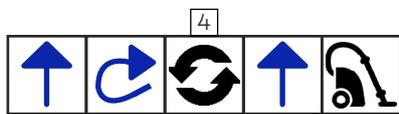
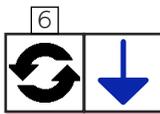
Pen or Pencil

Coloured Pencil or Highlighter

MARK SCHEME

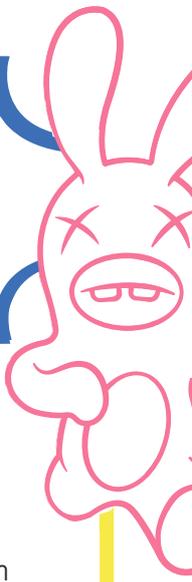


Accept any other correct identification of repeated instruction blocks.



Extend the Learning!

Once your students have completed the worksheet they can complete levels 11 through 17. If any are struggling with the concept of iteration, have them act out the instructions. You might find an activity where they need to follow instructions to pick up multiple objects helpful here.



It's time to introduce another new block and therefore another programming concept. The new concept is called selection.

The new selection block looks like this



The gap after the ? is where a condition goes. A condition is a test that the robot will perform to decide whether to run the code or not. The result of the test will be either yes or no. The second gap is where the code, that will be run if the result of the test is yes, will go. If the result of the test (the condition) is no then this code will not be run.

Let's look at an example condition:



This condition means 'Can you move forward?'

What do you think this condition means?



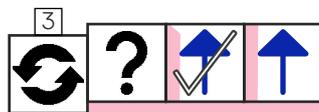
Let's have a look at using the selection block with a Rabbids Coding level, look at the example code and the example level and then answer the questions.



Will the Rabbid move forward when this program is run?

YES **NO**

Using a selection block inside a loop can start to automate your code, have a look at the example below and then answer the questions.

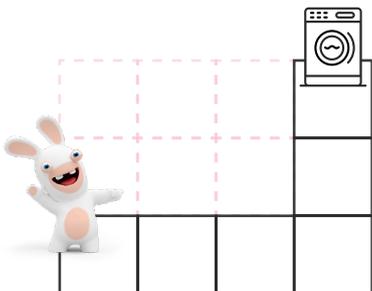


Will the Rabbid move forward when this program is run?

YES **NO**

If yes, how many spaces will the Rabbid move?

Now have a go at solving this problem using the smallest number of code blocks possible. Draw your code in the space provided:



B **I** **A**



This worksheet is designed to be used prior to students beginning level 18 of the Rabbids Coding game. It covers concepts used in levels 18 - 24.

SELECTION 1

CONCEPTS COVERED:

Sequence & Repetition & Selection

National Curriculum learning objectives covered in this session

	Activity	Level
✗ Designs programs that accomplish specific goals	4	Advanced
✗ Solves problems by decomposing them into smaller parts	2,3,4	Beginner
✗ Uses logical reasoning to explain how some simple algorithms work	1,2,3,4	Advanced
✗ Corrects errors in algorithms	4	Beginner
✗ Designs a range of systems and content that accomplish given goals	4	Beginner
✗ Uses sequence in programs	4	Intermediate
✗ Uses repetition in programs	4	Advanced
✗ Uses selection in programs	4	Beginner

Equipment List:

(One Per Student)

Printed Worksheets

Pen or Pencil

Mark Scheme

Means 'Can you turn right?'



Will the Rabbid move forward when this program is run?

YES



Will the Rabbid move forward when this program is run?

YES

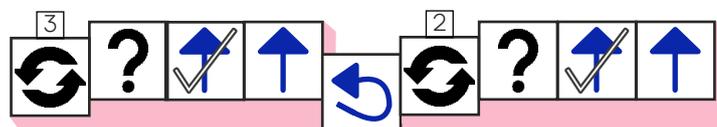
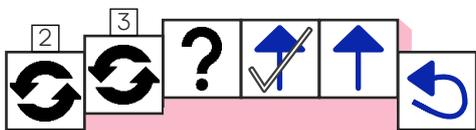


If yes, how many spaces will the Rabbid move?

1

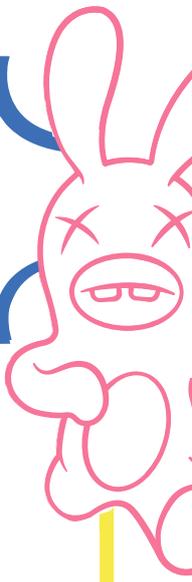
If yes, how many spaces will the Rabbid move?

3



Extend the Learning!

Once your students have completed the worksheet they can complete levels 18 through 24. If any are struggling with the concept of iteration, have them act out the instructions. You might find an activity where they need to follow instructions to pick up multiple objects helpful here.

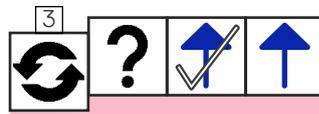
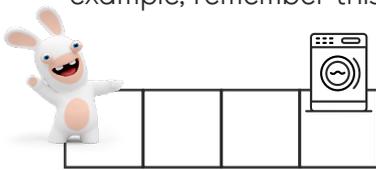


Now you have mastered using a count controlled loop (where you enter how many times you want it to repeat) let's look at another type of loop - the while loop.

This is what the while loop block looks like:



Like the selection block, the while loop uses a condition and will keep repeating the code contained inside it while the result of the condition is true. Once the condition controlling the loop is false the loop stops and any code after the loop will be executed (run). Lets look at an example, remember this code to make our Rabbid move to the washing machine?

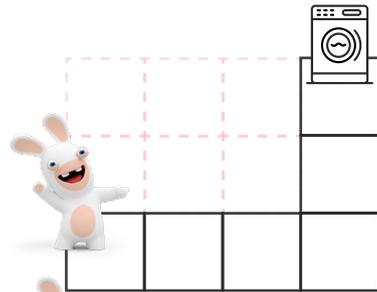


Does using the while loop make the code shorter?

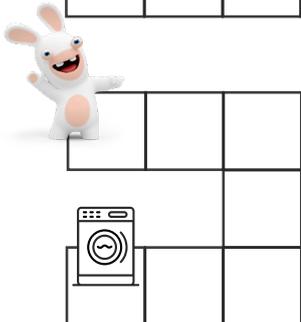
We could solve this problem using a while loop instead - it would look like this:



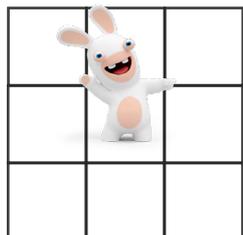
YES NO



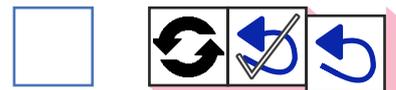
Write a set of instructions that will move the Rabbid all the way around the path to the washing machine. Your code will need at least one while loop.



Write a set of instructions that will move the Rabbid all the way around the path to the washing machine. Your code should use a while loop.

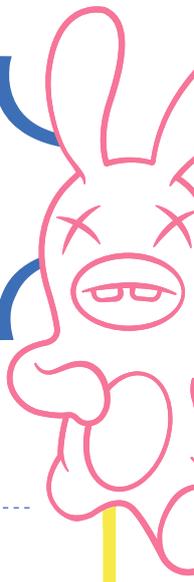


Have a look at this example code, how many times will it repeat?



This is called an infinite loop, why do you need to avoid this happening?

B
I
A



This worksheet is designed to be used prior to students beginning level 25 of the Rabbids Coding game. It covers concepts used in levels 25 - 28.

REPETITION 2

CONCEPTS COVERED:

Sequence & Repetition

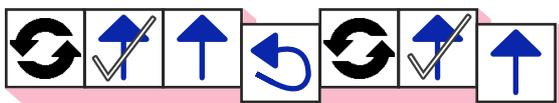
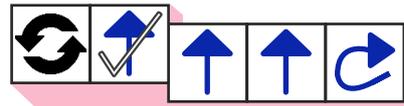
National Curriculum learning objectives covered in this session

Activity	Level	Equipment List: (One Per Student)
✗ Designs programs that accomplish specific goals	2,3	Printed Worksheets Pen or Pencil
✗ Solves problems by decomposing them into smaller parts	2,3,4	
✗ Uses logical reasoning to explain how some simple algorithms work	1,2,3,4	
✗ Detects errors in algorithms	2,3,4	
✗ Corrects errors in algorithms	4	
✗ Designs a range of systems and content that accomplish given goals	2,3	
✗ Uses sequence in programs	2,3	
✗ Uses repetition in programs	2,3	

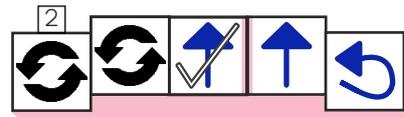
Mark Scheme

Does using the while loop make the code shorter?

YES



or



Have a look at this example code, how many times will it repeat?

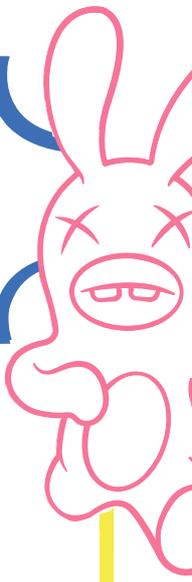
∞

This is called an infinite loop, why do you need to avoid this happening?

The code will never stop running

Extend the Learning!

Once your students have completed the worksheet they can complete levels 25 through 28. If any are struggling with the concept of while loops, try a game of musical statues - while the music is playing they should dance.

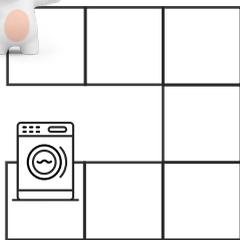


It's time to introduce one final block. The new block is an extension of the selection block. This block allows you to add some code that will run if the result of the condition is false.

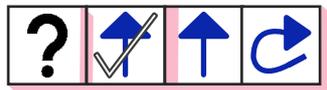
An extended selection block looks like this



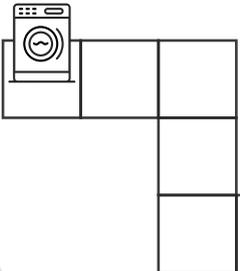
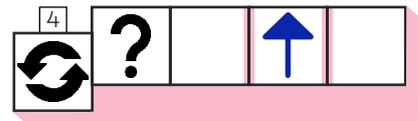
The extra gap at the end of the block is where the code that will run if the result of the condition is false will go. Let's look at an example:



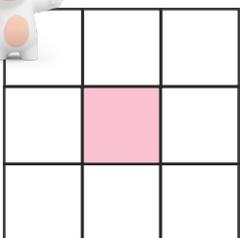
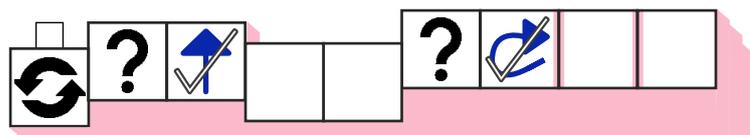
If we ran this code for this level, which of the instructions would be executed (run)? Make sure you think carefully about how the Rabbid can move.



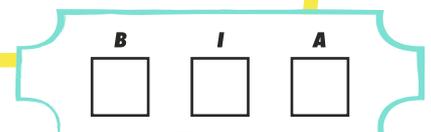
You can use selection blocks inside a loop to repeat them. Complete this code so it has a condition and code that will run if the result of the condition is false.



You can also use selection statements inside other selection statements - we call this nesting. Complete the code to get the Rabbid to the washing machine!



Now have a go at writing code that will move the Rabbid around the path and return it to its starting position using the smallest number of code blocks possible. Draw your code in the space provided





This worksheet is designed to be used prior to students beginning level 29 of the Rabbids Coding game. It covers concepts used in levels 29 - 32.

SELECTION 2

CONCEPTS COVERED:

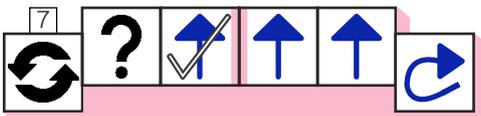
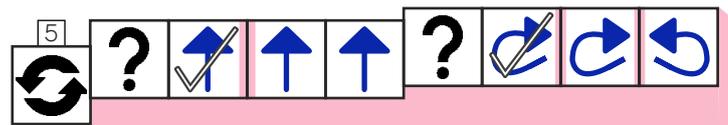
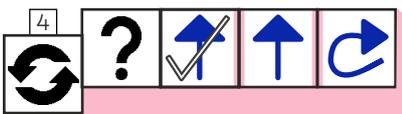
Sequence & Repetition & Selection

National Curriculum learning objectives covered in this session

Activity	Level	Equipment List: (One Per Student)
✗ Designs programs that accomplish specific goals	2,3,4	Printed Worksheets Pen or Pencil
✗ Solves problems by decomposing them into smaller parts	2,3,4	
✗ Uses logical reasoning to explain how some simple algorithms work	1,2,3,4	
✗ Corrects errors in algorithms	2,3,4	
✗ Designs a range of systems and content that accomplish given goals	2,3,4	
✗ Uses sequence in programs	2,3,4	
✗ Uses repetition in programs	2,3,4	
✗ Uses selection in programs	2,3,4	

Mark Scheme

If we wrote this code for this level, which of the instructions would be executed (run)?



Extend the Learning!

Once your students have completed the worksheet they can complete levels 29 through 32. If any are struggling with the concept of selection, have them act out the instructions. You might find an activity where they need to follow instructions that include selection statements to decide whether they should pick up objects or not helpful here.