

PRIMM with code page 1

Work with a partner. Don't load Scratch.



Don't load
Scratch



Work with a partner
of same ability

Code-it Gold Resource

Pattern code with procedures

Investigate (read code)

Read the code on the left. It has two procedures you can tell they are procedures because they have been defined.

The main program below uses the procedures as many times as it needs.

Work with a partner to answer these questions.

1, How many times in the main program is the **rectangle** procedure used?

2, Put a circle around the loop that is nested inside another loop.

3, How many times in the main program is the **square** procedure used?

4, Initialisation means thinking about how the idea can be reused by resetting itself back to where it started and removing the effects of previous use. Circle any instructions that might be initialisation.

Predict

Think about what the code does in the main program starting at the top and working through to the bottom.

Explain each step to your partner. Now draw what you think the program will look like

when it runs.

The image shows Scratch code blocks. On the left, two procedures are defined: 'rectangle' and 'square'. The 'rectangle' procedure starts with 'pen down', followed by a 'repeat' loop of 2 iterations. Each iteration contains 'move 50 steps', 'turn 90 degrees', 'wait 0.2 secs', 'move 20 steps', 'turn 90 degrees', and 'wait 0.2 secs'. The procedure ends with 'pen up'. The 'square' procedure starts with 'pen down', followed by a 'repeat' loop of 4 iterations. Each iteration contains 'move 20 steps', 'turn 90 degrees', and 'wait 0.2 secs'. The procedure ends with 'pen up'. On the right, the 'Main Program' starts with 'when clicked', 'point in direction 90', 'go to x: 0 y: 0', 'clear', and a 'repeat' loop of 4 iterations. The first iteration contains 'turn 90 degrees', 'rectangle', and 'move 80 steps'. The second iteration contains a 'repeat' loop of 3 iterations, with 'square' and 'turn 120 degrees' inside. The third iteration contains 'move -80 steps'.

Exploring Nested Loops Using Procedures



PRIMM with code page 2

Work with a partner. Open Scratch and load
exploringnestedloopswithprocedures



Code-it Gold Resource

Run the code

Were your predictions correct?

Mark your investigate questions on the previous page using the answer sheet.

Modify (to make small changes)

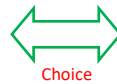
- 1, Name two ways to make the program run more slowly?
- 2, What does the move 80 and the move -80 do to the pattern?
Change the numbers to find out.
- 3, What would you change to make the program draw four squares after each rectangle?
- 4, What would you change to make the program draw five rectangles perfectly spaced?

Mark your modify questions using the answer sheet.

Make

Work on your own

Work through each challenge below



Choice



Work on
your own

Option 1

Create another nested loop and another procedure called **smallsquare** to draw a pattern of squares at the end of each square.

Option 2

Change the main program so that it uses the same procedures and nested loops to create a different pattern.

Option 3

Come up with your own suggestion that uses nested loops and procedures. Talk to your partner about it first.

Exploring Nested
Loops Using
Procedures



Investigate answers

1, 4 times as it is in a loop

2, Circle around this code



3, It is used 12 times. The outer counted loop multiplies by the inner counted loop ($4 \times 3 = 12$)

4, point in direction, go to x and y, clear

Modify answers

1, Increase the wait blocks in the procedures to longer than 0.2 seconds. Add more wait blocks into either the procedures or the main program. (1 mark for each change, 2 marks in total)

2, 80 moves the three square pattern further out from the central pattern and the -80 move back in to draw another rectangle in the centre. (1 mark)

3, You would need to change the nested loop so that instead of three loops it carried out four loops and you would need to change the turn between loops to 90 degrees as $4 \times 90 = 360$ whereas $4 \times 120 = 480$ would be over 360 and lead to an uneven pattern. (1 mark)

4, Change the outer loop to 5 and the first turn right to 72 degrees. (1 mark)

Exploring Nested Loops Using Procedures