

Completion with Algorithm 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

Investigate the algorithm

Read the algorithm on the right. 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?

Complete the code

Work with a partner. Load the code

`nestedloopswithprocedurescompletion`

Both procedures have been create and all the blocks are created for the main program but none of them are in the correct order.

Use the algorithm for the main program to complete the code.

Once you have finished look at the code on the answer sheet to check if your code creation was correct.
Fix any parts that are incorrect.

| | |
|--|---|
| define rectangle Start drawing pen down loop 2 move 50 forward right 90 degrees pause Loop 2 move 20 forward right 90 degrees pause stop drawing pen up | define square Start drawing pen down loop 4 move 20 forward right 90 degrees pause stop drawing pen up |
|--|---|

Pattern algorithm with procedures

Main program algorithm

Start green flag
Point right
Return character to centre with x and y command
Clear all lines
Loop 4 times
 right 90 degrees
 rectangle procedure
 Move 80 forward
 Loop 3 times
 square procedure
 right 120 degrees
 Move backwards 80



Work with a partner
of same ability

Exploring Nested Loops Using Procedures





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 instead of four? HINT There are 360 degrees in a circle

Now mark your modify changes using the answer sheet

Create

Work through the challenges below



Option 1

Create another nested loop and another procedure called **smallsquare** to draw a pattern of smaller 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 idea that uses nested loops and procedures. Talk to your partner about it first.

Exploring Nested Loops Using Procedures

Exploring Nested Loops Using Procedures

Answers to Completion with Algorithm

Investigate the algorithm answers

1, 4 times as it is in a loop (1 mark)

2, You should have drawn a loop around (1 mark)

Loop 3 times

square procedure

Right 120 degrees

3, It is used 12 times. The outer counted loop multiplies by the inner counted loop ($4 \times 3 = 12$) (1 mark)

Complete the code answers (3 marks for successful completion)

The image shows three Scratch code snippets. The first snippet is a main program starting with 'when clicked', pointing in direction 90, going to x:0 y:0, erasing all, and then repeating a sequence of 4 times: turn 90 degrees, call 'rectangle' procedure, move 80 steps, repeat 3 times: call 'square' procedure, turn 120 degrees, and move -80 steps. The second snippet is a procedure named 'rectangle' that starts with 'pen down', repeats 2 times: move 50 steps, turn 90 degrees, wait 0.2 seconds, move 20 steps, turn 90 degrees, wait 0.2 seconds, and ends with 'pen up'. The third snippet is a procedure named 'square' that starts with 'pen down', repeats 4 times: move 20 steps, turn 90 degrees, wait 0.2 seconds, and ends with 'pen up'.

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 idea 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)