

Python Unit 2: Lesson 3: Loops and shapes

Learning Objectives

Learn how to use loops to draw shapes in Python.

Success Criteria

Pupils can...

- explain how to code a loop and know that a loop is repeated instruction
- demonstrate how to use loops and define angles to draw a variety of 2D shapes
- understand how to affect the size of shapes using Python
- use loops to instruct the turtle to carry out a sequence of repeated commands

Starter

10 minutes

Complete Step 1 as a class. Make the square, then ask pupils what are the **main problems with typing commands to draw each side of the square separately?**

Give a practical example offline. Choose someone to be the turtle. Give them a pile of books to hand out and precise instructions for them to follow.

Say you want one given to Amy, one to Vicky, one to Badar, one to Richard. Is there a more effective way they can give this information?

What could they say that would require less instruction?

Discuss different commands you could give to the turtle, alternatives to saying individual names (could refer to everybody, everyone, every person in the class, the whole class, etc.).

As a class, complete Step 2. Can we figure out how to make an octagon?

Key questions

What are the problems with typing commands over and over again, to do something like draw a square, or hand out books?

How can we address pupils in the class to give turtle less instructions?

Main

25 minutes

Ask pupils to follow the instructions on screen to complete each step of the lesson. Encourage them to experiment and spend time on each step to ensure they understand what each part of the code does.

Key questions

What does **for n** in range (4) mean?

What do we need to consider to set our variable?

Can you adapt the right turn variable to make another shape?

What shapes can you create? What do you need to review? Can you spot any patterns?

Plenary

5 minutes

Can pupils guide a friend to create the same shape they made by only giving verbal instructions? Ask a pair to demonstrate to class.

Key questions

Can you follow your partner's instructions?

Extension

Modify values in Step 8 by changing angle, how far forward you're going, and the number of times you're looping to try to draw a circle.

In the command `t.forward(100)`, 100 is a parameter. A parameter is extra information given to Python telling it how to execute a command. Alternative examples of such a command would be: 'make me 16 cups of coffee' or 'go to floor 8'. Can pupils think of any others?