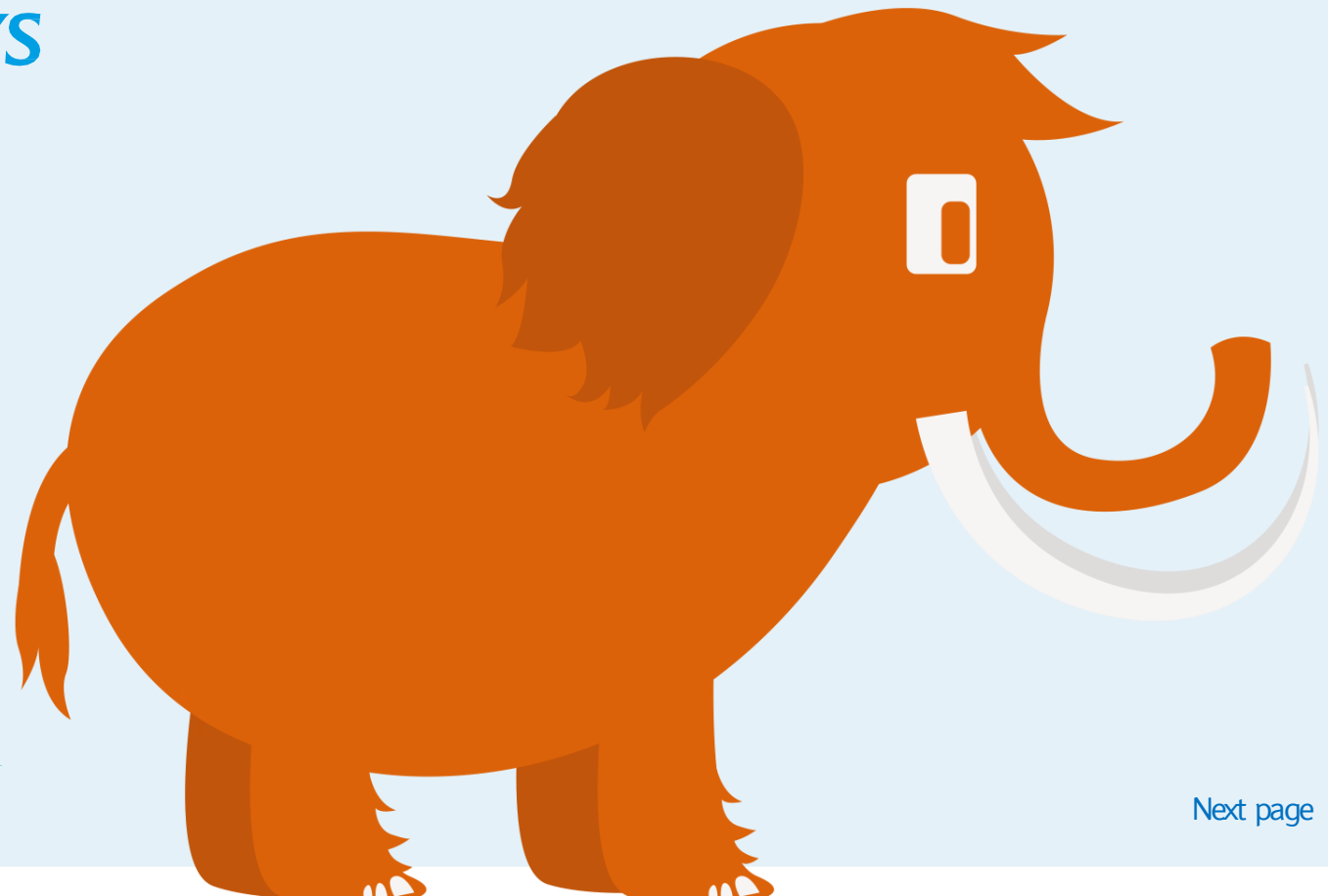Student workbook

Drawing shapes with VEXcode VR

Code Playground

BARCLAYS

Drawing shapes with VEXcode VR
VEXcode VR project

In this session, we will learn about iteration – using a loop to repeat a sequence of instructions. By completing these challenges you will learn to –

- use a repeat loop where appropriate to make your code more efficient
- understand the relationship between the number of sides and corners that a shape has

This project is designed for the VEXcode VR system, you can access it here - https://vr.vex.com/

Hope you enjoy the project!
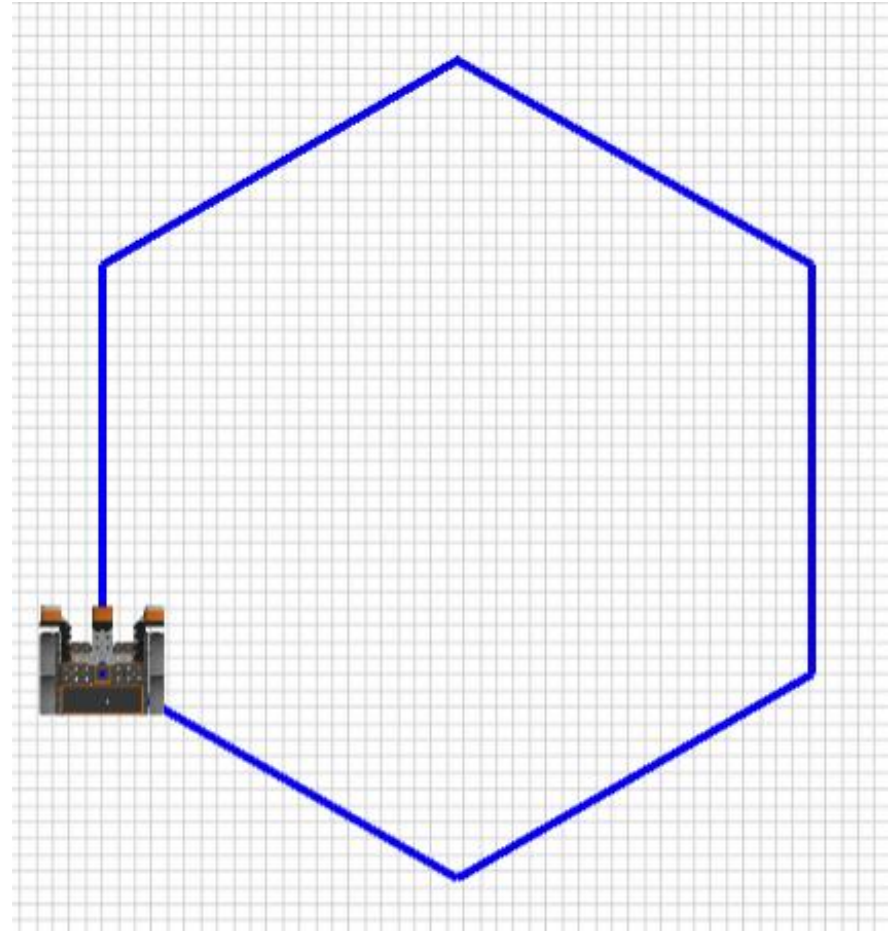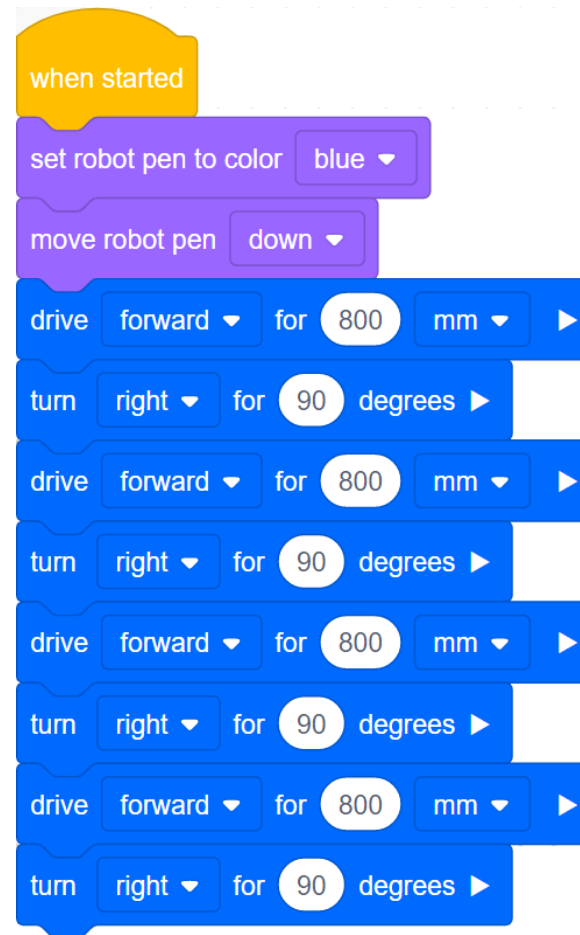
Drawing shapes with VEXcode VR

VEXcode VR project

Step 1

In this activity we are going to learn how to use a loop to repeat sequences of code.

Start by drawing a square using the pen tool with this code.

Do you notice anything about the sequence of commands in this code? Can you see a pattern?
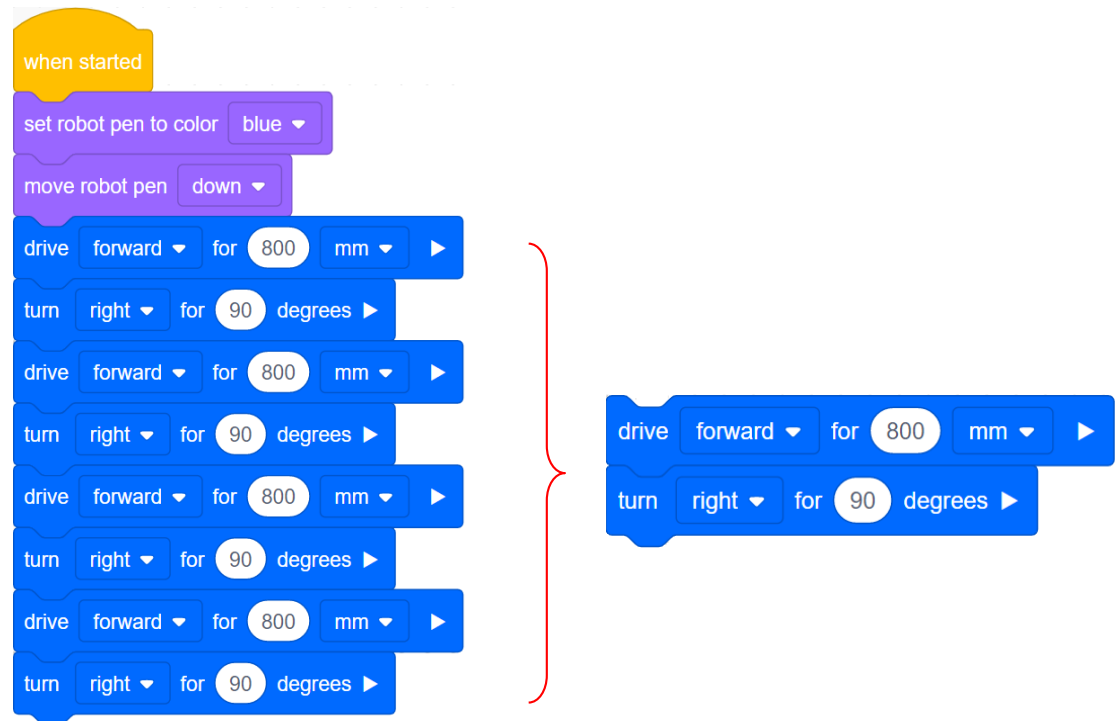
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Did you spot that these two commands are repeated 4 times? Once for each side of the square.

You can use a loop to repeat a section of code over and over. This is called iteration.

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Step 2

Go to the yellow Control menu in the toolbox. There are different types of loops, you need to find the repeat loop which looks like this.

The repeat loop has a parameter which can be changed. This is the number of times that the sequence will be looped.

You can place a sequence of commands inside the loop to make them happen more than once.
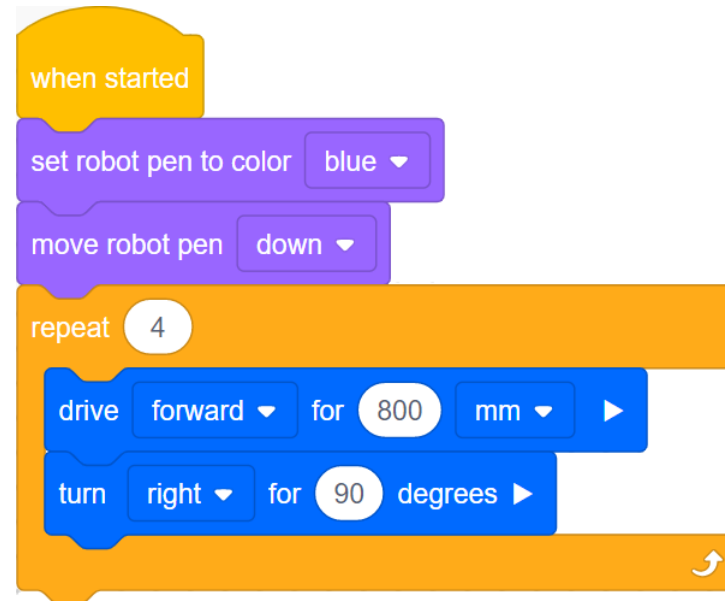
Code Playground

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Step 3

For this task, use the 'Art Canvas' playground.

To make our robot move in a square, you can place one 'drive for' and one 'turn for' block inside the loop. And because a square has 4 sides, the sequence needs to repeat 4 times.

Remember to make sure the pen is down and you have chosen a pen colour. This only needs to happen once, so it can be before your loop.

```
when started

set robot pen to color    blue ▼

move robot pen    down ▼

repeat    4
    drive    forward ▼    for    800    mm ▼    ▶
    turn    right ▼    for    90    degrees    ▶
                                                  ↻
```

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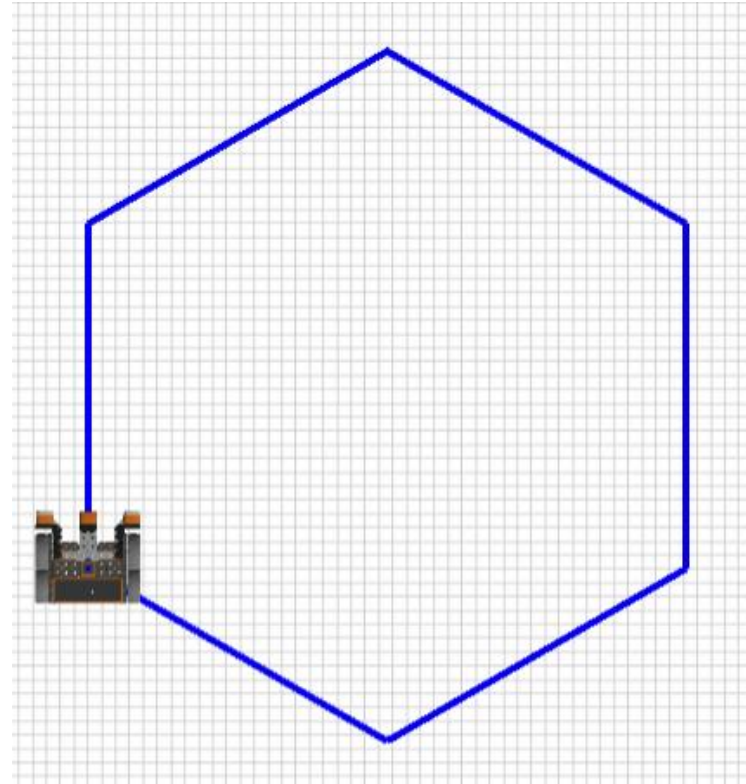VEXcode VR project

Step 4

A square has four sides and four corners and each of the corners is 90 degrees. In total, the robot turns through 360 degrees. This means at the end of the loop, it is facing back the way it started.

A hexagon has six sides. What would you need to change to make the robot draw a hexagon?

For a hexagon, the loop would need to repeat 6 times, once for each side. But be careful – you also need to change the number of degrees that the robot turns – we still want it to turn through 360 degrees in total.

You can work out how many degrees to turn like this: 360 ÷ the number of sides

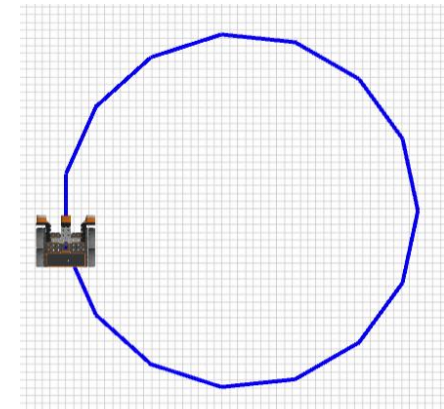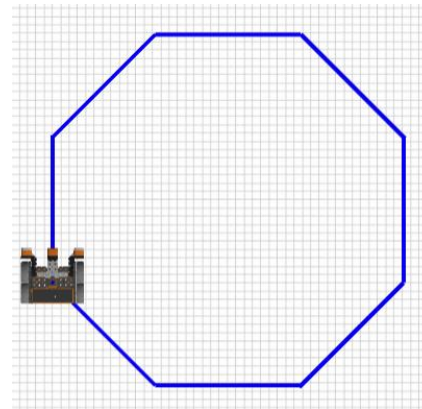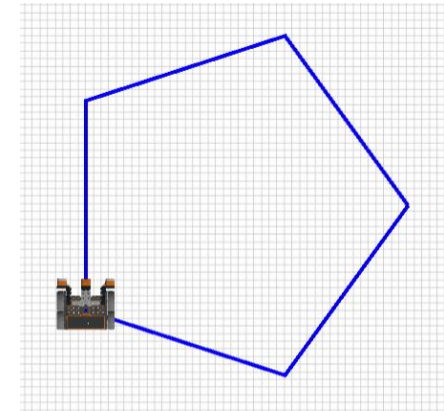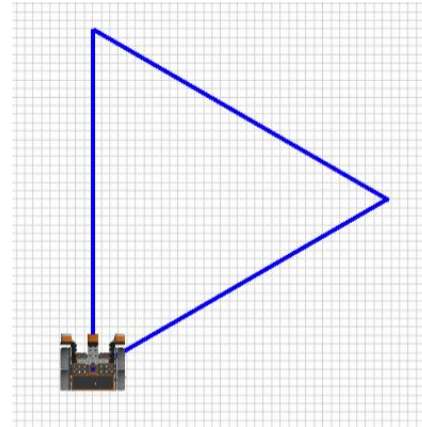So for a hexagon, this would be 360 ÷ 6 which is 60 degrees.

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Step 5

Can you work out how to draw these shapes with your robot.

A triangle (3 sides), a pentagon (5 sides), an octagon (8 sides) and a hexadecagon (16 sides)

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Level up!

- What other shapes can you draw with your robot?

- Can you put shapes together to create a picture?

- How can you amend the code to draw patterns instead of shapes?

Notes

Code Playground