Year 7 - Programming essentials in Scratch: part II
Lesson 8 - Fly cat, fly!

Learner activity sheet

National Centre for Computing Education

Raspberry Pi

Homework: Solutions

Introduction

This homework has been designed to give you more practise with condition-controlled loops and check your understanding of them.

Tracing variables through **Repeat until** loops

Here is an **example** of how a variable can be traced through a **Repeat until** loop.

This block of code adds 2 to the score until the score has reached 10.

Trace table

Index	Score	What is happening?
0	0	Score is initialised as 0
1	2	Add 2 to 0 to make 2, wait 1 second, check if score = 10
2	4	Add 2 to 2 to make 4, wait 1 second, check if score = 10
3	6	Add 2 to 4 to make 6, wait 1 second, check if score = 10

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| 4 | 8 | Add 2 to 6 to make 8, wait 1 second, check if score = 10 |
| 5 | 10 | Add 2 to 6 to make 8, wait 1 second, check if score = 10, score does = 10, so the loop ends. |

Now try one yourself using the code block and trace table below.

This block of code subtracts 2 from the score until 'score equals 0'.

Trace table

Index	Score	What is happening?
0	10	Score is initialised as 10
1	8	Subtract 2 from 10 to make 8, wait 1 second, check if score = 0
2	6	Subtract 2 from 8 to make 6, wait 1 second, check if score = 0
3	4	Subtract 2 from 6 to make 4, wait 1 second, check if score = 0
4	2	Subtract 2 from 4 to make 2, wait 1 second, check if score = 0
5	0	Subtract 2 from 2 to make 0, wait 1 second, check if score = 0, score does = 0, so the loop ends.

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Complete this loop

A game starts with three lives. Each time the sprite touches the spikes, the lives are reduced by one. The game ends when the lives reach zero.

A loop has been started for this, fill in the blanks.

```
when [flag] clicked
set lives to 3
repeat until < Lives = 0 >
    if < touching spike ? > then
        change lives by -1
    wait 1 seconds
end_game
```

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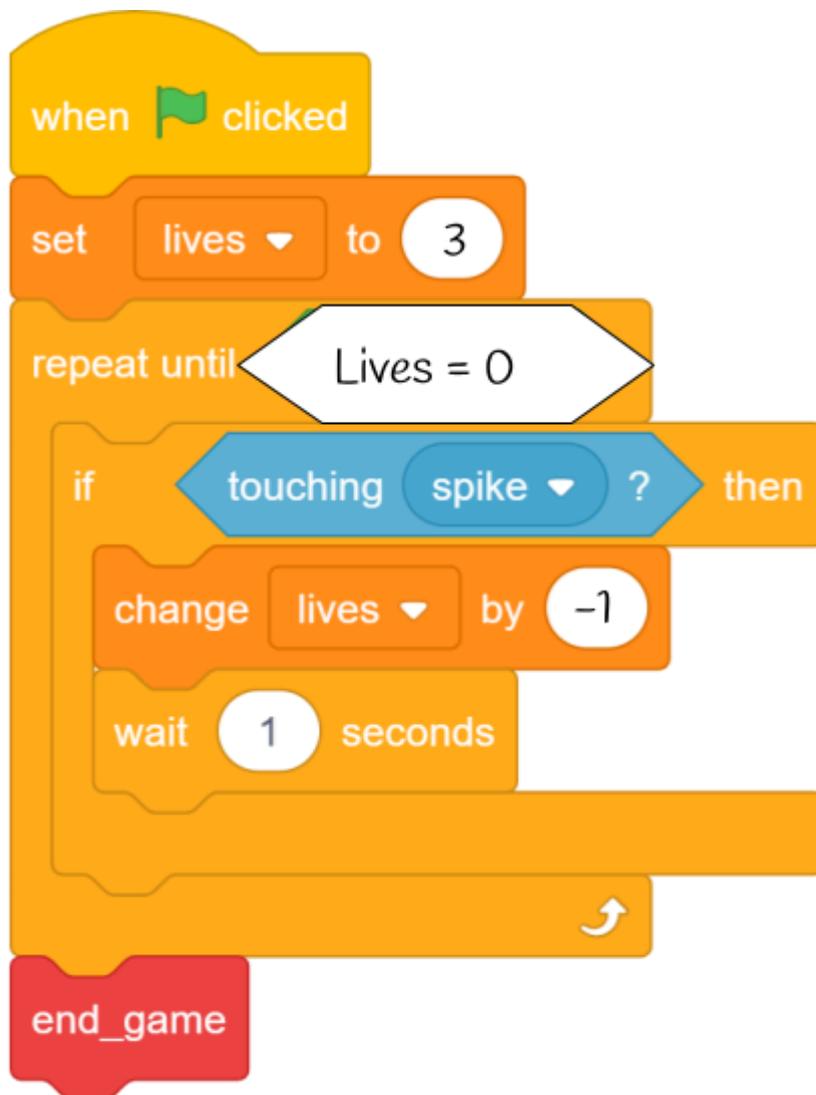
Design a loop

A battle game starts with the players **strength** set to 10. Each time the player touches the enemy its **strength** is reduced by 2. When the players **strength** reaches 0, the game ends.

Design a loop in Scratch that could carry out these conditions.

```
when [flag] clicked
set strength to 10
repeat until < strength = 0 >
    if < touching enemy ? > then
        change strength by -2
    wait 1 seconds
end_game
```