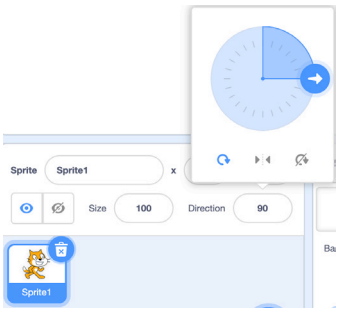
Scratch Workbook Solutions

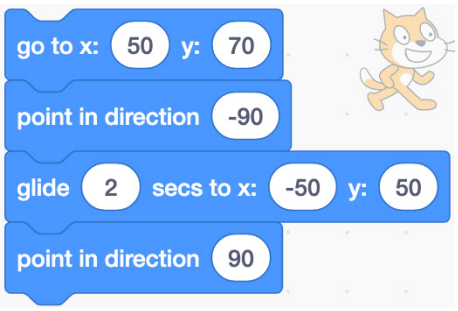
Module 1

Say "hello" to Scratch

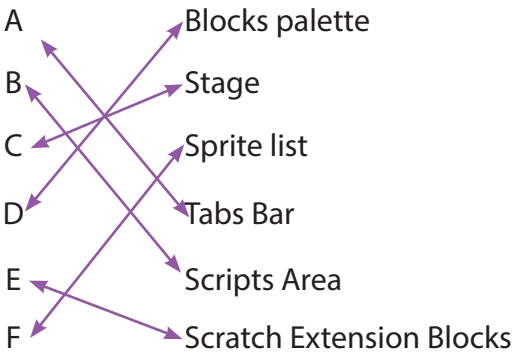
❶ Sample Solution
When the green flag is clicked the sprite will go to the position x:100 y:100 on the stage. The sprite will then pause for 1 second, move downwards by 200 steps, pause for .5 seconds, move left 100 steps and turn forward by 90 degrees. The sprite will glide for 1 second to the stage position x:0 y:0 and point facing in a forward direction.

❷ **Select can rotate button**



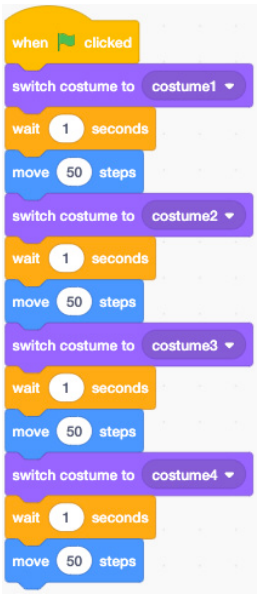


❸ **The Scratch Interface Quiz**



Playing With Pictures

❶



Tell me what to do

❶ Sample Solution

1. Buy a top up voucher in a shop or at a vending machine.
2. Dial 1741 on your phone.
3. Listen to the instructions.
4. Enter the code on the voucher and press the # key on your phone.
5. Listen for your new balance to make sure it's correct.
6. Hang up.

❷ Sample Solution

1. Making a cup of tea
2. Brushing your teeth
3. Playing a dvd

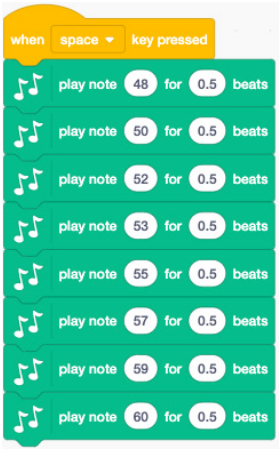
❸ Sample Solution

1. Begin on side A
2. Take goat across to side B
3. Return with empty boat to side A
4. Take dog across river to side B
5. Return with goat to side A
6. Take cabbage to side B
7. Return with empty boat to side A
8. Take goat to side B
9. END

Playing With Music

❶

❷



End of Module 1 Quiz

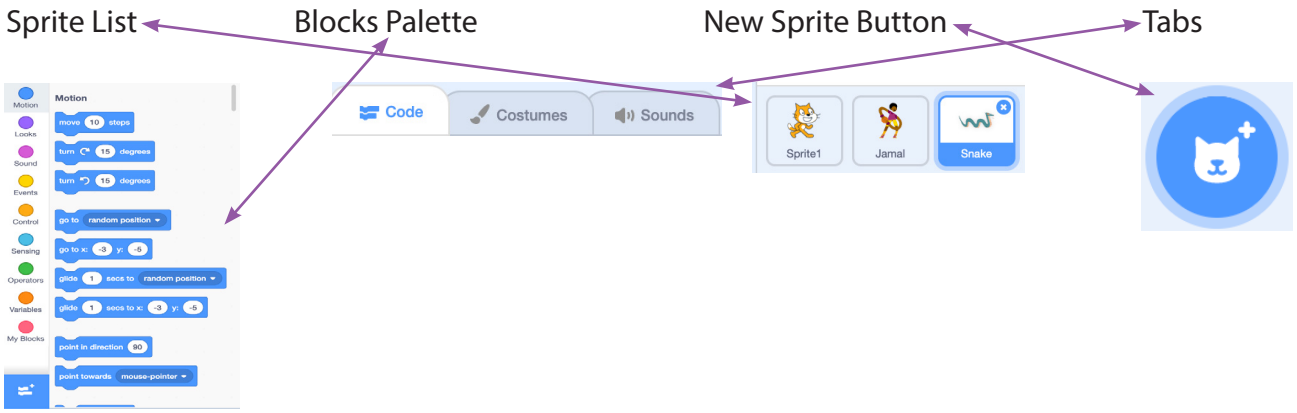
1. C.

2. B.

3. A.

4. D.

5. Match the following parts of the Scratch interface to the images



6. Match the letters from the diagram of the Scratch paint Editor to the correct description.

A	Colour palates
B	Flip
C	Toolbar
D	Add image from a file
E	Switch between vector / bitmap modes
F	Zoom

7. A.

8. B.

9. B.

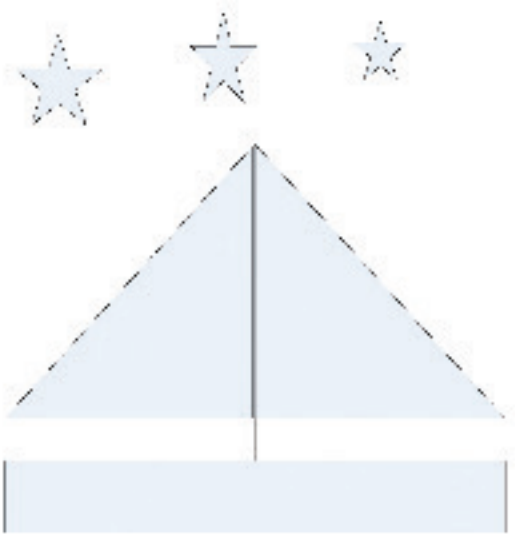
Think Like a Computer

❶ Sample Solution
In the centre of the page draw a rectangle about 3mm high 3 cm wide.
At the midpoint of the top side of rectangle draw a line upwards 5cm in length.
Draw a rectangle 4cm high 2 cm wide with the midpoint of the bottom side touching the top of the upwards line.
Draw 3 circles inside the top rectangle all 1cm in diameter that are centred horizontally across the rectangle and spaced evenly vertically in the rectangle.

❷ Sample Solution

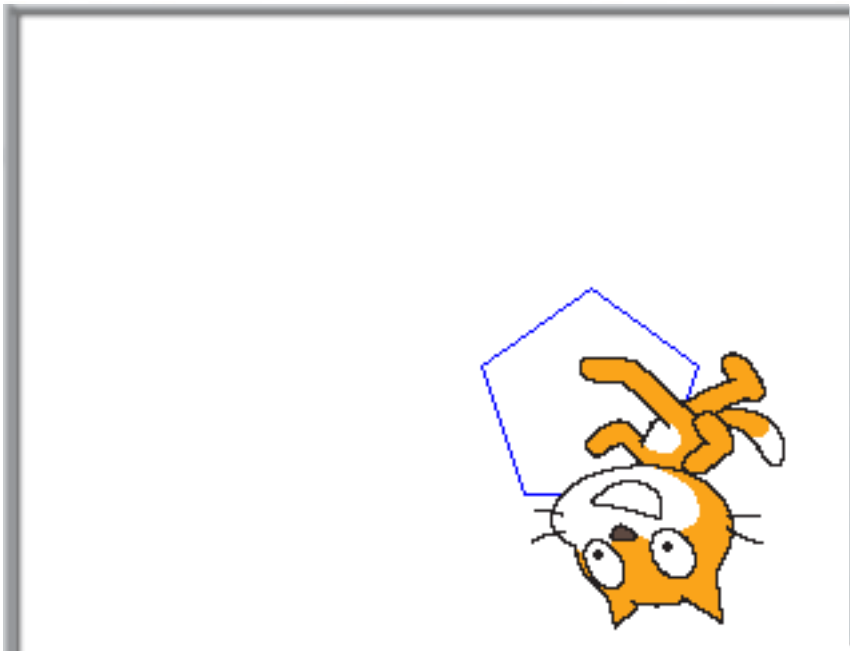
1. Draw 3 circles on top of each other. The top circle is the smallest, the middle circle is middle sized and the bottom circle is the largest
2. On top of the top circle, draw a square with a line underneath it extending out at the sides of the square
3. In the top area of the bottom circle draw a coloured small circle
4. In the centre of the middle circle draw two small coloured circles
5. In the top circle, draw two small solid circles side by side in the upper part of the circle
6. In the top circle, draw three small circles side by side in the bottom part of the circle in a U shape.
7. In the top circle, draw a left facing right angled triangle in the centre of the circle with the base twice the side of the height.
8. On the right hand side of the middle circle, draw a line facing north east direction and at the end of the line draw a small hexagon
9. On the left hand side of the middle circle, draw a line facing north west direction and at the end of the line draw a small hexagon

❸

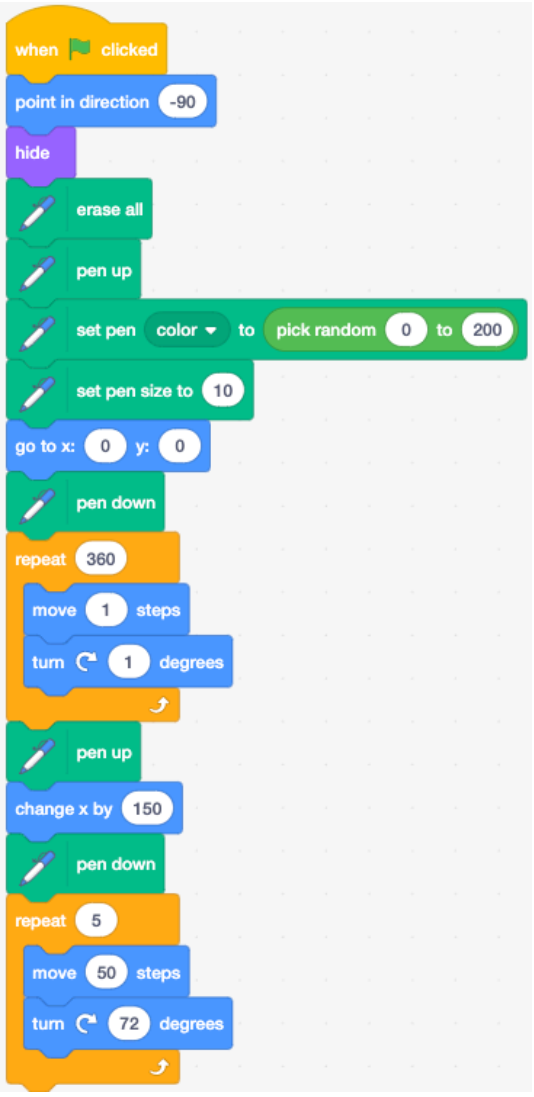


Could You Repeat That Please?

❶

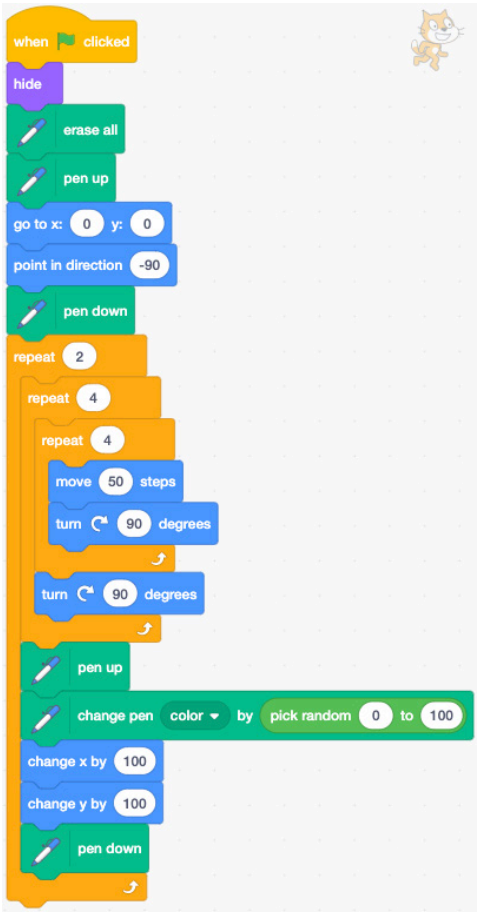


❷

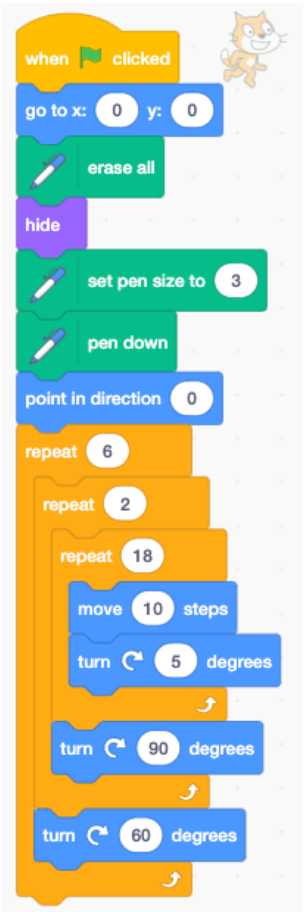


Over and Over Again

❶



❷



End of Module 2 Quiz

❶ C.

❷ B.

❸ D.

❹ C.

❺ A.

Module 3

Where Are You now?

Linear Search – 14 checks. Check names 1 by 1.
Binary Search – 3 checks. > 10 Levey, >15 Moloney, =18 Power
Hash Search – 5 checks. Hash key 5, 4th item under this hash key list

Me First Sorting

First Name (A to Z)
Anna
Brian
Mary
Ruth
Shane

Surname (Z to A)
Scott
Ryan
Ryan
Horgan
Hogan

PPSN (low to high)
7860133C
7860277B
7861212F
8392109D
9058693D

Exercise
3 times through the list
3 swaps required

Anna, Ruth, Brian, Shane, Mary (Original List)
Anna, Brian, Ruth, Shane, Mary (First Pass through list – Swap 1)
Anna, Brian, Ruth, Mary, Shane (First Pass through list – Swap 2)
Anna, Brian, Mary, Ruth, Shane (Second Pass through list – Swap 3)
Anna, Brian, Mary, Ruth, Shane (Third Pass through list no swaps required)

CSI – Finding Information on the Internet

Exercise 1

1. Maroon
2. Laithreoirí
3. Unplug
4. Somali Shilling
5. Elleboog
6. Aerophobia
7. Transport
8. Iguazu

Letters 1 – 8: M L U S E A T I

Magic Word Unscrambled: S I M U L A T E

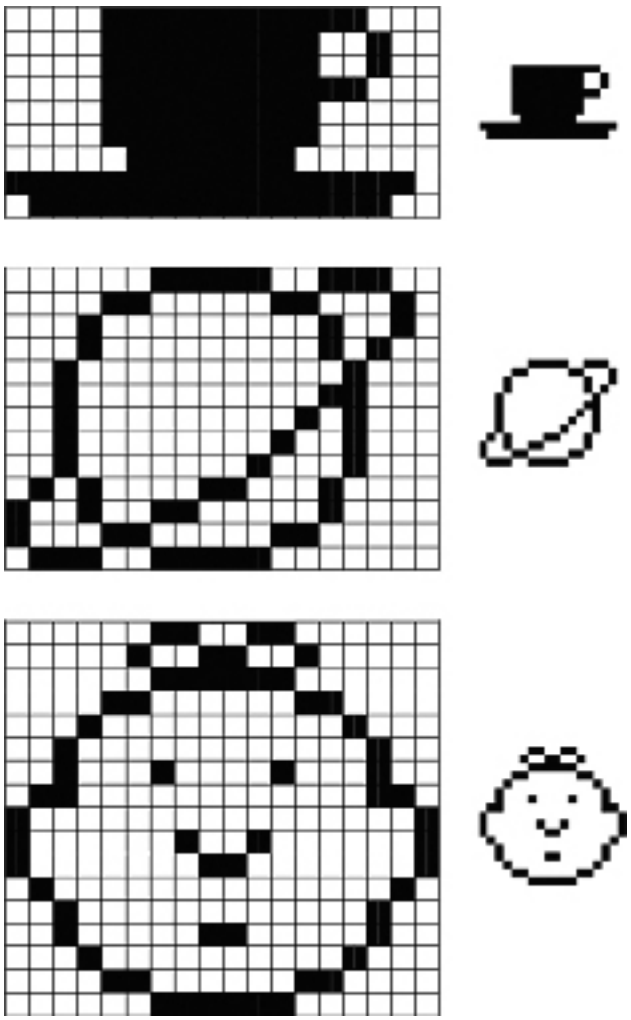
End of Module 3 Quiz

1. C.
2. D.
3. D.
4. D.
5. A.

Module 4

Look at Me

❶



End of Module 4 Quiz

❶ A.

❷ C.

❸ B.

❹ C.

❺ B.

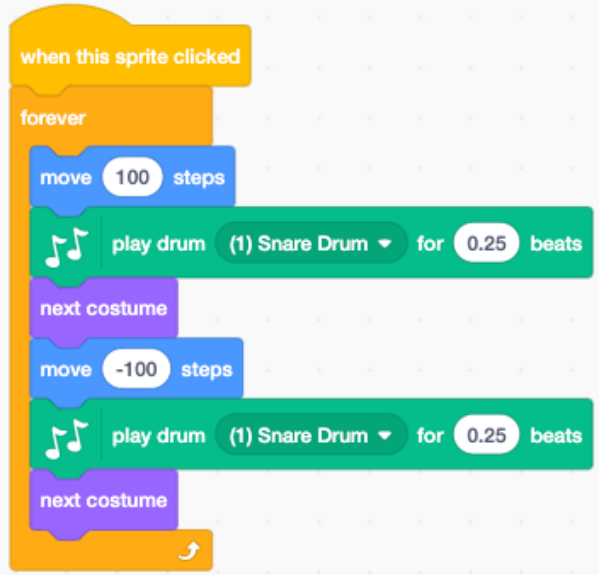
❻ B.

❼ C.

Easy Exercises

❶ Move to a Beat

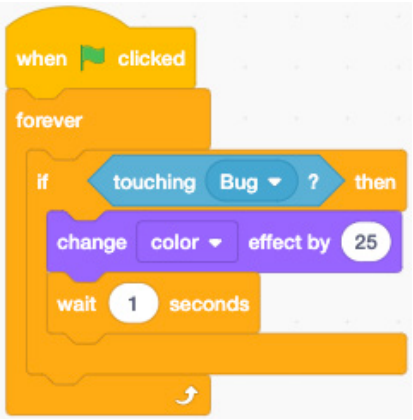
Check that the sprite moves when clicked. Make sure that drum beats are included in the script. Encourage the use of costume changes.



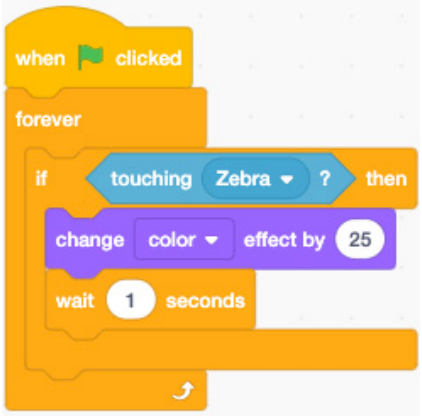
❷ Colour Burst

Check that the green flag starts the program. Both sprites require code to change colour.

Zebra Script

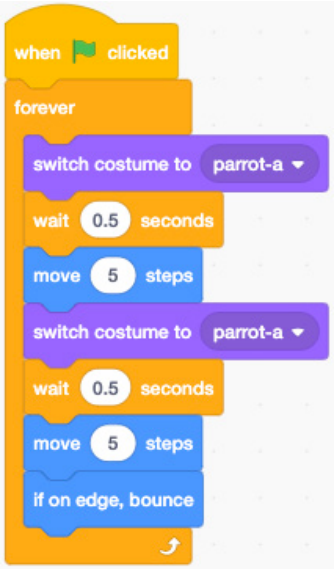


Bug Script



❸ Polly Moves About

A wait command can be used to control the speed of the parrot. Use the "if on edge, bounce" command to make the parrot bounce off the edge of the stage.

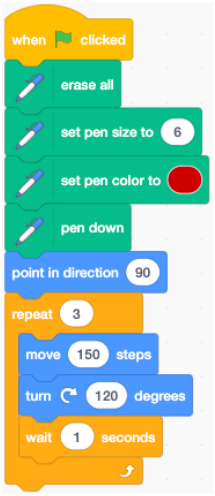


❹ Random Drum

Use the pick random command. The most efficient way of playing 5 random beats is using a repeat loop rather than 5 separate "play drum" commands.

❺ Draw a Triangle

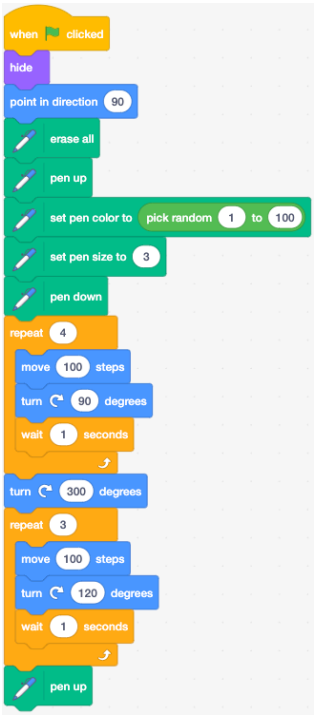
The most effective way of drawing a triangle is by using a repeat loop to draw and rotate 3 times instead of 3 separate draw and 3 rotate commands. Don't forget to put the pen down to start drawing!



Difficult Exercises

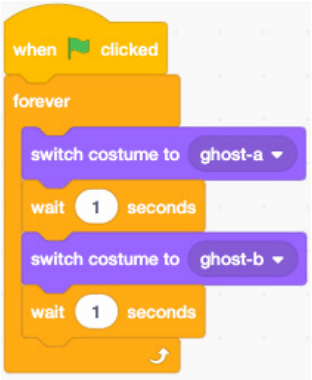
❶ Build a House

You will need to use 2 repeat loops for the triangle and square parts of the house. Make sure your sprite is pointing in the right direction and that you position the sprite correctly inside the house.



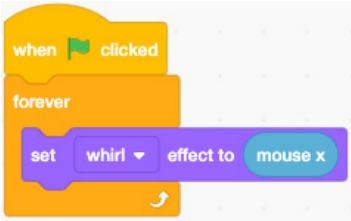
❷ Spooky Surprise

Create costume 2 by copying and editing costume 1 in the paint editor. Use a forever loop to repeat the switch between costume 1 and costume 2 continuously. A wait command can be used to decrease the speed of the animation.



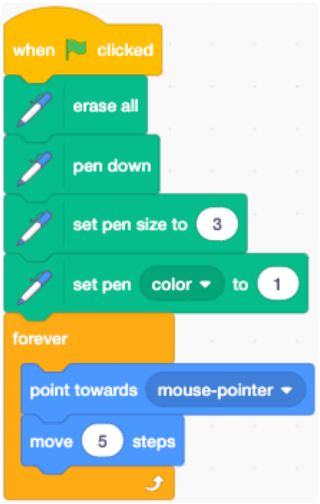
❸ Extraordinary Whirl

The set whirl effect should be placed in a forever loop. The forever loop allows the whirl effect to change continuously as the x position of the mouse changes. The "mouse x" command is found in the sensing block.



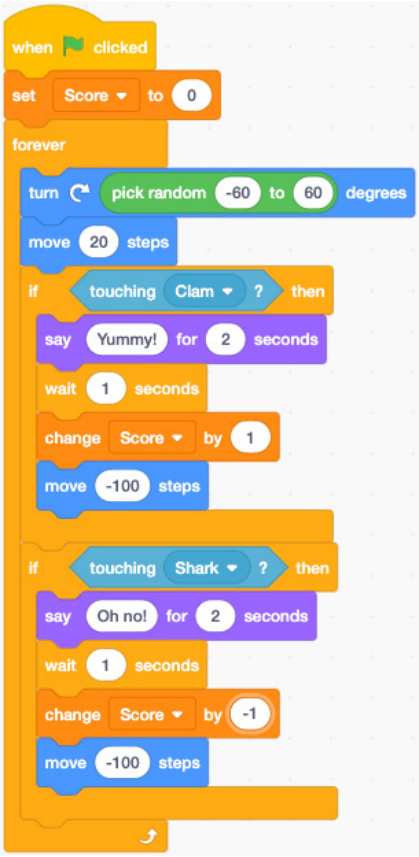
❹ Scribbling Dog

Use the pen down command to allow the sprite to scribble on the stage. Set the pen to any size or colour. Use the "point towards mouse-pointer" inside a forever loop to follow the mouse. Move the sprite to leave a trail.



❺ Score goes Up and Down

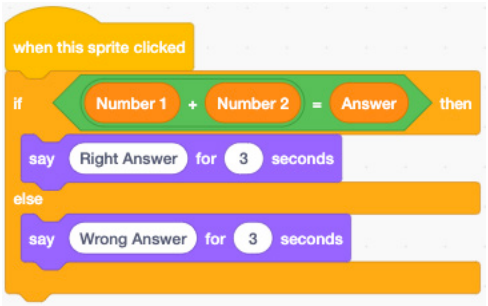
Create a variable score. Use the wait command to decrease the speed of the animation..



Extreme Exercises

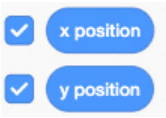
❶ What's the Answer?

Create 3 variables: Number 1, Number 2 and Answer. Use an if else statement. By using the 'when Sprite 1 clicked' command, clicking on the sprite should tell you if the answer is right or wrong. Remember to double click on your variables to make them into sliders as shown on the card.



❷ Keeping Track

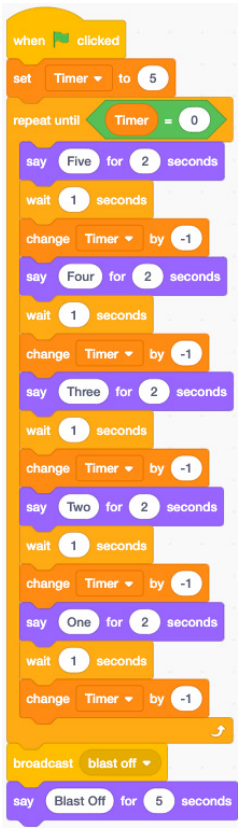
To make the variables for x position and y position appear on the stage, click the check box next to the block as shown here.



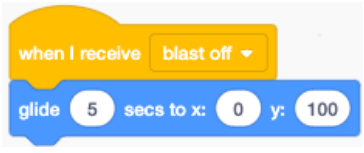
Once the variables appear on stage, you can then use a forever loop and pick random commands to make the sprite move randomly. The variables track the position of the sprite.

❸ 5,4,3,2,1

Draw a rocket or just use a picture of a plane from the Scratch image library. Create a variable called Timer and set it to 5. Use a 'repeat until' loop. When Timer = 0, broadcast 'blast off' to the rocket sprite.

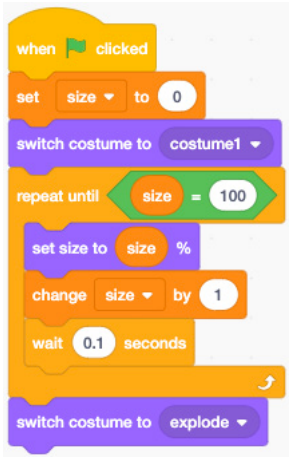


The rocket sprite contains the following code.



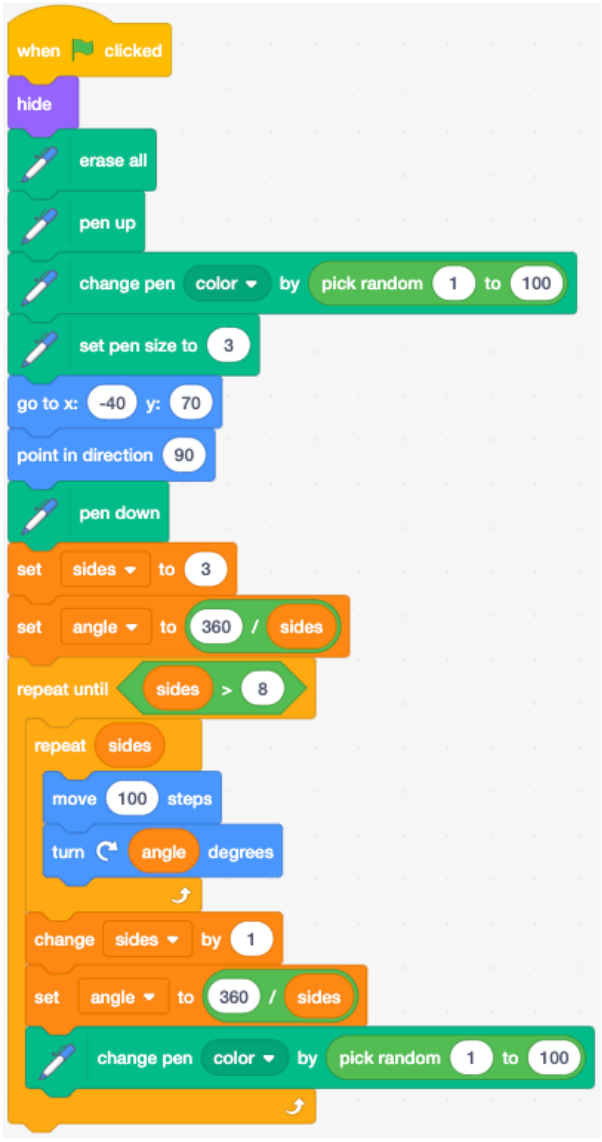
❹ Bigger and Bigger

Make the sprite shrink to zero. Create a variable named size. Use a repeat until loop to make the sprite grow to until it reaches full size (100%) again.



❺ Shape Sensation

Use variables to store sides and angle. Start with a triangle. Use a 'repeat until' loop to stop when sides = 9. Use 'wait' to slow things down.



Module 6

Changing Things Solutions

The full Scratch solutions for Module 6 modified projects are located at:
https://scratch.mit.edu/studios/226005

Towers Of Hanoi

❶ For 15 disks $(2^n-1) = 215-1 = 32768-1 = 32767$
For 25 disks $(2^n-1) = 225 - 1 = 33554432 - 1 = 33554431$
For 1,099,511,627,775 moves $1,099,511,627,775 = (2^n-1)$
$1,099,511,627,775 + 1 = 2^n$
$1,099,511,627,776 = 2^n$
$\text{Log}_2(1,099,511,627,776) = n$
$n = 40$

Number of Disks	Number of Moves Required to Solve the Problem
6	63
9	511
15	32,767
25	33,554,431
40	1,099,511,627,775
64	9,223,372,036,854,775,808

The Travelling Salesman Problem

❷

Date	Journey From	Journey To	Distance
Jun-21	Dublin	Portlaoise	85
Jun-22	Portlaoise	Thurles	65
Jun-23	Thurles	Tipperary Town	45
Jun-24	Tipperary Town	Limerick	45
Jun-25	Limerick	Tralee	110
Jun-26	Tralee	Cork	120
Jun-27	Cork	Clonmel	100
Jun-28	Clonmel	Waterford	55
Jun-29	Waterford	Kilkenny	60
Jun-30	Kilkenny	Dublin	125
		Total Distance	810

End of Module 7 Quiz

1. B.
2. D.
3. A.
4. C.
5. B.

End of Module 8 Quiz

1. D.
2. B.
3. C.
4. D.

End of Module 9 Quiz

1. C.
2. B.
3. C.
4. B.

End of Module 10 Quiz

1. C.
2. B.
3. A.
4. C.