

Scratch – Simple Programming

Simple Game Part 2

<http://www.yahmad.co.uk/>

Unit Overview

Objectives

Understand why computer programming scripts are used.

Understand the use of Variables as place holders for information.

Understand the script required to build simple games.

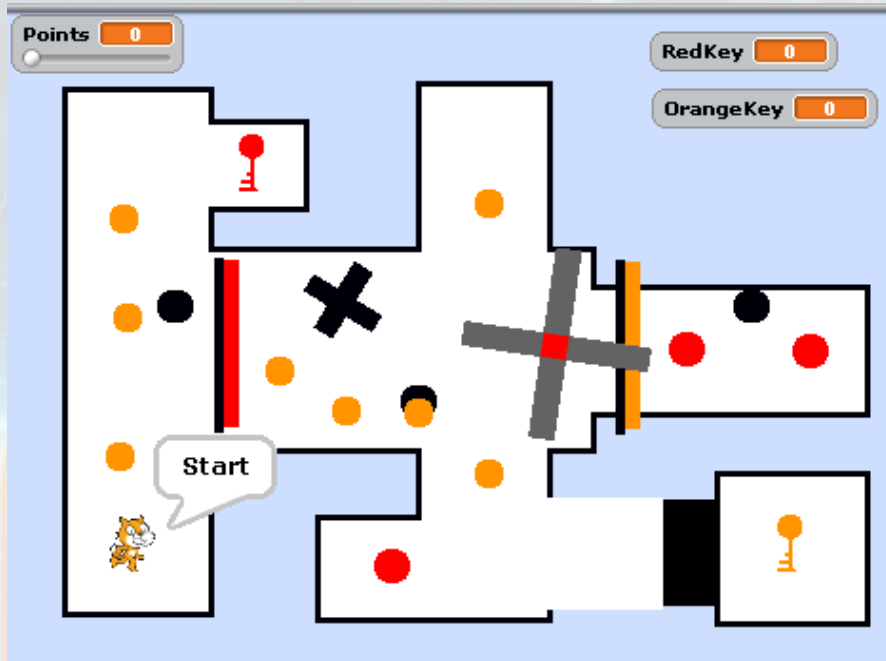
Outcomes

Time

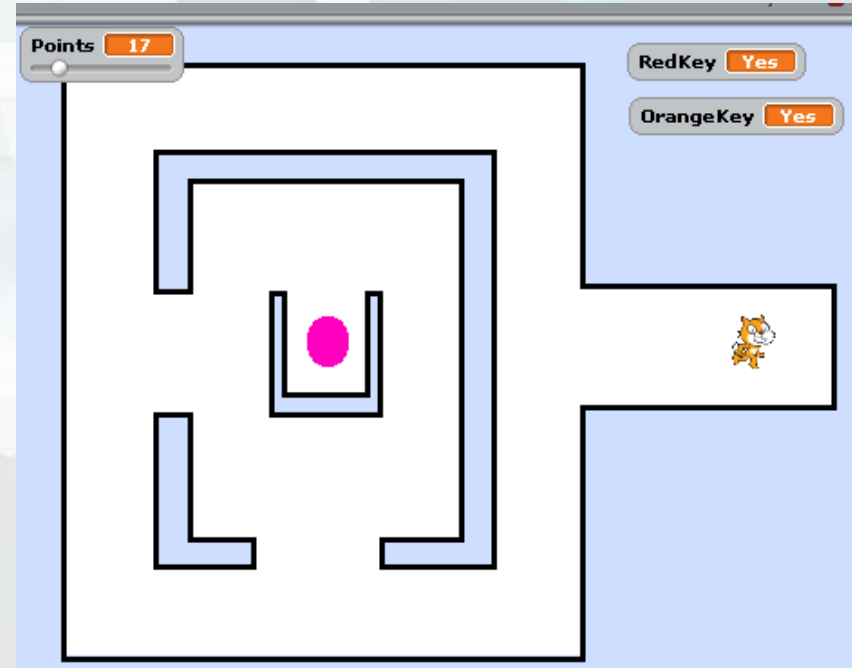
Task	Outcomes	Time
Task 1	Glide (X & Y axis)	
Task 2	Glide Game	
Task 3	Create Maze	
Task 4	Character Controls	
Task 5	Maze: Forever IF	
Task 6	Maze: Points	
Task 7	Broadcast	
Task 8	Levels	

Starter 1 - Discuss this Game

Level 1



Level 2



What is the purpose of this game?

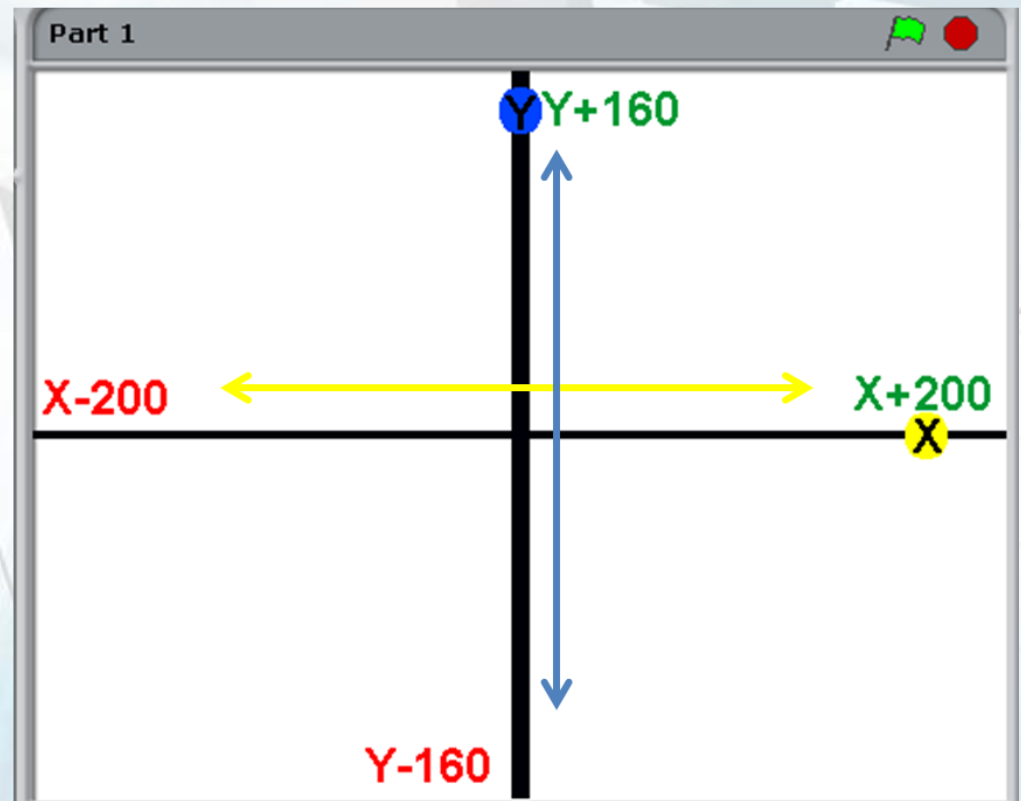
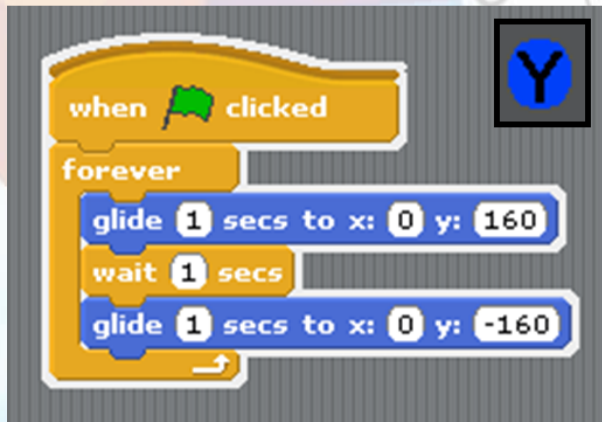
How would you complete this game?

Describe the use of the variables?

Identify the different scripts used in this game?

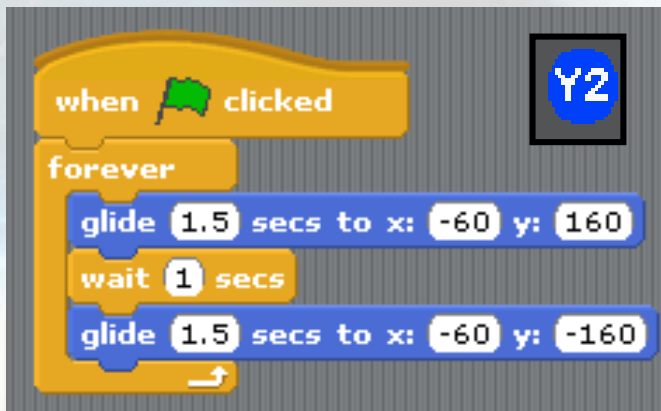
Task 1 – Glide (X & Y axis)

1. Open the **Glide Scratch File**.
2. Create the script shown so that the **blue (Y)** and **yellow (X)** ball glide along the appropriate axis.



Task 1 – Glide (X & Y axis)

3. Create duplicate sprites for the blue and yellow balls on the same scratch file.
4. Create the script shown for the new sprites.
5. Click on the green flag to preview the glide.



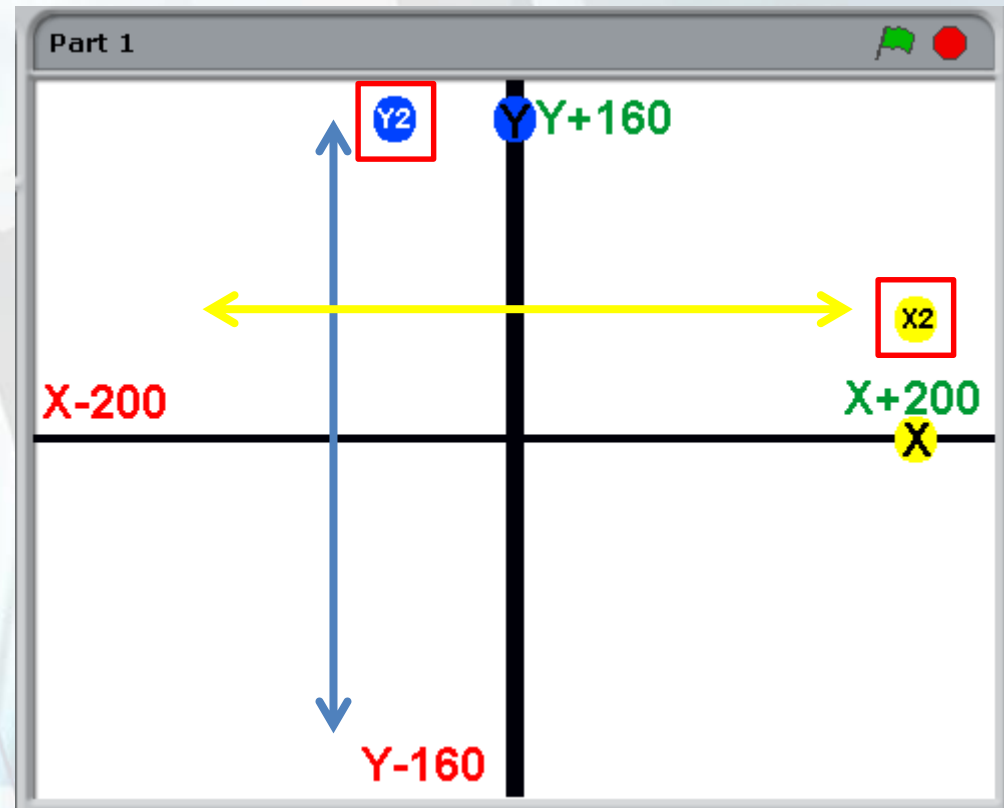
Scratch script for sprite Y2 (blue ball):

- when green flag clicked
- forever loop:
 - glide 1.5 secs to x: -60 y: 160
 - wait 1 secs
 - glide 1.5 secs to x: -60 y: -160



Scratch script for sprite X2 (yellow ball):

- when green flag clicked
- forever loop:
 - glide 1.5 secs to x: 200 y: 60
 - wait 1 secs
 - glide 1.5 secs to x: -200 y: 60



Task 2 – Glide Game

```
when clicked
  forever if touching color [ ] ?
    move 10 steps
    wait 0.2 secs
    next costume

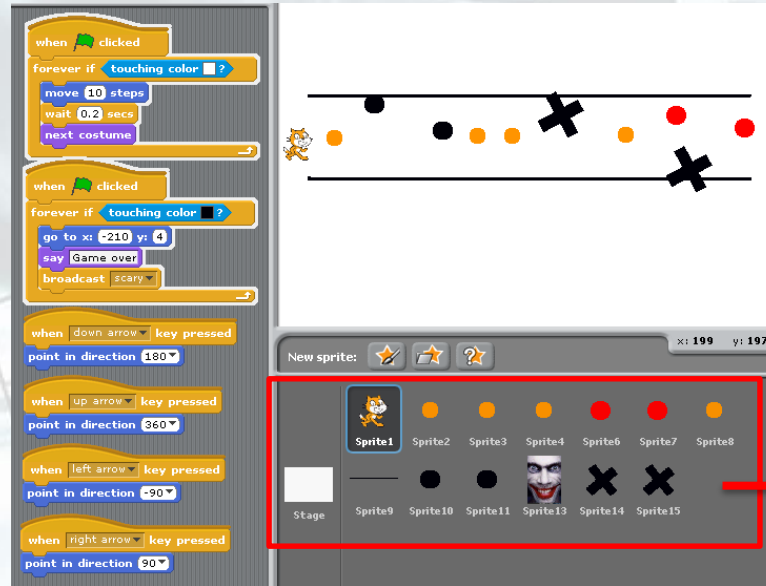
when clicked
  forever if touching color [ ] ?
    go to x: -210 y: 4
    say Game over
    broadcast scary

when down arrow key pressed
  point in direction 180

when up arrow key pressed
  point in direction 360

when left arrow key pressed
  point in direction -90

when right arrow key pressed
  point in direction 90
```



Aim: To collect all the points without touching anything in black.

Create new sprites for the content.

Tip: You can duplicate some sprites.

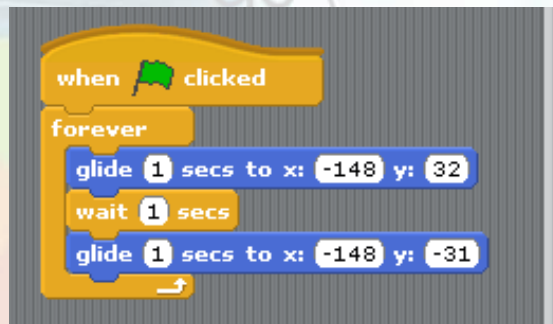
1. Create the content (sprites) for the Glide Game including:
 - Black bars
 - black gliding balls
 - Black Crosses
2. Set the character controls (keyboard).

Task 2 – Glide Game

3. Click on the relevant sprite and add the script shown below:

Black Gliding Balls: You will only have to change the position of the different gliding balls on the X (horizontal) axis.

Black Cross: The cross will forever turn by 1 degrees and loop until the game ends.



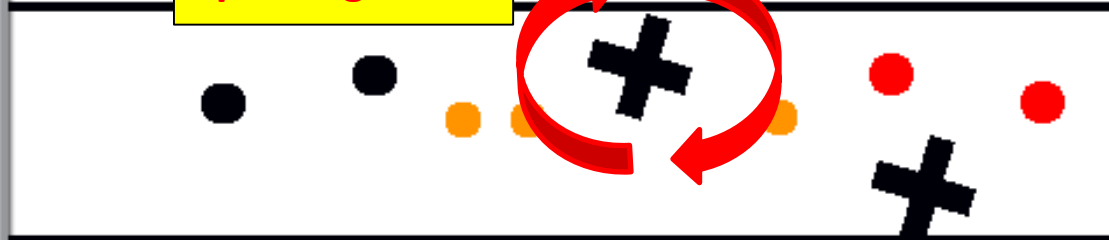
```
when green flag clicked
  forever loop
    glide 1 secs to x: -148 y: 32
    wait 1 secs
    glide 1 secs to x: -148 y: -31
```

Gliding Balls



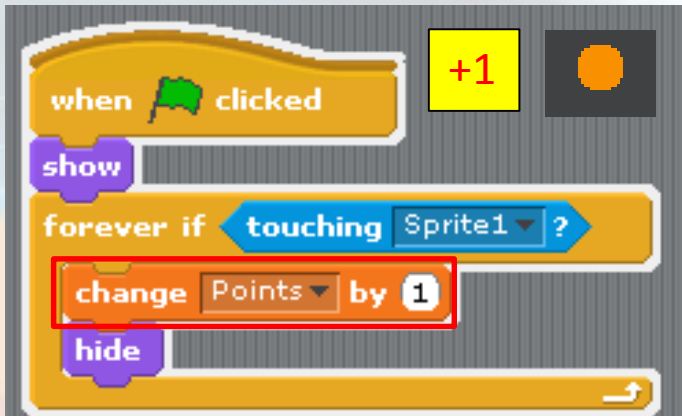
```
when green flag clicked
  forever loop
    turn 1 degrees
```

Spinning Cross



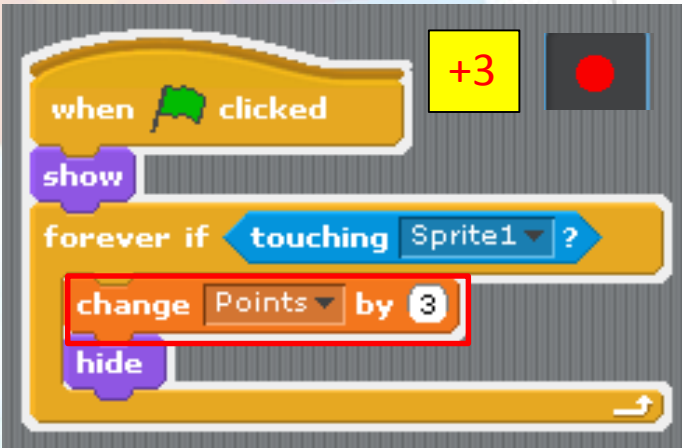
Task 2 – Glide Game

4. Create a **variable for the points**.
5. Click on orange and red sprites and add the script for the points.
When the cat (sprite1) **touches the orange and red balls**, points will be added to the **points variable** and the sprite will then be hidden.



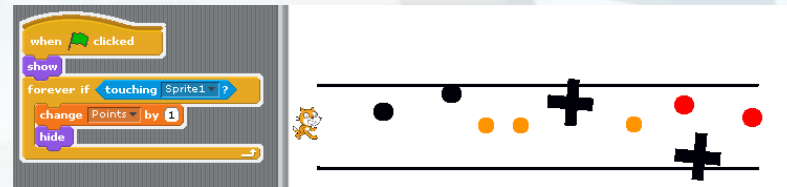
```
when green flag clicked
  show
  forever if touching Sprite1
    change Points by 1
  hide
```

A Scratch script for an orange ball. It starts with a 'when green flag clicked' block, followed by a 'show' block. Then there is a 'forever if touching Sprite1' loop containing a 'change Points by 1' block and a 'hide' block. A yellow box with '+1' and an orange ball icon are shown next to the script.



```
when green flag clicked
  show
  forever if touching Sprite1
    change Points by 3
  hide
```

A Scratch script for a red ball. It starts with a 'when green flag clicked' block, followed by a 'show' block. Then there is a 'forever if touching Sprite1' loop containing a 'change Points by 3' block and a 'hide' block. A yellow box with '+3' and a red ball icon are shown next to the script.



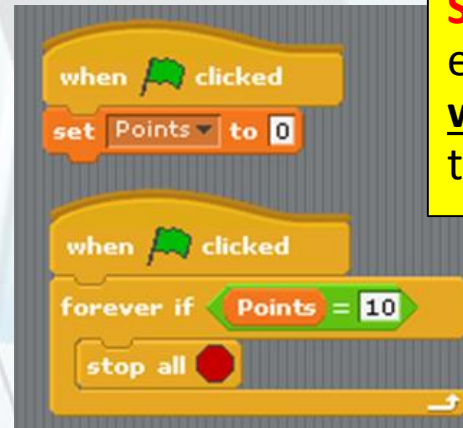
```
when green flag clicked
  show
  forever if touching Sprite1
    change Points by 1
  hide
```

A Scratch script for a black cross. It starts with a 'when green flag clicked' block, followed by a 'show' block. Then there is a 'forever if touching Sprite1' loop containing a 'change Points by 1' block and a 'hide' block. A yellow box with '+1' and a black cross icon are shown next to the script.



```
when green flag clicked
  show
  forever if touching Sprite1
    change Points by 3
  hide
```

A Scratch script for a black cross. It starts with a 'when green flag clicked' block, followed by a 'show' block. Then there is a 'forever if touching Sprite1' loop containing a 'change Points by 3' block and a 'hide' block. A yellow box with '+3' and a black cross icon are shown next to the script.



```
when green flag clicked
  set Points to 0
  when green flag clicked
  forever if Points = 10
    stop all
```

A Scratch script for a 'stop all' block. It starts with a 'when green flag clicked' block, followed by a 'set Points to 0' block. Then there is another 'when green flag clicked' block, followed by a 'forever if Points = 10' loop containing a 'stop all' block.

Stop All: When the points equal ten then **all the scripts will stop**. Place this script on the **stage**.



Task 2 – Glide Game (Broadcast)



```
when green flag clicked
  forever if touching color black?
    go to x: -210 y: 4
    say Game over
    broadcast scary
```

6. You should have a sprite which will be shown once the game has ended (Sprite 1 – Cat) touches the black.

7. Using the **broadcast** and **receive** script show the scary face once the game has ended.

Broadcast **scary** when game ends.



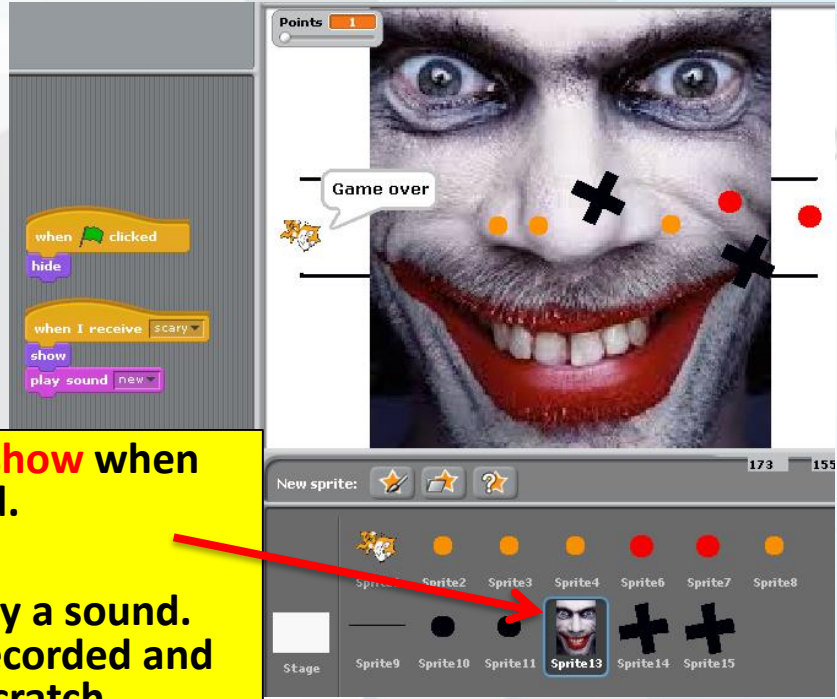
```
when green flag clicked
  hide

when I receive scary
  show
  play sound new
```

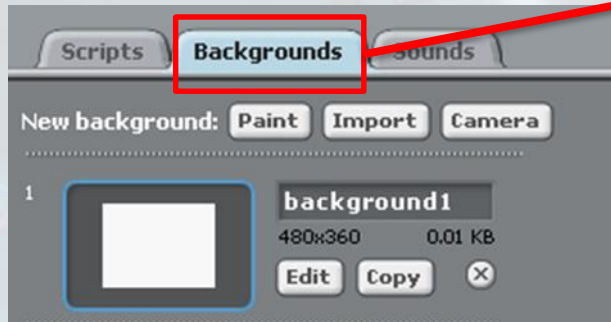
Scary Face will be **hidden** when game starts.

Scary Face will **show** when **scary** is received.

You can also play a sound. Sound can be recorded and imported into scratch.



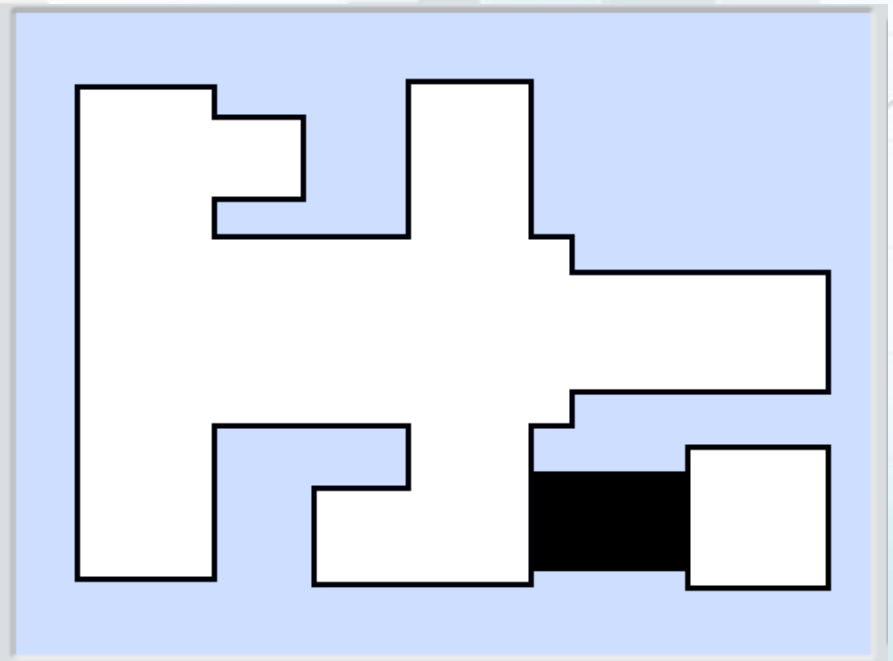
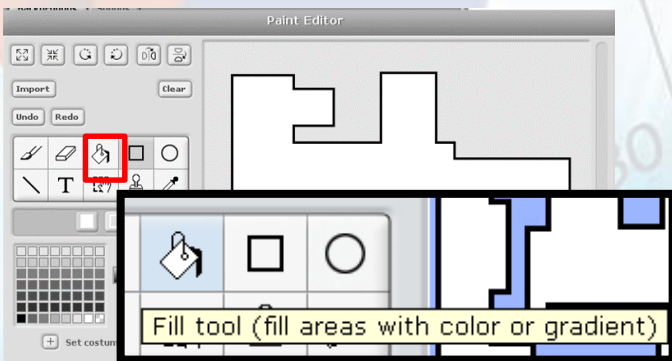
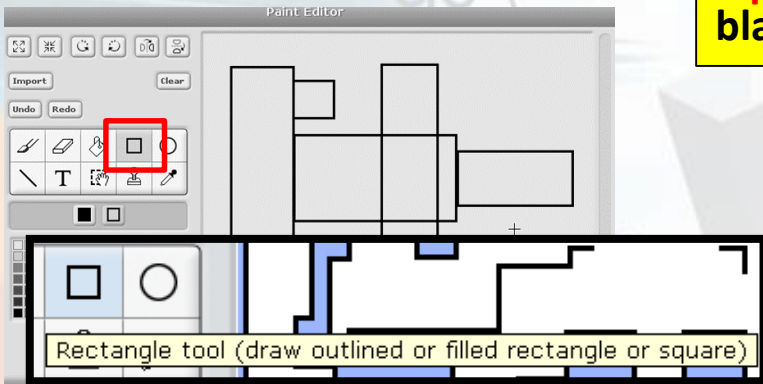
Task 3 – Create Maze



1. Edit the **stage background** and draw your maze using the **Rectangle** and **Fill** tools.

The outline of the maze should be **black** which will mean if the sprite makes **contact with the outline** then the **game will come to an end**.

Tip: Use a White rectangle or brush to cover the black lines inside of the maze.



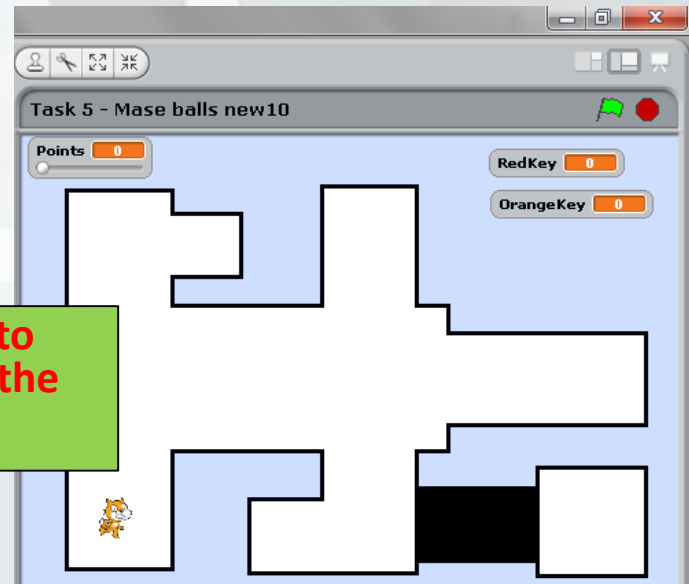
Task 4 – Character Controls

The image shows a collection of Scratch code blocks for character controls, arranged in a grid. The blocks are as follows:

- Top Left:** A script starting with "when green flag clicked", followed by a "forever if" loop with the condition "touching color black?". Inside the loop are "hide" and "broadcast Gameover" blocks.
- Top Right:** A script starting with "when green flag clicked", followed by "go to x: -170 y: -100", "wait 1 secs", "show", and "say Start for 2 secs". Below this is another "forever if" loop with the condition "touching color white?". Inside the loop are "wait 0.5 secs", "next costume", and "go to mouse-pointer" blocks.
- Middle Left:** A script starting with "when green flag clicked", followed by a "forever if" loop with the condition "touching color pink?". Inside the loop are "hide" and "broadcast Youwin" blocks.
- Middle Right:** A script starting with "when green flag clicked", followed by a "forever if" loop with the condition "Points = 17". Inside the loop is a "broadcast nextlevel" block.
- Bottom:** A script starting with "when I receive Youwin", followed by a "hide" block.

Red arrows point from callout boxes to specific blocks: one points to the "when green flag clicked" block in the top right; another points to the "touching color pink?" condition in the middle left; a third points to the "Points = 17" condition in the middle right; and a fourth points to the "broadcast Youwin" block in the middle left.

Set a start point and a countdown for the sprite.



Conditions to move onto the next level.

Conditions to win the game.

Conditions to end the game.

2. Set the **character controls** (keyboard or mouse). Mouse controls have been used for this example.
3. Set a **start point** for the sprite.
4. Create a **points variable**.

Task 5 – Forever IF

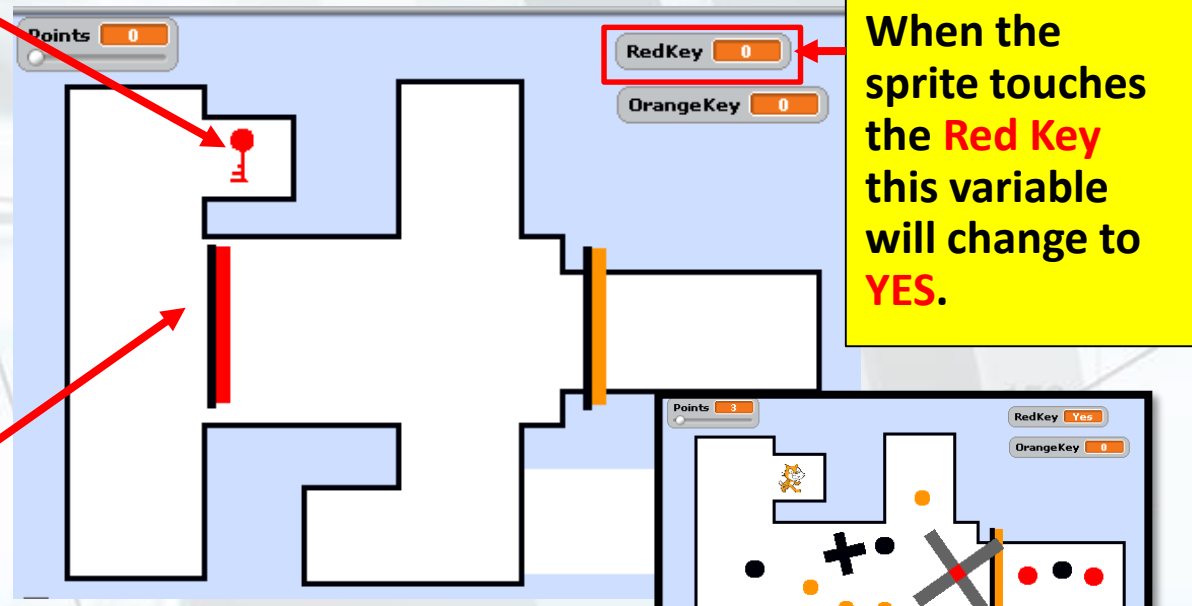
5. Create a **variable for Red Key** and **Orange Key**.
6. Create the **sprite for the Keys** and the **doors** and add the script shown. Make sure the outline of the door is black so that the game will end if the sprite comes into contact with the door.

```
when green flag clicked
  show
  forever if touching Sprite1?
    set RedKey to Yes
  hide
```

```
when I receive Gameover
  hide
```

```
when green flag clicked
  show
  forever if RedKey = Yes
    hide
```

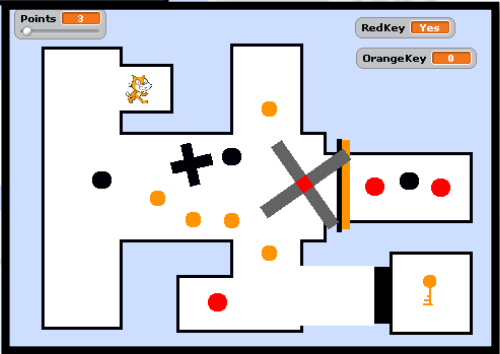
```
when I receive Gameover
  hide
```



When the sprite touches the **Red Key** this variable will change to **YES**.

This door will **show** until the **Red Key Variable** changes to **YES**.

```
when green flag clicked
  switch to background background1
  set Points to 0
  set RedKey to 0
  set OrangeKey to 0
  set GreenDoor to 0
```



On the **stage** set the **variables to 0** at the start of each game.

Task 5 – Forever IF

Forever IF: Conditions to decrease size of the sprite.

```
when green flag clicked
  show
  forever
    turn 1 degrees
  when I receive nextlevel
    hide
  when I receive Gameover
    hide
  when clicked
    forever if Points = 0
      switch to costume costume1
    forever if Points = 4
      switch to costume costume2
    forever if Points = 7
      switch to costume costume3
    forever if Points = 11
      hide
```

Task 5 - Mase balls new10

Points 0

Start green flag scrip

OrangeKey 0

3

7 Create a sprite for a big cross. Then create two more costumes and decrease the size of the cross.

8. Add the script shown. The cross will spin and decrease in size when the points are collected. Eventually the cross will disappear.

1

costume1

118x123 1 KB

Edit Copy X

2

costume2

84x86 0.65 KB

Edit Copy X

3

costume3

50x48 0.35 KB

Edit Copy X

Shrink sprite

Costumes decreases in Size



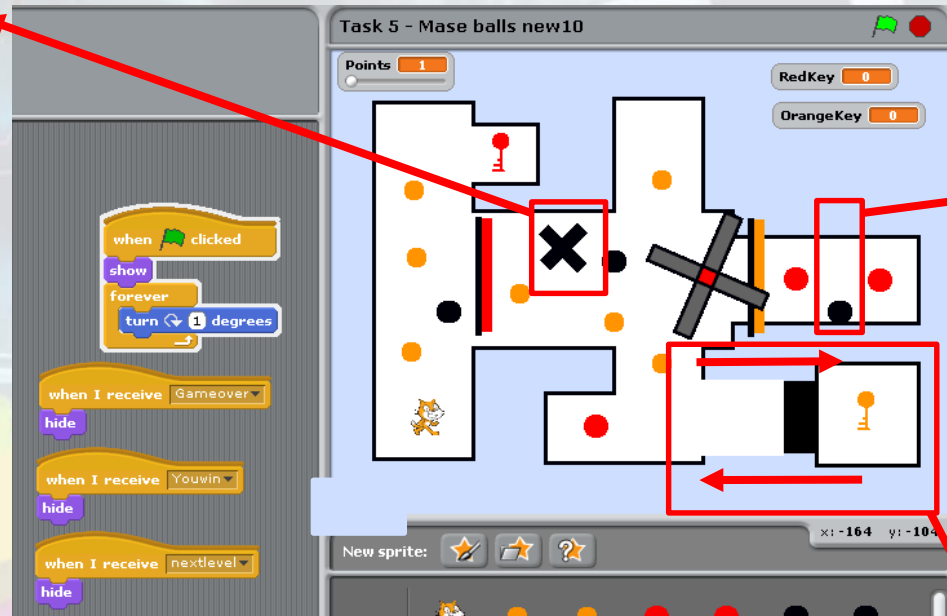
Task 5 – Forever IF & Glide



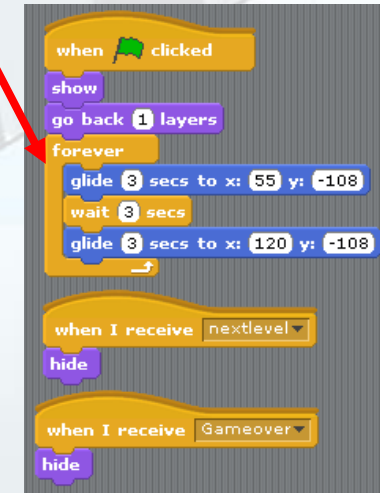
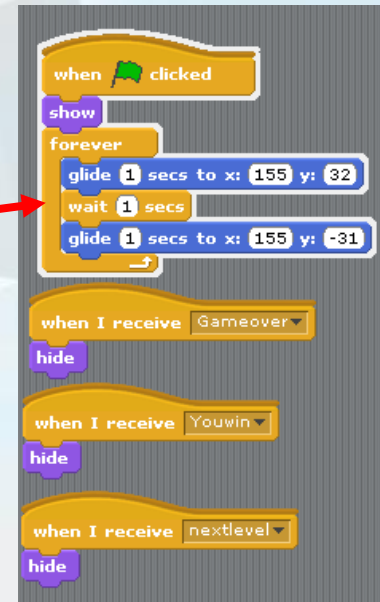
You can also make the cross glide up and down.

Hide the sprites when the game is over (Win/lose) or when you move to the next level.

9. Create the sprites which will be either spinning or gliding.
10. Apply the script shown to these sprites.



White Rectangle will be gliding. Sprite will have to get across to collect the orange key. However if the sprite touches the black the game will end.



Task 6 – Points

11. Create the sprite for the points and add the script shown.

- The **orange ball** will **add one** to the **points variable**.
- The **red ball** will **add three** points to the **points variable**.

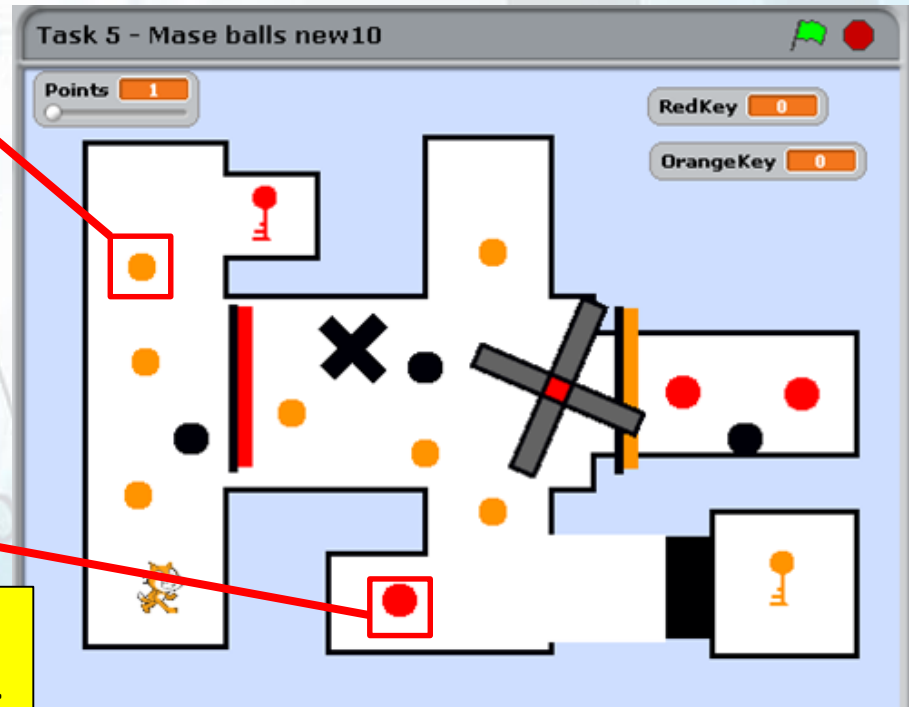
```

when green flag clicked
  show
  forever if touching Sprite1?
    change Points by 1
  hide
  when I receive Gameover
    hide
  
```

```

when green flag clicked
  show
  forever if touching Sprite1?
    change Points by 3
  hide
  when I receive Gameover
    hide
  
```

Hide the sprites when touching sprite 1 (cat) or the game is over.



Task 7 – Broadcast



12. Add the **broadcast** script when the condition for the game ending (**Touching black**) has been met.
13. You can **create a new sprite for the Game Over Screen**.
14. Add the **receive script** for the Game Over sprite.

When **the game starts** the **game over sprite will be hidden**.



When the **Gameover broadcast is received** then all other game **elements will be hidden** and the game over sprite will only be visible.



Task 8 – Level

when green flag clicked

forever if **Points = 17**

broadcast nextlevel

New sprite: Sprite1

when I receive nextlevel

switch to background background2

Stage

Broadcast for next level

Receive to show background2

Scripts Backgrounds Sounds

new background: Paint Import Camera

background1 480x360 9 KB

background2 480x360 15 KB

Points 17

RedKey Yes

OrangeKey Yes

Stage

when green flag clicked

forever if touching color [pink]

hide

broadcast Youwin

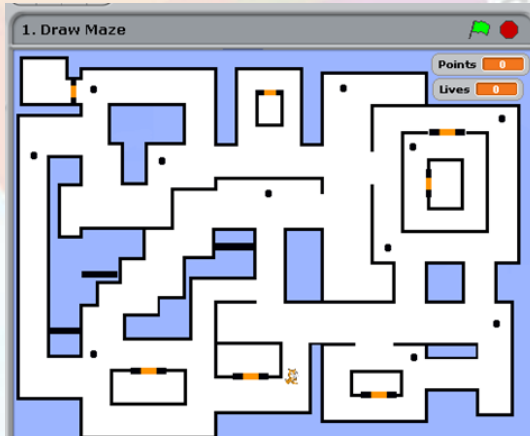
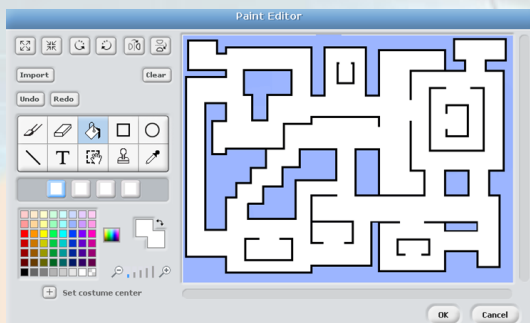
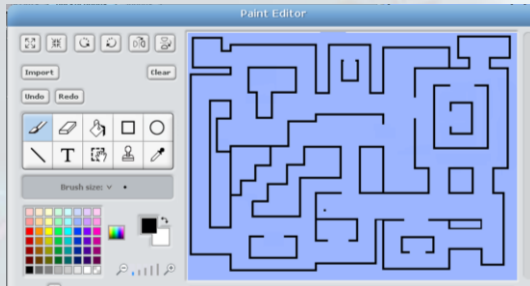
when I receive Youwin

show

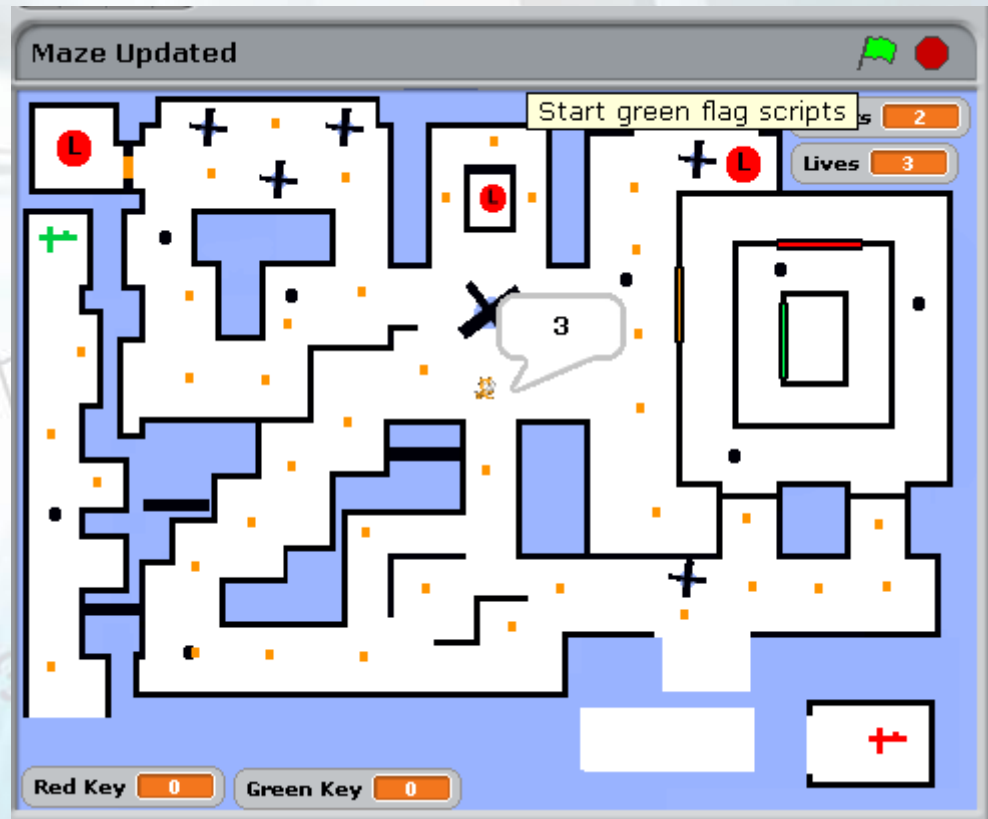
You Win

- 15. Set the condition for the game to go to the next level (**Points = 17**).
- 16. Then create a **broadcast for the next level**.
- 17. Create a **new background with a new maze**.
- 18. Create a condition for the game to end (Win).
- 19. Create a **broadcast and receive script to show the You Win sprite**.

Create your own game



Create your own game using the skills you have picked up from this task. You may include additional features such as lives.



Plenary – Refer to the Lesson Objectives

Objectives

Understand why computer programming scripts are used.

Understand the use of Variables as place holders for information.

Understand the script required to build simple games.

Plenary Task (Q&A)

Peer assess each other scripts.

Based on the skills you have learnt think about creating your own game. What type of scripts would you use.