














Scratch – Developing Games: Scoring and Levels

<p>Aim: Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.</p> <p>Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.</p> <p>Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.</p> <p>Complete game playability by adding scoring and levels.</p> <p>I can add point-scoring and levels to game code.</p>	<p>Success Criteria: I can identify new features to be added to a game. I can create a variable. I can use code to increase the value of a variable. I can add relevant messages that are linked to a final value.</p>	<p>Resources: Lesson Pack</p> <p>Desktop computers, laptops or tablets. (This lesson is intended for use in conjunction with Scratch 3 software.)</p> <p>Whiteboards and pens</p>
	<p>Key/New Words: Code, algorithm, sprite, character, backdrop, block, script events, sequence, levels, repeat, commentary, consequence, action, penalty, test, debug, costume, score, variable.</p>	<p>Preparation: Open Scratch website and load _____ in advance.</p> <p>Differentiated Scoring and Levels Activity Sheet – as required</p>

Prior Learning: This lesson builds on Lessons 4 and 5 (Creating the Splat Game) and also prior units on Scratch programming.

Learning Sequence

	<p>Review the Game: Ask children to review the status of the game so far. Ensure that children are given some time to add in any features from previous lesson that have not yet been completed. <i>Can children state the features that have now been added and what is missing?</i> Consider all ideas from children and discuss possible implementation, then direct them to the introduction of point-scoring. Compare to other games children know.</p>	
	<p>Point-Scoring: Ask children how points will be scored in the game. This is likely to be for the character successfully jumping over each oncoming water balloon. Ask how the computer code will recognise that this has happened. One way is to count each time the balloon hits the wall, as the character must have therefore avoided being hit.</p>	
	<p>Making a Variable: Explain to children that a variable is the name for something which can be given a numerical value and that this value can be changed as desired within the code. Demonstrate that we can make our own variable by clicking on the 'Variables' option in the 'Code' tab. Link back to the Year 4 unit on Questions and Quizzes. Remind children how to make a variable, name it 'Score' and add 'Set Score to 0' at the beginning of the game.</p>	
	<p>Try It Yourself: <i>Can children add a variable and the create the code to add point-scoring to their game?</i></p> <div style="display: flex; justify-content: space-around;"> <div>  <p>Children input a simplified version of the script, as instructed on the Scoring and Levels Activity Sheet, making choices to edit particular values.</p> </div> <div>  <p>Children are given instructions on the Scoring and Levels Activity Sheet and must follow them to create the script, while making some of their own coding decisions.</p> </div> <div>  <p>Children use the open-ended prompts on the Scoring and Levels Activity Sheet to develop their code. Individual solutions to creating the script may vary but trial and error should be encouraged.</p> </div> </div>	
	<p>Play the Game: Choose children to show the design of their game. Play and evaluate, then look at the code. Test and debug. Appraise each other's games and suggest next steps. <i>Can children test and debug each other's code?</i> Save for future editing.</p>	

Taskit: Can you add an extra level to the game with increased difficulty?

Playit: Remember to try playing your game and share it with friends. Have fun!

Guidance for Macros in PowerPoints

We use macros within PowerPoints to increase the interactivity of our presentations. Follow this simple process to get the most out of this resource.

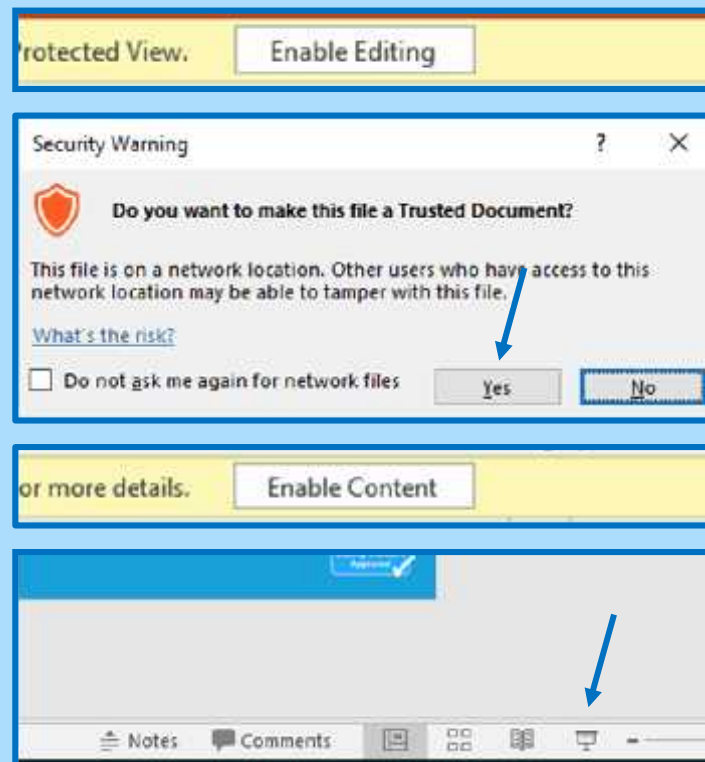
What to do:

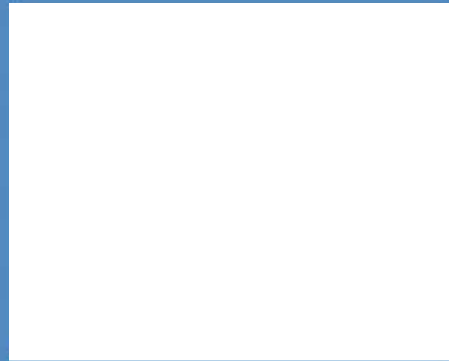
Open the PowerPoint file and enable editing.

A security warning box may appear. Click yes.

Click enable content.

Enter presentation mode (start the slide show).





Computing

Scratch Developing Games

Scoring and Levels



Aim

- I can add point-scoring and levels to game code.

Success Criteria

- I can identify new features to be added to a game.
- I can create a variable.
- I can use code to increase the value of a variable.
- I can add relevant messages that are linked to a final value.

Review the Game



- Let's review the status of the game so far.
- What features have now been added and what is missing?
- Your first task will be to add in any features from the last lesson that have not yet been completed in your game.



Point-Scoring

How will points be scored in the game?

- ✓ The character must successfully jump over each oncoming water balloon.

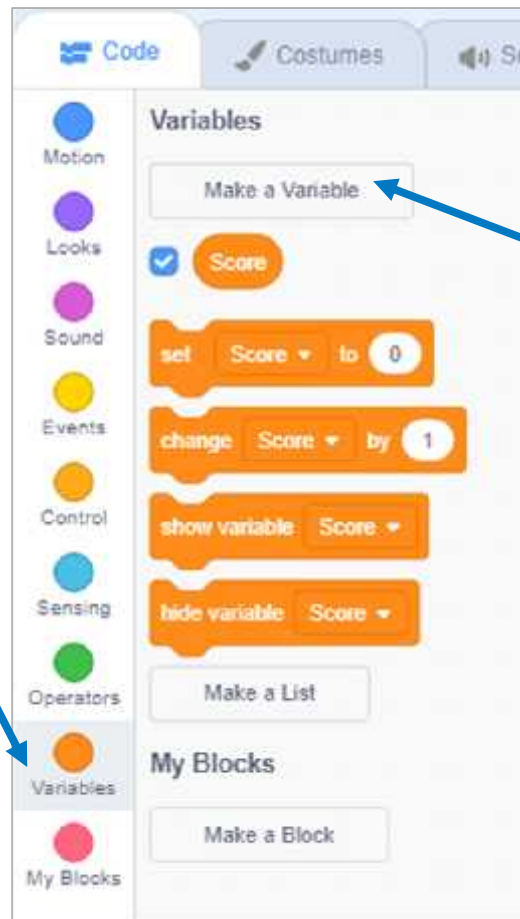
How will the computer code recognise that this has happened?

- ✓ One way is to count each time the balloon hits the wall, as the character must have therefore avoided being hit.



Making a Variable

We can make our own variable by clicking on the Variables option in the Code tab.



Click on Make a Variable, name it 'Score' and add 'Set Score to 0' at the beginning of the game.

Try It Yourself



Now, see if you can add scoring to your game by increasing the 'Score' variable every time the character jumps the balloon.

Use the **Scoring and Levels Activity Sheet** to help.

The image shows a screenshot of a digital activity sheet titled "Scoring and Levels". It is divided into three columns, each with a star icon in a black banner at the top: one star, two stars, and three stars. The first column, "Scoring", shows a Scratch script with a "Set Score to 0" block. The second column, "Scoring", shows a "When green flag clicked" event block followed by a "Say Hello" block and a "Change Score by 1" block. The third column, "Scoring", shows a "When green flag clicked" event block followed by a "Say Hello" block and a "Change Score by 1" block. To the right of these columns is a "Data" table with columns for "Data" and "Category". Below the table is a "My Blocks" section with a "Make a block" button. The "Levels" section contains text: "How can the player advance to the next level?" and "How can the player lose a level?". At the bottom right is a game preview window showing a cat character on a green field with a blue balloon and a score of 0. The background of the activity sheet is a light blue and green gradient.

Play the Game



○ Make sure you have saved your file 'Splat Game v3'.

○ Compare games and coding solutions with other children in the class.

○ Try out each other's games to see if they act as expected.

○ Test and debug the code.

○ Can you suggest the possible next steps for this game?



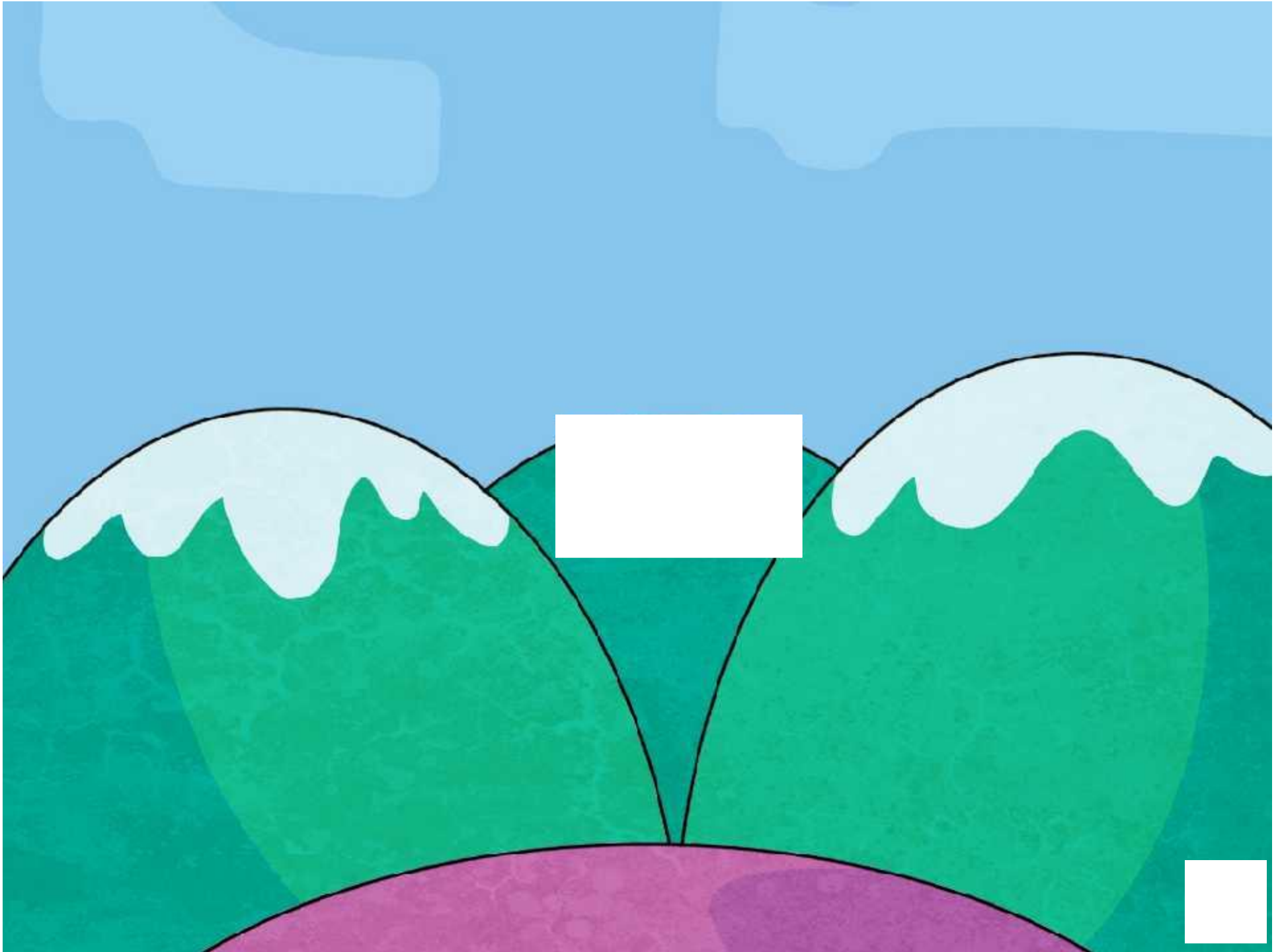
Aim



- I can add point-scoring and levels to game code.

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Aim: I can add point-scoring and levels to game code.				Date:					
				Delivered By:			Support:		
Success Criteria	Me	Friend	Teacher	T	PPA	S	I	AL	GP
I can identify new features to be added to a game.				Notes/Evidence					
I can create a variable.									
I can use code to increase the value of a variable.									
I can add relevant messages that are linked to a final value.									
Next Steps									
) _____									
) _____									

T	Teacher	I	Independent
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Scoring and Levels

Scoring

Use the Variables section in the Code tab to Make a Variable.

Set **Score to 0** at the beginning of the code.

You could add these **If Then Else** blocks to display messages when the final score is calculated.

Find the '**Score**' block in the Data section and use the '**□=□**' block from the Operators section.

Add this block to Change the Score by 1 each time the balloon touches something.



Scoring and Levels

```
when green flag clicked
  go to x: -150 y: 30
  forever loop
    if not touching Sprite2? then
      say Can't hit me!
    else
      change Score by -1
      start sound meow
      say Oh no! for 1 seconds

when space key pressed
  change y by 100
  switch costume to costume2
  wait 0.75 seconds
  change y by -100
  switch costume to costume1
```

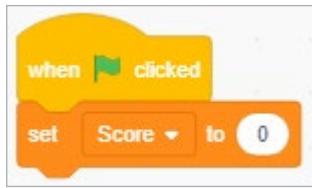
Add this **Change Score by -1** block here for each time the balloon hits the character.

Can you explain how this works?



Scoring and Levels

Scoring



Use the Variables section in the Code tab to Make a Variable.

Set Score to 0 at the beginning of the code.

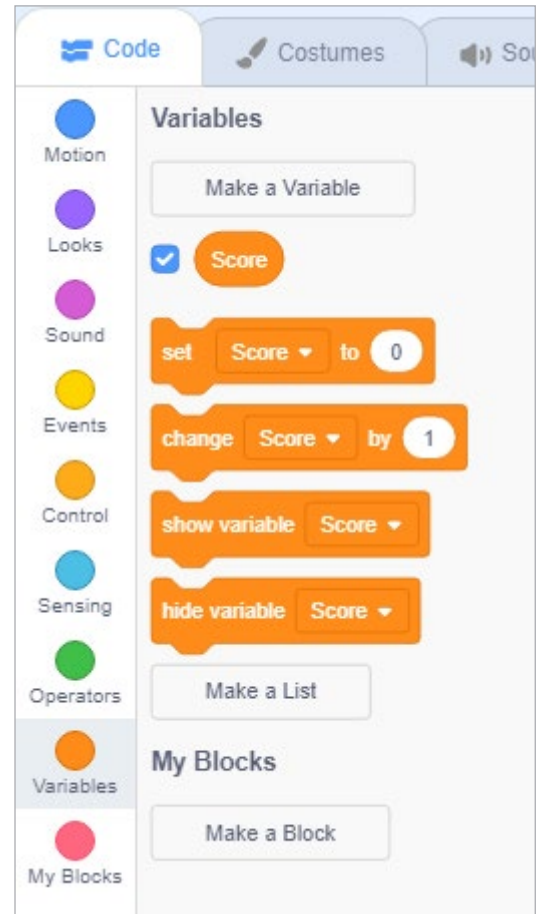
In the code for the character sprite, **Change Score by -1** when the sprite is hit by the balloon.

In the code for the balloon, **Change Score by 1** each time it hits either the wall or character.

Can you explain why this works?

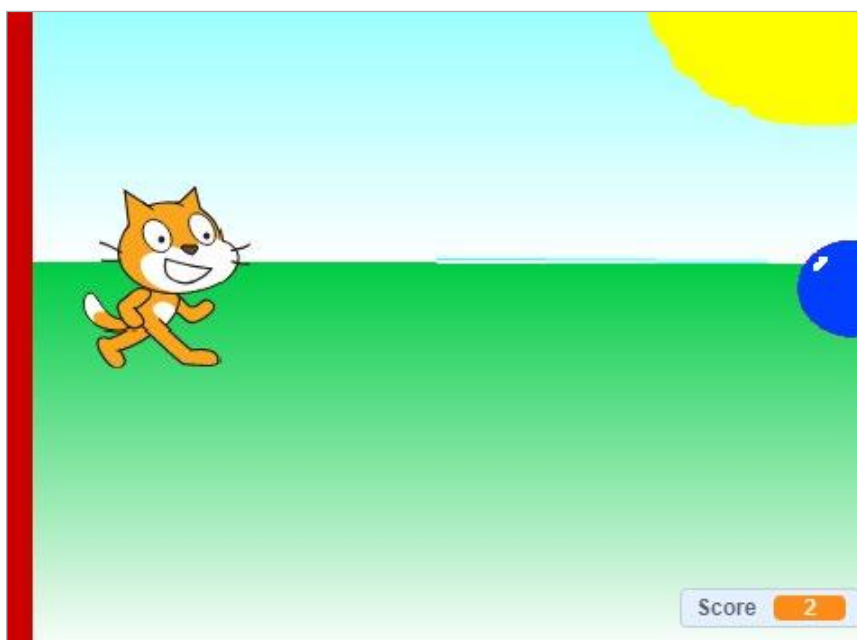
Add messages to appear at the end of the game, based on the final score for the player, e.g. 'Well done – great score!' or 'Bad luck – try again next time!'

This section of code could go at the end of the balloon code. Try using the block for **If Then Else**.



Levels

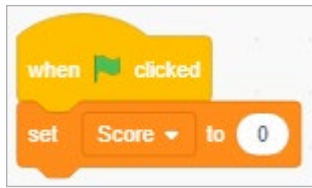
How can the game be developed to add extra difficulty or levels? Maybe make the balloon travel faster or more times, or perhaps add a whole new backdrop or sprite. As a final challenge, try to write the code for the next level!





Scoring and Levels

Scoring

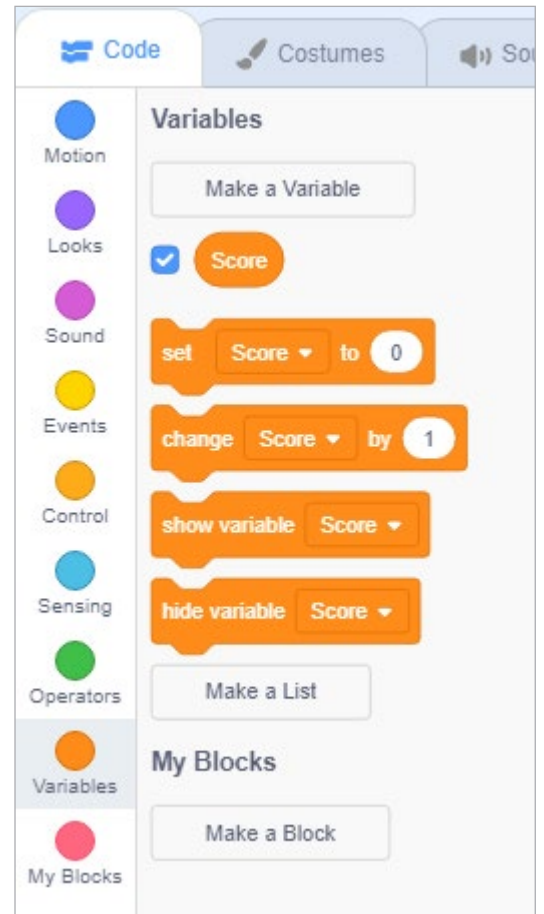


Use the Variables section in the Code tab to Make a Variable.

Add point-scoring to your game so that a point is scored every time the character successfully jumps over the balloon.

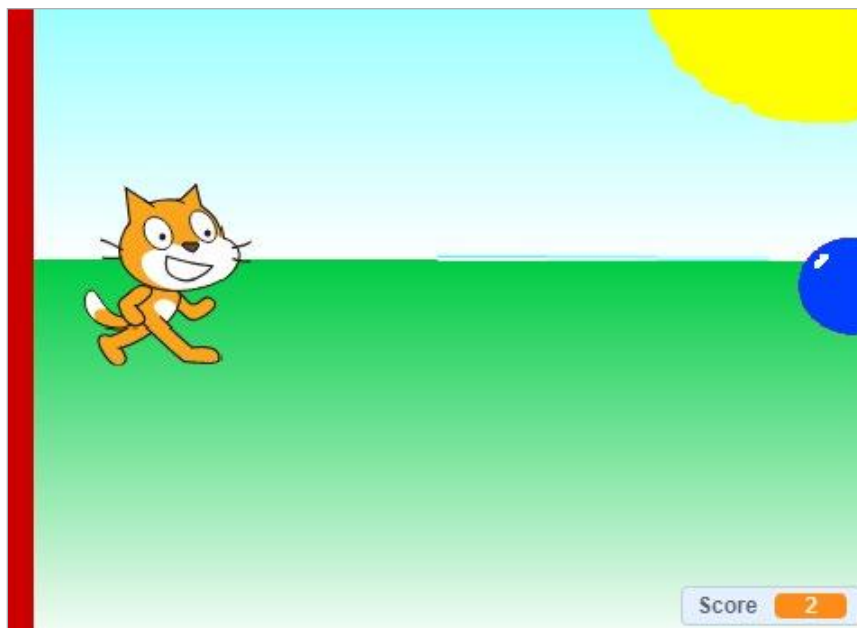
Test and debug the code.

Add messages to appear at the end of the game, based on the final score for the player, e.g. 'Well done – great score!' or 'Bad luck – try again next time!'



Levels

How can the game be developed to add extra difficulty or levels? Maybe make the balloon travel faster or more times or perhaps add a whole new backdrop or sprite. As a final challenge, try to write the code for the next level!

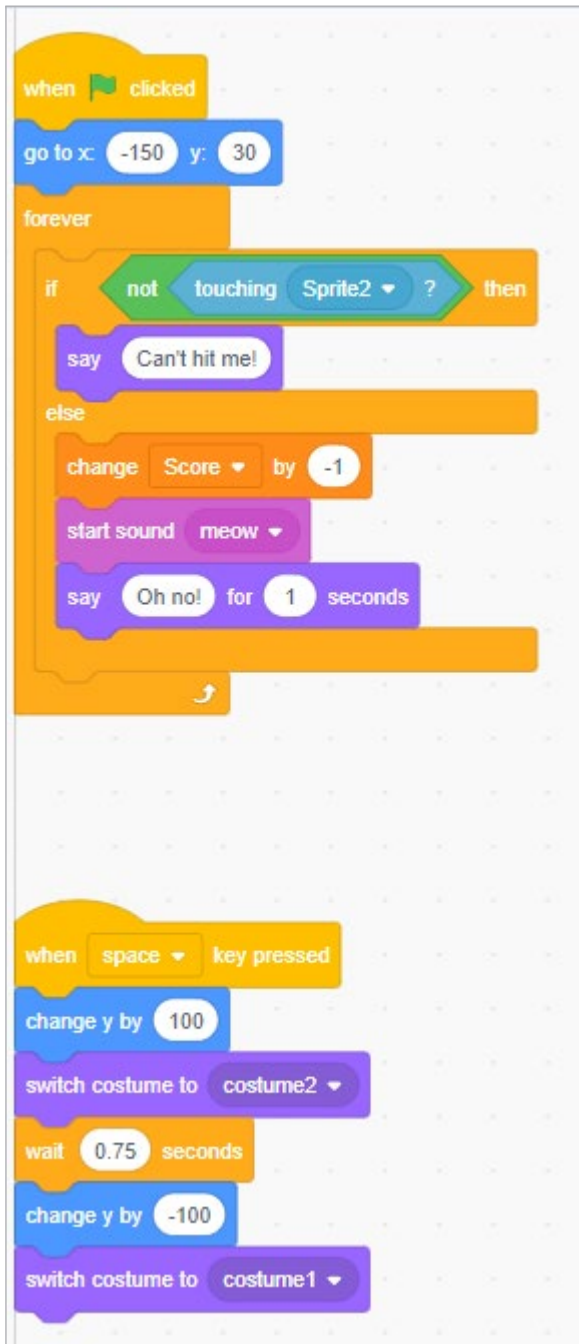


Scoring and Levels

Children's individual solutions to creating the script may vary but trial and error and experimentation with ideas should be encouraged. It is good practice to save the coding file regularly. Children could also be directed to use 'Save As' in order to save different versions of their code, making it easier to return to a previous version in the event of errors.

Adapted code for the game could look like this:

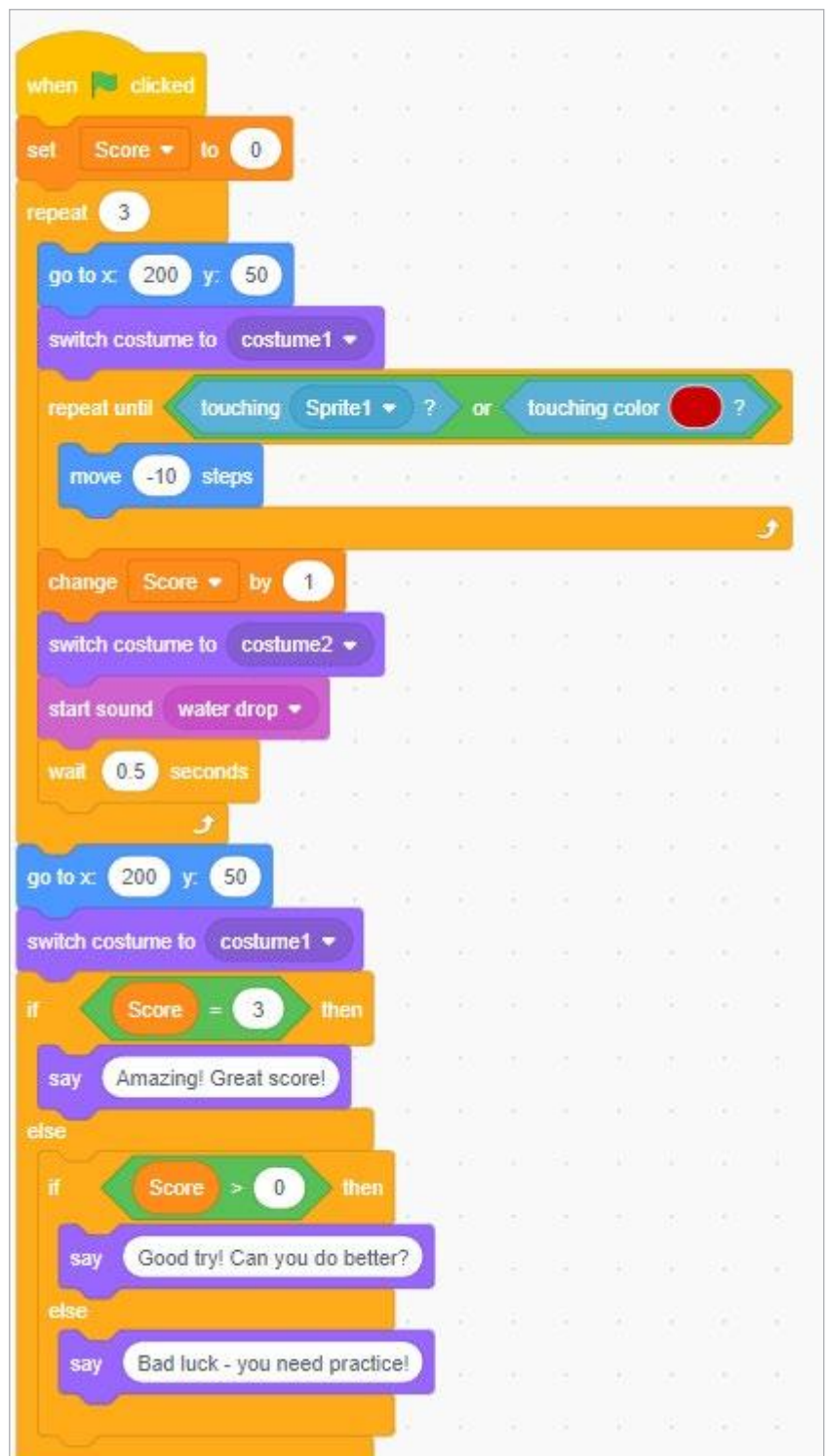
Character Sprite



```
when clicked
  go to x: -150 y: 30
  forever
    if not touching Sprite2 ? then
      say Can't hit me!
    else
      change Score by -1
      start sound meow
      say Oh no! for 1 seconds

when space key pressed
  change y by 100
  switch costume to costume2
  wait 0.75 seconds
  change y by -100
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```

Balloon Sprite



```
when clicked
  set Score to 0
  repeat 3
    go to x: 200 y: 50
    switch costume to costume1
    repeat until touching Sprite1 ? or touching color red ?
      move -10 steps
    change Score by 1
    switch costume to costume2
    start sound water drop
    wait 0.5 seconds
  go to x: 200 y: 50
  switch costume to costume1
  if Score = 3 then
    say Amazing! Great score!
  else
    if Score > 0 then
      say Good try! Can you do better?
    else
      say Bad luck - you need practice!
```

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