Module 6
Changing Things

Lesson 1 **I Like Mine Better 1 - Modifying Code 1**

Students modify existing Scratch projects.

Lesson 2 **I Like Mine Better 2 - Modifying Code 2**

Students build on Lesson 1 by modifying more existing Scratch projects.

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Lesson 1 – I Like Mine Better

Resources:
Scratch Projects with Modifications (Resource 1), Instructions Sheet for Modifying Projects 1 - 3 (Resource 2), Teacher's Solutions Sheets (Resource 3), Original Scratch Projects (Resource 4)

Key Vocabulary:
Code, Script

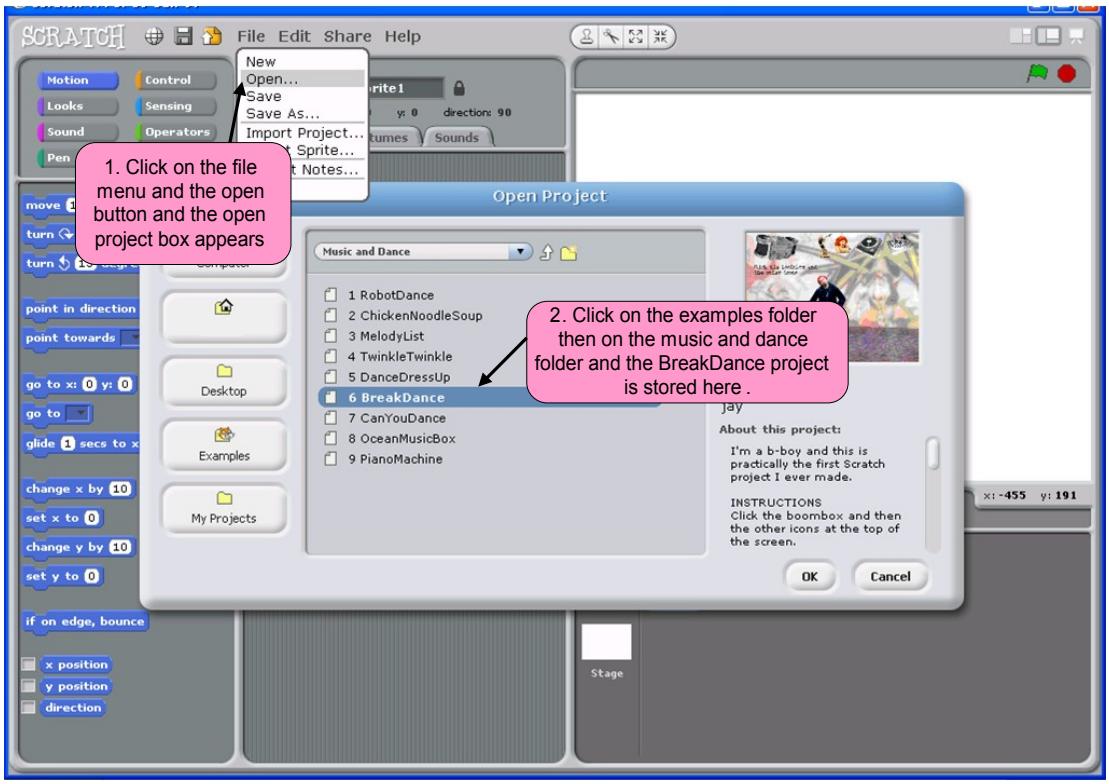
Description:
Students will open existing projects in Scratch. They will then be given instructions on how to modify the code / scripts in Scratch. Students will modify the scripts accordingly to make their sprites behave differently.

Learning Objectives:
1. To introduce students to the idea of modifying existing code / scripts in Scratch.
2. To enable students to identify the part of the script that needs to be modified in order to program new or different behaviour.

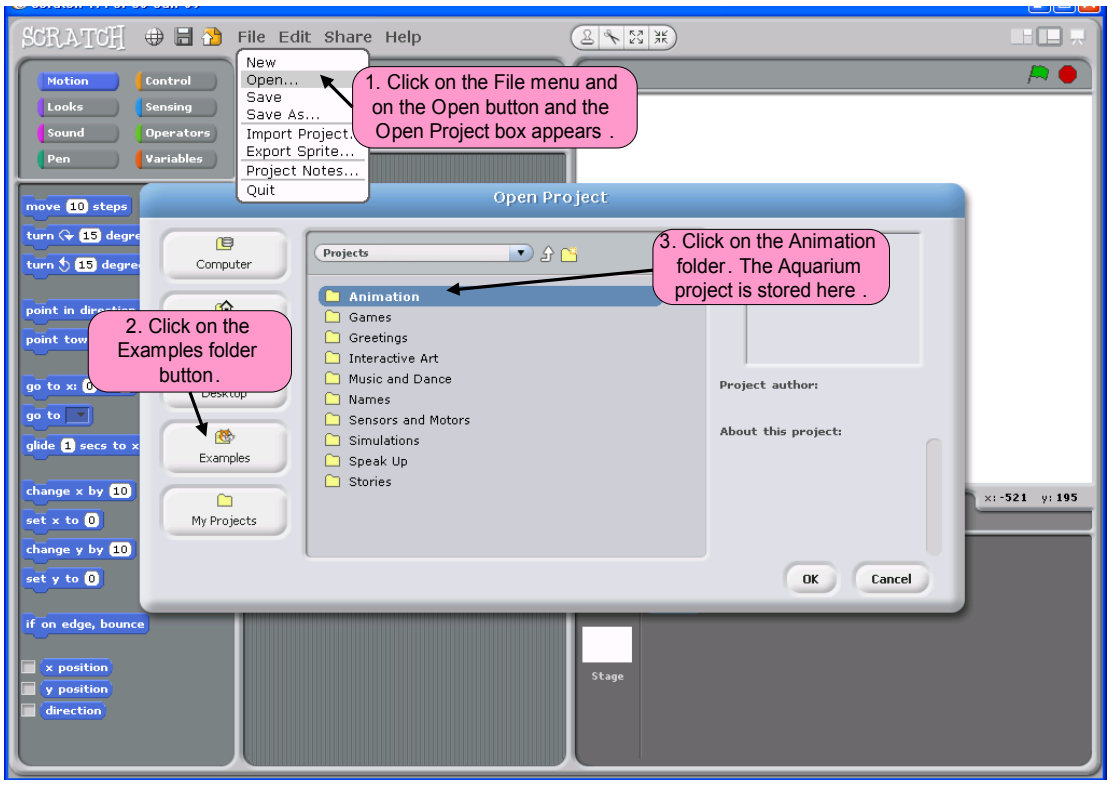
Lesson Introduction:
- Tell students that computer programmers often change or modify code that already exists, to make a program do something new or something differently.
- Tell them that today they are going to modify the scripts in some Scratch projects to change the behaviour of their sprites. Perhaps they will like their own versions of the projects better!

Lesson Breakdown:
1. Ask students to open Project 1 – BreakDance first. See the following images for details on how to open each of the 3 projects in this lesson.

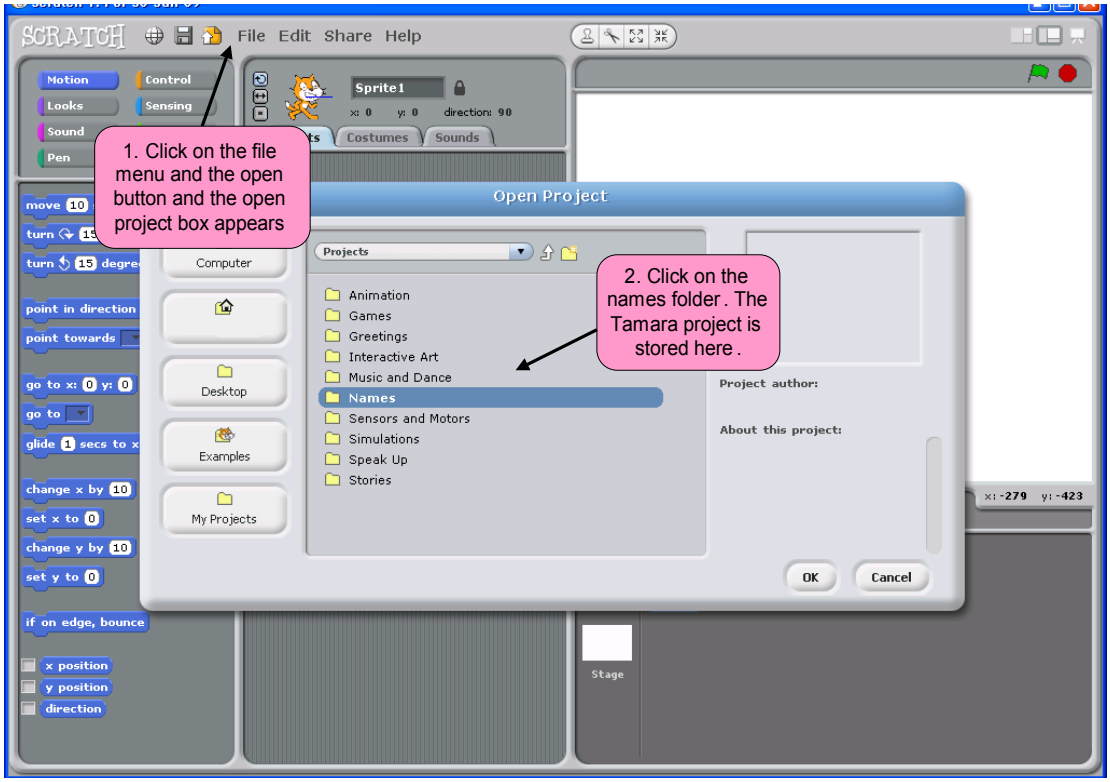
Project 1 - BreakDance



Project 2 – Aquarium



Project 3 – Tamara



Note: If any of the projects mentioned are not available in the version of Scratch you have downloaded, you may find the original Scratch projects on the CD (Resource 4).

1. Give students the Instructions for Modifying Projects sheet (Resource 2) and ask them to implement the changes for projects 1, 2 and 3, as instructed.
2. Once they have attempted each project, you may show them the solution files, Scratch Projects with Modifications (Resource 1).

Note: The printable solutions for each project modification are located in the Teacher's Solutions sheets (Resource 3).

Extension activity

Ask students to choose their favourite project from projects 1, 2 and 3. Ask them to suggest and implement 3 further modifications to this project.

Resource 1

Scratch Projects with Modifications

A folder containing all Scratch projects with modifications completed.

CD Resource

“M6L1R1 Modified Scratch Projects 1”

Resource 2

Instructions Sheet for Modifying Projects 1 - 3

A sheet of modifications required for projects 1 - 3, Lesson 1.

Instructions for Modifying Projects in Scratch – Lesson 1

Project 1 – BreakDance

1. Change the background.
2. Import another sprite into the project and make it dance in different ways when the green flag is clicked.

Project 2 – Aquarium

1. Animate the seaweed i.e. plant1, plant2 and plant3.
2. If Creature1 touches Creature6, make Creature1 say “hello”. Make Creature6 say “hi there” in response to Creature1.
3. Add a suitable soundtrack. You will find lots of music and sounds at http://www.pacdv.com/sounds/ or you can add your own sound effects from the Scratch library of sounds.
4. Change the colour of Creature5 if it is touching plant1.
5. Increase the size of Creature3 if touching Creature2.

Project 3 – Tamara

1. Change the name Tamara to the name JACK.
2. Change the behaviour of the letters. When the mouse touches the letter K draw a triangle. Change the pen size to 4 first and use the ‘wait’ command to slow down the drawing.
3. Change the letter C to a cat when clicked (i.e. when the mouse is over it and the mouse is down at the same time).
4. When the mouse is touching the letters J, A and K, play a different sound. Play ‘meow’ when the letter C is clicked. (You will need to import sounds from the Scratch sounds library).

Resource 3

Teacher's Solutions Sheets

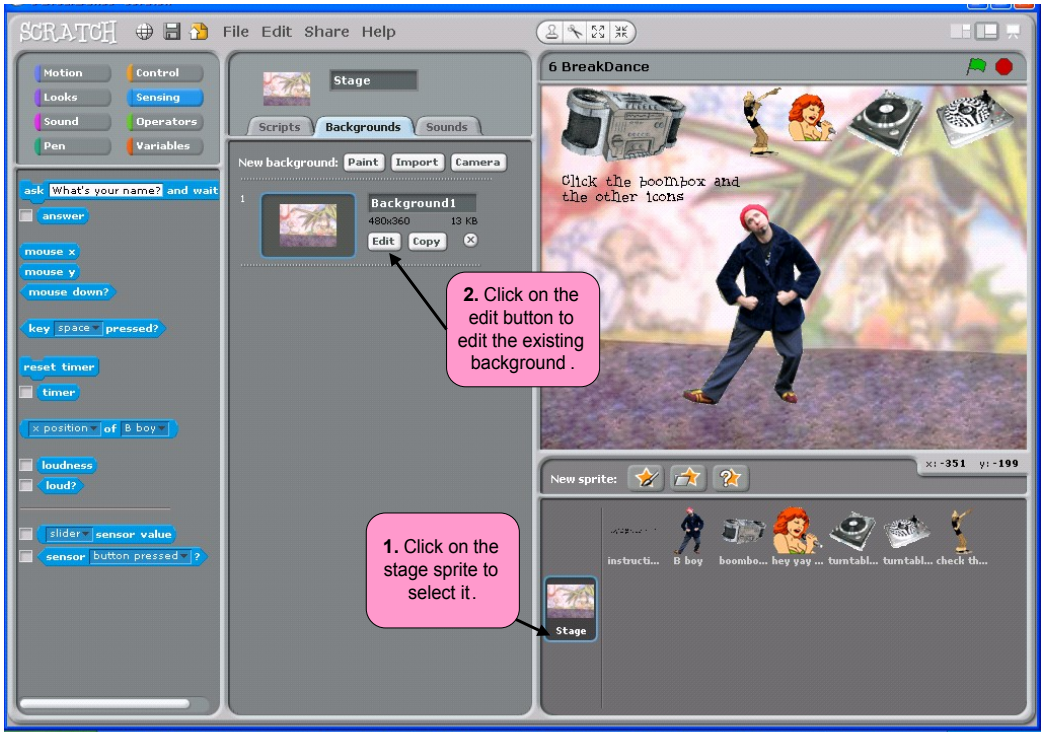
A sheet of modifications required for projects 1-3, Lesson 1.

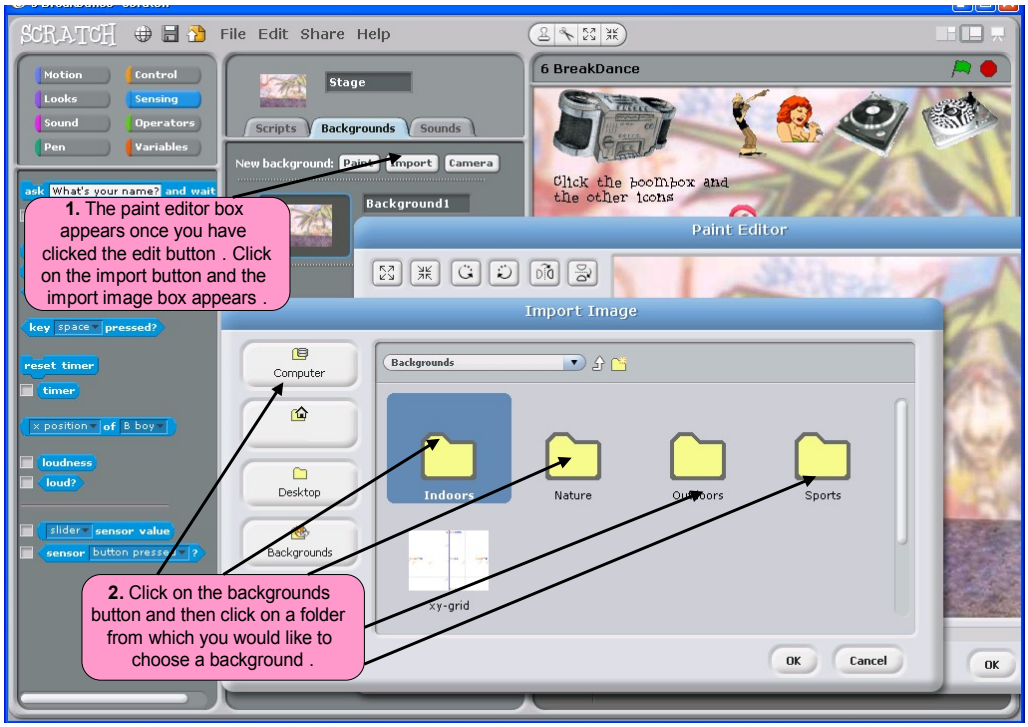
Teacher's Solution Sheet for Lesson 1

Project 1 – Break Dance

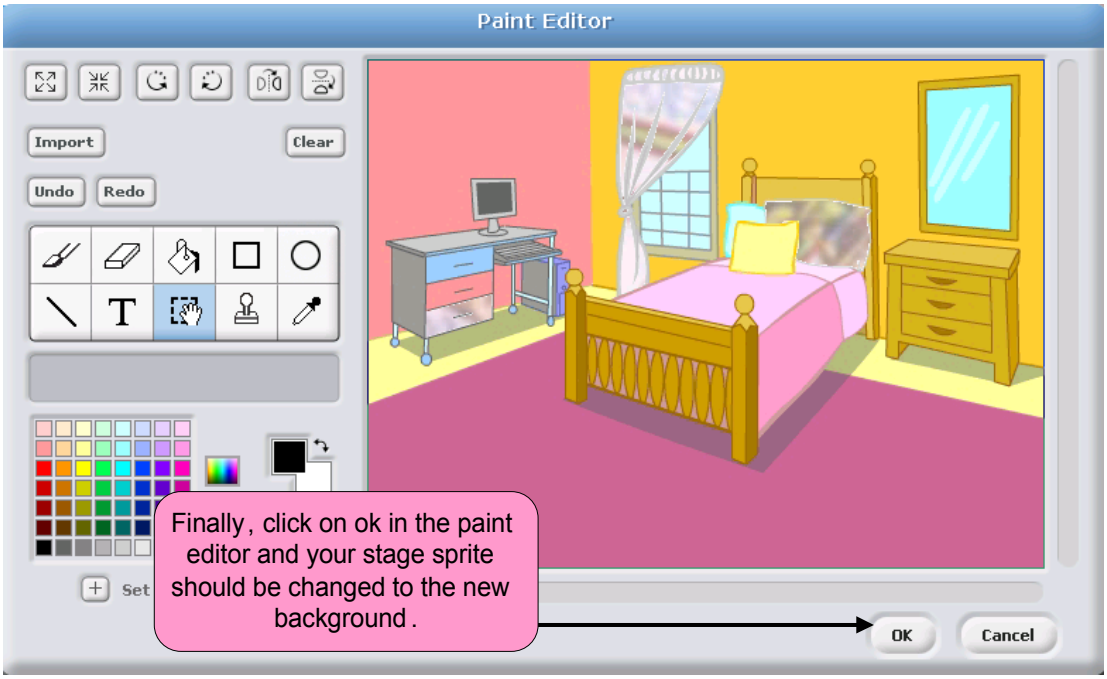
1. Change the background.

The following images show the steps needed to change the background for your stage sprite.



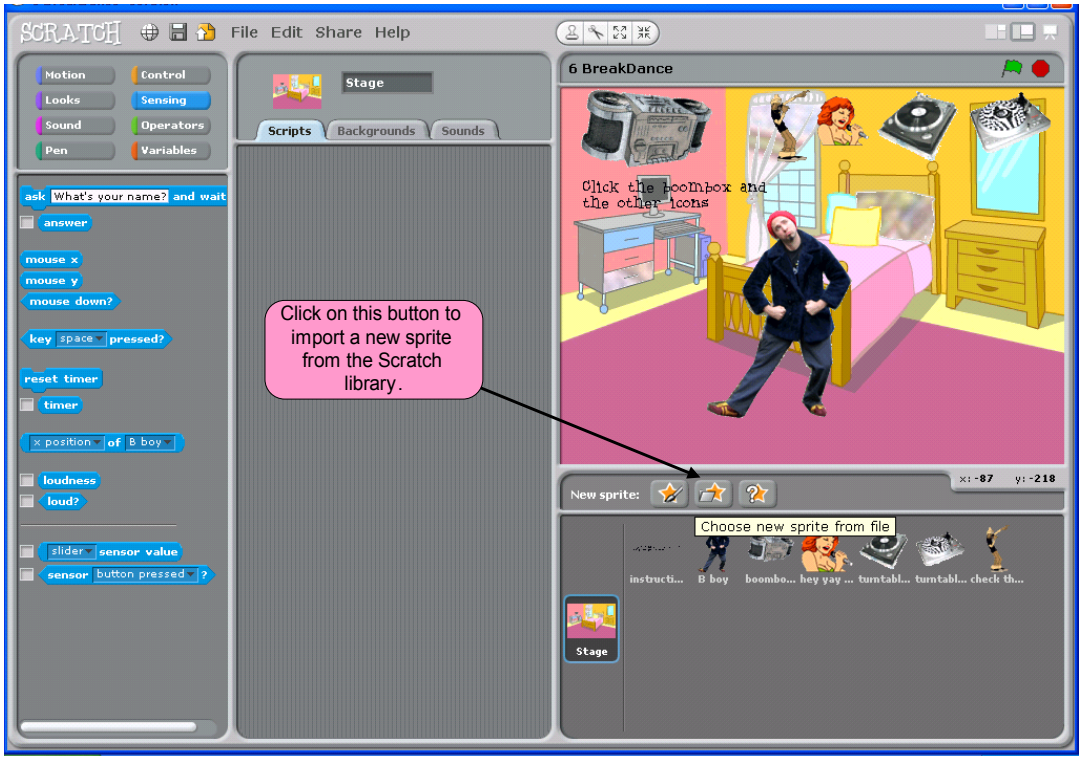


Import Image
Computer
brendan.osullivan
Desktop
Backgrounds
Indoors
bedroom1
bedroom2
chalkboard
clothing-store
room1
Having chosen a folder , such as indoors, click on a background you like and then click on ok .
OK
Cancel

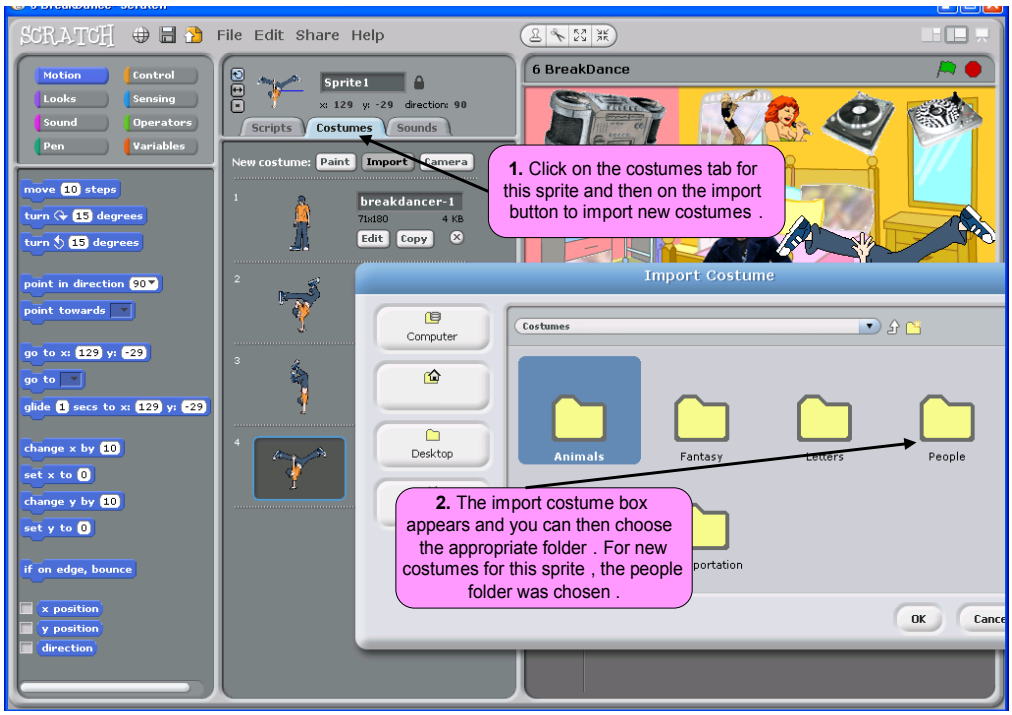

Paint Editor
Import
Clear
Undo
Redo
Set
Finally, click on ok in the paint editor and your stage sprite should be changed to the new background.
OK
Cancel

2. Import another sprite into the project and make it dance in different ways when the green flag is clicked.

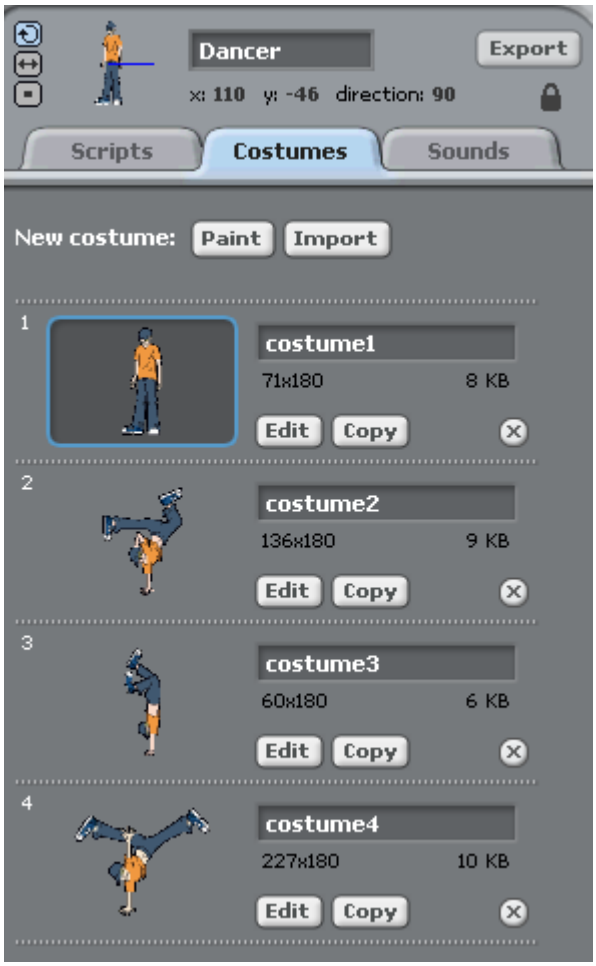
The following image shows how to import a new sprite into the project.



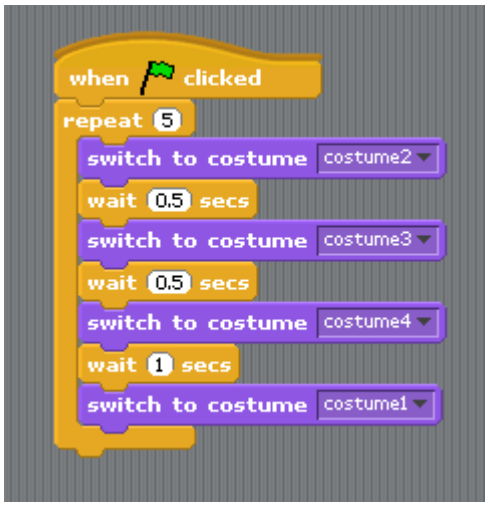
The sprite chosen for the solution is the 'breakdancer1' sprite from the people folder in the Scratch library. 3 new costumes were imported for this sprite, as shown in the following 2 images.



Once you have chosen your new costume, click on OK.
The costumes for the sprite should appear in a list as shown.



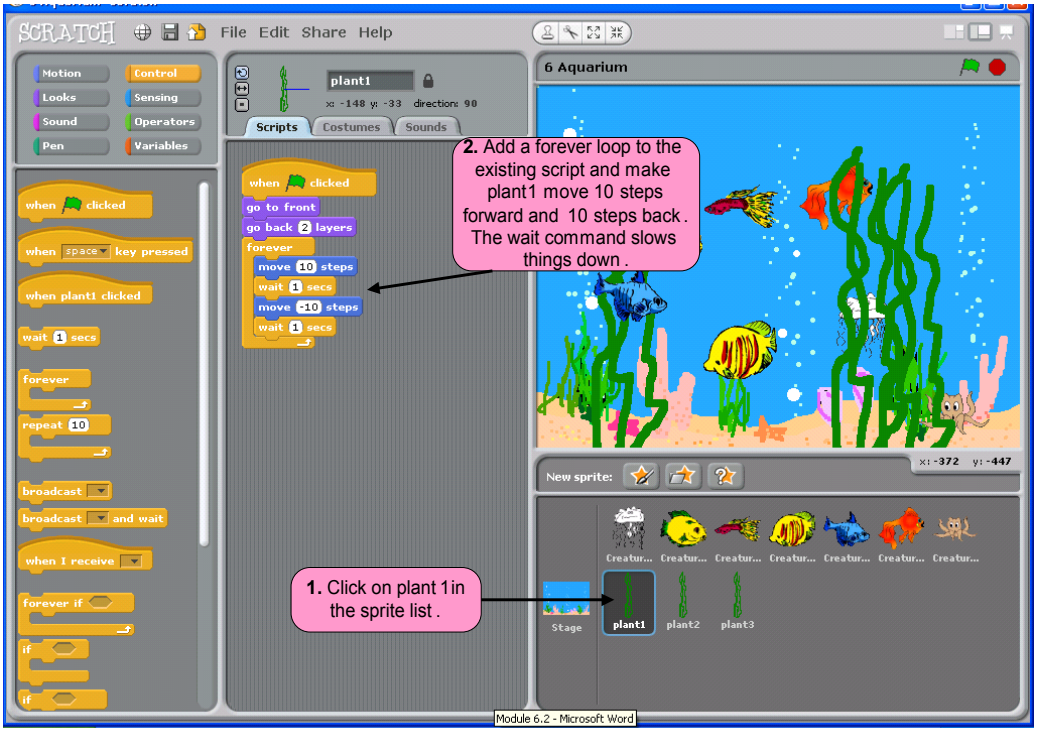
The sample script for making this sprite dance when the green flag is clicked is shown below.



Project 2 – Aquarium

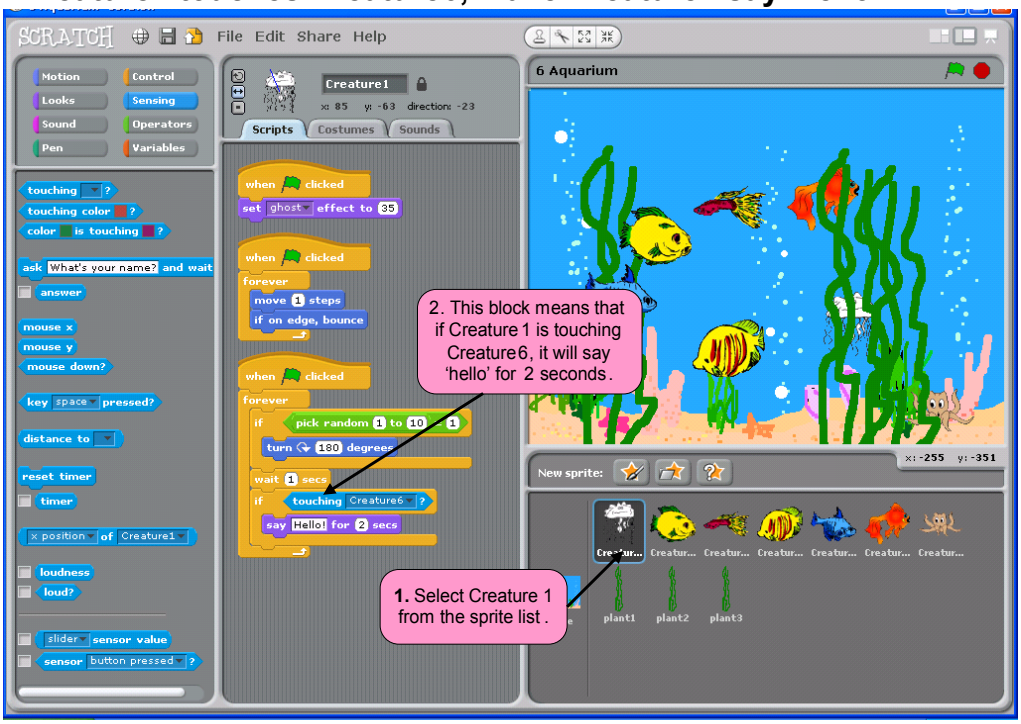
1. Animate the seaweed.

When you open the Aquarium project, the seaweed sprites are plant1, plant2 and plant3. Click on the plant1 sprite first, to select it, as shown in the following image. You can then add a forever loop, as shown, to move plant1 backwards and forwards.

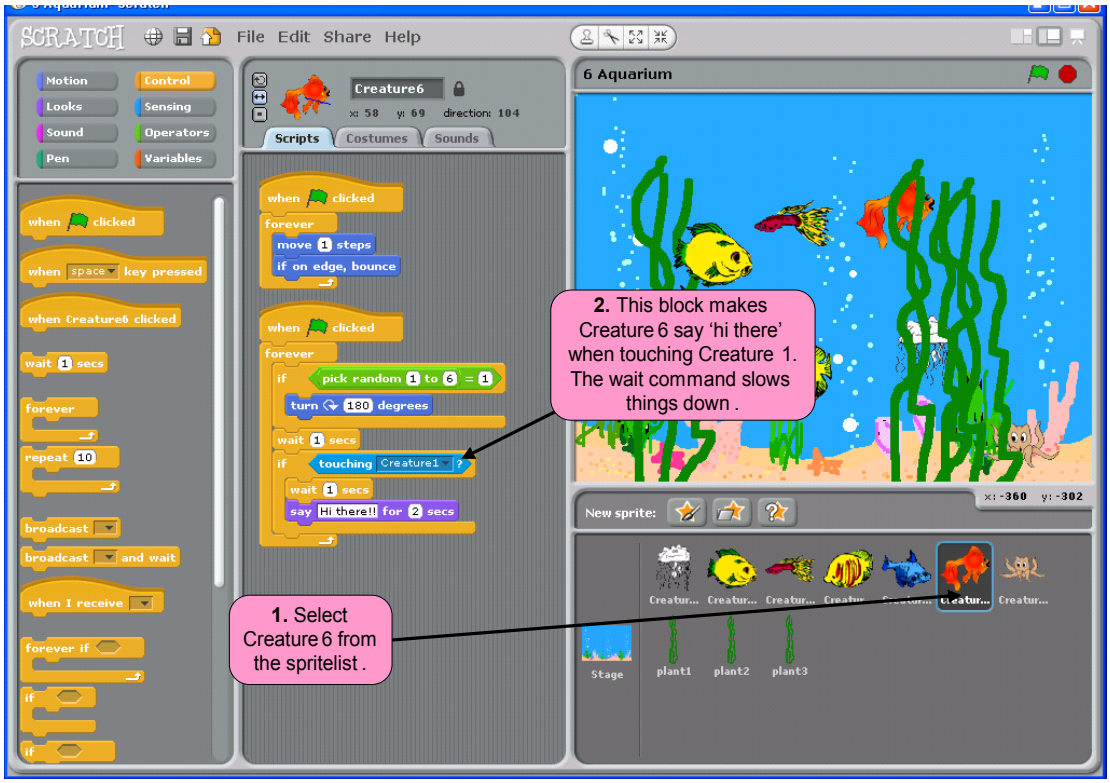


Similar steps may be taken to animate the sprites plant2 and plant3.

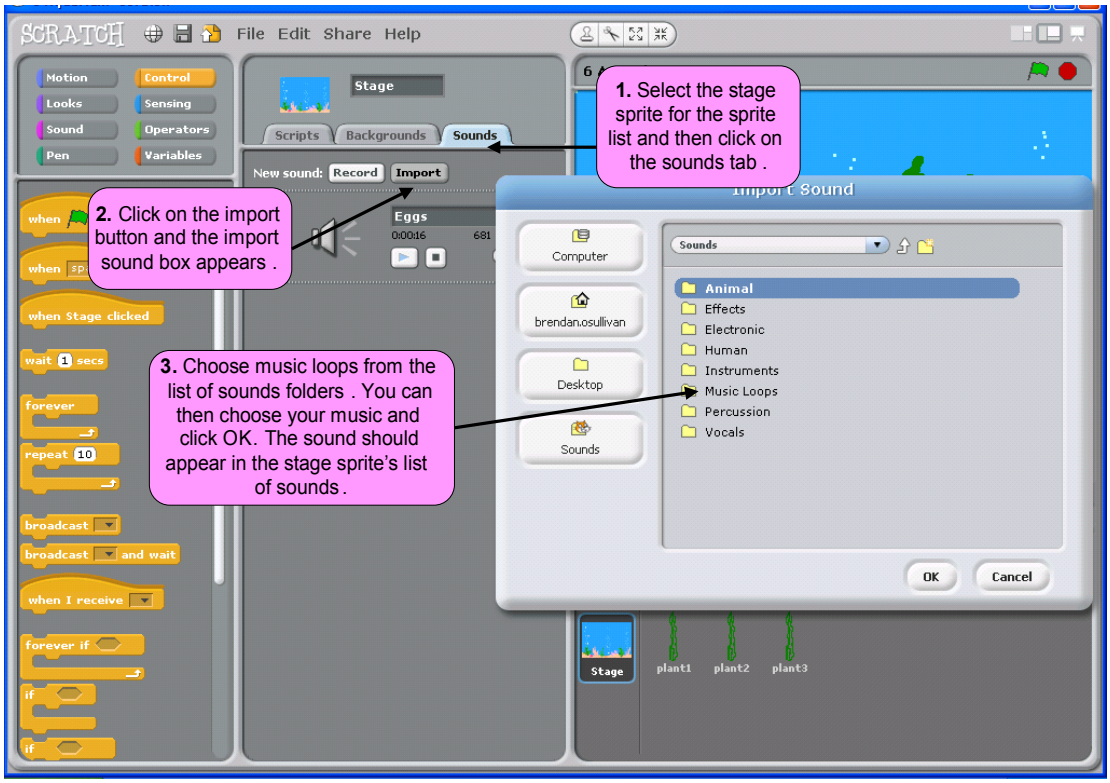
2. If Creature1 touches Creature6, make Creature1 say 'hello'.



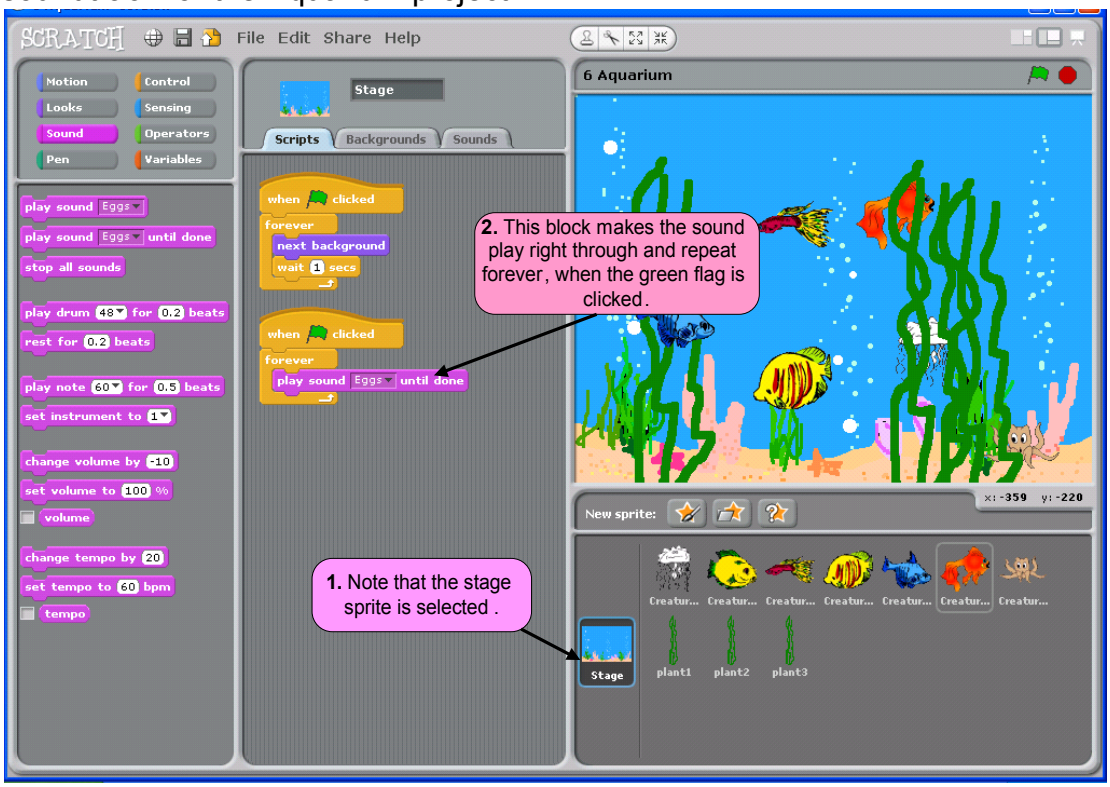
Make Creature6 say ‘hi there’ in response to Creature1.



3. Add a suitable soundtrack.

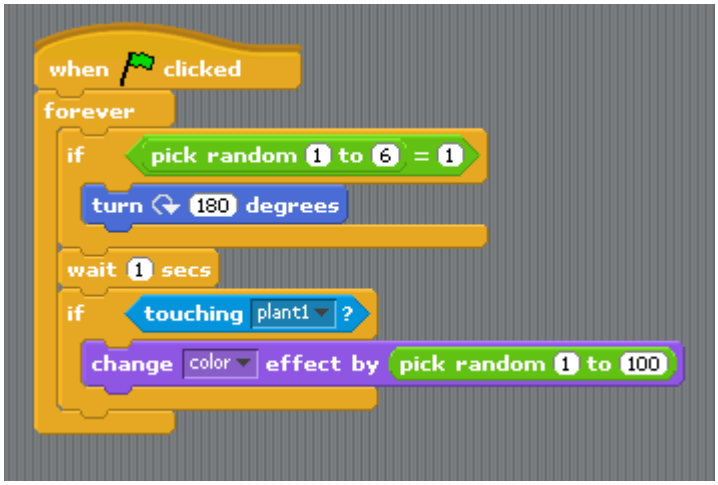


Once you have chosen your sound, click on the scripts tab for the stage sprite and the following image shows the code you will need to play the sound as a soundtrack for the Aquarium project.

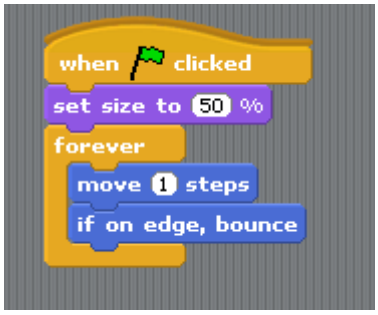


4. Change the colour of Creature5 if it is touching plant1.

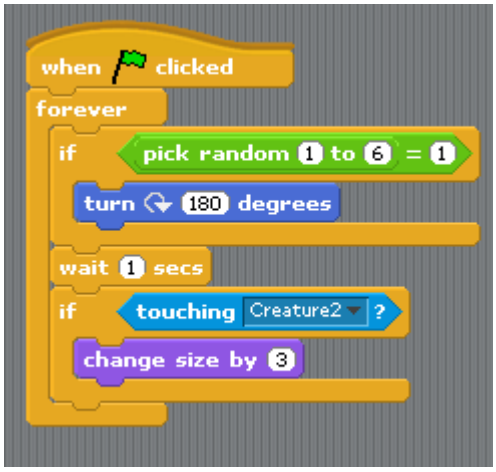
Make sure that Creature5 is selected in the sprite list area. The second 'if' block below can then be added to the existing code. This means that if Creature5 is touching plant1, it will change colour by a random number between 1 and 100.



5. Increase the size of Creature3 if touching Creature2.
Make sure Creature3 is selected.
Add the ‘set size to 50%’ block to the first block of code. This ensures that each time the green flag is clicked, Creature3 returns to 50% of its size.



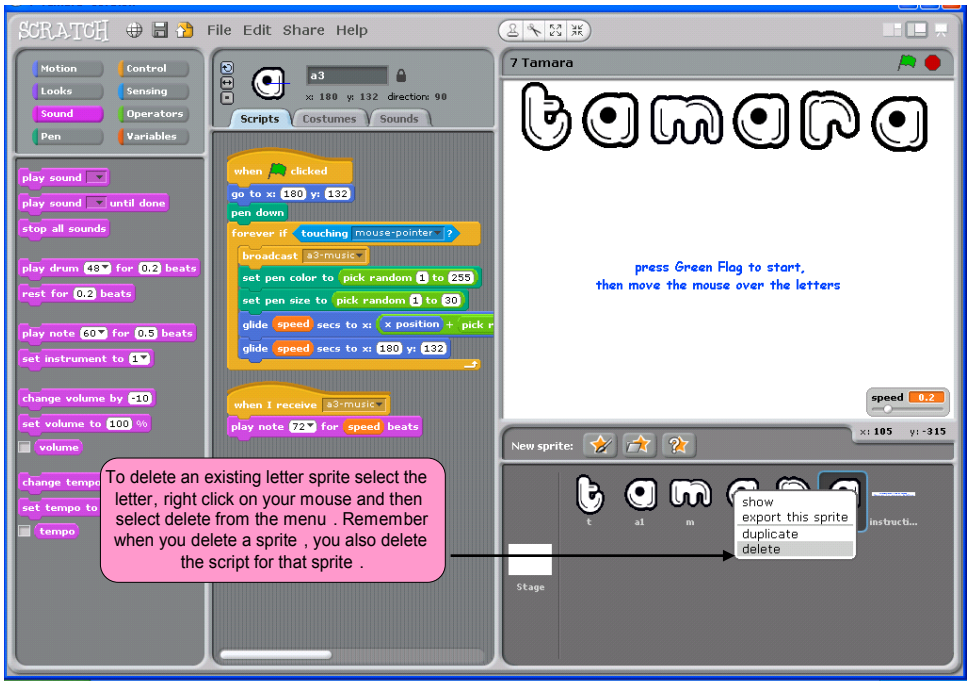
The second ‘if’ block in the following script ensures that Creature3 increases in size each time it touches Creature2.



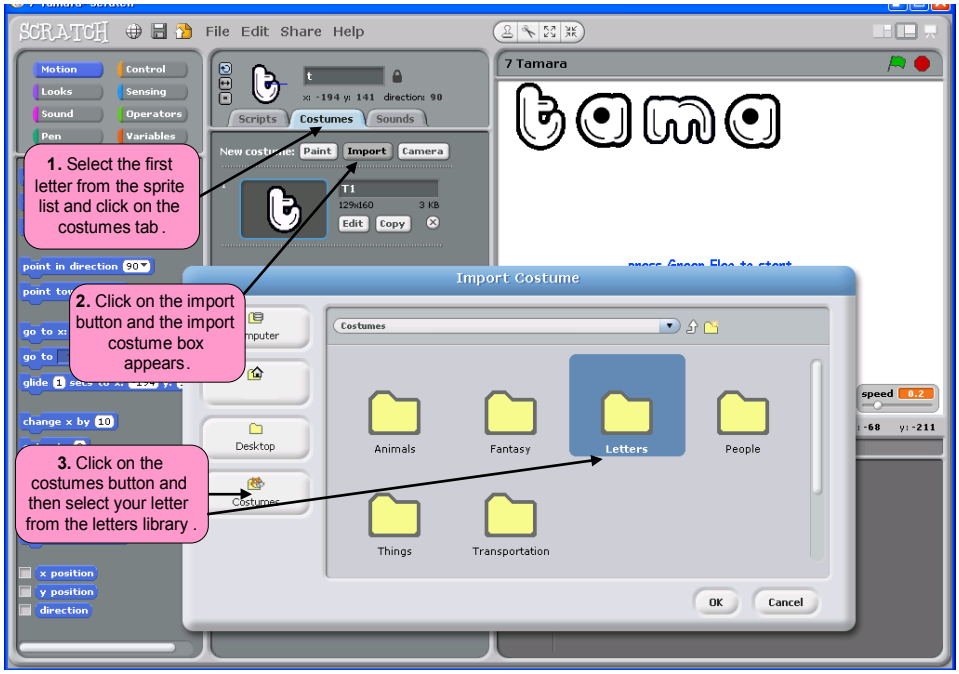
Project 3 – Tamara

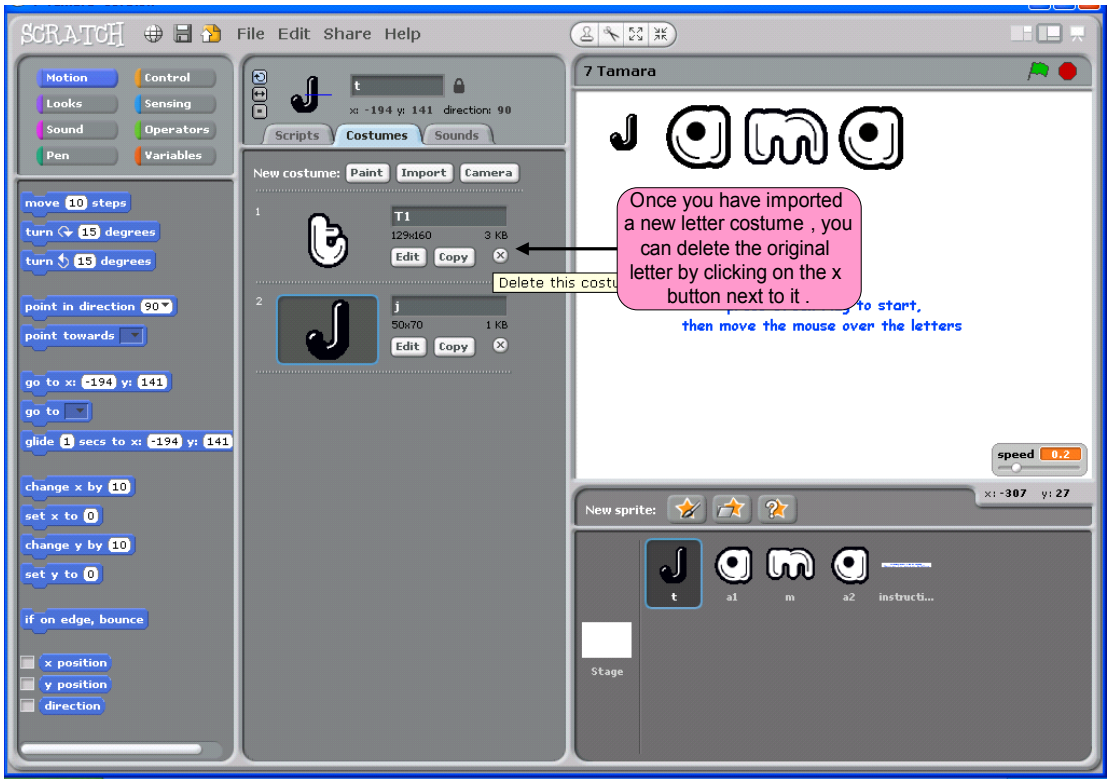
1. Change the name Tamara to the name JACK.

First delete the last 2 of the existing letter sprites i.e. r and a, so you are left with 4 letters for the word 'JACK'. **Remember** when you delete a sprite you also delete the script associated with that sprite! It is better therefore for this exercise to keep 4 of the letters to change to the letters for 'JACK' so we will still have the scripts for these.

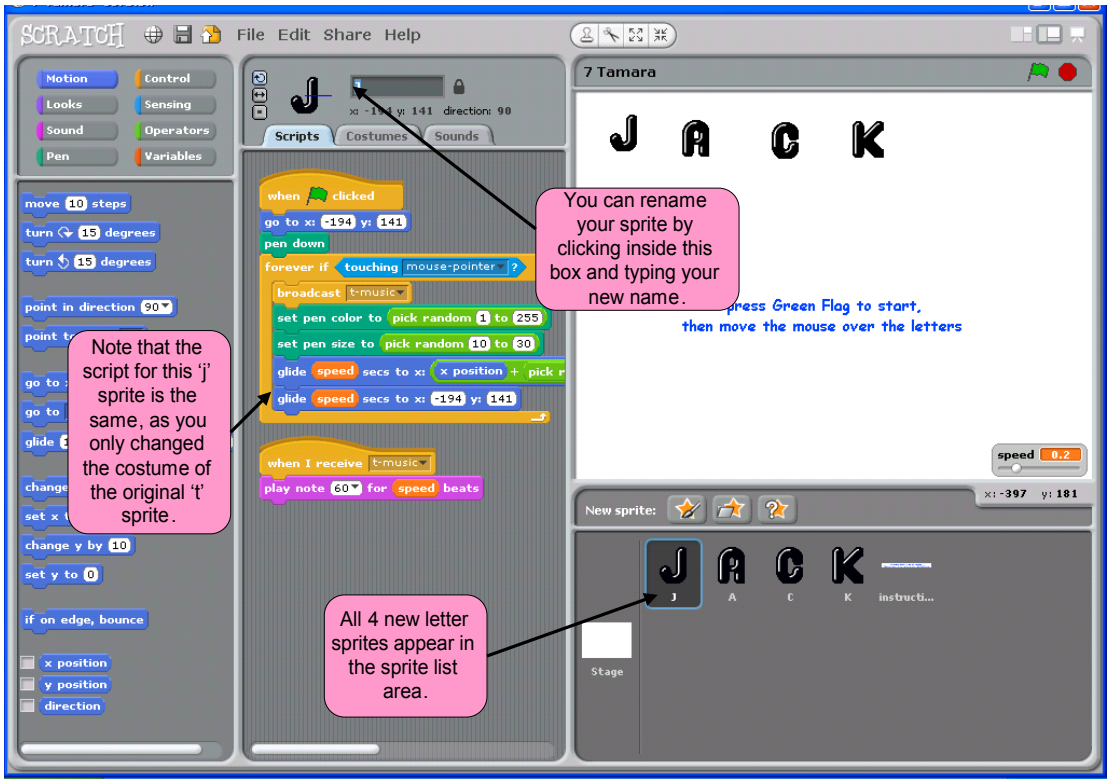


Follow the instructions over to change the 4 remaining letters to J A C K.

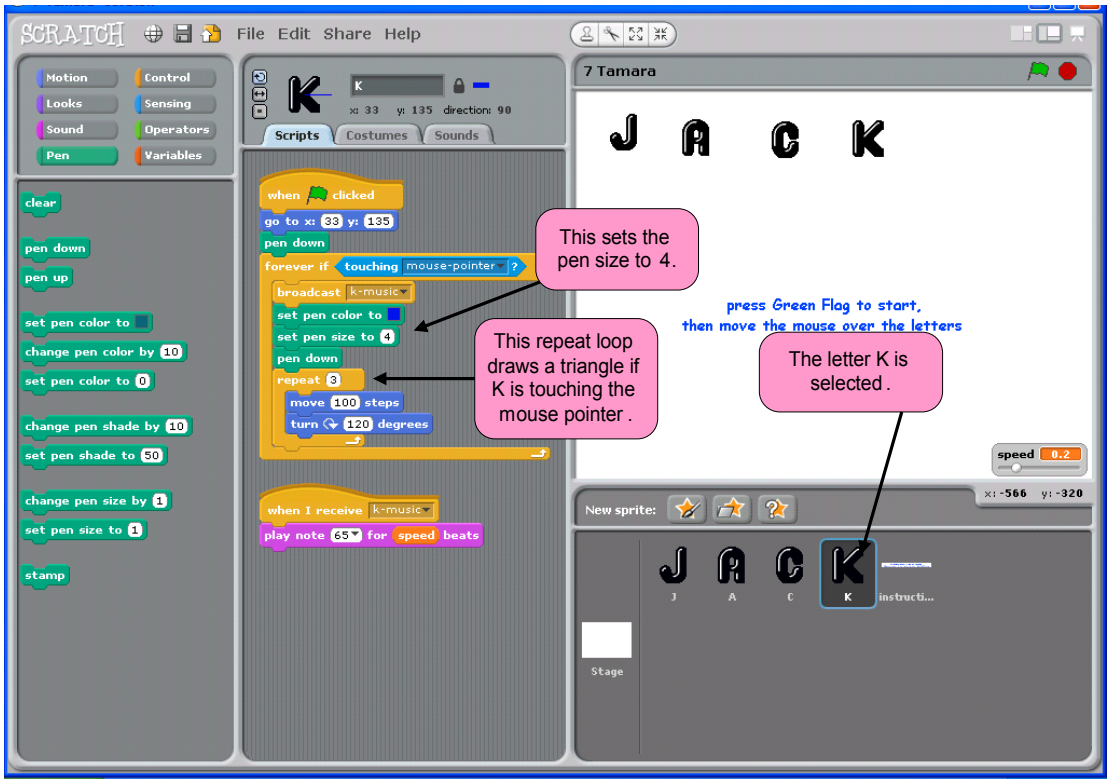




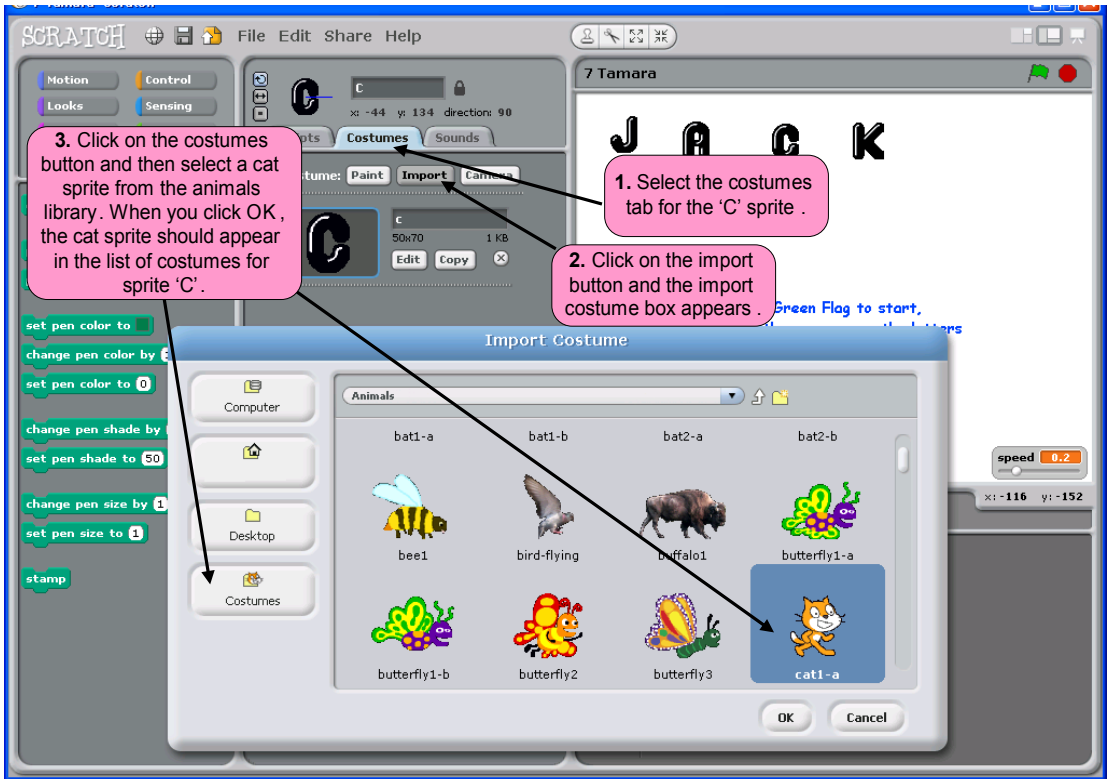
Repeat the previous steps until you have the letters J A C K as your new sprites. You can change the names of the sprites as shown in the following image.



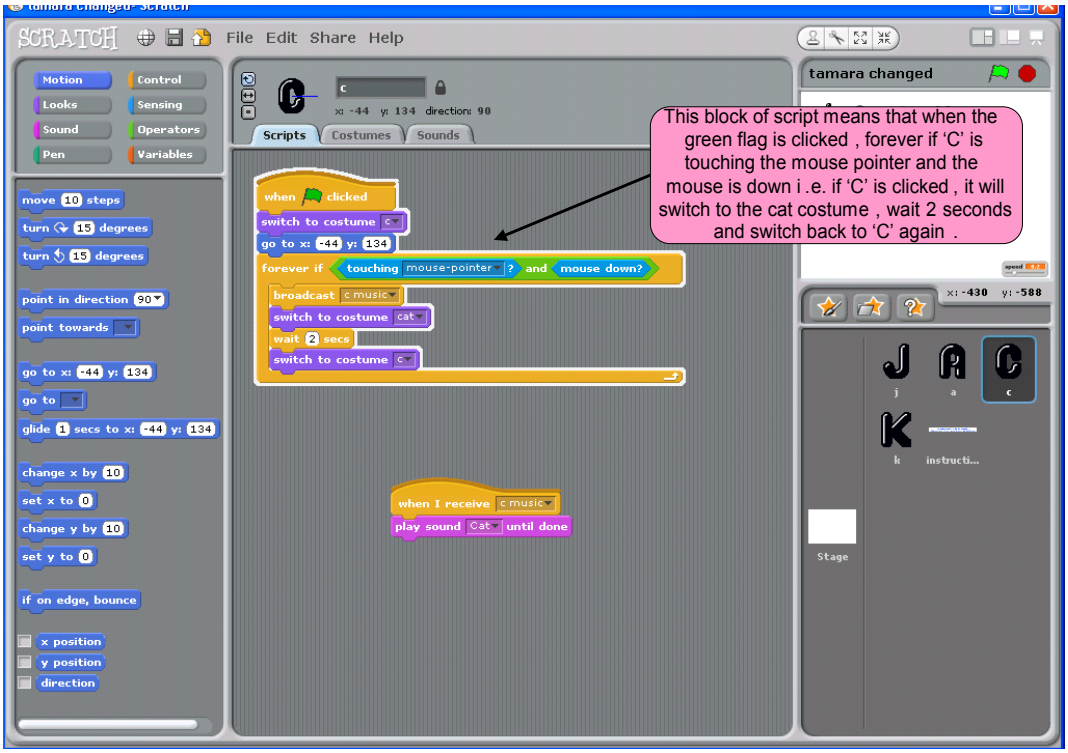
2. When the mouse touches the letter K, draw a triangle. Change the pen size to 4 first and use the wait command to slow things down.



3. Change the letter C to a cat when clicked.
Import a cat costume first.

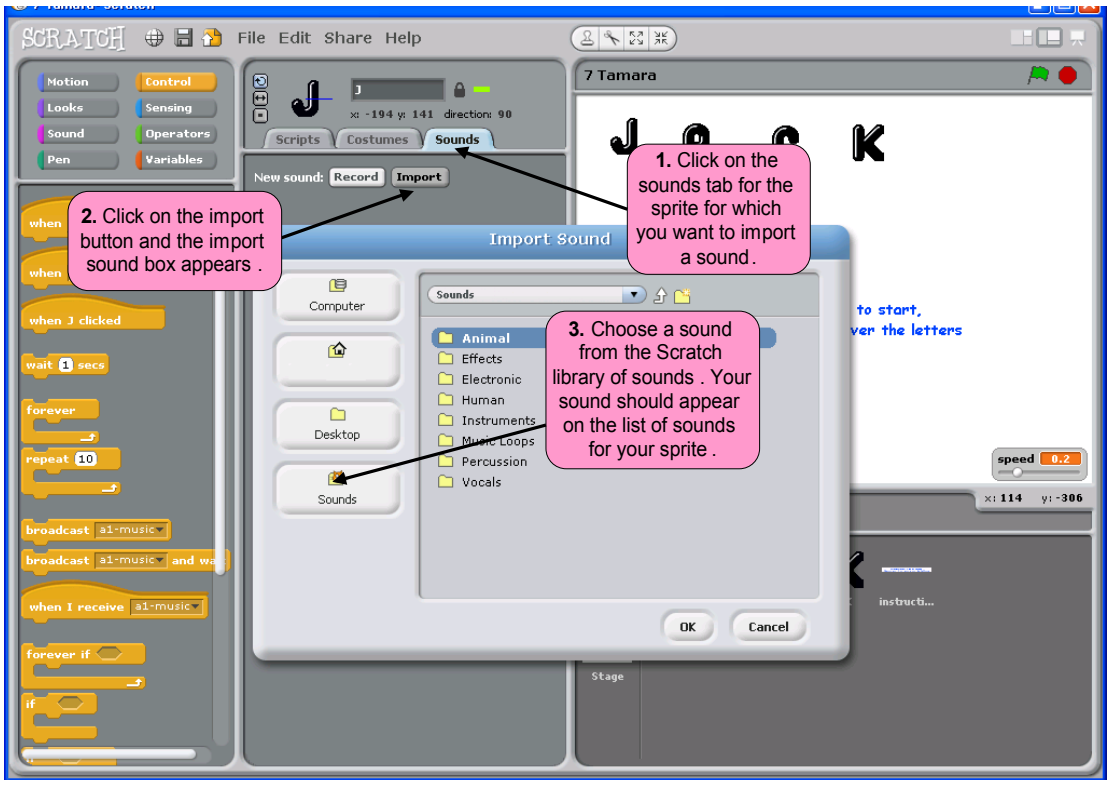


To make the C sprite change to a cat when clicked, use the first block of script in the following image.

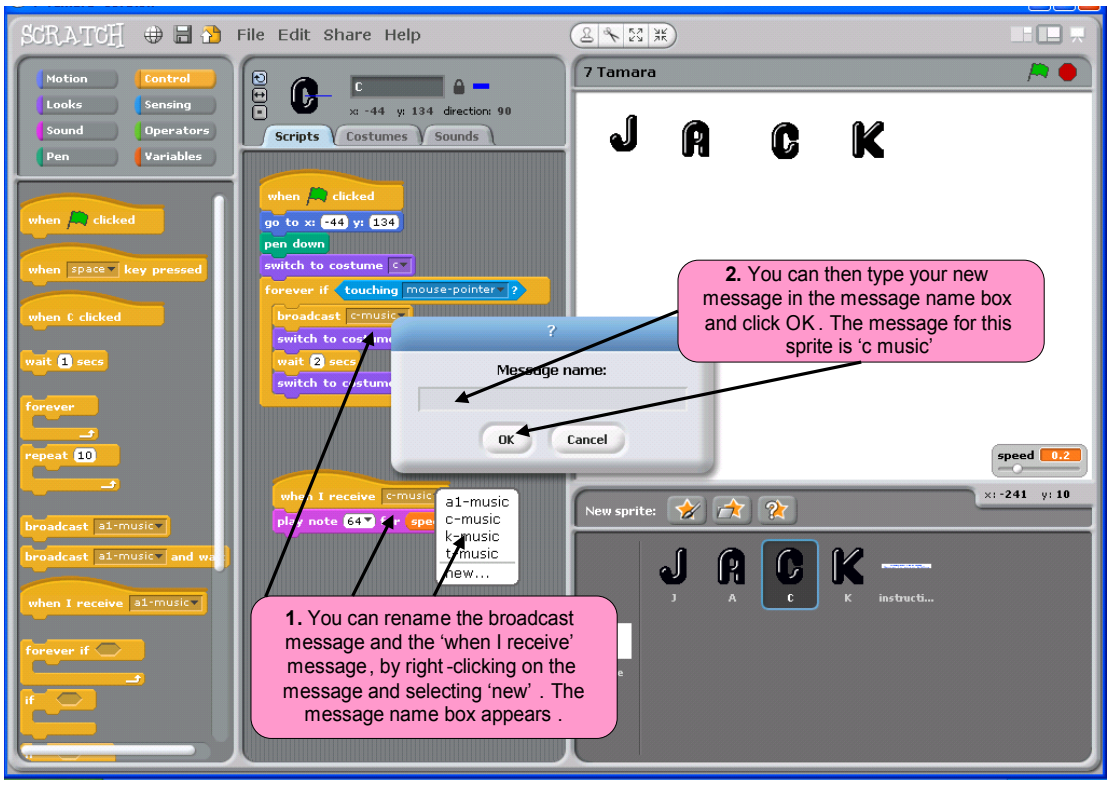


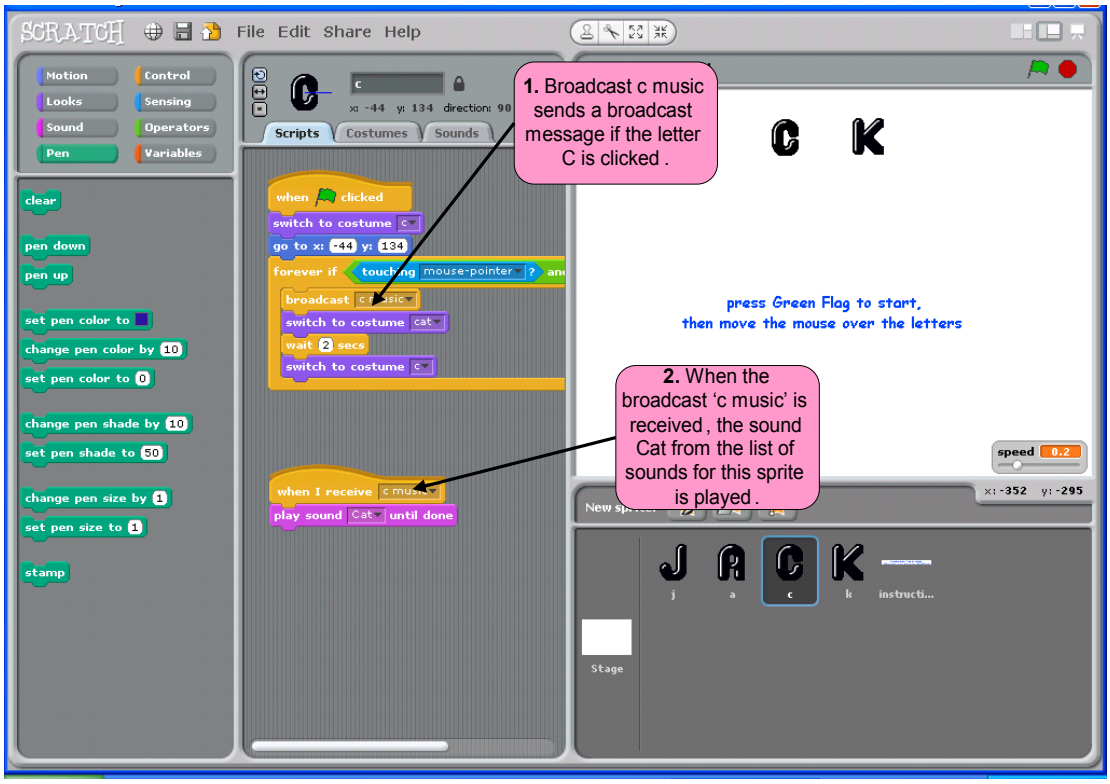
4. When the mouse is touching the letters J, A and K play a different sound. Play 'meow' when the letter C is clicked.

Import your sound from the Scratch sounds library first.



Once you have imported your sound, the following image shows you how to apply your sound to your sprite e.g. the cat's 'meow' sound.





Repeat the steps above to add sounds of your choice to the other letters.

Resource 4

Original Scratch Projects

The 3 Scratch projects for the lesson before they were modified. This is for teachers who do not have the original projects on the version of Scratch which was downloaded.

CD Resource

“M6L1R4 Original Scratch Projects 1”

Lesson 2 – I Like Mine Better 2

Resources:
Scratch Projects with Modifications (Resource 1), Instructions Sheet for Modifying Projects (Resource 2), Teacher's Solutions Sheets (Resource 3), Original Scratch Projects (Resource 4)

Key Vocabulary:
Code, Script

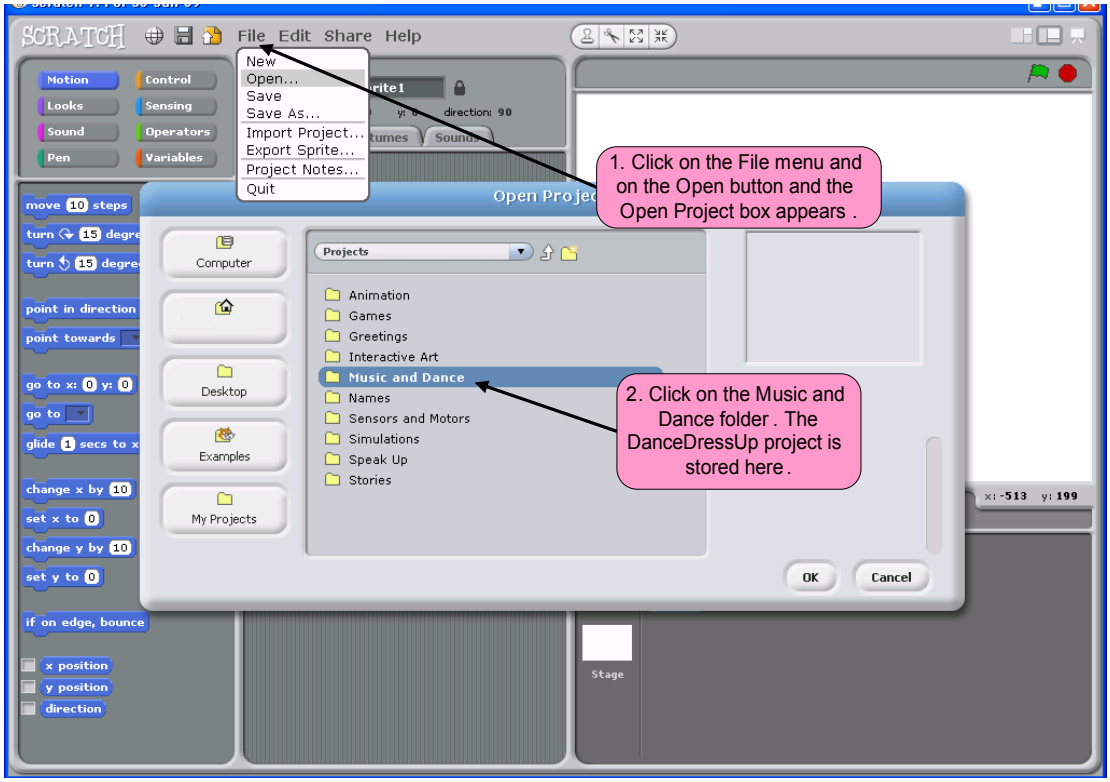
Description:
Students will open and modify other existing projects in Scratch. This is a follow on from Lesson 1. Students will be given instructions on how to modify the code / scripts in Scratch. Students will modify the scripts accordingly to make their sprites behave differently.

Learning Objectives:
1. To introduce students to the idea of modifying more complex existing code / scripts in Scratch.
2. To enable students to identify the part of the script that needs to be modified in more complex projects, in order to program new or different behaviour.

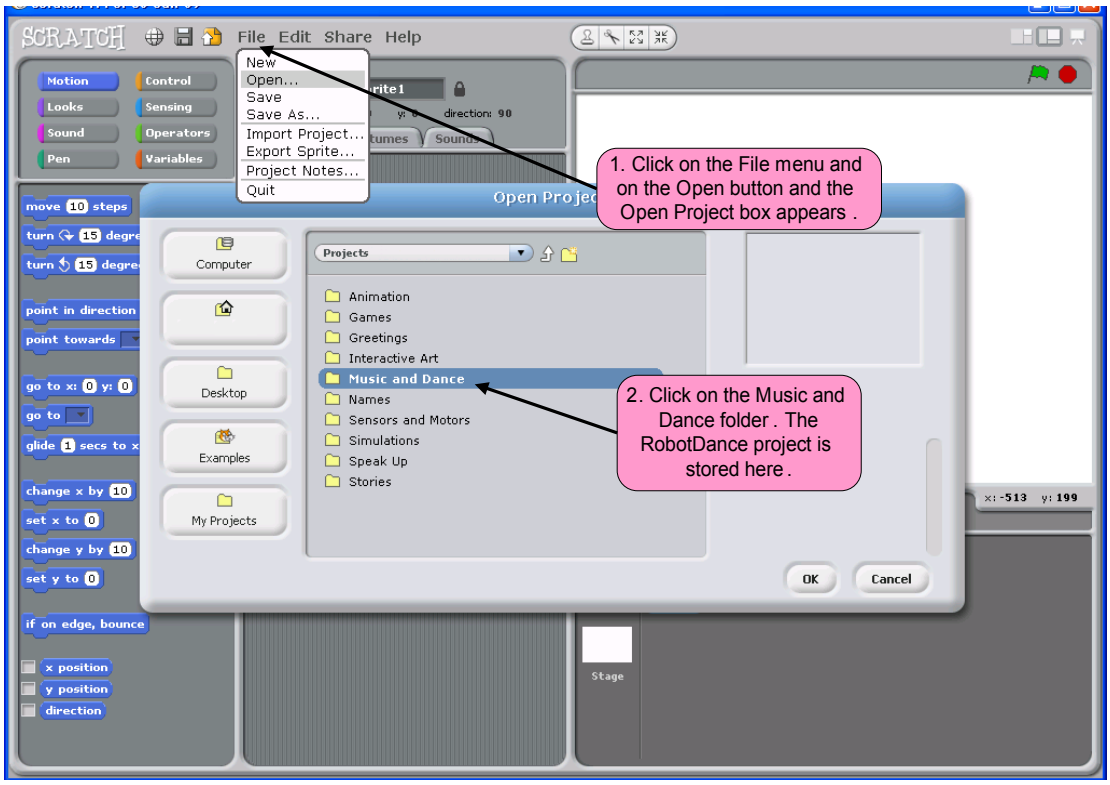
Lesson Introduction:
- Remind students that computer programmers often change or modify code that already exists, to make a program do something new or something different.
- Tell them that today they are going to modify the scripts in more complex Scratch projects to change the behaviour of more sprites.

Lesson Breakdown:
1. Ask students to open Project 1 – Dance DressUp first. See the following images for details on how to open each of the 3 projects in this lesson.

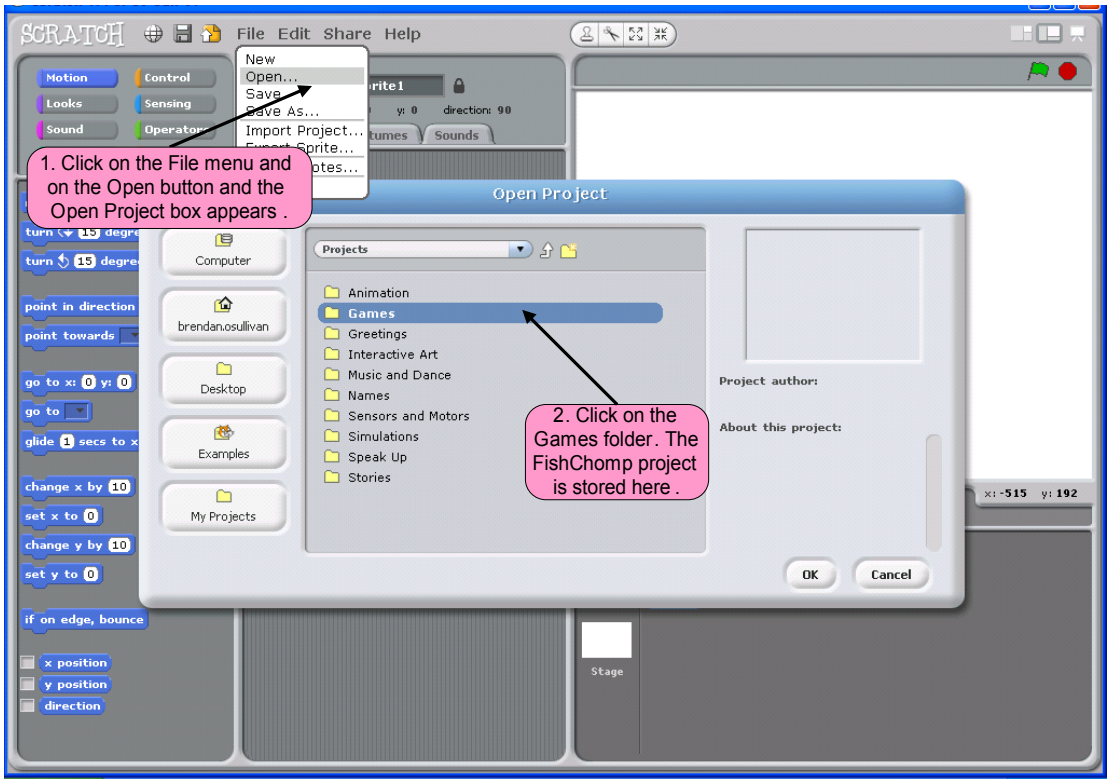
Project 1 – DanceDressUp



Project 2 – Robot Dance



Project 3 – FishChomp



Note: If any of the projects mentioned are not available in the version of Scratch you have downloaded, you may find the Original Scratch Projects on the CD (Resource 4).

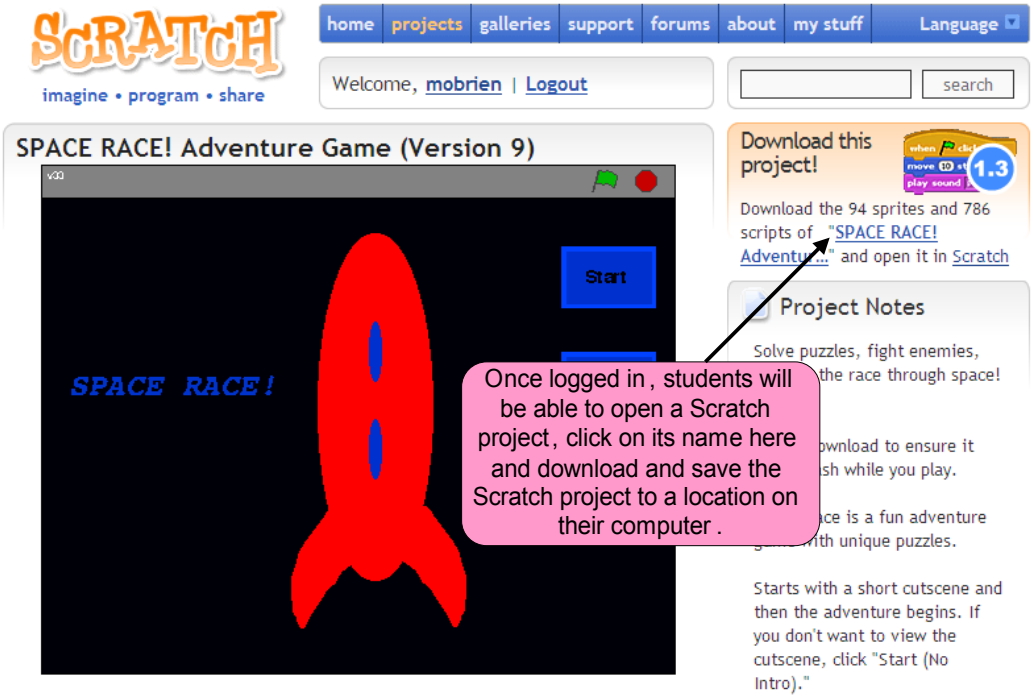
2. Give students the Instructions Sheet for Modifying Projects (Resource 2) and ask them to implement the changes for projects 1, 2 and 3, as instructed.
3. Once they have attempted each project, you may show them the solution files Scratch Projects with Modifications (Resource 1).

Note: the printable solutions for each project modification are located in the Teacher's Solutions sheets (Resource 3).

Extension activity

1. Ask students to choose their favourite project from projects 1, 2 and 3. Ask them to suggest and implement 3 further modifications to this project.
2. As a further extension activity, ask students to download their favourite project from the Scratch website and modify the scripts to create their own version of the project.
   N.B. Although students can view projects on the Scratch website at http://scratch.mit.edu, they will need to set up an account on the Scratch website before they can download projects they wish to modify. See ***Module 10, Lesson 2 'Sharing – Setting up a Scratch Account'*** for information on how to set up an account on the Scratch website. Once logged in, students will then be able to

download any project they open on the Scratch website and modify it in Scratch. See the image which follows for information on how to download a project once logged in.



Resource 1

Scratch Projects with Modifications

A folder containing all modified Scratch projects with modifications completed.

CD Resource

“M6L2R1 Modified Scratch Projects 2”

Resource 2

Instructions Sheet for Modifying Projects

A sheet of modifications required for projects 1-3, Lesson 2.

Instructions for Modifying Projects in Scratch – Lesson 2

Project 1 – DanceDressUp

1. Introduce a new sprite called Ella.
2. Give her 3 different costumes like the other sprites.
3. When the green flag is clicked, Ella should be the smallest sprite and make sure to position her at the end of the line of other sprites on stage.
4. When Ella is clicked, she should change costume.
5. When the e key is pressed, make Ella dance on the brown platform, in whatever way you like, before returning to her original position. (Tip: you may duplicate some code from the other sprites by right-clicking on the block of code and dragging it to the Ella sprite).
6. When the letter keys for the other sprites are pressed (i.e. a, b, c, d), make Ella dance in line like the other sprites. (Tip: you may duplicate some code from another of the sprites by right-clicking on the block of code and dragging it to the Ella sprite).

Project 2 – RobotDance

1. Delete a robot from the floor.
2. Change the stage.
3. Add a new robot, called Robot 4, and make it jump up and say "Yippee" when the space bar is pressed.
4. Add a new soundtrack. You can add your own sound effects or music from the Scratch library of sounds.
5. Add a new variable 'speed' and change the speed at which one of the robots dances. (Hint: Make the variable counter into a slider, by double-clicking on it).

Project 3 – FishChomp

1. Add a variable called score for the hungry fish sprite.
2. Change the score if the hungry fish sprite eats any of the 3 goldfish sprites.
3. If the score is equal to 10, change the background, hide all the sprites and display the message 'You Win'.

Resource 3

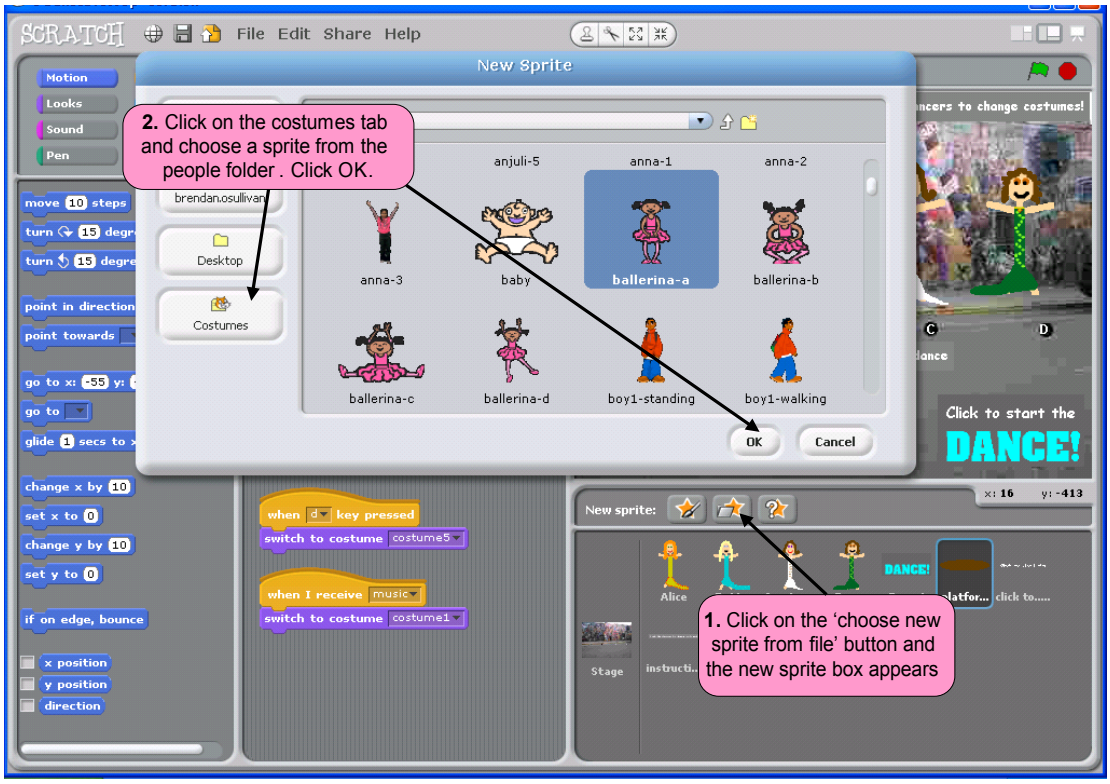
Teacher's Solutions Sheets

A sheet of modifications required for projects 1-3, Lesson 2.

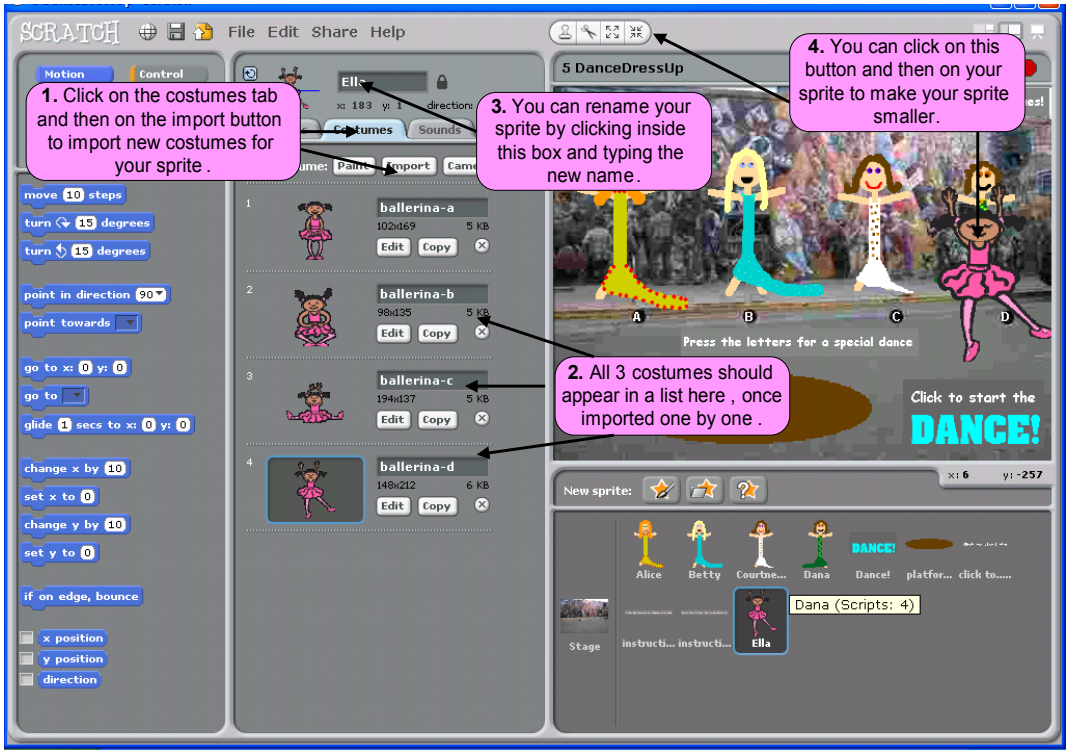
Teacher's Solutions Sheet – Lesson 2

Project 1 – Dance Dress Up

1. Introduce a new sprite called Ella.

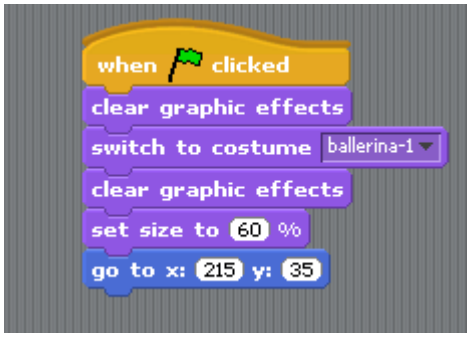


2. Give her 3 different costumes like the other sprites.



3. When the green flag is clicked, Ella should be the smallest sprite and make sure to position her at the end of the line of other sprites on stage.

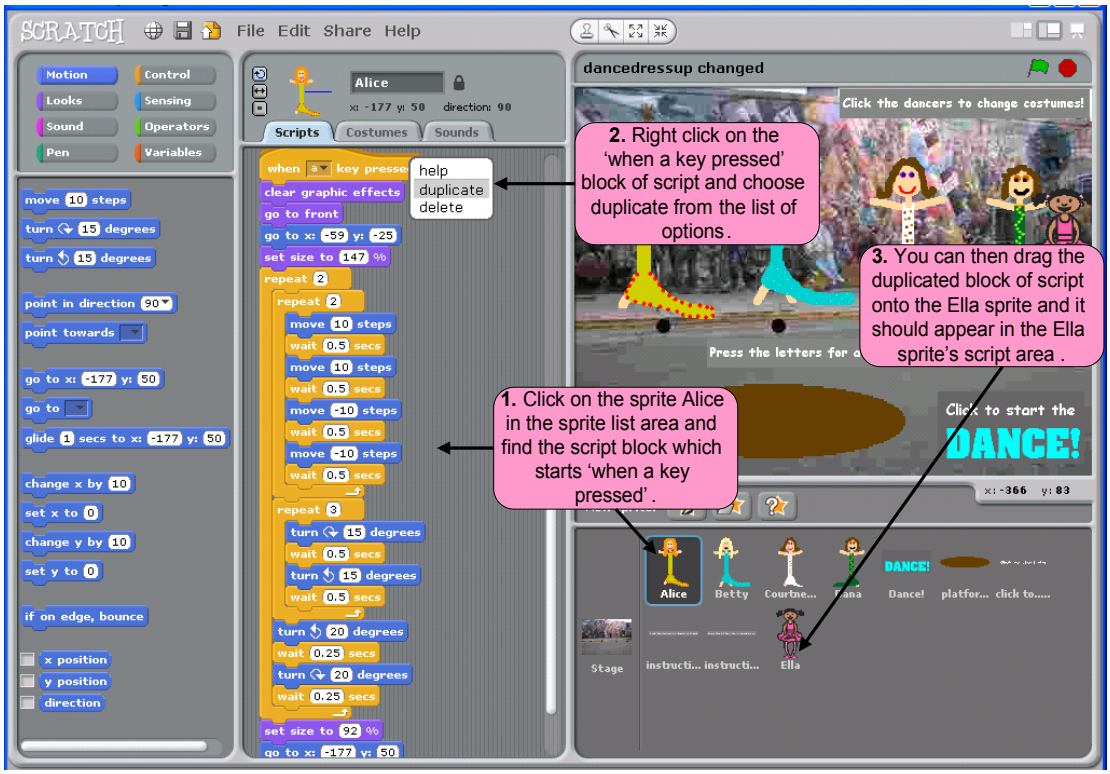
The next biggest sprite, Dana, is set at 72% in size when the green flag is clicked, so students should set new sprite Ella's size to approximately 60%, when the green flag is clicked.
Students should also figure out the (x,y) position Ella needs to be in when the green flag is clicked. She should also switch to her first costume, each time the flag is clicked. The script solution for question 3 is below.



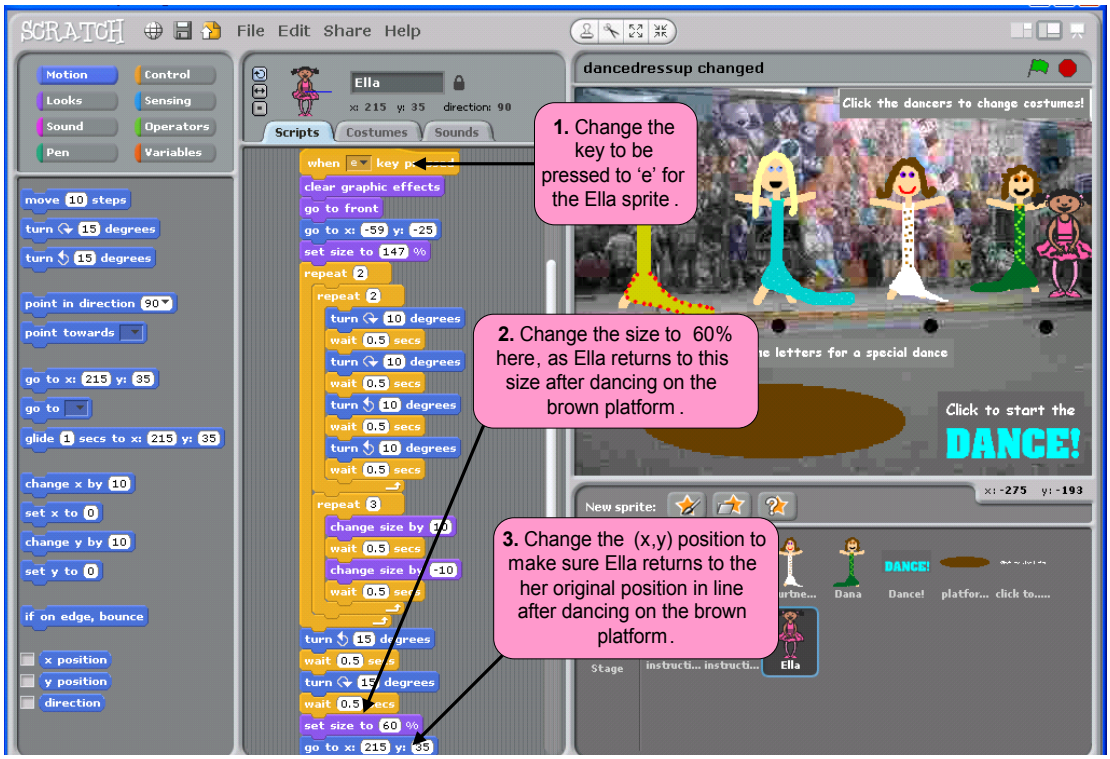
4. When sprite Ella is clicked, she should change costume.
See script below.

5. When the e key is pressed, make Ella dance on the brown platform, in whatever way you like, before returning her to her original position. (Tip: you may duplicate some code from the other sprites by right-clicking on the block of code and dragging it to the Ella sprite).

The other sprites already have scripts associated with them when a key is pressed. Students should first copy the code from one of these sprites and drag and drop it onto the Ella sprite as shown. This will eliminate the need to build this part of the script from scratch.

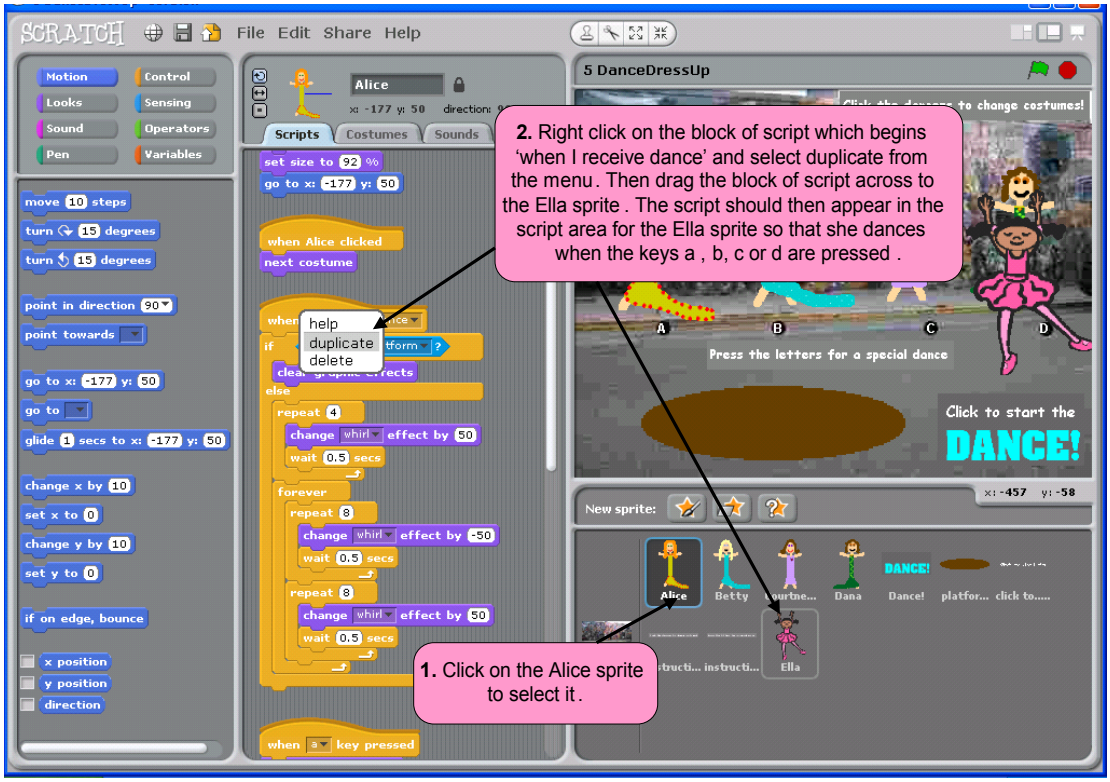


The students should then edit the script for the Ella sprite when the 'e' key is pressed, as shown.



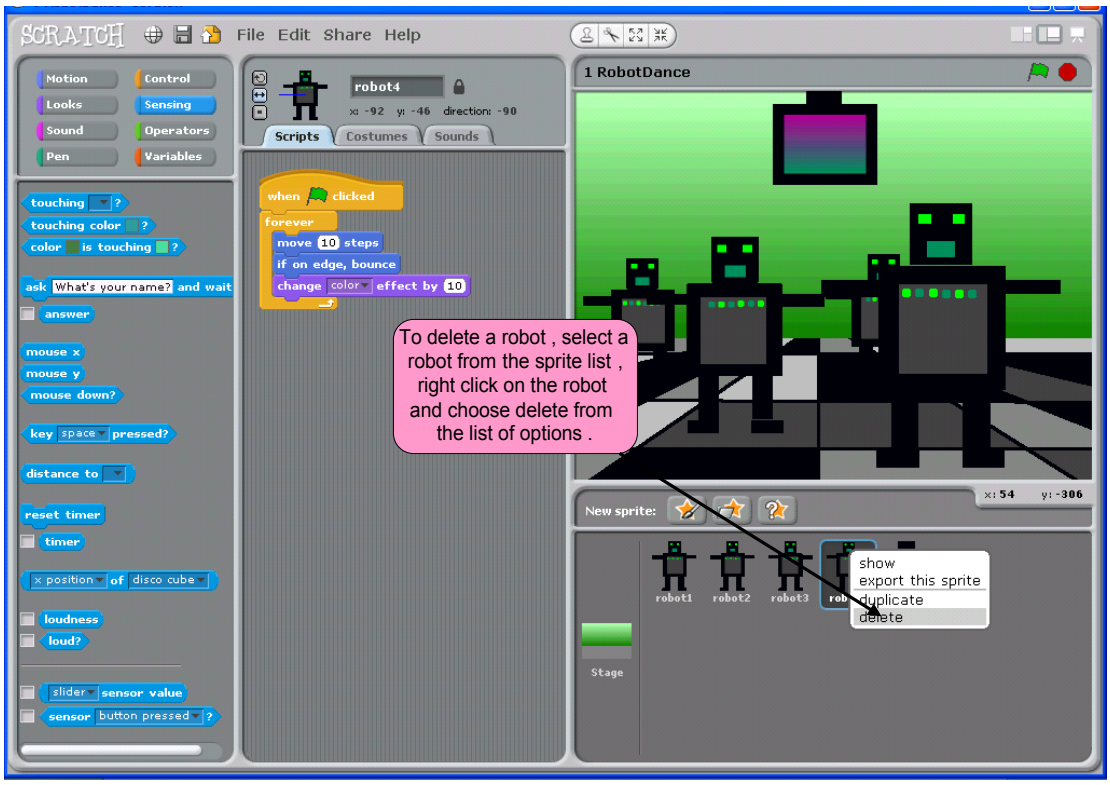
6. When the letter keys for the other sprites are pressed (i.e. a, b, c, d), make Ella dance in line like the other sprites. (Tip: you may duplicate some code from another of the sprites by right-clicking on the block of code and dragging it to the Ella sprite).

To make Ella dance in line like the other sprites, right click on the block of code which begins with 'when I receive dance' and drag it across to the Ella sprite as shown. This will make Ella dance in a whirl like the other sprites, when the keys a, b, c or d are pressed.

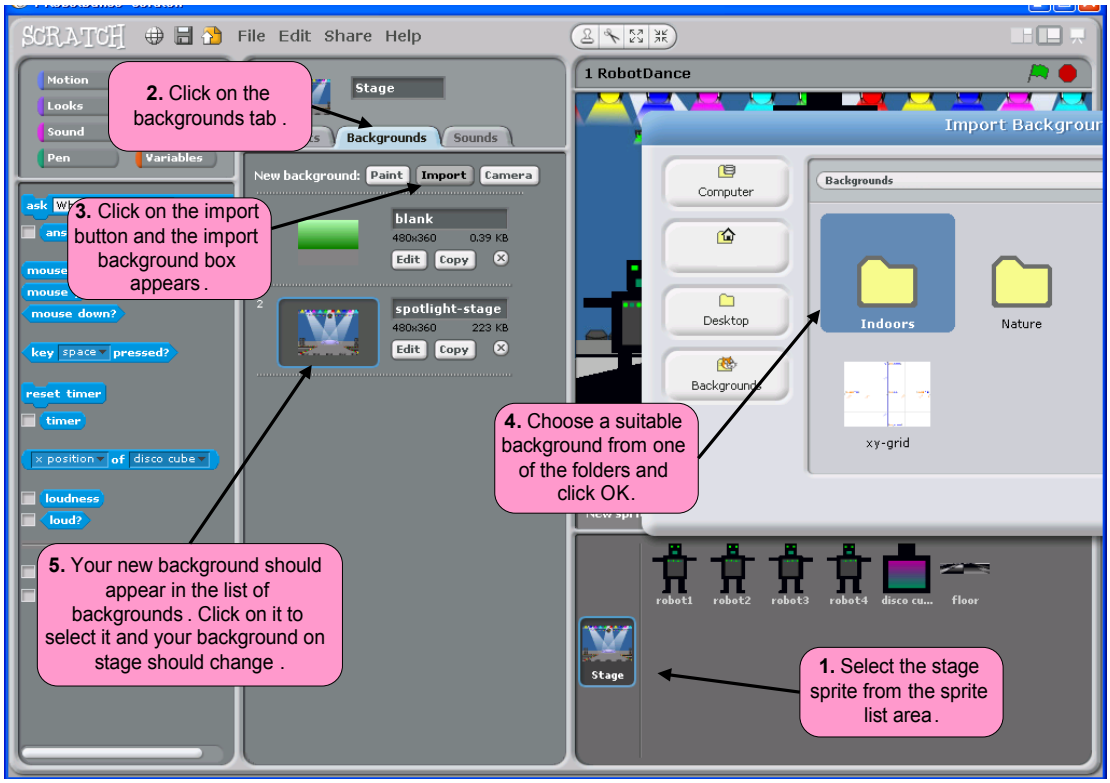


Project 2 – Robot Dance

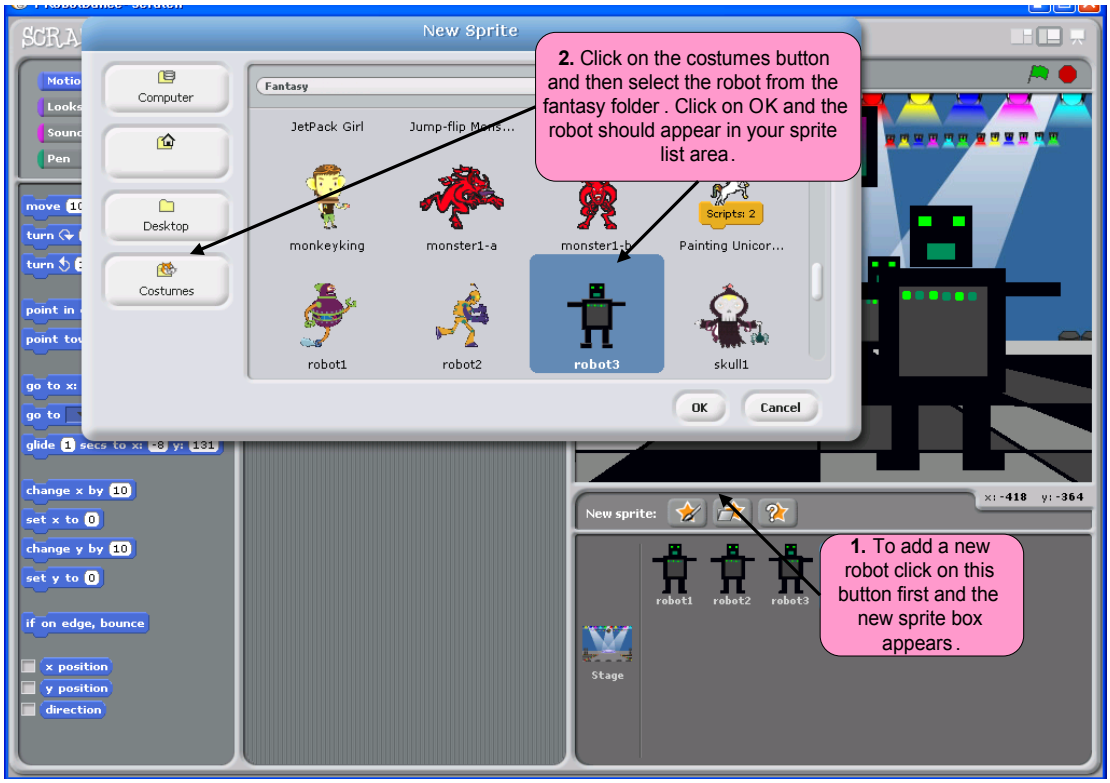
1. Delete a robot from the floor.

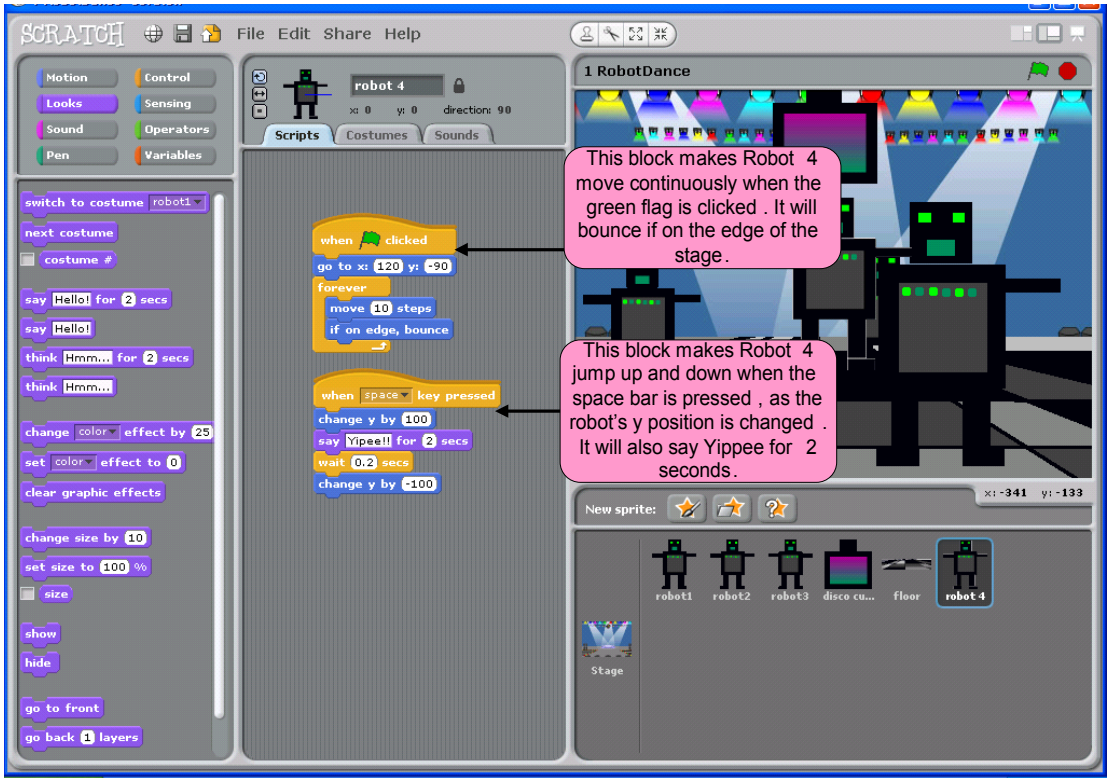


2. Change the stage.



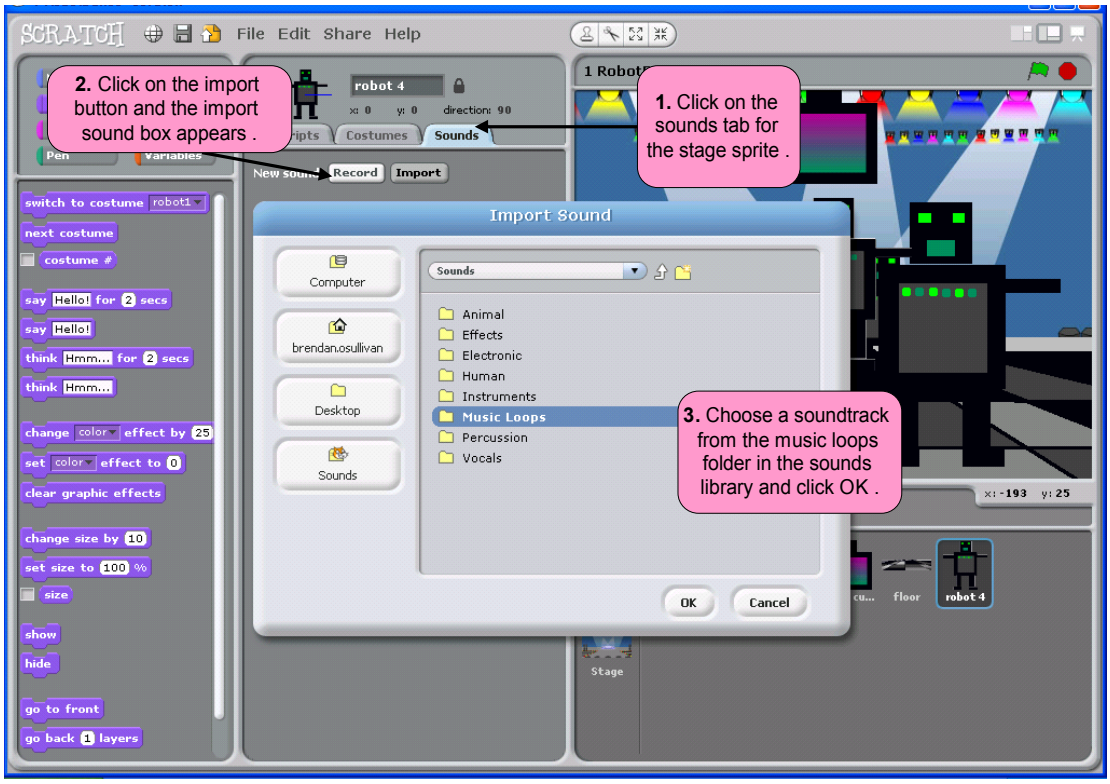
3. Add a new robot called Robot 4 and make it jump up and down and say "Yippee" when the space bar is pressed.





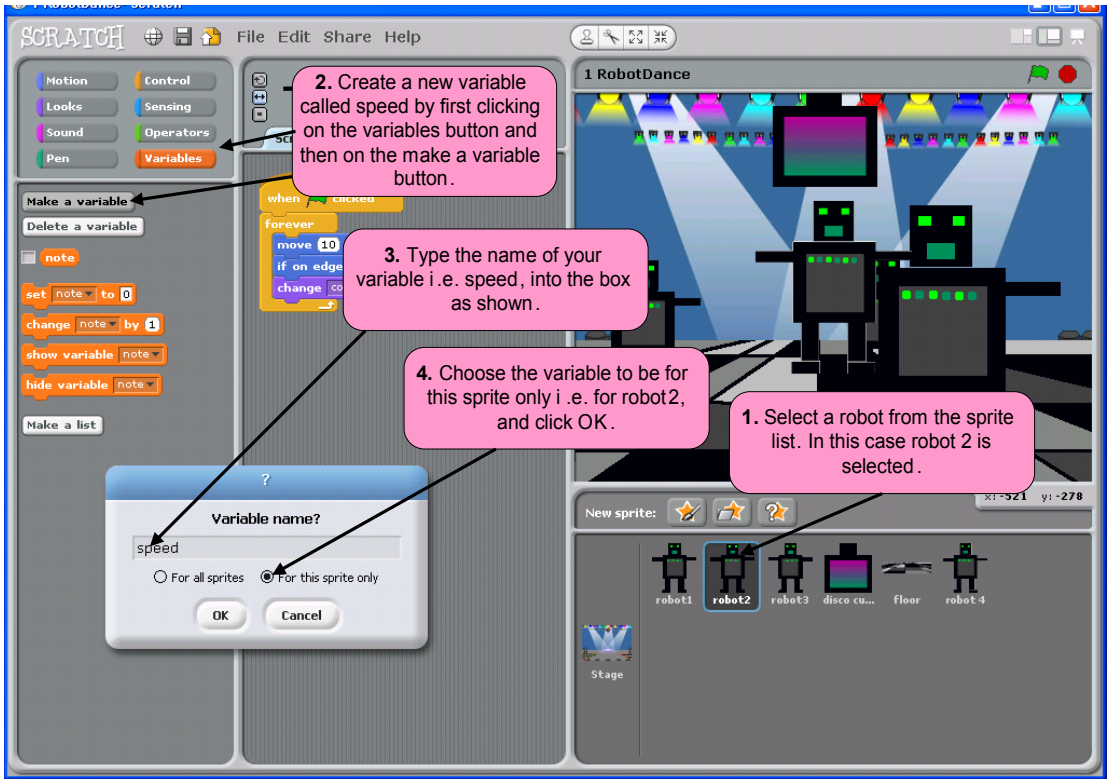
4. Add a new soundtrack. You can add your own soundtrack or music from the Scratch library of sounds.

The following shows you how to add a soundtrack from the Scratch library of sounds.

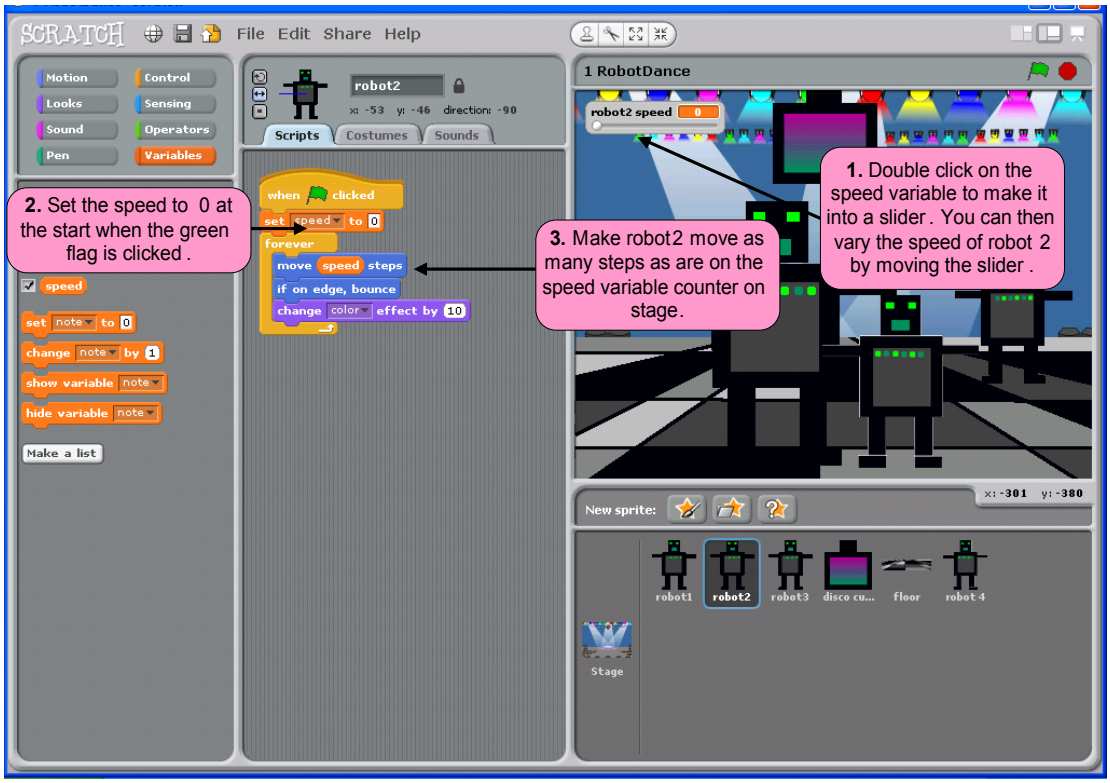


The following script should be added to the stage sprite to allow the imported soundtrack to play continuously when the green flag is clicked.

5. Add a new variable 'speed' and change the speed at which one of the robots dances.

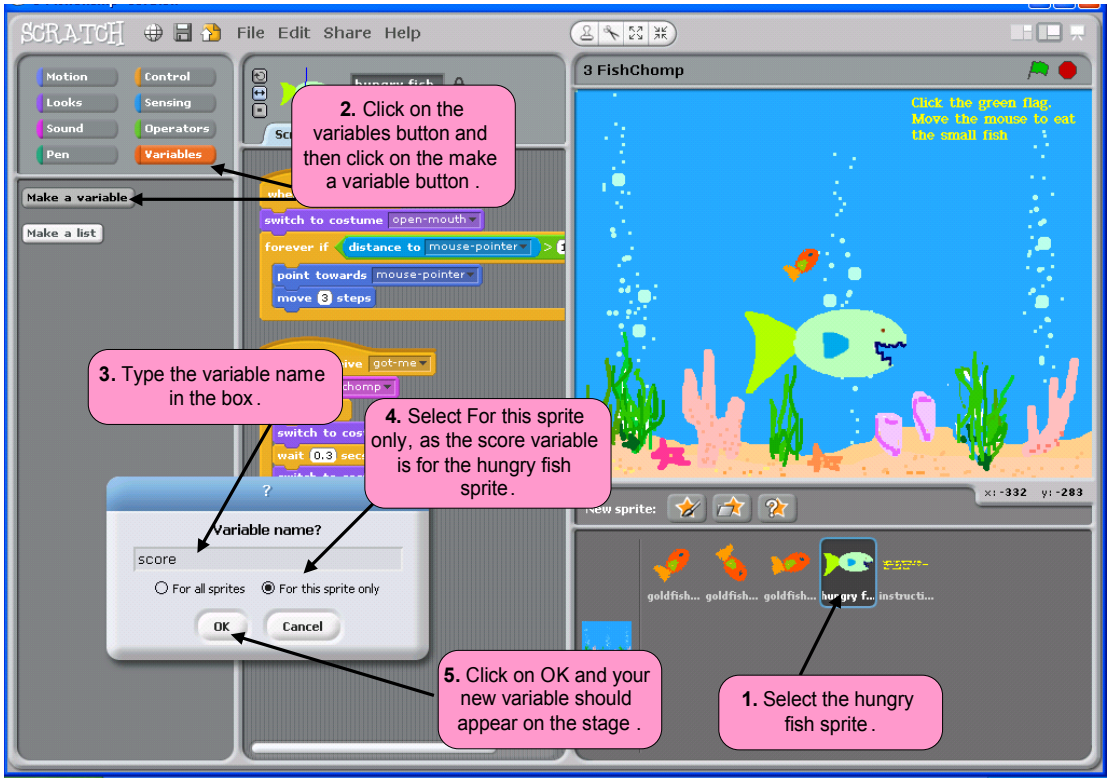


You can double click on the variable on stage to make it into a slider and then the code below will change the speed of robot 2 as you move the slider.



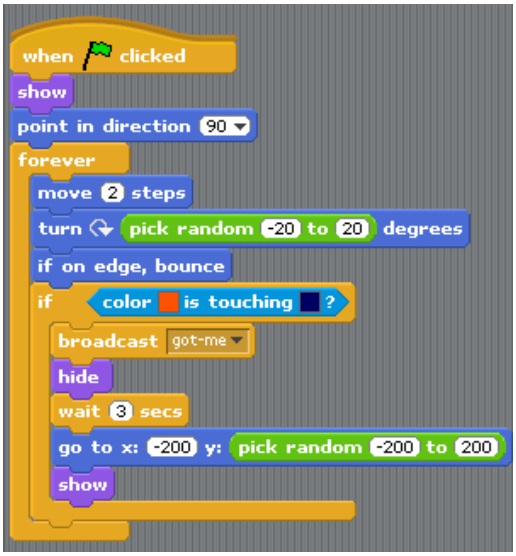
Project 3 – FishChomp

1. Add a variable called score for the hungry fish sprite.



2. Change the score if the hungry fish sprite eats any of the 3 goldfish sprites.

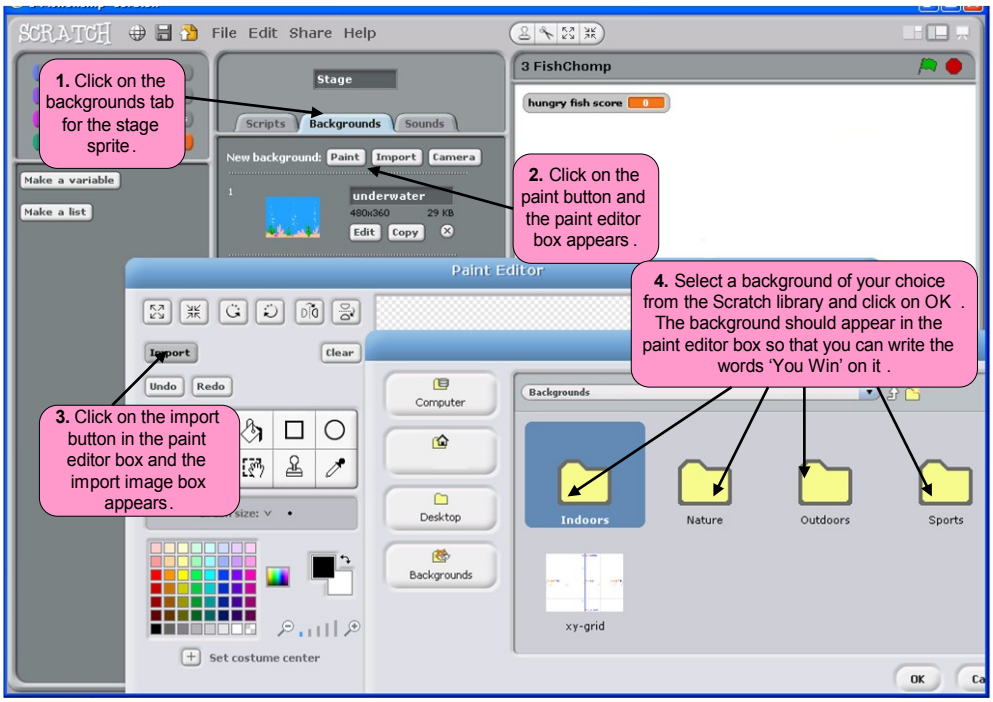
Remember each of the gold fish sprites has the following script, so that if the blue mouth of the hungry fish touches the orange of the goldfish, the message 'got me' is broadcast:



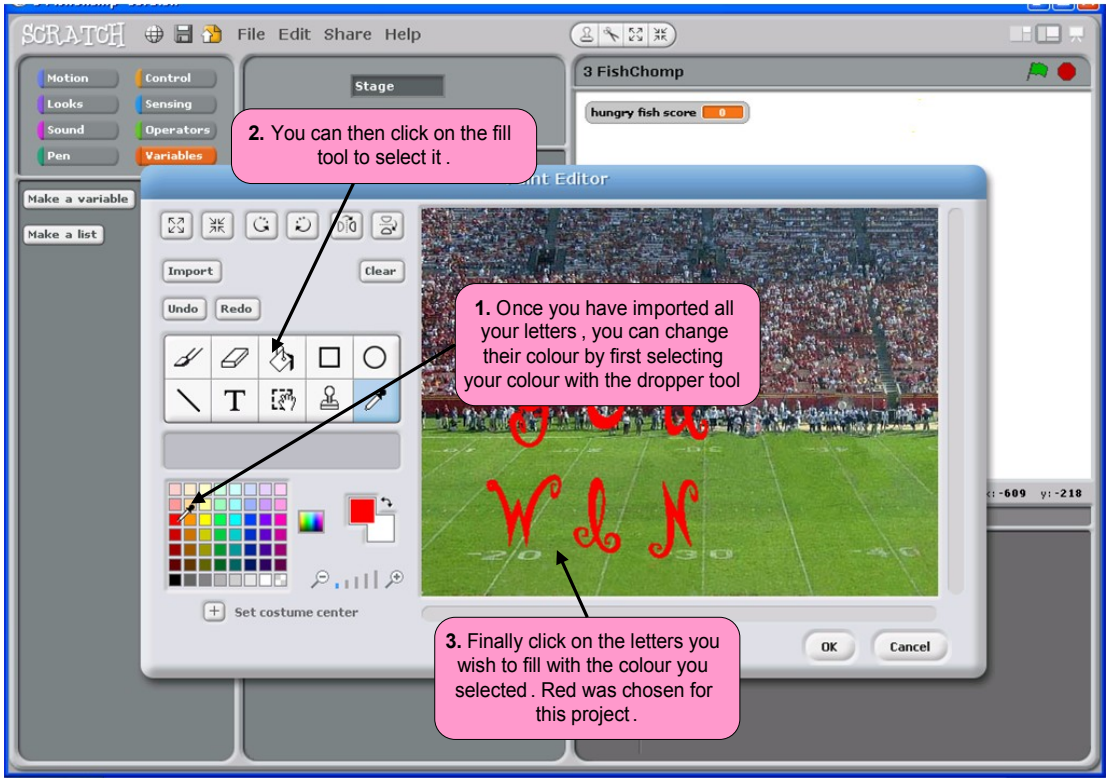
The following image shows the script for the hungry fish sprite. When the message ‘got me’ is received by the hungry fish sprite (i.e. it has eaten one of the goldfish), the score will change by one. Remember to set the score to 0 each time the green flag is clicked.

3. If the score is equal to 10, change the background, hide all the sprites and display the message ‘You Win’.

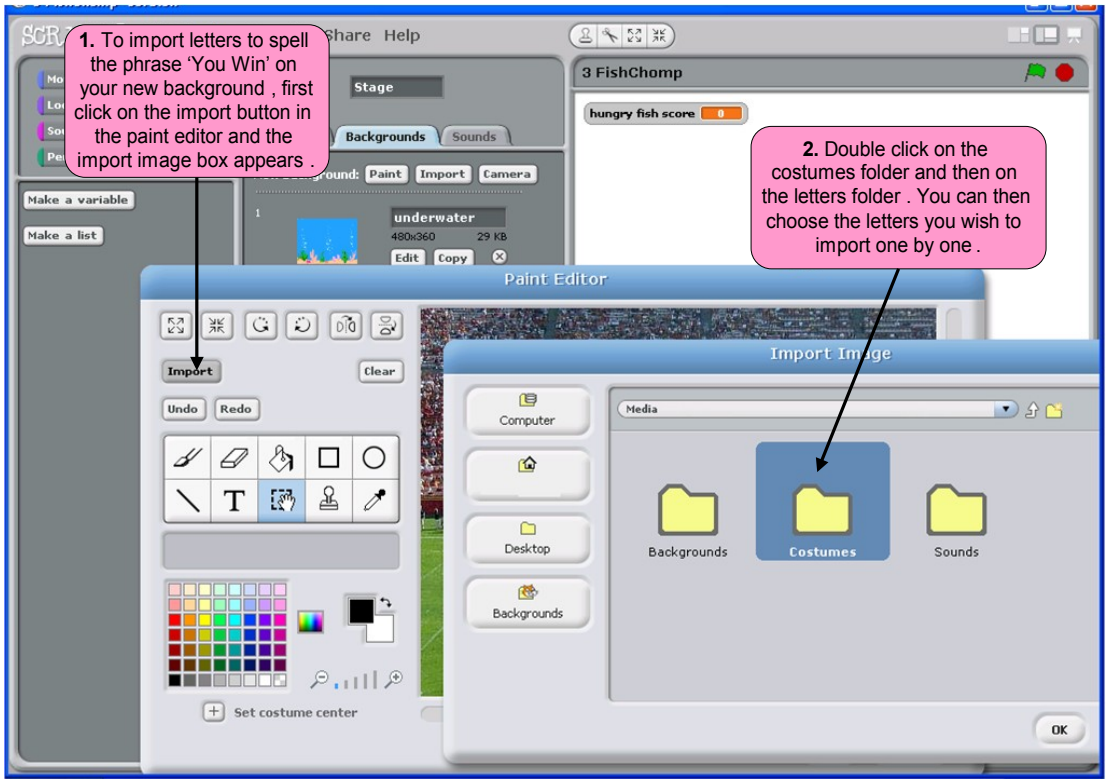
A new background displaying the message ‘You Win’ is created first.



The letters to spell ‘You Win’ are then imported. It is also possible to paint the letters using the paintbrush tool in the paint editor.

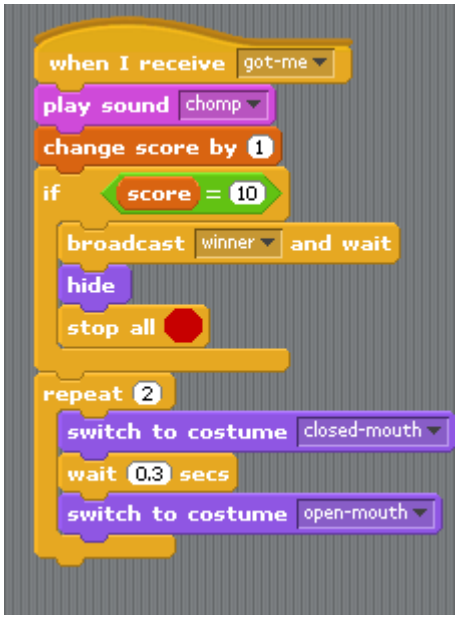


You can change the colour of the letters you imported as shown.



Finally you need to change the script for the hungry fish and the gold fish when the score is equal to 10.

The script for the hungry fish sprite looks like this.

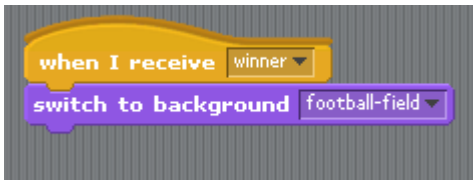


The ‘if score = 10’ block means that if the score is equal to 10, the message ‘winner’ is broadcast to all sprites. The hide command hides the hungry fish and the stop all stops everything at the end, once the score is equal to 10.

The sprites goldfish 1, goldfish 2, goldfish 3 and the instructions sprite all have the following script.

This means that they will all be hidden then they receive the ‘winner’ message at the end of the game.

The stage sprite has the following script.



Resource 4

Original Scratch Projects

The 3 Scratch projects for the lesson before they were modified. This is for teachers who do not have the original projects on the version of Scratch which was downloaded.

CD Resource

“M6L2R4 Original Scratch Projects 2”