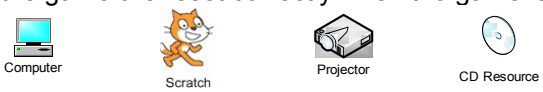
Module 4
Build a Game

Lesson 1 Game On

Students will design a game on paper. Students will implement their design using Scratch. This lesson introduces 2 characters, the Good Guy and the Bad Guy. Students choose a background for their game. The Good Guy is programmed to move around using the keyboard and react when it touches the Bad Guy. The Bad Guy moves around the stage in a random fashion.

Lesson 2 Game Over

Students further develop their game created in the previous lesson. A counter is used to store the number of lives. A set of events are programmed for the end of the game. Students must ensure that all aspects of the game are reset correctly when the game is restarted.



Lesson 3 Look at Me

Students are introduced to the idea of computers storing images as numbers. They complete a number of coded drawing exercises. Students are also introduced to image file sizes and import their own images into Scratch, using the types of image files accepted by Scratch.

Lesson 4 I Can't Hear You

Students learn how to record their own sounds in Scratch. Students learn how to import various sounds and music from the Internet into Scratch. They learn about the types of sound file formats accepted by Scratch.

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Lesson 1 – Game On

Resources:

Design a Game worksheet (Resource 1), Sample Game Version 1 (Resource 2)

Key Vocabulary:

Conditional Statements, Background, Random numbers

Description:

Students will learn how to make a game. They start by using a worksheet that helps them design the look and feel and behaviour of the game. In Scratch, 2 characters are introduced, the Good Guy and the Bad Guy. A suitable background is added. The Good Guy is programmed to move around using the keyboard and the Bad Guy is programmed to move around the stage in a random fashion. An event will be programmed to occur when the Good Guy is touched by the Bad Guy. Finally version 1 of the game is saved ready for further development in the next lesson.

Learning Objectives:

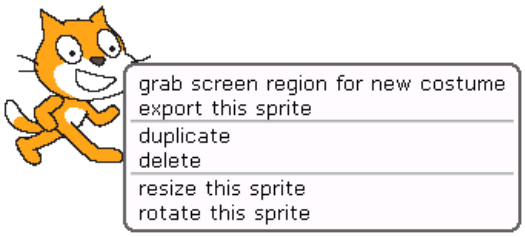
1. To learn about the process of project design.
2. To introduce conditional statements in Scratch.

Lesson Introduction:

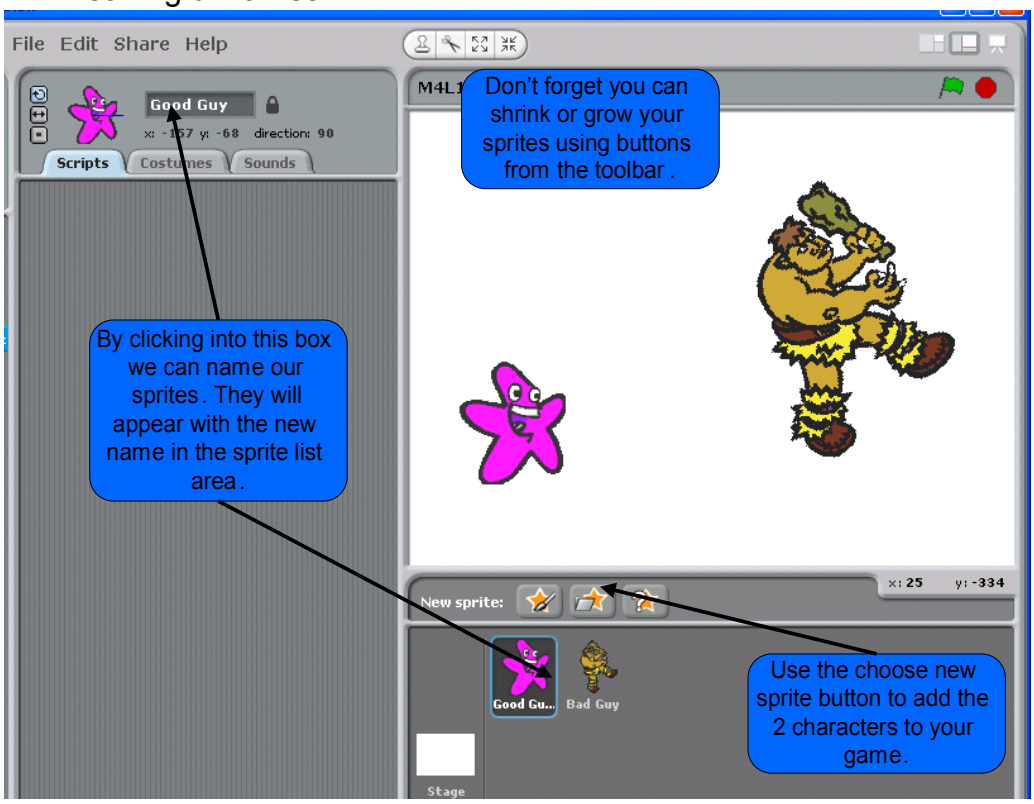
- Tell students that the upcoming lessons will involve making a game.
- It may be useful to show the finished game (Resource 2 from Lesson 2, Module 4) to students first.
- The first part of the lesson will involve the Design a Game sheet (Resource 1). The purpose of this activity is to think about game design without using the computer.
- Once the Design a Game activity is completed the students will use Scratch to implement their design.

Lesson Breakdown:

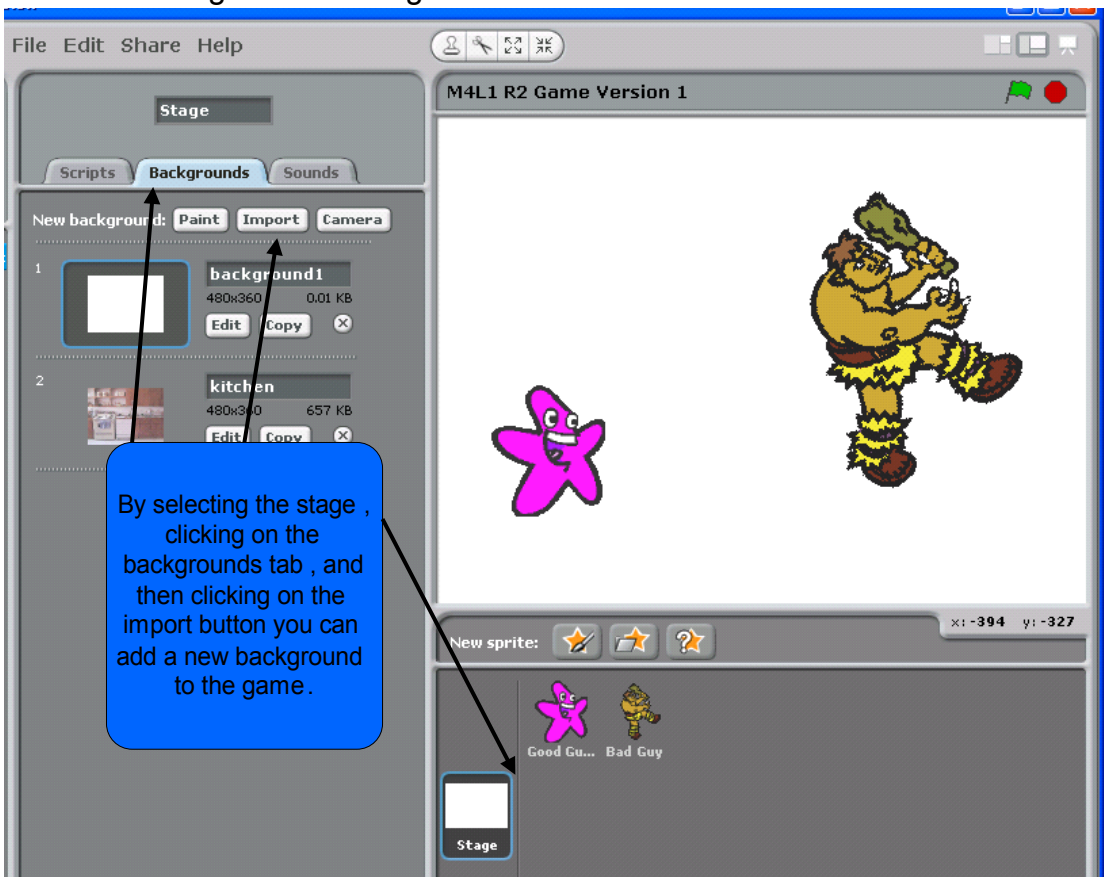
1. Use the Design a Game worksheet (Resource 1) to guide students through the process of design.
2. After completing the design choose the characters and backgrounds for the game. (These skills are covered in Module 1 Lesson 3 – Playing with Pictures). First open Scratch and remove the default character by right clicking as shown below.



3. Add the 2 characters to the game. It is useful to give your sprites meaningful names.

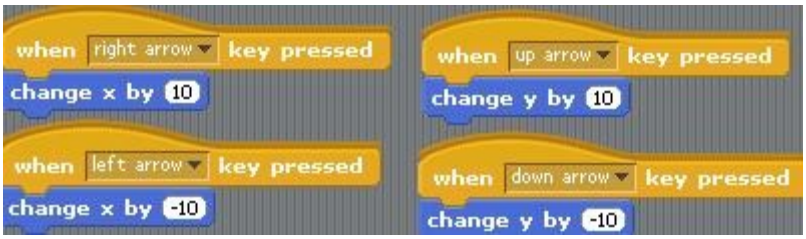


4. Add a background to the game.



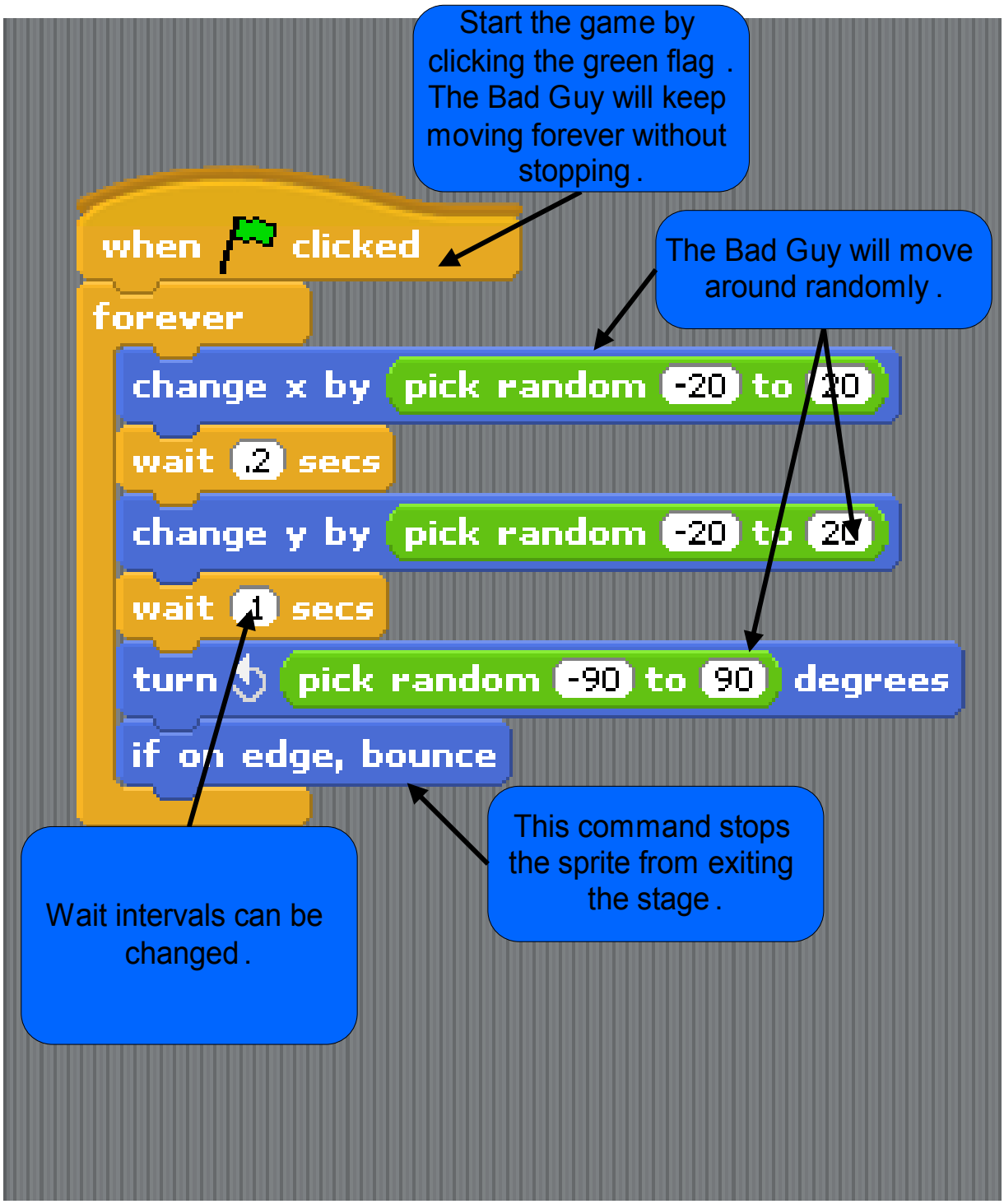
5. Select the Good Guy in the sprite selection area.

6. Program the Good Guy to move using the arrow keys as shown in Module 1 Lesson 5.



7. Select the Bad Guy in the sprite selection area.

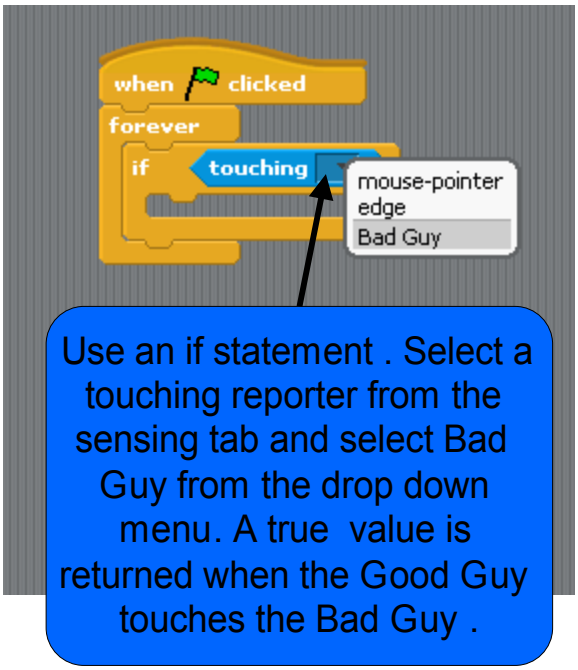
8. Program the Bad Guy to move randomly.



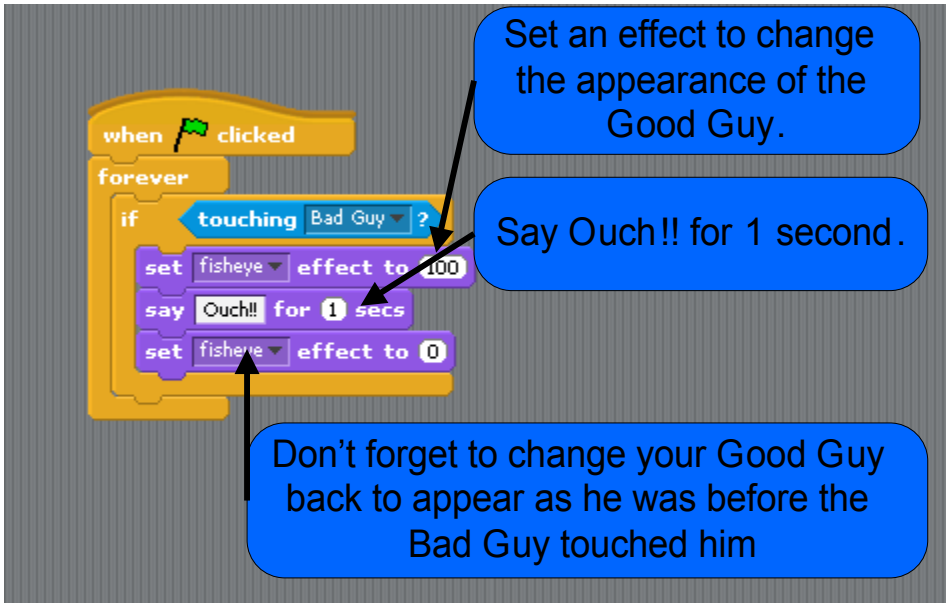
9. We want something to happen in our game when the Good Guy touches the Bad Guy. To trigger this we need to use a conditional statement called an “if statement”.
   E.g.
   If Good Guy touches the Bad Guy
   Perform a certain action

   As the Good Guy will be impacted when the collision occurs we will select the Good Guy and add a script for him.

10. Add a conditional statement that causes a reaction when the Good Guy senses the Bad Guy touching him.



11. Let students program the behaviour that occurs when the 2 characters touch. See a possible set of behaviours below.



12. Ask students to save the file as Game Version 1 as the next lesson will build new features into the game.
    The completed game for this lesson, Sample Game Version 1, is available as Resource 2.

Extension activity

- Students could enhance the Good Guy functionality effect by including a costume change when moving in different directions.
- Instead of controlling the Good Guy using the arrow keys, students could try using different keys. Different actions could be introduced for the Good Guy. E.g. hit "spacebar" to make him jump.
- Students could alter the random movement of the Bad Guy to make the speed and motion appear as realistic as possible.

Resource 1

Design a Game

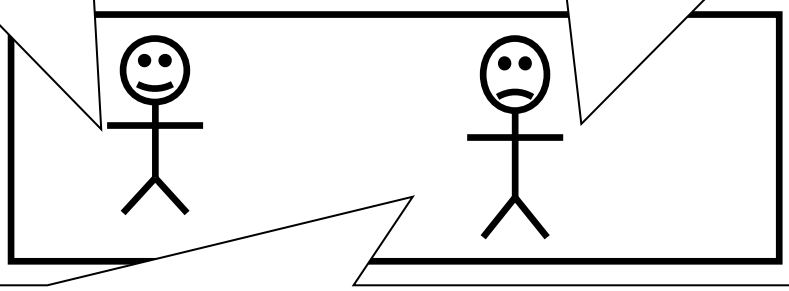
A worksheet that guides students through game design.

Design a Game

When you start a programming project it is a good idea to brainstorm away from the computer. Lets start with a simple computer game. It has 2 characters and a background. Fill in the worksheet to get inspiration and ideas for your game. Read through the design features carefully to understand how to play the game before you get it working in Scratch.

1. Description of your **Good Guy** Character

2. Description of your **Bad Guy** Character



3. Description of the **Background** you would like to use for your game

4. **Game controls.** Describe a special action that you can program for the spacebar key (E.g. jump, make Sprite disappear).

Key Used	**Movement**
Up Arrow	Move Up
Down Arrow	Move Down
Left Arrow	Move Left
Right Arrow	Move Right
Space Bar	

5. **Game play**. Tick the box when you have each feature of the game play working correctly

Game Feature	**Working?**
a. Bad Guy moves randomly so the Good Guy can't guess where he is going.	☐
b. The Good Guy starts the game with 5 lives.	☐
c. If the Good Guy is touching Bad Guy then the Good Guy loses a life.	☐
d. If the Good Guy's lives become equal to zero the game stops and a Game Over background appears.	☐
e. When the Game restarts the background is reset and the lives are initialised back to 5.	☐

6. **Improvements**. Describe what improvements you would make to the game

Resource 2

Sample Game Version 1

A sample game in Scratch for the lesson.

CD Resource

“M4L1R2 Game Version 1.sb”

Lesson 2 – Game Over

Resources:

Sample Game Version 1 created in the previous lesson (Resource 1), Sample Game Version 2 for this lesson (Resource 2), Sample Game Version 3 (Resource 3)

Key Vocabulary:

Variable, Broadcast, Initialise, List

Description:

Students add new functionality to the game developed in the previous lesson. Variables are introduced to keep count of the number of lives remaining for a character. Broadcast messages are introduced to trigger a set of events when the game is over. Students will add a script to make sure everything is reset correctly when the game is restarted. Students are introduced to Lists and will create a list of comments for the Good Guy to say randomly.

Learning Objectives:

1. To learn about variables and lists.
2. To learn how to use broadcast messages to trigger events in Scratch.
3. To understand the importance of initialising everything at the start of a game.

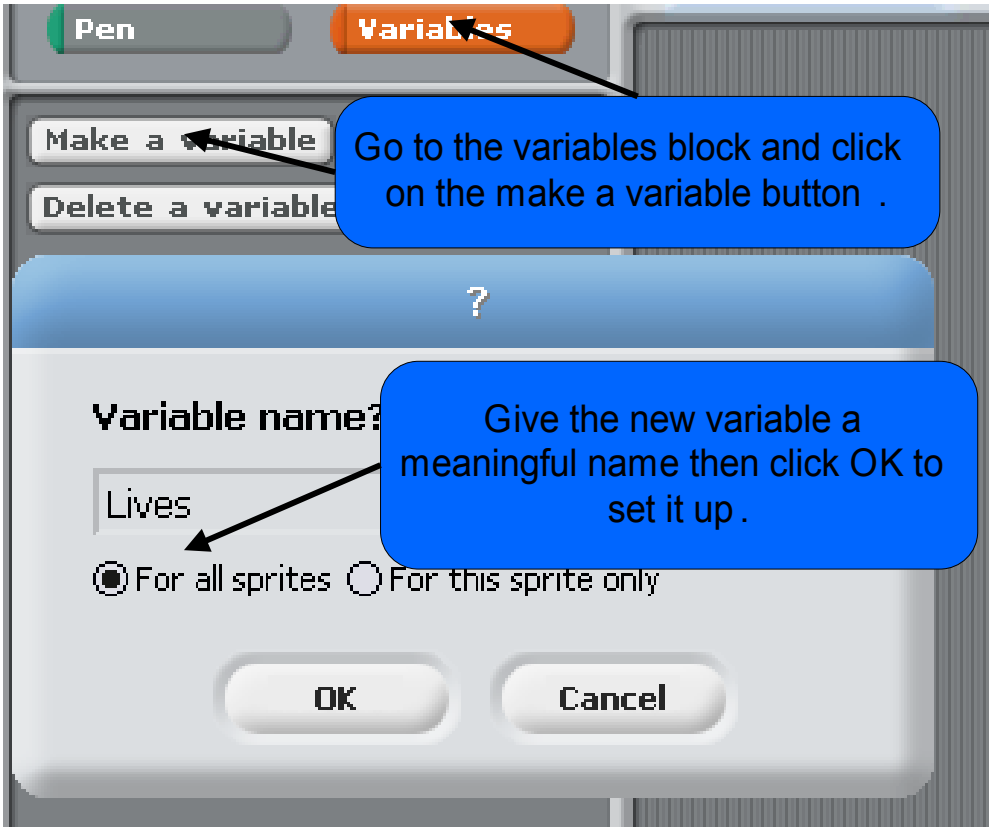
Lesson Introduction:

- Tell students they will build on and further develop the game created in the previous lesson.
- Variables are holders for numbers in Scratch. They will be used to keep count of the number of lives remaining for a character.
- A special feature called a broadcast will be used to trigger all events that need to run when the game ends.
- We will then notice problems when our game is started again. To solve the problems some values will have to be reset (Initialised).
- We will use lists to store a list of comments for the Good Guy sprite to say randomly. Lists can store numbers as well as strings of letters and other characters.

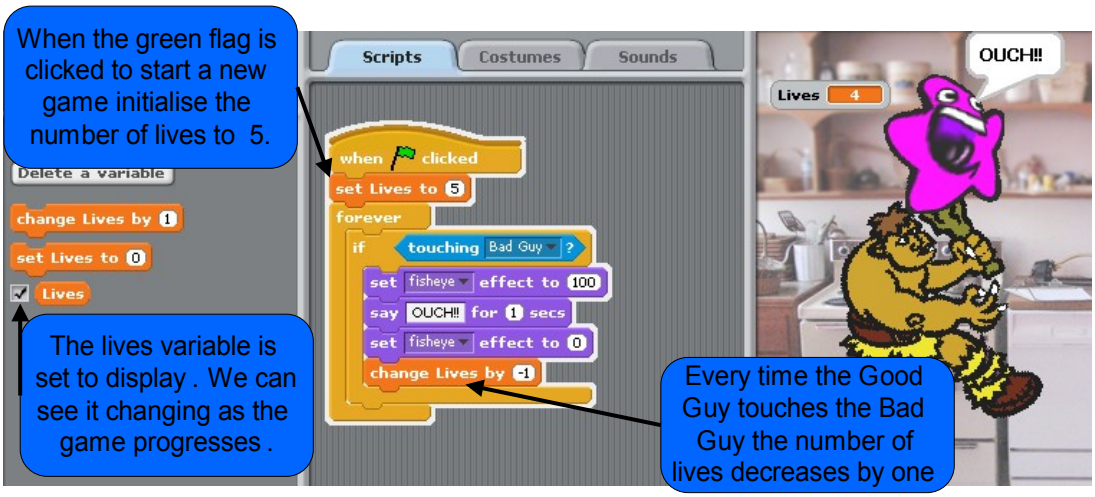
Lesson Breakdown:

1. Open Game Version 1 that was saved at the end of the previous lesson. If you do not have a copy of Game Version 1 use a copy of Resource 1.

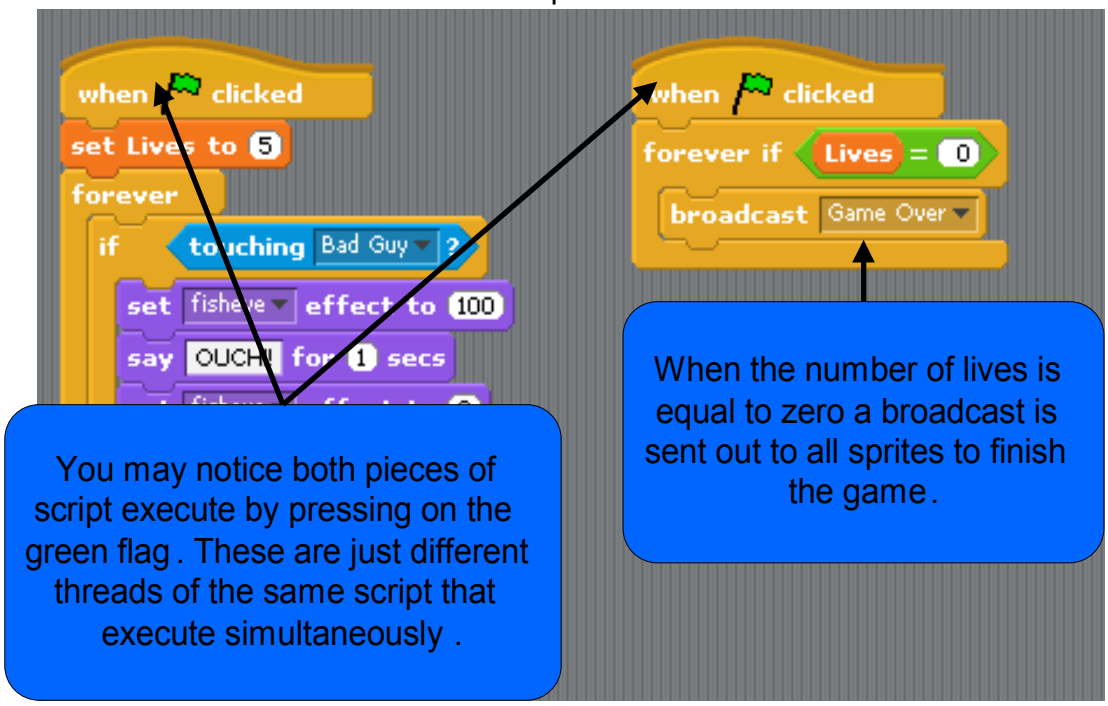
2. We are going to create a variable to store a value that changes during the game. This variable tracks the number of lives remaining for the Good Guy. To create the variable select the variables block and click the Make a variable button as shown below.



3. It is time to include the variable in the Good Guy script. When the game is started the number of lives will be set (initialised) to 5. In the previous lesson a conditional statement was used to track every time the Bad Guy touches the Good Guy. Include a line in this script to decrease the number of lives by one when the sprites collide.

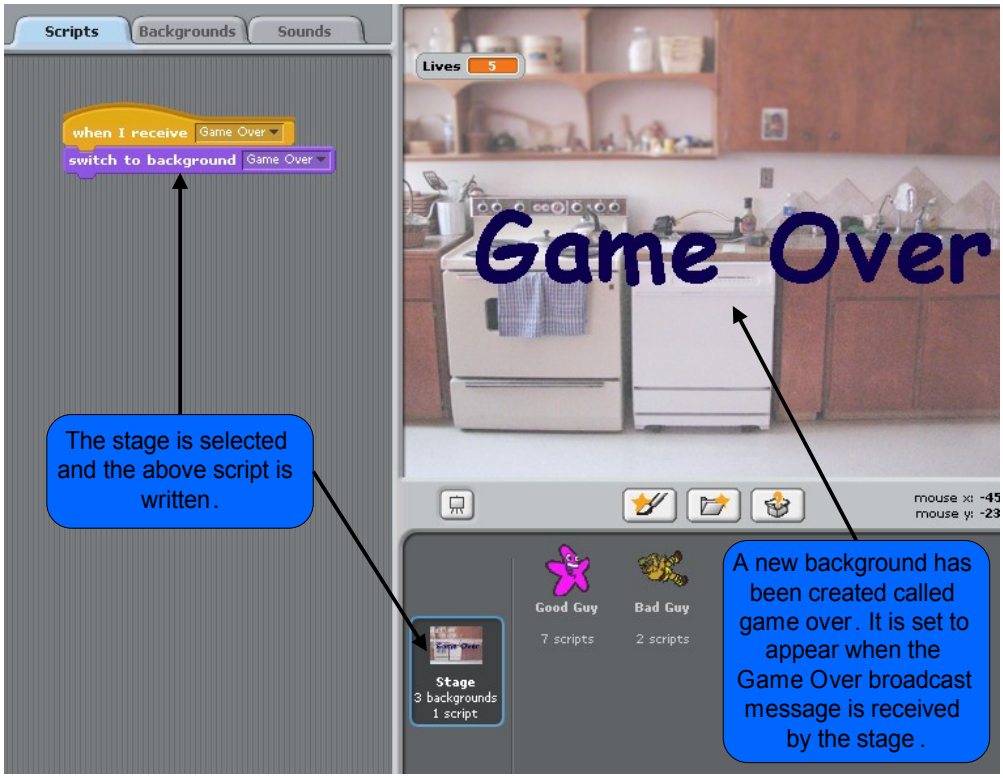


4. Next program the Good Guy to broadcast a message saying “Game Over” if the number of lives is equal to zero.

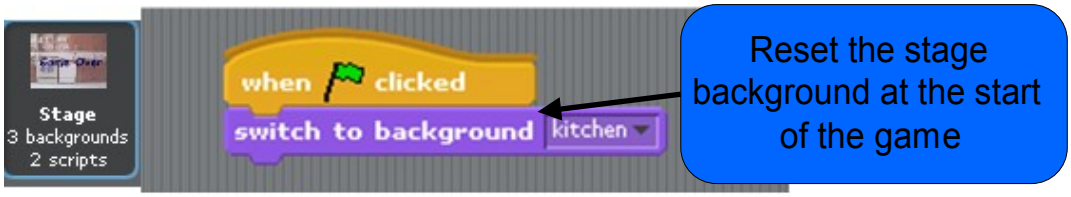


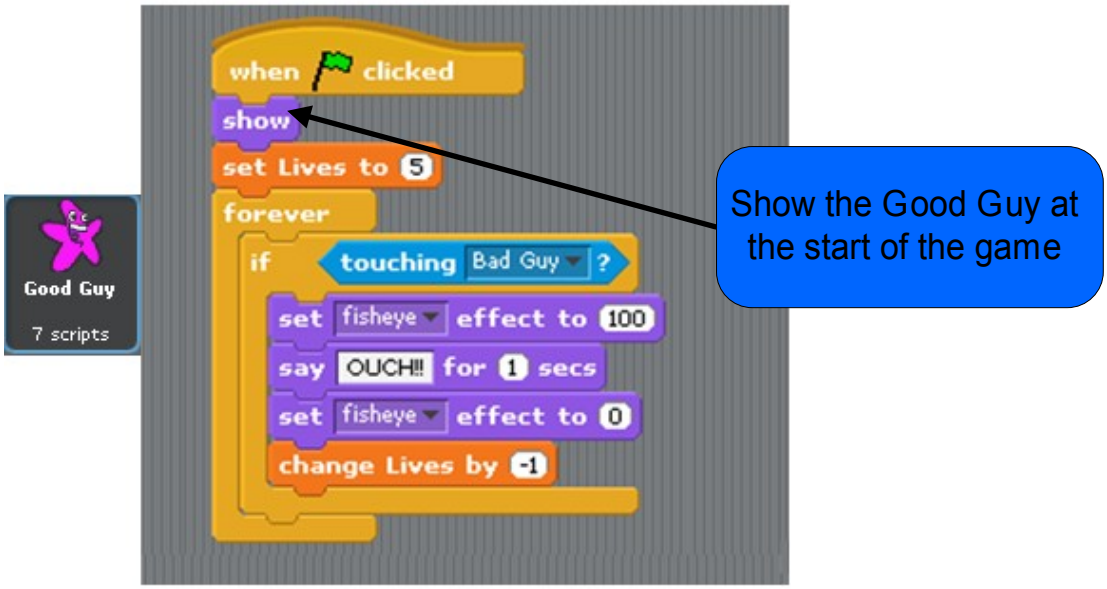
5. Program both sprites to disappear when the Game Over broadcast message is received.

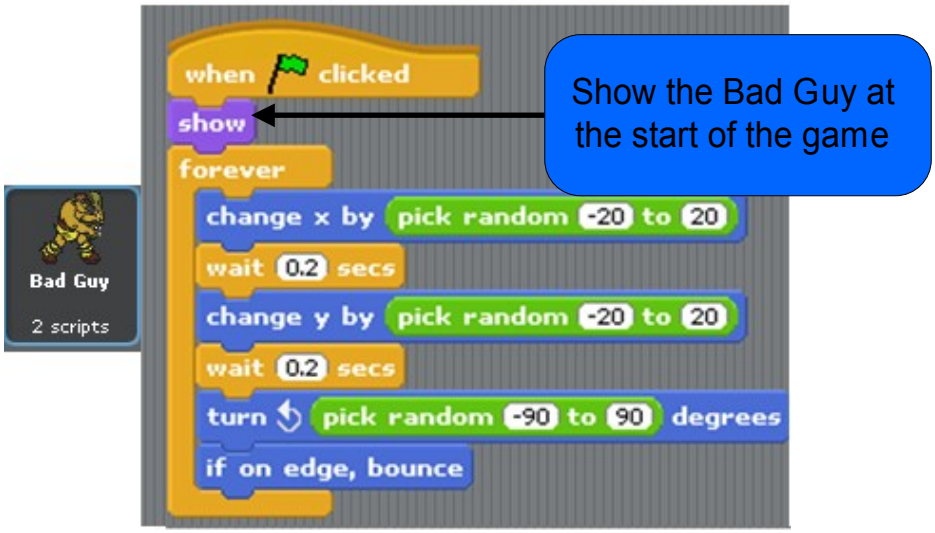
6. Program the background of the stage to change when the Game Over broadcast message is received.



7. Ask students to test out the game by running it until the game is over. Does anything strange happen when the green flag is clicked again to restart the game?
8. We need to program the Good Guy and Bad Guy to reappear when the green flag is clicked using the show command. The background needs to be reset too.



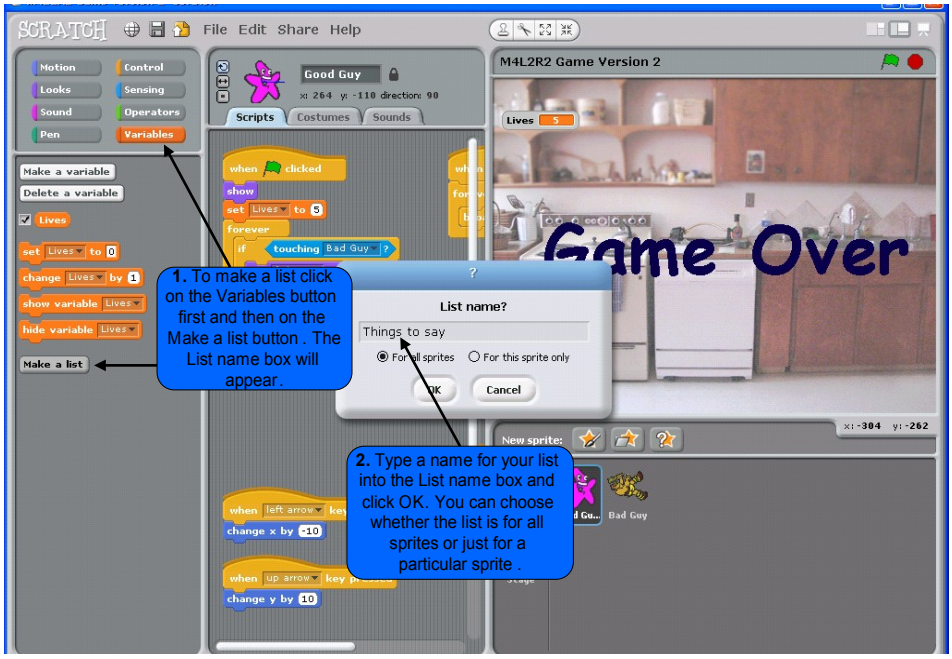




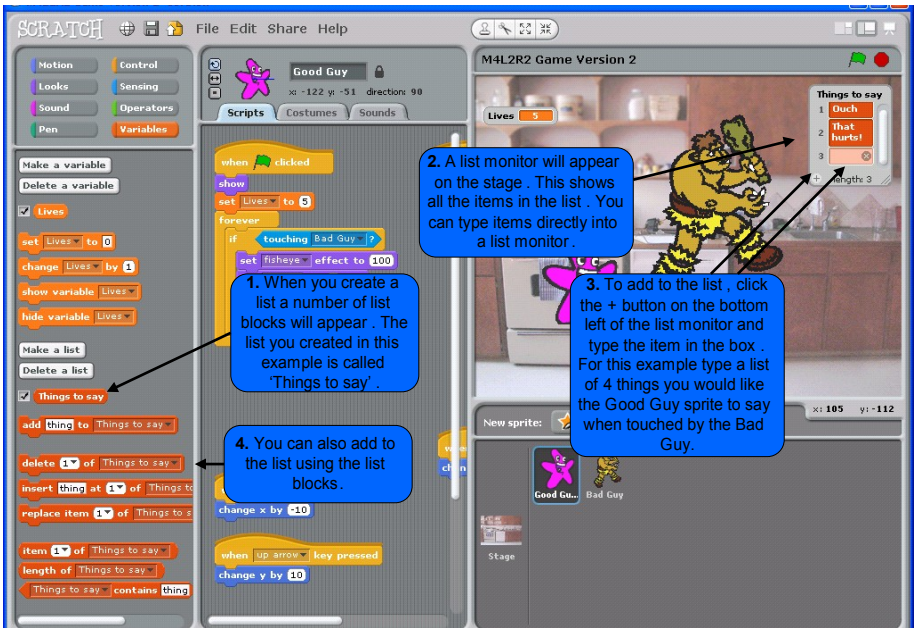
9. Save the game as Game Version 2, which is available as Resource 2, ready for further developments.
10. Explain to students that they will now change what the Good Guy says when he touches the Bad Guy. He will say something different or random each time. To do this we will use Lists, which can be found under the Variables blocks category in Scratch. Students will create a

list of 4 things they would like the Good Guy to say randomly when touched by the Bad Guy.

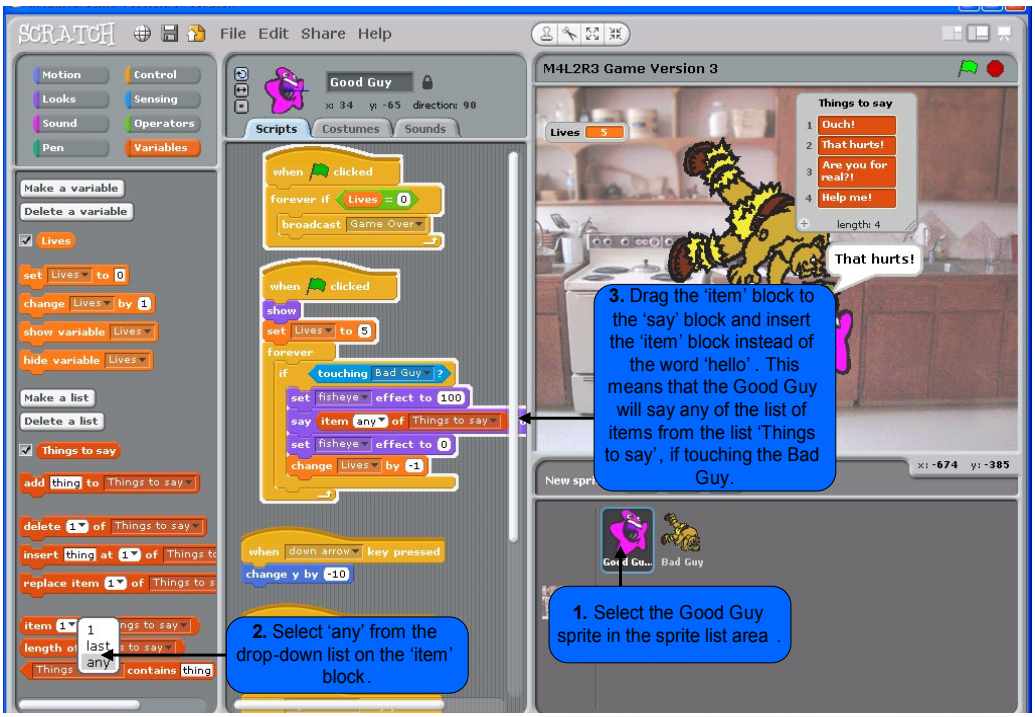
11. To create a list, go to the Variables blocks category and click on the 'Make a list' button and then type a name for your list i.e. 'Things to say', as shown in the following image.



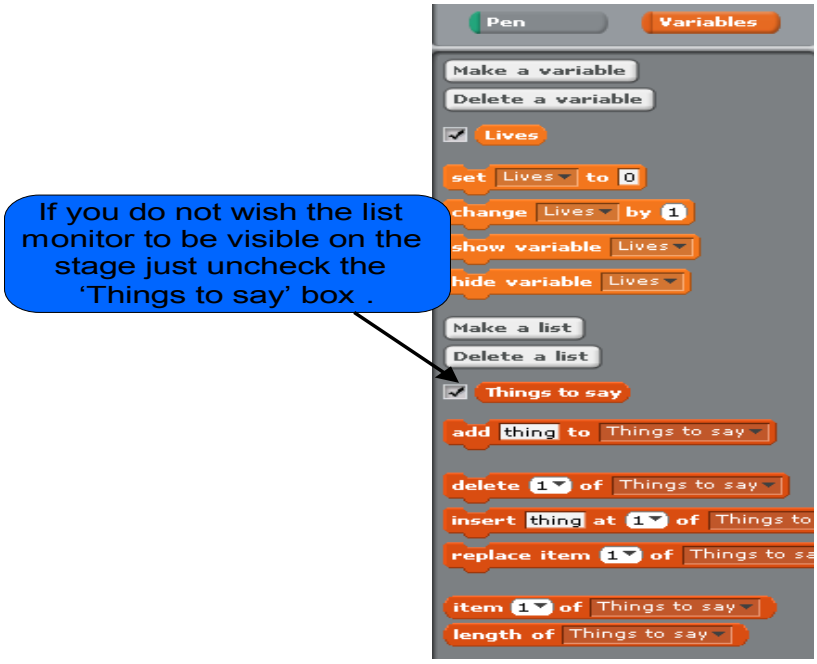
12. Once you give your list a name, a number of list blocks will appear under the Make a list button. A list monitor will also appear on the stage and this shows all the items in a given list. The list monitor is empty at first and will have length 0. To add to the list, click on the + button at the bottom left of the list. The length will increase by one each time you add to the list, as shown. Add 4 things the Good Guy will say when touched by the Bad Guy.



13. To make the Good Guy sprite say any of the items from the list in a random order, first select the Good Guy sprite in the sprite list area. Choose the item block from the list blocks and select ‘any’ from the drop-down list. Drag the ‘item’ block to the ‘say’ block as shown in the following image, and insert the ‘item’ block instead of the word ‘hello’. This will make the Good Guy sprite say any of the items on the ‘Things to say’ list, if he is touching the Bad Guy sprite.



14. Explain to students that if they do not wish the list monitor to be visible on stage they can uncheck the box next to ‘Things to say’ as shown in the following image.



15. The final version of the game with the inclusion of the List example is available as Game Version 3 (Resource 3)

Extension activity

- Students could develop a scoring system for the game and a way of winning or losing at the end of the game.
- Students could introduce levels to the game. The speed and movement of the Bad Guy could increase as the levels progress.
- Students could use Lists to add a list of things for the Bad Guy to say if touching the Good Guy.

Resource 1

Sample Game Version 1

A sample game in Scratch created in the previous lesson. This is used as the starting point for this lesson.

CD Resource

"M4L1R2 Game Version 1.sb"

Resource 2

Sample Game Version 2

A sample game in Scratch for the lesson.

CD Resource

“M4L2R2 Game Version 2.sb”

Resource 3

Sample Game Version 3

A modified version of the sample game M4L2R2 in Scratch with Lists included.

CD Resource

"M4L2R3 Game Version 3.sb"

Lesson 3 - Look at Me[1]

Resources:

Letter 'a' with and without Numbers (Resource 1), 3-Pictures Worksheet (Resource 2), Grid for Coded Picture for Classmate (Resource 3), Understanding Pictures (Resource 4).

Key Vocabulary:

Image compression, Lossy Compression, Lossless Compression, Pixel, Image file formats, JPEG(.jpg), GIF(.gif), PNG(.png), Bitmap(.bmp), TIFF(.tiff), Open Source, Run Length Encoding.

Description:

Students are introduced to the idea of computers storing images as numbers. Students are shown how to represent black and white images using numbers and they complete a number of drawing exercises using numbers. Students are introduced to the idea of compression as decreasing the file size of images so they can be stored and transmitted more efficiently. They view a PowerPoint presentation which introduces them to some of the image file formats used today. They learn about the types of images used in Scratch. They then experiment by importing their own images into Scratch and can personalise their game using photos as an extension activity.

Learning Objectives:

1. To introduce students to the idea of how images are stored in a computer.
2. To introduce image compression to students and to familiarise them with the various image file formats, including those accepted by Scratch for import.

Lesson Introduction:

- Introduce students to the idea that computers are often used to store drawings, photographs and other pictures.
- Explain to students that computers can only really store numbers and that they will explore how images are stored using numbered codes and they will have fun drawing their own pictures using codes.

Lesson Breakdown:

1. Ask students to name computer applications that store images e.g. a drawing program, a game with graphics, Scratch.
2. Explain to students that computers can only really store numbers and ask them if they could suggest how a picture could be stored using only numbers.

[1] This lesson is based on Computer Science Unplugged Activity 02 – Image Representation http://csunplugged.com

3. Show how images are displayed on a computer screen, as follows:
   Computer screens are divided up into a grid of small dots called **pixels**. The word pixel is a derived from "picture element." On a black and white screen, each pixel is either black or white.
   Figure 1 (Resource 1) shows a picture of a letter "a" that has been magnified so that the dots are visible. (This image could be shown on an overhead projector, or drawn on the board.) When a computer stores the picture, all that it needs to store is which dots are black and which are white.

   The following is a copy of the image from Resource 1:

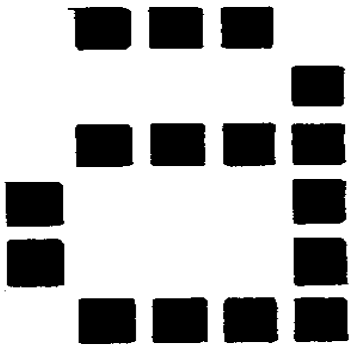


Figure 1

4. Using the image of Figure 1.1 (Resource 1), show how pictures can be represented by numbers. The first line consists of one white pixel, then three black, then one white. Thus the first line is represented as 1, 3, 1.
   Note: The first number always relates to the number of white pixels. If the first pixel is black the line will begin with a zero.
   The following is a copy of the image from Resource 1:

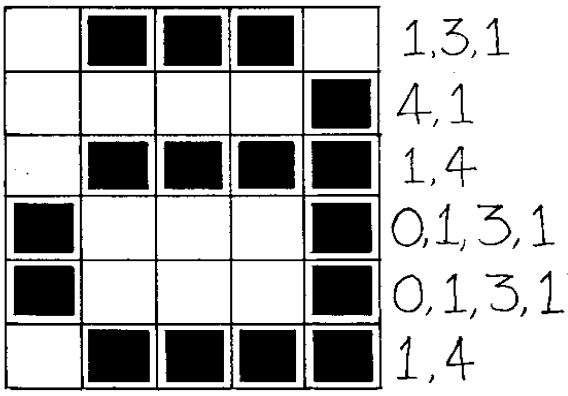
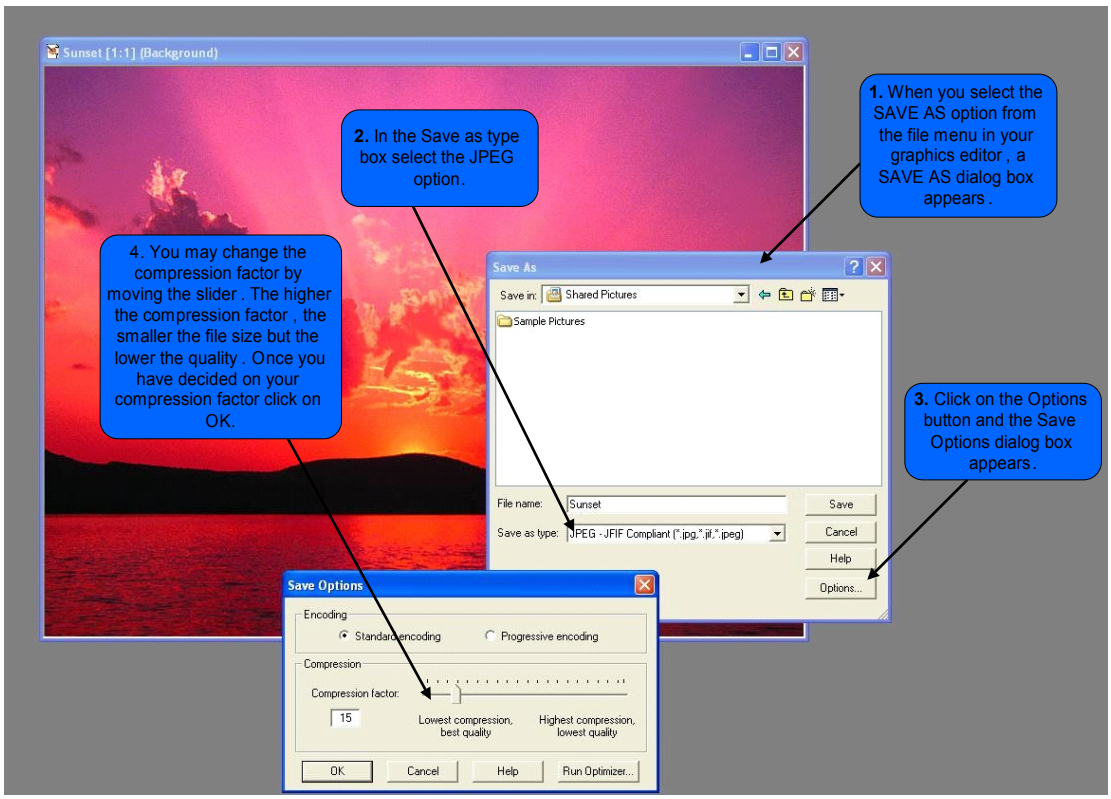


Figure 1.1

5. Give students the worksheet with the 3 grids to draw 3 pictures (Resource 2). Use the same rules as in Figure 1.1.
6. Once students have drawn the 3 images (see teacher's solutions in Resource 2), give students the extra grids (Resource 3) and ask them to draw a coded picture for a friend.
7. Explain to students that the simplest way to represent a black and white picture on a computer is to represent the white pixels with a zero (0) for example and the black pixels with a one (1). But as they have

seen from the previous activities, it is common for images to contain large blocks of white pixels and runs of black pixels so the grouping technique that was used in the activities is much more efficient. Rather than representing every pixel with a number, it is possible to group pixels together as was the case in the image activities.

8. Tell students that saving space, using techniques like this, is called ‘compression’ and is very important for working with images on computers. With compression many more images can be stored and viewing images over the Internet will take much less time as the file size will be smaller. Therefore "Compression" is a computer term that represents a variety of mathematical formats used to compress an image's byte size. In the black and white images in the drawing exercises a few black pixels together could be represented by one number and the same for a few white pixels together. This compression technique is called "run-length encoding". The process of "run-length encoding" is applied where runs of pixels that are all the same colour are stored in one single value. Bitmap images (.bmp), which are accepted by Scratch, can be compressed using run-length encoding. The longer the run of pixels, the more compression. Bitmaps with little detail or colour variance will compress significantly. Run length encoding is also applied to fax machines as there are often large amounts of black and white pixels on faxed documents.
9. Start the PowerPoint presentation (Resource 4).
10. Revise again the idea of image compression as minimizing the size in bytes of a graphics file without degrading the quality of the image too much. The reduction in file size allows more images to be stored in a given amount of disk or memory space. It also reduces the time required for images to be sent over the Internet or downloaded from Web pages.
11. Tell students that the 2 most popular image formats for the Internet are JPEG and GIF. Show students the 2 images in the PowerPoint presentation, one of which has been compressed using JPEG file format and the other which is compressed using the GIF file format. Tell them that one of the images has been compressed using a format called JPEG (Slide 2) and the other using GIF (Slide 3) but do not tell them which is which.
12. Explain the 2 image file formats to the students:
    In computing, **Joint Photographic Experts Group JPEG** (pronounced JAY-peg), is a compression algorithm as well as an image file format. It is an ideal format for paintings of realistic scenes with smooth variations of tone and colour, such as digital photographs. It is not well suited for line drawings and other textual graphics. JPEG is the most common image format used by digital cameras.
    When you wish to save your image as JPEG in a graphics editor such as Paint Shop Pro, you should choose the SAVE AS option. The SAVE AS dialog box should have an option for the degree of compression as shown below:



The JPEG file is very small, often compressed to perhaps only 1/10 of the size of the original data, which is a good thing for photos on the Web or in email. However, this fantastic compression efficiency comes with a price. JPEG uses lossy compression (lossy meaning "with losses to quality"). This means that some image quality is lost when the JPEG data is compressed and saved, and this quality can never be recovered.

The **Graphics Interchange Format** (**GIF**) is an image format that has become widely used on the Internet. The format uses a palette of up to 256 distinct colours but this colour limitation makes it unsuitable for reproducing colour photographs and other images with continuous colour and shading. It is better suited for simpler images such as graphics or logos with solid areas of color. It also supports animations. GIFs use lossless compression to reduce the file size without degrading the visual quality.

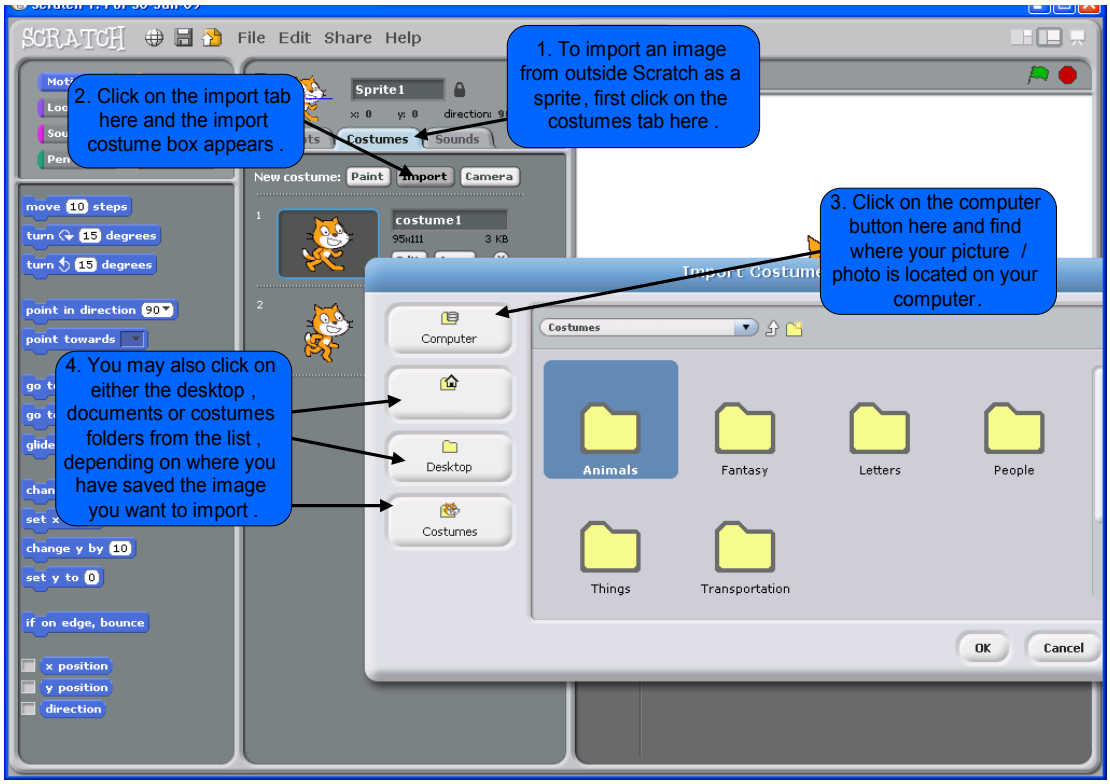
13. Tell students about the other types of image files supported by Scratch and explain the different ways of creating a new costume in Scratch.
    - Click to paint a new costume in the Paint Editor.
    - Click to import an image file from your hard disk.
    - Drag in one or more images from the web or your desktop.
14. Tell students that Scratch can recognize many different image formats: JPEG, BMP, PNG, and GIF (including animated GIF). Explain that BMP (Bitmap) and PNG (Portable Network Graphics) are simply other file formats.
15. Bitmap is a very popular and simple image file format that can be used by image processing programs.
16. PNG was created as the free, open source successor to GIF. It is a popular alternative to GIF since it uses better compression techniques

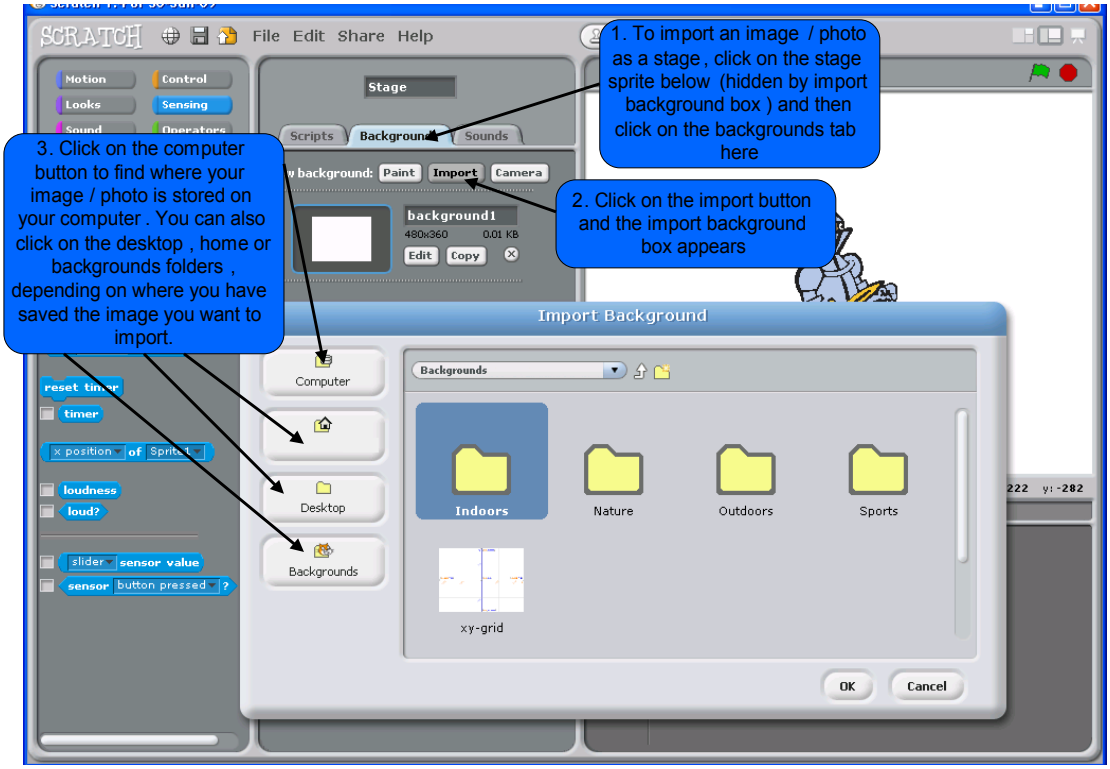
and does not have a limit of 256 colours. Some older browsers do not support the PNG file format.

17. Ask students to import some images into Scratch that have the file extensions .jpg, .gif etc. They can check the file format by right-clicking on the image and selecting properties. They can personalise the game they have created in Lessons 1, 2 and 3 of Module 4, if they wish.
    They can use images stored on the computer already or they may use a site with free images such as http://www.fotosearch.com/ or http://www.freefoto.com.

Extension activity

- Ask students to take a picture of an object in the classroom.
- Ask students to save the image onto their computer and then to import the picture into Scratch (See the image on next page outlining how to import an image as a sprite or as a stage). Students should ensure that the photo has a file format that Scratch accepts, as mentioned in the lesson.




SCRATCH
File Edit Share Help
Motion
Control
Looks
Sensing
Stage
Scripts
Backgrounds
Sounds
Paint
Import
Camera
background1
480x360
0.01 KB
Edit
Copy
1. To import an image / photo as a stage , click on the stage sprite below (hidden by import background box) and then click on the backgrounds tab here
2. Click on the import button and the import background box appears
3. Click on the computer button to find where your image / photo is stored on your computer . You can also click on the desktop , home or backgrounds folders , depending on where you have saved the image you want to import.
Import Background
Computer
Desktop
Backgrounds
Indoors
Nature
Outdoors
Sports
xy-grid
OK
Cancel
reset timer
timer
loudness
loud?
slider sensor value
sensor button pressed ?

Resource 1

Letter ‘a’ with and without Numbers

A magnified letter a, to illustrate pixels. Figure 1 has no numbers, Figure 1.1 has numbers to show groupings of black and white pixels.

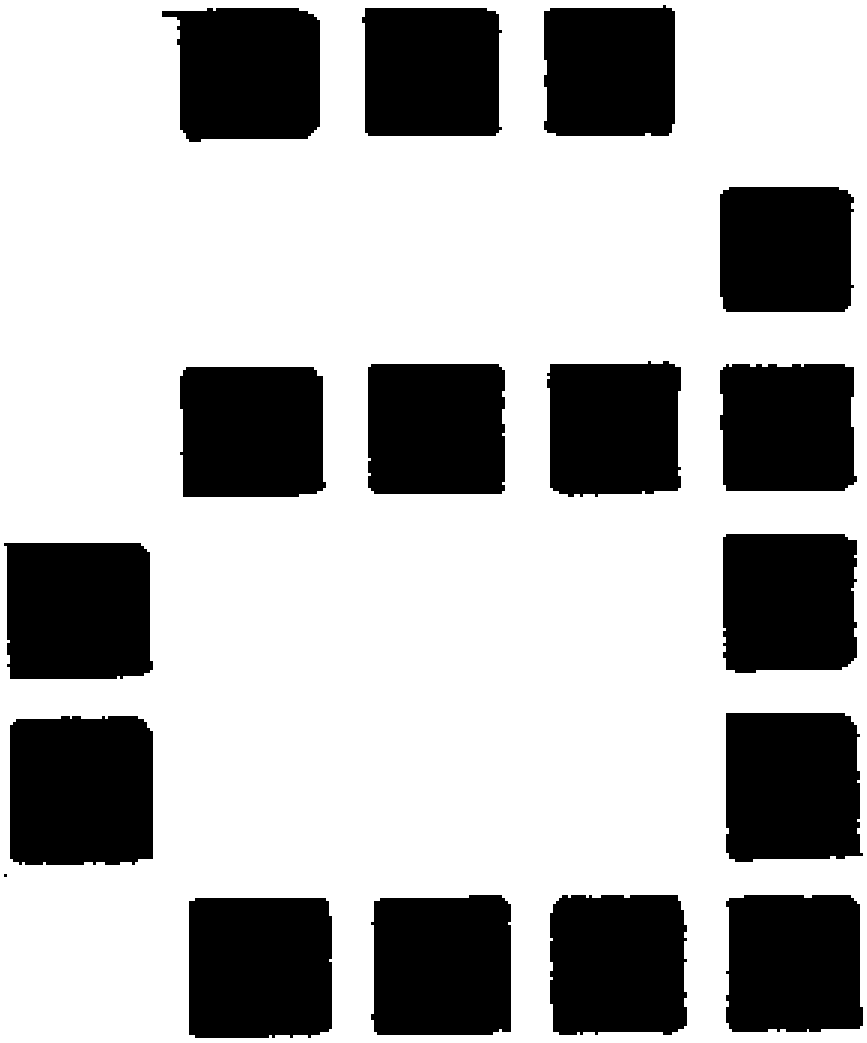


Figure 1

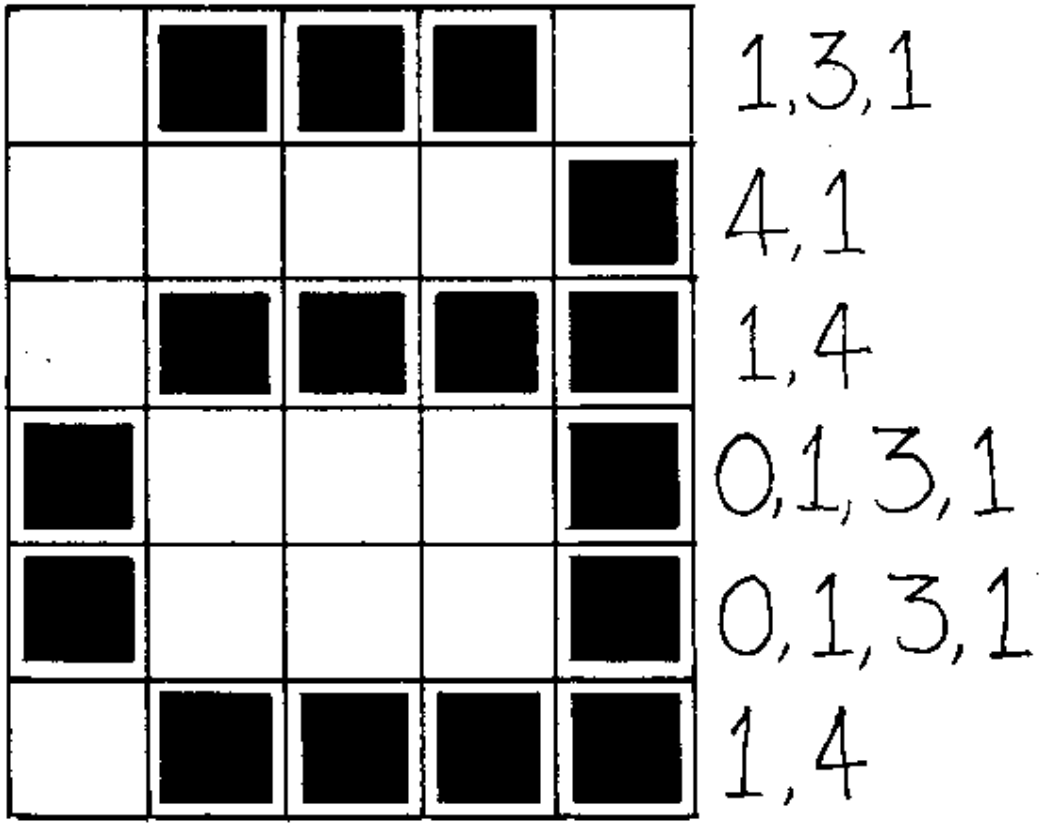
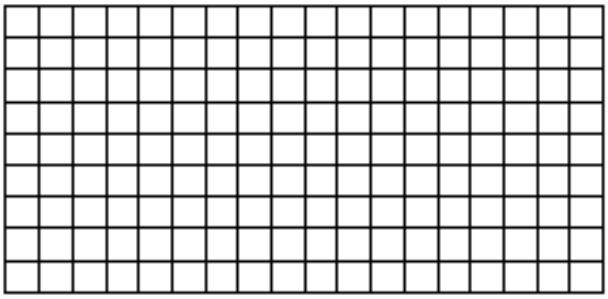


Figure 1.1

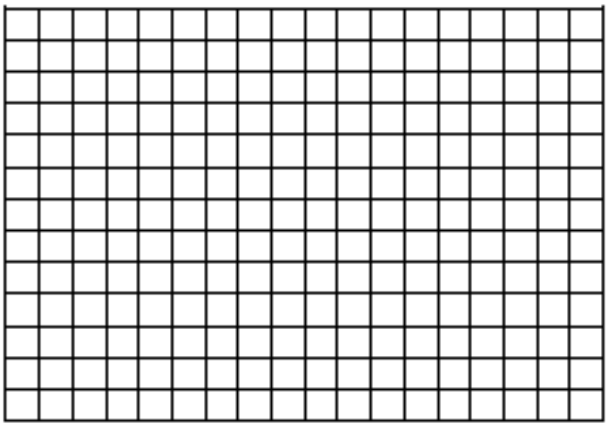
Resource 2

3-Pictures Worksheet

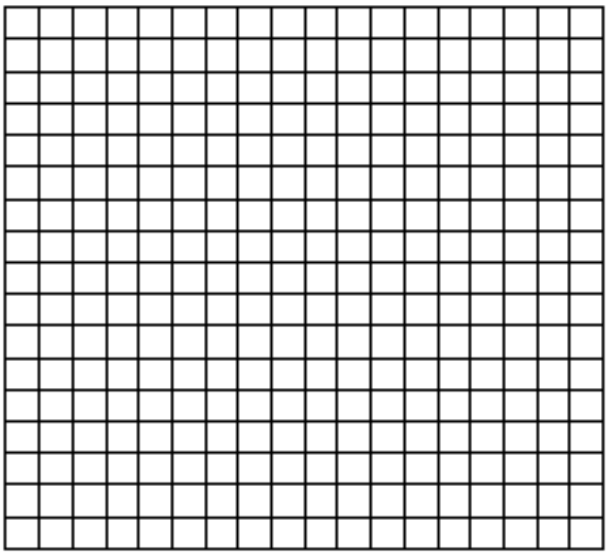
A worksheet where students shade in squares (representing pixels) to build pictures, using numbers as codes. Teacher's solutions included.



4, 11
4, 9, 2, 1
4, 9, 2, 1
4, 11
4, 9
4, 9
5, 7
0, 17
1, 15



6, 5, 2, 3
4, 2, 5, 2, 3, 1
3, 1, 9, 1, 2, 1
3, 1, 9, 1, 1, 1
2, 1, 11, 1
2, 1, 10, 2
2, 1, 9, 1, 1, 1
2, 1, 8, 1, 2, 1
2, 1, 7, 1, 3, 1
1, 1, 1, 1, 4, 2, 3, 1
0, 1, 2, 1, 2, 2, 5, 1
0, 1, 3, 2, 5, 2
1, 3, 2, 5

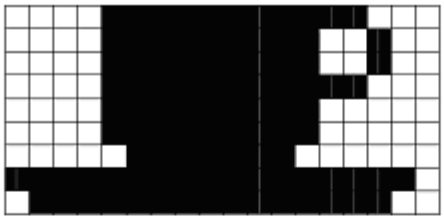


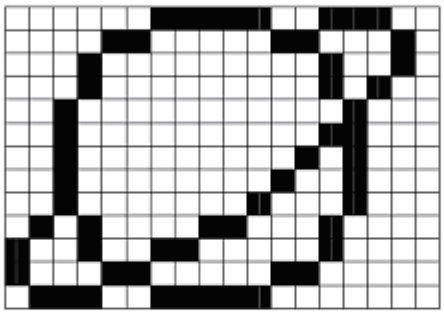
6, 2, 2, 2
5, 1, 2, 2, 2, 1
6, 6
4, 2, 6, 2
3, 1, 10, 1
2, 1, 12, 1
2, 1, 3, 1, 4, 1, 3, 1
1, 2, 12, 2
0, 1, 16, 1
0, 1, 6, 1, 2, 1, 6, 1
0, 1, 7, 2, 7, 1
1, 1, 14, 1
2, 1, 12, 1
2, 1, 5, 2, 5, 1
3, 1, 10, 1
4, 2, 6, 2
6, 6

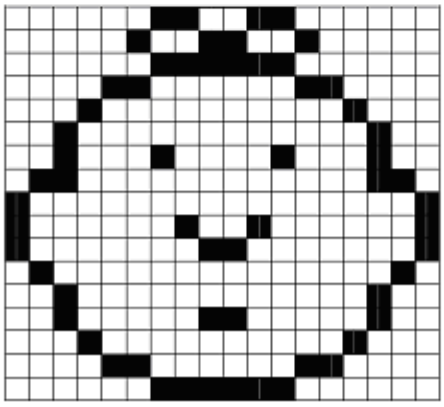
Use the instructions below to draw three pictures in the boxes above.

- Use the numbers to colour in the squares for each picture.
- There is a row of numbers for each line in the pictures.
  For example the line 4, 9, 2, 1 means you leave 4 squares empty, colour in the next 9, leave 2 empty and colour in the next 1.
- **Remember** 0 at the start means there are no white pixels at the start of the line.

Teacher’s Solutions for 3 Pictures



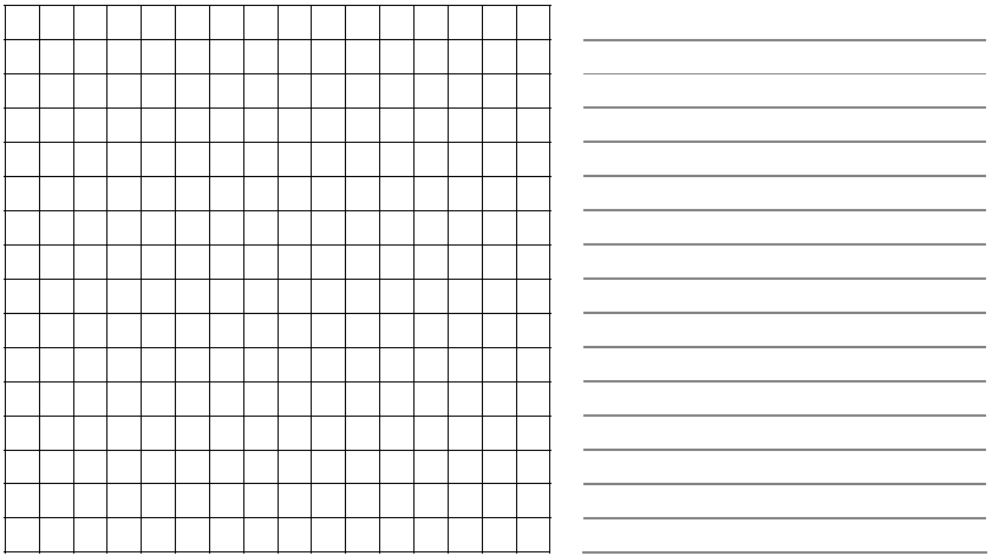


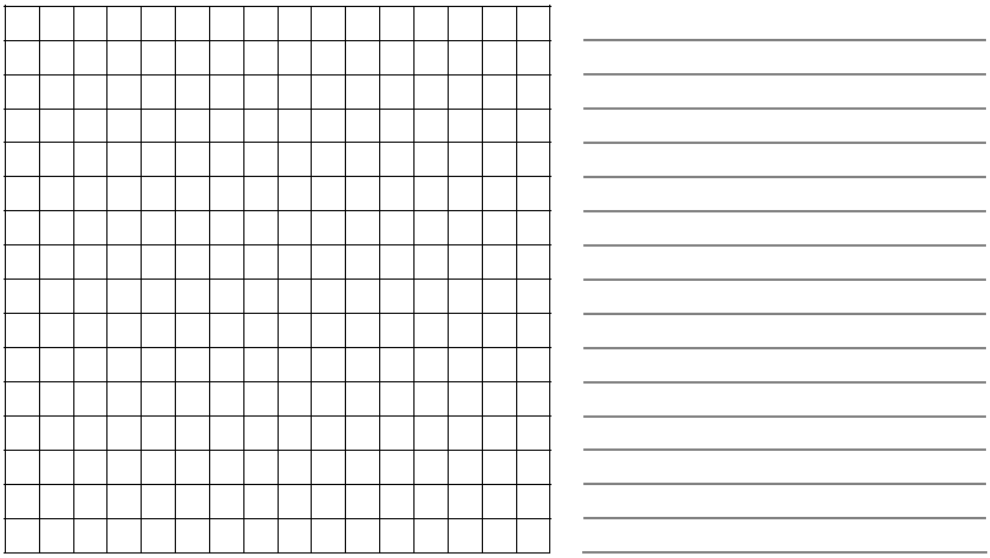


Resource 3

Grid for Coded Picture for Classmate

A worksheet with grid so that students can draw their own coded picture for a classmate to draw, using the student's code.





Now that you know how numbers can represent pictures, why not make your own coded picture for someone in your class?

- Draw your picture in the top grid and when you have finished, write the code numbers beside the bottom grid.
- Cut along the dotted line and give the bottom grid to your classmate to colour in using the code numbers.
- You do not have to use the whole grid. Just leave some blank lines at the bottom if your picture does not take up the whole grid.

Resource 4

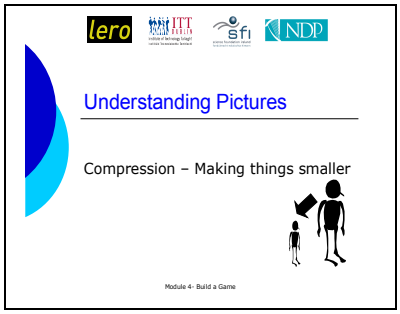
Understanding Pictures

A PowerPoint presentation to explain Scratch image file formats.

CD Resource

“M4L3R4 Understanding Pictures.ppt”

Slide 1



Introduce Topic.
Graphics files take up a lot of space on computers.
We are going to talk about compression, which decreases the file size of images so they can be stored and transmitted more efficiently.
Compression involves minimizing the size in bytes of a graphics file or image file.

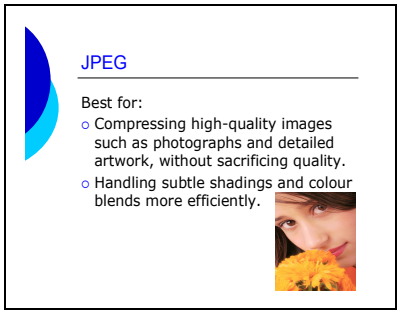
Slide 2

The following 2 images are photos of the same landscape, but one is saved using one form of compression and the other is saved using another form of compression.
This is the first image (It is a JPEG).
Look at this picture and the following picture and see if you notice anything different about the quality of the picture.

Slide 3

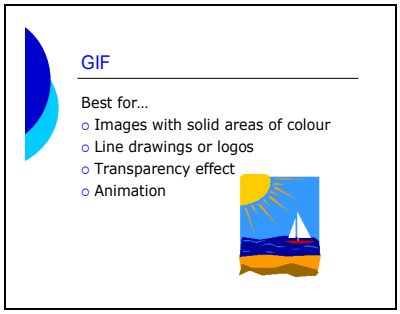
This is the second picture (GIF) and is saved using a different form of compression.
Look at the picture and see if you notice anything different as I move from one picture to the other.

Slide 4



Let's introduce the first file format for compressing images: JPEG.
JPEG (pronounced jay-peg) is the acronym for **Joint Photographic Experts Group**, the name of the group that developed it. It is an image compression format for full colour (high-quality) images. This image compression method is very suitable for photos.
It is good at dealing with subtle shadings that are commonly found in photos.
You can see an example of a photo saved using the JPEG file format.

Slide 5



The second type of file format used for compressing images is called GIF.
GIF (pronounced with a hard 'g') is the acronym for **Graphics Interchange Format**, an image compression format limited to 256 colours. It is considered best for images with solid areas of colour such as logos, or animation and is not as suitable for areas with subtle shadings such as photos.
You can see an example of a GIF here, with this picture having large blocks of colour.

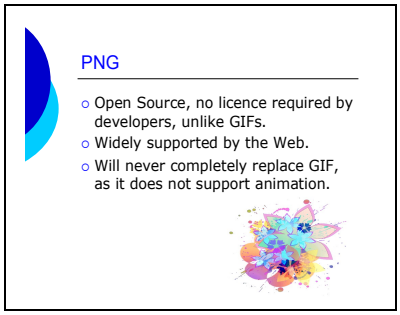
Slide 6

Now you have an understanding of JPEG and GIF formats.
What format do you think this image is stored in?
.

Slide 7

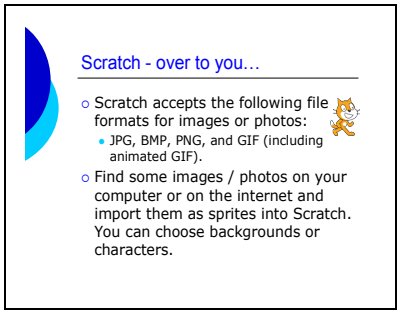
What format do you think this image is stored in?
This image (Slides 3 & 7) is a GIF and the previous image (Slides 2 & 6) is a JPEG. You can notice that the sky especially in the second image, the GIF image, is more pixelated and not as smooth as the first JPEG image. As discussed previously, JPEG is more suitable for photos.

Slide 8



The third file format we will discuss is PNG.
PNG (pronounced ping) is the acronym for **Portable Network Graphics**, an image compression format approved by the World Wide Web Consortium (W3C) as a replacement for GIF. GIFs use a patented data compression algorithm and PNG is patent- and licence-free.
Unlike GIFs the PNG format does not support animation.
You can see an example of a PNG here. The format supports transparency effects.
PNG was created to replace the GIF format as it does not require a licence to develop. We say PNG is Open Source. Open Source software is free and is available to everyone to inspect, change, download, and explore as they wish.
PNG is widely supported by the Web. It will never fully replace GIF however, as it does not support animation.

Slide 9



Scratch will allow you to use the following file formats for images or photos: JPEG (with the file extension .jpg), Bitmap (with the file extension .bmp), PNG (with the file extension .png) and GIF (with the file extension .gif).
You can now find some images on your computer or on the Internet in the formats mentioned and import them into Scratch.
Choose new backgrounds or new character images.

Lesson 4 – I Can't Hear You!

Resources:
I Can't Hear You (Resource 1)

Key Vocabulary:
MP3, WAV, AIF, AU sound file formats.

Description:
Students will learn how to record their own sounds in Scratch. A microphone and earphones or speakers are necessary for this lesson (a webcam with headset included would be most suitable). Students will learn about various sound file formats accepted by Scratch. Students will learn how to import music or sounds into Scratch from the Internet, using a specified website. Students will then personalise their projects using sounds and music of their choice.

Learning Objectives:

1. To introduce students to the various sound file formats used in Scratch.
2. To allow students to import various sound file formats into Scratch to enhance their projects.

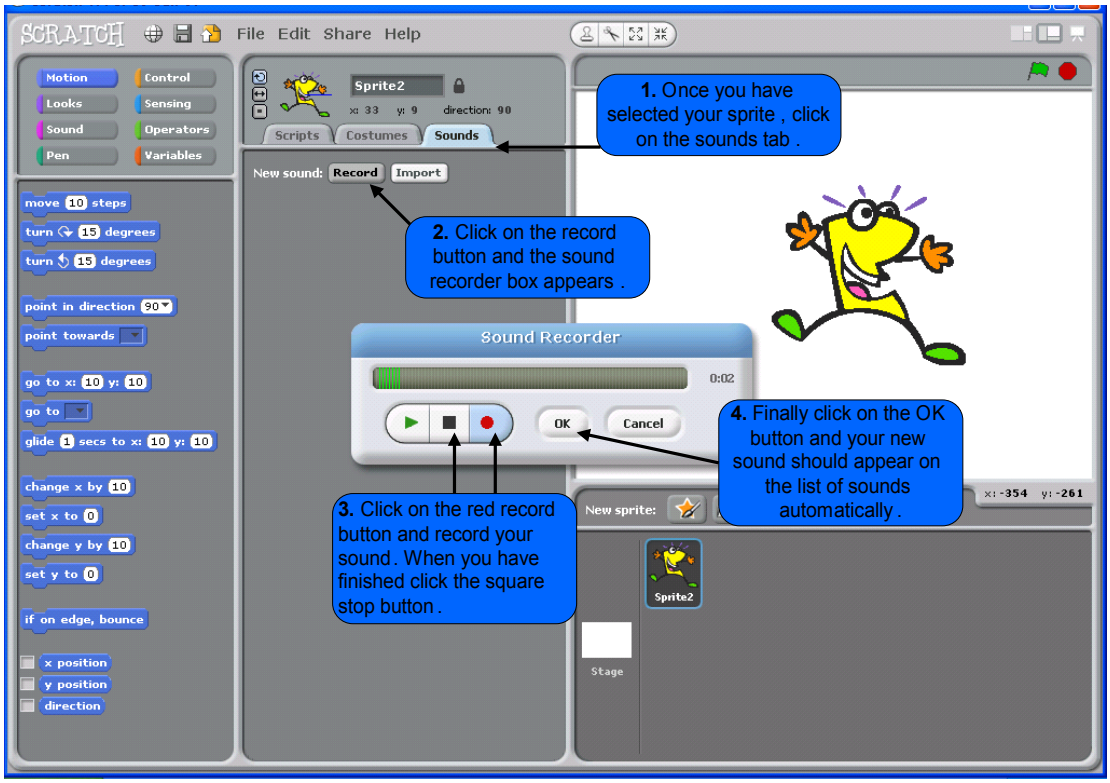
Lesson Introduction:

- Tell students that they will learn about sound in computers and how to store sounds more efficiently on a computer.
- Remind them that they have already experimented with sounds in Scratch during Lesson 5 in Module 1, where they played music. Tell students they will record their own sounds to add to the Scratch sounds library, as well as importing new sounds and music from the Internet.

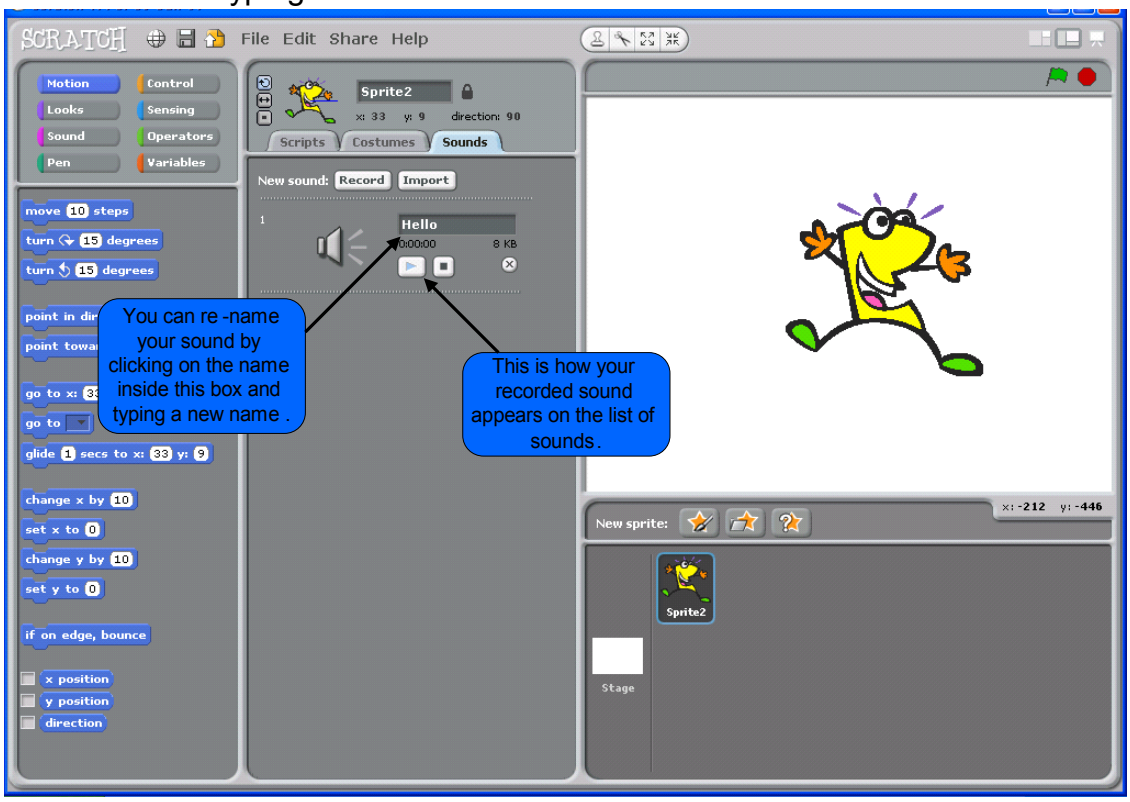
Lesson Breakdown:

1. Ask students to open Scratch.
2. Ask students to click the sounds tab to see the sprite's sounds. Tell them it is possible to record new sounds and import sound files in Scratch.
3. Tell students that Scratch can read MP3 files and uncompressed WAV, AIF, and AU files. The sounds in the Scratch sounds library are in WAV format.
4. Ensure that the microphone is set up on the computer.

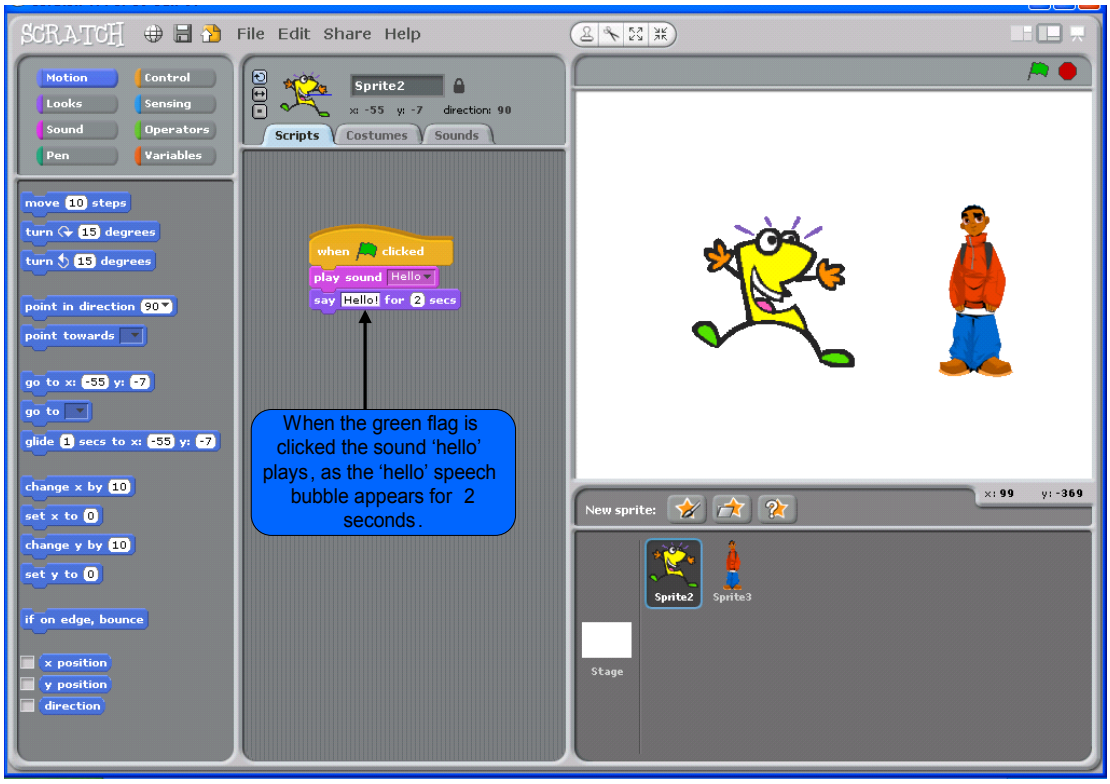
5. Ask students to choose a sprite and to click on the sounds tab as shown. Students can record sounds as shown.



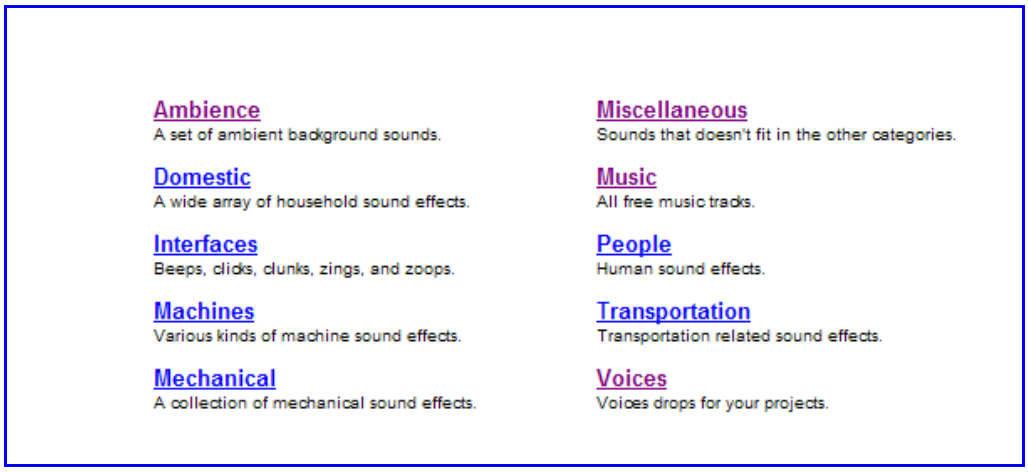
6. The image shows how a recorded sound can appear on a list of sounds. The sound can be renamed by clicking on the name inside the box and typing a new name as shown.



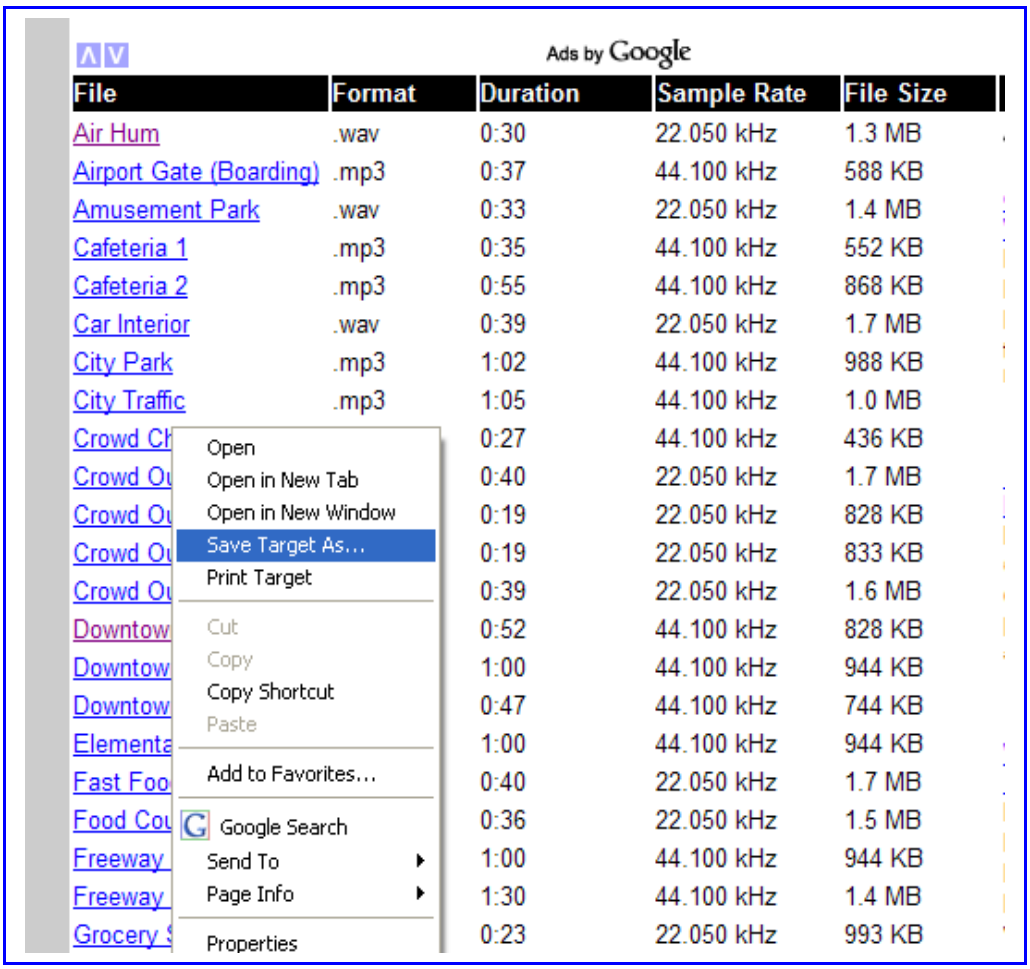
7. Ask students to record the sound '**hello**' and to make a sprite of their choice say 'hello' to another sprite. They must use a speech bubble as well as the recorded sound. The following image shows an example of how this may be done, once the sound has been recorded.



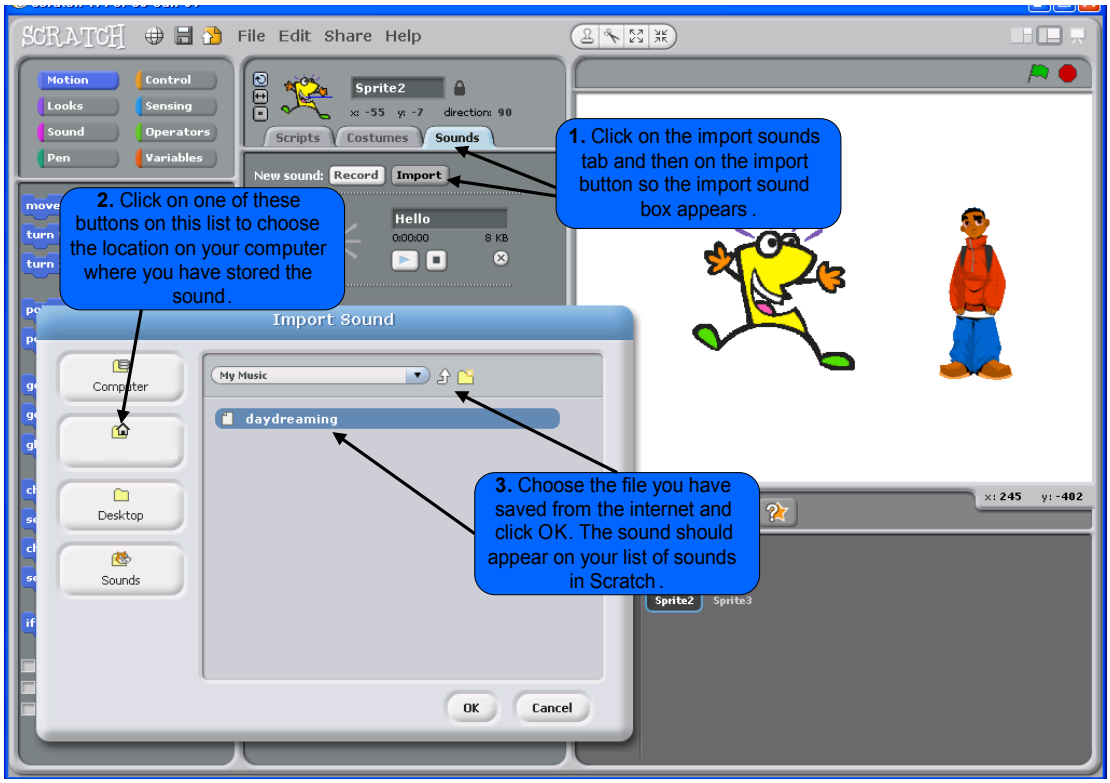
8. Start PowerPoint presentation on Sounds (Students should leave the Hello project above open).
9. Explain the various file formats that can be used in Scratch.
10. At the end of the presentation, tell students that they will now go to the website http://www.pacdv.com/sounds/, which has lots of free music and sound effects. See image for categories of sounds and music.



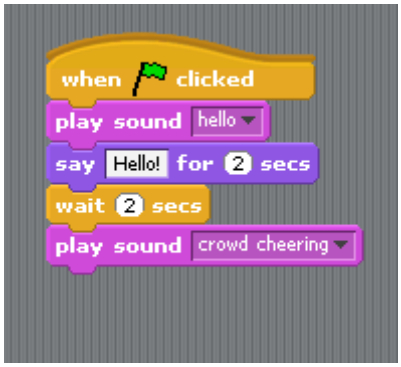
11. Tell students the sounds are in mp3 or wav formats and can be used in Scratch.
12. To save a file onto their computer, students can just right-click on a file they like and choose 'save target as' from the menu, as shown.



13. Students can then save the file to a location of their choice on the computer, e.g. desktop or student folder.
14. To import the new sound file, students should click the sounds tab in Scratch as shown, and click on the import button. They can then locate where they have saved the sound file from the Internet and import it into Scratch. It is possible to rename the sound, once it appears, by clicking on the name and typing your new name as explained earlier in the lesson.



15. Ask students to incorporate the new sound into the Hello project created during class. A sample script is shown below.



Extension activity

- Ask students to personalise the Scratch game they have worked on.
- Alternatively students can start a new Scratch project and create an interactive set of sprites with various sound effects, including music.

Resource 1

I Can’t Hear You

A PowerPoint presentation to explain sound file formats for Scratch.

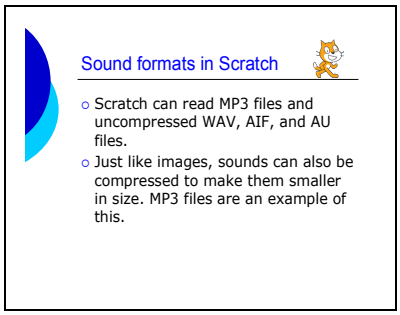
CD Resource

“M4L4R1 I Can’t Hear You.ppt”

Slide 1

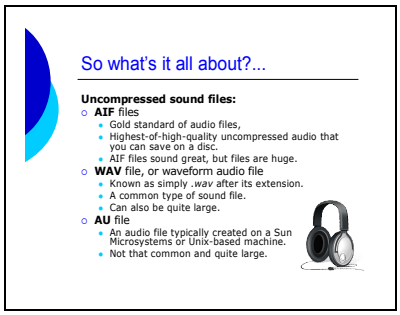
Today we are going to learn about sound and specifically the type of sound files that Scratch will accept.
Sound files can be large and, like images in the previous lesson, sometimes they have to be compressed to make them smaller and easier to store or transmit.

Slide 2



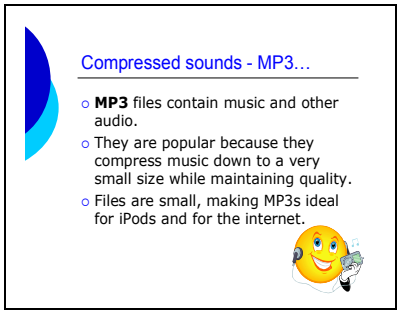
Scratch can read MP3 files, which are compressed audio files (more about this in a moment).
Scratch can also read uncompressed WAV, AIF and AU files. You must make sure that your sound files are in one of these formats, before importing them into Scratch.
Just like images in the previous lesson, sound files can also be compressed to make them smaller in size. MP3 files are an example of this.

Slide 3



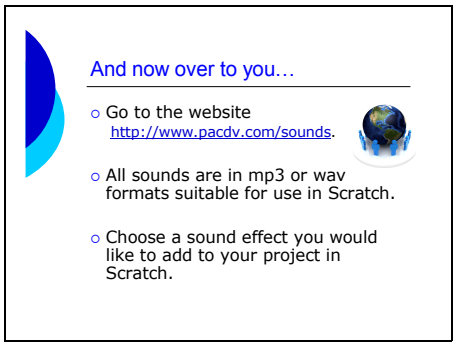
The following are uncompressed sound files and can be quite large.
AIF files are the highest of quality uncompressed audio but they are very large files.
WAV files or waveform audio files are common files but can also be quite large.
AU files are not that common and are also uncompressed so they are large files.

Slide 4



MP3 files are compressed audio files. These files contain music and other audio streams. They are very popular because they compress music down to a very small size, while still maintaining good quality sound.
MP3 files are ideal for iPods and the Internet because they are small.

Slide 5



We are now going to download some audio files in mp3 / wav formats from a website that has free sounds and music.
Go to the website http://www.pacdv.com/sounds and choose a sound effect you would like to add to your project in Scratch.
I will explain how to save the file onto your computer and import it into Scratch.
Remember Scratch accepts both mp3 and wav sound file formats.

References

Lesson 3

Recommended websites for sourcing royalty free images.
http://www.fotosearch.com/
http://www.freefoto.com.

Lesson 4

Recommended websites for sourcing royalty free sounds.
http://www.pacdv.com/sounds