



Creating an animation of the water cycle

Lesson 1: Introduction to programming. How to use Scratch. What can Scratch be used for?

Objective: To understand what a computer program is and what it does. To understand how to insert a background (stage) in Scratch. To understand how to insert a sprite and how to use the functions within the block palette make the sprite move.

Introduction to computer programming

Start by discussing with pupils the idea of computer programs and what they understand by this. Agree that a program is a set of instructions given to a computer so that it can perform a specific job for example: Print this document, save this picture, re-name this file etc... Emphasise that a computer (or any machine for that matter) will only ever follow the instructions it is given and that if something goes wrong it will be the programmer's fault NOT the computer's.

Illustrate this by asking a volunteer to be the 'programmer' giving the instructions and another to be the 'computer' carrying them out. The program could be for something as simple as folding a piece of A4 paper into quarters...simple at first glance perhaps, but if you break it down (decompose) it into its individual parts suddenly it becomes much trickier e.g. Step 1: Stand up, Step 2: Walk to the scrap paper drawer, Step 3: Open the drawer, Step 4: Take 1 piece of paper, Step 5: Close the drawer, Step 6: Walk back to the table.....



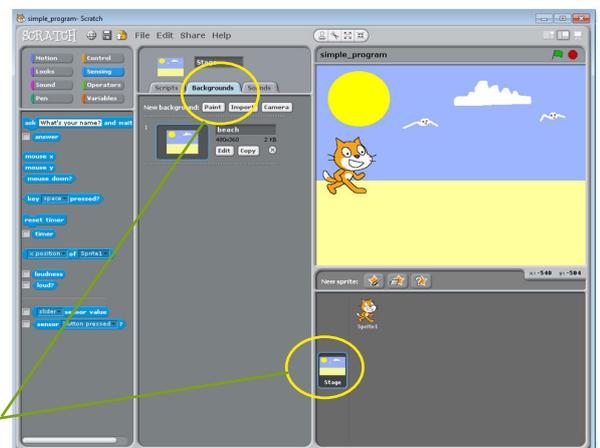
Give 'programmer' a chance to instruct the 'computer' without any input and watch closely to see if they leave out any instructions e.g. "How can the they walk over to the drawer if you haven't instructed them to stand up yet?" Remind them that the computer will only do what you instruct it to do.

If time allows, give the whole class the chance to repeat this activity in pairs, with one playing the role of the 'programmer' and the other the role of 'computer' following simple instructions. This will illustrate to the pupils the importance of giving clear instructions when programming.

Introduction to Scratch

Move onto introducing Scratch software (which pupils may already be familiar with) and linking it to the activity they have just done. Explain that Scratch can do all sorts of fantastic things with computer programming and that, during this unit of work, they are going to focus on making things move to create an animation of the water cycle.

Open Scratch and demonstrate how to insert a background to the 'stage' This can be done by clicking stage>backgrounds followed by either 'Import' or 'Paint' depending on whether you want to use an existing background or would like to create one yourself (not that easy to do if you don't have much time)





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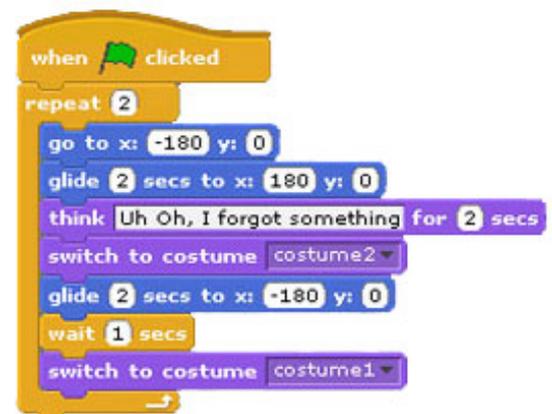
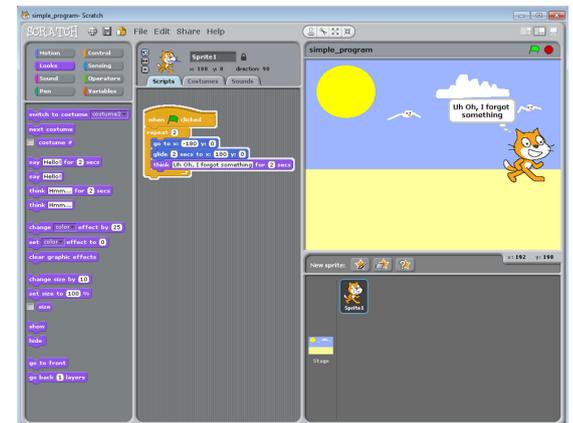
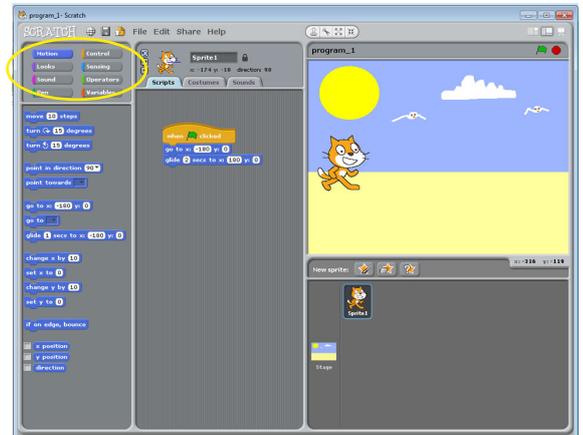
Introduction to Scratch continued

To demonstrate how to get the cat (who is known as a 'Sprite' and who appears by default when you first open Scratch) to move, select Motion from the blocks palette on the top left of the screen. This presents a few different options for movement. In the example to the right, the 'Go to' command has been set to the co-ordinates (-180, 0) which means the cat will begin from this point. Then the command 'Glide to' has been added. This command lets you type in the destination, again using co-ordinates, and the length of time you would like the glide to take.

Important: Movement in Scratch is based on co-ordinates, with the (0,0) co-ordinate being located in the centre of the stage.

Next try selecting Looks from the blocks palette as this will allow you to, amongst many other things, make the cat say or think something. In this example the cat glides to the right of the screen, stops and thinks to himself 'Uh Oh, I forgot something.' This can be taken as far as you feel confident. In the lesson 1 folder you will find the Scratch file called 'Simple Program' which is shown in these example images, so you could open it and run the program as a demonstration.

The code to the right shows how the cat glides to the edge of the screen, remembers that he has forgotten something, then switches to costume 2, which is exactly the same as costume 1, only flipped over, so it looks as though he has turned around. He then glides back to where he started, waits for a second, switches back to costume 1. This is all surrounded by the Repeat command which, as the name suggests, means that the whole thing gets repeated as many times as you like.





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Pupil activity

- Encourage pupils to spend time experimenting with the Scratch interface and learning which buttons and commands do what. They might like to try importing a background stage from the gallery (Stage>Backgrounds>Import) or creating their own sprite to program by clicking 'New Sprite' in the bottom right corner. Remind them that this lesson is all about exploring the software and getting used to how it works.
- Challenge pupils to program their sprite to perform at least 3 different commands e.g. Move, spin, say something
- As an extension suggest that pupils introduce a new sprite and try programming it to move/speak/spin etc... at the same time as sprite 1.
- Pupils must then save their files using the 'Save As' function, so they can be edited next time.



Plenary

At the end of the lesson discuss what pupils have found out by playing with Scratch. What did they enjoy? Were there any things which they wanted to make their sprite do that they weren't able to? If pupils have correctly saved their Scratch files into a location on their network drive it might be possible for the teacher to navigate to that location and display their project for the rest of the class to review and evaluate. Can they explain what is happening as their sprite moves around the stage?