

Animation

Bring your Scratch creations to life through the power of animation. Improve your animations by harnessing the power of repetition.

- 1, Design an animation around a theme
- 2, Create the animation as a series of sprite costumes
- 3, Program the animation to move using sequence
- 4, Improve the programming efficiency by using a repeat x loop.

Scratch 2.0 Planning by Phil Bagge
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-When pupils move from sequence to repetition they are using a more efficient algorithm that uses less coding commands. If they can see and explain that it is better because it uses less code they are evaluating their algorithms.

-If pupils realise that repetition would be a better way of programming their animations because they have used it before in earlier projects such as Captain Meow or exploring right angles then they are generalising, adapting an idea to do something different.

Module Aims

Pupils will create automated animations through learning about and using the power of repetition.

Computer Science Concepts

- sequence
- Left click mouse input
- Repetition

National Curriculum Programs of Study Pupils should be taught to:

design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts

use sequence, selection, and repetition in programs; work with variables and various forms of **input** and output

use logical reasoning to explain how some simple algorithms work and to **detect and correct errors in algorithms and programs**

Prior experience needed

-None although simple projects like Smoking car, Magic Carpet or Conversation give them more confidence in manipulating Scratch code. Ideal for Year 3.

Preparation before the lesson

-Choose an animation theme or allow pupils free choice. We have linked to plant growth in science as a demonstration.

Approximate Time needed

2-3 Hours depending on your pupils prior Scratch 2 experience.

1. Design an animation around a theme

Hand out the animation planners. If pupils have created stop motion animations before then remind them of how they took a new photo after changing a model slightly. In Scratch they are going to draw a picture and then copy it before changing it slightly copying it and changing it etc. Before they do that they can plan their animation using quick sketch pictures to show their changes. Give out animation planners. There are three rows so pupils can design two ideas and a changing background if they have time. You may want to demonstrate your own animation planner on the interactive whiteboard for a few frames if you think it will help.

2. Create the animation as a series of sprite costumes

Demonstrate how to navigate to paint new sprite.

Then left click on costumes tab.

Generally bitmaps are more easier to draw animations with. You can change modes in the bottom right.

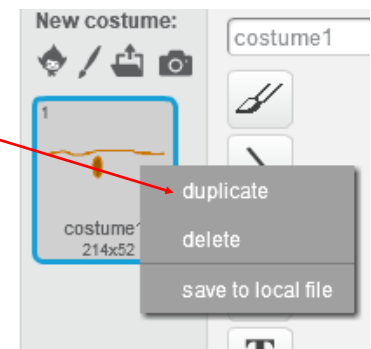
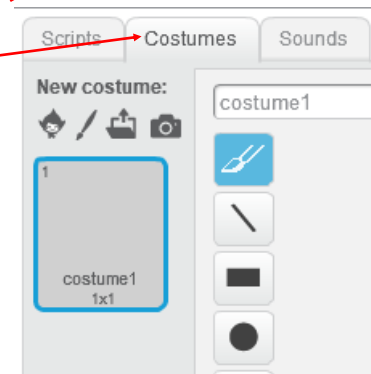
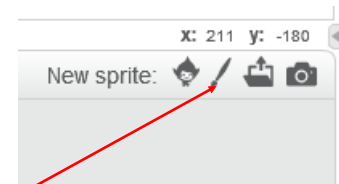
Draw your first animation. Don't worry if it is not a great first attempt. This will give you a chance to demonstrate the rubber (eraser), undo and clear buttons.

Paper Flip Book Example

First 2 minutes good to view

<https://www.youtube.com/watch?v=Un-BdBSOGKY>

Animations don't have backgrounds in each frame but children can plan an animated stage background and they could make this animate.



Once you have drawn the picture that you want, right mouse click and select duplicate.

This will give you a copy of your first picture.

Adapt the new picture.

Right mouse click and duplicate again.

Soon you will have whole string of different pictures.

Point out to the pupils how each costume has a different name.

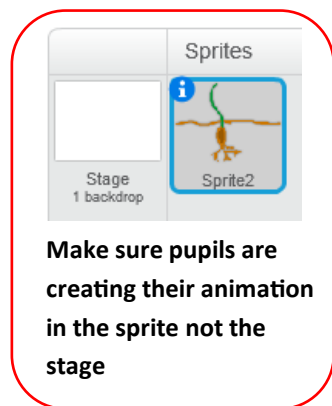
costume1, costume2, costume3 etc

Run through the sequence by left clicking on costume 1, 2, 3 etc so pupils can make the connection between the picture looking like it is moving as it goes from picture to picture.

Use the words sequence.

Now give pupils lots of time to create their own animation.

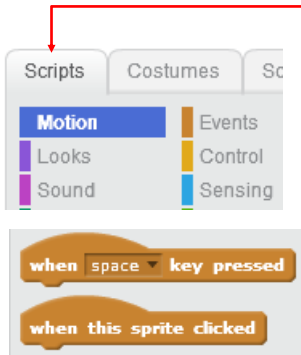
Go round and check they are making them in new sprites and not the stage.



Make sure pupils are creating their animation in the sprite not the stage

3. Program the animation to

move using sequence



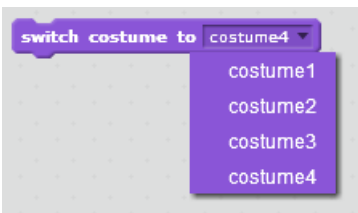
Left click on Scripts to get to the programming blocks.

Talk through a choice on inputs with pupils. Explain that they may need to make more than one animation run. What inputs would be good to use? Keys would allow a lot of animations to run separately. What other inputs would be good? The when this sprite clicked input would work for each new animation as well. The green flag would mean that every animation started at the same time. The decision is theirs.

Open up the looks blocks.

Cycle between the costume names and the looks blocks so pupils can make the link between this block and the drop down menu.

Choosing Inputs



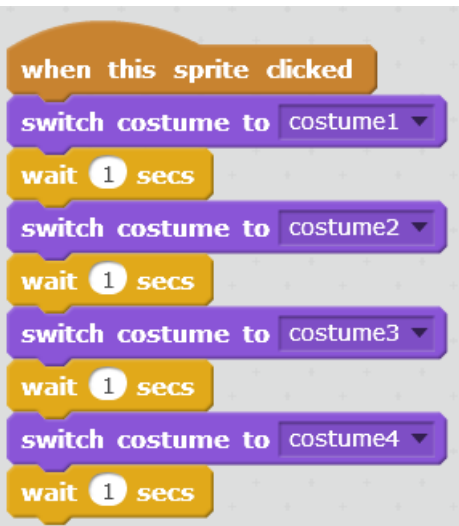
Point out that they will also need wait blocks.

Now give them time to program and debug their animation.

tion.

They will eventually end up with something like this.

Challenge them to slow their animation down or speed it up. Speeding it up will get you into tenths of a second or at least 0.5 of a second.



Common Bugs

No waits so the code whizzes through from costume 1 to costume 4.

No changes to the costume blocks so it changes to the same costume on each occasion.



4. Improve the programming efficiency by using a repeat x loop.

If you have already covered run a programming project that uses repeat x loops such as Captain Meow or Exploring Right angles challenge pupils to find a way to animate the same sequence using much less code blocks. Don't show them the repeat x blocks but do point out the next costume block in looks.

If they have not used a repeat loop before then remind pupils using some of the [unplugged repetition activities](#).

Remind them that they need their animations to start on a set costume but after that it just needs to run next animation for so many times. Ask them how many times it would need to repeat for their animation?

Can they explain what they want the animation to do to their partner step by step?

Give them time to puzzle it out with no help and record any pupils who manage this.

After a reasonable amount of time drag out useful blocks as a scaffold.

Record pupils who get this without the aid of the scaffold, those who need the useful blocks scaffold and any who need more help.

Extension

If pupils made an animation for a theme you chose why not give them free choice to design and make. If they had free choice why not make an

animation connected to a school project.

Could they explore other animation techniques and make their own animation at home?

Sharing and adapting

You are welcome to share this project and adapt it internally for your school.

If you wish to modify it and republish it yourself please get in touch with the me via twitter or email. I am normally ok with this as long as credit for the original work has been given and there is substantial addition or difference in the adaptation.

Without written consent the following creative commons licence applies.

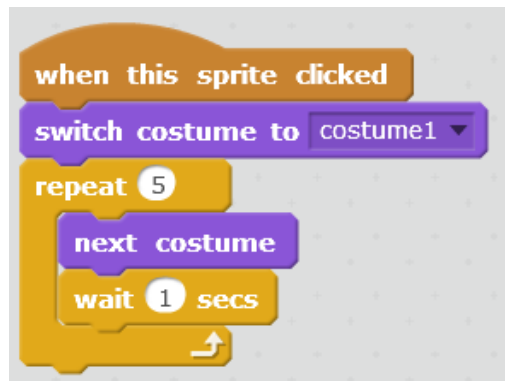
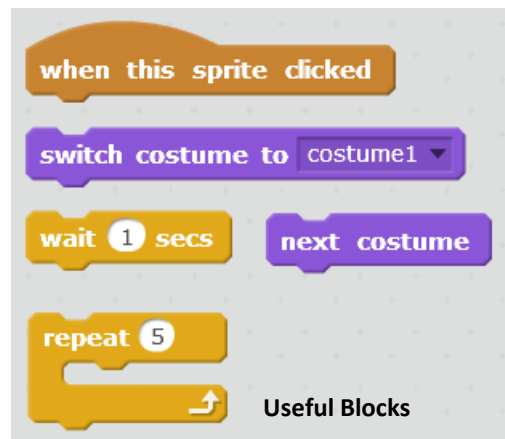
Phil Bagge 17th May 2018 V1

<http://code-it.co.uk/contact/>

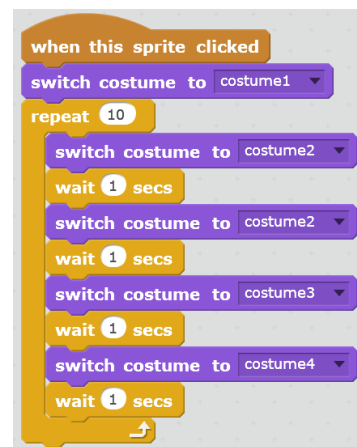


next costume

Clicking on this while watching the costumes helps children understand what it does



Correct Code although the number of repeats and the names of the costumes will vary.



Code that repeats but is not most efficient