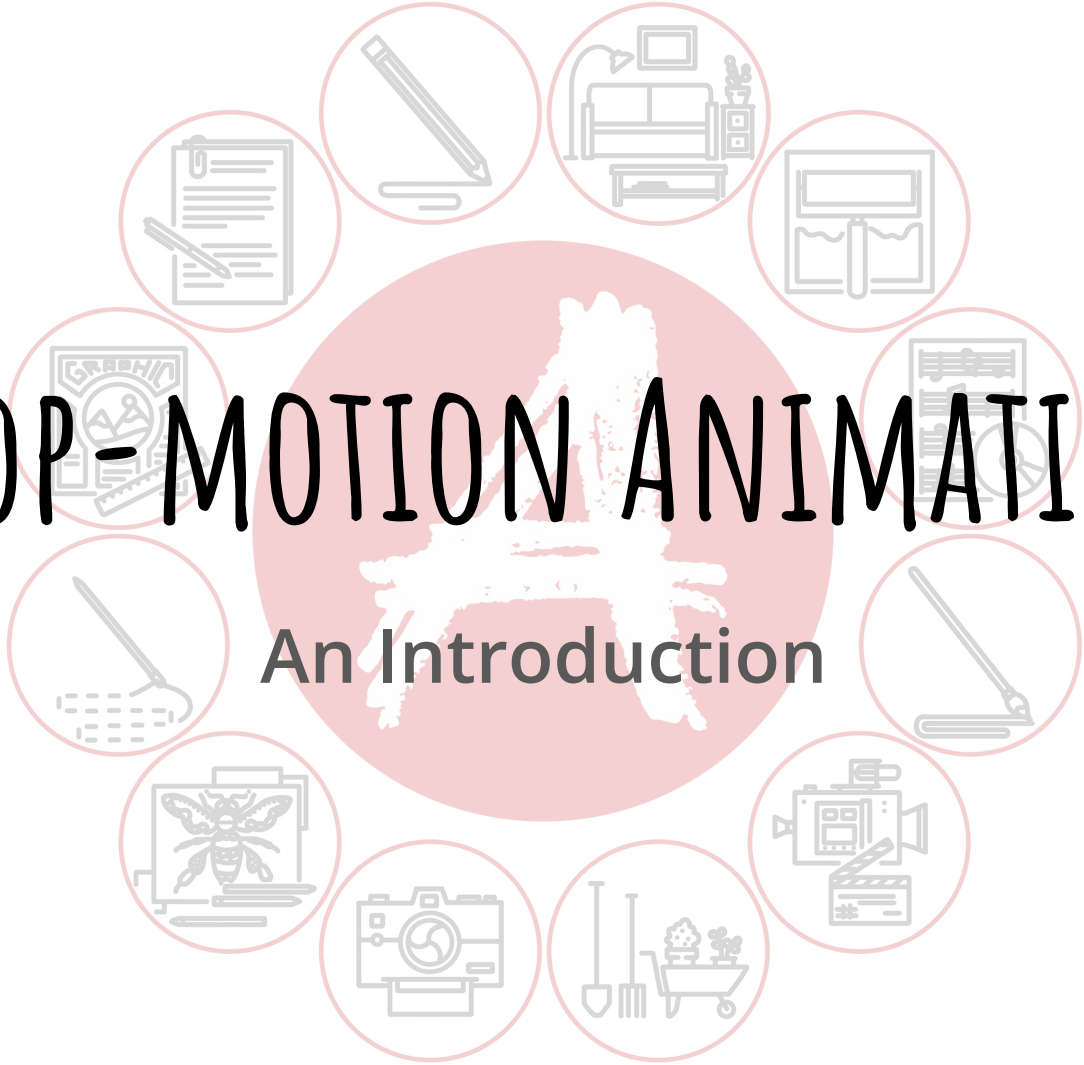
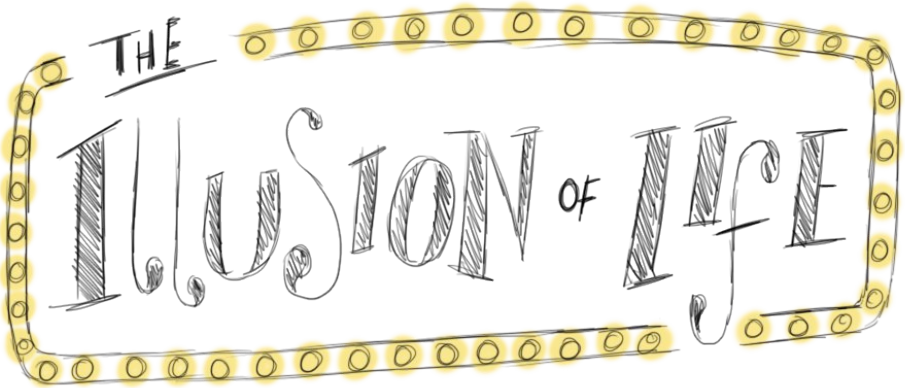


Stop-motion Animation

An Introduction

What is Animation?

In its simplest form, animation is essentially making something that doesn't move (inanimate) look like it is moving (animate). This can be done through repeated drawings or paintings (traditional 2D), using puppets or clay (stop-motion) and using computer programmes and software (CG and 3D). All of these methods have one aim in mind: to create 'the illusion of life'.



Key Resource: The Evolution of Animation

The following video shows how animation has evolved from it's very first days using contraptions like the 'Zoetrope'. Whilst you watch these clips, think about the different types of animation used. How many of these films do you recognise?

The Evolution of Animation 1833-2017

https://www.youtube.com/watch?v=z6TOQzCDO7Y

Many older animations are available to watch on Youtube, such as '*Gertie the Dinosaur*' and '*Felix the Cat*', and it's important to appreciate these as being the roots of modern animation.

Younger Animators might also get a kick out of watching some classic '*Looney Tunes*' cartoons.

What is movement?

A movement is when something goes from point A to point B in a certain amount of time. The amount of time it takes dictates how fast that movement is. In other words, if something goes from point A to B in a short amount of time then it is a fast movement, and if it takes a long time then it is a slow movement.

Experiment:

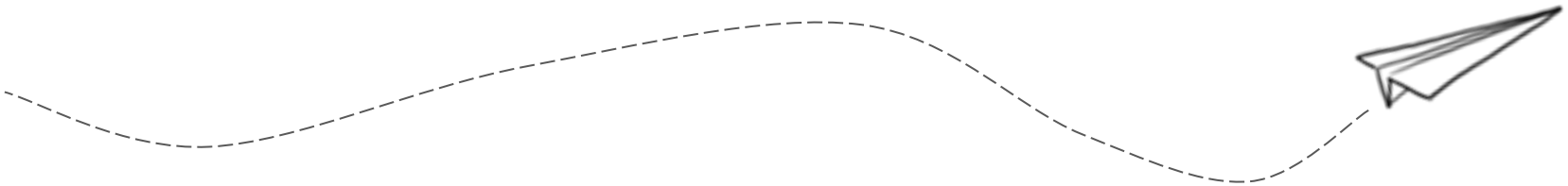
Try out some actions like waving, spinning in a circle and walking all at different speeds. How do the actions feel when you do them much slower than usual or much faster? Pay attention to where point A and B are in your movements.

Animated Movement

In traditional animation we break a movement up into little parts using either drawings or photographs.

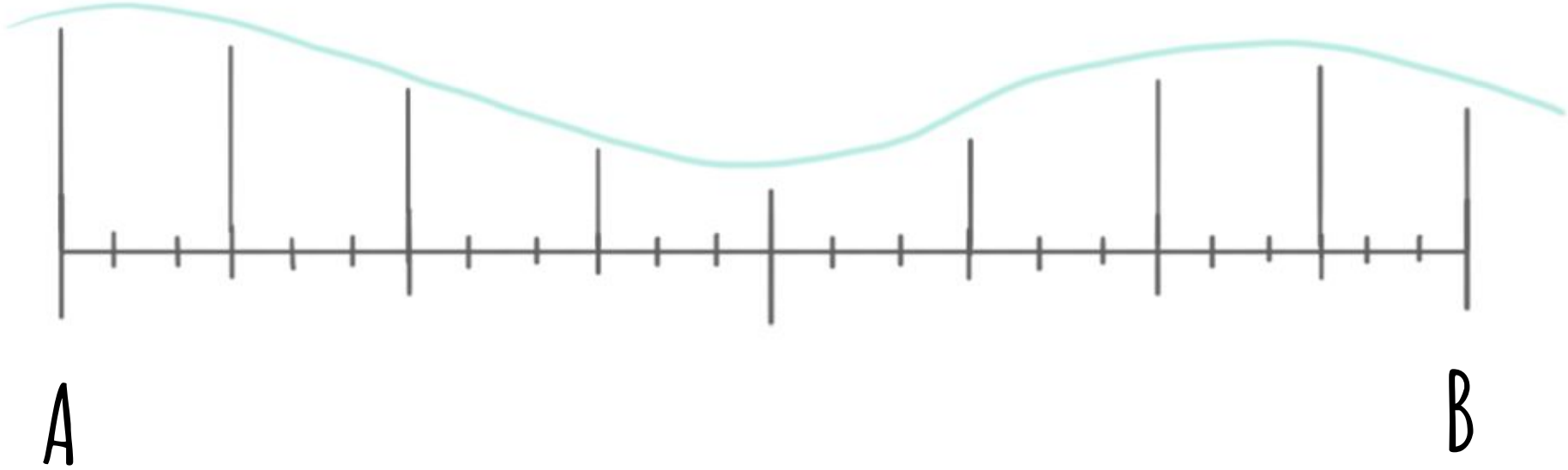
It takes 24 images or **Frames** (drawings or photos) to make 1 second of animation. So if we know how quick we want an action to be, we can work out how many bits we need to break that action up into.

Don’t worry if this is a little confusing; we’re going to work through it using a paper plane as an example.



This gauge shows 1 second, broken up into 24 '**frames**' (images). The blue line shows the path that the paper plane will take.

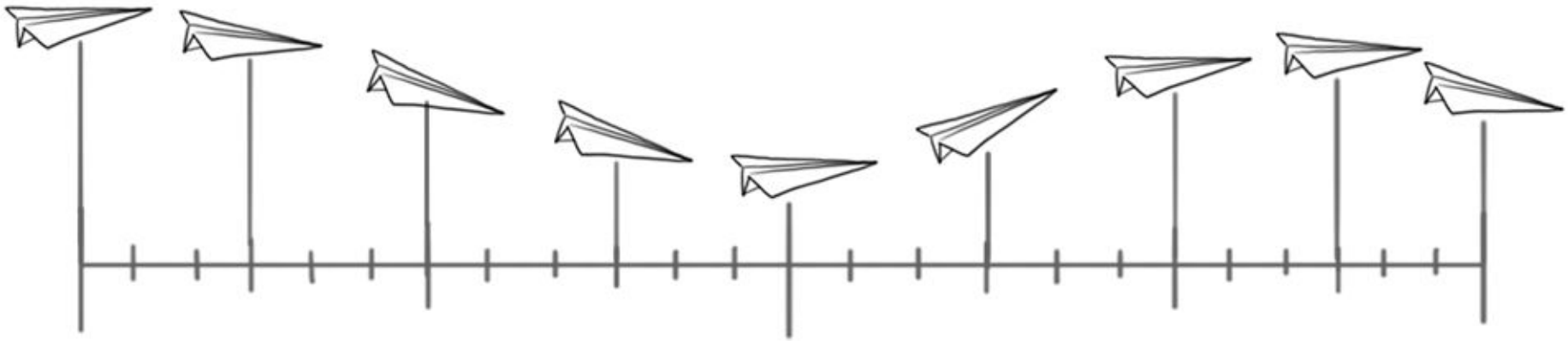
Now we need to fill in the gaps between **A** and **B**, to create movement.



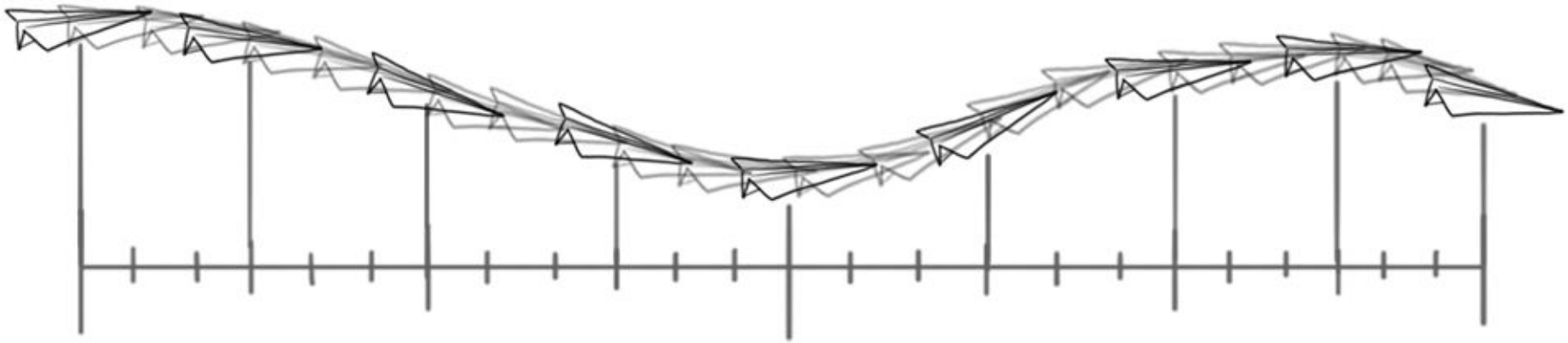
First of all, we will add images that show the main movement of the paper plane; these are called **Keyframes.**

By doing this, we get a good idea of how the plane will move, how it will turn, and it's speed.

Note: Be sure that your object is always pointing in the direction that it is going to give it natural movement...we don't tend to walk where we're not facing!



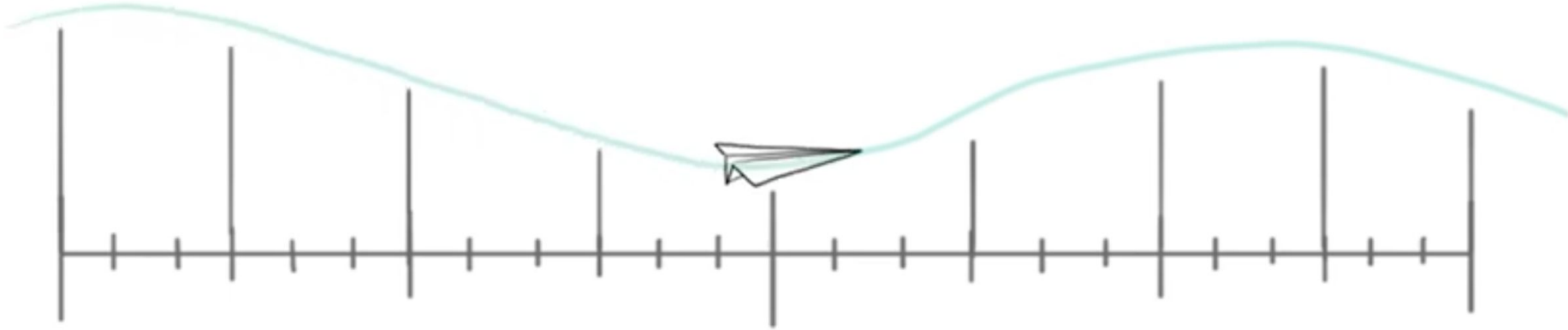
Now we just need to fill in the gaps between the **Keyframes**. This is called '**inbetweening**' (or 'tweening' for short).



When we take all of these separate frames and 'play them' one after another, it creates an animated movement. We could speed up the movement by taking away some of the inbetween frames so that it doesn't last as long, or slow it down by adding more in, as demonstrated in the video below.

Animating a Paper Plane

https://www.youtube.com/watch?time_continue=3&v=2vmxHQJ7I-Y&feature=emb_logo



Stop-motion Animation

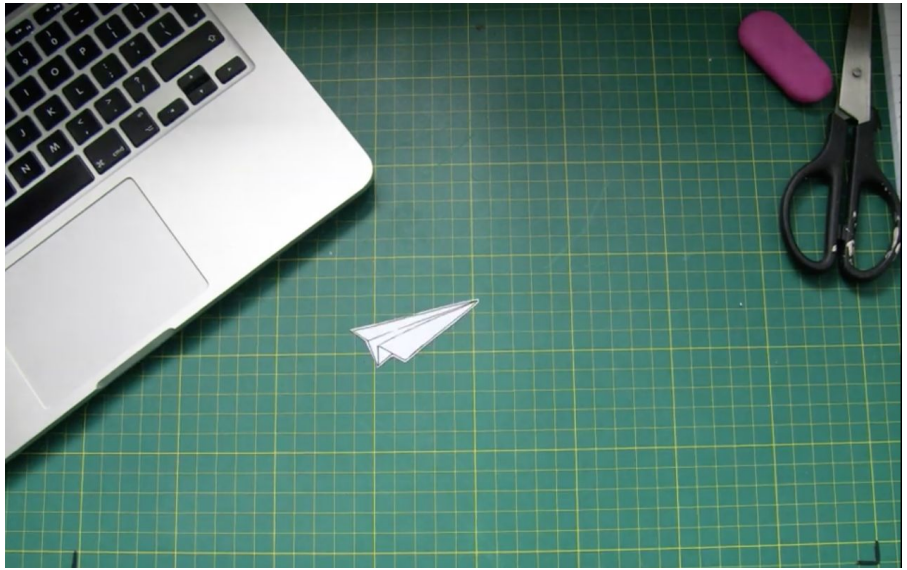
Stop-motion uses photographs as the frames for animation. This means that everything is happening in real life, right there in front of the animator. It takes a lot of patience and a steady hand, but with it we can make just about anything look like it has come to life.

The biggest difference in animating using stop-motion is that when we are animating an action it has to be done in order. We can't create the keyframes and then go back and fill in the gaps in between because we are physically moving the object we are animating. Because of this, it often takes a lot more planning to animate using stop motion.

Also, stop-motion tends to be done at 12 frames per second, instead of 24. Often this means taking double photos or making each photo last twice as long, which is known as '**shooting in two's**'.

The paper plane diagram we created can be used to visualise how it would move frame by frame in stop-motion with a cut-out. The action would be created by moving the paper plane cut-out a little bit at a time, taking a photo after each little movement. When all of the photos are ‘played back’ one after another it will animate the plane flying.

One thing that makes stop-motion exciting and unique is that it is all physical and real.
That means that real-life physics play a part in the animation, and it is easier to make movements feel more natural and controlled.



https://www.youtube.com/watch?v=DHAMR7N9Gco&feature=emb_logo

Key Resource: The Evolution of Stop-motion

Stop-motion has come a long way and, even with the advancements in Computer Generated Animation, it is still evolving. Stop-motion animation has been produced for as long as film has existed. It was used as the very first form of Special Effects in film, and continues to hold its own as an impressive and beautiful art form.

The following video shows how it has changed throughout the years. Whilst you watch, observe all of the different mediums used (clay, puppets, etc.) and think about how you would go about breaking down some of the actions and movements to animate them yourself.

The Evolution of Stop Motion

https://www.youtube.com/watch?v=X0QemvmpzfQ

Stop-motion Software and Apps

Before we go any further, you will need some way to animate. The options vary depending on what you have access to, but one is by no means better than the other. When you start out it is better to choose the option that will let you focus on the animation, rather than having to worry about technology.

One of the easiest ways if you have a tablet or smartphone is to download a stop-motion app. Pick one that is well rated and free (you can do a lot with the basic features of most apps available).

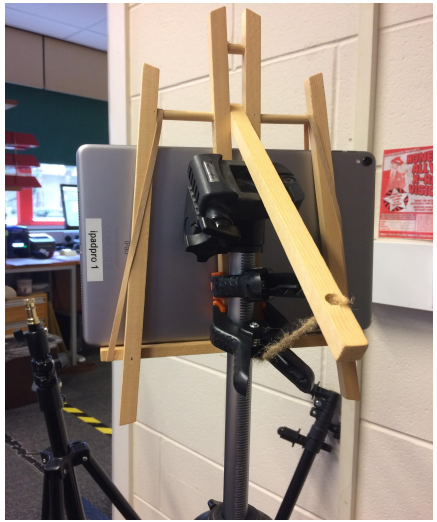
OCA recommends 'Stop Motion Studio' (free).

If you have the tools to do so, you can set up a camera rig, take the photo's and then compile them all together in a programme like Adobe After Effects.

Your Camera Rig

Whether you decide to use a phone, tablet, or camera, you will need to set something up that will hold it still whilst you are animating. This could be using a tablet or phone stand, a mount or a tripod, but if you don't own anything like that you may have to improvise something.

Think of creative solutions. As long as it stops your camera from moving around and still allows you to take photos then it will work well enough. There's no need for expensive rigs when you're just starting out. In fact, even as a professional, you may find yourself having to make do in a pinch (clamps and strong rubber bands are life savers).



Tips for Smoother Animation

You are now going to do a few exercises that will help you to get to grips with the concept of stop-motion animating and hone some basic skills that you will be able to take further. Here are some helpful tips for making the process run smoother:

- Keep a steady hand, and move everything with purpose. If you don't want it to move, then it shouldn't move.
- Move everything a small amount at a time. It is easy to remove frames if your movement feels too slow, but it is impossible to go back and add more in.
- Make sure you are out of the camera view when you photograph each frame (unless you are animating yourself).
- Try not to bump, shake or move either the camera or the surface you're animating on.

Exercise: Pixilation

Creating a stop-motion animation from the human body is called **Pixilation** (different to Pix**e**lation). Animating this way provides the animator with a whole host of both possibilities and problems, the main one being **keeping still.** However, it does help us to think about realistic movement. How do joints work? How does the speed of certain actions differ? How do movements speed up and slow down?

Make some short stop-motion animations using either yourself or someone else as your stop-motion 'puppet'. Do some simple movements or actions, and think carefully about how to break them up into frames to photograph.

Compare your stop-motion actions to what it looks like when you do them in real time.

Example: Pixilation

(203 Frames - 8 seconds long - 10 minutes to make)

https://www.youtube.com/watch?v=CWRD0FgvlW4&feature=emb_logo

Exercise: animating a single object

Create a short stop-motion animation using a single object. You should consider what will show up best on camera for you, depending on whether you are shooting overhead or straight on.

Start off simple, making only one kind of movement or action. (A pencil could roll, an eraser can follow a path or a mug could spin around).

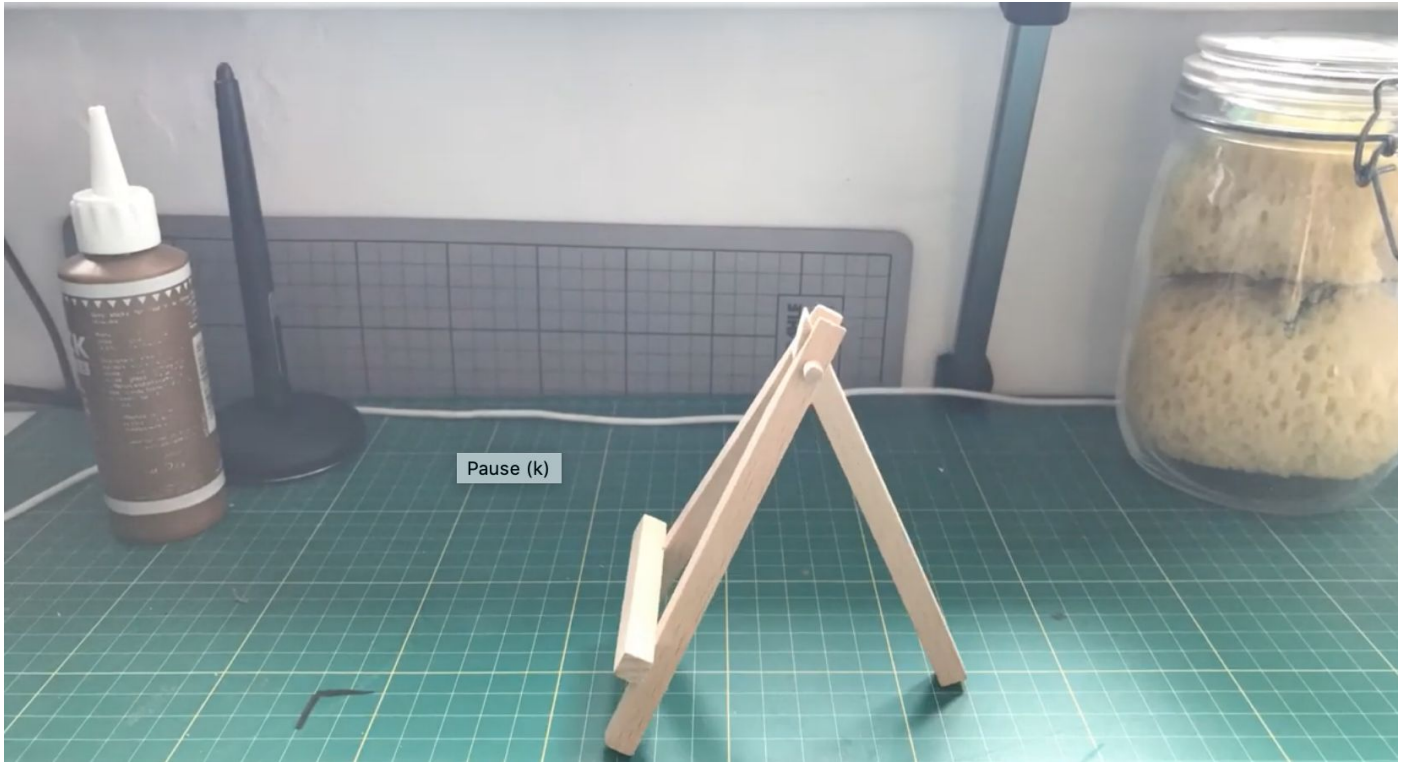
Try this as many times as you want, and with a variety of different objects to get a good idea of how things move and what is/isn't possible with those objects.

Here is when you will find out how much time and patience it takes to animate using stop-motion. Younger Animators may be surprised (or surprise you) with how much focus they have!

Example: Animating a Single Object

(158 Frames - 13 seconds long - 40 minutes to make)

https://www.youtube.com/watch?v=6JgfbHDHxNQ&feature=emb_logo



Exercise: Animating Multiple Objects

In the same way as in the last exercise in which you animated a single movement of an object, you will now animate several objects moving at the same time.

This is where it gets complicated, and you need to pay close attention to the different actions going on, and keep track of which objects you have moved each frame.

To start off, pick 2 objects and animate them doing different, simple movements.

As you progress, try adding more objects in to the mix and see how you fare keeping track of them!

Example: Animating Multiple Objects

(157 Frames - 13 seconds long - 60 minutes to make)

https://www.youtube.com/watch?v=HFXlo9AfeWQ&feature=emb_logo

Exercise: Animating Multiple Movements

Slightly different to the last exercise, now, instead of moving multiple objects, you will animate one object moving in several different ways at the same time.

Find an object that has several different points of movement. A good example is a desk lamp with an adjustable neck, or, if you have them, dolls or action figures. **Make sure that whatever you use has nice stiff joints that will hold a pose while you take photos.**

Animate your object, but make it move in more than one way each frame. It could move on a joint as well as spinning around or moving across the scene.

Example: Animating Multiple Movements

(65 Frames - 5 Seconds long - 20 minutes to make)

https://www.youtube.com/watch?v=Ja5wffqBcxk&feature=emb_logo

Final Project: A Short Story

Now you have experimented with movement, objects and pixilation, it's time to bring it all together.

Create a stop-motion animation that shows an interaction between two or more objects.

This will require you to think up and plan a small 'story'. What kinds of personalities do the objects have? Is one scared of the other(s)? How do they meet on screen?

Try to use everything you've learnt so far to create this final piece, including some Pixilation if you can!

Example: A Short Story

(425 frames - 35 seconds long - 2 hours to make)

https://www.youtube.com/watch?v=o7IomwjUssA&feature=emb_logo

Reflections

We hope you have enjoyed learning the basics of animation and stop-motion with us. You can now take what you've learned and develop it further. The only limit is your imagination.

It is important to remember to constantly self-evaluate your work as you go along. Keep rewatching your animations and learn from any mistakes. It takes a lot of patience, hard work and time to create good stop-motion, so whatever you create you should be proud of!

The OCA would love to see what you've created. Share your films and experiments with us by tagging us in them on Facebook, Instagram and Twitter.

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