

STOP-MOTION ANIMATION

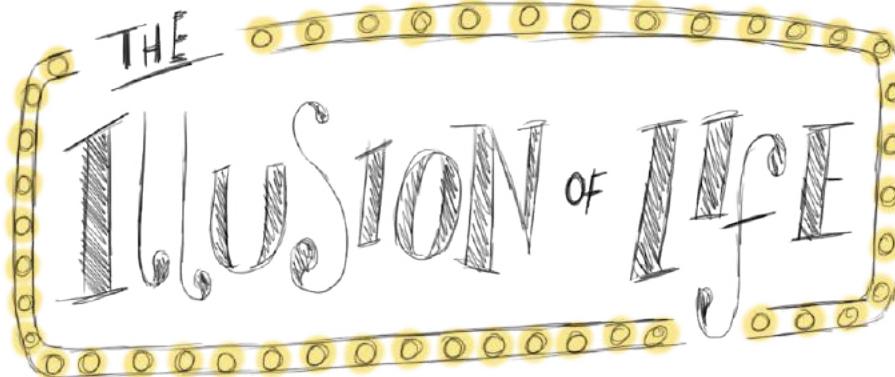
Using Paper

If you have already completed the OCA's creative challenge '**Stop Motion Basics**' then you will have already encountered the first section from this workshop which covers the foundations of animation and stop-motion basics.

You can skip forward to page 15 to dive straight into using paper, or work your way through from the beginning to refresh your memory.

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 its 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:

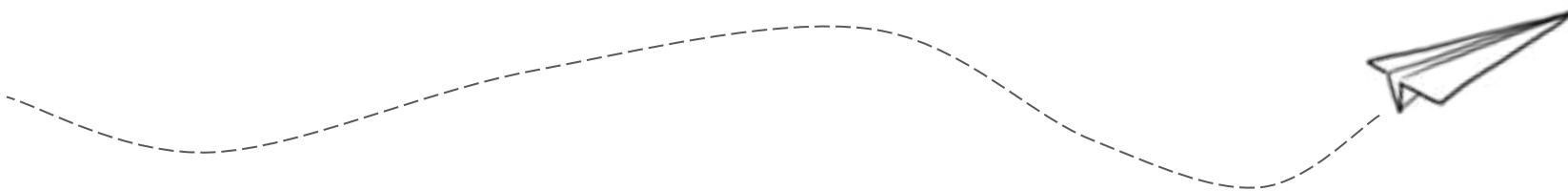
Try out some actions like waving, spinning in a circle and walking all at different speeds. How do the actions feel when you do them much slower than usual or much faster? Pay attention to where point A and B are in your movements.

ANIMATED MOVEMENT

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

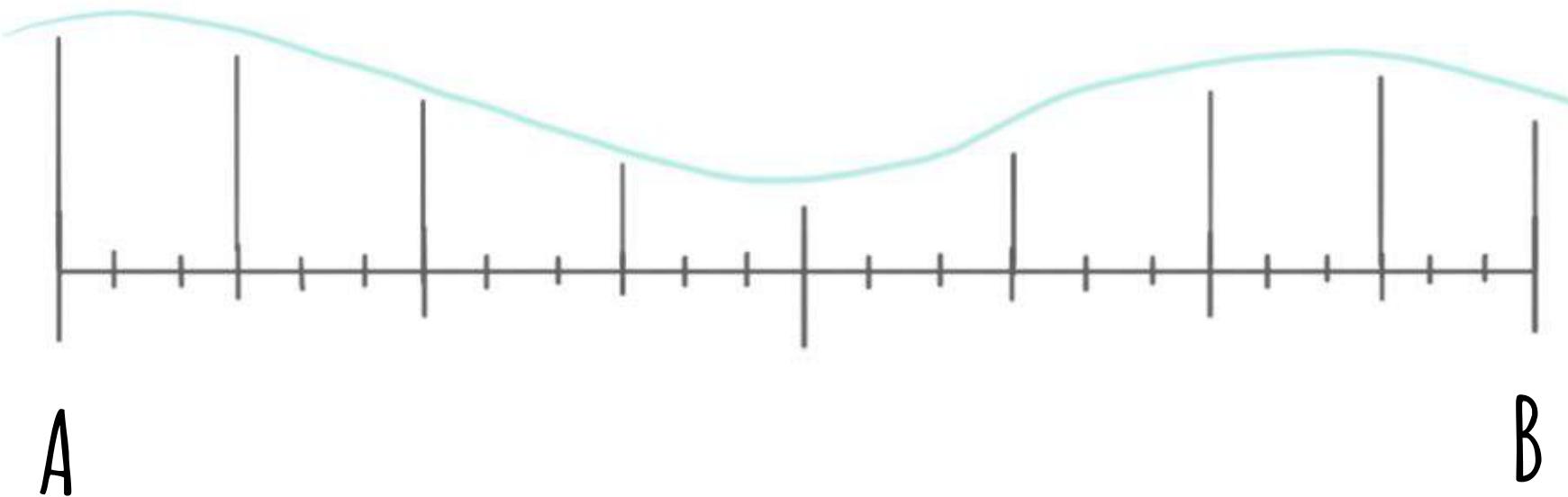
It takes 24 images or **Frames** (drawings or photos) to make 1 second of animation. So if we know how quick we want an action to be, we can work out how many bits we need to break that action up into.

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.

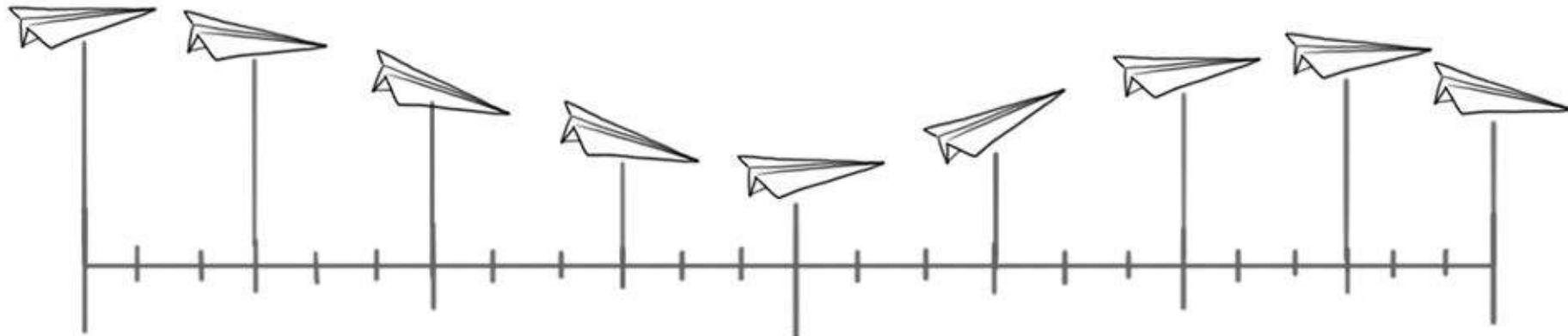
Now we need to fill in the gaps between **A** and **B**, to create movement.



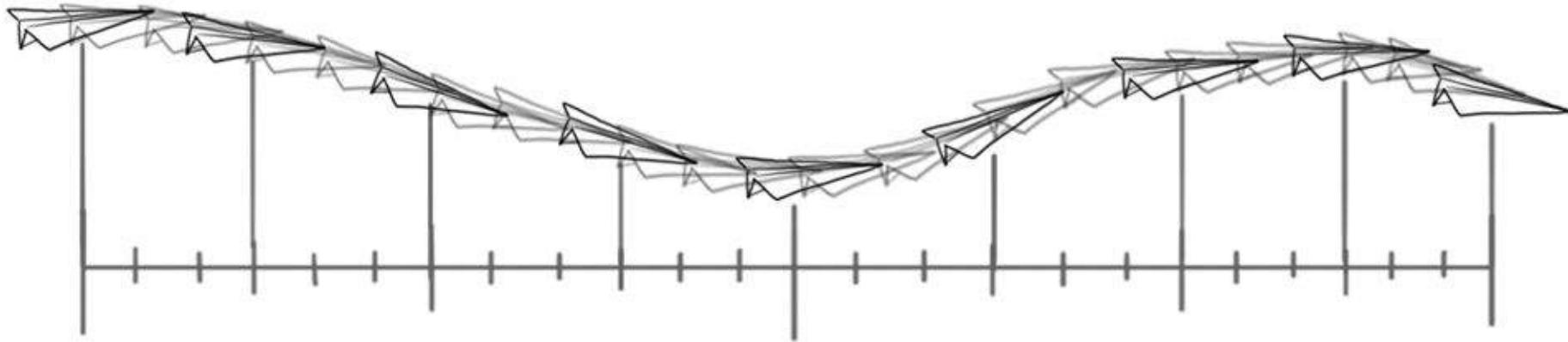
First of all, we will add images that show the main movement of the paper plane; these are called **Keyframes**.

By doing this, we get a good idea of how the plane will move, how it will turn, and its 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).

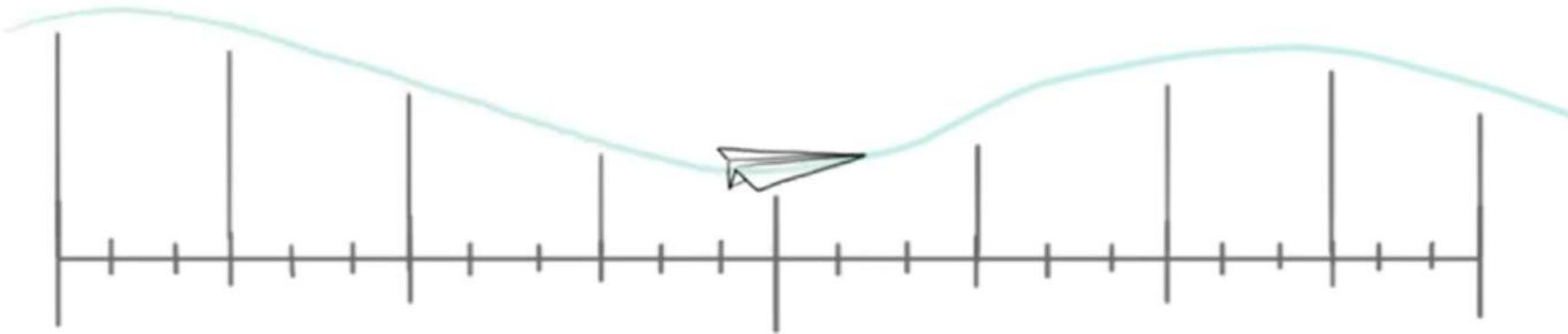


When we take all of these separate frames and 'play them' one after another, it creates an animated movement. We could speed up the movement by taking away some of the inbetween frames so that it doesn't last as long, or slow it down by adding more in, as demonstrated in the video below.



ANIMATING A PAPER PLANE

https://www.youtube.com/watch?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**'.



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).

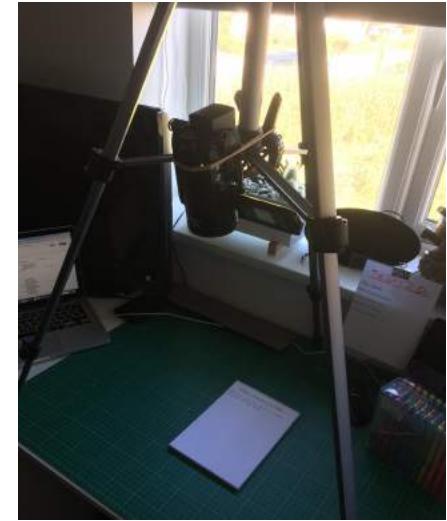


If you have the tools to do so, you can set up a camera rig, take the photo's and then compile them all together in a programme like Adobe After Effects.

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).



Depending on how you have set up your camera rig, you will be animating on either a flat surface (like a table) or a wall.

If you are animating ‘top-down’ on a table or desk then you won’t need to fix down your paper, but you will need to be careful that your cut-outs don’t accidentally blow away or move around. Be sure that there is no wind or breeze that can disturb it and move around and close doors slowly so that you don’t cause an accidental breeze yourself.

If you are animating ‘straight on’ you will probably be using a wall or whiteboard. In this case you will need sticky tac to hold the cut-outs on the wall. Be sure to use enough to make them grip firmly, but not too much that it shows up as a big lump on camera. You will also need to be careful when moving your paper cut-outs. If you are too firm or fast you risk ripping them.

TIPS FOR SMOOTHER ANIMATION

You are now going to do an exercise that will help you to get to grips with the concept of stop-motion animating with paper. 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: ANIMATING A PAPER PLANE

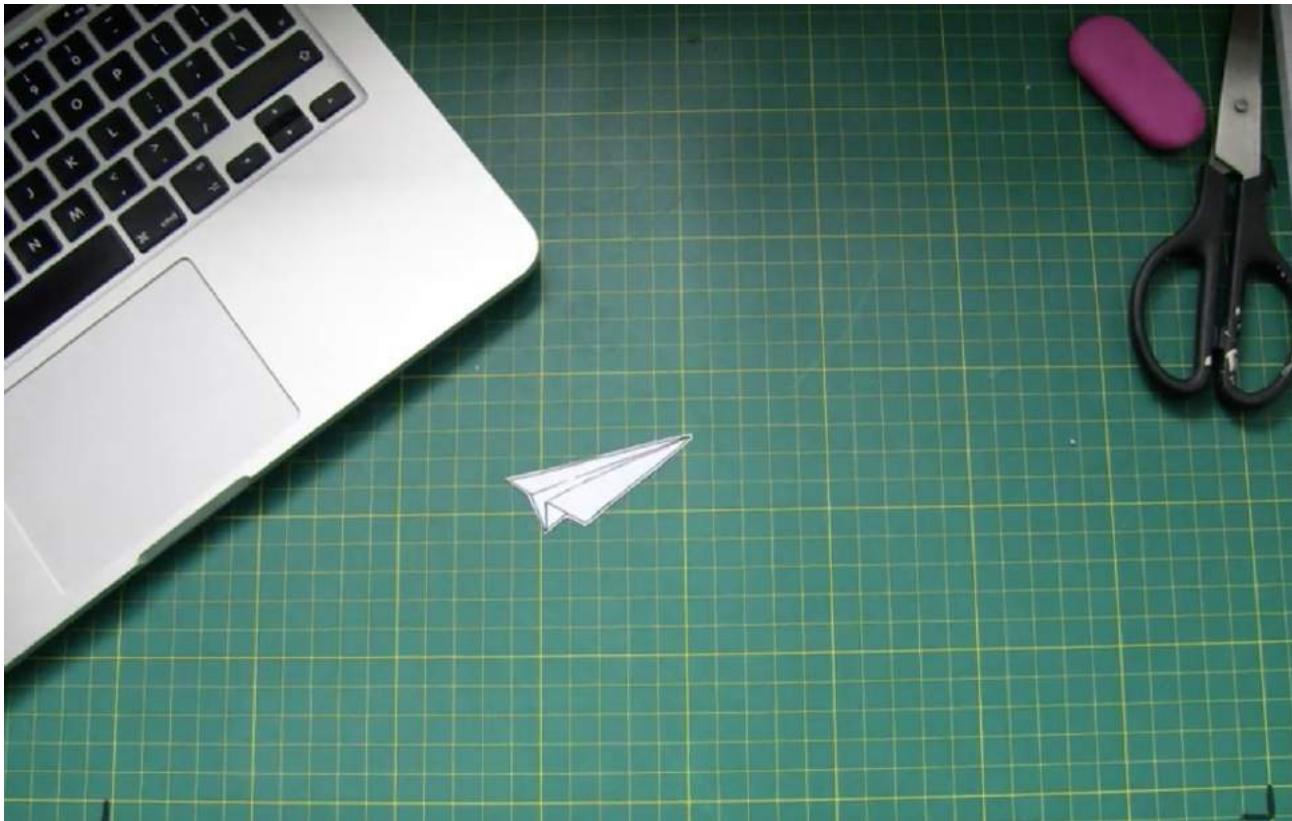
The paper plane diagram we created can be used to visualise how it would move frame by frame in stop-motion with a cut-out. The action is created by moving the paper plane cut-out a little bit at a time, taking a photo after each little movement. When all of the photos are 'played back' one after another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

Draw and cut out your own little paper plane and animate it 'flying' along a surface using your chosen app or software. Start from just off screen and move the cut-out a little bit at a time, taking a picture after every little movement.

Do a few different experiments of the plane following different paths. If you feel adventurous try making it do a loop.

EXAMPLE: PAPER PLANE ANIMATION

<https://youtu.be/DHAMR7N9Gco>



USING PAPER

Using paper cut-outs is a great way to get into stop-motion animation. You can create your own characters and scenery either through digital drawing or by hand drawing and painting. You can print off images of existing characters (maybe from your favourite cartoon), or use some that someone else has already made for you. You can also create intricate and beautiful jointed puppets. There's nothing stopping you from using photographs too. Depending which you use, your animation will have a different style and aesthetic.

You don't necessarily have to use pictures either. Making words float around and change is a style in itself and can create some interesting imagery.

EXERCISE: THE SHAPE OF WORDS

To get familiar with paper as a medium and how it moves on the surface you've chosen, you will create a short stop motion animation using letters.

Use a piece of coloured paper to cut out the individual letters of the name of an animal.

Play around with the positioning of the letters to make it look like that animal. I.e: if you chose 'POLAR BEAR' try to make the letters look like the shape of a polar bear.

Now create a stop motion animation of the letters moving around until they spell out the name of the animal instead.

Try doing this the other way around as well: going from word to shape.

EXAMPLE: THE SHAPE OF WORDS

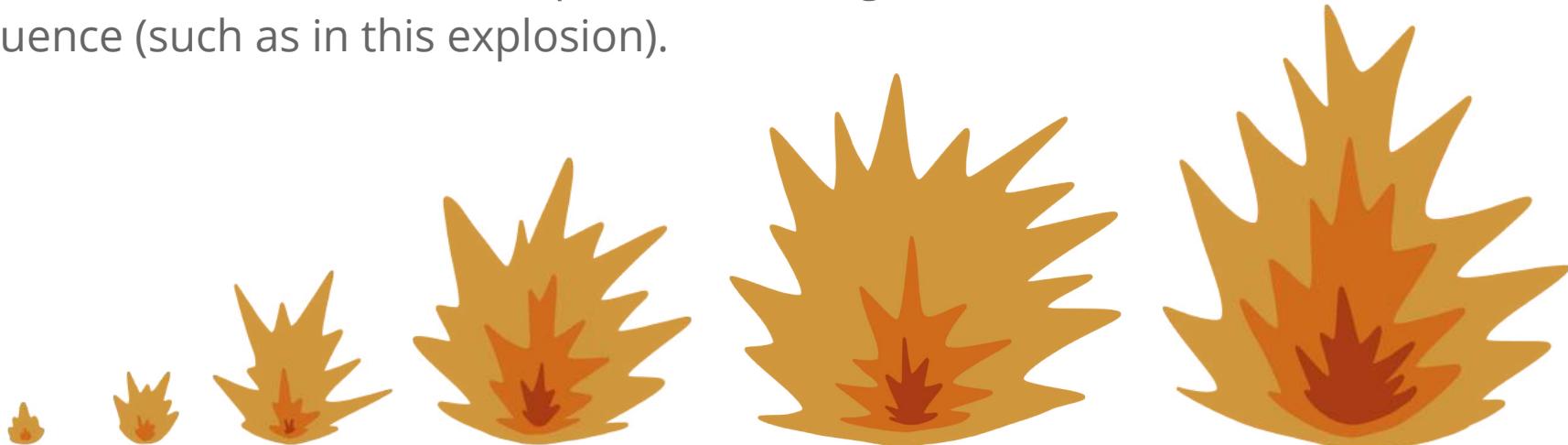
https://www.youtube.com/watch?v=C4TUCZW6clA&feature=emb_logo



REPLACEMENT ANIMATION

Because we're using paper to animate, there is only a limited amount of movement we can get from it.

In stop-motion we sometimes use 'replacements'. This is a lot like the way we sequence frames in drawn animation. We have a different cut-out for each frame of the animation, and replace each image with the next one in its sequence (such as in this explosion).



Example Available at:
https://www.youtube.com/watch?v=RGna7P7YxKw&feature=emb_logo



EXERCISE: REPLACEMENT ANIMATION

This exercise focuses on using the replacement technique to animate a sequence of images.

Pick a simple movement, action or sequence. This could be a person waving, a fire flickering or a plant growing.

Draw and cut out each frame of the sequence (refer back to the explosion example if you're unsure). It is up to you how many images are in the sequence, but remember that the more images there are and the more subtle the changes the better and smoother it will look.

Animate your sequence using stop-motion. Remember, when you replace an image with the next one be careful to put it in the exact same place so that it doesn't look like your object/person is floating around and the actions line up.

MAKING A JOINTED DOLL

Although movement may be limited when we use paper in stop motion it certainly doesn't mean it isn't an option at all.

A jointed paper doll or **puppet** is a wonderful way to begin exploring character animation in stop-motion. It is essentially a paper cut out of a character with moving joints. The neck, legs, arms, hands and feet can all be moved independently, so the character can perform a variety of animated movement.

There are many examples of jointed paper puppets online, including fully designed templates. Creating a basic puppet, however, does leave it open to you to customise how you want, and can even be made so that clothing and hair are all interchangeable.



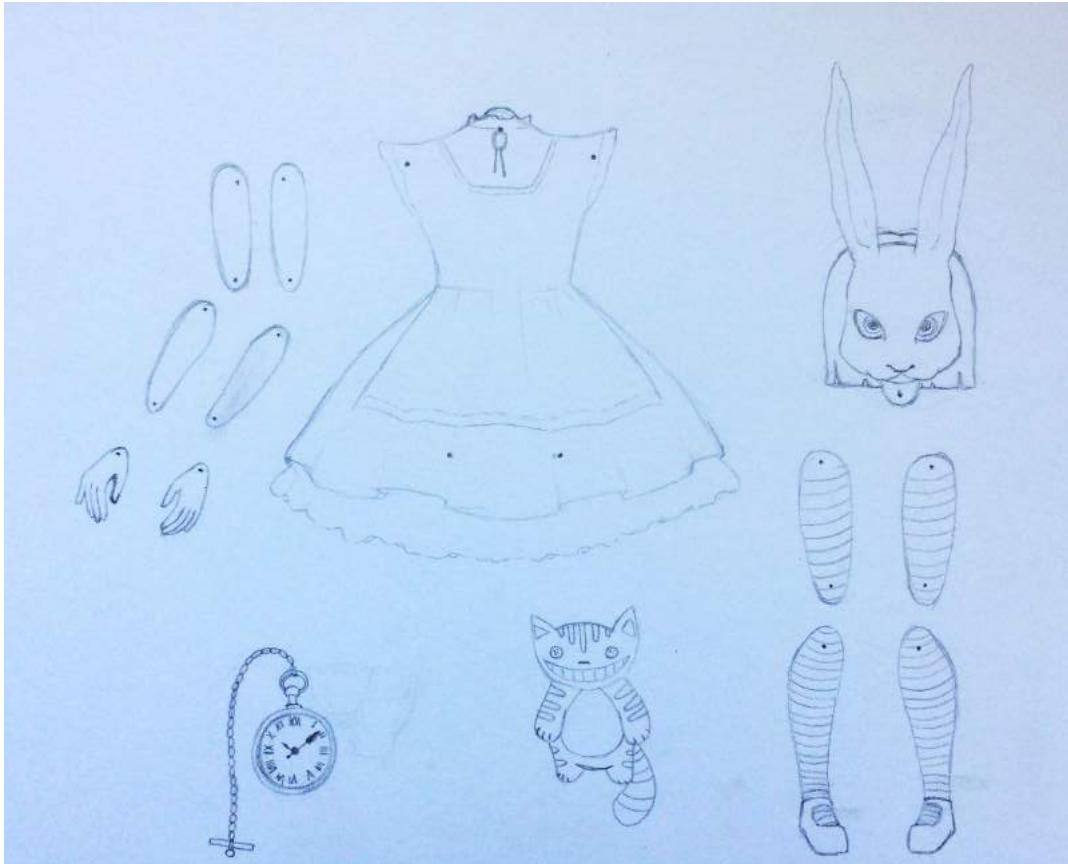
EXERCISE: PAPER DOLL

Create your own jointed paper doll character using either the templates provided in the PDF download on the original blog post, or from a design or template you've found online.

If you choose to use the templates provided then you can customise them either by drawing clothing or details onto them before cutting them out, or by using the outlines to create clothing overlays that you can stick onto the paper puppet. Whichever you choose, pay attention to where the joints will be and don't cover them up, remove them or accidentally glue them stiff.

When assembling your puppet use either split pins or thick thread to create the joint.

INSTRUCTIONS: MAKING A PAPER DOLL-STEP 1



First of all draw the outline of each of the separate parts of your doll in pencil on a piece of white card.

You could either use one of the downloadable templates as a base and add on character elements, or, if you feel confident enough, you could draw it freehand. Use the examples as a guide or look online for inspiration.

INSTRUCTIONS: MAKING A PAPER DOLL-STEP 2



Colour in your doll.

You could use any of the following techniques to create a range of effects:

- Pencils.
- Pens.
- Paints.
- Inks.
- Collage.
- Printed patterns or images.

INSTRUCTIONS: MAKING A PAPER DOLL-STEP 3

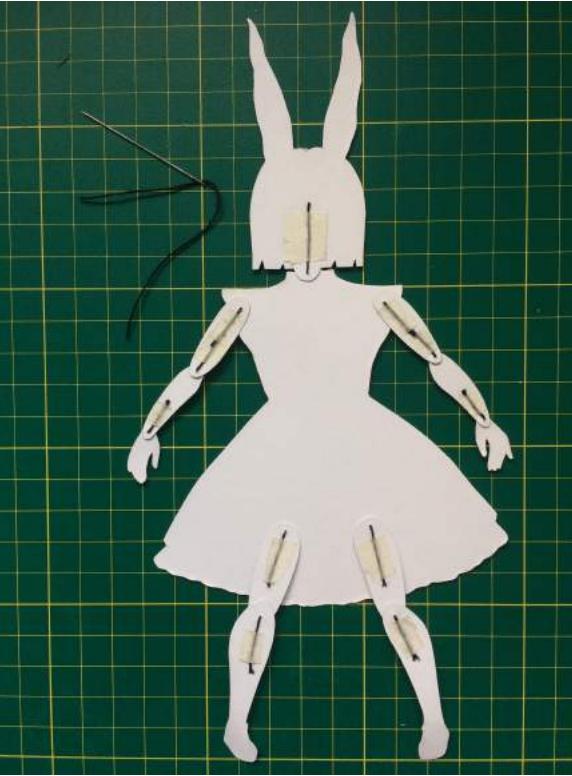


Cut out the individual pieces of your puppet.

You may want to use scissors or a craft knife depending on how small some of the details are that need cutting out.

At this point you can also use a pin or the tip of a craft knife to poke through the holes where you will be joining the pieces together.

INSTRUCTIONS: MAKING A PAPER DOLL-STEP 4



Join the parts of your puppet together.

If you are using split pins then use small ones and push them through gently.

If using thread, as in this example, make a neat knot in the thread and pull it through both parts using a needle, keeping the knot on the visible side. At the back, pull the thread tight and use tape to stick it down. Don't cover the hole as this will stop the joint from moving.

Cut off any excess thread.



EXERCISE: PUPPET ANIMATION

Now you will use your paper puppet to do a few animation tests.

Animate your puppet:

- Waving one or both hands.
- Kicking one leg after the other.
- Bending at the knees and getting back up.
- Bowing at the waist.
- Nodding their head.
- Walking a few steps.

Finally, animate a movement or sequence of movements that requires moving more than one joint, like a dance.

EXAMPLE: PUPPET ANIMATION

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



EXERCISE: CUT-OUT CREATIONS

Build a collection of cut-outs to use in your stop motion animations.

You may decide to design and create your own, print some off from the internet, or you can use those created by the OCA (available in the PDF download on the blog page).

Create several characters, some objects (or props) and some background images. Think about the story you may be telling or the scene the characters will be acting out and what you will need to complete it. You might want to make more jointed paper dolls, or you might not. You may also want to add words and letters into the mix.

If you have previously completed the OCA's Visual Storytelling Workshop then you may want to carry on from where you left off and create the characters and scenes from your 'Hero's Journey' story.

FINAL PROJECT: A SHORT STORY

You will now create a short story and animate it using the paper puppets and cut-outs you've created throughout the workshop.

Write out a quick outline of what will happen in your animation so that you have something to work from, and create any extra elements you may need. You may want to paint some backgrounds, or make more props or scenery pieces. Perhaps your story will just be about showcasing all of the wonderful extra clothing pieces you have made for your paper doll.

Remember your stop-motion basics when doing this (small, smooth movements), and if you're unsure about any actions simply do them yourself to see how they should look before you animate them.

REFLECTIONS

We hope you have enjoyed learning the basics of paper 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!



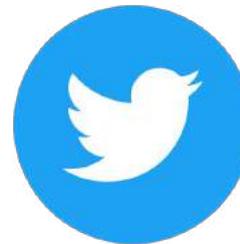
The OCA would love to see what you've created. Share your films, experiments and puppets with us by tagging us in them on Facebook, Instagram and Twitter.



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