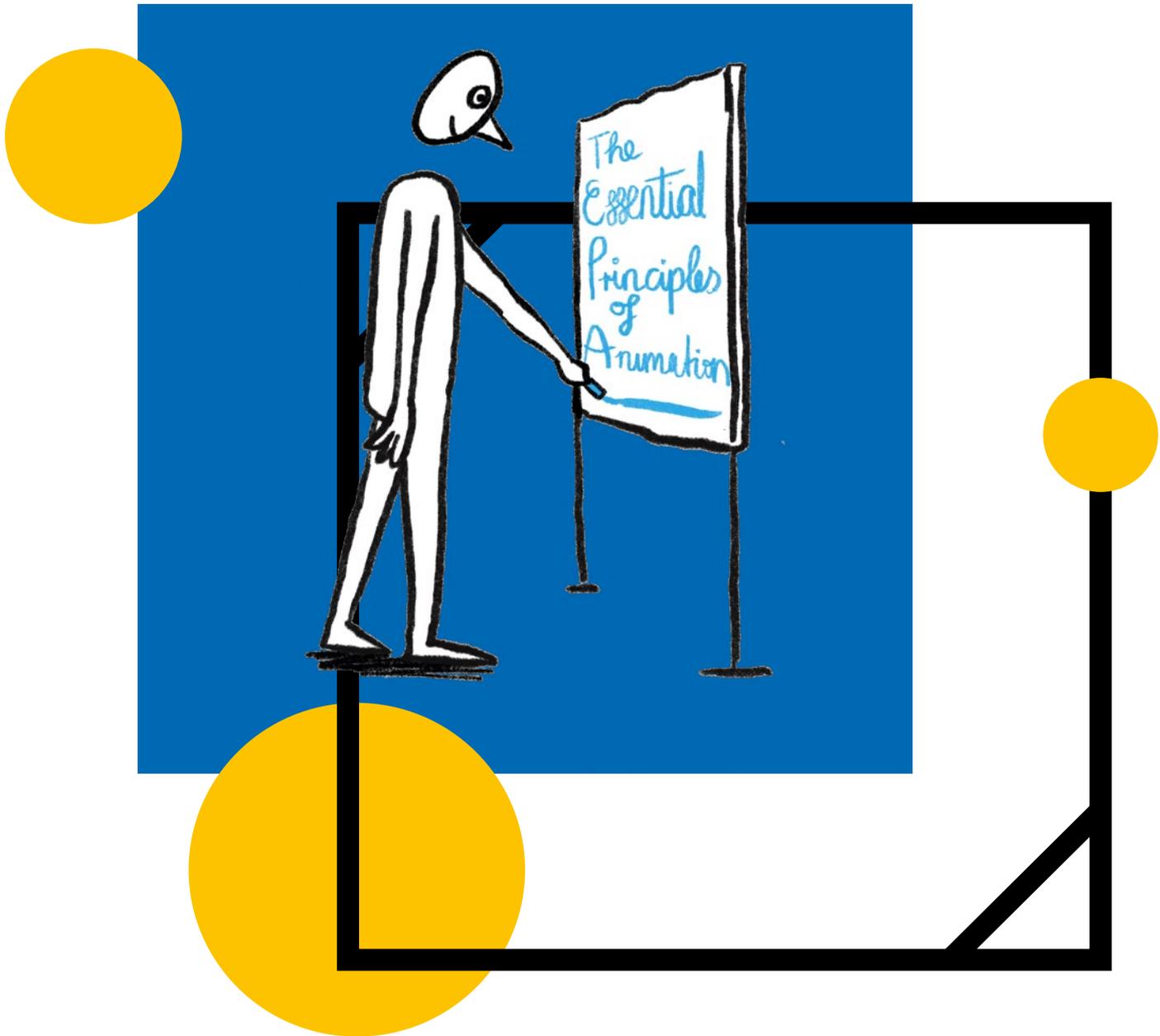


Drawings in motion

Bouncing ball



Animation and illustration
? hours
[skills?] development

What you need



Tracing Paper

Best to buy A3 so you can cut it down to size if needed.

Felt Tip Pens

Preferably Sharpies but any pen that will dry well on the tracing paper will do.

Try and get a variety of colours. A good place to start would be the primary colours which are red, blue and yellow. As well as black.

Pencils

Best to use a slightly softer pencil like a B2 but not too soft as it might smudge when rubbed out.

Smart Phone with Stop Motion Studio

This is a free download from the app store. It's a simple stop frame application. Which means it takes individual photos of your drawings and puts them together in a sequence to make an animation.

Rubber/Eraser

Scissors

Non essential materials

(but useful to have)

Smart Phone Tripod

You can get one of these online for around £15. They help to keep the smart phone still when taking pictures of your drawings. Though Stop Frame Studio has onion layers (a faint image of the previous frame) so the tripod is not essential.

Clear Masking Tape

If you are working on a drawing desk at an angle or you are a perfectionist and like your drawings flat then the tape will come in useful.

Light Box

Out of all the non essentials a light box will be the most expensive investment. Prices vary a lot. The benefit of having a light box is that it will eliminate the lines of the tracing paper and make your drawings clearer. Learning the fundamentals does not require a light box and you might want to invest in one when you have mastered the basics.

A4 Paper

To use as backgrounds for your animation.

How to use Stop Motion Studio

1. Download and open the app and press the plus sign to start a new animation
2. Click the phone icon in the top right corner
3. When you have lined up your first drawing create your first frame by pressing the big red button on the righthand side.
4. When you come to take your second frame make sure you activate the onion layer from your previous frame. To do this slide the circle on the top left on the screen down until you see a faint image of the previous frame come through. Use this to reference where to place your drawing.
5. When you have created all your frames press the back button on the top right corner of the screen and then play your animation by pressing the play button at the bottom right of the screen.
6. When you are happy with your animation, press the back button on the top left of the screen.
7. To save as either a movie or a gif, click select on the top right of the screen and press the select button visible on your animation. Then press the download button on the top left and click either Animated Gif or Export Movie.

Overview

The bouncing ball is a very simple animation exercise and can teach students several of the essential principles of animation.

In this exercise we will be looking at two different fundamental concepts:

- **Squash and Stretch**

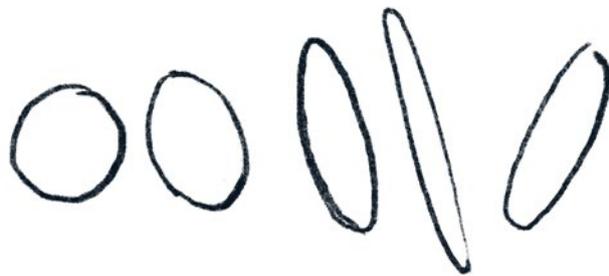
Where we change the volume of an object to dramatise movement.

- **Arcs**

The idea that most animals, insects, plants and even a rubber ball will move in a circular motion.

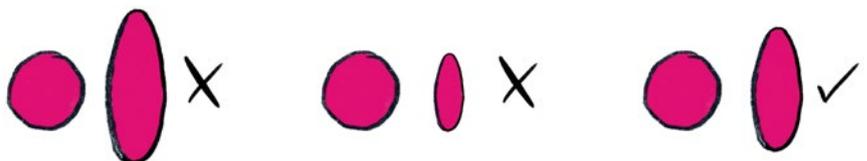
Workshop

At the start feel free to simply trace the drawings below to use in your animation or use your own. Remember though that when you are staring out it's better to keep your drawings simple.



To start the workshop, draw a circle. The first circle you draw will become a measure for keeping consistent volume when you squash and stretch your ball. For example, when you start to stretch your ball on a decent it's important to make sure that the stretch is not of a larger or smaller volume from your original circle.

For example:



Workshop

Frames 1 and 2

To start get a piece of white A4 paper and open up Stop Motion Studio (refer to previous section—How to use Stop Motion Studio). Secure the A4 paper to your work table applying a small amount of tape to secure all four corners.

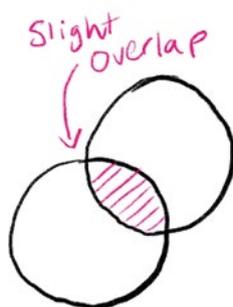
Frame #1

Start by drawing your ball as a circle on tracing paper. You can use the drawings provided or you could draw the ball yourself.

Using Stop Frame Studio take your first frame with the ball in the top left of your screen.

Frame #2

For the second frame make sure you have your first frame slightly visible by activating your onion layers (refer to previous section- How to Use Stop Motion Studio). When you have done that position your second frame to the top right of the first frame so that it slightly overlaps.

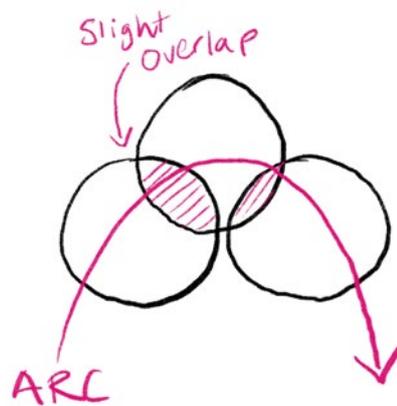


Workshop

Frames 3 and 4

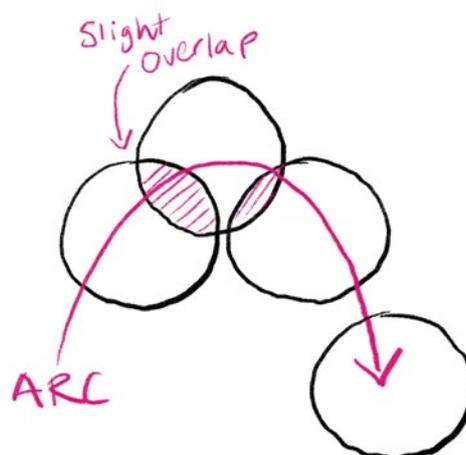
Frame #3

For the third frame place the circle at the bottom right for the second frame. This will create an arc effect of your ball and will make the animation feel more natural.



Frame #4

Place the fourth frame below the third so that the ball is now moving away from the arc and descending to the floor. There should be no overlap for this frame.

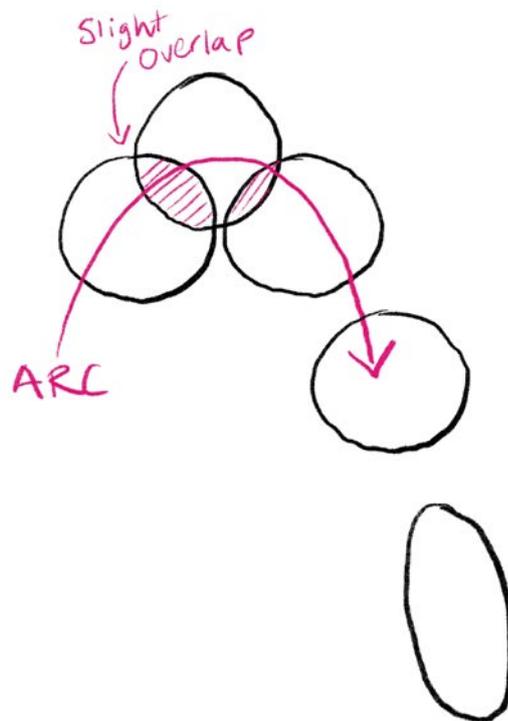


Workshop

Frame 5

Frame #5

As the ball continues on its decent you need to start stretching its form. Remember, don't increase or decrease its volume when you draw this frame.

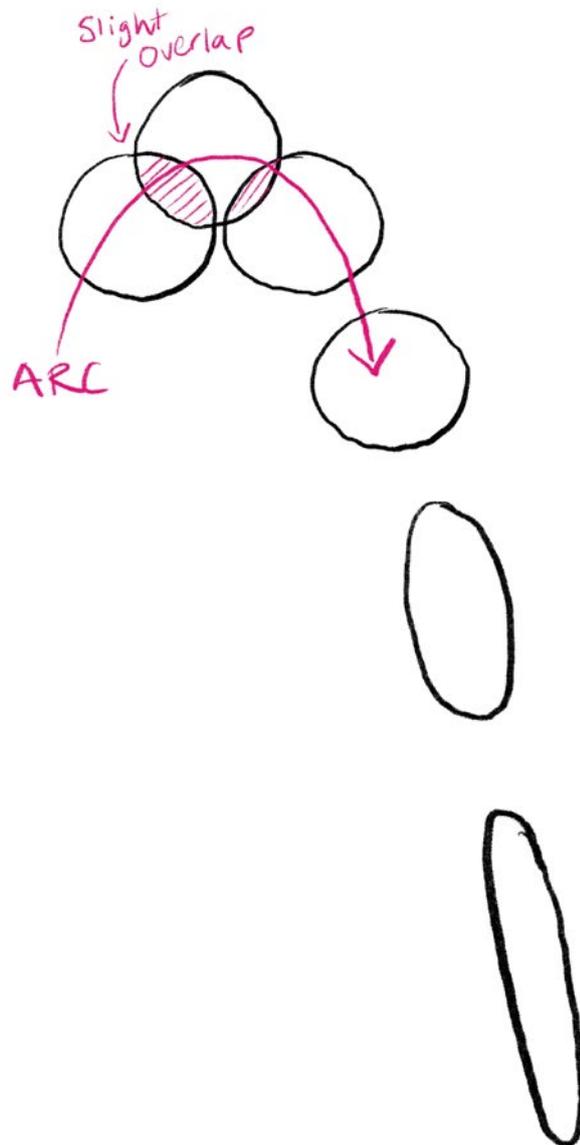


Workshop

Frame 6

Frame #6

On the sixth frame really stretch the ball to exaggerate the decent before impact.

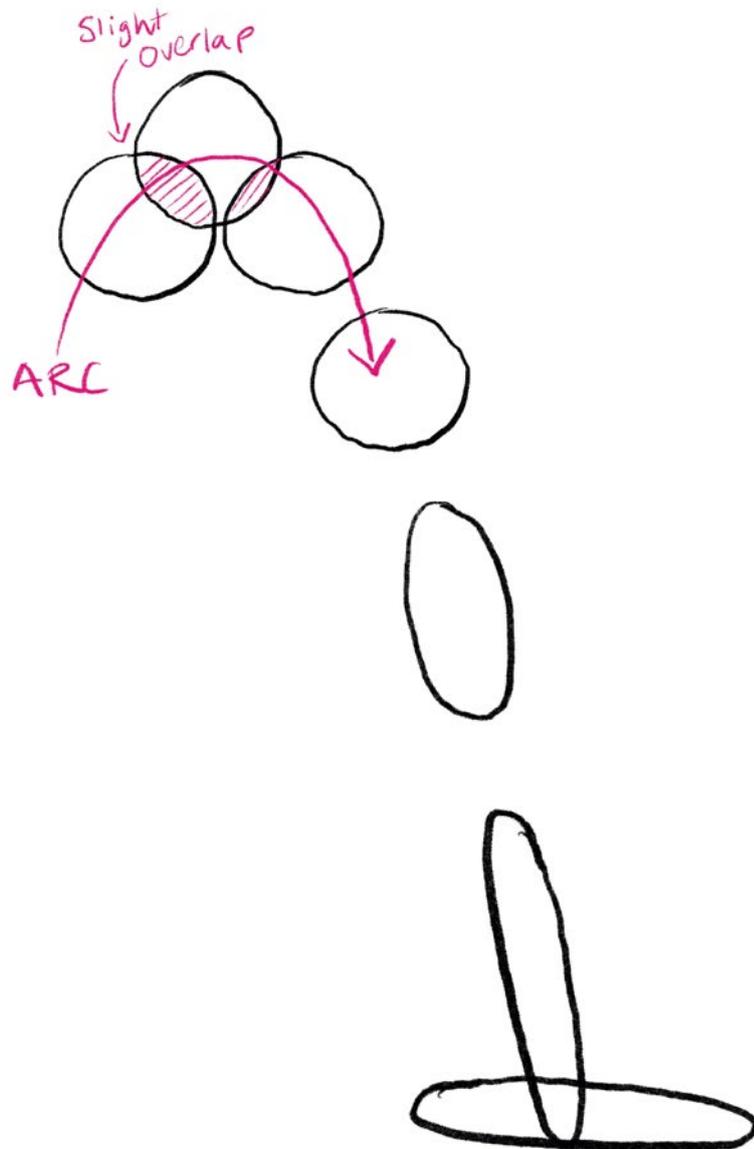


Workshop

Frame 7

Frame #7

As the ball makes impact the stretch turns into a squeeze. As you can see in the seventh frame the ball has flattened out on impact. If it helps you can trace the sixth frame and turn it on its side.

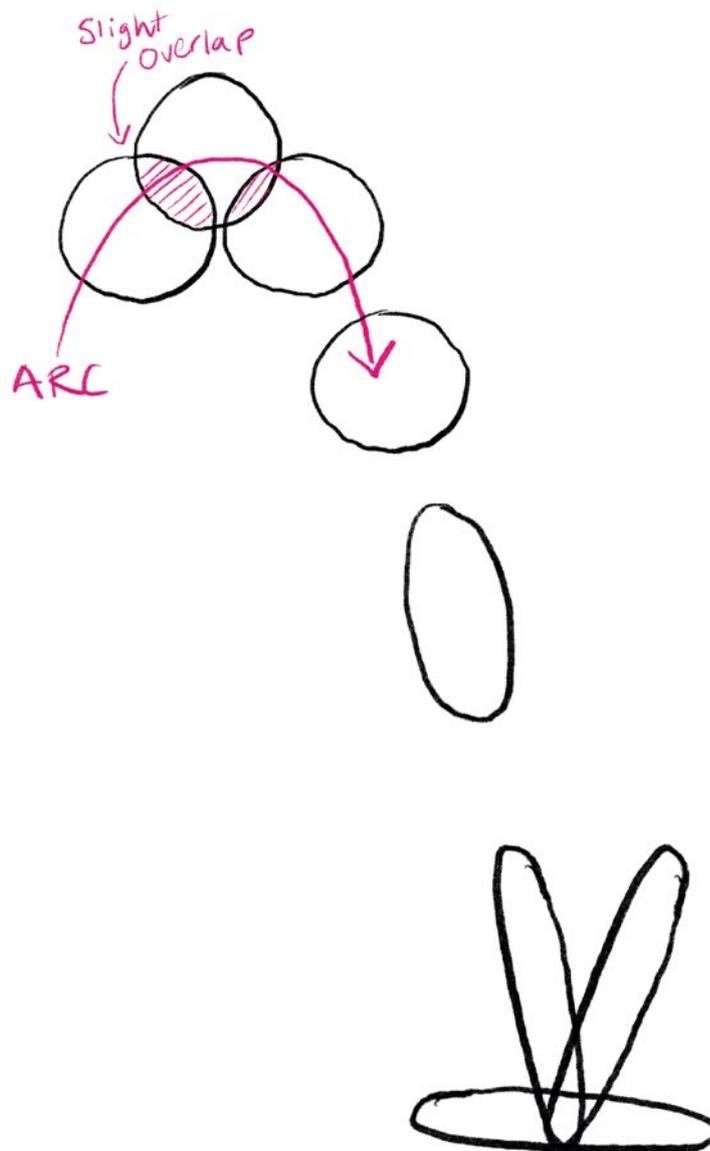


Workshop

Frame 8

Frame #8

For the final frame the ball has now released its energy to start a new incline. To do this draw another stretch frame like the one in frame six but going in the opposite direction.

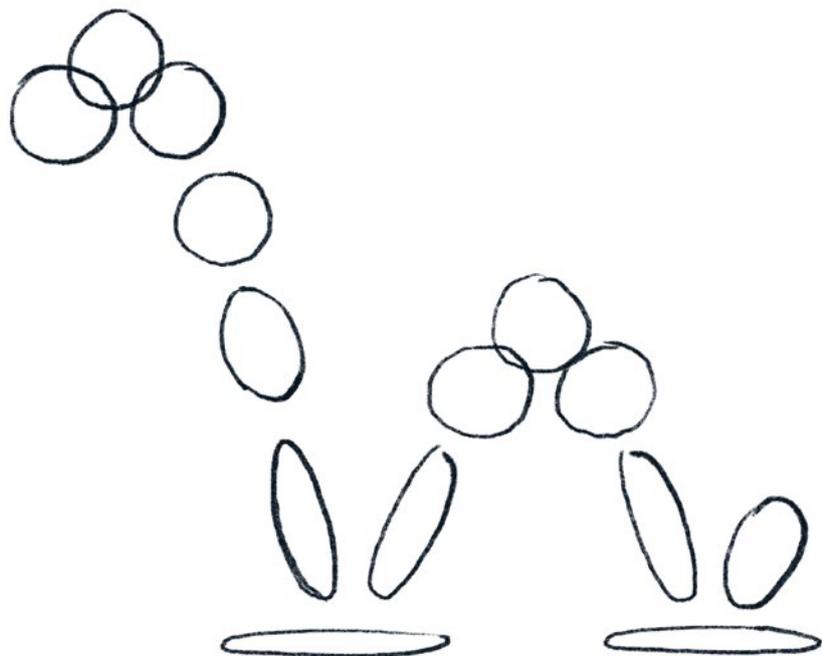


Workshop

To continue

Try and get the ball to bounce two times in a row. Try and remember to decrease the height of each bounce to make the animation feel more natural.

Also, remember those arcs!



Extension activities

If you have successfully made a ball bounce using squash and stretch, then why not get creative with it?

Exercise 1

Draw a little round animal that is hopping about. Every time it hits the floor it squashes and stretches very much like the bouncing ball.

Exercise 2

If you are feeling really experimental you could draw a face smiling? As the smile gets wider the face squashes down and then when the mouth relaxes the face stretches back.

Exercise 3

Use your imagination! Come up with your own version of squash and stretch. It's not just for bouncing balls. For example maybe someone hitting a wall at speed, someone jumping over a puddle or someone breathing in and out

Whatever you do make sure you have fun with it!

Resources

Williams, Richard (2001)
The Animators Survival Kit

Thomas, Frank and Johnston, Ollie (1981)
The Illusion of Life Disney Animation

Lodigiani, Cento The Illusion of Life
vimeo.com/centodesign

Becker, Alan 12 Principles of Animation
youtube.com/watch?v=uDqjldl4bF4



Ravensbourne Outreach tutors and students have produced a new series of online projects and courses to help you stay creative at home

If you'd like to find out more please visit our website makeit.ravensbourne.ac.uk or email us at outreach@rave.ac.uk

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Twitter: [@ravensbourneWP](https://twitter.com/ravensbourneWP)

#letsmakeitcreative

