Animation Basics

A) Animation

The illusion of life.

- In animation we attempt to make things that aren't really there appear as though they could actually exist and move in the real world.

- Bad animation is very obvious and most audiences will pick up on that.

B) Principles Of Animation

There are 12 principles that apply to all forms of animation, but we will only focus on a few of them.

- Stretch and Squash
- Timing and Spacing
- Slow In and Slow Out
- Arcs
- Secondary Action
- Follow Through/Overlapping Action
- Straight Ahead and Pose-To-Pose
- Staging
- Appeal
- Solid Drawing
- Exaggeration
- Anticipation

Stretch and Squash

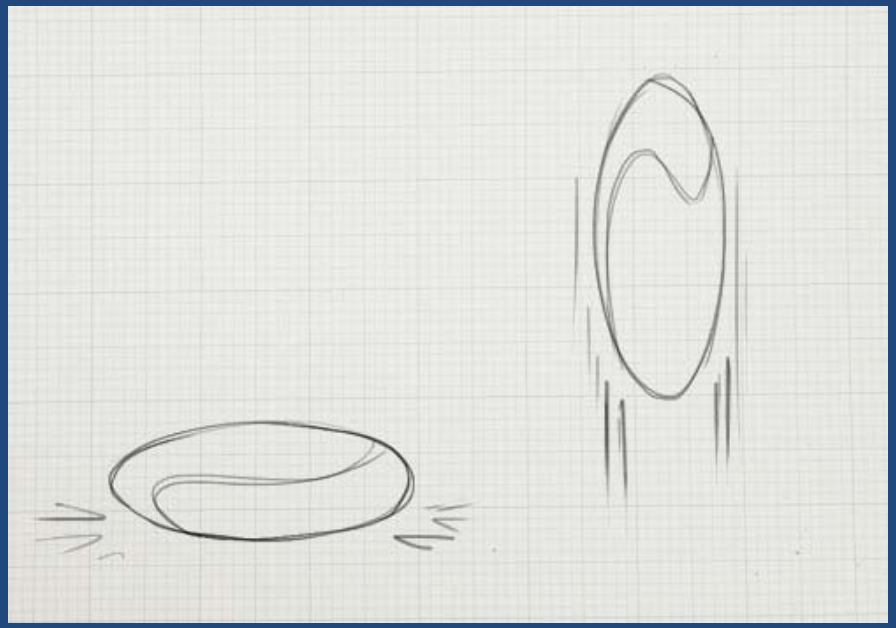
- The most important principle in animation, stretching and squashing gives an object weight and flexibility.

- While distorting a shape, it should always keep the same VOLUME.

Example:

If a ball is squashed downward, it will get wider.

If a ball is stretched upward, it will get thinner.



Slow In and Slow Out

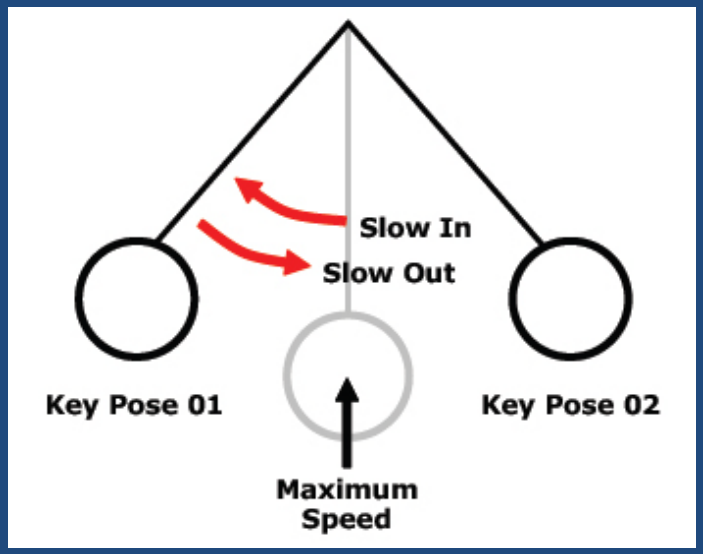
- Along with timing and spacing, this gives speed, weight, and purpose to an object's motion.

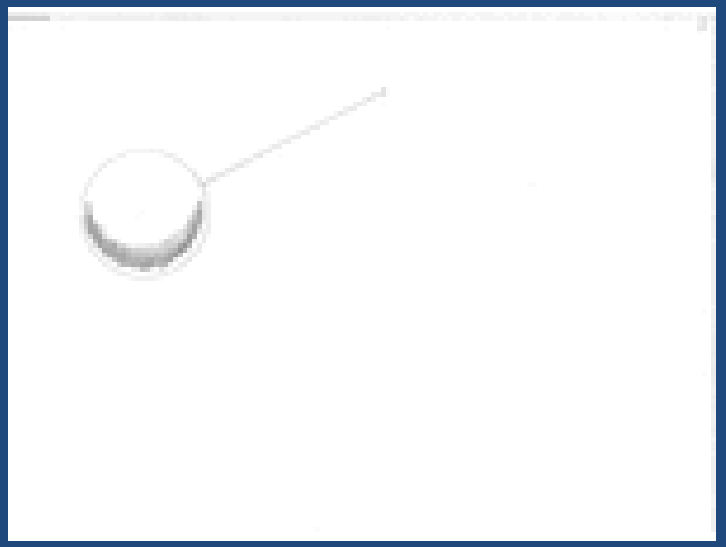
- Spacing drawings closer together will give the illusion of slower movement.

Example:

Most of the drawings in this pendulum would favor the key poses.

This creates the swinging effect.





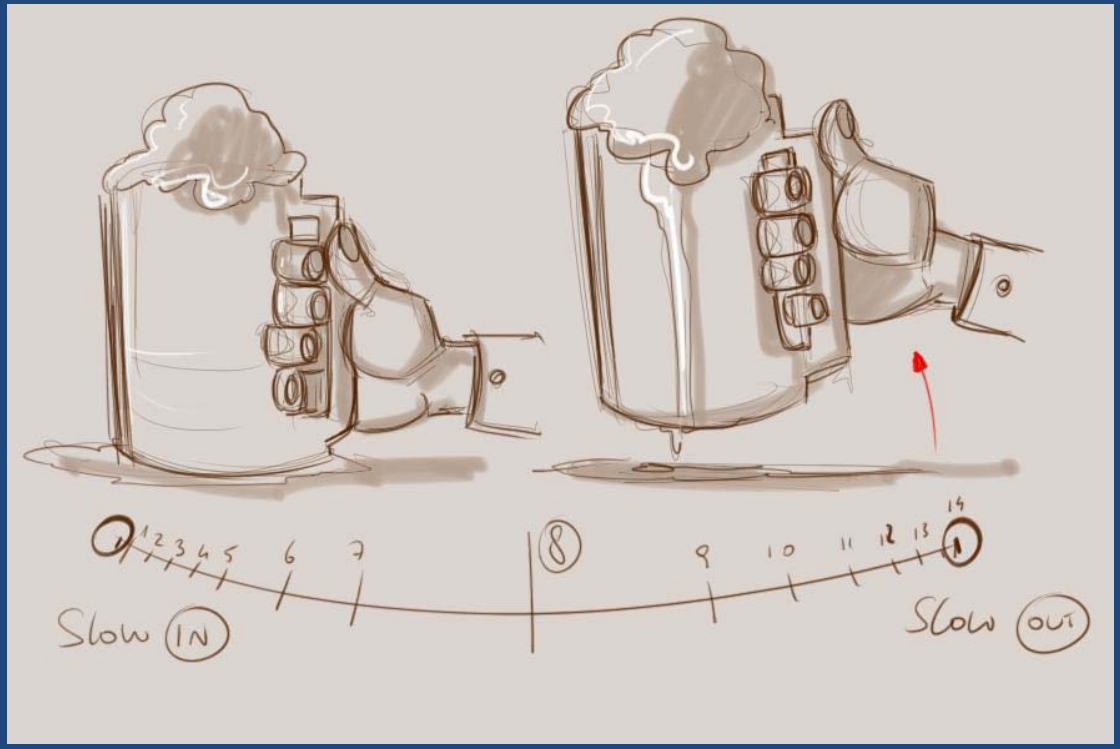
Slow In and Slow Out

- Completely even timing always looks unnatural.

- Every action should use some slow in and slow out.

Example:

The mug will gain speed as it raises and then slow down again to stop.



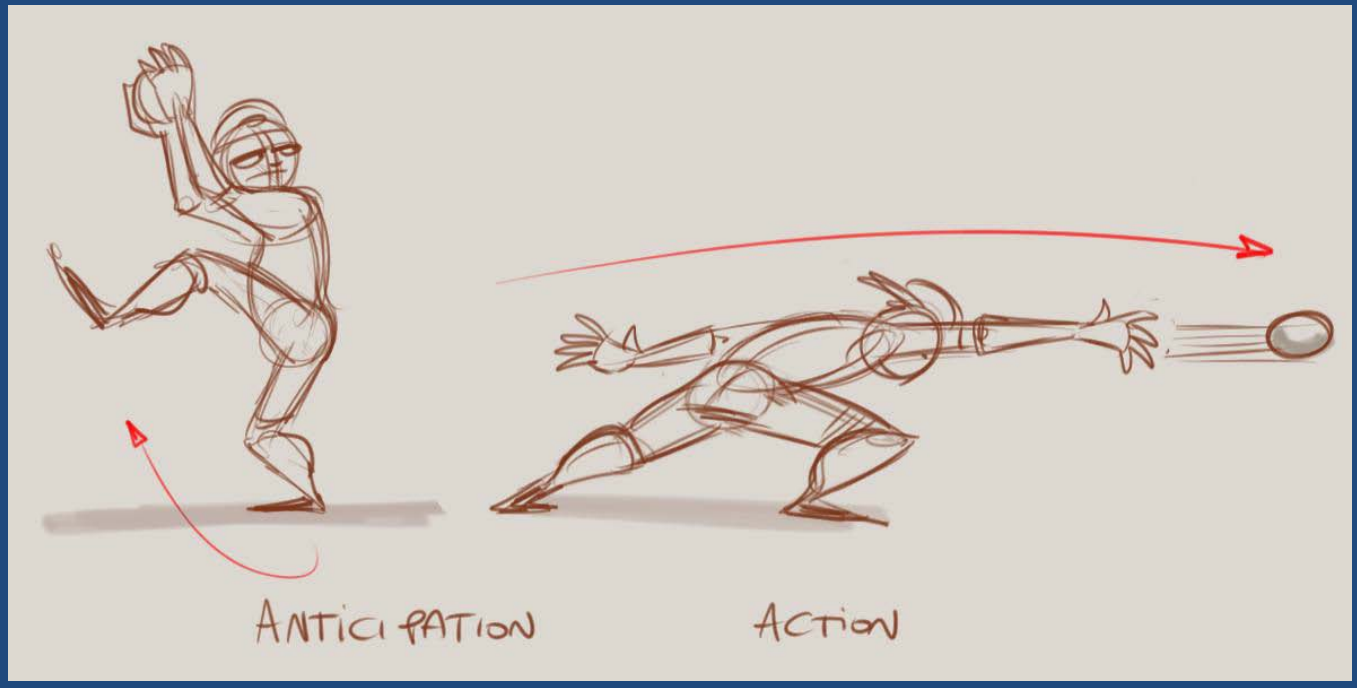
Arcs

- All actions move along an arched trajectory.

Example:

The character sweeps their leg forwards and upwards.

Then their entire body arcs around for the throw.



C) Animating

The actual process of animating your scenes (the fun part).

- 24 frames per second
- Thumbnails & Reference
- Posing
- Keys/Keyframes
- In-betweens

24 fps

- In TV animation we generally use 24 frames per second settings.
- We also usually animate “on 2s”. This means there is a new drawing or movement every 2nd frame, so each drawing is held on screen for 2 frames.
- This is easiest to work with, it gives enough time for the audience to register the motion and cuts the amount of drawings in half; 12 drawings per second.
- However, 3D animation is done “on 1s”, so every frame has a new movement.
- Sound is most often synced 2 frames BEHIND the visual. So you usually see a foot hit the ground a tiny bit before you hear the step sound effect.

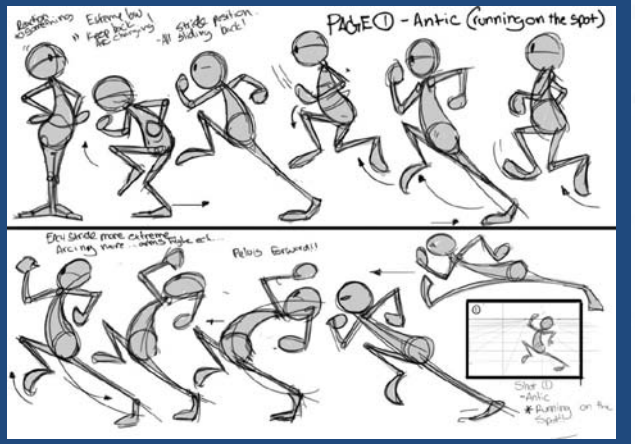
Thumbnail/Planning

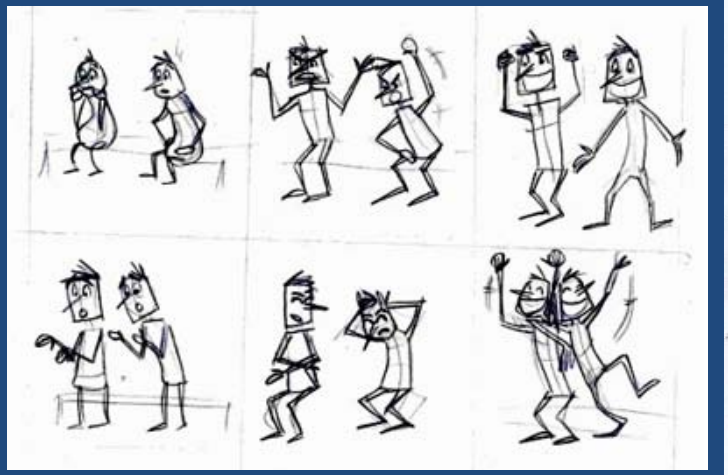
- Before you start your animation, you should always draw out some thumbnails and plan what actions you want the character to do.

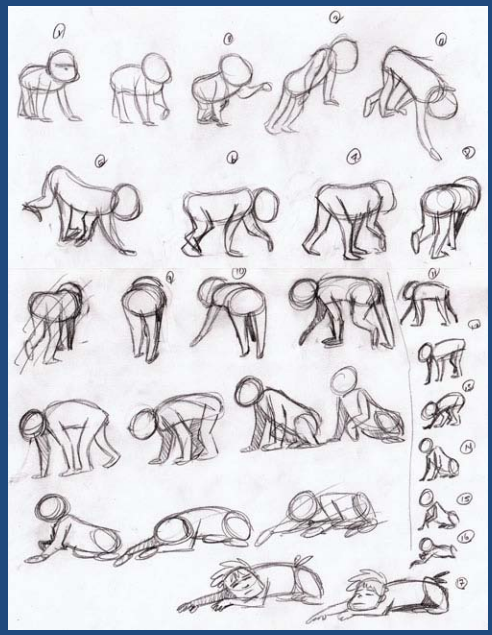
- It's always a good idea to refer to reference material for your action.

- If you're not a good artist—Don't worry! It's actually better to have very loose and simple thumbnails. The point is just to get an idea of the motion in the scene for the next step.

Example:





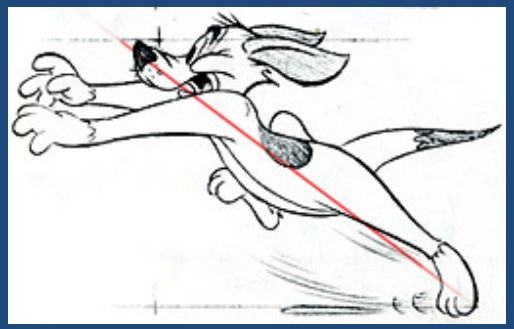


Posing

- Using your thumbnails, find the main poses your character will need to hit during the animation and flesh them out to be as dynamic as possible.

- You can do this step digitally or draw it, but try to keep the poses energetic and don't be afraid to exaggerate, it gets the point across better.

Example:

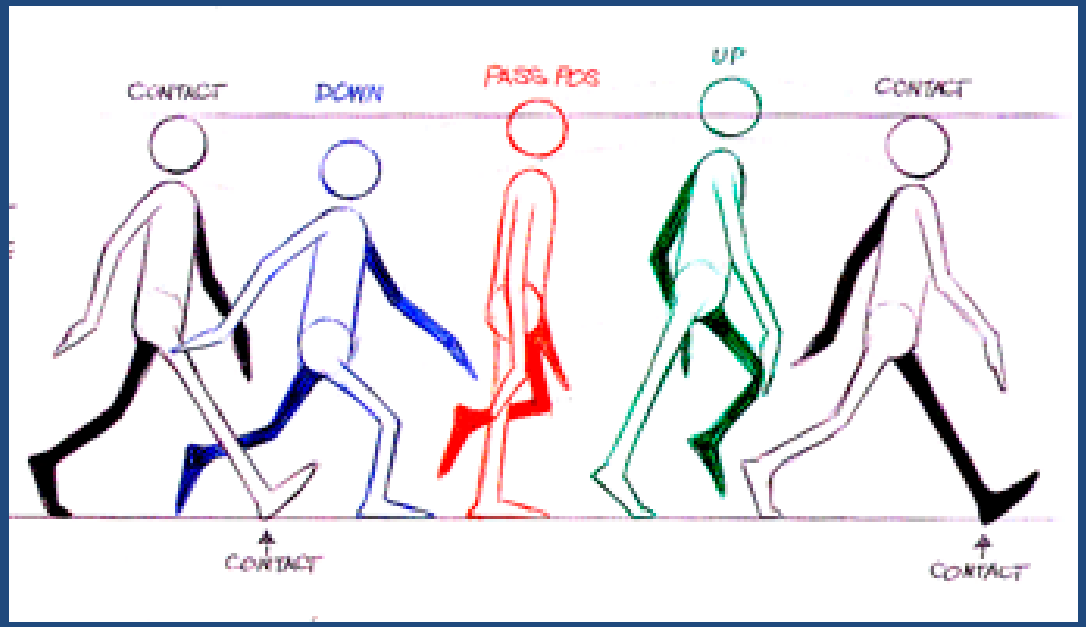


Key Animation

- Your poses are going to be the main parts of your animation, called “keys”. But you will need a few more keys to break the animation down further.

- These can be drawings in the middle of animation, or extra poses like an action’s follow-through. Decide what the most important drawings are going to be and make sure they are the best drawings.

Example:



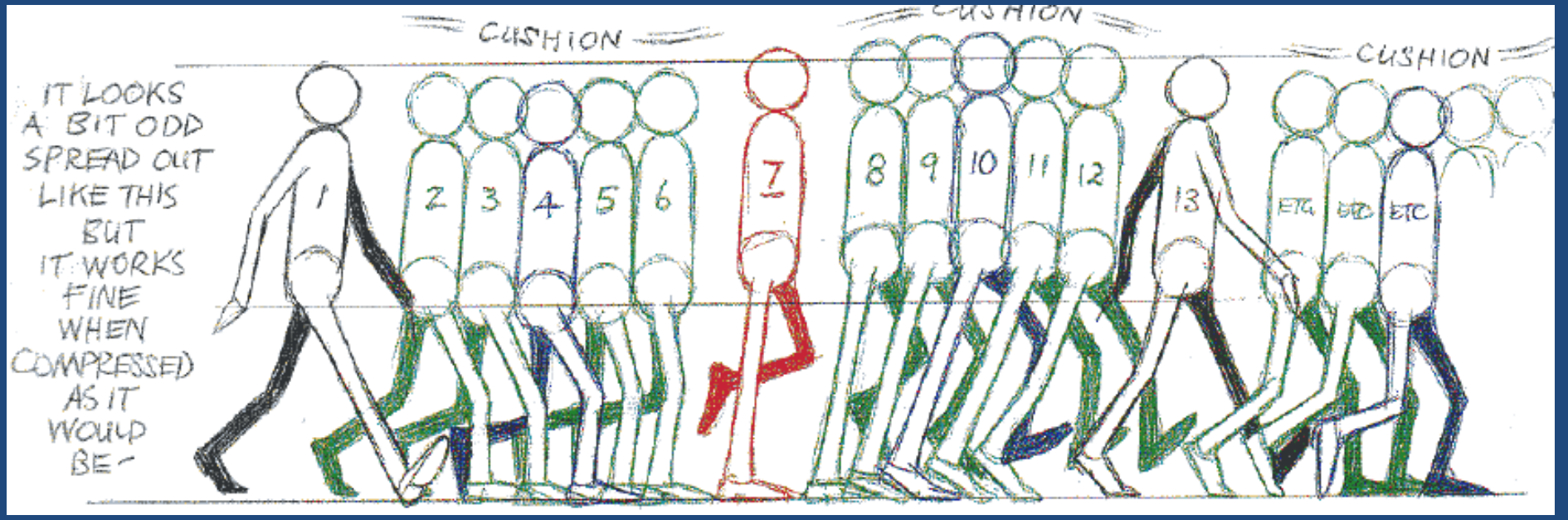
In-Betweens

- This is the last stage of animating, filling in the gaps between key drawings.

- Keep the principles of animation in mind with these drawings, as they come into play more here than in keys.

Example:

In-Betweens added to the keys from earlier.



In-Betweens

Just to show the difference, here is a student's animation in the blocked out posing stage, and then fully animated. You will want to test out how your animation is going many times at the posing and key stages so that you don't waste time in-betweening.

You WILL have to change things as you go.

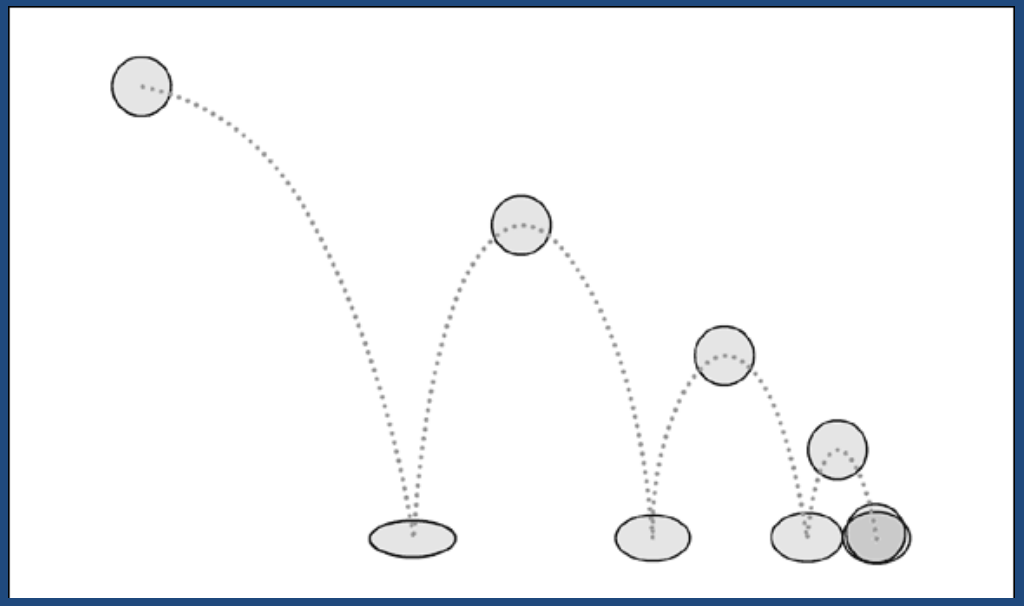
D) Bouncing Ball

To show these principles and steps working together, we will go through a basic animation of a ball bouncing into a scene.

- In the planning stage you will define the overall path of action of your animation. Keep in mind that the ball only bounces ½ of it's previous height because the ball loses momentum after each bounce.

Example:

These will be your main key drawings for this animation.



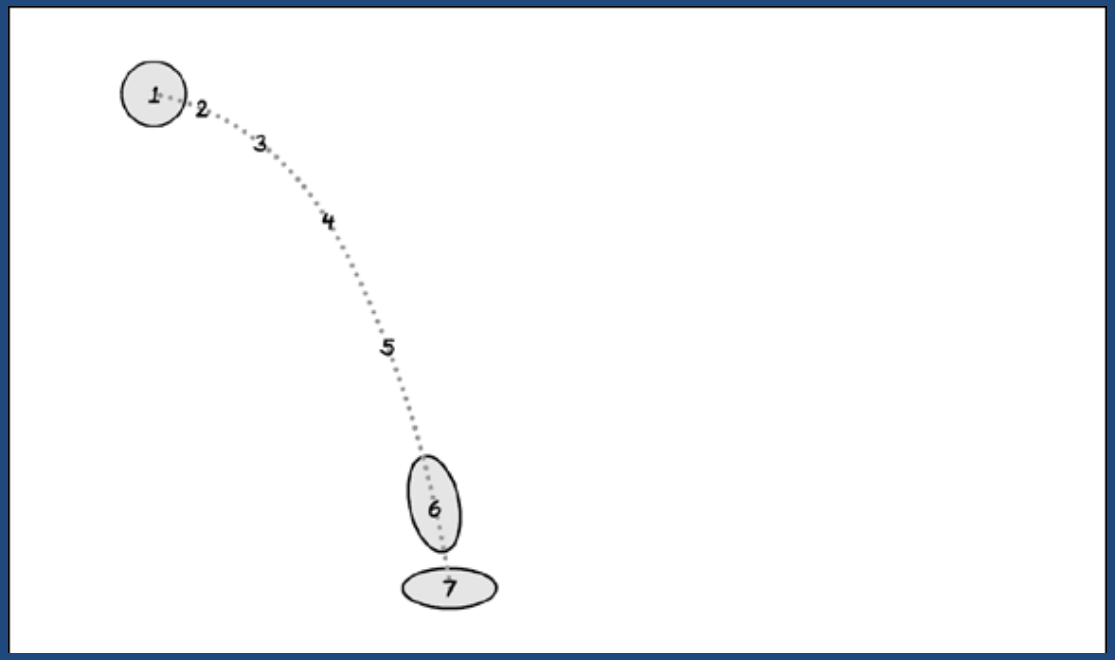
D) Bouncing Ball

- Next you will add “breakdown keys”. These are key drawings that will help keep you on track with your in-betweens, they are as important as the main key drawings.

Example:

Drawing 6 is the most important drawing between 1 and 7.

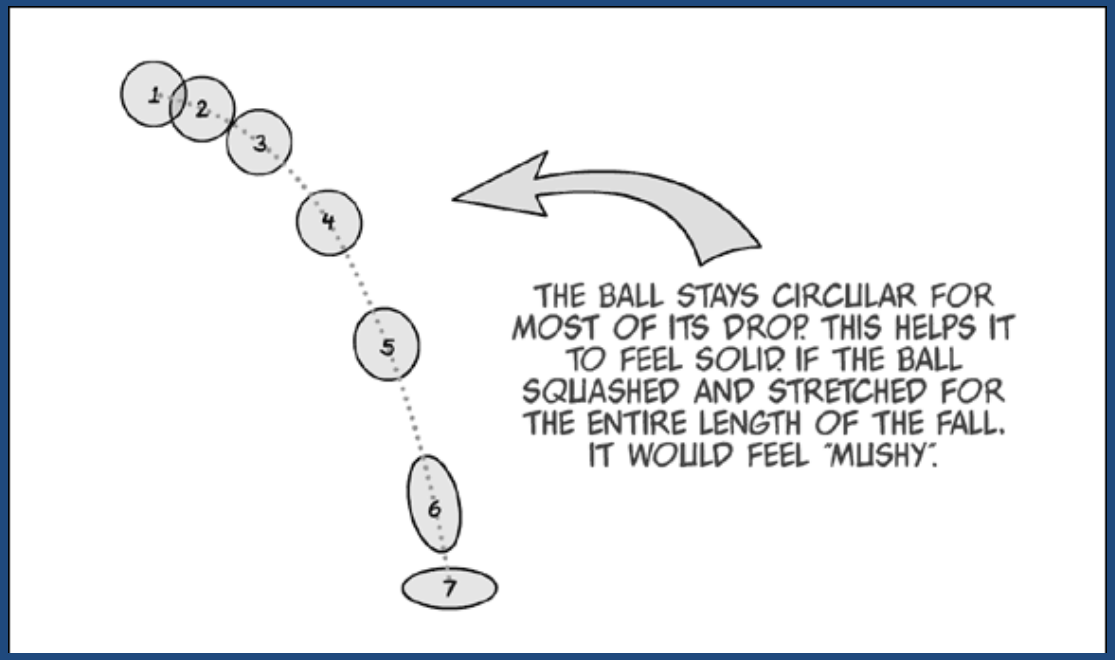
It will be the most stretched before the squash in drawing 7.



D) Bouncing Ball

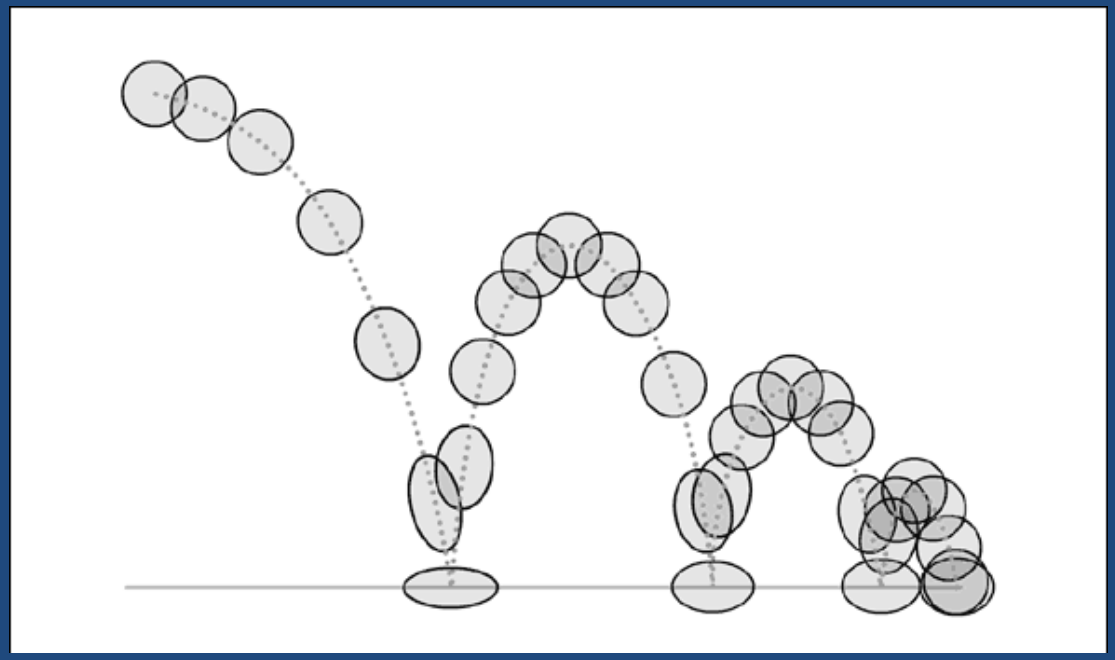
- Once you have finished your breakdown keys throughout the animation, you can begin your in-betweens. Though it looks like you're just connecting the dots, this is where you have to really keep timing/spacing, arcs, and stretch/squash in mind. Be sure to check the motion and consistency as you go—Play your animation and flip from each drawing as often as possible.

Example:



D) Bouncing Ball

- In the end, if all your drawings were put on one frame, it should look something like this. Note that as the bounces lose height, the drawings also get closer together. Drawings should be closer at the top of each bounce to give the illusion of hang time. The ball will stretch and squash less with each bounce, too, because it's not falling as far. Your final drawing should be of the ball completely still, and not distorted at all.



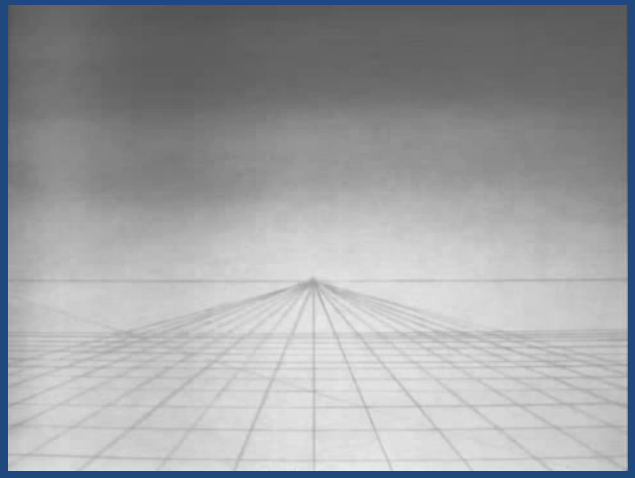
D) Bouncing Ball

- When all your in-betweens are done you should watch your animation many times over. Check to make sure that the volume is consistent, along with everything else. Most importantly, don't get discouraged if a chunk of the animation doesn't look right, that's part of the process!

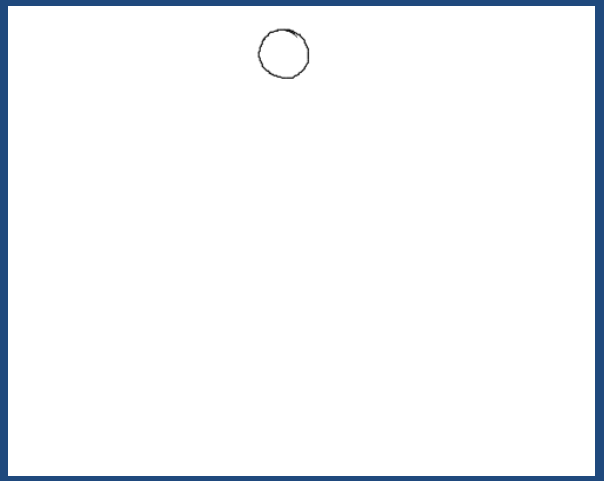
Example:

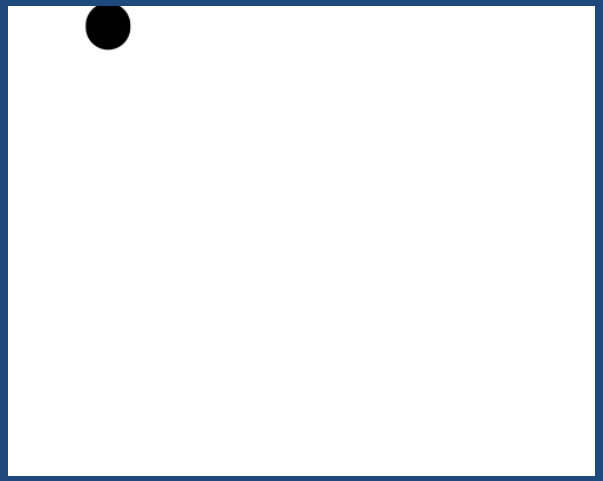
Here is a decent bouncing ball done with the principles, and two without.

The bad examples have improper timing, stretch/squash, and path of action.



Good





BAD