

Hand-Drawn Animation

- History of Hand-Drawn Animation
- Hand-Drawn Techniques
- Introduction to Photoshop

History of Hand-Drawn Animation

Hand-Drawn Animation, more commonly referred to as **Traditional Animation**, is the act of drawing out all frames by hand. Hand-Drawn Animation was one of the first and most-widely used forms of animation during the peak of animation in the mid 1900's.

Hand-Drawn Animation had little reliance on computers, but could be **easily integrated with computers** as well, thus serving as a very popular animation form during the creative transition to computer platforms.

As platforms change, most hand-drawn practices remain the same. Artists still draw out all frames, but now have additional tools to help monitor and transform frames than in previous generations.



Ratatouille, 2007

In The Old Days

Artists would draw on thin, **translucent sheets of plastic** known as **cells**. Sheets could be stacked up on each other to create a finished character.

On one cell could be the basic colors of a character, on another could be the shading, and another layer could hold interchangeable parts, i.e face & eye rigs.

Lightboard shows **previous frames stacked on each other**. Easy to ink a character by placing a new sheet on top of an old roughed-out sketch.

Can also show **two keyframes** and draw an **in-between frame**. This is known as **onion-skinning**, where you look at different layers of the translucent layers of an onion skin.



<https://www.youtube.com/watch?v=oktGIZQgYWs>

Nowadays

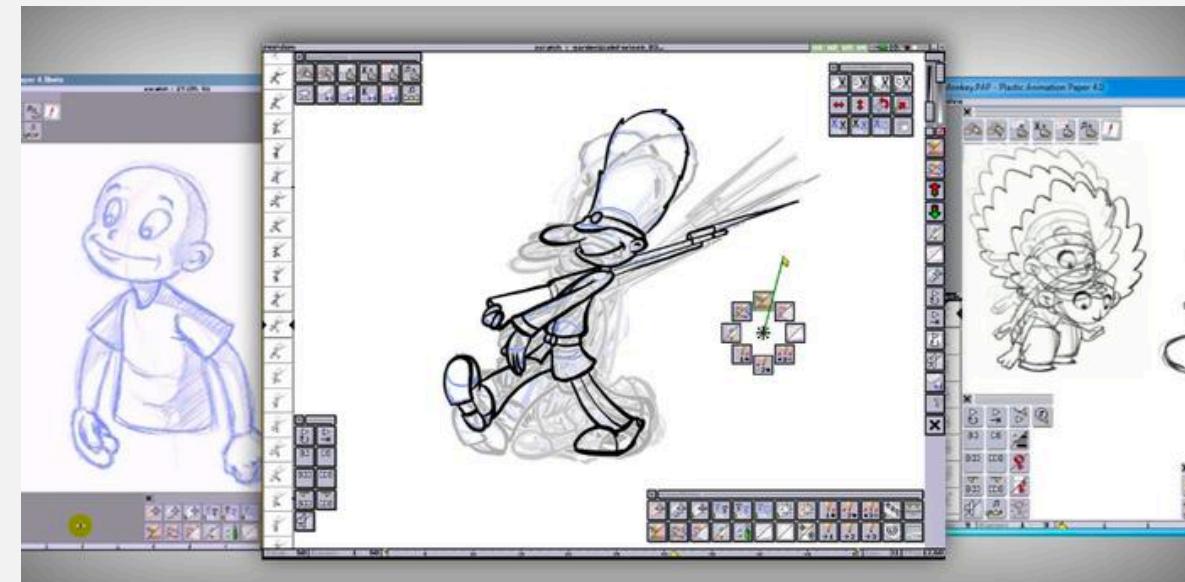
Computer software attempts to preserve the benefits of lightboards and cells while adding in new features.

Cells are replaced with a new notion of **layers**. Different parts of a character can be drawn onto different layers, and layers can be compressed down into each other.

Introduces the notion of a **frame**, where each frame holds its own set of layers.

Can use **onion-skinning** between layers in helping draw in-betweens.

Adds new features such as **transformations** and **deformations**, ease of **erasing**, **version history**, more stable **brush control**, and more.



- ~~History of Hand-Drawn Animation~~
- Hand-Drawn Techniques
- Introduction to Photoshop

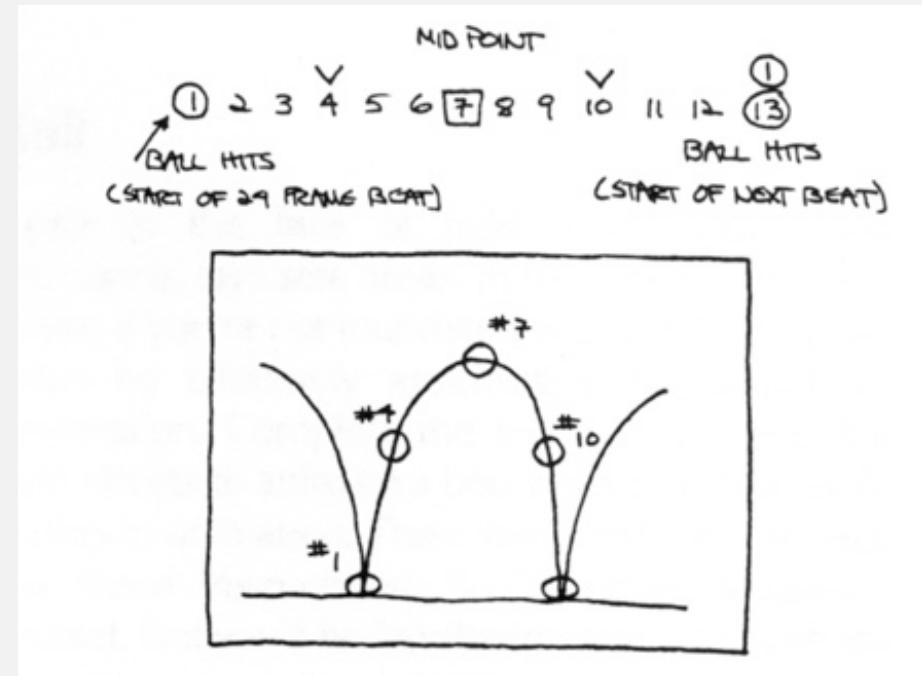
Pose-to-Pose

Most Hand-Drawn Animation is drawn out by **keyframes first**. Then, animators revisit the frames and draw in-betweens.

Animation studios will have **senior animators** work on **keyframes**, after which, more **inexperienced animators** will work on **in-betweens**.

Keyframing requires not only a **steady hand**, but precise **posing** abilities and years of natural and real-life drawings.

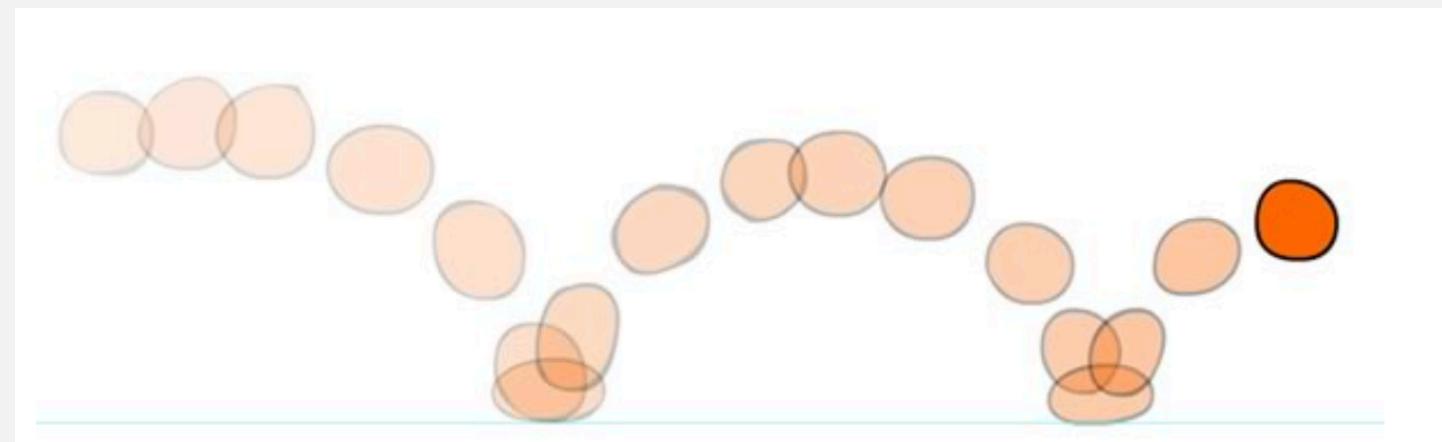
Sometimes keyframes will be shipped overseas to a cheaper animation studio for the in-between frames to be drawn out.



Onion Skinning

Onion-Skinning is a tool that lets you see **previous** and **future frames** at a lower opacity. This helps when you have two keyframes and want to add an in-between frame.

Onion-Skinning can also help you visualize the **spatial trajectory** and **motion** of your objects. It is a good debugging tool to make sure trajectories are arc like and maintain proportions.

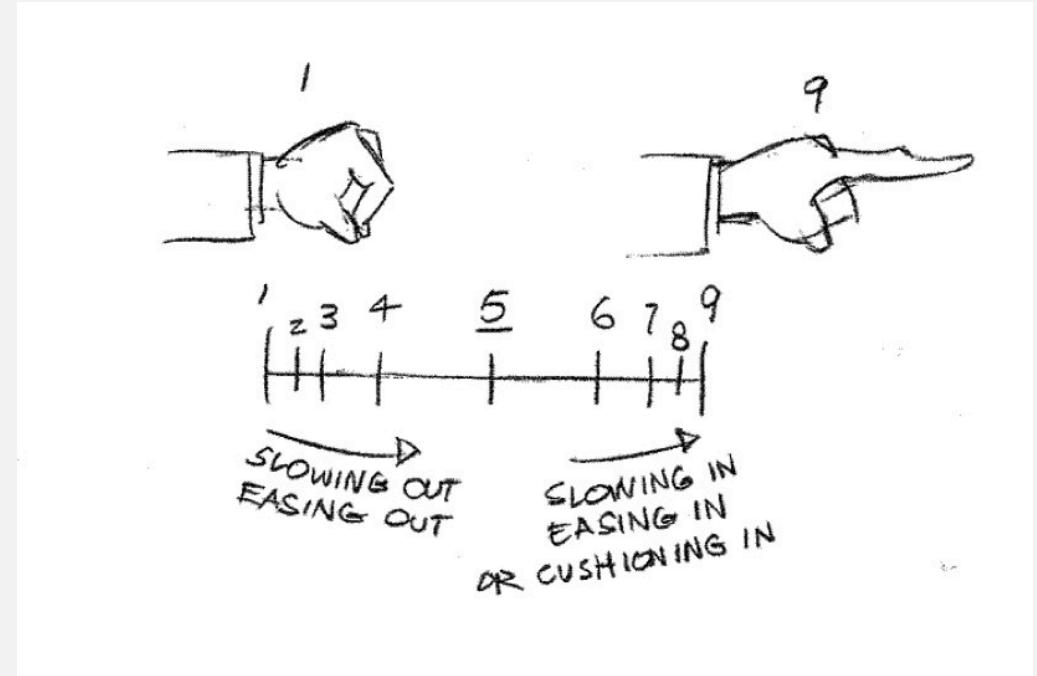


Easing

Easing is a strategy where objects **accelerate** into and out of their motion. It is derived from physics where objects with **inertia** have to feel a force in order to ease their way into a new momentum.

Easing can be visualized in a **1D chart** with **tick marks**, where the ticks represent **equal time separation** between frames, but **varying spatial separation**. The closer the tick marks, the smaller the spatial separation, and the slower the motion.

A strategy in this example would be to draw a frame in the middle of frames 1 and 9 (call it 5), then a frame between 1 and 5 (call it 4), then 1 and 4 (call it 3), and then 1 and 3 (call it 2). This is referred to as **subdivision**, and is an easy strategy to guarantee appropriate easing.



Illusion of Life, 1999

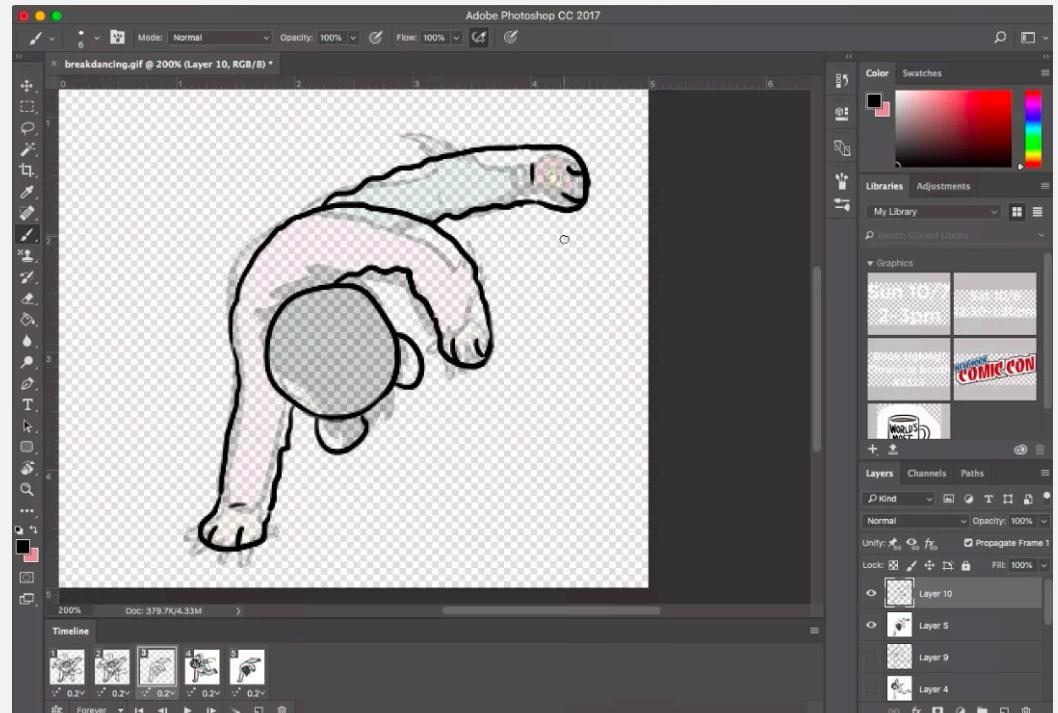
Layers

Layers are used to separate different components of your animation and edit or transform them independently.

General strategy is to have layers for:

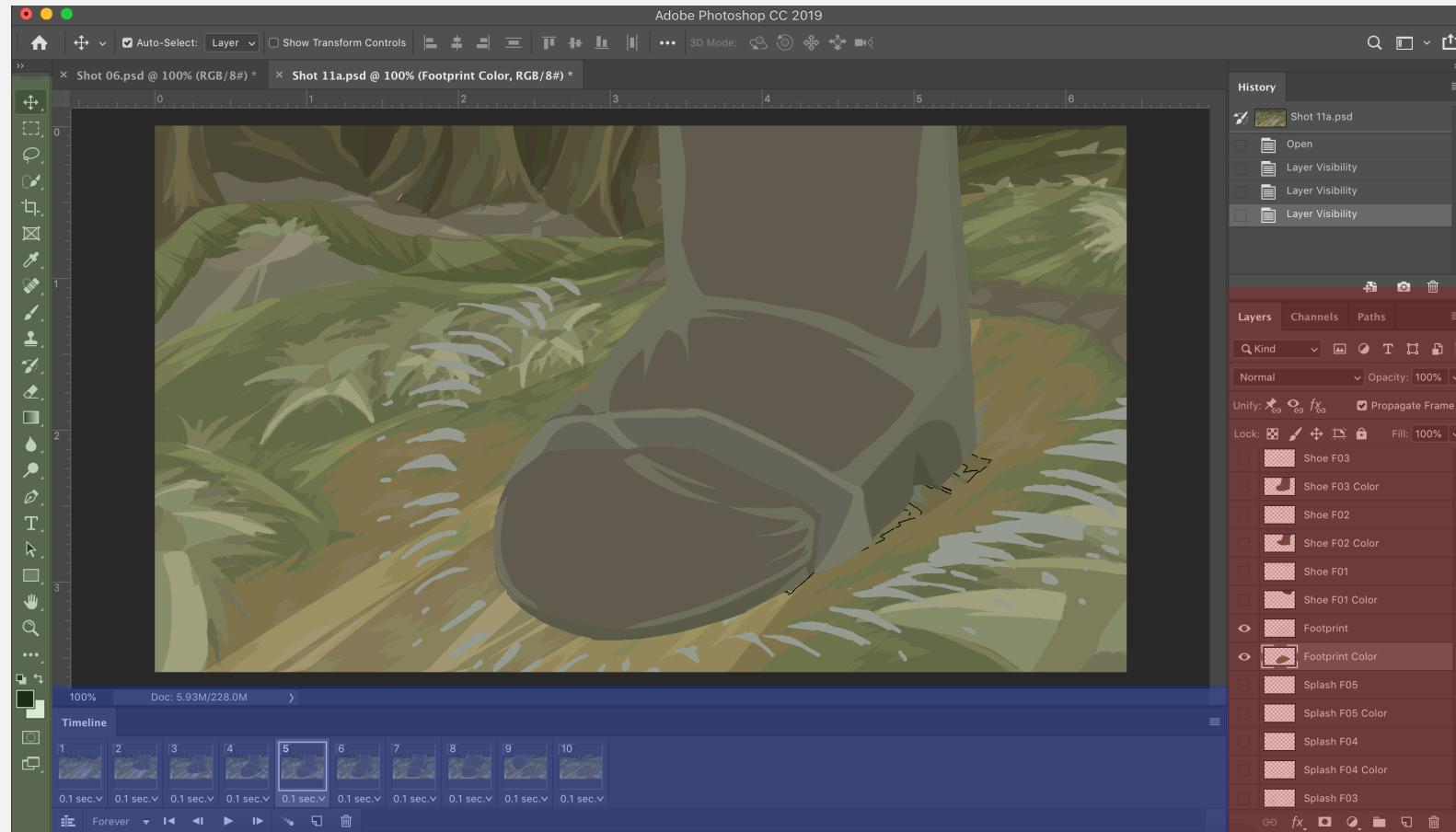
- Sketch
- Ink
- Color
- Shading
- Lighting

Sketch layer is only for reference and will be deleted in the end. Remaining layers can be merged back down into one.



- History of Hand-Drawn Animation
- Hand-Drawn Techniques
- Introduction to Photoshop

Photoshop Interface



Brush, Erase, Swatch, Select, Pan, Zoom Tools
Timeline, Playback
Layers Panel

Photoshop

Photoshop is a flagship photo and digital media editor software made by Adobe. It was first released in 1990

Photoshop has a lot of functionality in the photo-editing domain, but can also be used as an animation software with its built-in **timeline** support.

Photoshop is not fully-fledged, meaning it **cannot export animations** on its own. Rather, it can export a **series of layers** that can be reimported back into a composition-based software with a structured timeline (Adobe After Effects or Premiere Pro), where frames can be timed and rendered out to production.



Photoshop, 1990

Why Photoshop?

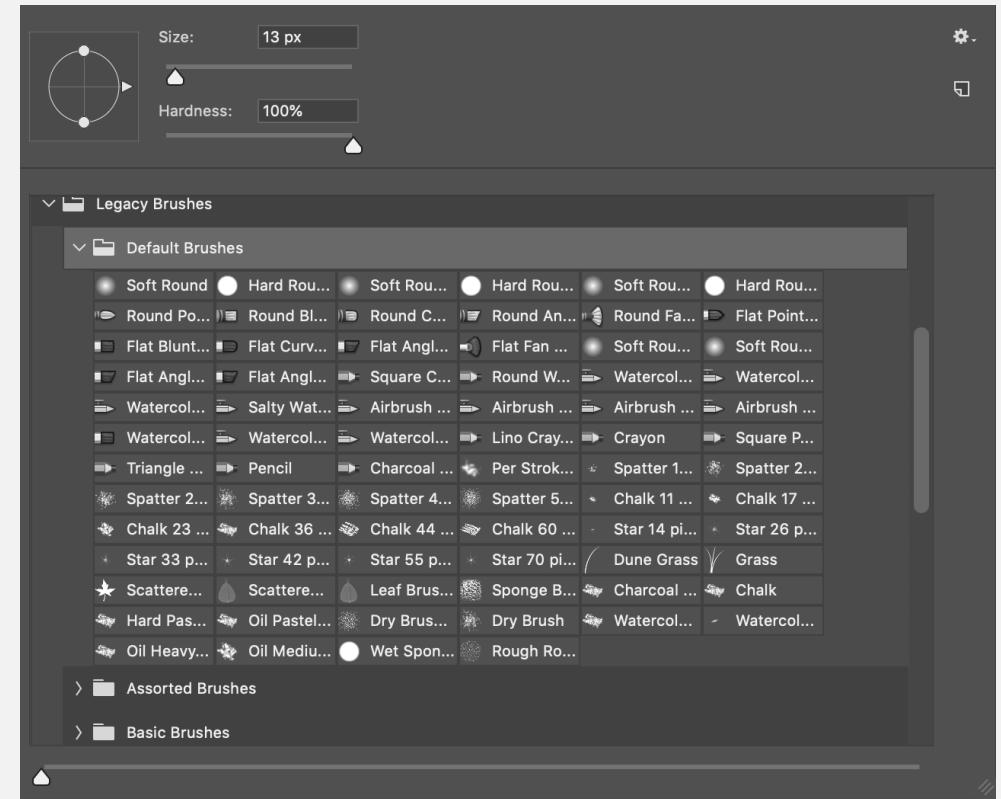
Flash Professional is commonly advertised as Adobe's primary animation software, but lacks the drawing capabilities integrated into Photoshop's **brush**, **color**, and **selection** tools.

Strokes are more **customizable** and **accurate** in Photoshop.

Vast brush library with easy-to-import **external brushes** that makes the workspace faster.

Larger support for brush **sensitivity**, **tilt**, and **range**.

Easier to save and interact with color **swatches**.



Photoshop, 2018

Homework

- ❑ Use Photoshop's drawing feature to draw the outlines of two main keyframes of any object.
- ❑ Use subdivision to create in-between frames that incorporates easing techniques.
- ❑ Stage the frames out using the timeline panel.
- ❑ Upload the photoshop file to the course Drive.

Questions?

Live Demo