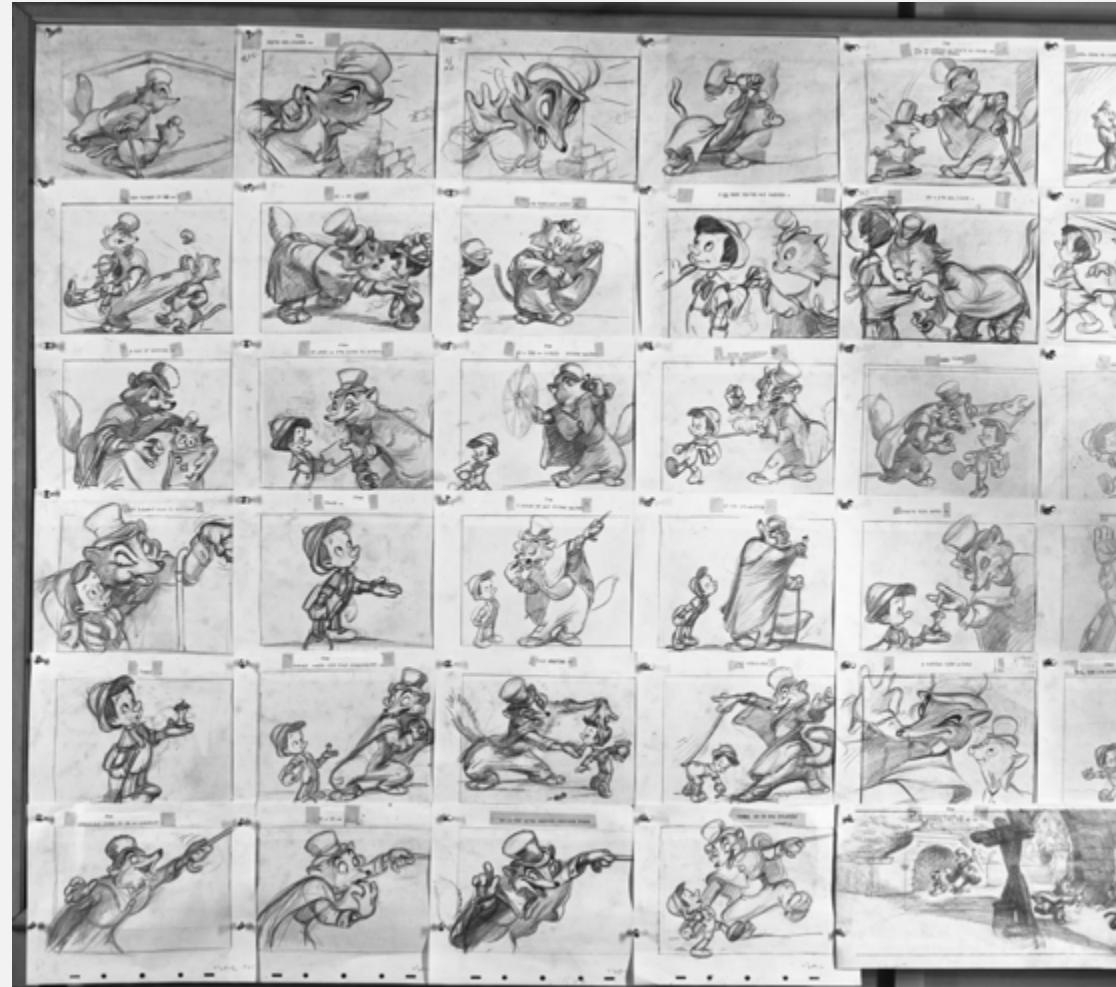


# Storyboarding

- History of Storyboarding
- Storyboarding Techniques
- Storyboarding on a Computer
- From Storyboard to Animatic
- The 12 Principles of Animation

# Storyboarding in Early Animation



Pinocchio, 1940

# Storyboarding in Early Animation



Aladdin, 1992

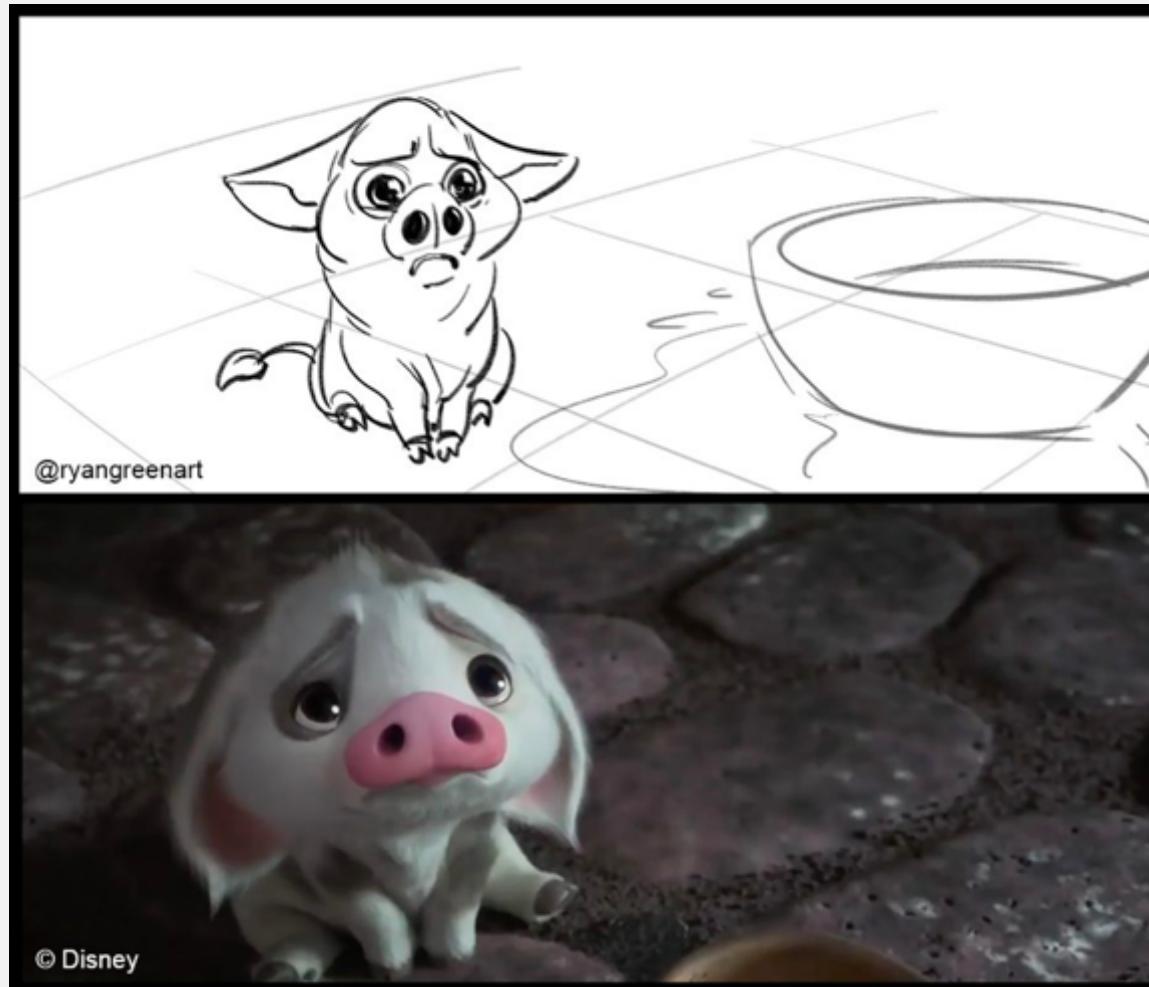
# Storyboarding in Early Animation



Jungle Book, 1967

# Storyboarding Now

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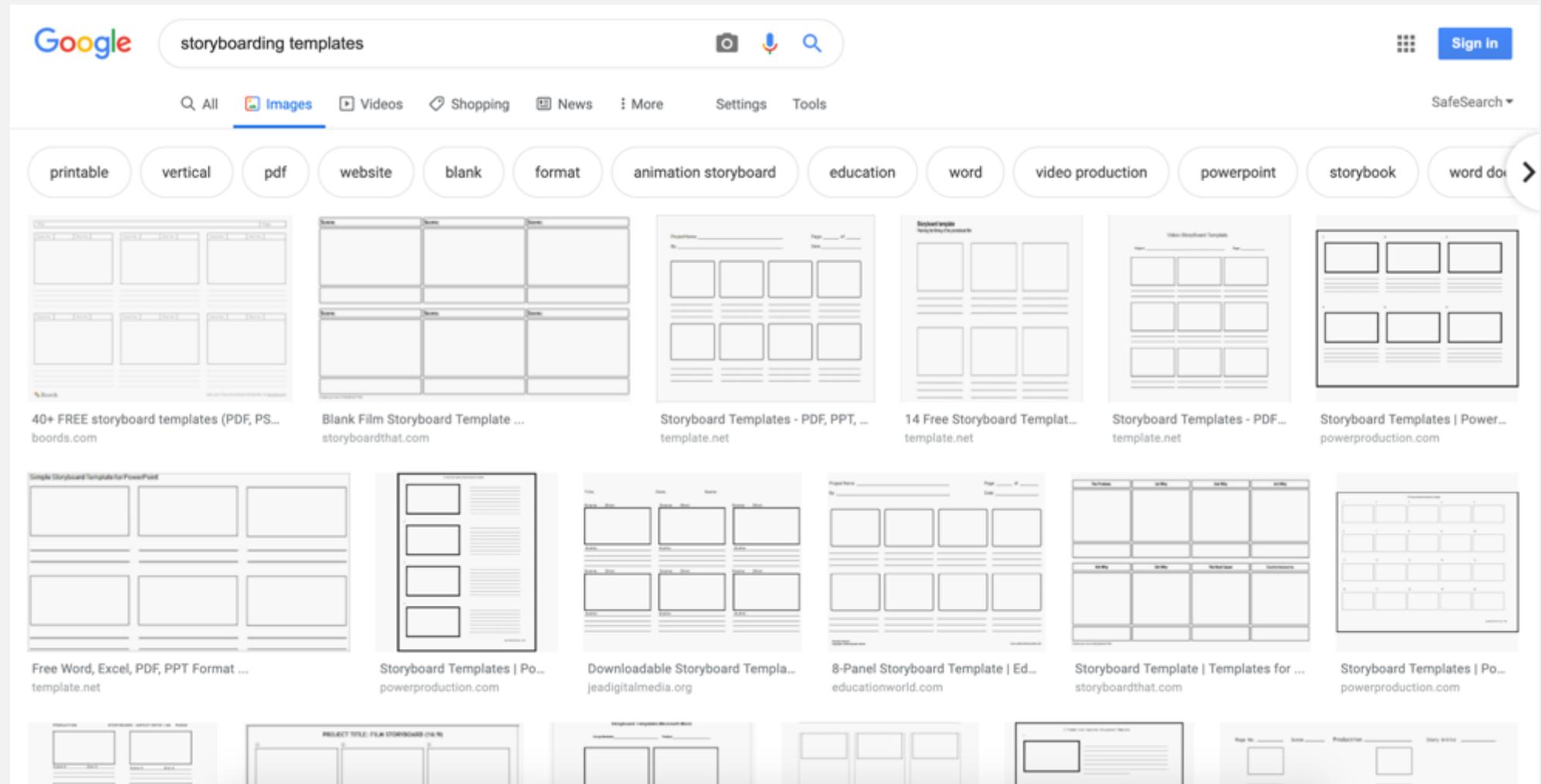


Moana, 2016

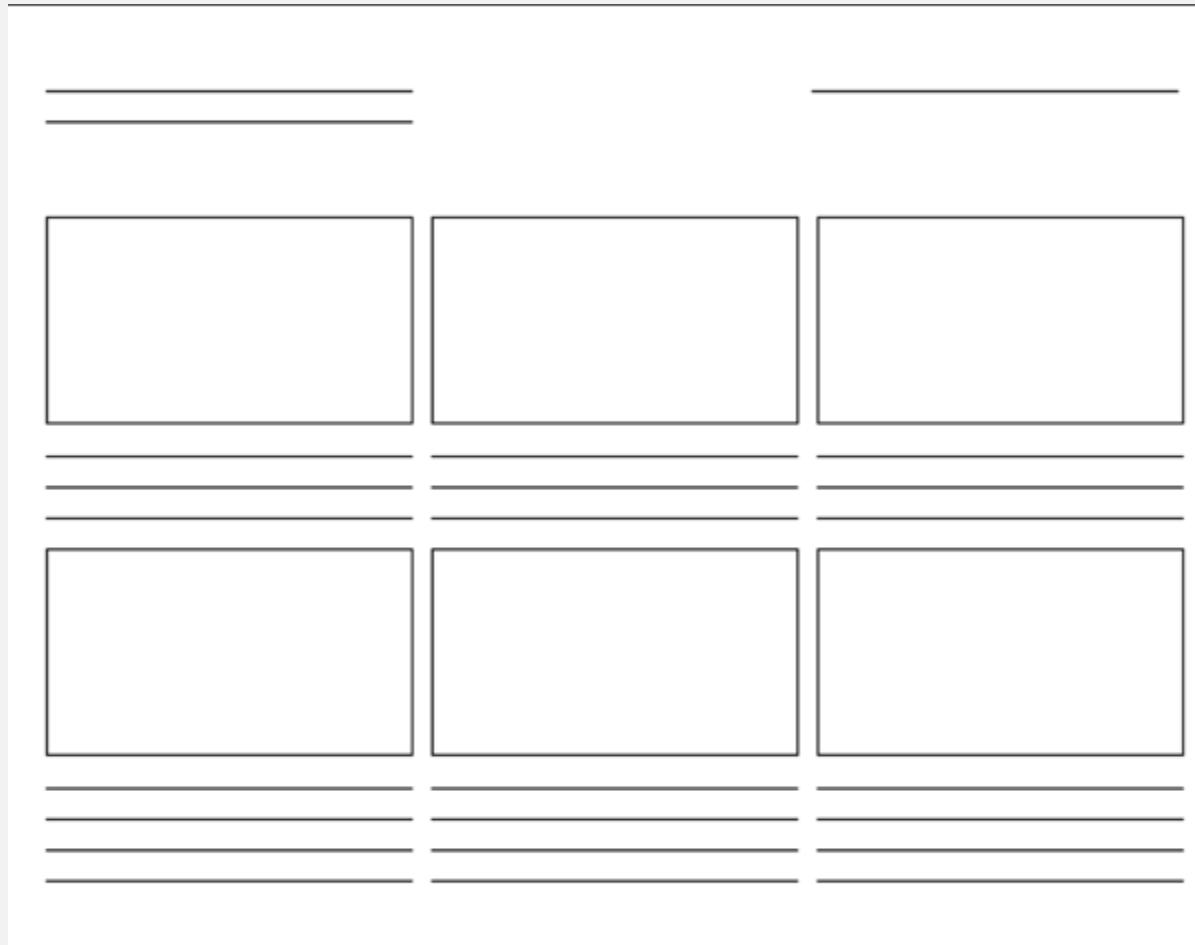
- ~~History of Storyboarding~~

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# Storyboarding Template



# Storyboarding Template



Located on website under files tab.

# Storyboarding Key

Draw only the most important frames.

Storyboards will only be seen by you and your colleagues. **Don't waste time drawing in-betweens** that you can visualize yourself. Aim for the bigger picture.

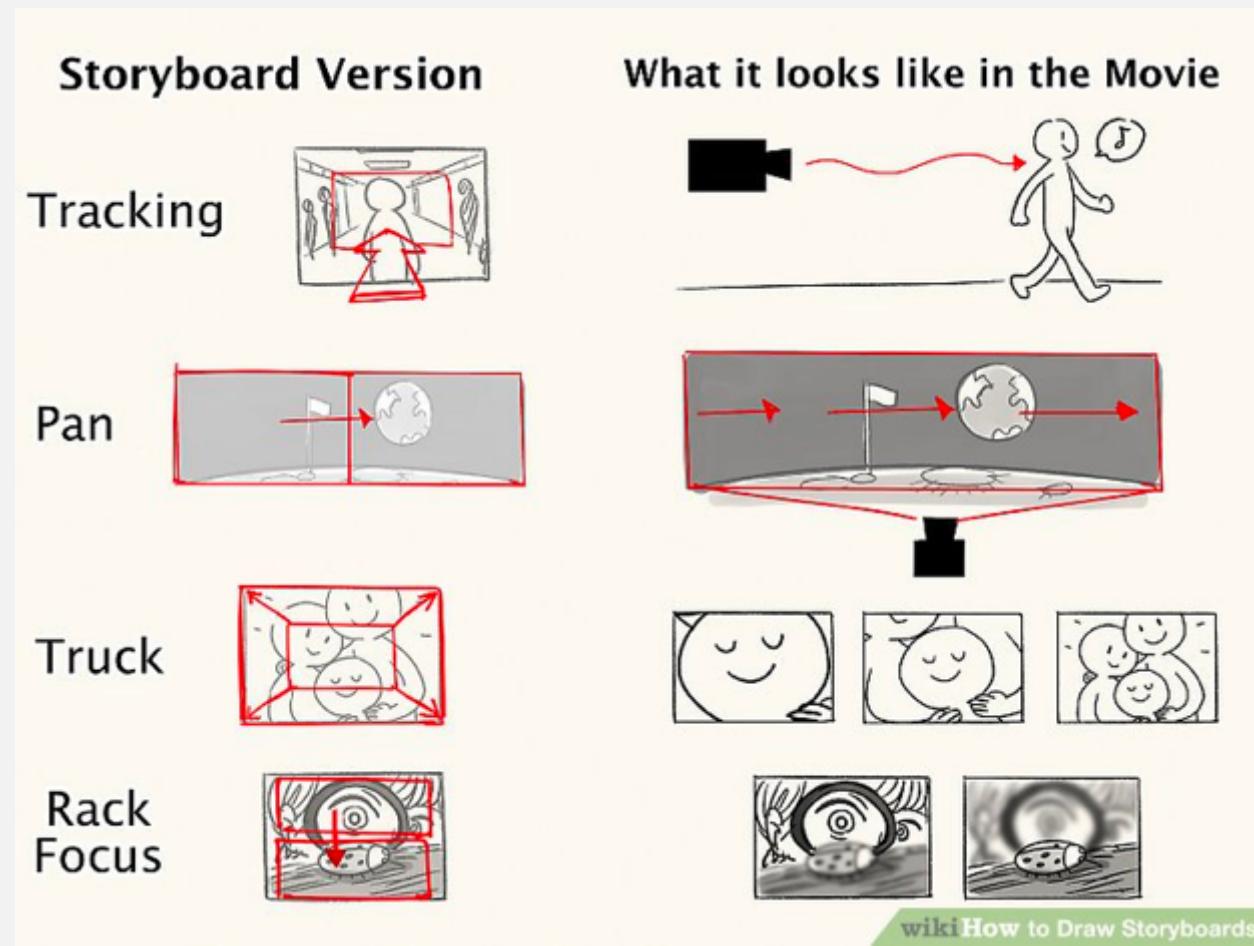
For each frame, focus on Character Art or Background, not both.

Most storyboards skip the background if it remains constant between frames. **Only draw backgrounds when they change** or are a focus of a particular shot.

Keep notes on each frame.

What are the characters doing? What is the camera doing? What motions are occurring, and in what direction? **Use arrows and viewports on the frame to illustrate these dynamics** and jot down a few notes on what is happening.

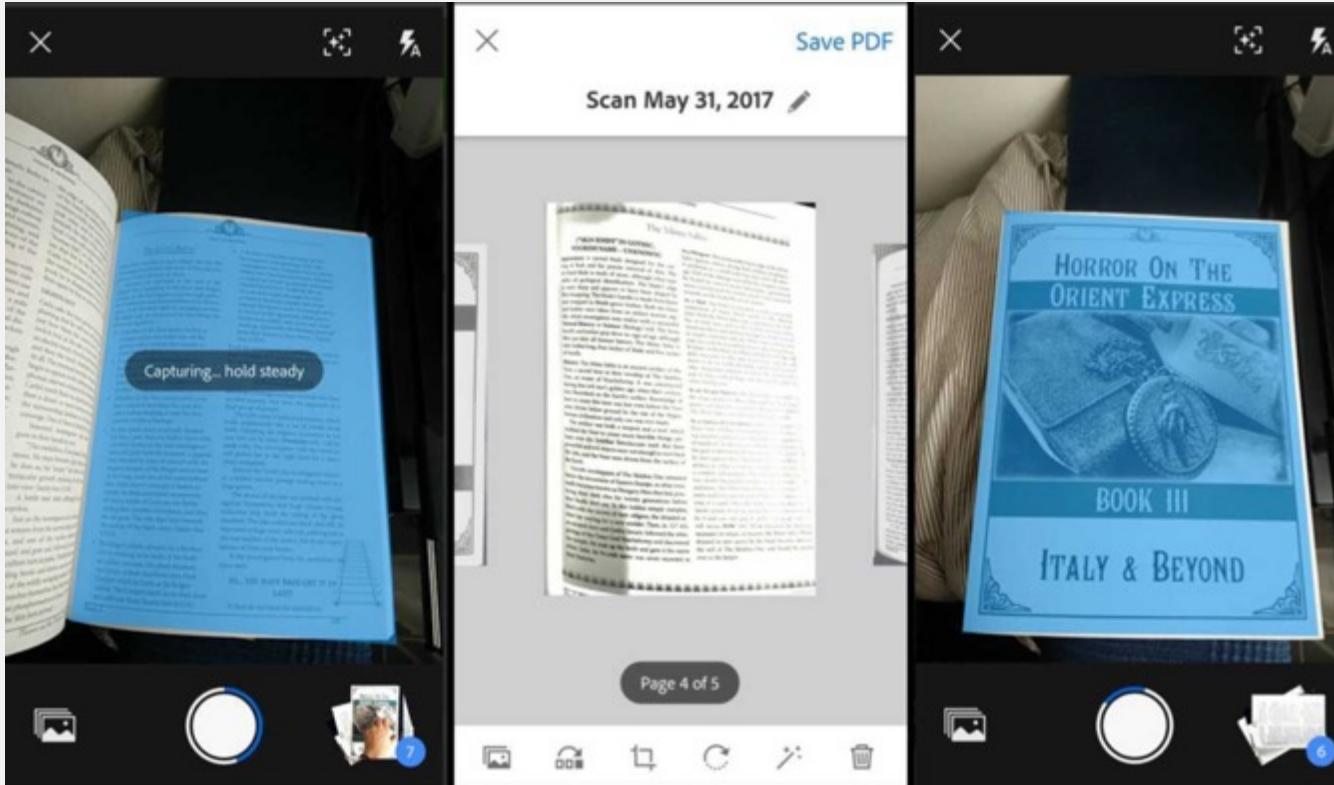
# Storyboarding Key



<https://www.wikihow.com/Draw-Storyboards>

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- ~~Storyboarding Techniques~~
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# Scanning in Storyboards



- Adobe Scan
- Clear Scanner
- Cam Scanner
- Tiny Scanner
- Office Lens
- Turbo Scan
- Smart Doc Scanner
- Fast Scanner

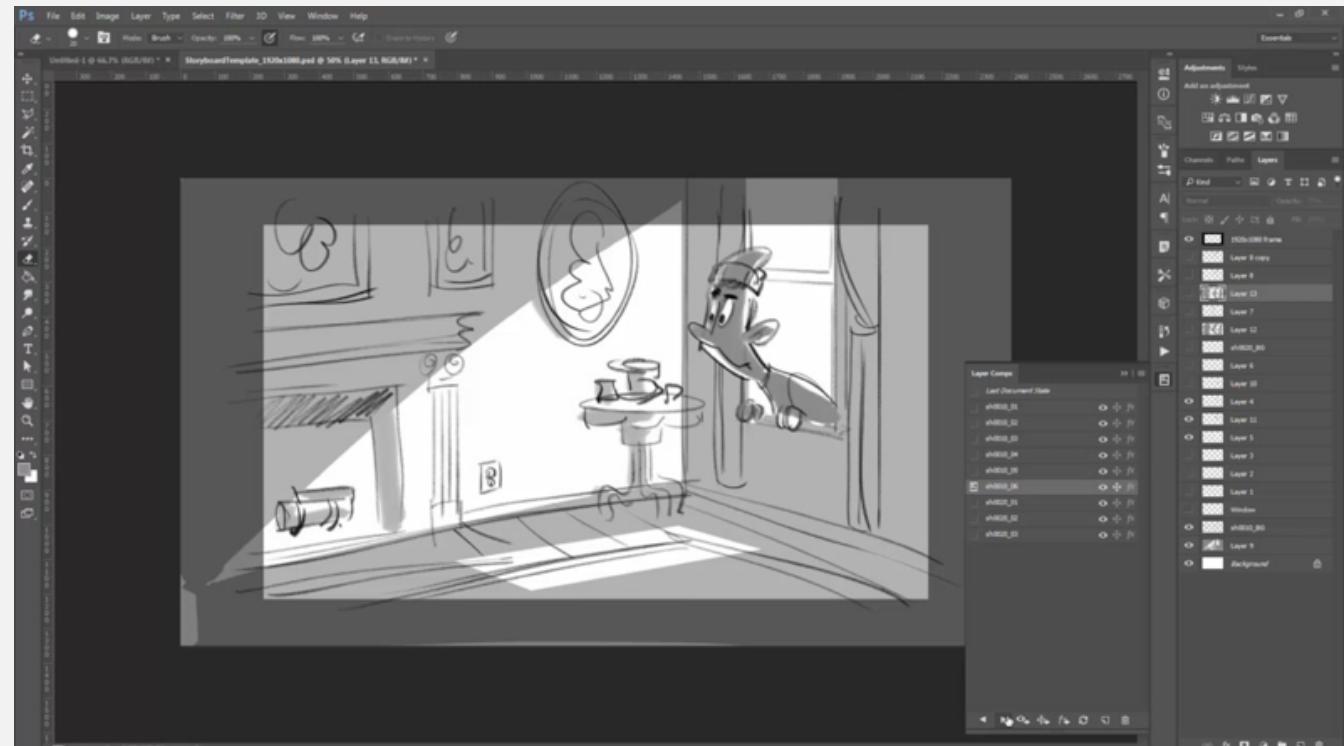
<https://fossbytes.com/best-android-scanner-apps/>

# Drawing Storyboards Digitally

Layers are **separated** in the Layers Panel so that they can be easily modified without disrupting neighboring elements.

Comes in handy when **converting storyboards to animatic**.

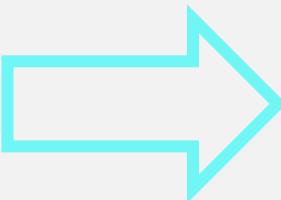
Animators may opt to keep outlines and shading on different layers if the lighting in the scene is dynamic. This makes animating the lighting easier without worrying about accidentally modifying strokes.



<https://vimeo.com/213626234>

- ~~History of Storyboarding~~
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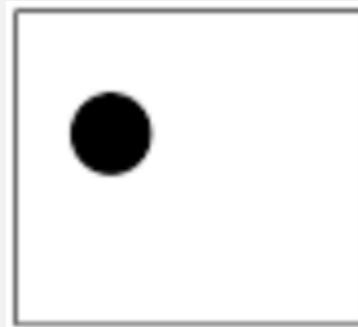
# Adding Timing



**Scale-up frames and play frames out sequentially.** Doing so allows animators to time the duration of their frames and get a sense of the overall timing of a scene.

# Why Care About Timing?

Q: How fast is this ball moving?



Not so easy?

Q: How fast is this ball moving now that I've given you more information?



# Why Care About Timing?

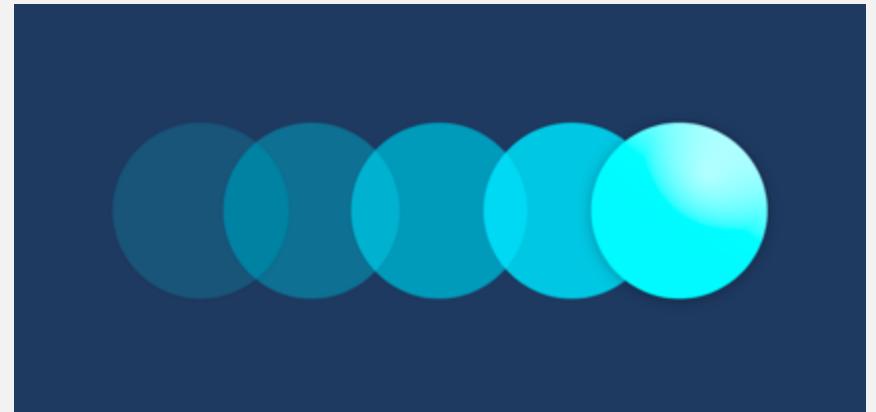
Storyboarding + Timing = Animatic!!

This is a real equation.

Storyboarding can only convey movements in an **unidentifiable field of time**. Storyboards almost never progress between frames with equal timing. Most often artists specify how long to hold on each frame.

Animatics transition through storyboards as a slideshow, adding a sense of **timing** that, combined with **distance traveled** for objects, projects a sense of **motion**.

Animatics lower ambiguities caused by storyboards.



# Problems With Motion

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Motion in storyboarding is an **under-constrained problem**.

Multiple motions exist that can produce that ball's motion. We aren't given enough constraints to be certain that our predicted motion is the only answer.

The ball is **close** and is moving **slowly**.

The ball is **far** and is moving **quickly**.

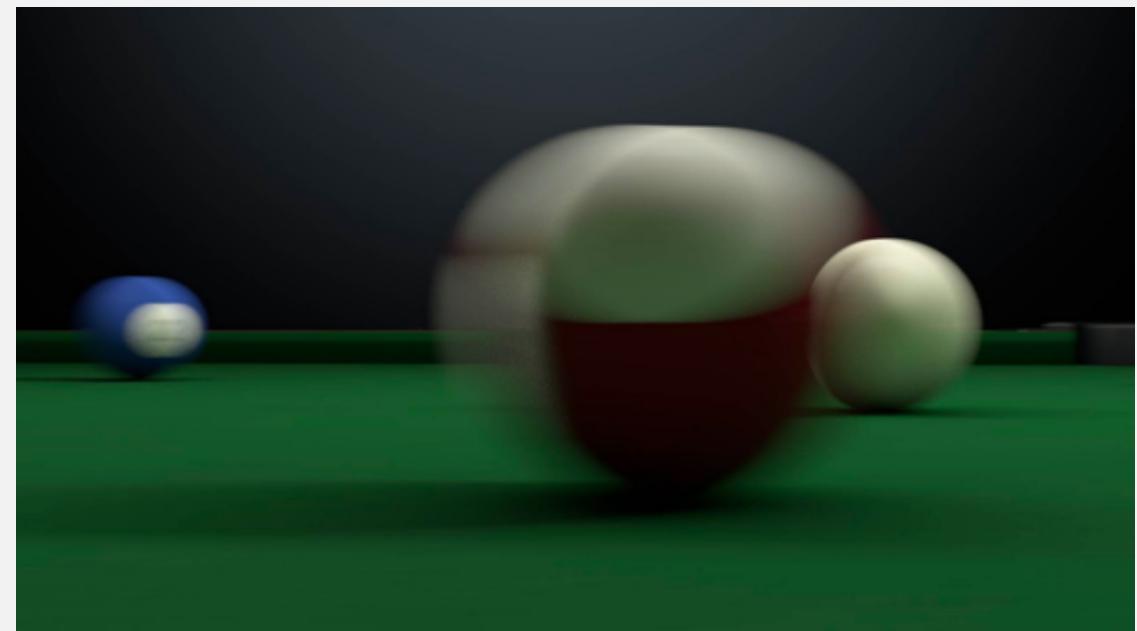
The ball is **very far** and has **gotta go fast**.

This specific problem is known as parallax.

We will cover this in future lectures.

"Well, if I know the size of the ball, then I know how far away it is, and now I know how fast it's moving!"

What if you don't know the size?



# Problems With Motion

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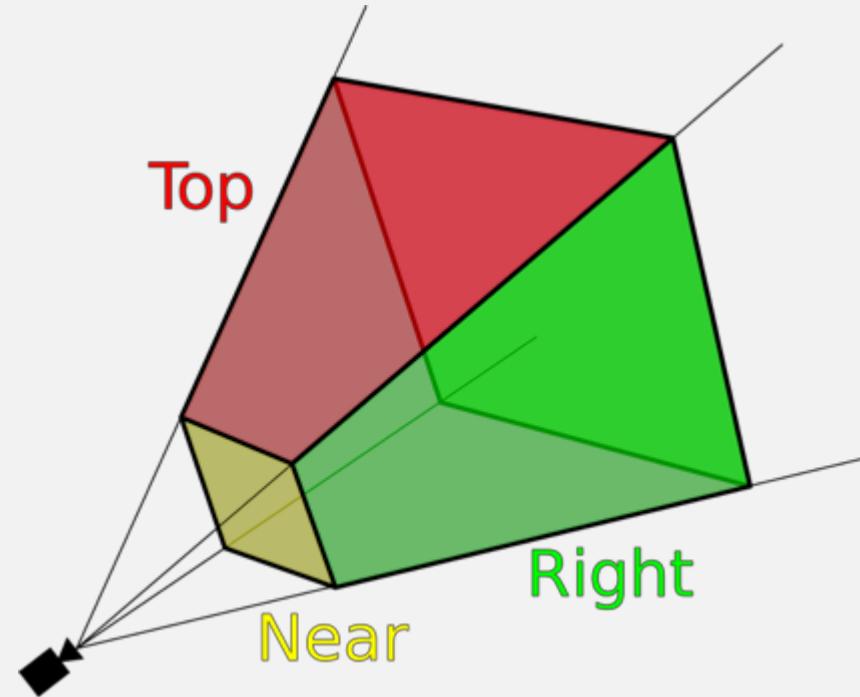
Storyboarding only gives a glimpse of object movement.

We get a sense of an object's **(travel-distance)x(depth)** relationship is without being certain of either.

Our **view frustum** cannot differentiate between either scenario. Knowing the size of an object gives us info on its depth which gives us info on its travel-distance.

“But what if I don't know the size?”

Animations should always try to convey sizes. Strategies such as lighting, blur, and relative movements exists that can help differentiate sizes of objects in scene.



\* The front and back squares are the same size to our eyes.

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# The 12 Principles

The 12 principles of animation were released by **Disney animators Johnston & Frank Thomas** in 1981. They are key properties widely referenced in the animation industry today.

Squash & Stretch

Anticipation

Staging

Straight Ahead vs. Pose to Pose

Follow Through

Easing

Arc Motions

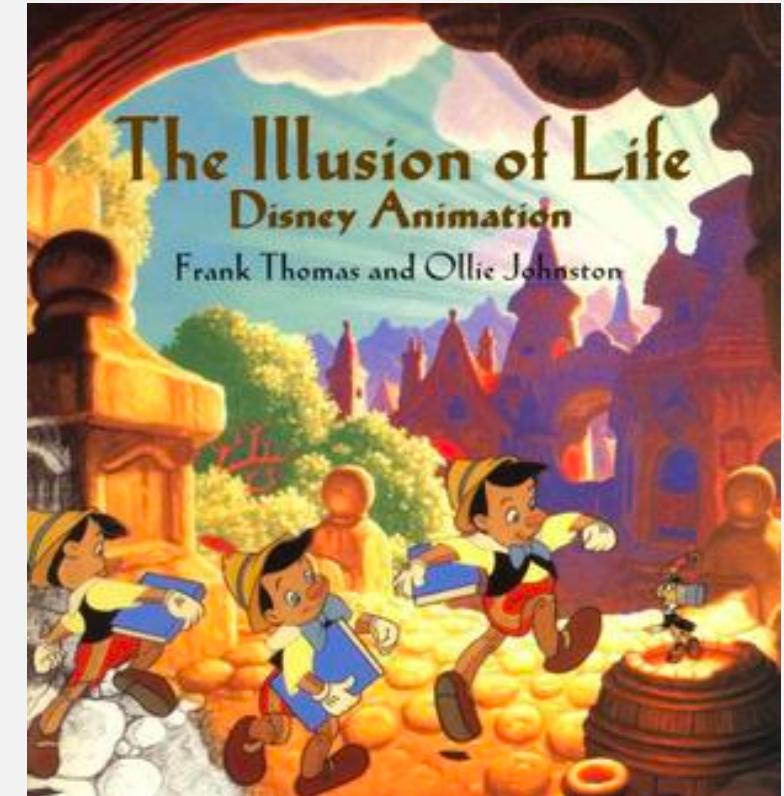
Secondary Actions

Timing

Exaggeration

Solid Drawing

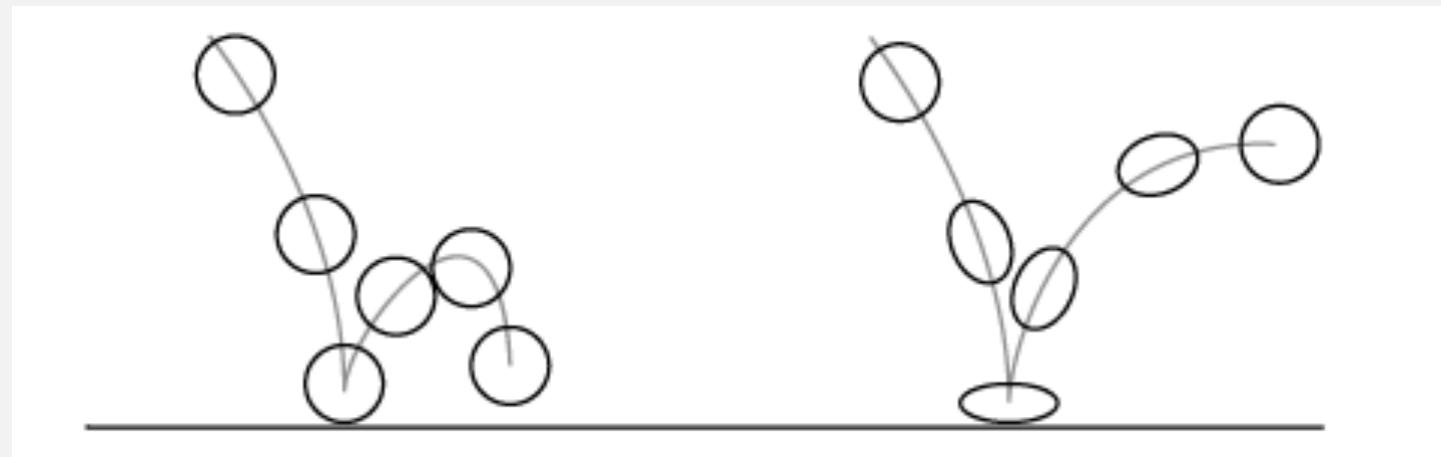
Appeal



# Squash & Stretch

Squash & Stretch is the **deformation** that occurs when an object **hits a surface or another object**. This gives the illusion that the object is rubbery, a common trope in animation.

Common in rubber-hose animations where characters take a more rubber-based material form. Characters feel more free and energetic.



# Anticipation

Anticipation is the act of **waiting for an action to occur**. It adds delays between actions so that viewers can focus on the action before it actually occurs.

A jumper bends his legs before jumping. A bowler swings his arm back before throwing a bowling ball.



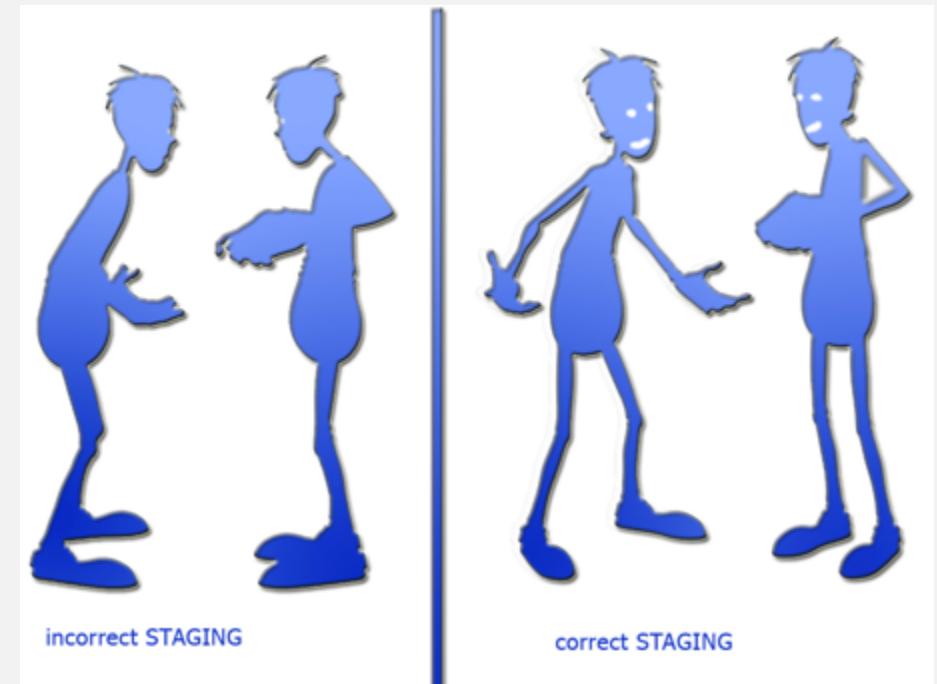
<https://blog.animationmentor.com/anticipation-the-12-basic-principles-of-animation/>

# Staging

Staging is the **view** of the scene such that **no important actions or characters are obstructed** from our view.

Camera angle, character placement, and lighting are all contributing factors.

Background scene should not obstruct from the main scene.



<https://jineumanblog.wordpress.com/2014/06/20/12-principles-of-animation/>

# Straight Ahead vs. Pose to Pose

Straight Ahead is the process of drawing in every frame **sequentially**.

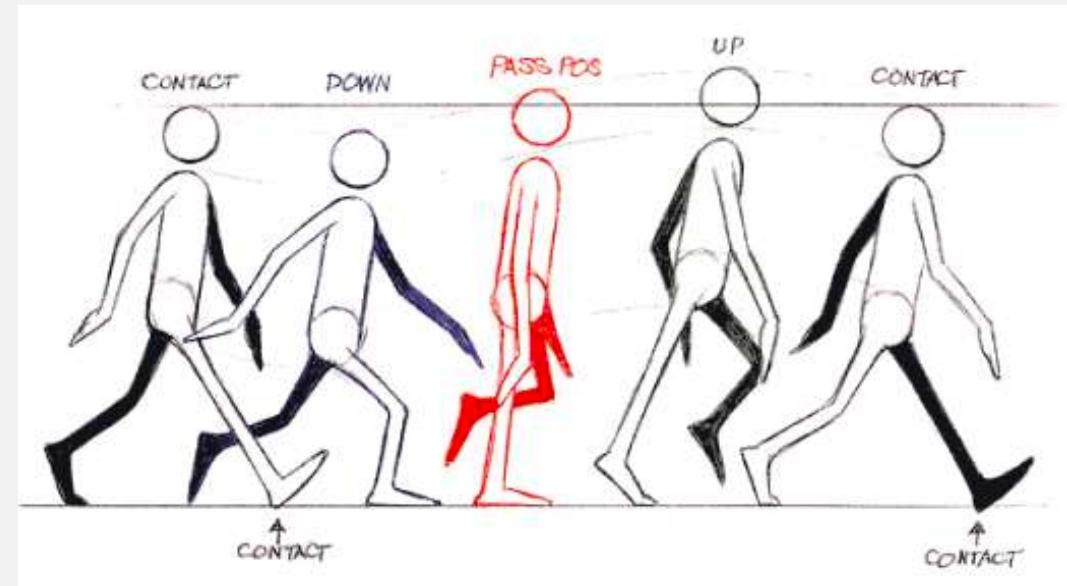
Easier to create more realistic movements this way, but harder to keep proportions constant. Characters end up being less dynamic and less exaggerated.

Pose to Pose is the process of drawing in **key frames first**, and then going back to draw in-betweens.

Allows for more controlled and dynamic posing.

Adopted more in animation settings where computers are able to help out with the in-between stages.

Senior artists draw keyframes, Junior artists draw in-betweens

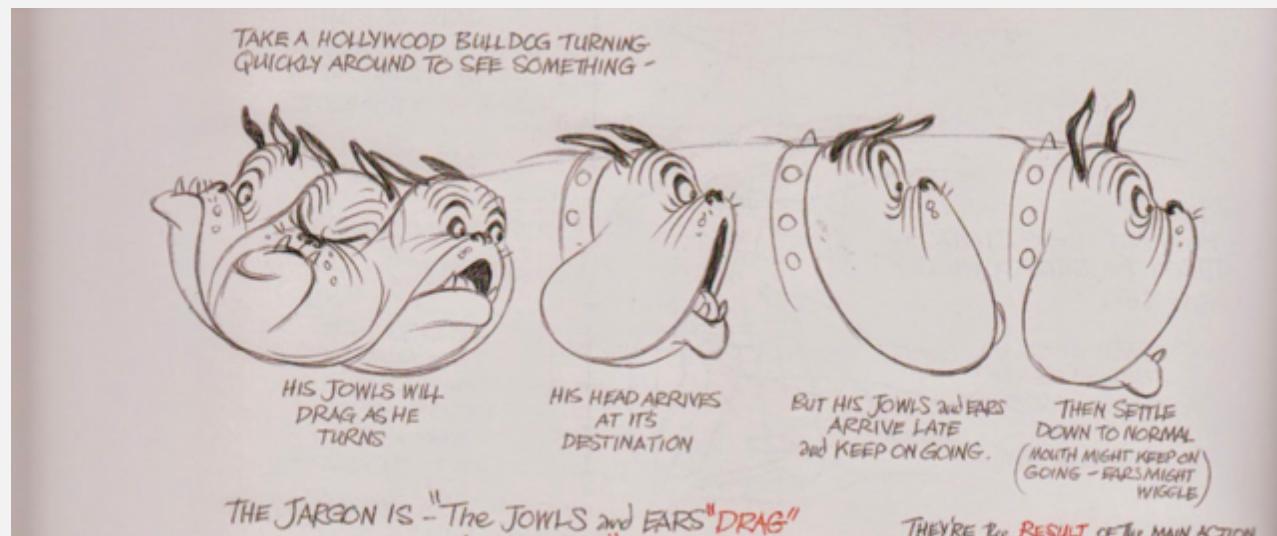


The Animator's Survival Kit, 2001

# Follow Through

Follow through is **continuing the motions of an action** even after the motion has ended. It is based off the physical property that an object in motion stays in motion.

Different parts of the body follow through at different rates. Hair continues to move even after the head has stopped moving.

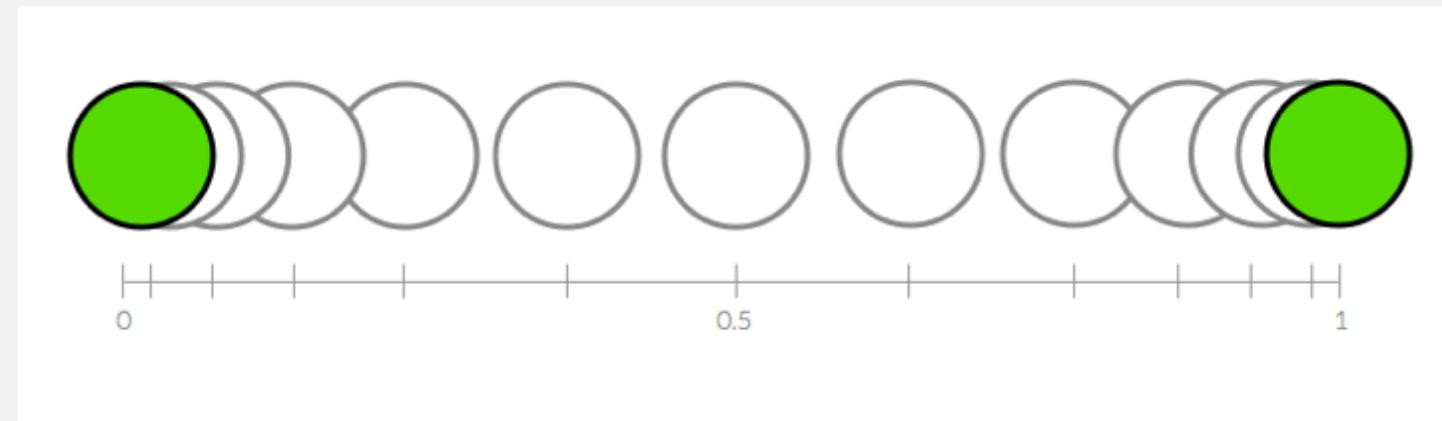


The Animator's Survival Kit, 2001

# Easing

Easing is how an object **speeds up** at the start of a motion and **slows down** before reaching the end.

Characters don't start at a constant velocity. They accelerate to their desired velocity and decelerate once reaching their endpoint.

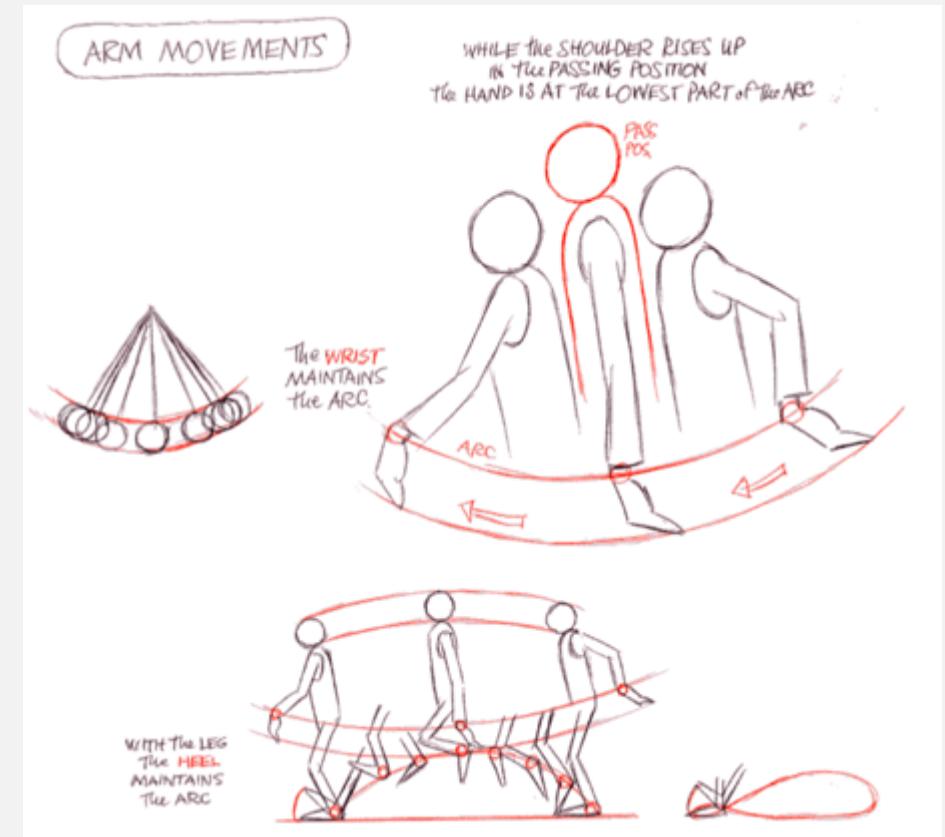


# Arc Motions

Arc Motions guarantee that **spatial trajectories** are arc-like.  
Helps to build fluidity in the motion.

Joints rotate, allowing for arc-like movements.

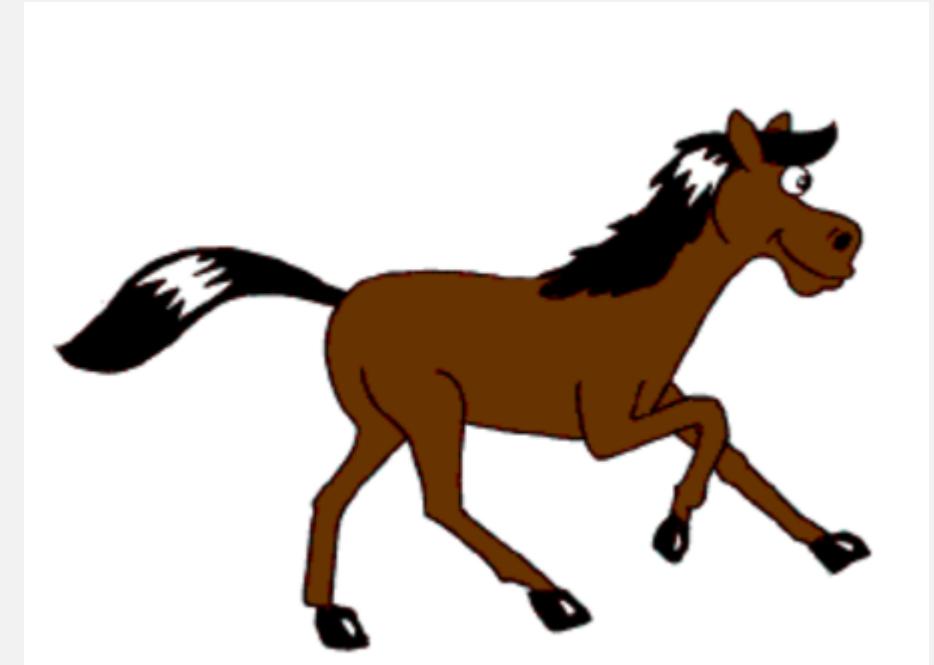
Walk cycles are a combination of many arc movements.



# Secondary Actions

Secondary actions are the **additional motions** incorporated with the motions of a system. These additional motions do not help the overall character move, but illustrate a sub-animation cycle that we usually see **accompany the main action**.

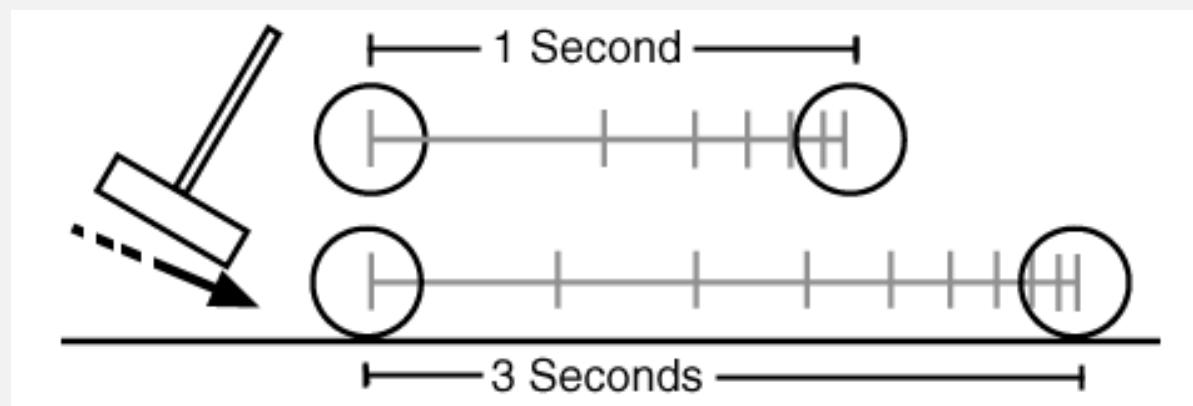
A person running could have their hair shuffle in the wind passing by. A dog digging could have its tail wagging in excitement.



# Timing

Timing is how the motions play out, and at what **time intervals**.

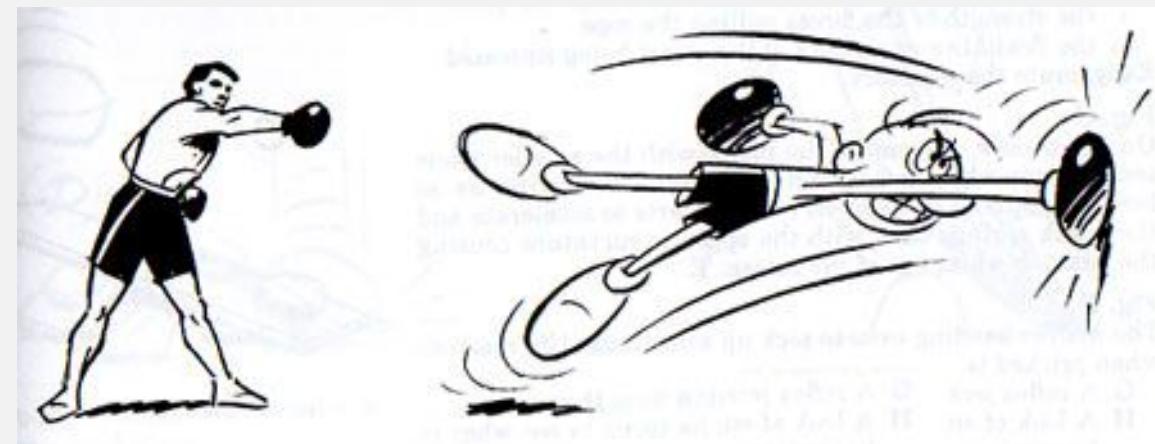
Used to determine how fast an object should be moving. How many frames should be used to describe this motion?



# Exaggeration

Exaggeration is **carrying motions faster and farther**,  
breaking them from the boring sense of real life.

Adds more energy to the characters.

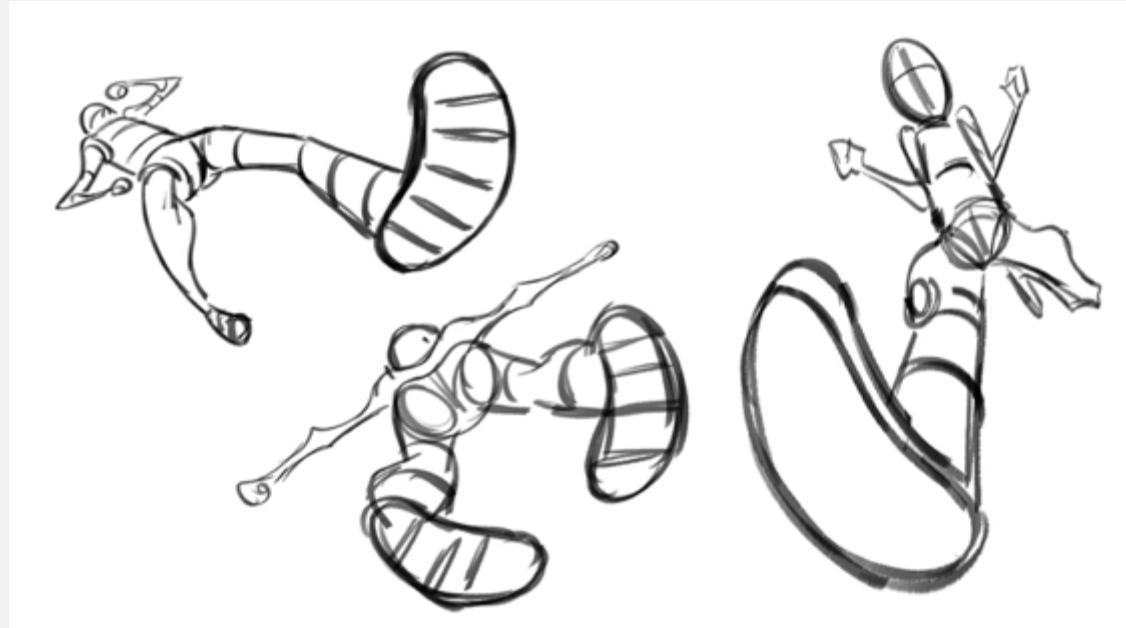


# Solid Draw

Solid Draw is adding **depth** to a character to make them seem more lifelike. Even 2D animation tries to make characters with 3D depths.

Can be achieved using 3D dynamic lighting with character highlights and shading.

Experience usually comes from practicing a lot of drawing and sketches from real-life, getting accustomed to the anatomy of humans and other creatures.



<http://www.dsoucre.in/course/principles-animation/solid-drawing>

# Appeal

Appeal is the **charisma** in a character.

Isn't just limited to scripting and dialogue. How a character looks and acts also plays a huge role in how viewers will perceive them.

**Symmetric** faces are likeable. **Unbalanced or hard-to-read** faces aren't.

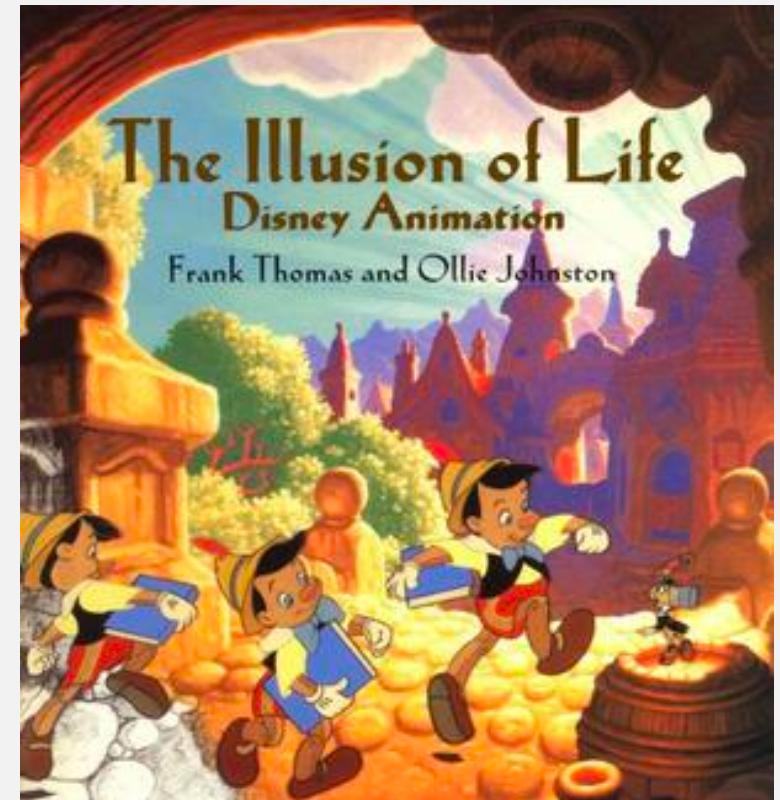
Your audience **will spend a lot of time with your main characters**. Make sure they're charismatic!



# The 12 Principles

The 12 Principles are a set of principles that should be used in animation. Incorporating them in earlier stages such as **storyboarding** will make the process a lot more fluid in the future.

If an animation seems rough, sudden, or just off, refer back to these principles and see if you're following them. Rejection of these principles can often lead to jerky, unpolished movements and scenes. Save yourself time and fix any weird scenes in the storyboarding stage before moving on.



# Homework

- Print out the storyboarding template (or any other online template). You can also choose to do this activity with a graphics tablet.
- Complete a page's worth of storyboarding. You can elect to have a storyboard with few or many panels in it.
- Leave notes detailing any key actions in a scene as well as arrows and viewpoints illustrating motions.
- Scan your document (.pdf or image) and upload to the course Drive, referring to the syllabus for naming conventions.

# Questions?

# Live Demo