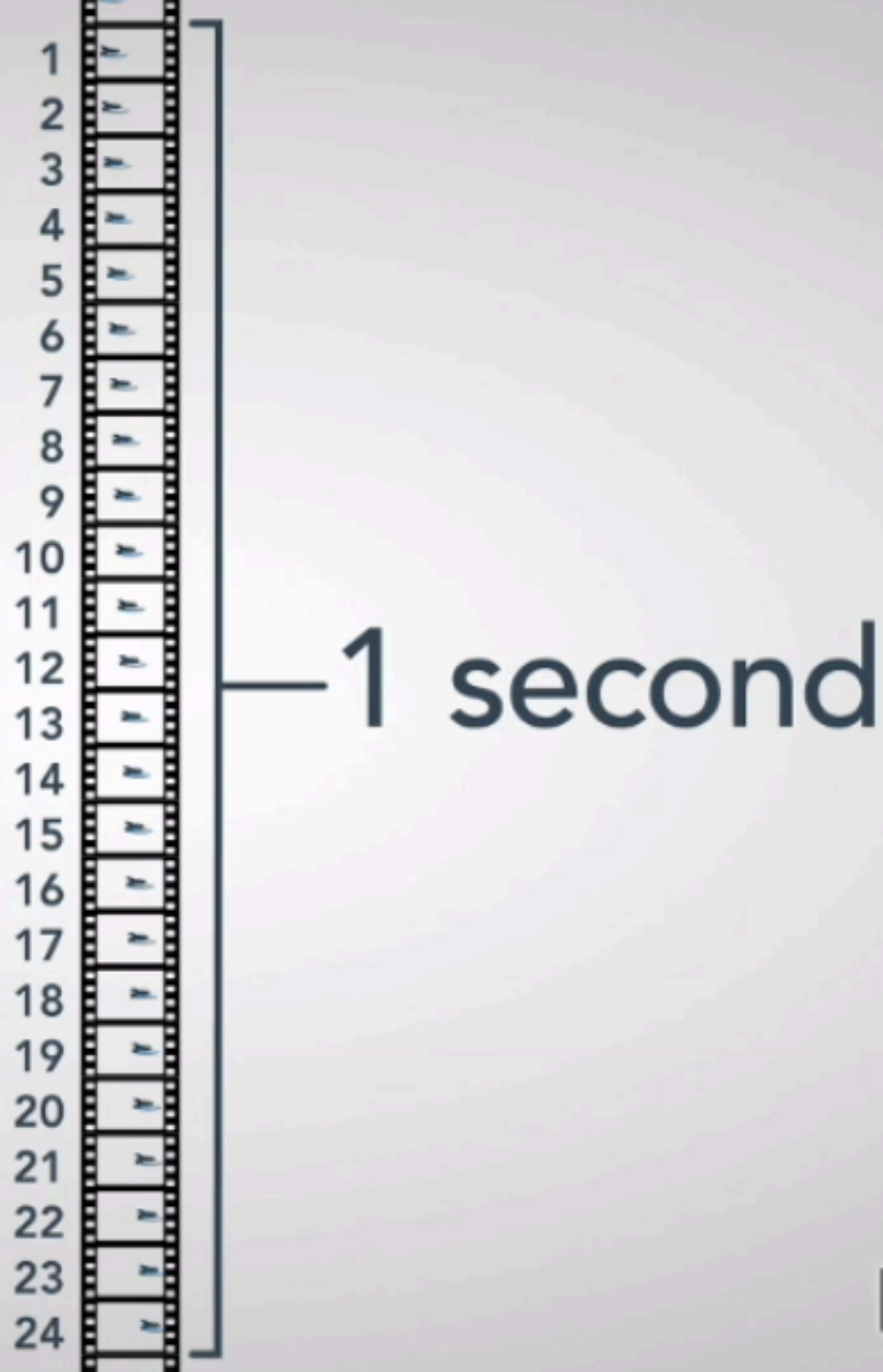


GD-105
Animation

Winny Lucas

Frame Rate



Working with different frame rate.



30 fps - NTSC (North America)

25 fps - PAL (Europe / Asia)

Frame rate: is the frequency (rate) at which an imaging device produces unique consecutive images called frames.

24 fps – motion picture film

30 fps – video

60 fps

128 fps

Difference between recorded frame rate vs playback

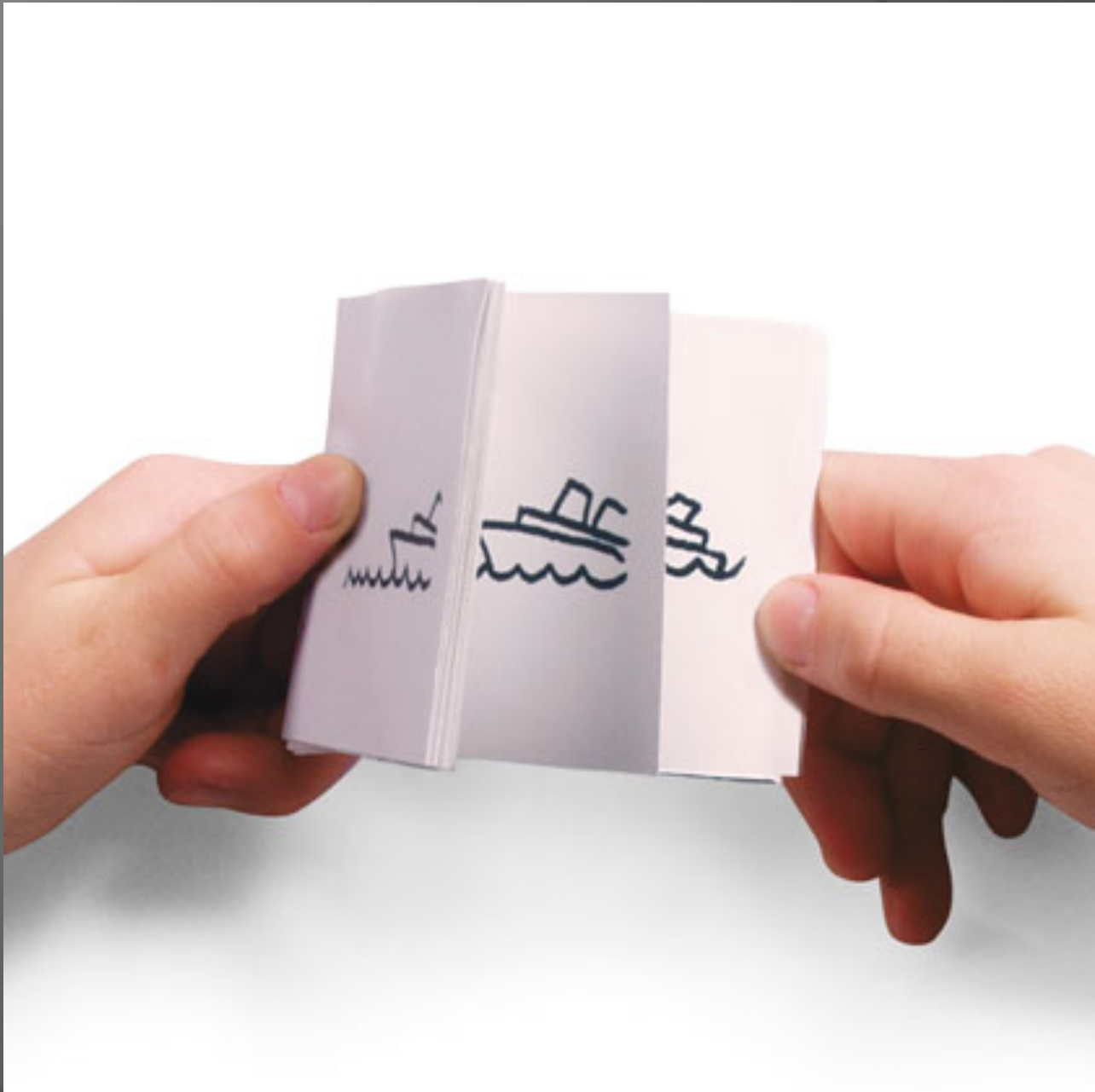
Motion is the strongest visual appeal to attention.

Motion implies a change in the conditions of the environment, and change may require reaction. It may mean the approach of danger, the appearance of friend or of desirable prey.

Persistence of vision: is the phenomenon of the eye by which an after image is thought to persist for a fraction of a second on the retina. ($1/24$ of a second)

Animation: is the rapid display of a sequence of images to create an illusion of movement.



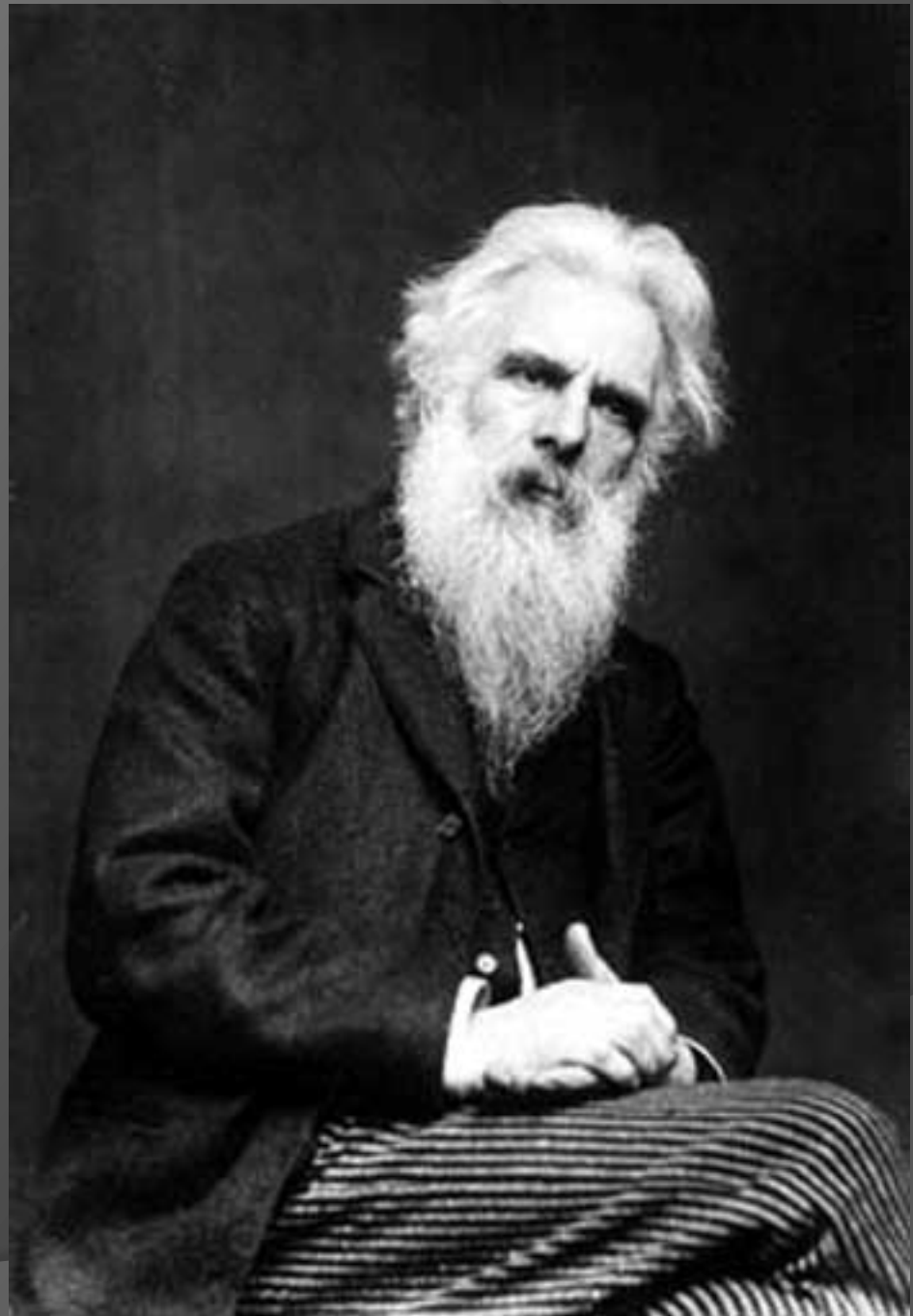




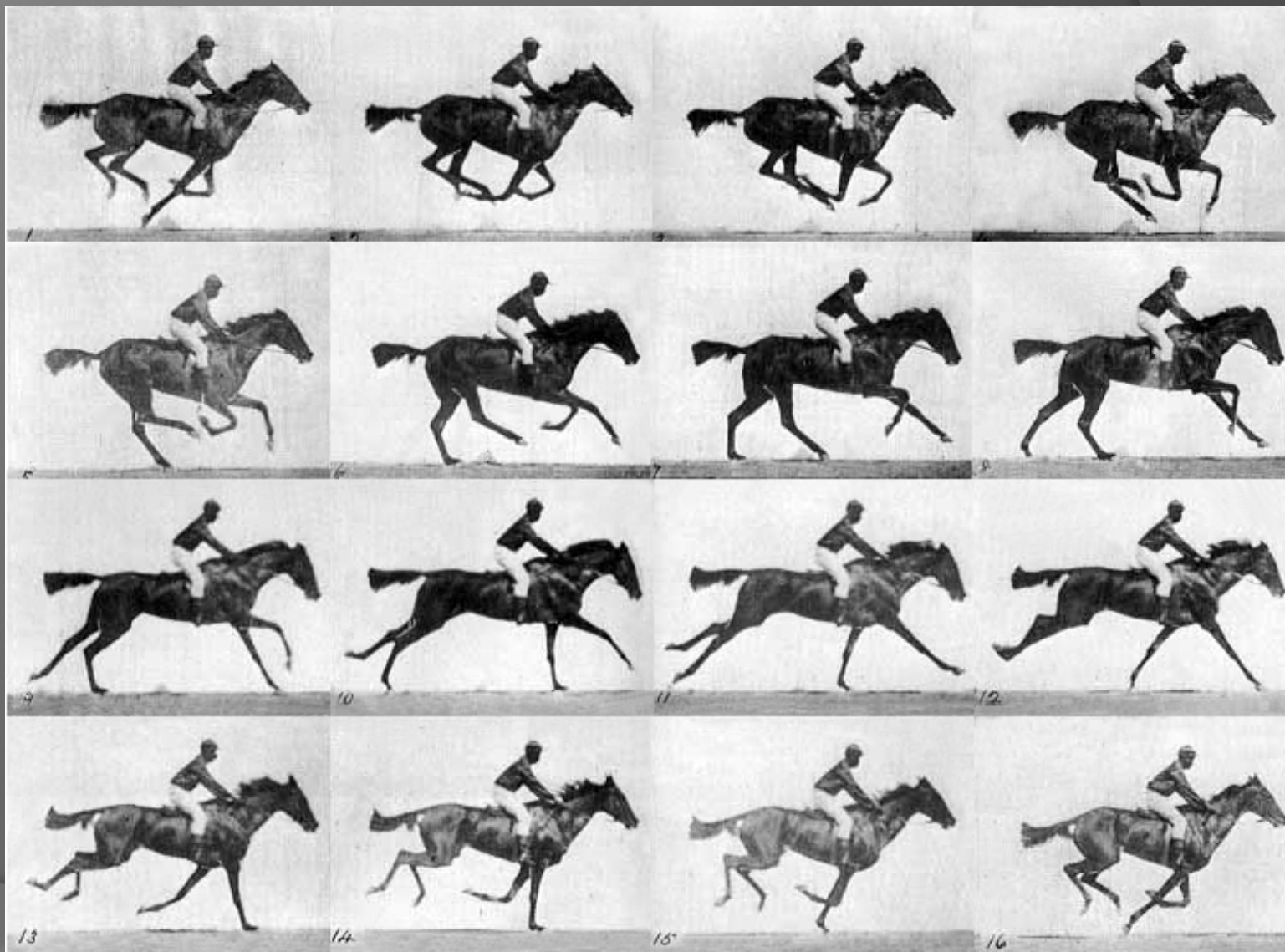
Eadweard Muybridge

English photographer
important for his
pioneering work in
photographic studies of
motion.

He transformed
photography and laid
the foundations for
motion pictures.

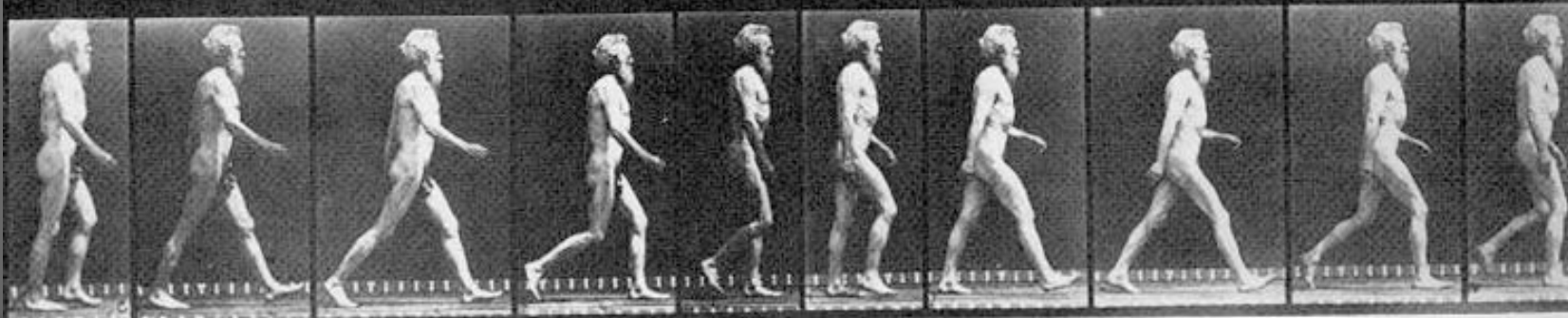
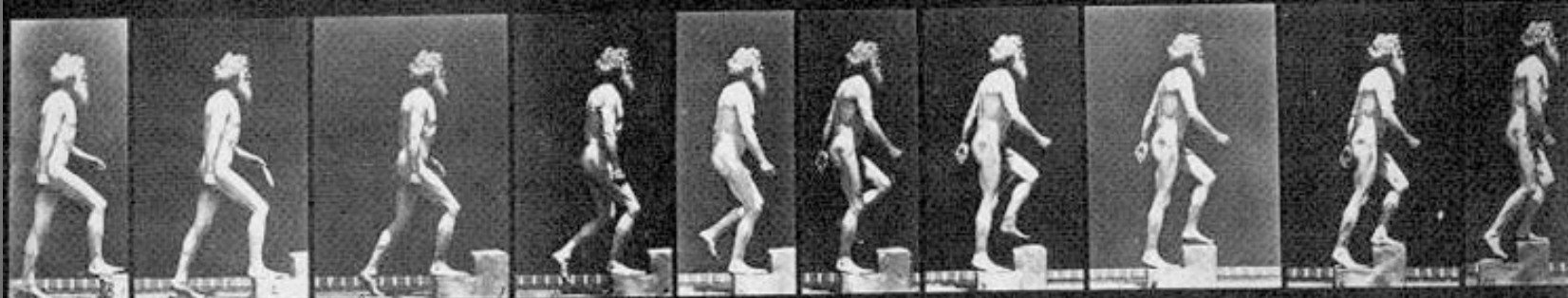


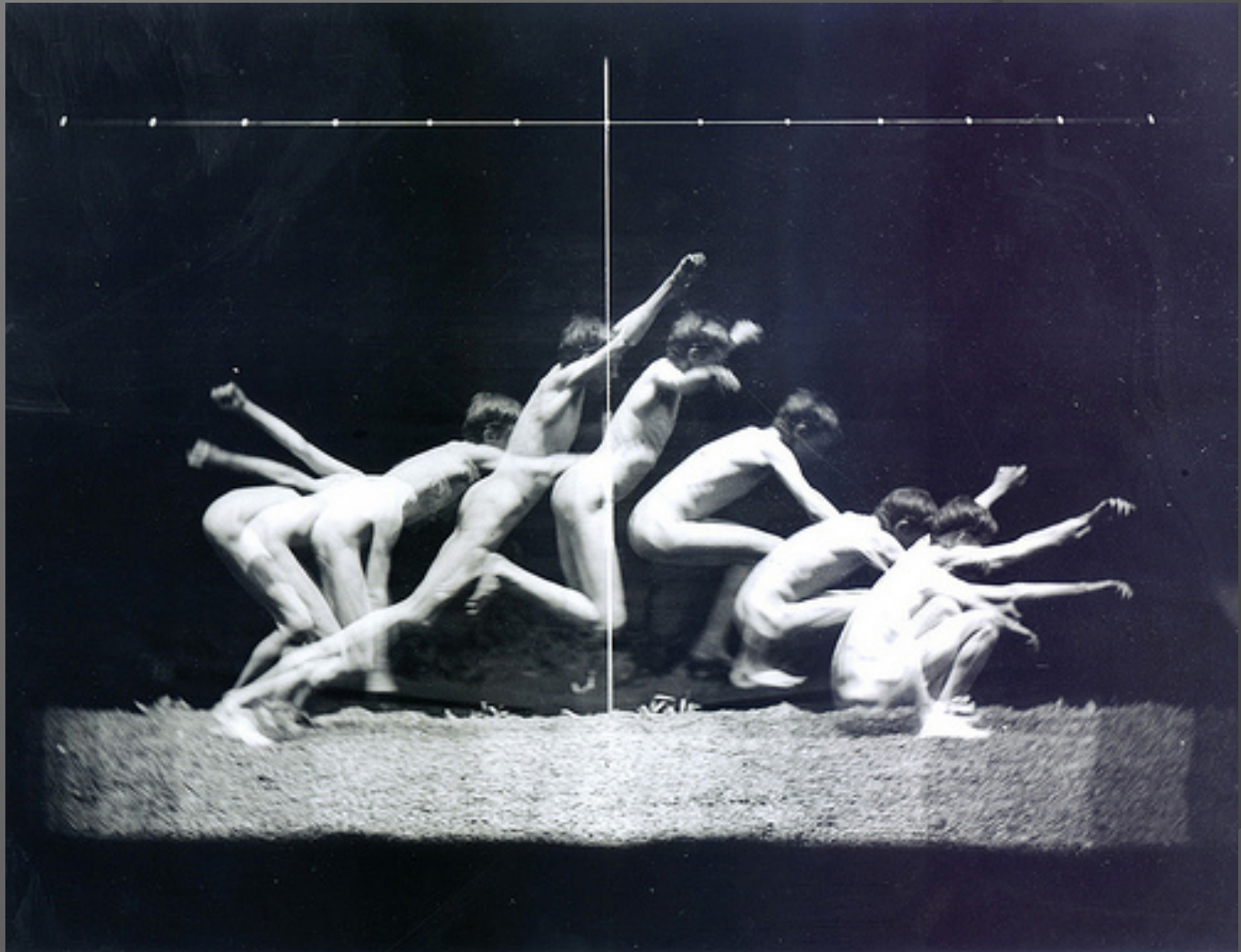
The horse in motion: a businessman and race-horse owner hired Muybridge to settle a debate— whether all four feet of a horse were off the ground at the same time while trotting.

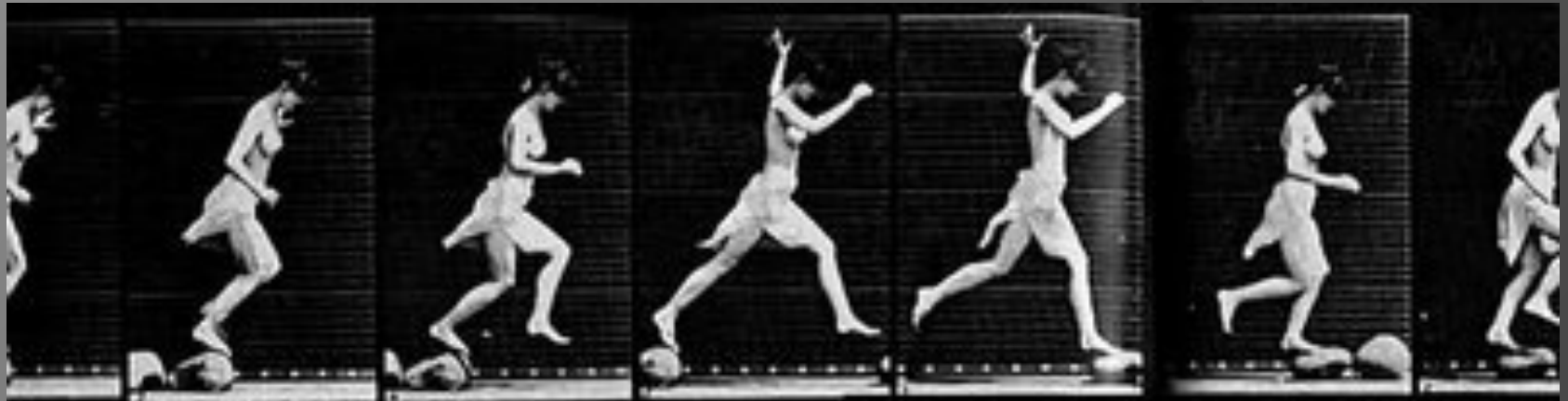


Later motion studies: In the 1880s, the University of Pennsylvania sponsored Muybridge's research using banks of cameras to photograph people in a studio, and animals from the Philadelphia Zoo to study their movement. The human models were photographed against a measured grid background in a variety of action sequences.









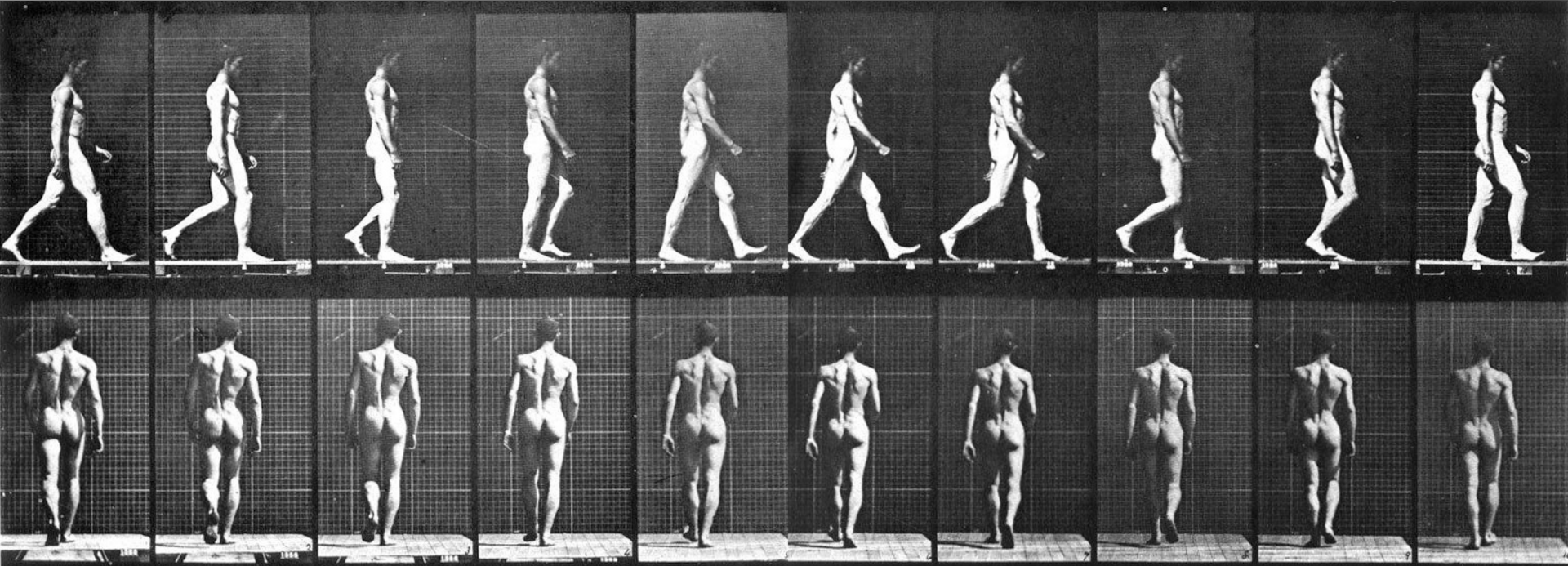
Edward Muybridge: Woman leaping from rock to rock 1880's



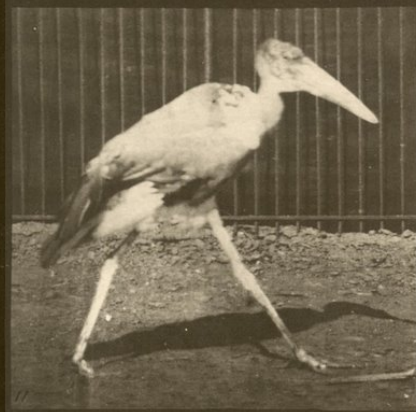
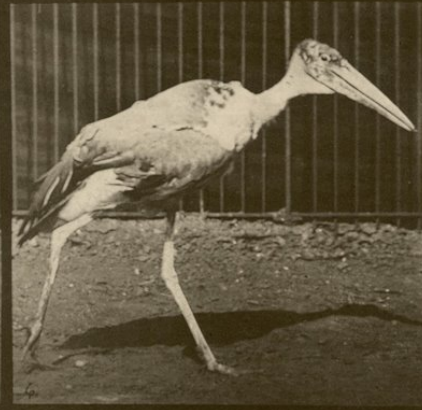
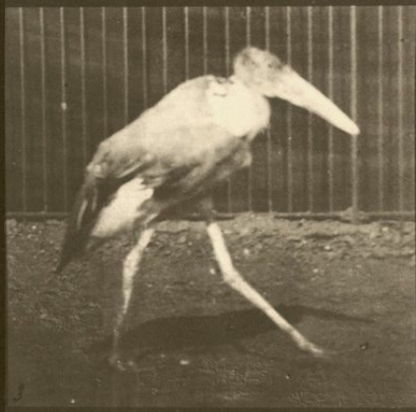
Edward Muybridge: Woman walking 1880's



WALKING AND TURNING AROUND RAPIDLY WITH A SATCHEL IN ONE HAND, A CANE IN THE OTHER. 1887





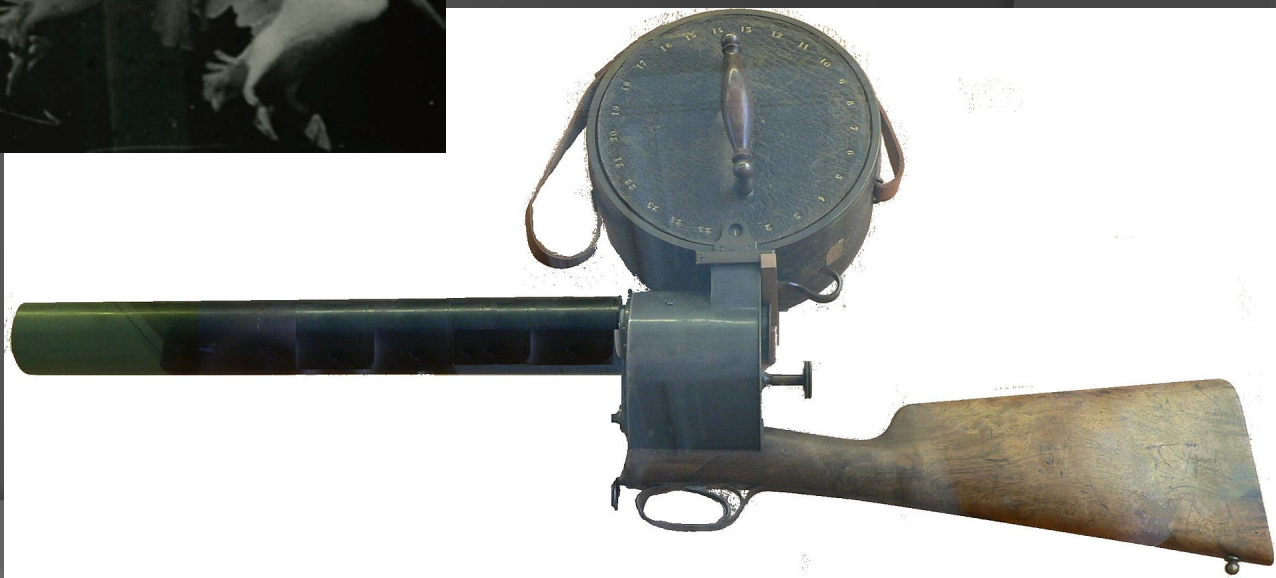


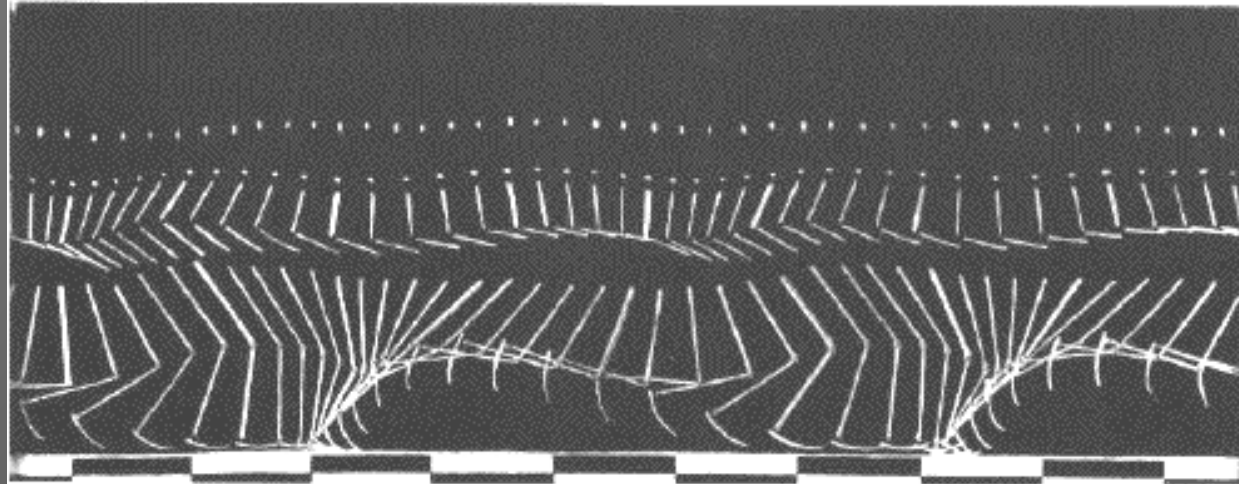
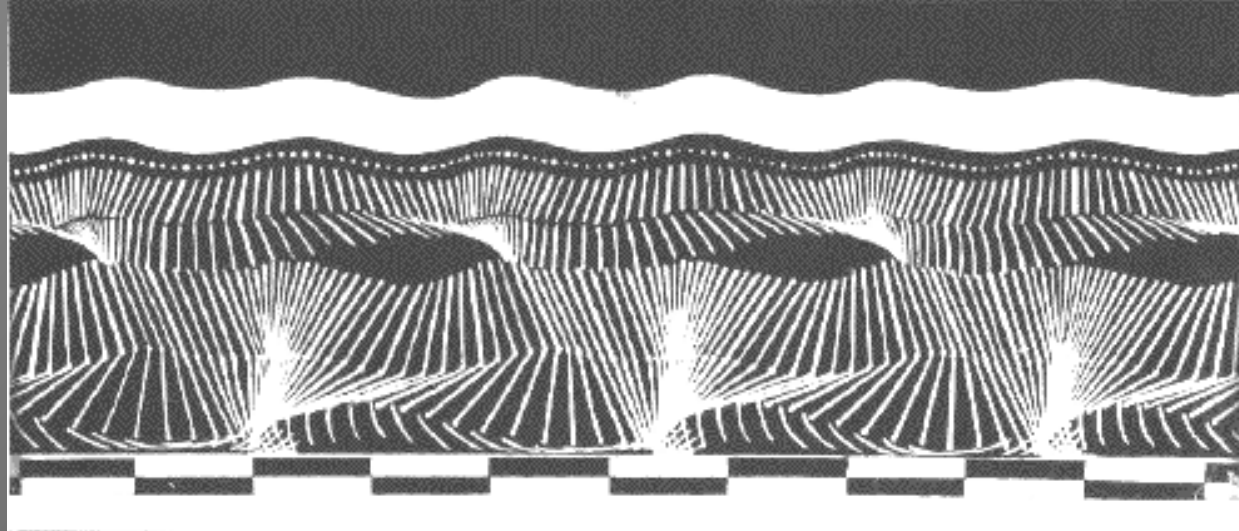
Etienne-Jules Marey:

His research on how to capture and display moving images helped the emerging field of cinematography.



Marey's chronophotographic gun was made in 1882, it was capable of taking 12 f/s, and all the frames were recorded on the same picture. He used these pictures studying horses, birds, dogs, sheep, donkeys, elephants, fish, microscopic creatures, molluscs, insects, reptiles, etc.







High speed photography:

<https://edgerton.mit.edu/high-speed-imaging/high-speed-images>

High speed photography produces slow motion - the object moving in negative space now encounters resistance. The air becomes viscous and dense.

High speed shots make movements of a sportsman or dancer not only slower (slow motion) but wooly and soft.

Sneezing

<https://www.youtube.com/watch?v=YoDSzti470M>

Shakes:

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

<http://dsc.discovery.com/videos/time-warp-bulldog-shake.html>

Time lapse video: each frame is captured at a rate much slower than it will be played back.

Eg 01: BBC, Life – episode: Plants

<http://www.youtube.com/watch?v=bn9H8hbAAWQ>

Eg 02: Adaptation- the evolution of the screenwriter

<http://www.youtube.com/watch?v=rTvYccMDvMU>



Link to Doc MIT

<http://edgerton-digital-collections.org/techniques>

Imaging at a trillion frames per second

http://www.ted.com/talks/ramesh_raskar_a_camera_that_takes_one_trillion_frames_per_second.html

High frame rate:

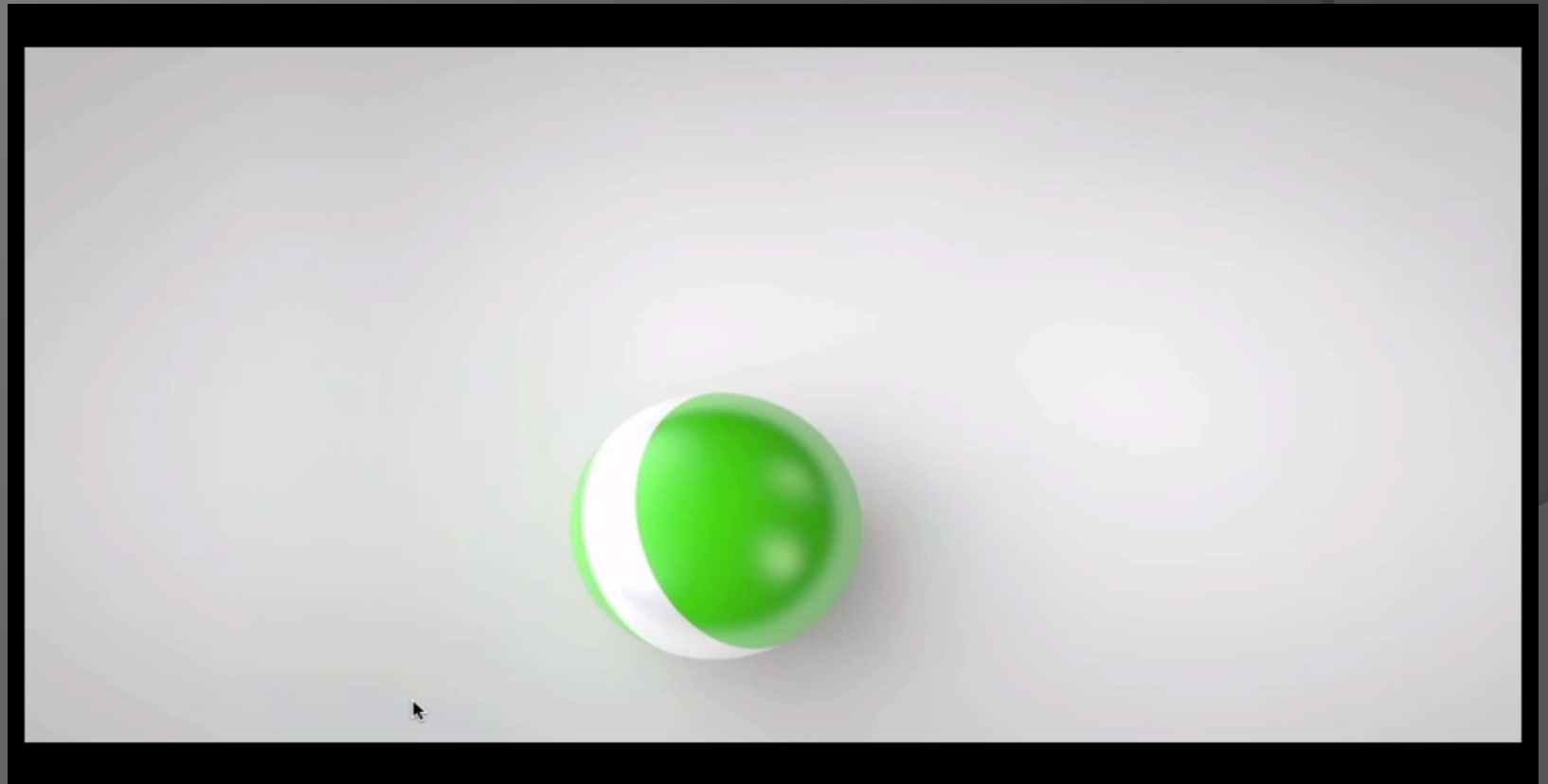
<https://vimeo.com/40316231>

<http://www.youtube.com/watch?v=J6RduM0wr24>

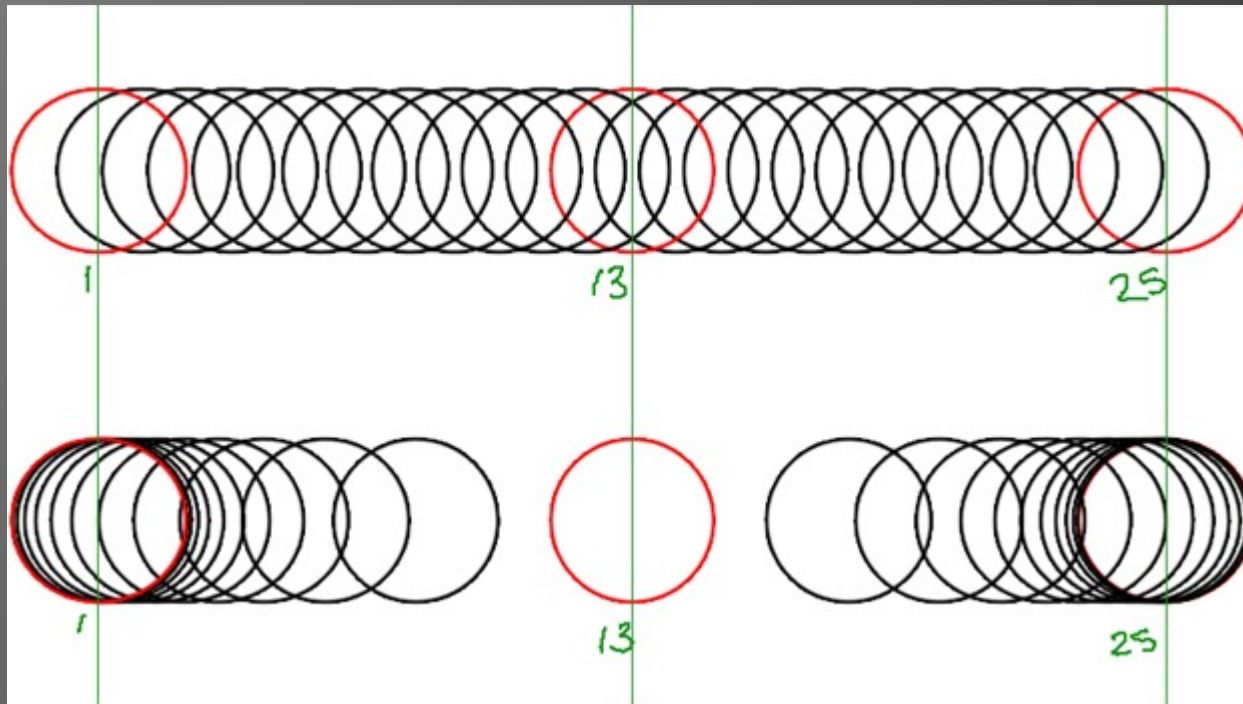
The 12 Principles of Animation

1. Timing and spacing

- giving meaning to the motion & weight



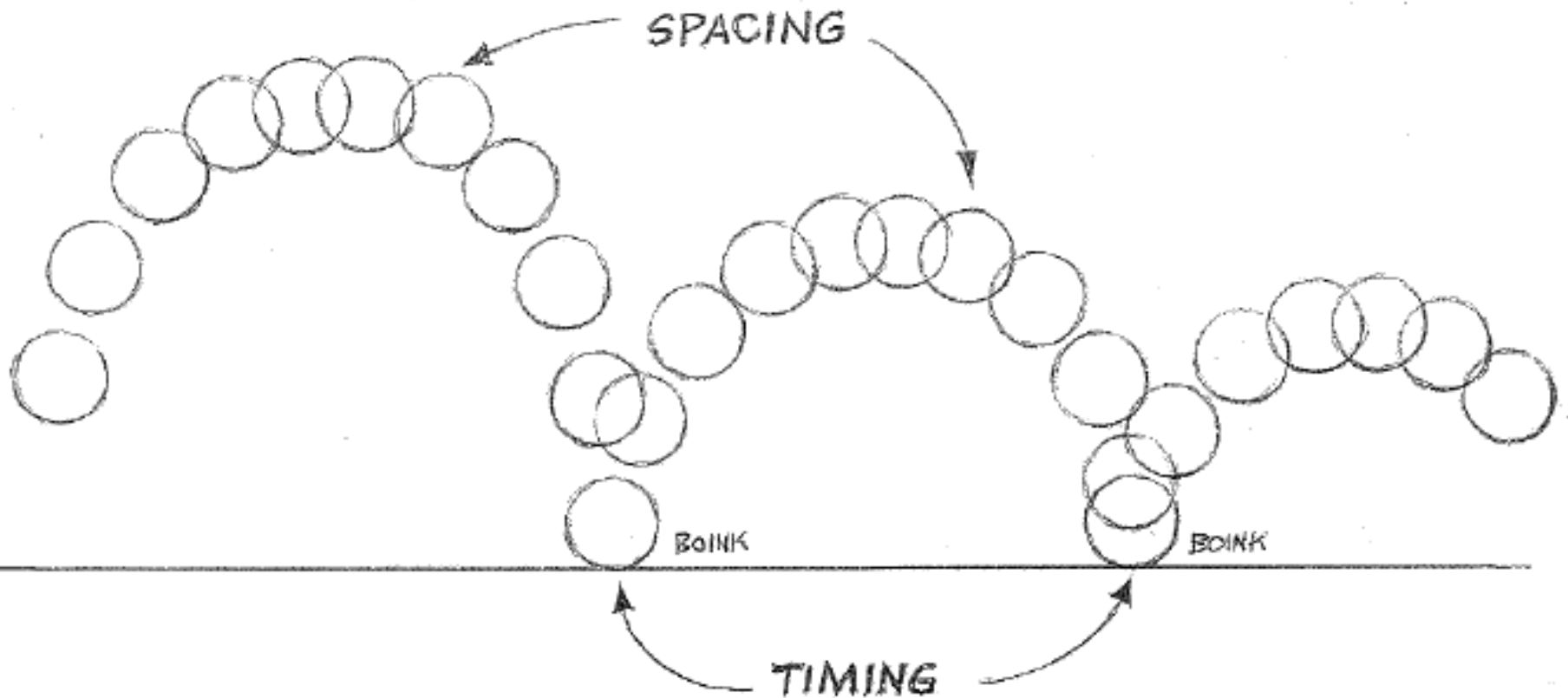
Timing and spacing



Timing and spacing

<http://www.youtube.com/watch?v=yyRUrDUHLP0>

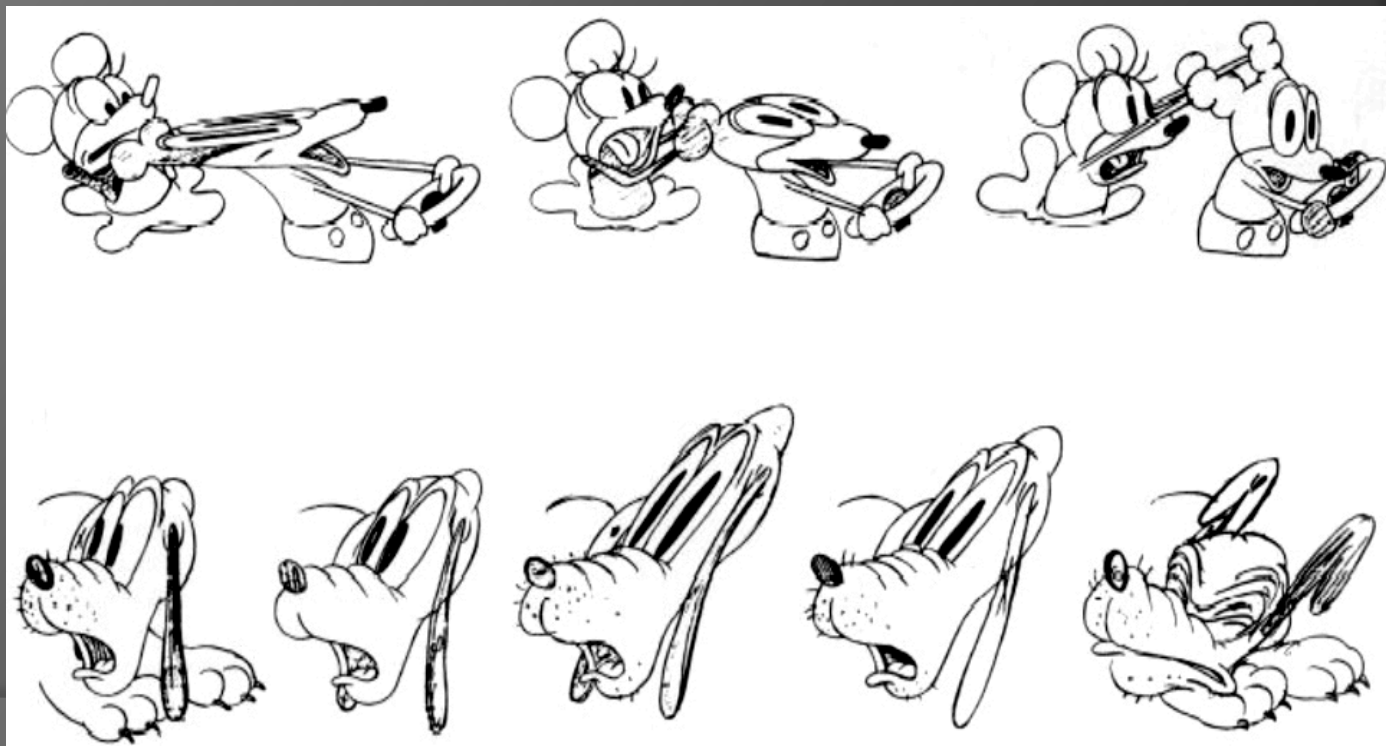
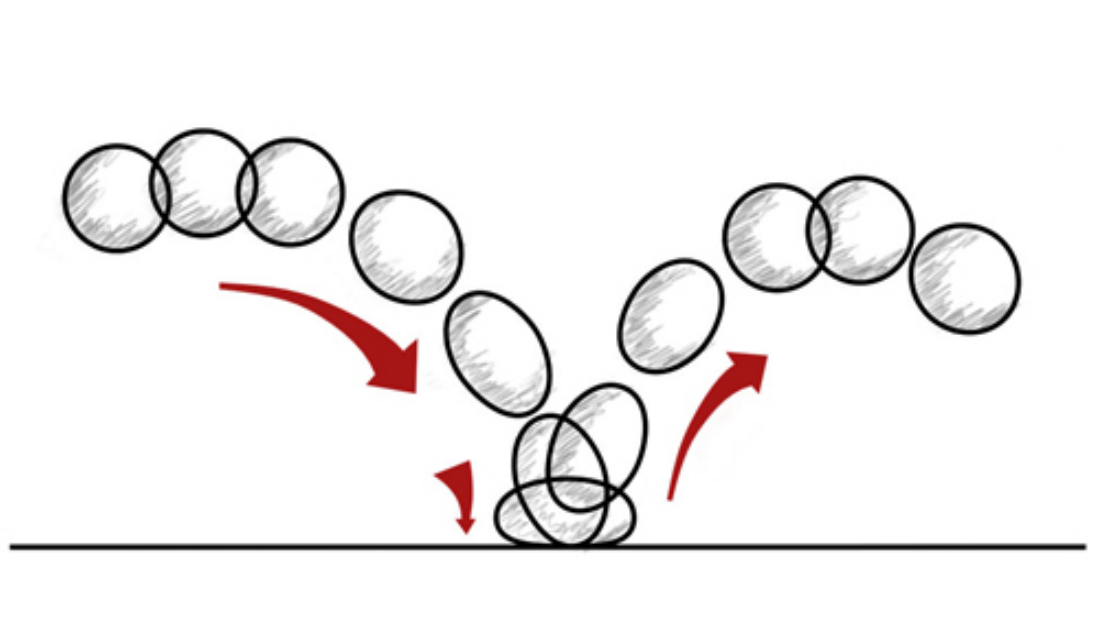
v=yyRUrDUHLP0

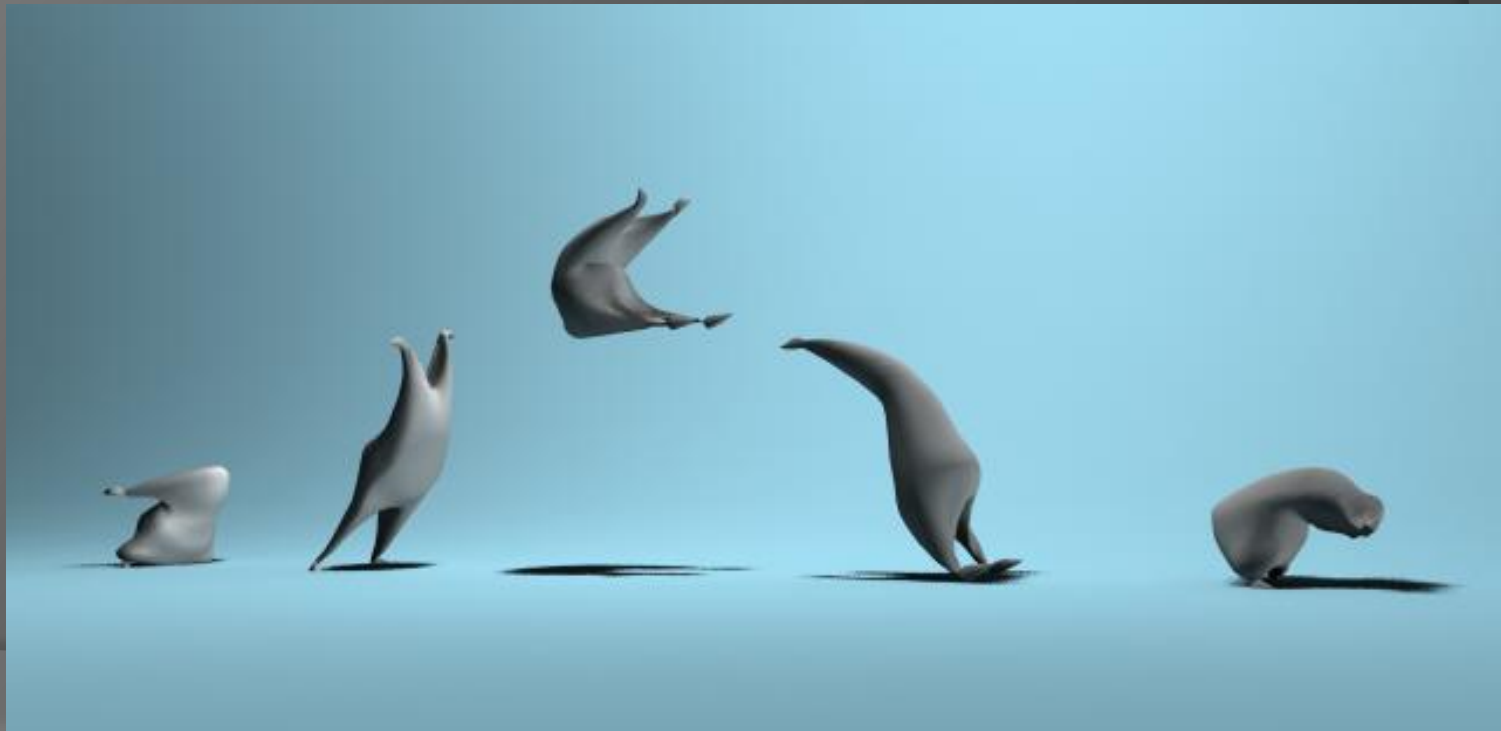
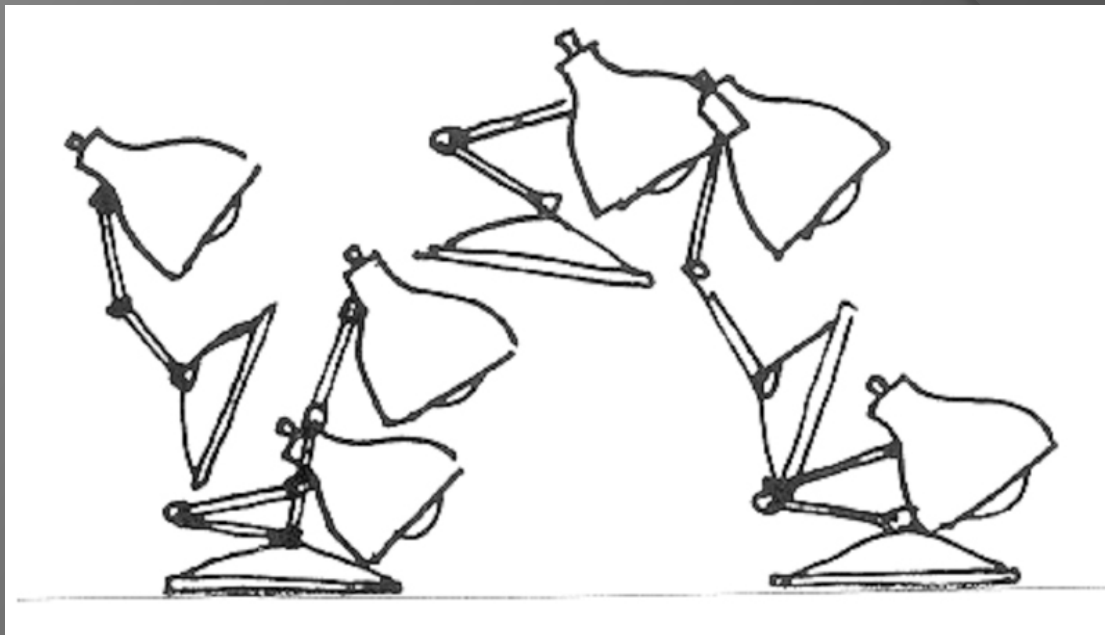


2. SQUASH AND STRETCH

This action gives the illusion of weight and volume to a character as it moves.

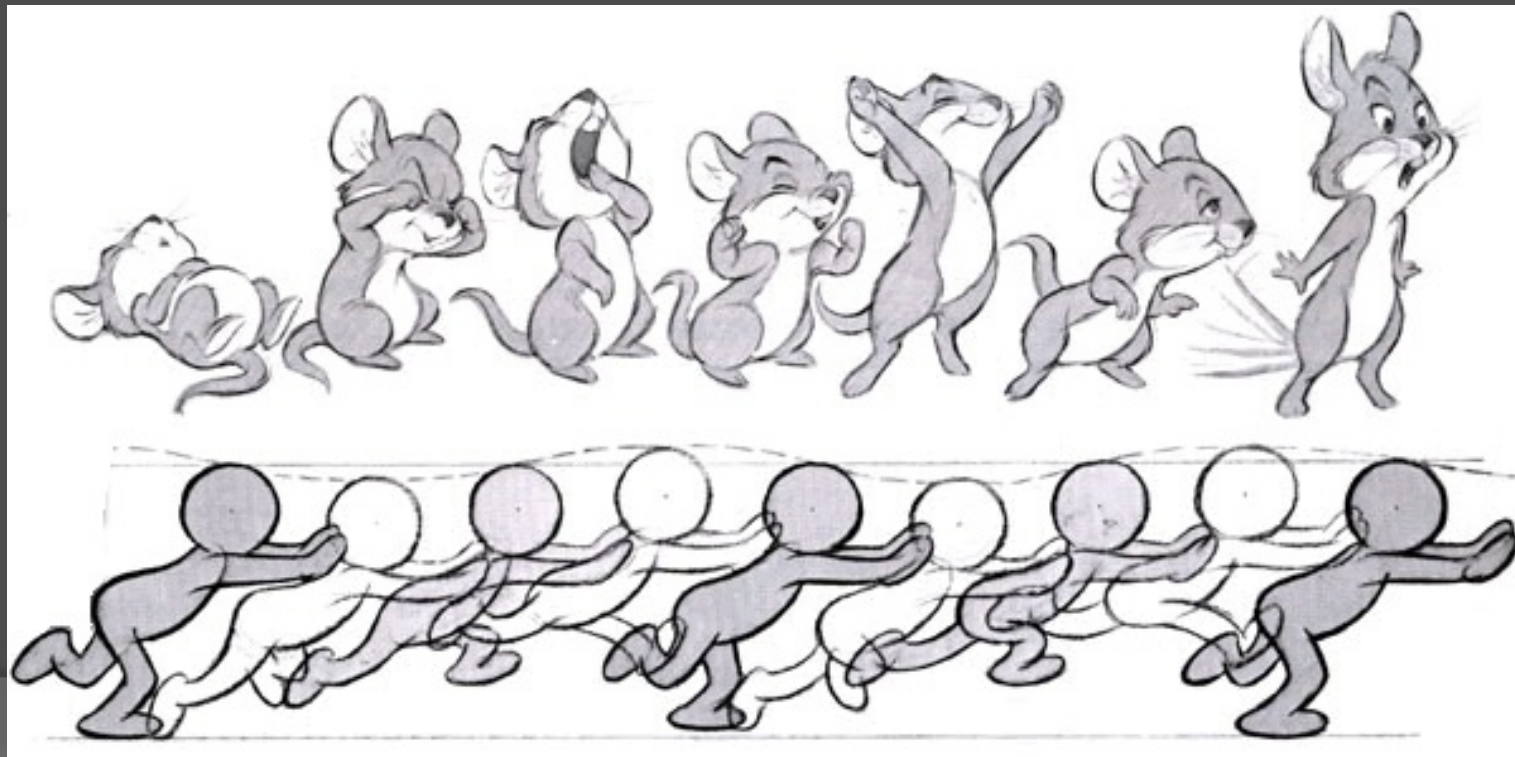
How extreme the use of squash and stretch is, depends on what is required in animating the scene. It can be used in all forms of character animation from a bouncing ball to the body weight of a person walking.



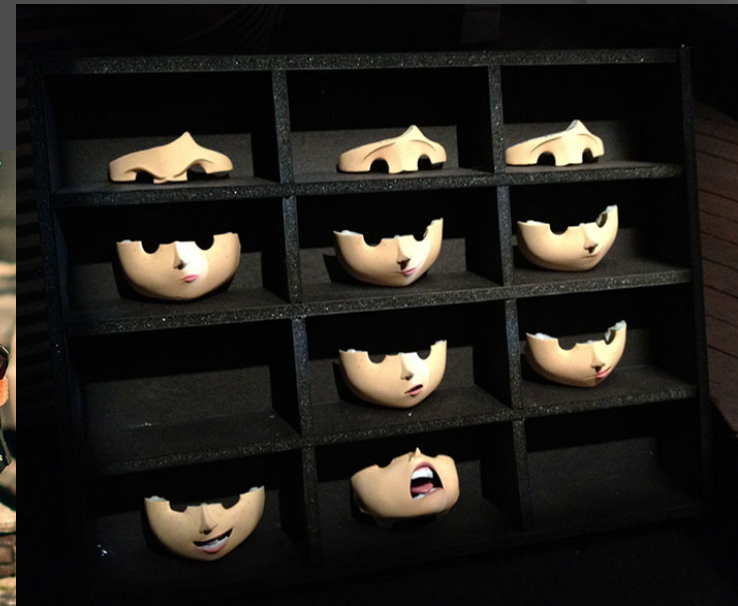


3. Straight ahead and pose to pose (animation techniques)

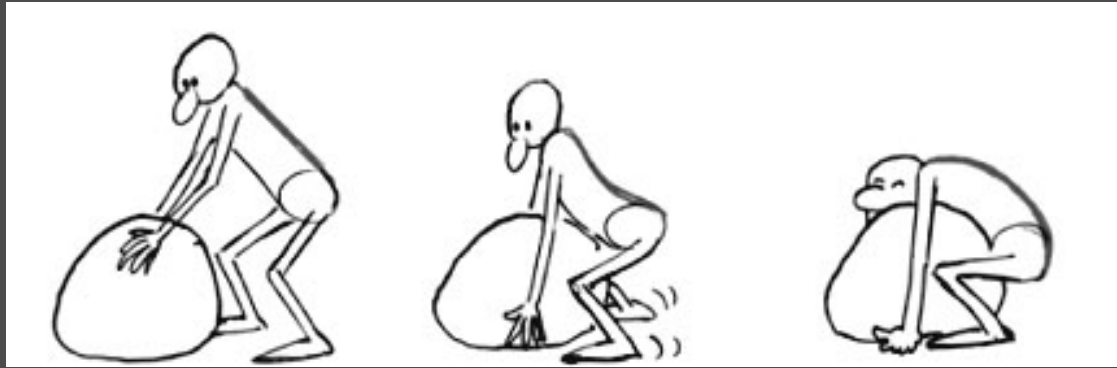
Straight ahead action: literally works straight ahead from the first drawing in the scene. It's a linear process, can be more spontaneous, come up with new ideas along the way.



Stop Motion animation is always done with this method. Effects animation, lip sync, facial expressions, and many methods of Inbetweening are often done with straight ahead animation.



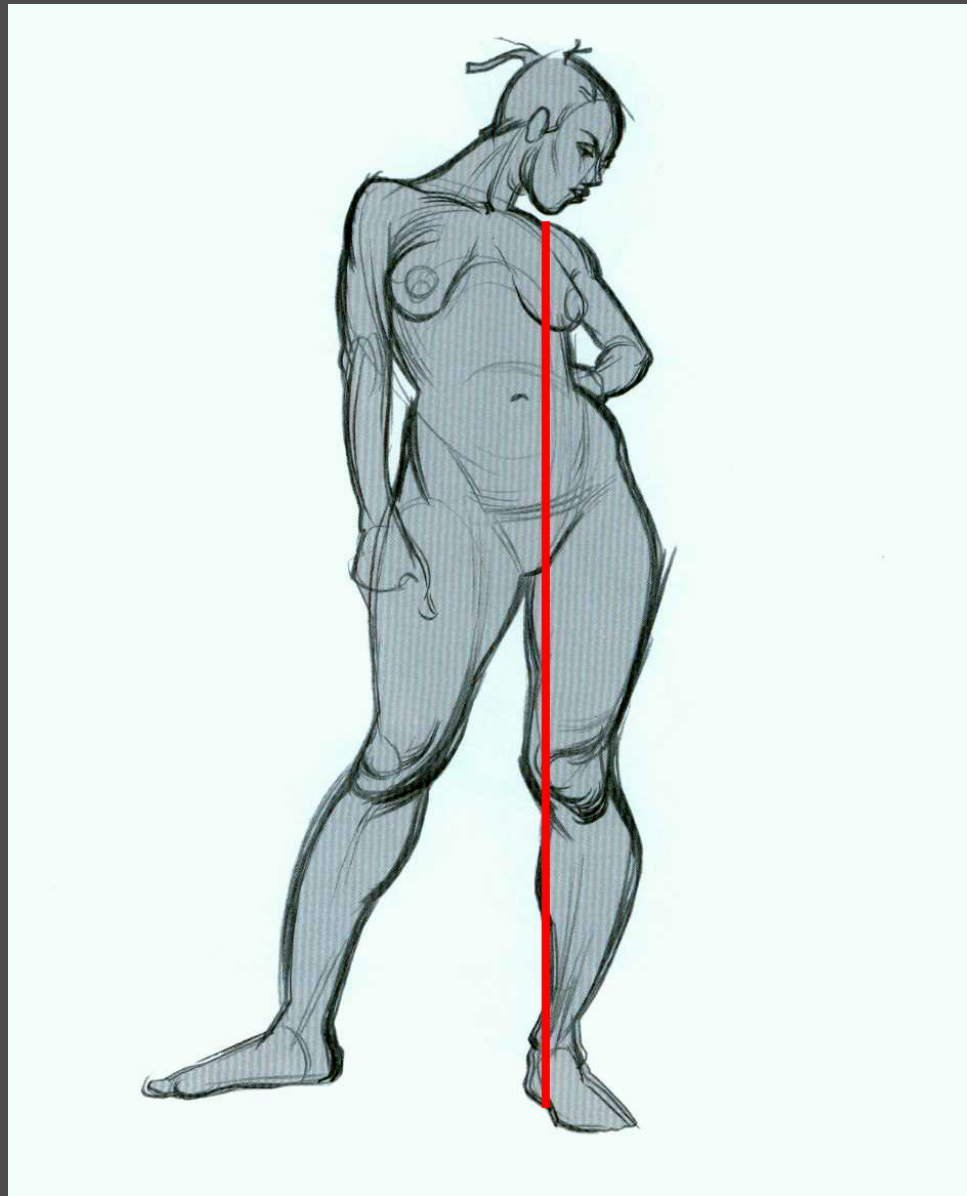
Pose to pose: the animator plans his action, figuring out just what drawings will be needed to animate the scene. Layout all the key poses to start



The Key to great poses...

- Create Visual Interest
- Maintain Clarity of Action
- Know Where the Weight Is
- Establish Strong Line of Action

Weight



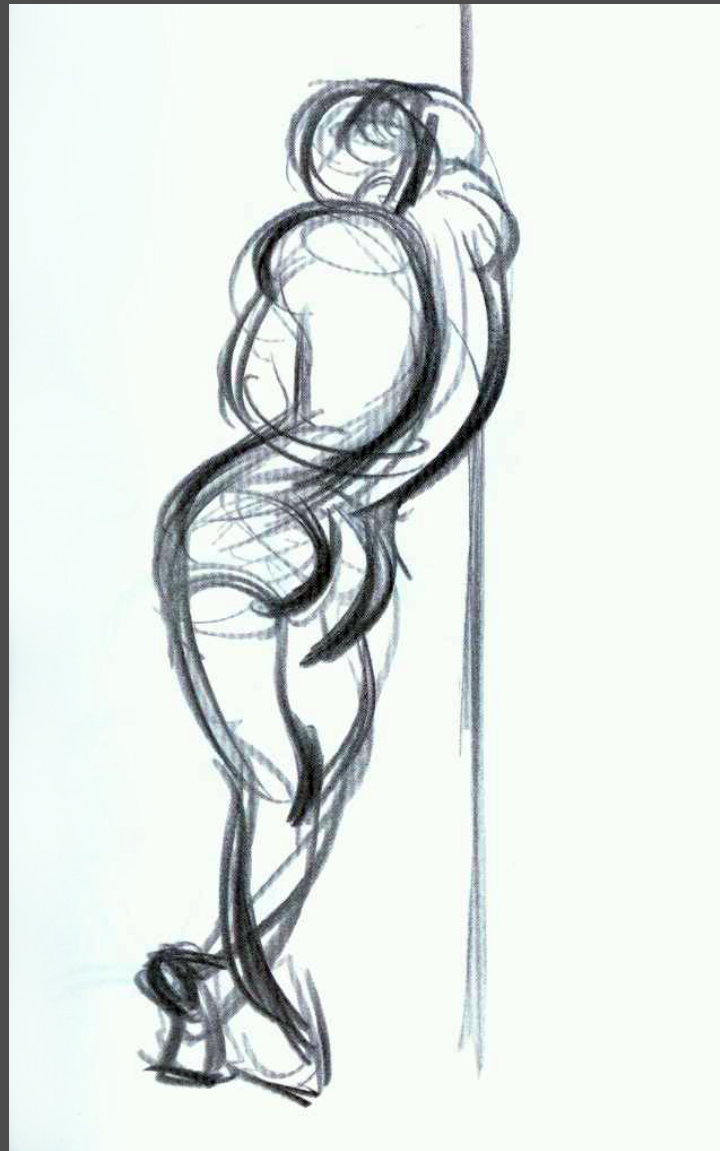
Weight - Head



Weight - Head



Weight - Hips



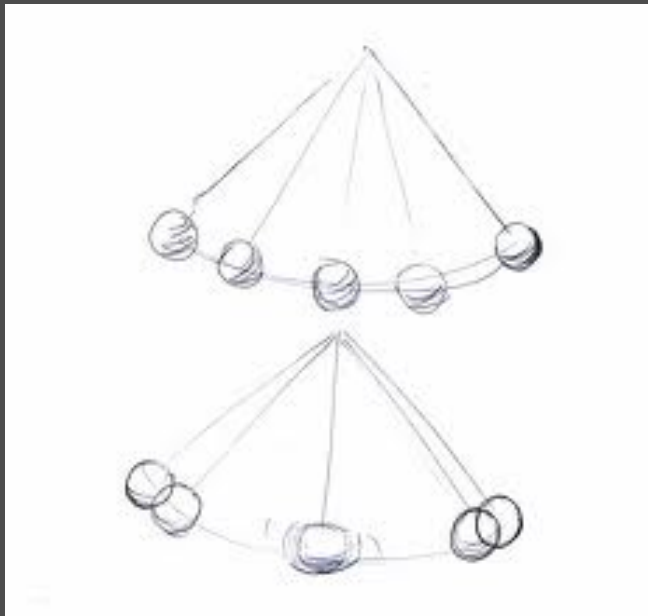
Weight - Hips and Head

4. ARCS

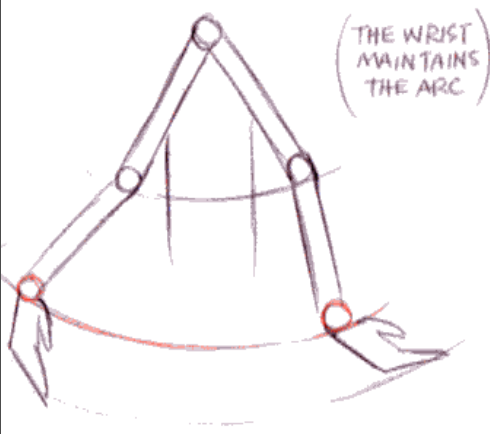
All actions, with few exceptions (such as the animation of a mechanical device), follow an arc or slightly circular path. This is especially true of the human figure and the action of animals.

Arcs give animation a more natural action and better flow.

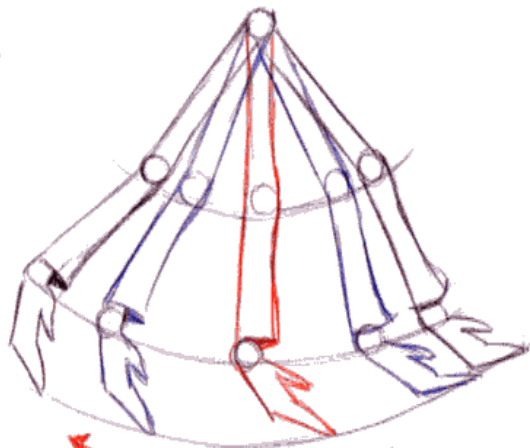
Think of natural movements in the terms of a pendulum swinging. All arm movement, head turns and even eye movements are executed on arcs.



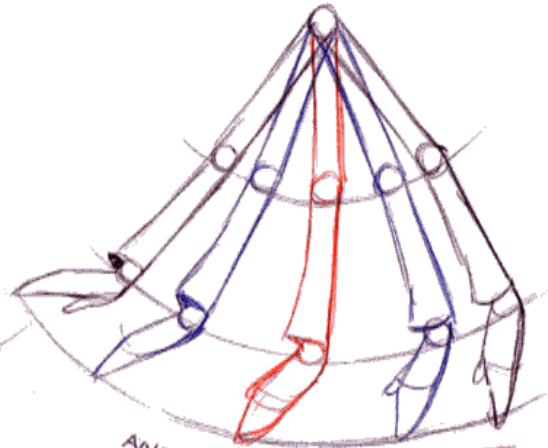
TO GET SOME FLEXIBILITY IN AN ARM SWING
WE'D DRAG THE HAND -



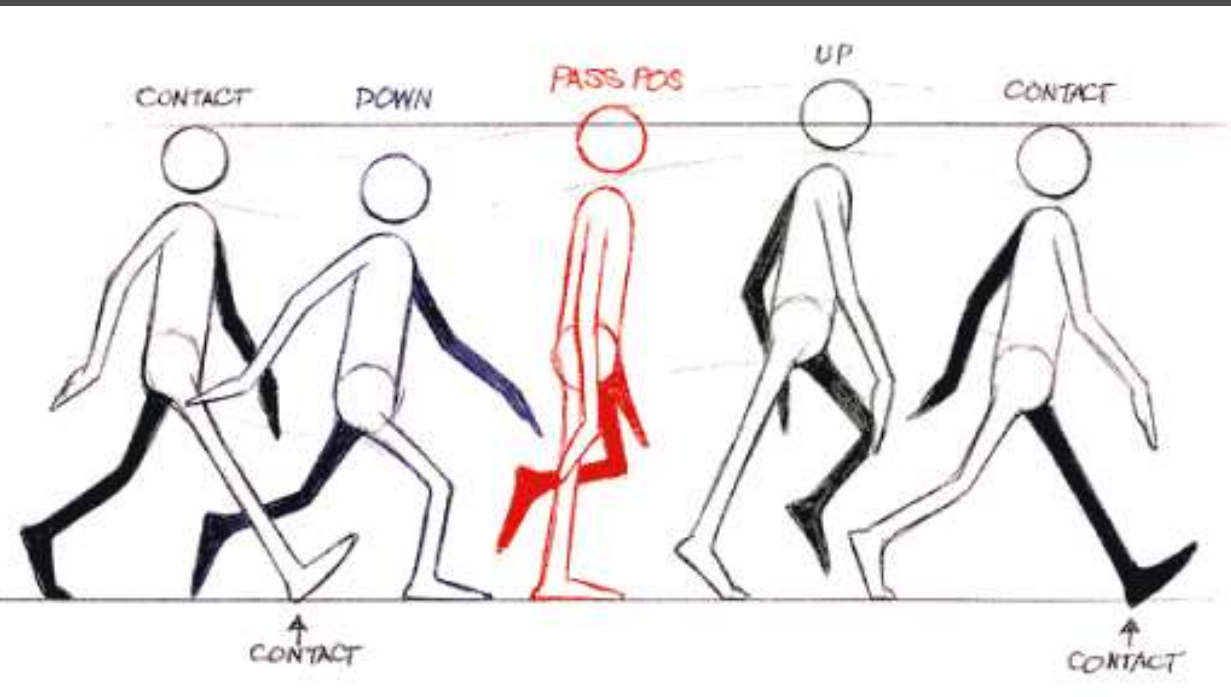
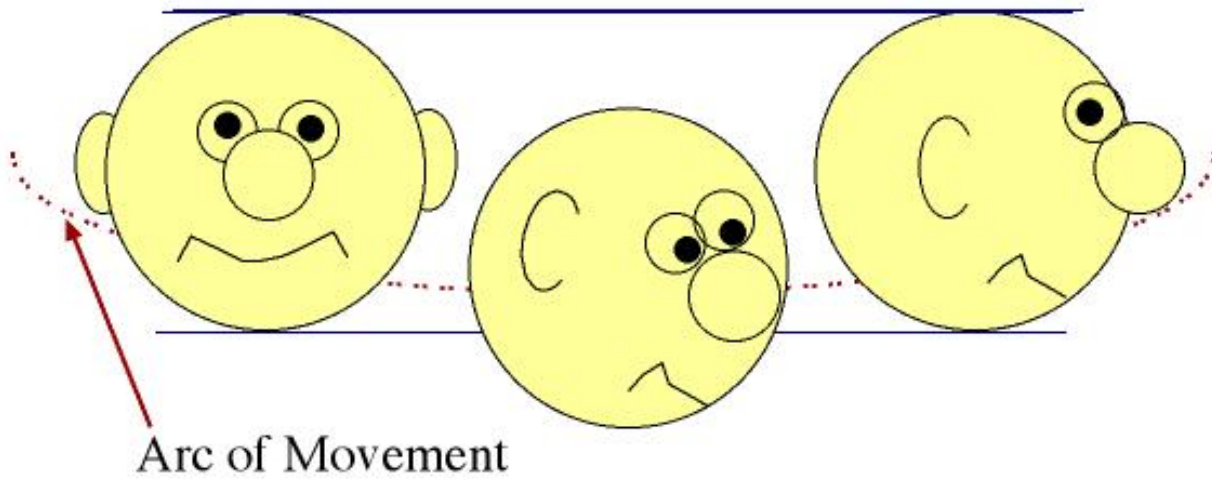
(THE WRIST
MAINTAINS
THE ARC)



GOING THIS WAY



AND COMING BACK



Line Of Action

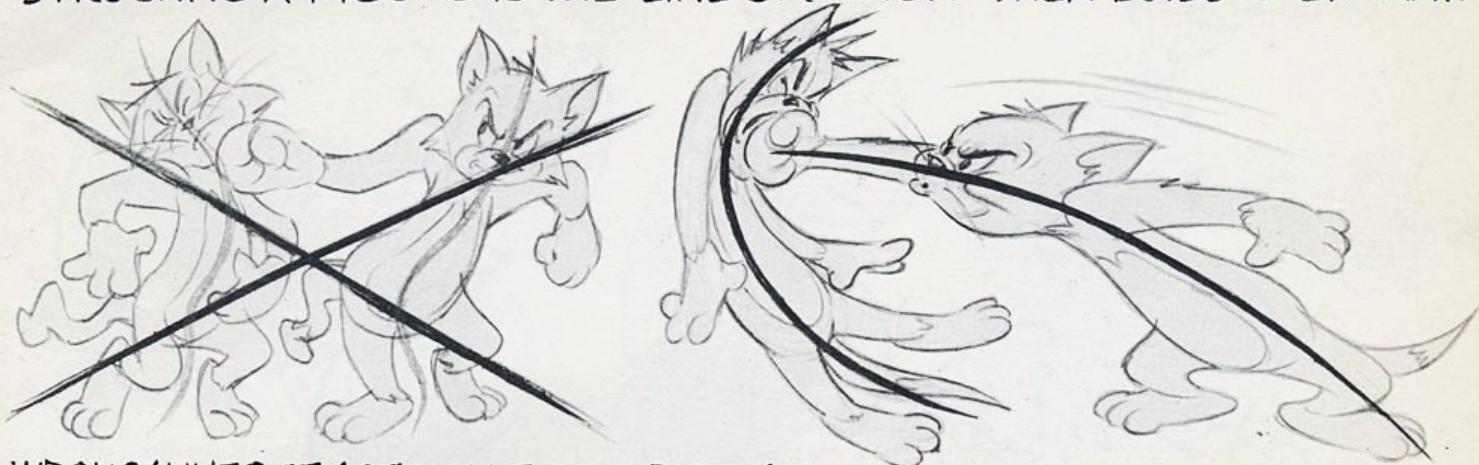
This is the visual path of implied movement of energy and weight through a character as defined by a single line arcing through the character's body down to a primary point of balance.



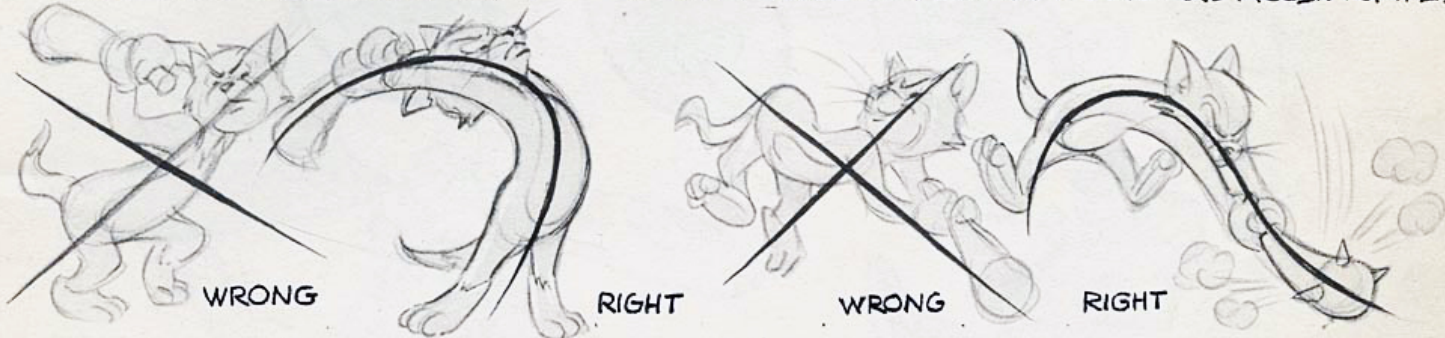
Line Of Action - Visual Interest

LINE OF ACTION

AN IMAGINARY LINE EXTENDING THRU THE MAIN ACTION OF THE FIGURE IS THE "LINE OF ACTION" -- PLAN YOUR FIGURE AND ITS DETAILS TO ACCENTUATE THIS LINE -- BY SO DOING YOU STRENGTHEN THE DRAMATIC EFFECT -- THE FIRST THING TO DRAW WHEN CONSTRUCTING A FIGURE IS THE LINE OF ACTION -- THEN BUILD OVER THAT.

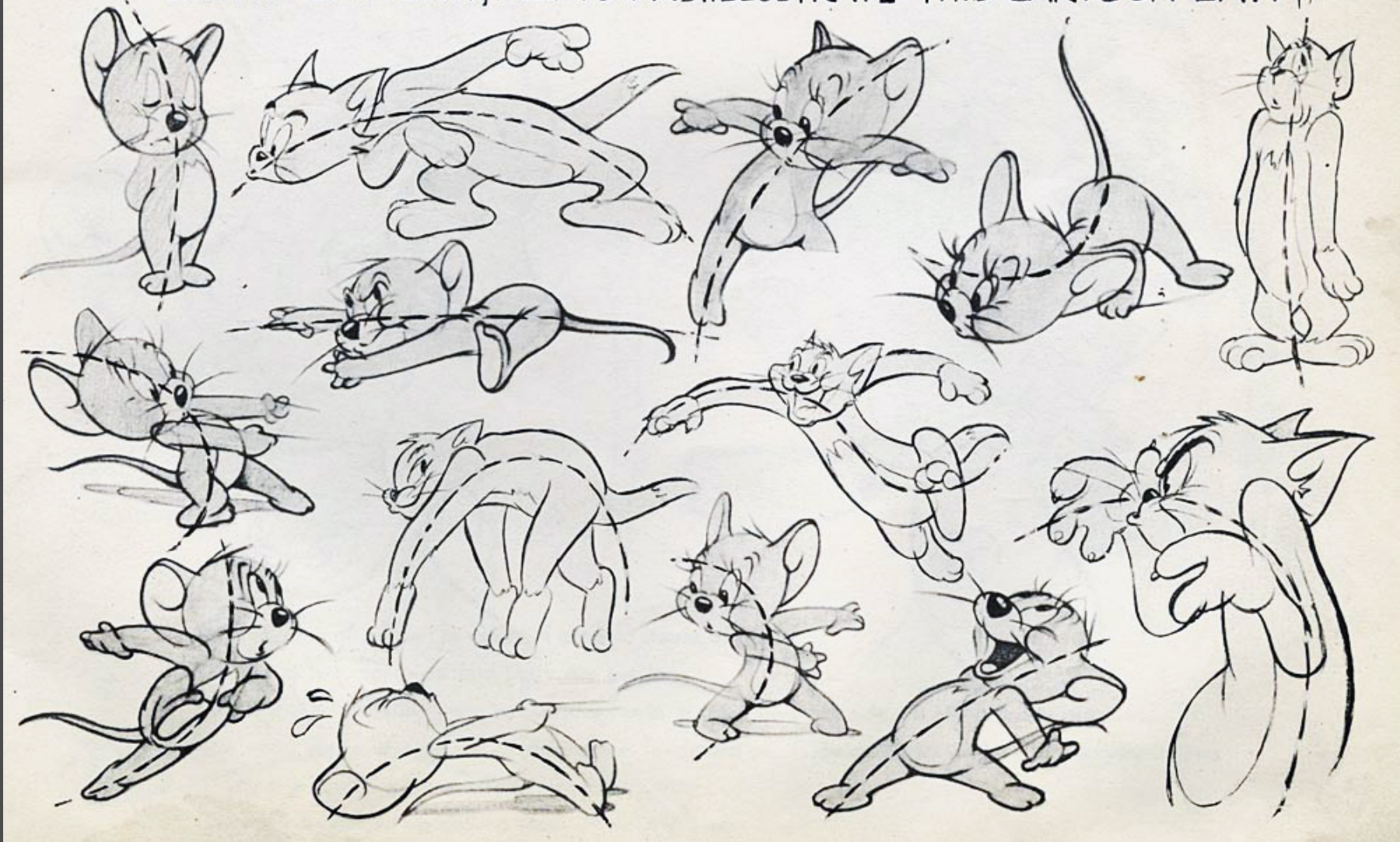


WRONG! LINES OF ACTION UNFIT --- RIGHT! LINES OF ACTION FIT AND ARE ACCENTUATED



Line Of Action - Clarity in Action and Force

BELOW "TOM+JERRY," M.G.M. STARS. ILLUSTRATE THIS CARTOON LAW:

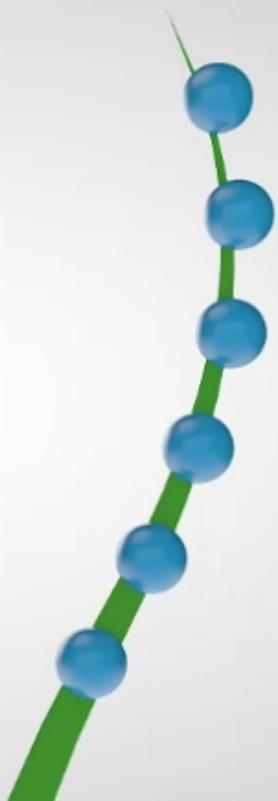
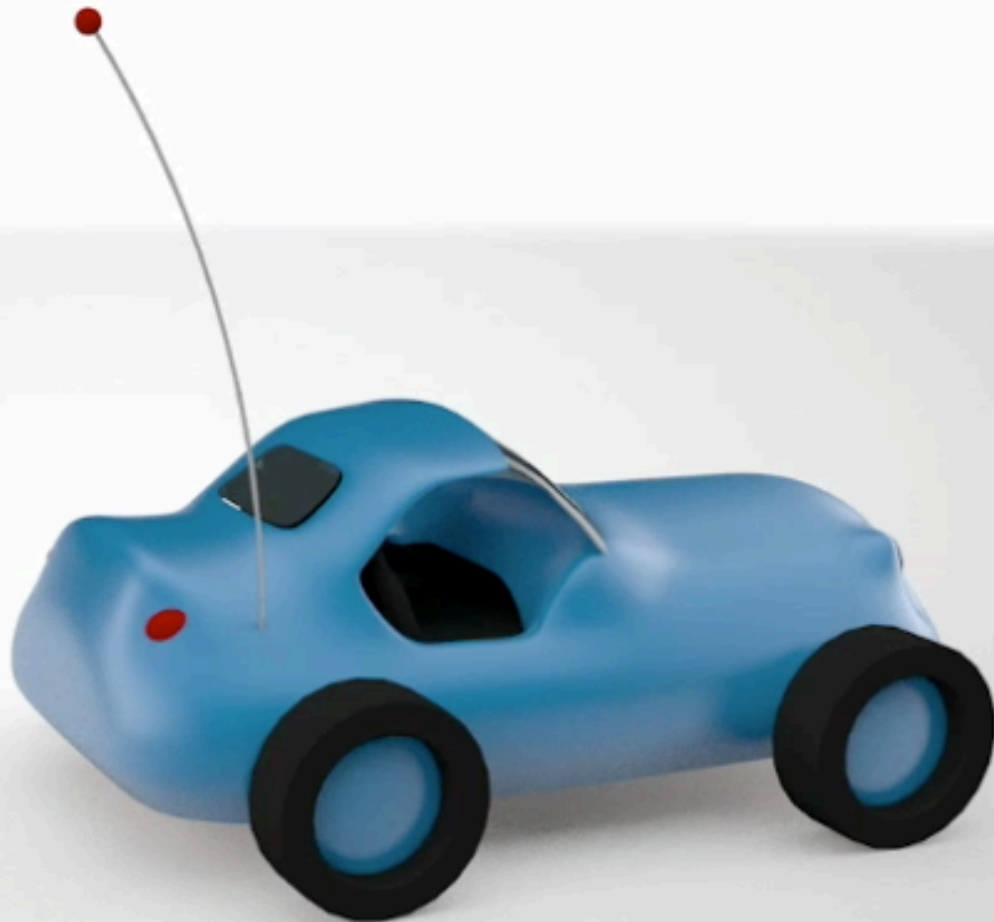


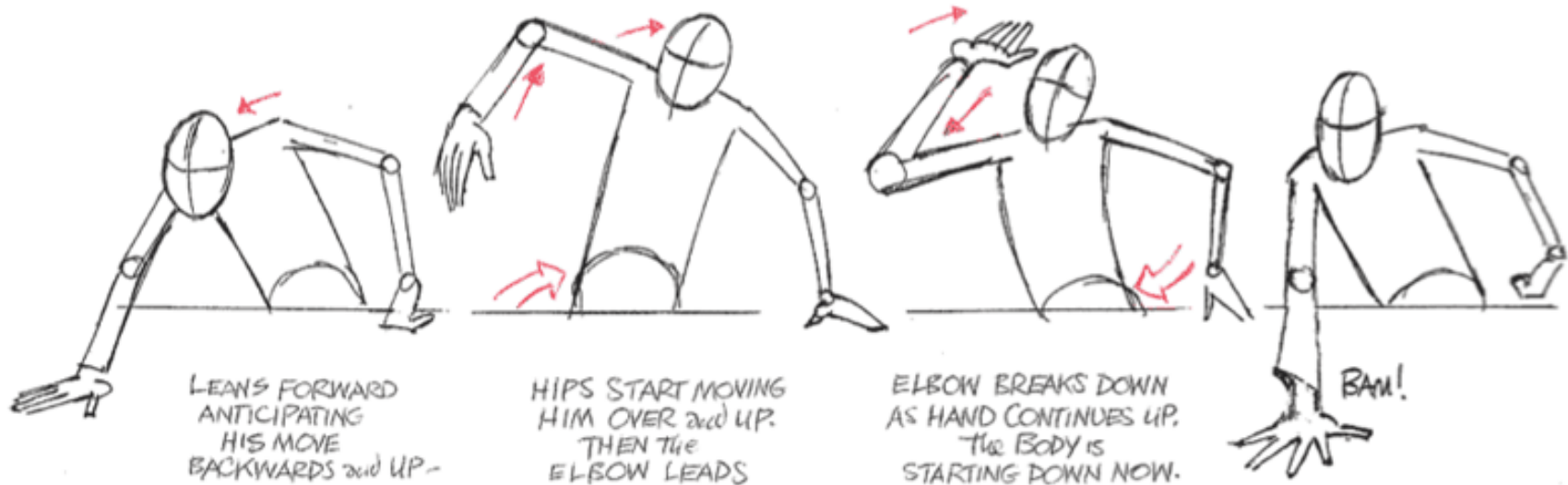
Line Of Action - Weight, Action, Interest, Force

5. FOLLOW THROUGH AND OVERLAPPING ACTION

When the main body of the character stops all other parts continue to catch up to the main mass of the character, such as arms, long hair, clothing, coat tails or a dress, floppy ears or a long tail (these follow the path of action).

Not everything happens at the same time, not everything stops all at once. This is follow through.





LEANS FORWARD
ANTICIPATING
HIS MOVE
BACKWARDS and UP-

HIPS START MOVING
HIM OVER and UP.
THEN the
ELBOW LEADS

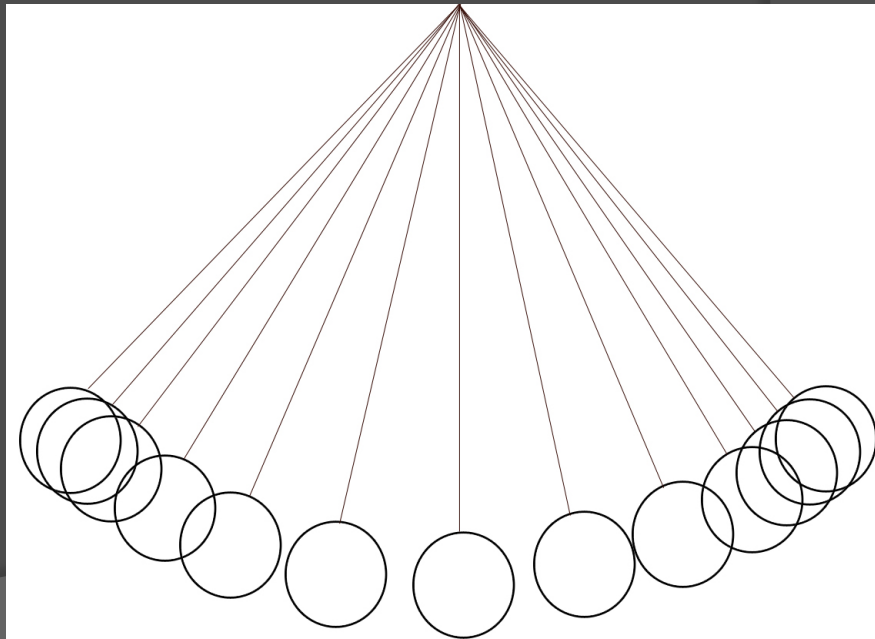
ELBOW BREAKS DOWN
AS HAND CONTINUES UP.
The BODY IS
STARTING DOWN NOW.

BAM!

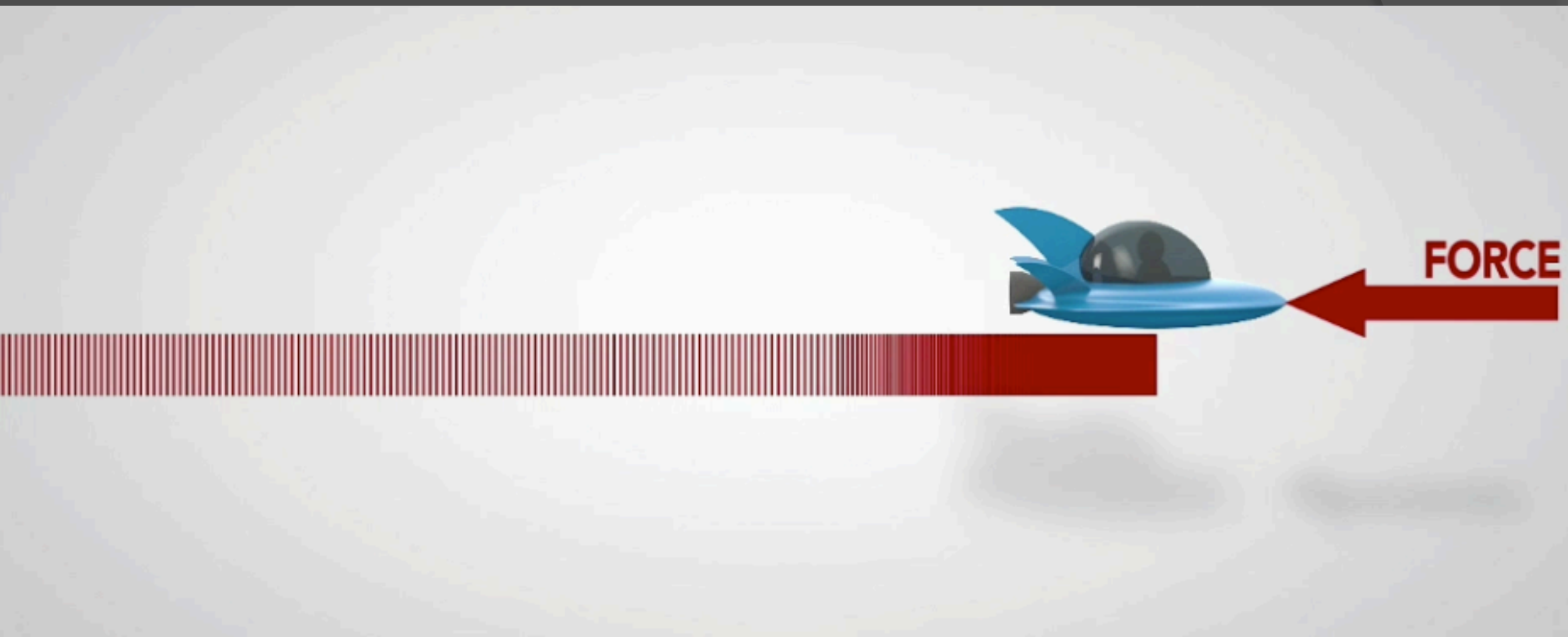
6. Ease In and Ease Out/slow in and slow out.

This is the style or method in which an action begins and terminates.

Slow-ins and slow-outs soften the action, making it appear more life-like.



Ease Out

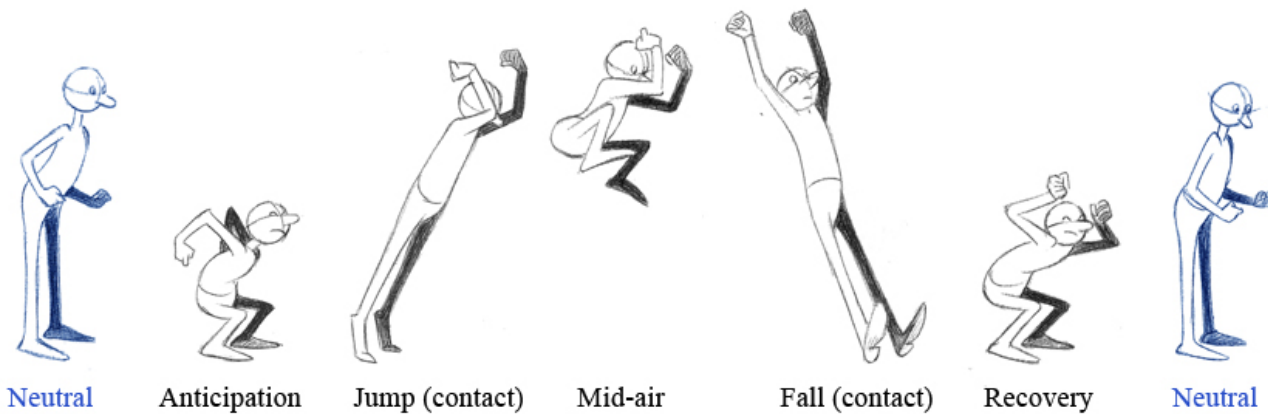


7. ANTICIPATION

This movement prepares the audience for an action the character is about to perform.

Usually the reverse direction of the movement.

- Eg: A dancer does not just leap off the floor. A backwards motion occurs before the forward action is executed.



8. SECONDARY ACTION

Adding secondary actions to the main action gives a scene more life, and can help to support the main action.

The important thing about secondary actions is that they emphasize, rather than take attention away from the main action. If the latter is the case, those actions are better left out.

secondary actions



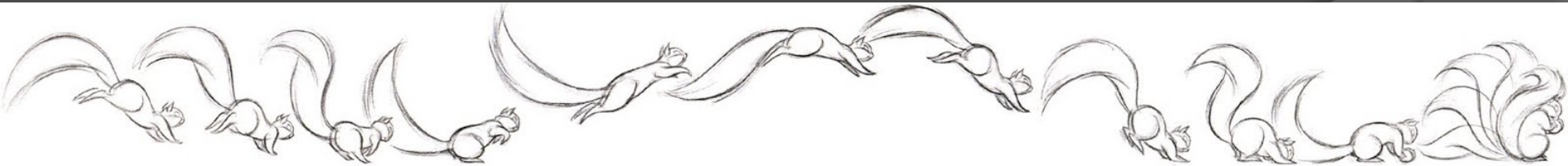
SHOW SECONDARY ACTIONS

NO! I'm not angry at you!

NO! I'm not angry at you!

ANGRY CHOP

for more life and meaning



9. EXAGGERATION

Exaggeration is simply accentuating the essence of an idea through design and action.

It's a purposeful abstraction of facial features, expressions, poses, attitudes and actions.

Use good taste and common sense to keep from becoming too theatrical and excessively animated.



11. Visual Appeal

Appeal is the pleasing and fascinating quality that makes a person enjoy what they are watching.

Appealing animation does not mean being cute and cuddly. All characters have to have appeal whether they are heroic, villainous, comic or cute.

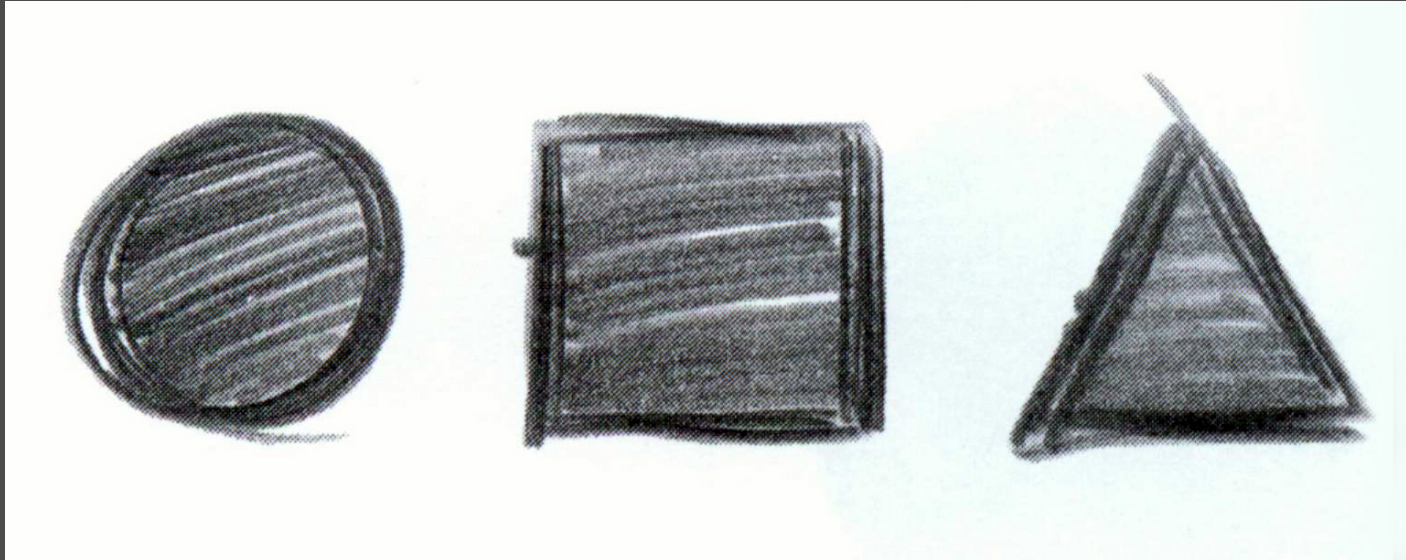
APPEAL

A live performer has charisma.

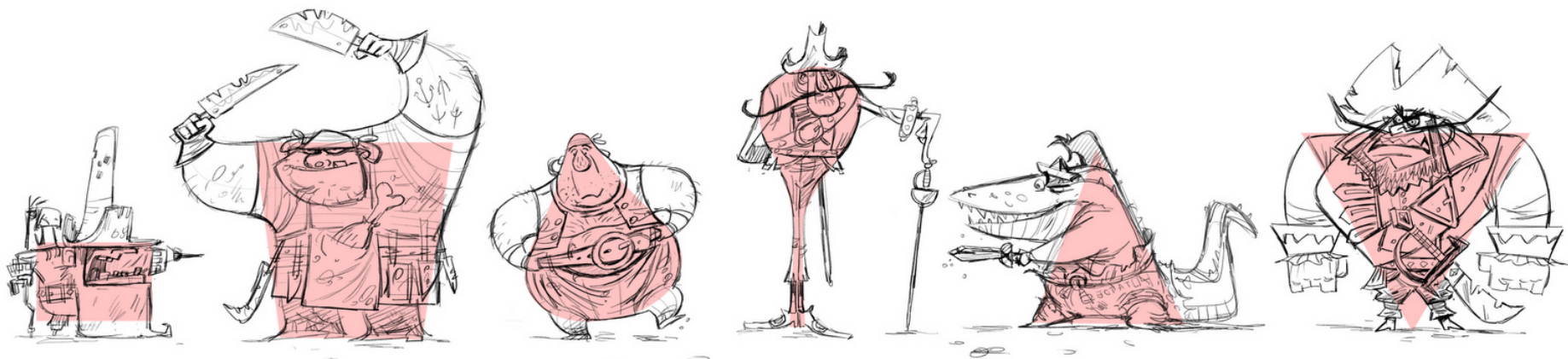
An animated character has appeal.

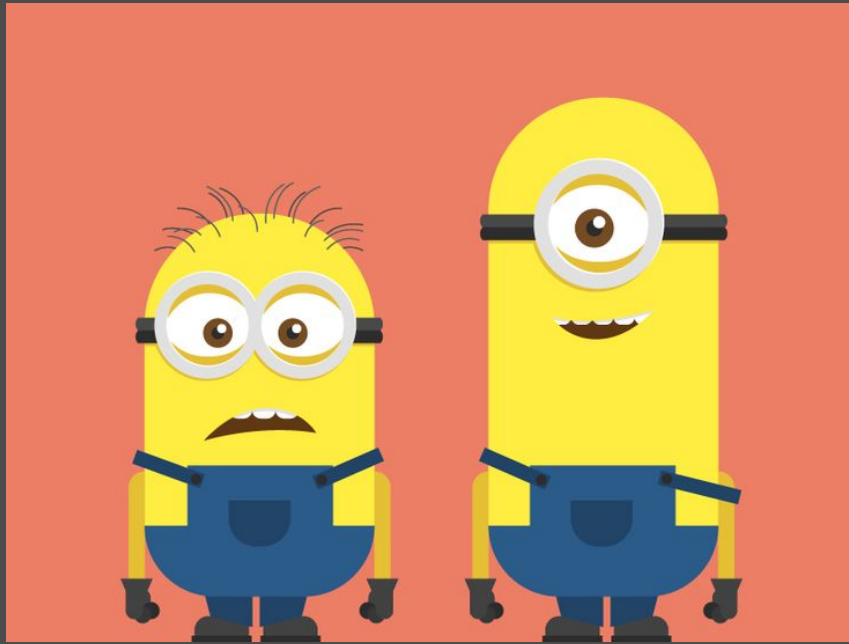
Appeal, as you will use it, includes an easy to read design.

- Pose: Usually not too much mirroring, show attitude, personality
- Push for weight, depth, and balance.
- Clear silhouette



Visual Appeal - Symmetry





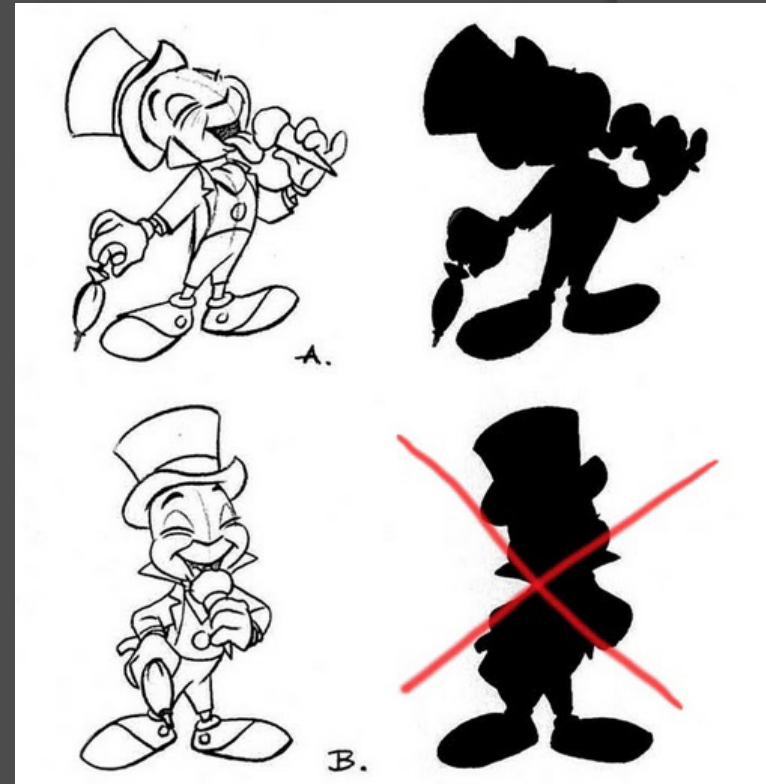


Visual Appeal - Asymmetry

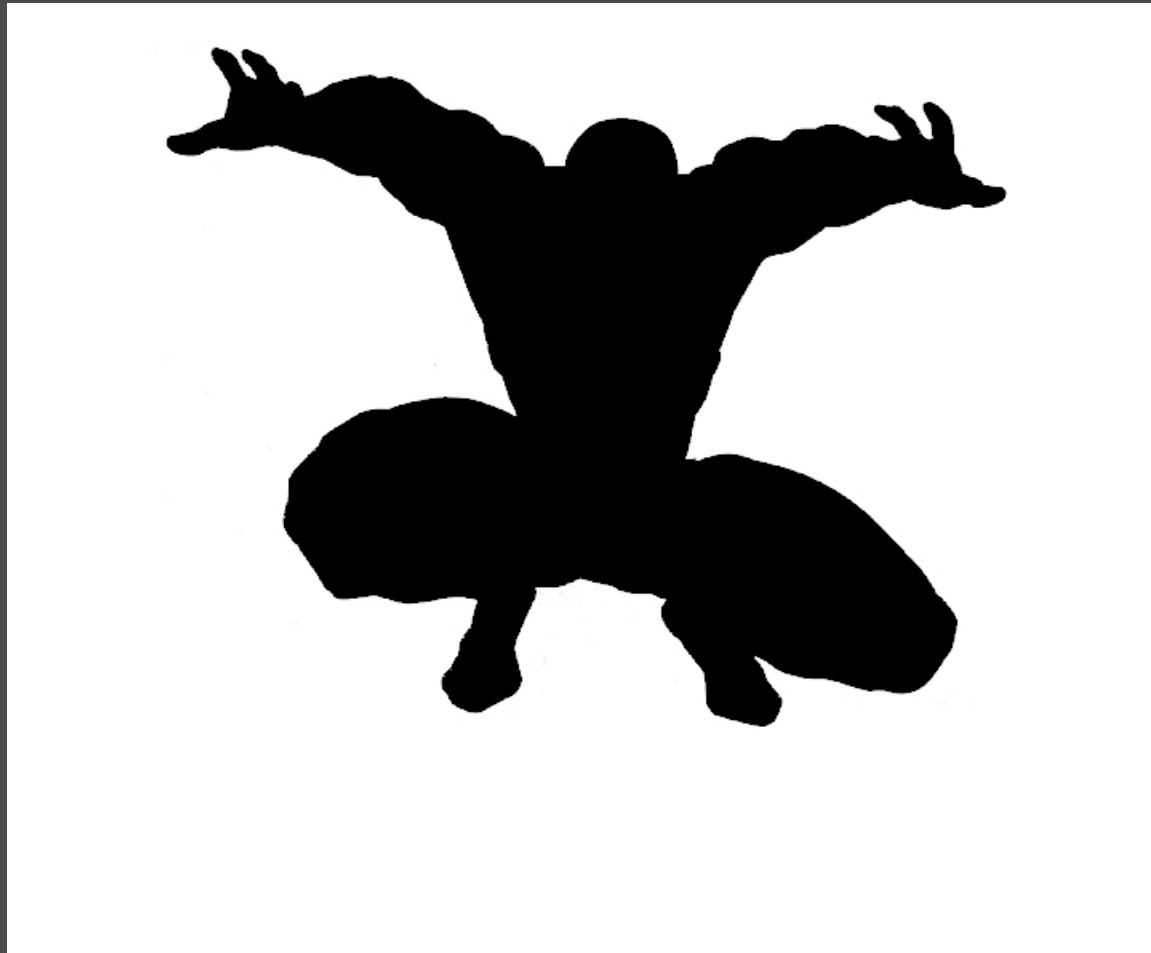


Visual Appeal - Depth

Clarity of Action - Silhouette

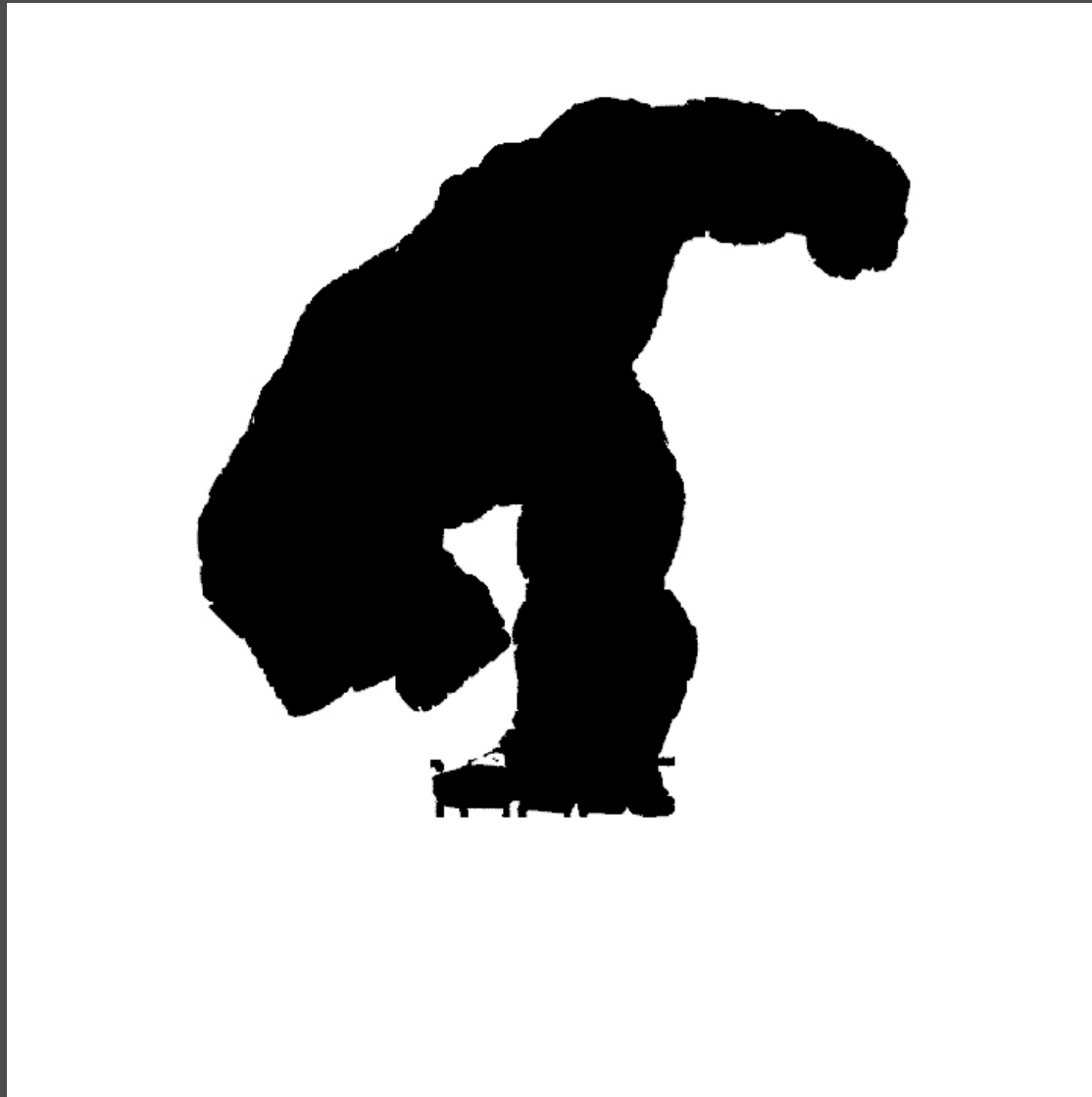


Clarity of Action - Silhouette





Clarity of Action - Silhouette



Clarity of Action - Silhouette



Clarity of Action - Silhouette



Clarity of Action - Silhouette



Clarity of Action - Silhouette

Visual Appeal in style.



Visual Appeal in style.



Visual Appeal in style.



Visual Appeal in style.



12 Staging

Presenting the idea of a scene so that it is **unmistakably** clear.

Staging is achieved through...

- Character Pose
- Composition of Frame
- Using camera or stage clearly directing viewers where to look and when.
- <http://www.youtube.com/watch?v=4Zv9vRz4QYM&feature=related>

XYZ space
in different situation.

- Center of Mass: golf swing
- Center of motion: golf swing
- Center of compact: bouncing ball.

Factors that affect dependence:

Size:

The smaller objects will assume motion

-If both the large and small object move: large objects seem to move slower than smaller objects.



Anthropomorphism: The attribution of human characteristics to non-human things. The illusion of intelligence.

Screening...

