

The Principles of Animation

*"When we consider a new project, we really study it ...
not just the surface idea, but everything about it."*

Walt Disney

1. Squash and Stretch
2. Anticipation
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4. Straight Ahead Action and Pose-to-Pose
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Squash and Stretch (Sometimes called "Squish and Stretch")

When a fixed shape is moved about on the paper from one drawing to the next, there is a marked rigidity that is emphasized by the movement. In real life, this occurs only with the most rigid shapes, such as chairs, dishes, and pans. Anything composed of living flesh, no matter how bony will show considerable movement within its shape in progressing through an action.

The squashed position can show the form either flattened out by pressure or bunched up and pushed together. The stretched position always shows the same form in a very extended condition. The movement from one drawing to the next became the very basis of animation.

Anticipation

The audience watching an animated scene will not be able to understand the events on the screen unless there is a planned sequence of actions, which leads them clearly from one activity to the next. They must be prepared for the next movement and expect it before it actually occurs. This is done by preceding each major action with a specific move that anticipates for the audience what is about to happen.

Anticipation can be as small as a change of expression or as big as the largest physical action. Before a man runs, he crouches low, gathering himself like a spring, or, the reverse, he draws back in the opposite direction, raising his shoulders and one leg, as he aims himself at the place of the next activity.

The anticipatory moves may not show why a character is doing something, but there is no question about what he is doing -- or what he is going to do next. Expecting that, the audience can enjoy the way it is done.

Few movements in real life occur without some kind of anticipation - to the golfer, it is the backswing; to the baseball pitcher, it is the windup.

Staging

Staging is one of the most general of the principles because it covers so many areas and goes back so far in the theater. Its meaning, however is very clear: it is the presentation of any ideas so that it is completely and unmistakably clear. An action is staged so that it is understood, a personality so that it is recognizable, an expression so that it can be seen, a mood so that it will affect the audience.

The most important consideration is always the "story point". If a "spooky" feeling is desired, the scene is filled with the symbols of a spooky situation. An old house, wind howling, leaves or papers rustling through the yard, clouds floating across the moon, threatening sky, bare branches scraping against the window, shadows moving back and forth - all of these things say "spooky". A bright flowerbed would be out of place.

Straight Ahead Action & Pose-to-Pose

There are two main approaches to animation - Straight Ahead Action and Pose to Pose.

Straight Ahead Action works straight ahead from the first drawing of the scene. The animator does one drawing after the other, getting new ideas as he goes along, until he reaches the end of the scene. He knows the story point of the scene and the action that is to be included, but, he has little plan of how it will all be done at the times he starts.

Pose-to-Pose animation relies on the animator planning his action, figuring out what drawings will be needed to animate the action, making the drawings, relating them to each other in size and action, and giving the scene to assistants to draw the inbetweens. Such a scene is always easy to follow and works well

because the relationships have been carefully considered before the animator gets too far into the drawings.

With Pose to Pose, there is clarity and strength, in Straight Ahead Action, there is spontaneity.

Generally, there is a mixture of both types of animation in a film.

Follow Through and Overlapping Action

There are five main types of Follow Through and Overlapping Actions:

1. If a character has any appendages, such as long ears, or a tail, or a big coat, these parts continue to move after the rest of the figure has stopped. The movement of each must be timed so it will have the correct feeling of weight, and it must continue to follow through in a believable way.

2. The body itself does not move all at once, but instead, it stretches, catches up, twists, turns and contracts as the forms work against each other. As one part arrives at the stopping point, others may still be in movement; an arm or hand may continue in action even after the body is in its pose.

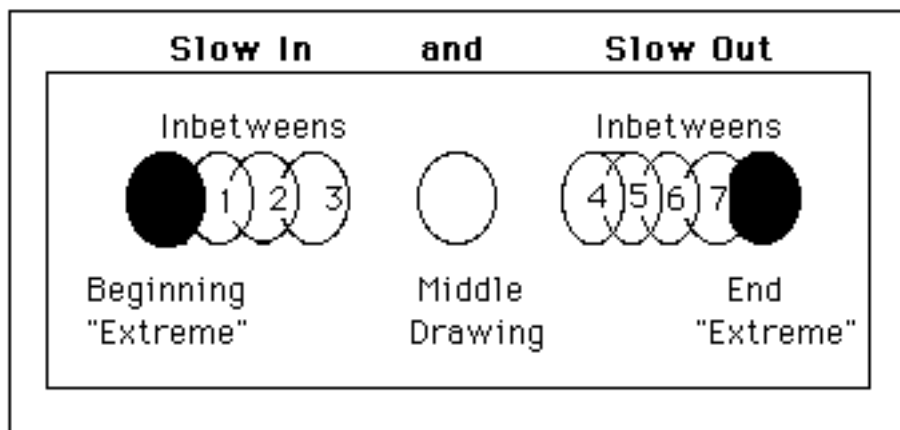
3. The loose flesh on a figure, such as its cheeks, will move at a slower speed than the skeletal parts. This trailing behind in an action is sometimes called "drag" and it gives looseness to the figure that is vital to the feeling of life.

4. The way in which an action is completed often tells us more about the person than the drawings of the movement itself. The anticipation sets up the action we expect, the action whizzes past, and now we come to the "punch line" of the gag, the follow through, which tells us what happened - how it all turned out. Obviously, the ending should be considered part of the entire action before any drawings are made.

5. The Moving Hold uses parts of all the other elements of Overlapping Action and Follow Through to achieve a new feeling of life and clarity. Two drawings are made, one more extreme than the other, yet both containing all of the elements of the pose. The drawing is held without movement on the screen for a few frames, at least 4, maybe as many as 8 - this is to allow the audience time to absorb the attitude. The second drawing is held the same way, thus keeping the illusion of dimension and the flow of action.

Slow In and Slow Out

Once an animator works over his poses (the "Extremes") and redraws them until they are the best he can, he naturally wants the audience to see them. He times these key drawings to move quickly from one to the next, so that the major part of the footage of the scene will be either on or close to those "extremes". By putting the inbetweens close to each extreme and only one fleeting drawing halfway between, the animator achieves a very spirited result, with the character zipping from one attitude to the next. This is called Slow In and Slow Out, because that is the way the inbetweens are times.



Arcs

Most of the moves a living organism makes are non-mechanical (the actions of a woodpecker are an exception). Almost every movement will describe an arc of some kind.

Instead of characters popping up and down like mechanical gadgets on an engine, characters are now "arced" over at the top of their steps, and "arced" under at the bottom position.

Action needs to be plotted out with charts and dots, as well as rough poses, to determine just how high and how low the character should go in any action. Arcs are sketched in, as the key actions are planned, to guide the eventual drawings along this curved path.

Secondary Action

A sad figure wipes a tear as he turns away. Someone stunned shakes his head as he gets to his feet. A flustered person puts on his glasses as he regains his

composure. -- This extra action that supports the main action is called a Secondary Action.

This type of action is a supplementary action - it should not upstage or become more interesting than the primary action. When used correctly, Secondary action will add richness to the scene, naturalness to the action, and a fuller dimension to the personality of the character.

Timing

The number of drawings used in any move determines the amount of time that action will take on the screen. If the drawings are simple, clear, and expressive, the story point can be put over quickly.

If the action is fast and to the point, no inbetweens are needed, however, if the action is slow and drawn out, more inbetweens are needed to convey the timing.

Timing also refers to the number of frames of film to be shot of a single drawing. One exposure is called "ones", two exposures is called "twos". For most normal action, there is no need to make a new drawing for every frame of film. Each drawing can occupy two of the frames, and the audience will never detect it at 24 frames a second. This saves immense amounts of work and in the slower movements gives a smoother appearance to the action. A fast action on "twos" has more sparkle and spirit than the same action with inbetweens.

Exaggeration

Exaggeration is simply taking an emotion and making it more emotional - to take an action and push it almost to distortion - to take something to the extreme.

If a person is sad, make him sadder.

If a car is bouncing, make it really bounce.

If a character is funny, make him funnier. ETC.

Solid Drawing

Does your drawing have weight, depth, and balance? These are the basics of solid, 3-Dimensional drawing.

Drawings should not have "twins" - the unfortunate situation in which both arms or both legs are not only parallel, but also doing exactly the same thing.

Your animated shapes must have volume yet still be flexible. They must be plastic - that is, capable of being shaped or formed, pliable.

Appeal

Appeal does not necessarily mean cutesy and cuddly. Your eye is drawn to the figure that has appeal, and once it is there, it is held while you appreciate what you are seeing. A villain, even though chilling and dramatic, should have appeal; otherwise you will not want to watch what she is doing.

A weak drawing lacks appeal. A drawing that is complicated or hard to read lacks appeal. Poor design, clumsy shapes, awkward moves, are all low on appeal.

Reference: The Illusion of Life: Disney Animation -- by Frank Thomas, Ollie Johnson

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