Disney’s 12 Principles of Animation

(portions of this are from John Lasseter; Pixar - from ACM Computer Graphics, Volume 21, No. 4, July 1987 and from The art of 3D computer animation and effects By Isaac Victor Kerlow)

1. **Squash and stretch**

Used to exaggerate the amount an object deforms usually with the purpose of achieving a more comedic effect. The most important rule to squash and stretch is that, no matter how squashed or stretched out a particular object gets, its volume remains constant. If an object squashed down without its sides stretching, it would appear to shrink; if it stretched up without its sides squeezing in it would appear to grow. Consider the shape and volume of a half filled flour sack when dropped on the floor, it squashed out to its fullest shape. If picked up by the top corners, it stretched out to its longest shape. It never changes volume. The typical example is animating a ball bounce.

2. **Anticipation**

The technique of anticipation helps to guide the audience’s eyes to where the action is about to occur. It is used to direct the attention of the audience to the right part of the screen at the right moment. Anticipation, including motion holds, is great for announcing the surprise. In three-dimensional computer animation it can be fine-tuned using digital time-editing tools such as time sheets, timelines, and curves. More anticipation equals less suspense. Horror films, for example, switch back and forth from lots of anticipation to total surprise.

3. **Staging**

Staging, or mise-en-scene as it is also known, is about translating the mood and intention of a scene into specific character positions and actions. Staging the key character poses in the scene helps to define the nature of the action. Animatics are a great tool for previsualizing and blocking out the staging before the final animation. There are many staging techniques to tell the story visually: hiding or revealing the center of interest, and a chain reaction of actions-reactions are a couple of them. It is important, when staging an action, that only one idea be seen by the audience at a time. If a lot of action is happening at once, the eye does not know where to look and the main idea, the action, will be "upstaged" and overlooked. The object of interest should contrast from the rest of the scene. In a still scene, the eye will be attracted to movement. In a very busy scene, the eye will be attracted to something that is still. Each idea or action must be staged in the strongest and the simplest way before going on to the next idea or action. The animator is saying, in effect, "Look at this, now look at this, and now look at this." Staging can also be aided with contemporary cinematic techniques such as slow motion, frozen time, motion loops, and hand-held camera moves.

4. **Straight Ahead Action and Pose to Pose**

Straight-ahead action and pose-to-pose are two different animation techniques that yield fairly different results. In the early days of hand-drawn animation pose-to-pose action became the standard animation technique because it breaks down structured motion into a series of clearly defined key poses. In straight-ahead action the character moves spontaneously through the action one step at a time until the action is finished.

5. **Follow through and overlapping action**

Follow-through and overlapping action are two techniques that help make the action richer and fuller with detail and subtlety. Follow-through action consists of the reactions of the character after an action, and it usually lets audiences know how he or she feels about what has just happened or is about to happen. In overlapping action multiple motions influence, blend, and overlap the position of the character. In terms of motion graphics, an action should never be brought to a complete stop before starting another action, and the second action should overlap the first. Overlapping maintains a continual flow and continuity between whole phrases of actions.
6. **Slow In and Slow Out**

Slow-in and slow-out consist of slowing down the beginning and the end of an action, while speeding up the middle of it. A snappy effect is achieved when motion is accelerated and retarded in this way. In three-dimensional computer animation slow-ins and slow-outs can be fine-tuned with digital time-editing tools. The inverse variation of this effect, a fast-in and fast-out, is often times seen in TV commercials and music videos where the beginning and end of the sequence are accelerated while the middle is slowed down giving it a surreal or dreamy feeling.

7. **Arcs**

Using arcs to animate the movements of characters and objects helps achieve a natural look because most living creatures move in curved paths, never in perfectly straight lines. Non-arc motion comes across as sinister, restricted or robotic. In motion design arcs, are typically done using Bezier curves.

8. **Secondary Action**

Secondary action consists of the smaller motions that complement the dominant action. Secondary actions are important in heightening interest and adding a realistic complexity to the animation. A secondary actions is always kept subordinate to the primary action if it conflicts, becomes more interesting, or dominates in any way, it is either the wrong choice or is staged improperly. In motion design we can take advantage of layers and effects for building up different secondary motions.

9. **Timing**

Timing is the precise moment and the amount of time that a character spends on an action. Timing adds emotion and intention to the characters’ performance. Most computer animation tools allow us to fine tune the timing by shaving off or adding frames with non-linear time-editing. Proper timing is critical to making ideas readable. It is important to spend enough time (but no more) preparing the audience for: the anticipation of an action; the action itself; and the reaction to the action. If too much time is spent on any of these, the audience’s attention will wander. If too Little time is spent. the movement may be finished before the audience notices it, thus wasting the idea. The faster the movement, the more important it is to make sure the audience can follow what is happening. The action must not be so fast that the audience cannot read it and understand the meaning of it.

10. **Exaggeration**

Exaggeration usually helps characters or objects deliver the essence of an action. A lot of exaggeration can be achieved with squash and stretch. The intensity of a moment can be increased with cinematography and editing, not just with performance. A scene has many components to it the design, the shape of the objects, the action, the emotion, the color, the sound. Exaggeration can work with any component but not in isolation. The exaggeration of the various components should be balanced. If just one thing is exaggerated in an otherwise lifelike scene, it will stick out and seem unrealistic. However, exaggerating everything in a scene can be equally unrealistic to an audience. Some elements must be based in nature, with others exaggerated unnaturally. If there is an element that the audience can recognize, something that seems natural to them, that becomes the ground for comparison of the exaggeration of the other elements, and the whole scene remains very realistic to them.

11. **Solid Drawing**

Solid modeling and rigging, or solid drawing as it was called in the 1930s, emphasizes the clear delineation of shape necessary to bring animated characters to life. Solid and precise modeling helps to convey the weight, depth and balance of the character, and it also simplifies potential production complications due to poorly modeled characters. For motion design this applies to the visual elements of your project.

12. **Appeal**

The word appeal is often misrepresented to suggest cuddly bunnies and soft kittens. It doesn’t: it means anything that a person likes to see: a quality of charm, pleasing design, simplicity, communication, or magnetism. Your eye is drawn to the figure or object that has appeal, and, once there, it is held while you appreciate the object. A weak drawing or design lacks appeal. A design that is complicated or hard to read lacks appeal. Clumsy shapes and awkward moves all have low appeal.