

ANIMATION

Animation creates the illusion of movement by showing a series of drawings, models, or even puppets one after the other quickly. Because our eyes hold onto an image for about 1/10 of a second, when images appear one after another quickly, our brain sees them as moving. In the past, animators drew or painted on **transparent** celluloid sheets, called cels, to take pictures of each frame. Early cartoons used this method, but now, most animations are made with **CGI**.

To make movement look smooth, the speed at which consecutive images appear, known as the **frame rate**, is important. Often, animators show one image for two frames, which means 12 drawings per second for motion, but it might not be very smooth. Films usually use **24 frames per second** for smoother motion.

The process of creating animation can be divided into several key steps, regardless of the specific technique being used. It begins with the *conceptual phase*, where the story, characters, and setting are developed. Before making an animated film, each part is planned with **storyboards**. These are **sketches** and **captions** that outline the film, showing how each second will look. This is because making changes after animation is costly and time-consuming.



Picture 1: Storyboard

The *production phase* then takes over, where the actual animation is created. The final step is *post-production*, where the animated sequences are **edited** together with the sound design, music, and any visual effects to produce the final piece.

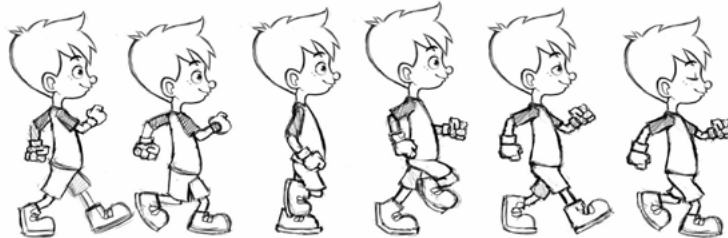
The history of animation

The roots of animation can be traced back to prehistoric cave paintings, where animals were depicted with multiple legs in superimposed positions, suggesting motion. However, the official journey of animation began in the late 19th century. One of the earliest techniques, the phenakistoscope, introduced in 1833, was a spinning disk allowing viewers to see a repeating sequence of animations through small slits.

Fast forward to 1906, the first animated film using hand-drawn images was created. *Humorous Phases of Funny Faces* by J. Stuart Blackton showcased a series of drawings that come to life on a blackboard. However, it was Walt Disney's *Steamboat Willie* in 1928, featuring Mickey Mouse, that truly popularized animation, setting the stage for the golden age of American animation.

Traditional animation

Also called cel animation, this is an old animation style where each frame is drawn by hand on clear plastic sheets called “**cels**.” After drawing and coloring, these cels are photographed or **scanned** and then put together with sound. This method needs a lot of drawings, making it time-consuming and mostly done by big companies. Using cels lets animators avoid redrawing background images by layering different elements on separate cels. Nowadays, computers can do similar tasks, making the process easier. Traditional animation is mostly 2D, like in *Aladdin* or *The Lion King*, though not all 2D animations are traditional.



2D Animation

2D animation can be traditional, like early Disney movies — *Pinocchio*, *Beauty and the Beast*, etc., or **vector-based**, where the motion can be controlled by vectors rather than pixels. Vector-based animation uses mathematical values to resize images, so motion is smooth. They can re-use these creations so the animator doesn’t need to keep drawing the same characters over and over again. You can move around these vectors and animate that way..

Computer-Generated Imagery (CGI)

Revolutionizing the industry, CGI uses digital software to create animations. From Pixar’s *Toy Story*, the first fully computer-animated feature film, to the stunning visuals of *Frozen*, CGI allows for complex animations that were unimaginable with earlier techniques. Even though it uses computers, it’s still a detailed process. Animators build 3D models of characters and scenes, which can be viewed from any angle. It can also create realistic effects for live-action movies.

Stop Motion

Stop motion includes various techniques like **claymation** and **cutout animation**. It’s like making a **flipbook** but with physical objects. Films like *Wallace and Gromit* and *The Nightmare Before Christmas* are examples of stop motion. This method has evolved from using film cameras to special video machines that help animators see their work in progress.

Motion Capture

It is commonly used in the film and video game industries to create realistic animations of humans or creatures by capturing the performance of a person wearing a motion capture suit. These suits have markers or sensors that track the performer’s movements, which are then translated into digital models to animate characters in movies, video games, or any 3D environment. Movies like *Avatar* and video games such as *The Last of Us Part II* showcase the realistic animations achieved with motion capture.

Motion Graphics

Motion graphics are digital animations that seem to move, often used in ads or movie titles. They usually include text and are meant to communicate something to the viewer, often seen in business contexts. These animations are typically used in advertising, film opening titles, web animations, and informational videos.

EXERCISES

1. Answer the questions.

- What does CGI stand for, and how is it used in animation?
- What materials are used in different animation techniques?
- How are frames shown in animation?
- Describe the basic steps of stop motion animation. Name one modern film that used stop motion animation.
- Can you name different animation types seen in daily life?

2. Explain the following words.

| | |
|-------------|--------------|
| sequence | cel |
| transparent | vector-based |
| frame rate | claymation |
| storyboard | pixilation |
| sketch | cutout |
| caption | flipbook |

3. Mark the following statements True or False.

- *Steamboat Willie* was the first animation to feature Mickey Mouse.
- Stop motion animation involves drawing each frame by hand.
- Motion capture is a technique used to create lifelike animations by recording human movements.