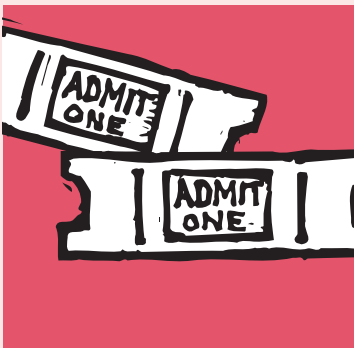
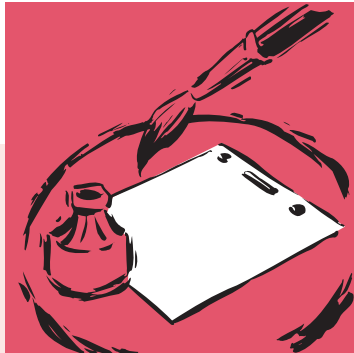


ANIMATION:

CREATING MOVEMENT FRAME *by* FRAME



DEAR EDUCATOR:

Young Minds Inspired, in cooperation with the Academy of Motion Picture Arts and Sciences, is proud to present this newest addition to our series of study guides that focus on different branches of the Academy. In this guide, students will learn about animation. The kit has been designed for students in high school English, language arts, visual arts and communications courses. The activities capitalize on students' natural interest in current films and the excitement generated by the Academy Awards®. They are designed to teach valuable lessons in critical thinking.

The Academy, organized in 1927, is a professional honorary organization composed of more than 6,000 motion picture craftsmen and women. Its purposes include advancing the art and science of motion pictures, promoting cooperation among creative leaders for cultural, educational and technological progress; recognizing outstanding achievements; and fostering educational activities between the professional community and the public. Academy members are the people who create movies—the cream of the industry's actors, animators, art directors, cinematographers, costume designers, directors, film editors, documentarians, make-up artists, composers, producers, sound- and visual-effects experts and writers.

Please share this material with other teachers in your school. Although the material is copyrighted, you may make as many photocopies as necessary to meet your students' needs.

To ensure that you receive future mailings, please contact Randy Haberkamp at rhaberkamp@oscars.org. Also, feel free to e-mail us at feedback@ymiclassroom.com to comment about the program at any time. We welcome your thoughts and suggestions.

Sincerely,

Roberta Nusim, Publisher



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TEACHER'S RESOURCE GUIDE



PROGRAM COMPONENTS

1. This instructional guide
2. Four student activity masters in English and Spanish
3. A four-color wall poster for classroom display
4. A response card for teacher comments

TARGET AUDIENCE

This program has been designed for students in secondary school English, language arts, visual arts, and communications courses.

PROGRAM OBJECTIVES

1. To enhance student interest in and knowledge about the motion picture development and production process
2. To encourage students to use critical thinking as they learn how animators work
3. To engage students in an exploration of film as an art form and a medium of communication
4. To help students become more visually literate

INTRODUCTION

ABOUT THE ACADEMY AND ITS AWARDS

The first Academy Awards were handed out on May 16, 1929, not long after the advent of “talkies.” By 1930, enthusiasm for the ceremonies was so great that a Los Angeles radio station did a live, one-hour broadcast, and the Awards have enjoyed broadcast coverage ever since. The number and types of awards have grown and changed over the years to keep up with the development of the motion picture industry. Awards of Merit—Oscars—are presented in each (or in subdivisions) of the following categories: acting, animation, art direction, cinematography, costume design, directing, documentary film, film editing, foreign language film, make-up, music, best picture, short film, sound, visual effects, and writing. In an age when awards shows seem as common as nightly news programs, the Academy Awards are unique because the judges—the approximately 6,000 Academy members—are the top filmmakers from around the world. The question, “Who gets the Oscar?” is decided by a true jury of peers. The awards process provides a wonderful opportunity to teach your students about the many craft areas and the many communications techniques that play a part in creating a motion picture. Filmmaking is by nature a collaborative process, with each creative area supporting and being supported by the others. Because our space is limited, this kit focuses on just one of those areas—animation.

SELECTING FILMS FOR STUDENT VIEWING

Students may select the films they wish to view for the following activities, or you may wish to suggest films that are appropriate.

The following animated feature films have won Academy Awards, are available on DVD and may be appropriate for your students: *Snow White and the Seven*

Dwarfs (1937), *Fantasia* (1941), *Who Framed Roger Rabbit* (1988), *Toy Story* (1995), *Shrek* (2001), *Spirited Away* (2002), *Finding Nemo* (2003), *Wallace & Gromit in The Curse of the Were-Rabbit* (2005), *Happy Feet* (2006), *WALL-E* (2008), and *Up* (2009).

Other animated features that have been nominated for Academy Awards and are available on DVD include: *Beauty and the Beast* (1991), *Ice Age* (2002), *Jimmy Neutron: Boy Genius* (2001), *Monsters, Inc.* (2001), *Lilo & Stitch* (2002), *Spirit: Stallion of the Cimarron* (2002), *Treasure Planet* (2002), *The Triplets of Belleville* (2003), *Howl’s Moving Castle* (2005), *Persepolis* (2007), *Bolt* (2008), *Coraline* (2009), *Fantastic Mr. Fox* (2009), and *The Secret of Kells* (2009).

Academy Award-nominated and winning short films available on DVD include: *Walking* (1969), *The Crunch Bird* (1971), *Closed Mondays* (1974), *The Street* (1976), *The Sand Castle* (1977), *Crac* (1981), *Luxo Jr.* (1986), *The Man Who Planted Trees* (1987), *Creature Comforts* (1990), *A Close Shave* (1995), *La Maison en Petits Cubes* (2008), and *Logorama* (2009).

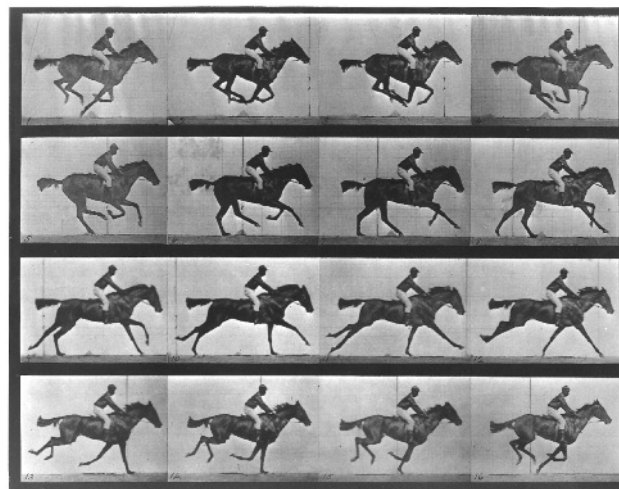
Additional animated films that may be suitable for your students including the features: *Alice in Wonderland* (1951), *Sleeping Beauty* (1959), *The Nightmare before Christmas* (1993), *Princess Mononoke* (1997), *The Iron Giant* (1999), *Chicken Run* (2000), and *Waltz with Bashir* (2008); and the short films *Neighbours* (1952), *Pas de Deux* (1968), *Mindscape* (1976), *Guard Dog* (2004), and *Oktapodi* (2008).

ACTIVITY ONE

The ORIGINS of ANIMATION



From the beginning, animation has been an important part of film history. Even before the invention of the motion picture camera, photographer Eadweard Muybridge used sequential photographs to analyze animal and human movement. Early 19th century mechanical devices such as the thaumatrope, praxinoscope and zoetrope anticipated motion picture animation by quickly flashing a calibrated sequence of still



Eadweard Muybridge Motion Study Circa 1872

pictures past the viewer. These devices took advantage of a phenomenon called “persistence of vision” in which the brain reads a rapid series of images as an unbroken movement. Animated films work on the same principle. Each frame of an animated film is a separate still picture, individually exposed. Drawings or props are moved slightly between exposures, creating an illusion of movement when the film is projected.

In 1892, Émile Reynaud opened his popular Théâtre Optique in Paris, where he projected films that had been drawn directly on transparent celluloid, a technique that would not be used again until the 1930s. The “trick-films” of Parisian magician Georges Méliès mixed stop-motion and single-frame photography with live-action film for magical effect. By the early 20th century, animators such as J. Stuart Blackton and Winsor McCay in the U.S. and Émile Cohl in France were making animated films composed entirely of drawings. Brothers Max and Dave Fleischer, creators of Betty Boop, patented the rotoscope in 1917, enabling animators to copy the movement of live action by tracing filmed live-action images frame by frame.

Raoul Barré and Bill Nolan opened the first animation studio in New York in 1914. Soon studios in New York, California and elsewhere were producing short films that screened in theaters before the main feature. Over the next few decades, cartoon series flourished, featuring popular characters such as Felix the Cat, Disney’s Mickey Mouse, Walter Lantz’s Woody Woodpecker and Warner Bros.’

Bugs Bunny and Wile E. Coyote. In the 1940s, George Pal’s Puppatoons represented one of the few examples of commercial animation using three-dimensional materials.

In 1923, Walt and Roy Disney, Ub Iwerks, and other animators formed a company that would dominate animation for many years. Not only did the studio’s animators produce finely drawn films, but they emphasized unique, specific characters and movement that revealed the characters’ personalities. The Disney studio produced *Steamboat Willie* (1928), the first cartoon to synchronize sound with movement, and the short three-color Technicolor film *Flowers and Trees*, which won the first Oscar for animation in 1932. In 1938, *Snow White and the Seven Dwarfs*, the first American feature-length animated film, received a Special Academy Award for significant screen innovation. More than half a century later, the Walt Disney Company was still breaking new ground: 1991’s *Beauty and the Beast* was nominated for Best Picture alongside four live-action films, a feat that was repeated in 2009, when the Disney Pixar animated film *Up* was one of ten Best Picture nominees. In 1995, Disney released the Pixar production *Toy Story*, the first feature-length computer-animated film, which the Academy honored with a special award to its creator John Lasseter.

Animated and live-action films have in common such basic film devices as scripts, camera moves, close-ups and long shots. Although many people think of animation as limited to fantasy or to children’s

stories, it’s also an effective technique for filmmakers dealing with more complex, adult issues and themes. The 2008 animated feature *Waltz with Bashir*, for example, uses animation to explore soldiers’ suppressed memories of events in the Middle East. What ultimately separates animated and live-action techniques (though the two are often combined in the current age of computer-generated imagery) are the different ways they are put on film. In live-action films, the camera captures an action in continuous time, as events unfold, although the film’s editor may later change the continuity. In an animated film, however, it is the camera that creates the movement, frame by frame, and each step is carefully planned before filming begins.

Students can practice several animation techniques as well as demonstrate persistence of vision by making a flipbook. Review the animation terms for this activity. The beginning, middle, and ending drawings of a flipbook are similar to what animators call “extremes” or “key frames” and the drawings that link them could be considered “inbetweens.” By stacking index cards and using a metal clip to fasten them or by using a pad of paper, the student will make a simple type of registration system, similar to that traditionally used by animators to keep their drawings lined up properly. Each page is comparable to a frame of an animated film; flipping the pages is similar to the action of a projector.

Have the students begin their flipbooks by thinking of an action they would like to animate. The action should have a beginning, middle, and end. The image can be as simple as a growing flower or a circle that mutates into a square and then back into a circle, or as elaborate as the student’s talent or interest allows. Using a pad of heavy paper (small sizes work better) or a stack of index cards, have your students draw their starting image in pencil at the bottom of the last page. They should draw a sequence of at least 24 visuals, which is equal to one second of screen time, changing the

drawing slightly on each page. If they like, they can color or shade their images. The more each drawing resembles the one preceding it, the smoother the action will appear when the book is flipped. Have your students remove every other image from their books and flip again, noting the difference. Ask them to discuss the ways in which a flipbook is similar to an animated film, using some of the criteria presented above.

SUPPLEMENTARY ACTIVITY: If you have access to a DVD player that can freeze frames, show a sequence from a selected animated film to your students, advancing the action one frame at a time. Have the students identify the extremes of the sequence and consider the way the drawings progress from the beginning point to the ending point.

ACTIVITY TWO

DRAWING MOVEMENT

The development of cel animation greatly simplified the animator’s task. Working on transparent celluloid or acetate sheets called “cels” freed the animator from repeatedly drawing the same image and made it unnecessary to redraw background images. Separate elements of the drawing could be placed on individual cels and then assembled in layers of

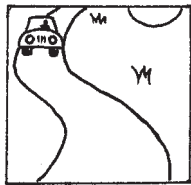


Walter Lantz in his studio.

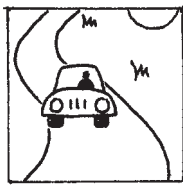
two or three for the camera. For example, if one scene showed only a moving arm, the animator might draw the body on one cel and each progressive arm movement on additional cels. Then the various movements could be inserted on the same body visual in subsequent scenes. Cels also enabled the animator to include more detail in the characters and background, as one drawing could be used multiple times without recopying. Today, similar functions can be performed using a computer.

PART A. As hand-drawn animated films became longer and more elaborate, an assembly line of sorts developed in the studios. Certain animators specialize in backgrounds, while others design and draw the extremes. “Inbetweeners” then complete the numerous drawings that connect the two extremes. Other animators fill in the colors, clean up the drawings, and apply special effects such as fire, smoke, water, shadows, and lighting.

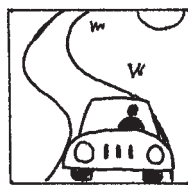
The boxes on the activity sheet represent frames in an animated film. In the first row, the beginning and ending “extremes” of an action are shown. It takes planning to get to the right position at the right time. Thought, as well as imagination, is required to make something move in a believable way. To illustrate the process, have your students use the middle five boxes on that page to take the action from its beginning to its end. Check that the midpoint of the movement occurs in the middle box.



First box

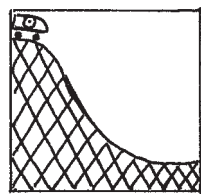


Middle box

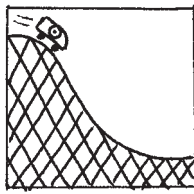


Final box

Next, in the second row, have your students complete the action shown in the first two boxes. Ask them to consider different ways of visualizing movement. For example, they might act out a possible sequence, or they might observe a similar action in real life. Have them change one element of the series and discuss how that change affects the outcome or the mood. Then have them add a special effect.



First box



Second box

SUPPLEMENTARY ACTIVITY: Have your students analyze the scene they have just drawn to determine how many different cels would be needed to film it. These might include a background cel, cels for the changing

positions of the characters or objects, and a cel for a special effect such as weather, shadows or reflections. Ask them to consider what cels would have to be added or changed for the actions to take place and what cels would remain the same throughout the scene. Then have them make cels on sheets of acetate or tracing paper and experiment with exchanging them to create new scenes.

PART B. Like painters, animators use perspective and scale to create depth, and color to enhance mood, but most of the visual information in an animated film is transmitted through movement. Before animating a scene, animators study the way their subjects move, whether they are animals, people or leafy trees. Although the movements they draw are based on real life, animators often caricature or exaggerate both movement and design. Animated characters, like human actors, express themselves with gestures, mannerisms, posture and facial expressions as well as voice. A tilted head can indicate surprise. A body slanted forward suggests speed. A character freezes at a scary sound. Background movement also conveys meaning. The gentle flutter of leaves signals a breeze, but when the leaves toss and turn, it could mean a storm is coming.

Animators use the term “squash and stretch” to describe the effect of gravity on living creatures and pliable material. Racing after the Road Runner, Wile E. Coyote flies off a cliff and plummets downward. His body smashes into the ground (squash) and then elongates into a bounce (stretch). In this instance, the deformation is used for comic effect, but in more realistic situations squash and stretch lend weight to characters and make expressions such as smiles or frowns convincing.

Choosing the right look for a character is important for creating its personality. A “cute” character might be drawn with characteristics that resemble a human baby’s, such as a large head, small body, high forehead, big eyes and short, plump arms and legs. A bully, on the other hand, might have a small head, a thick or nonexistent neck, a big chest, and short legs. Exaggerated features and a quirky posture could indicate a comic character. The animator can also use these traits to ridicule stereotypes. The mutant toys in *Toy Story*, for example, turn out to be selfless and helpful, not dangerous as they first seem to be. Handsome Gaston in *Beauty and the Beast* is also egotistical and mean.

Discuss with your students what animator Norman McLaren meant by the statement, “Animation is not the art of drawings-that-move but rather the art of movements-that-are-drawn.” Have them think of an emotion such as anger, fear, happiness, or surprise and act it out in front of a mirror or the class. Ask them to describe the facial and body movements that communicated the emotion and explain why some people consider animators the actors of an animated film.

SUPPLEMENTARY ACTIVITY: Show your students an animated sequence and ask them to describe the characters’ personalities and to list the ways in which they



are revealed. Some suggestions are: the opening sequence of *Spirited Away*, the scene in which WALL-E meets EVE in *WALL-E*, the sequence in *Bolt* when Bolt and Mittens meet Rhino, and the short *Luxo Jr.* You might also have your students compare the enchanted objects in *Beauty and the Beast* with their human manifestations. How do the animators give the same personality to each? In contrast, how do the animators of *Coraline* show the differences between Coraline's real parents and her "other" parents?

ACTIVITY THREE IMAGINING ACTION

Cel animation is the most familiar type of animation, but a good animator can bring clay models, sand, paper, puppets, or pins to life. Shapes or figures are cut out and photographed against a backlight for silhouette animation or arranged and shot from above to create collage animation. A more three-dimensional effect can be achieved by using stop-motion photography to animate movable figures made of clay, wood, or other materials.

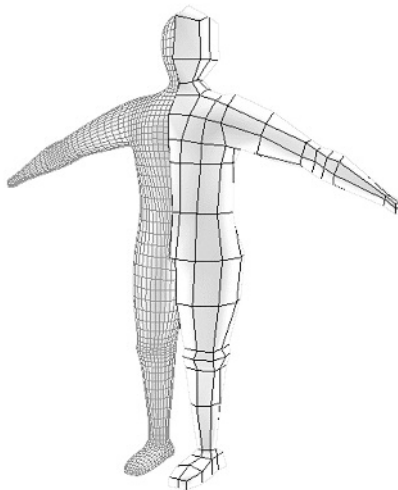
In the two types of animation called "time-lapse photography" and "pixilation," a camera is set to snap one frame at regular intervals. Time-lapse compresses time, reducing the blooming of a flower, for instance, to a few seconds of screen time. Pixilation works in a similar manner, but with actors performing in real time. When the film is played back, the action appears jerky, something like an old silent movie when it is projected at the speed of sound movies.

Animated films can also be made by drawing or scratching directly on the film, painting scenes on glass, moving wire-thin black pins on a white pinboard or even by using the photocopying machine.

No matter what the material, each step of an animated film is worked out beforehand on storyboards, a representation of a film in outline form, using sketches, small drawings, and captions. Since every second of a typical animated film involves 12 to 24 changes (more than 50,000 visuals for a 70-minute film), it is too expensive and time-consuming to complete an entire animation sequence and then scrap it. Even if the animator is not telling a story but has an abstract design in mind, he or she plans in detail the progression of images and how they can be combined to achieve the desired effect. The storyboard is an indispensable tool for the animator and is revised often.

Comic strips, with their captions, close-ups, long shots, and other storytelling techniques, are similar to storyboards and can help your students understand

the format. Encourage them to study comic strips or graphic novels to learn the components of visual storytelling. Discuss the way pacing, dialogue, color, line, shape, and composition create moods, convey emotion and move the story forward. Consider the way movement is depicted in a still drawing. Then have students storyboard the key moments in a sequence from one of their own stories or from a selected animated film, using some of the techniques they have studied.



Computer-Generated Image Model

SUPPLEMENTARY ACTIVITY:

Show students a sequence or short film made without the use of cels. Some suggestions from the list at the beginning of this teacher's guide are *Crac* (pastel-on-paper drawings), *Closed Mondays*, *Creature Comforts*, *A Close Shave*, and *Wallace & Gromit in*

The Curse of the Were-Rabbit (all four done in clay), *The Street* (washes of watercolor and ink), *The Sand Castle* (sand), *Mindscape* (pinboard), *Neighbours* (pixilation), *Pas de Deux* (optical printing), and *Coraline* and *Fantastic Mr. Fox* (stop-motion puppets). Have students create a short animated film using an alternative medium like one of the above, or by using puppets, dolls, silhouettes, shadows, or construction paper.

ACTIVITY FOUR MOVEMENT *in* THREE DIMENSIONS

Using computer generated imagery (CGI), an animator can reproduce the three-dimensional effects of stop-motion photography or the two-dimensional effects of hand-drawn animation. Instead of pen and ink, paint, clay, paper, or cels, computer animators use a monitor, computer tools, and software that includes complex mathematical formulas. Rather than sketching out characters and objects like traditional animators, computer animators build a three-dimensional "model" that can be viewed from different angles. CGI can imitate camera moves and angles that would be difficult or impossible to achieve with traditional cel animation: the swoop from the chandelier to the dancing couple in the ballroom scene of *Beauty and the Beast*, for example. Because of its ability to mimic reality, CGI is also used to produce special effects in live-action films. CGI can create digital tears or blood, embellish backgrounds and sets, make a small crowd seem large, or touch up the actors' wrinkles and flaws.

The 1982 film *Tron*, which combined live action with animation, was the first film to use CGI on a large scale. When the Academy instituted the Best Animated Feature Film award in 2001, the first

Oscar went to the CGI-animated film *Shrek*. Early computer graphics looked unappealingly flat, but recent improvements in technology make it possible to create more realistic surfaces. The most difficult task facing the special effects animators who created the character Gollum for the live-action film *The Lord of the Rings: The Two Towers* was developing new computer codes to provide the creature with translucent, lifelike skin.

Having the use of a computer does not necessarily mean less work for the animator. It took four years to complete *Toy Story*, the first completely CGI-animated feature; coincidentally, it took the same amount of time for the Disney studio to finish *Snow White and the Seven Dwarfs*. CGI may never completely replace traditional animation, because some animators still prefer the latter's personal touch and slight irregularities. For others, using CGI can be compared to using a word processor instead of a typewriter for writing, in that the new tool allows the animator to manipulate ideas and images with greater freedom.

CGI and stop-motion animated films are sometimes also referred to as 3D films because those techniques create a more lifelike illusion of three-dimensional characters and backgrounds. Many animated features are now stereoscopic films – films with 3D effects. Through the use of digital equipment, specially designed movie screens and polarized lenses, viewers are fooled into experiencing a movie as a three-dimensional space rather than as images on a flat screen.

PART A. Have your students compare hand-drawn or stop-motion animation to CGI animation, using selections from the following groups of films. *Snow White and the Seven Dwarfs*, *Lilo & Stitch*, *The Secret of Kells*, and *Fantasia* employ hand-drawn cel animation. *Coraline* and *Fantastic Mr. Fox* use stop-motion photography. *Happy Feet* and *Up* use CGI animations. You may also have them compare different scenes within a particular animated film. Most of *Beauty and the Beast* was drawn on cels, but the ballroom scene is a good example of early computer animation. CGI was used to create the stampede scene in *The Lion King*, an otherwise hand-drawn film. Ask your students if they notice differences between CGI and traditional animation. Have them consider why animators might choose a traditional method of animation if CGI animation can duplicate traditional effects.

PART B. Each year, an outstanding array of new animated films is released. Some are especially appropriate for families, some are appealing to teens, and some are geared toward adult audiences. If you or the parents of your students feel that some, or even all of this year's nominated films might be inappropriate for viewing by young people, you can modify this activity. Ask your students to view one of the films nominated for achievement in animation and analyze it in terms of how its storytelling, character development, and animation contributed to the total effect of the film. Students may also view Academy Award-nominated and -winning films from past years to complete the exercises. A list of those films appears at the beginning of this teacher's guide.

ACADEMY OF MOTION PICTURE ARTS AND SCIENCES



ADDITIONAL RESOURCES

- Acting for Animators: A Complete Guide to Performance Animation – Revised Edition*, by Ed Hooks. Heinemann, 2003.
- The Animation Book: A Complete Guide to Animated Filmmaking from Flip-Books to Sound Cartoons to 3-D Animation – New Digital Edition*, by Kit Laybourne. Crown, 1998.
- Animation from Pencils to Pixels: Classical Techniques for the Digital Animator*, by Tony White. Focal, 2006.
- Animation: From Script to Screen*, by Shamus Culhane. St. Martin's, 1988.
- The Animator's Survival Kit – Expanded Edition*, by Richard Williams. Faber and Faber, 2009.
- Blue Sky: The Art of Computer Animation Featuring Ice Age and Bunny*, by Peter Weishar. Harry N. Abrams, 2002.
- Chuck Amuck: The Life and Times of an Animated Cartoonist*, by Chuck Jones. Farrar, Straus and Giroux, 1989.
- Clay Animation: American Highlights 1908 to the Present*, by Michael Frierson. Twayne, 1994.
- Muybridge's Complete Human and Animal Locomotion*, by Eadweard Muybridge. Dover Books, 1979.
- Cracking Animation: The Aardman Book of 3-D Animation*, by Peter Lord, and Brian Sibley. Thames & Hudson, 2010.
- The History of Animation: Enchanted Drawings*, by Charles Solomon. Wings Books, 1994.
- The Illusion of Life: Disney Animation*, by Frank Thomas and Ollie Johnston. Hyperion, 1995.
- Of Mice and Magic: A History of American Animated Cartoons – Revised Edition*, by Leonard Maltin. New American Library, 1987.
- Toy Story: The Art and Making of the Animated Film*, by John Lasseter and Steve Daly. Hyperion, 1995.

SOURCES FOR SHORT ANIMATED FILMS

DVDs:

- Leonard Maltin's Animation Favorites from the National Film Board of Canada includes *Mindscape* and *Pas de Deux* (only available on VHS)
- Collection of 2005 Academy Award Nominated Short Films (also released in 2006 and 2007)
- Pixar Short Films Collection, includes *Luxo Jr.*, *Geri's Game* and *Lifted*
- And the Winner is (Oscar Winning and Nominated Short Films from the National Film Board of Canada), includes *The Danish Poet*, *Ryan*, *Walking*, and *My Grandmother Ironed the King's Shirts*.

WEB SITES:

- www.oscars.org for more information about the Academy of Motion Picture Arts and Sciences.
- www.filmeducation.org for teaching resources, free education packets and additional reading from the British Film Institute.
- memory.loc.gov/ammem/oahtml/oahtml.html Includes samples of very early animated films on repository at the Library of Congress that can be viewed on the computer.
- www.nfb.ca/nfbstore National Film Board of Canada films *Mindscape*, *Neighbours*, *Pas de Deux*, *The Sand Castle*, *The Street* and *Walking*
- www.aardman.com *Creature Comforts*, *A Close Shave* and *Wallace & Gromit in The Curse of the Were-Rabbit*. This site also has pictures and information about making stop-motion animated films.
- www.youtube.com
- www.filmposium.com
- www.ymiclassroom.com

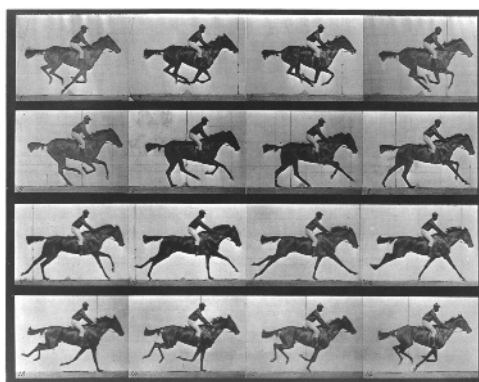


The ORIGINS of ANIMATION

The earliest animation used mechanical devices such as the praxinoscope, the thaumatrope, and the zoetrope instead of film. After the invention of the movie camera, filmmakers such as Georges Méliès in Paris and J. Stuart Blackton in New York mixed animation with live-action film for magical effect. In 1906, Blackton made the first completely hand-drawn animated film, *Humorous Phases of Funny Faces*. In 1914, Raoul Barré and Bill Nolan built the first studio devoted to animated films. Winsor McCay took animation a step further with the creation of “Gertie the Dinosaur.” He became one of the first animators to use a distinctive style of movement to express an animated character’s personality. Then in 1922, a group of animators headed by Walt Disney opened a studio in California that would influence animated filmmaking for decades, producing such works as *Steamboat Willie* (1928), *Flowers and Trees*—which won the first Oscar for Cartoon Short Subject in 1931/32—*Snow White and the Seven Dwarfs* (1937), *Beauty and the Beast* (1991), and *The Lion King* (1994).

All animation, whether mechanical, on

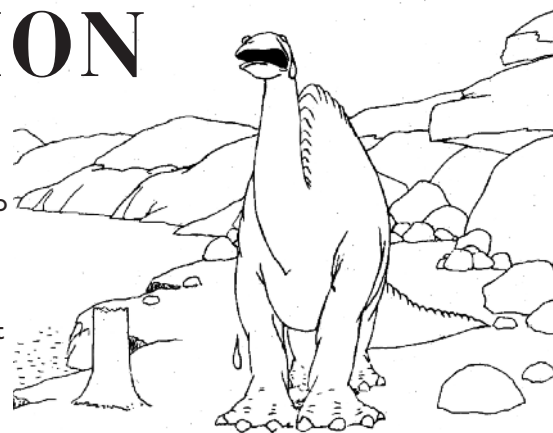
film, or in a digital format, works because the human brain perceives a quickly moving sequence of still images as continuous action. This is called “persistence of vision.” Animated films are assembled one “frame” at a time, each frame or exposure representing a tiny change in the character or scene being animated. When the film is projected, the drawings appear to move. For traditional movies, 24 frames add up to one second of viewing time when projected.



Eadweard Muybridge Motion Study Circa 1872

Think of an object or action you would like to animate. Begin your flipbook by drawing the first image on the last page of a pad of paper or a stack of index cards.

On the next page, trace over the drawing, changing it slightly each time until you have completed at least 24 pages. Think of each page as a frame of film. When you have completed the drawings, you can darken the lines with black ink, and color or shade the figures. Hold the book together at the top and flip the pages from back to front to see your image move.



Gertie the Dinosaur (1914)

What happens when you flip the pages slowly?

How does the movement change when you remove some of the pages?

What happens if you mix up the pages?

How is your flipbook similar to an animated film?

BASIC ANIMATION TERMS

FRAME: One exposure on the filmstrip. There are sixteen frames in each foot of film and twenty-four frames per second of running time on the screen.

LIVE ACTION: A motion picture of real people and things, filmed in real time.

PERSISTENCE OF VISION: The perceptual phenomenon that creates an illusion of movement when a series of still pictures flashes by in rapid succession.

PRAXINOSCOPE: An early animation device similar to a zoetrope that uses mirrors instead of slits.

REGISTRATION: Any system that holds the drawings, cels,

or frames in place. In a flipbook, the binding of a pad of paper, or the clip that holds a stack of index cards resembles the pegs used by an animator to keep drawings lined up.

ROTOSCOPE: A tool that enables an animator to trace live-action footage frame by frame.

THAUMATROPE: A flat disk with a different drawing on each side. When the disk is rotated, the drawings appear to combine. A common example has a bird on one side and a cage on the other.

ZOETROPE: A hollow cylinder containing a strip of paper with sequential images. When the cylinder is spun, images seen through regularly placed slits seem to move.

DRAWING MOVEMENT

Until 1914, when Earl Hurd patented “cels” (transparent sheets of celluloid or acetate), animators limited themselves to simple line drawings (like those depicting Gertie the Dinosaur). Without cels, the entire scene, including the background, had to be redrawn every time a character or object moved. Using cels, each part of the scene could be drawn separately. For example, when a character’s arm moved, the animator would draw several cels with different arm movements and exchange them as necessary, and the same background drawing could be used multiple times. The thin cels were layered in stacks of three or four and, to the camera, the images looked as if they were drawn on the same page.

PART A. The beginning and ending drawings of the flipbook you made in **Activity One** are similar to what animators call “extremes” or “key frames.” The drawings that connect the extremes are known as “inbetweens.” In the five boxes below, draw or sketch the inbetweens. If you have trouble completing the action, act it out in front of a mirror. Try to make the action as lively as possible.



What happens in the scene?

Does the action move quickly or slowly?

How does the speed of the action affect the mood of the scene?

Every action in an animated film contributes to the story. By changing an action, the animator changes the story. Imagine a character walking down the street with his head in a book. If he bumps into a girl, he might anger her, or they might share a laugh. If he avoids her without looking up, the result would be completely different. The images in the first two boxes below show the beginning of an action. Complete the action in the next five boxes.



Now change one of the frames in the scene. How does this affect the rest of the scene?

What is the mood or atmosphere of the scene?

Add a special effect such as weather, reflections or shadows. How does this change the outcome of the story or its effect on the audience?

PART B. Animator Norman McLaren said that “animation is not the art of drawings-that-move, but rather the art of movements-that-are-drawn.” Consider a scene set in a forest. Each animal moves differently, from the awkward steps of a young fawn to the energetic hops of a cheerful rabbit. The gentle rustle of the leaves on the trees tells us it is a fine day. A stream winds beneath the trees, breaking slightly on the rocks under the surface. What mood does the scene convey?

Imagine that something dangerous approaches. How would that be reflected in the movements of the characters and their surroundings?

Think of an emotion such as fear, surprise or happiness and act it out in front of a mirror. What facial expressions did you use?

How did your body move?

What do you think McLaren meant by his statement?

Why do you think animators are called the “actors” of an animated film?

CEL ANIMATION TERMS

CEL: A clear piece of celluloid or acetate .005 of an inch thick, on which animation drawings are traced or photocopied.

EXTREMES: The beginning and ending of an animated action, also called “key frames” in computer animation.

INBETWEENS: The drawings that take an action from one extreme point to another.

SCENE: Continuous action in a single location.

SEQUENCE: A collection of individual scenes that tell a specific part of the story.

SPECIAL EFFECT: Any added effect, such as weather, shadows, reflections, or the like, that gives depth and dimension to the animated drawings.

SQUASH AND STRETCH: Two opposing distortions of an animated object that help create expression and force of motion in animation.



IMAGINING ACTION

Cartoons are the most familiar kind of animation, but an animator is not limited to drawn images. Paper, sand, glass, pins, clay models, and puppets are some of the materials animators have used to make films. Just about anything that can be shifted, scattered, cut, rotated, or molded can be animated. Silhouette, collage, and other forms of two-dimensional animation are lighted from below or above for different results. Animators of three-dimensional models and puppets use a stop-motion camera, which may expose just one frame for each

change in position. Pixilation and time-lapse photography speed up passing time for a comical or surreal effect. Materials for animated films are limited only by your imagination.

All animated films, however, start with a storyboard, which looks something like a comic strip. A storyboard is essentially a visual outline of a film. It helps the animator plan the film's action and indicates color schemes, style, framing, and sometimes dialogue as well. Using the storyboard, animators can discover any potential problems before they begin to create the film.

Choose a comic strip from the Sunday newspaper, or a short scene from a graphic novel or a comic book. Study the use of color, the different sizes of the images, and the way the visuals advance the story.

What happens in the scene?

Describe the way the artist creates a sense of movement.

What techniques does the artist use to develop mood and emotion?

Now, invent a simple story of your own. Identify its key moments. On a separate piece of paper, note the moments with a rough sketch and a caption or phrase. Then arrange the key moments in order in boxes like those in **Activity Two**.

Title of film _____

What happens in the sequence? _____

Are the characters animals, appliances, kids, adults? How will this influence the story? _____

Which frames are seen in closeup and which ones are seen from a distance? _____

Why? _____

Indicate them on your storyboard. How does the action flow from one key moment to another? _____

Is the information clearly presented? _____

Where does the story take place? _____

Do your backgrounds make that the setting clear? _____

Who is the most important character in the sequence? How would a viewer know that? _____

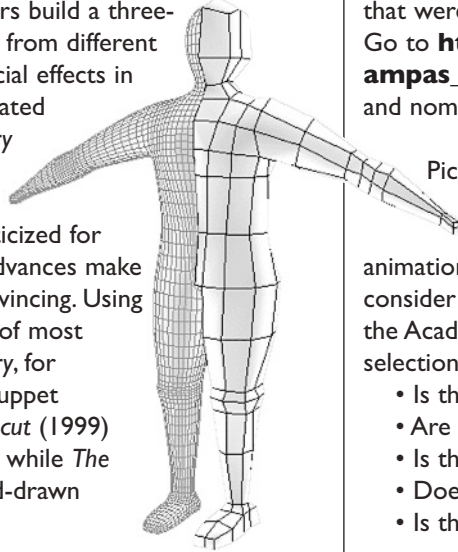
STORYBOARD TERMS

KEY MOMENT: The major points of a sequence, both of action and story development.

STORYBOARD: Small drawings and captions arranged in chronological order that show the action of the film step by step and help the animator plan the film's structure.

MOVEMENT *in* THREE DIMENSIONS

Instead of pen and ink, animators working with Computer Generated Imagery (CGI) use a variety of computer hardware and software tools. Rather than sketching out characters and objects like traditional animators, computer animators build a three-dimensional “model” that can be viewed from different angles. CGI was first used to create special effects in live-action films and to make short animated films, cartoons and commercials. *Toy Story* (1995) was the first full-length, totally computer animated film. Early computer animation was sometimes criticized for looking crude or lifeless, but technical advances make contemporary CGI animation more convincing. Using CGI, animators can reproduce the look of most traditional animation techniques. *Toy Story*, for example, looks similar to stop-motion puppet animation, *South Park: Bigger, Longer & Uncut* (1999) uses software to simulate paper cutouts while *The Lion King* (1994) combines CGI and hand-drawn animation.



Computer-
Generated Image
Model

COMPUTER ANIMATION TERMS

COMPUTER GENERATED IMAGERY

(CGI): Screen images that are animated using computers and software containing complex mathematical formulas.

MODEL: A three-dimensional virtual character created on the computer, which can be viewed from various angles.

PART A. View the sequences your teacher has chosen.

Titles of films: _____

What differences do you notice between traditional animation and CGI animation? _____

Which do you prefer and why? _____

Why might animators choose to use traditional methods and materials if they are able to get similar results using CGI? _____

PART B. In the previous activities, we learned that the animator’s job is to create rather than record the illusion of movement. Now it’s time to look at the films that were nominated for animation in previous years. Go to http://awardsdatabase.oscars.org/ampas_awards to find a complete list of winners and nominees.

Pick one film that you would like to see from the list of nominated films or another film that was recognized for achievement in animation in a previous year. As you watch the film, consider some of the guidelines that the members of the Academy follow when making their award selections:

- Is the storytelling clear and focused?
- Are the characters well-developed and believable?
- Is the animation well-executed?
- Does the animation style enhance the story?
- Is the pacing smooth?

After viewing the film, describe on the back of this sheet why you think the film won the award or was nominated. Put yourself in the shoes of an Academy member. Using what you know about each of this year’s nominated films—either from seeing them or reading about them—predict how the professional filmmakers in the Academy will vote.





Los ORÍGENES de la ANIMACIÓN

La animación más temprana usaba aparatos mecánicos como el praxinoscopio, el taumatropo, y el zoótropo en vez de película. Después de la invención de la cámara cinematográfica, cineastas como Georges Méliès en París y J. Stuart Blackton en Nueva York mezclaron animación con acción de actores reales para crear un efecto mágico. En 1906, Blackton hizo la primera película animada completamente dibujada a mano, *Humorous Phases of Funny Faces*. En 1914, Raoul Barré y Bill Nolan construyeron el primer estudio dedicado a la creación de películas animadas. La animación avanzó un paso más cuando Winsor McCay creó “Gertie the Dinosaur.” Fue uno de los primeros animadores que usó un estilo de movimiento distintivo para expresar la personalidad del personaje animado. Luego en 1922, un grupo de animadores dirigidos por Walt Disney abrieron un estudio en California que llegaría a influenciar la cinematografía animada por décadas.

Produjeron tales obras como *Steamboat Willie* (1928), *Flowers and Trees*—que ganó el primer premio Oscar de Película Animada Corta en 1931/32—*Snow White and the Seven Dwarfs* (1937), *Beauty and the Beast* (1991) y *The Lion King* (1994).

Toda la animación, sea mecánica, en película o en un formato digital, trabaja porque el cerebro humano percibe una secuencia de imágenes fijas en movimiento como acción continua. Esto se llama “persistencia de la visión.” Las películas animadas son hechas un “cuadro” a la vez. Cada cuadro o exposición representa un cambio minúsculo en el personaje o

la escena que se está animando. Cuando se proyecta la película, los dibujos aparentan moverse. En las películas tradicionales, hay 24 cuadros por cada segundo que se proyecta la película.



Gertie the Dinosaur (1914)

Piensa en un objeto o una acción que te gustaría animar. Empieza tu folioscopio dibujando la primera imagen sobre la última hoja de un bloc de notas o un montón de tarjetas de índice. En la próxima hoja, traza sobre el dibujo, cambiándolo ligeramente cada vez hasta completar por lo menos 24 hojas. Considera cada hoja como si fuera un cuadro de película. Cuando hayas completado los dibujos, puedes oscurecer las líneas con tinta negra y colorear las figuras. Mantén el libro junto con una mano mientras volteas las páginas desde atrás hacia adelante con la otra para ver tu imagen moviéndose.

¿Qué pasa cuando volteas las hojas lentamente?

¿Cómo cambia el movimiento cuando sacas algunas de las hojas?

¿Qué pasa si revuelves las hojas?

¿En qué maneras es similar tu folioscopio a una película animada?

TÉRMINOS BÁSICOS DE LA ANIMACIÓN

CUADRO: Una exposición de la cinta de película. Hay dieciséis cuadros en cada pie de película y veinticuatro cuadros por segundo de duración sobre la pantalla.

EN VIVO: Una película con personas y objetos reales, filmada a tiempo real.

PERSISTENCIA DE LA VISIÓN: El fenómeno sensorial que crea la ilusión de movimiento cuando una serie de imágenes fijas aparecen fugazmente en sucesión rápida.

PRAXINOSCOPIO: Uno de los primeros aparatos de animación, similar a un zoótropo, que usa espejos en vez de rendijas.

REGISTRACIÓN: Cualquier sistema que sujeta a los dibujos, celes o cuadros en su lugar. En un folioscopio, el

empasto de un bloc de papel o el gancho que mantiene unido el montón de tarjetas de índice se parece a las estacas que el animador usa para mantener sus dibujos en línea.

ROSCOPIO: Un instrumento que permite que el animador trace metraje en vivo cuadro por cuadro.

TAUMATROPO: Un disco plano con un dibujo diferente en cada lado. Cuando se hace girar el disco, los dibujos aparentan combinarse. Un ejemplo común es uno con un ave en un lado y una jaula en el otro.

ZOÓTROPO: Un cilindro vacío que contiene una cinta de papel con imágenes secuenciales. Cuando se pone a girar el cilindro, las imágenes son vistas por rendijas separadas por una distancia fija y parece que se están moviendo.

DIBUJANDO MOVIMIENTO



Hasta el 1914, cuando Earl Hund patentó la animación por acetatos, los animadores se limitaban a dibujos lineales simples (como esos en *Gertie the Dinosaur*). Sin cels se tenía que dibujar de nuevo la escena entera, incluyendo el fondo, cada vez que se movía un objeto o personaje. Usando acetatos, cada parte de la escena se podía dibujar por separado. Por ejemplo, cuando se mueve el brazo de un personaje, el animador dibuja varios acetatos con el brazo en diferentes posiciones. Estos dibujos se intercambian según es necesario y el dibujo del fondo se puede usar múltiples veces. Los acetatos son estratificados en pilas de tres o cuatro. Del punto de vista de la cámara, las imágenes aparentan ser dibujadas sobre la misma hoja.

PARTE A. El primer dibujo y el último dibujo del folioscopio que hiciste en la **Actividad Uno** son similares a lo que los animadores llaman “extremos” o “cuadros claves.” Los dibujos que conectan a los extremos son conocidos como “intermedios.” En los cinco cuadros más abajo dibuja los intermedios. Si se te hace difícil completar la acción, actúala frente a un espejo. Trata de hacer la acción tan vivida como sea posible.



¿Qué pasa en la escena?

¿Cómo se mueve la acción? ¿Despacio o rápidamente?

¿De qué maneras afecta la velocidad de la acción al estado de ánimo de la escena?

Cada acción en una película animada contribuye al cuento. Por medio de cambiar una acción, el animador cambia la historia. Imagina a un personaje caminando por la calle, perdido en un libro. Si se choca con una mujer, ella puede enojarse o pueden compartir una buena risa. Si él la evita sin mirar hacia arriba, el resultado será completamente diferente. Las imágenes en los primeros dos cuadros representan el comienzo de una acción. Completa la acción en los próximos cinco cuadros.



Ahora, cambia uno de los cuadros de la escena. ¿Cómo afecta esto al resto de la escena?

¿Cuál es el estado de ánimo o el ambiente de la escena?

Añade un efecto especial como lluvia, reflexiones o sombras. ¿Cómo cambia esto al resultado del cuento o su efecto sobre el público?

PARTE B. El animador Norman McLaren dijo que la “animación no es el arte de dibujos que se mueven, sino más bien el arte de movimientos que son dibujados.” Considera una escena en un bosque. Cada animal se mueve de una manera diferente. Sea los pasos torpes de un fauno joven o los brinco energéticos de un conejo alegre. El susurro ligero de las hojas de los árboles nos indica que es un buen día. Un arroyo serpentea debajo de los árboles, rompiendo ligeramente sobre las piedras bajo la superficie. ¿Cuál estado de ánimo es conducido por esta escena?

Imagina que algo peligroso se aproxima. ¿Cómo se reflejaría esto en los movimientos de los personajes y su ambiente?

Piensa sobre una emoción como miedo, felicidad o tristeza y represéntala frente a un espejo. ¿Cuáles expresiones faciales usaste?

¿Cómo se movió tu cuerpo?

¿Qué piensas que quiso decir McLaren por su declaración?

¿Por qué piensas que los animadores son llamados los “actores” de una película animada?

TERMINOLOGÍA DE ANIMACIÓN POR ACETATOS

CEL: Una hoja de celuloide o acetato de 0.005 pulgadas de grosor, sobre cual dibujos de animación son trazados o fotocopiados.

EXTREMOS: El comienzo y final de una acción animada, también llamados “cuadros claves” en animación por computadora.

INTERMEDIOS: Los dibujos que representan la acción desde un extremo hasta el otro.

ESCENA: Acción continua en un solo lugar.

SECUENCIA: Una colección de escenas individuales que representan una parte específica del cuento,

EFEECTO ESPECIAL: Cualquier efecto añadido, como lluvia, reflexiones o sombras, que le dan profundidad y la impresión de dimensión a los dibujos animados.

APLASTAR Y ESTIRAR: Dos distorsiones opuestas de objetos animados que ayudan crear expresión y la ilusión de movimiento en la animación.



IMAGINANDO ACCIÓN

Los dibujos animados son el tipo de animación mas conocido, pero un animador no esta limitado a usar solamente imágenes dibujadas. Papel, arena, vidrio, alfileres, modelos de masilla y títeres son algunos de los materiales que han sido usados por animadores para hacer películas. Casi cualquier cosa que se puede mover, desparramar, cortar, girar o moldear se puede animar. Silueta, collage y otras formas de animación bidimensional son iluminadas de abajo o de arriba para obtener resultados diferentes. Los animadores de modelos tridimensionales y títeres utilizan una cámara de animación fotograma a fotograma, que puede exponer solo un cuadro por cada cambio de posición. La

píxelación y la fotografía con toma a intervalos aceleran el paso del tiempo para crear un efecto cómico o surrealista. Los materiales para películas animadas son limitados solo por tu imaginación.

Sin embargo, todas las películas animadas comienzan con un storyboard, que es parecido a una tira cómica. Un storyboard es esencialmente un resumen visual de una película. Ayuda al animador a planear la acción de la película e indica la combinación de colores, el estilo, el enmarcado y a veces el dialogo también. Usando el storyboard, los animadores pueden descubrir problemas potenciales antes de comenzar a crear la película.

Escoge una tira cómica del periódico del domingo o una escena corta de una novela grafica o una historieta. Estudia el uso de color, los diferentes tamaños de las imágenes y la manera en que la composición visual avanza la historia.

¿Qué pasa en la escena? _____

Describe la manera en que el artista crea una sensación de movimiento. _____

¿Cuáles técnicas usa el artista para desarrollar el estado de humor y la emoción? _____

Ahora, inventa tu propia historia simple. Identifica sus momentos clave. En otra hoja de papel, anota estos momentos con un embozo y una leyenda o frase. Luego arregla los momentos clave en cuadros como los de la **Actividad Dos**.

Título de película _____

¿Qué pasa en la secuencia? _____

¿Hay personajes, animales, electrodomésticos, niños, adultos?
¿Cómo influirá esto a la historia? _____

¿Cuáles de los cuadros se ven en primer plano y cuales son vistos a distancia? _____

¿Por qué? _____

Indica estos momentos en tu storyboard. ¿Cómo fluye la acción de un momento clave al otro? _____

¿Está presentada claramente la información? _____

¿Adonde ocurre la historia? _____

¿Clarifican tus fondos el escenario en que esta ocurriendo la acción? _____

¿Quién es el personaje más importante de la secuencia?
¿Cómo lo sabrá el espectador? _____

TÉRMINOS DEL STORYBOARD

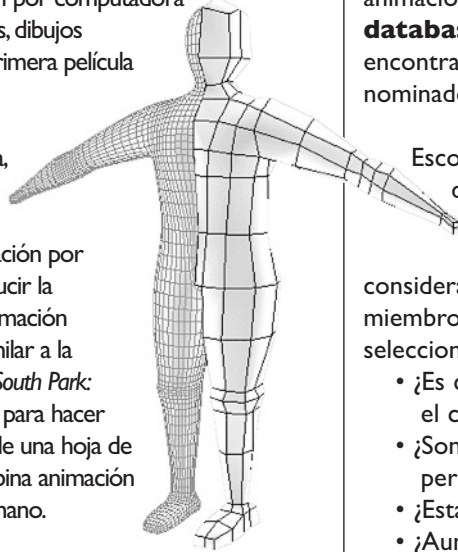
MOMENTO CLAVE: Los puntos más importantes de una secuencia, tanto en términos de acción como en el desarrollo de la historia.

STORYBOARD: Dibujos pequeños con leyendas arreglados en orden cronológica que muestran la acción de la película paso a paso y ayudan al animador a planear la estructura de la película.



MOVIMIENTO *en* TRES DIMENSIONES

En lugar de pluma y tinta, los animadores que trabajan con imágenes de síntesis usan una variedad de maquinaria y programas. En vez de dibujar a los personajes y objetos como los animadores tradicionales, los animadores por computadora construyen un “modelo” tridimensional que se puede mirar de diferentes ángulos. Al principio, la animación por computadora fue usada para hacer películas animadas cortas, dibujos animados y anuncios. *Toy Story* (1995) fue la primera película animada completamente por computadora. Inicialmente, las imágenes de síntesis fueron criticadas por parecer rudimentarias y sin vida, pero los avances técnicos han hecho que la animación por computadora contemporánea sea mucho más convincente. Usando la animación por computadora los animadores pueden reproducir la apariencia de la mayoría de las técnicas de animación tradicionales. Por ejemplo, *Toy Story* parece similar a la animación fotograma a fotograma de títeres, *South Park: Bigger, Longer, and Uncut* (1999) usa programas para hacer parecer que los personajes fueron cortados de una hoja de papel, mientras que *The Lion King* (1994) combina animación por computadora con animación dibujada a mano.



Modelo de Imagen de Síntesis

TÉRMINOS DE ANIMACIÓN A COMPUTADORAS

IMÁGENES DE SÍNTESIS: Imágenes sobre la pantalla que son creadas usando computadoras y programas que contienen formulas matemáticas complejas.

MODELO: Un personaje tridimensional virtual creado con una computadora que se puede mirar de varios ángulos.

PARTE A. Ve las secuencias que tu maestra/o ha escogido. Títulos de las películas: _____

¿Cuáles diferencias notaste entre la animación tradicional y la animación por computadora? _____

¿Cuál prefieres y por qué? _____

¿Cuáles razones puede tener un animador para escoger métodos y materiales tradicionales si puede conseguir resultados similares con la animación a computadora? _____

PARTE B. En las actividades anteriores, aprendimos que el trabajo del animador es crear más que grabar la ilusión de movimiento. Ahora es tiempo que miremos a las películas que fueron nominadas para los premios de animación en años previos. Ve a http://awards.database.oscars.org/ampas_awards para encontrar una lista completa de los ganadores y los nominados.

Escoge una película que te gustaría ver de la lista de películas nominadas u otra película que fue reconocida por éxito en animación durante un año previo. Mientras ves la película, considera algunas de las pautas seguidas por los miembros de la Academia cuando hacen sus selecciones para los premios:

- ¿Es clara y enfocada la manera en que se presenta el cuento?
- ¿Son bien desarrollados y verosímiles los personajes?
- ¿Esta bien realizada la animación?
- ¿Aumenta la historia el estilo de animación?
- ¿Tiene un paso fluido?

Después de ver la película, en el lado trasero de esta hoja describe por que piensas que la película gana el premio o fue nominada. Ponte en los zapatos de un miembro de la Academia. Usando lo que sabes sobre cada película nominada este año—sea porque la viste o porque leíste sobre ella—adivina como votaran los cineastas profesionales de la Academia.

