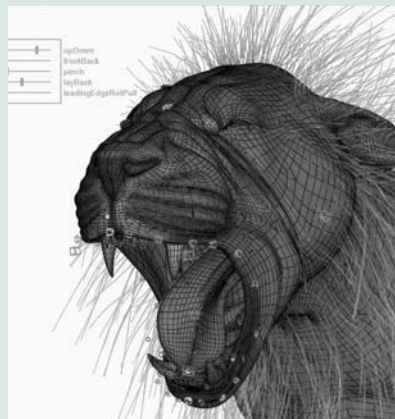# VISUAL EFFECTS:

SEEING *is* BELIEVING

Dear Educator:

Curriculum specialists Young Minds Inspired (YMI), 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 the subject of visual effects. The kits have been designed for students in English, language arts, visual arts, science and communications classes. As former teachers, we know that these critical-thinking activities capitalize on students' natural interest in current films and the excitement generated by the Academy Awards®.

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, makeup artists, composers, producers, sound and visual effects experts, writers and other contributors.

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To ensure that you receive future educational materials, please fill out and return the enclosed reply card.

Sincerely,

Roberta Nusim

Roberta Nusim
Publisher and former teacher

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Teacher's Resource Guide

PROGRAM COMPONENTS

1. This instructional guide, incorporating four student activity masters in both English and Spanish
2. A wall poster for classroom display
3. A response card for teacher comments

TARGET AUDIENCE

This program has been designed for students in secondary school English, language arts, visual arts, science 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 visual effects 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 media 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 of the following categories and their subdivisions: acting, animation, art direction, cinematography, costume design, directing, documentary film, film editing, foreign language film, makeup, 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 more than 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. The Academy Awards is only one of many activities sponsored by the Academy of Motion Picture Arts and Sciences. For more information, visit our Web site, **www.oscars.org**.

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 visual effects.

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 films, which have won Academy Awards for Visual and Special Effects, are available on DVD or VHS and may be suitable for your students: *Mary Poppins* (1964); *Fantastic Voyage* (1966); *Star Wars* (1977); *Superman* (1978); *Alien* (1979); *The Empire Strikes Back* (1980); *E.T. The Extra-Terrestrial* (1982); *The Abyss* (1989); *Terminator 2: Judgment Day* (1991); *Death Becomes Her* (1992); *Jurassic Park* (1993); *Forrest Gump* (1994); *Babe* (1995); *Titanic* (1997); *The Matrix* (1999); *The Lord of the Rings: The Return of the King* (2003); *King Kong* (2005).

Other features that have been nominated for Academy Awards for Visual Effects, which are available on DVD and may be appropriate for your students, include: *Hawaii* (1966); *When Dinosaurs Ruled the Earth* (1971); *Blade Runner* (1982); *Ghostbusters* (1984); *Little Shop of Horrors* (1986); *The Adventures of Baron Munchausen* (1989); *The Nightmare Before Christmas* (1993); *Twister* (1996); *Stuart Little* (1999); *Master and Commander: The Far Side of the World* (2003); *The Chronicles of Narnia: The Lion, the Witch and the Wardrobe* (2005).

For a complete list of Academy Award winners and nominees, visit **www.oscars.org.**

ACTIVITY ONE
VISUAL EFFECTS BEGINNINGS

Special effects artists make things happen in movies that might not normally occur in real life. When the real thing is too expensive, too dangerous or impossible to shoot, special effects artists are brought in. The term "special effects" first appeared in screen credits in the 1926 Fox film *What Price Glory?*, but special effects have been part of motion pictures from the beginning.

There are two major types of special effects. Visual effects include all types of image manipulation, whether they take place during principal photography or in post-production. Physical effects, also called practical effects, are performed live using "real world" elements. These include explosions, weather effects and stunts.

One of the phenomena that make motion pictures possible is "persistence of vision." Persistence of vision describes the ability that the human eye has to briefly retain an impression of an image after it has disappeared. This allows the brain to read a rapid series of images as an unbroken movement.

Georges Méliès, a French magician and filmmaker working in the late 19th and early 20th centuries, was among the first to exploit persistence of vision for magical effect. Méliès discovered that if he stopped the camera for a moment, moved or changed the object he was filming, and then started the camera again, he could make objects appear to turn into people or into different objects. In his 1899 film *Cinderella*, for example, Méliès turned a pumpkin into Cinderella's elegant coach. This technique is known as

stop-motion photography and is still used by animators and visual effects artists. In addition to stop-motion, Méliès employed such techniques as double exposure, fast and slow motion, and dissolves to create his "trick films."

With *The Great Train Robbery* (1903), American Edwin S. Porter introduced visual effects that, rather than trick the audience, added to the film's realism. Using a matte, a device that prevents a portion of the film from being exposed, he combined footage of a robbery inside a telegraph office with a separate shot of a moving train. When projected, the train appeared to steam past the window as the action took place inside.

KING KONG (1933) was a visual effects milestone that continues to inspire filmmakers. It used a variety of techniques including stop-motion animation of miniature sculptures, rear-screen projection and full-scale physical effects. This image of Kong was an 18" puppet. Actress Fay Wray on the tree would react to a projected enlargement of Kong in the background, or, in most cases, nothing at all. The two pieces of film were printed together later. Photo courtesy of Warner Bros.

Split-screen techniques using mattes enable actors to play more than one part in the same scene. After a portion of the lens is covered, the actor is filmed playing one character. Additional exposures, masking other portions of the film, are repeated as necessary.

In his 1921 film *The Playhouse*, Buster Keaton played multiple roles including, in one scene, an entire theater audience, a band leader, all the members of the band, and the dancers on stage. In another scene, he appears in nine different roles simultaneously. A special box with nine "gates" that could be opened one at a time as he performed each part was built for this sequence.

Stationary mattes (often called hard mattes), like those mentioned above, cover a fixed area, for example, the window of a train station. Traveling mattes are created by tracing the silhouette of a moving character or object and are different for each frame of the film. Mattes, background, and performance are then combined into one image.

Patented by Max Fleischer in 1917, the process known as rotoscoping, which uses a downward pointing

camera mounted on a frame, was originally intended to help animators draw lifelike animation by tracing a projected film of an actor frame by frame, as was done in *Snow White and the Seven Dwarfs* (1937). It is one of the ways visual effects artists create traveling mattes.

In the mid-1920s, Eugene Shuftan, a German cinematographer, developed a method of using mirrors to combine models and miniatures with full-scale sets. The Shuftan Process was used in a number of scenes in German director Fritz Lang's 1926 film *Metropolis*, which also employed animation, matte painting, rear projection and mechanical effects to create its vision of a futuristic city.

Matte paintings, either on glass or on other surfaces, re-create historical scenes or depict imaginary landscapes, fill empty skies with clouds, or substitute for elaborate interiors. When viewed through the camera lens, painted artwork blends with constructed sets and live action to produce an illusion of reality.

Models and miniatures are copies of people, animals, buildings, settings and objects. They can be smaller than real life, life-size or larger than the objects they represent, depending on the way they will be used. Miniatures or models are used to represent things that do not really exist, or that are too expensive or difficult to film in reality, such as explosions, floods or fires. The dinosaurs in *When Dinosaurs Ruled the Earth* (1971) and the Snow Walkers in *The Empire Strikes Back* (1980) were animated models. Miniatures portrayed the destroyed Los Angeles skyline in the 1974 film *Earthquake*.

Forced perspective is the optical illusion that exaggerates how much larger things closer to the viewer appear than things that are far away. In the 1942 film *Casablanca*, forced perspective was used to make the final scene, shot in a studio, look as if it had been filmed at an airfield. A smaller-than-life-sized cardboard model stood in for an airplane, its size making it seem far away. To increase the sense of distance, little people portrayed airport mechanics, and fog effects obscured the deception.

Slow-motion, fast-motion and time-lapse photography are some of the simplest visual effects. Scenes filmed at slow speed move faster than normal when projected at regular speed. This effect has been used in comedies since the silent era. It also makes it possible for car chases and other risky stunts to be performed safely at a slow speed. When scenes filmed at a fast speed are projected at normal speed, small animated models appear to move with deliberation like weighty, giant beasts. In time-lapse photography, the camera snaps a photo at set intervals. When the footage is projected, time is compressed, reducing the growth of a plant to a few seconds of screen time, for example.

With models and miniatures, stop-motion
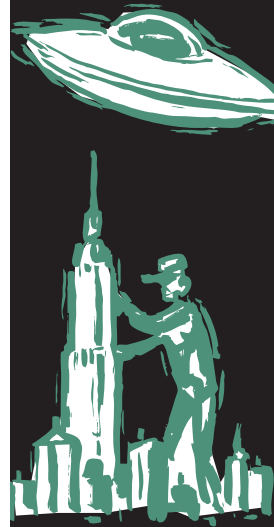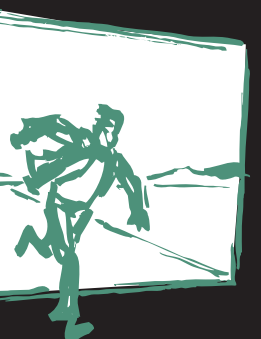
animation, miniature rear projection, and traveling mattes, among many other techniques, Willis O'Brien and other special effects artists created an imaginary lost world in the 1933 film *King Kong*. Techniques developed for this film are still employed by visual effects artists today, although now they may be produced in the computer.

Kong, the giant ape, was portrayed in most scenes by an 18-inch puppet covered in bear fur, with rubber tendons stretched between his joints. For closeups, the visual effects crew built a giant head, arm, hand, and foot of Kong. Three to four men inside the head operated the cables, levers, and compressed-air devices that controlled Kong's features.

Rather than create elaborate sets or try to film on location, *King Kong*'s filmmakers used rear projection. In rear projection, the camera shoots actors performing in front of a translucent screen while a previously filmed scene is projected on the back of the screen. In one scene, for example, actress Fay Wray hides in a treetop while footage of Kong fighting a tyrannosaurus is projected in the background.

Dynamation, developed by stop-motion animator Ray Harryhausen for the low-budget 1953 film *The Beast from 20,000 Fathoms*, used rear projection in a different way. Live action footage of actors in real surroundings was rear-projected frame by frame and models were then animated in relation to the action behind them.

Have your students make a thaumatrope to demonstrate persistence of vision. On a cardboard disk or rectangle, have your students draw a simple image, such as a bird, on one side. On the other side, draw a corresponding image, for example, a cage (upside down in relation to the bird). Some other possibilities are a lightning bolt and sky, a fish and water, a cactus and desert, or a bare tree and leaves.

Instead of drawing the images, students may also use pictures cut from magazines or their own photos. They may also combine photos and drawings—for example, a photo of a friend on one side and a drawing of a hat on the other. Ask the students to punch two small holes a quarter-inch in on opposite edges of the disk, in line with the middle of the images. Then have them cut two pieces of string about eight inches long and attach one string to each of the holes. To make the disk spin, have them pull the threads tight and twirl them between the thumb and forefinger of each hand. As the disk spins, persistence of vision makes the images on the two sides appear to blend into one. Discuss with your students the relationship between persistence of vision and special effects.

SUPPLEMENTAL ACTIVITY

To show your students how matte paintings work, start with a large photograph or clipping from a magazine. Then, using a piece of glass or clear plastic, have them alter some of the features of the picture, either by cutting out additional images or by painting on the glass or plastic. For example, they might replace telephone wires with clouds or mountains, put a roof on a flat building, replace a car with a horse and buggy, or add water where there is a lawn. Suggest that they incorporate forced perspective into the scene, using scale to suggest distance. If you have access to a digital camera, have your students practice combining the matte with three-dimensional objects.

ACTIVITY TWO
PHYSICAL EFFECTS

Physical effects, also known as practical, special or mechanical effects, are performed in front of the camera during principal photography. They include weather effects, water effects and pyrotechnics. Stunts, bullet hits, explosions and collapsing buildings are also considered physical effects.

Rather than rely on the weather to perform as needed, filmmakers look to physical effects to generate such atmospheric events as rain, fog, snow and wind. Sprinklers with various kinds of nozzles produce cinematic rain, which may be heated to keep the actors comfortable. Sometimes, as in the 1952 film *Singing in the Rain,* water is mixed with paint or with milk to help it show up on screen. Scenes that take place in the water or on rough seas are usually filmed in a studio tank with miniature ships and other vessels. In the 1997 film *Titanic*, miniatures in a tank represented the sinking ocean liner in some scenes.

Winds ranging from light breezes to hurricanes are created by wind machines, that is, fans of different sizes and powers. Small fans ruffle the actors' hair and clothes, while a Boeing 707 jet engine drove the tornados in the film *Twister* (1996). To make wind visible to the camera, lightweight particles such as dust or leaves may be scattered in its path.

Smoke "bombs," dry ice, pressurized air, and smoke machines using heated oil produce smoke effects. Smoke and lighting effects can also give an illusion of underwater conditions, a technique called "dry for wet." Dry ice simulates fog and will sometimes be held, carefully wrapped in protective layers, in an actor's mouth to vaporize his or her breath in cold weather scenes.

Traditionally, salt was substituted for snow in winter scenes, but because it is so harmful to the environment, other alternatives were developed. A combination of white sand, chalk and crystals was tried. Plastics, foams, painted glass, liquid paraffin and potato starch, and falling ash were also found to be effective. Ripped pieces of paper, which move almost like real snow, are a common solution. Several different substances, depending on the needs of a scene, may be used at the same time. New materials

that melt on contact like real snow may be used in closeup shots. Today, computer graphics (CG) are often used to paint backgrounds snowy white, while physical snow effects are used in the foreground.

The term "animatronics" was coined in the 1960s to describe three-dimensional mechanical figures developed by Disney engineers for attractions at Disneyland. The earliest mechanical creatures in film, however, date back to the silent era. In 1924, a 60-foot mechanical dragon controlled by 17 technicians was created for the German film *Die Nibelungen*. King Kong's giant head is another early example of a manipulated puppet.

Animatronics are powered by pumps, motors, hydraulics, computers or other electronic or mechanical means and may be preprogrammed or remotely controlled. Large animatronics may be controlled by many puppeteers, or operators, each responsible for a specific part of the creature. Animatronics include totally mechanical creatures like Yoda in *The Empire Strikes Back* and mechanical masks that enable an actor to control a character's facial expressions.

When animatronics are combined with digital animation, as they are in the *Jurassic Park* series, the more realistic-appearing animatronics are used in the closer shots, while digital animations are seen in the background. Some filmmakers prefer animatronics to CG because it is easier for actors to perform believably when they can interact with an actual entity rather than with a creature that will not appear until post-production.

Special effects makeup is any three-dimensional makeup process including animatronics and prosthetics. Prosthetic makeup—false limbs and features or other large pieces that are attached to actors—are another way to construct monsters, animals and other creatures. The mermaid's tail in *Splash*, for example, was a prosthetic made from flexible transparent urethane, dyed and painted to look like red fish scales. For the scene in the film *Alien* when the alien bursts through a crew member's chest, a fiberglass chest piece and blood-squirting tubes were used. A puppet operated with wires depicted the escaping creature. To portray the creature in a later scene, a very tall, thin actor wore a costume composed of layers of latex and a head with mechanical jaws.

Physical effects are often quite dangerous both for stunt performers and for the technicians who operate them. Working with stunt coordinators, the physical effects crew devises ways to make stunts as safe as possible. For example, breakaway glass and furniture let a stunt performer smash through a window or be hit by a chair without injury. Good editing also makes stunts safer. In a scene of a man jumping from a burning ship, for instance, the stunt man vaults from a trampoline into the water. Viewers don't see the trampoline, however, because the editor cuts to the face of a horrified onlooker.

Like all other physical effects, fires must be safe and containable. Often an accelerant is used on part of an otherwise fireproof set to prevent the fire from burning out of control. Devices called flame bars, metal bars of different sizes that burn propane gas, are used behind and in front of objects that are supposed to be on fire. Fireproof boxes filled with smoke and lit with bright lights can be placed inside buildings to make it appear that they are burning.

Explosions, whether small or large, are the domain of physical effects artists. Because blanks do not leave a significant mark when they contact their target, the physical effects crew sets off small explosions to register their impact. (Real bullets, fired by sharpshooters, were used in early films, but this practice was ended by the Screen Actors Guild in the late 1930s.) To show bullet hits on performers, the crew either bursts small capsules filled with fake blood, or places a low-powered explosive against a metal plate next to the performer's body.

Every explosion is carefully planned to look exactly as the director wishes and to be accomplished as safely as possible. Buildings or vehicles intended for destruction are first weakened, so that a very small amount of explosive will blow them apart. Miniatures are often blown up for practical and safety reasons. Big explosions are usually filmed at a faster-than-normal rate so they will last longer on screen when played back.

Discuss different physical effects with your students. Then show them one or more scenes from a film of your choice. Some suggestions are *The Birds*, *Earthquake*, *Alien*, *Blade Runner, Fantastic Voyage, Ghostbusters*, *Indiana Jones and the Temple of Doom, The Adventures of Baron Munchausen, Jurassic Park, Titanic,* or *Superman*. Ask them to try to figure out which of the physical effects you discussed might have been used in the scene(s). Have them suggest reasons why a director might choose to use physical effects rather than computer-generated effects.

SUPPLEMENTAL ACTIVITY

A storyboard is a sequential series of illustrations showing the key actions called for by the script. It helps filmmakers work out composition, camera angles, and action, and can also point out flaws in the script. Some filmmakers, like Steven Spielberg, use a process called pre-visualization, which is essentially a computer-animated storyboard. Pick a scene from a movie or a book that would use physical effects. Have your students make a storyboard of the scene showing how the effects might be put into the film. Discuss the ways the editor and cinematographer could help the effects seem most believable.

COMPUTER-GENERATED EFFECTS

New computer technology makes it possible to create more and bigger visual effects. While many new kinds of effects have been developed by computer graphics (CG) artists, much of what is accomplished using digital effects duplicates processes from the past.

Matte production, for example, is now automated, using preprogrammed software, although it remains a sophisticated process requiring great skill on the part of both the cinematographer and the matte technician. Actors are filmed in front of blue or green screens. The negative is then sent to either an optical printer or an electronic scanner and computer workstation and is composited, or joined together in the computer, with a previously filmed background shot in miniature or created digitally.

Computer graphics are often used to add fire effects, to paint backgrounds snowy white, or to make a small crowd seem larger, for example. For *The Lord of the Rings* series, thousands of three-dimensional computer-generated Orcs and Uruk-hai were added to the background of the battle scenes after filming was completed. Throughout the film, miniatures, digital shots, and the New Zealand landscape were digitally combined to construct an imaginary Middle Earth.

Some of the first films to use computer-generated visual effects were *The Empire Strikes Back* (1980), *Tron* (1982), and *The Last Starfighter* (1984). CG water effects were used for the first time in *The Abyss* (1989). An entire ocean was digitally simulated for *The Perfect Storm* in 2000. The monkeys in the 1995 film *Jumanji* were among the first 3-D computer-graphics characters to have fur, a breakthrough in the difficult task of digitally reproducing multi-dimensional hair.

Morphing, a technique that makes one image appear to transform seamlessly into another, was used effectively in *Terminator 2* (1991) to turn actor Robert Patrick into the liquid metal cyborg. The technique is also used to change shots of a stunt performer into those of an actor, merge a miniature with a full-sized prop, or combine separately filmed shots to create the illusion of one continuous shot.

The Oscar-winning film *The Matrix* used an innovative effect in which action appears to have been frozen in time while the camera roams freely around the scene. The effect, called "bullet time," was accomplished by placing over 100 still cameras around the action. The filmmakers used a computer model to tell them exactly where to place each camera. The cameras, which were concealed behind a circular blue screen, were set off sequentially at set intervals. When the separate frames were later projected at 24 frames per second, the resulting sequence stretched one second of action into a five-second moving camera shot.

The first completely computer-generated character in a full-length feature was the knight who emerged from a stained-glass window in *Young Sherlock Holmes* (1985). The character of Gollum, who played a major part in the *Lord of the Rings* films, was created using a combination of motion capture, CG techniques and animation.

Gollum's creation began when actor Andy Serkis performed the creature's movements in a studio, wearing markers attached to various points on his body. The markers were recorded by special electronic cameras in a process known as motion capture, creating a digital record of the actor's natural movements. Gollum's animators used this record to create the CG character. Later, Serkis's muscular legs were digitally altered to appear thin and frail.

Subsurface scattering, a way of lighting characters that duplicates the effect of light striking a translucent surface, was used for the first time in *Lord of the Rings: The Two Towers*. It helped Gollum's computer-generated skin look realistic.

Motion control is used when separately filmed elements, such as live action and miniatures or animation, will be combined into one shot. For the combined footage to look believable, camera positions and movement must be identical in each shot. Although earlier films used various techniques to coordinate camera movements, computer-programmed motion-control rigs were first used in *Star Wars* (1977).

Motion control allows visual effects artists to film a model or miniature multiple times with different lighting conditions. Motion control also makes it possible to film a live-action sequence in one part of the world, while visual effects artists elsewhere use identical data to film additional elements, such as miniatures.

Computer graphics are also changing the way special effects makeup is done. Some of the robots in *A.I. Artificial Intelligence* (2001) look human from the front, but reveal a machinery-filled skull when they turn their heads. Special effects designer Stan Winston and his team worked with makeup artist Ve Neill to achieve this effect. Blue-screen elements were incorporated into the makeup, allowing the CG artists to remove pieces of the actors' faces in post-production and replace them with digitally generated mechanics.

Show your students two similar films or scenes from films with different types of visual effects and ask them to compare the effects. Some suggestions for comparisons are: the 1933 *King Kong* with either or both of the subsequent *King Kong* films; *Raiders of the Lost Ark* with *Pirates of the Caribbean: Dead Man's Chest; Superman* (1978) with *Superman II, III* or *Superman Returns; Star Wars* (1977) with *Star Wars: Episode III Revenge of the Sith; Stuart Little* and *Babe; When Dinosaurs Ruled the Earth* (1971) and *Jurassic Park*. Discuss with your students which of the films were the most enjoyable, the most visually pleasing and the most exciting.

ACTIVITY FOUR

VISUAL EFFECTS *in* NON-EFFECTS MOVIES

An audience expects visual and special effects in fantasy, science fiction or action films. Many of the same techniques are also used in more subtle ways in films that do not have obvious visual effects. For instance, when Bridget Jones sits musing in her window in *Bridget Jones: The Edge of Reason*, the views of her London neighborhood, including the skyline and the moon, were created in the computer.

Similarly, the 2004 film *The Aviator* used computer graphics and forced perspective in sequences with the real Spruce Goose airplane. For example, miniature airplane engines mounted on a full-scale cockpit model appeared to be full-sized when viewed through the camera lens. In another scene, an aerial sequence from the 1930 film *Hell's Angels* was digitally re-created to match the original shot for shot.

It is often difficult for filmmakers to find unspoiled locations for films set in the past. Telephone wires, neon signs, overhead air traffic and other modern devices are visible and audible in the most isolated areas. One way around this problem is to create the setting in the computer. Pacific Ocean Park, a Southern California amusement park demolished 30 years ago, was digitally recreated, down to aged wood, broken railings, and seagull droppings, for the low-budget film *The Lords of Dogtown*. Utility wires, modern buildings and anything else that does not fit the film's time period may also be digitally removed from the film.

Visual effects artists can enhance the achievements of makeup artists, cinematographers, costume designers, and stunt actors. Flaws on the film itself, such as light leaks and scratches, can also be cleaned up using visual effects techniques. Makeup, costumes, color, and lighting can all be perfected in the computer, and physical effects, such as explosions and stunts, can be fine-tuned.

In *The Passion of the Christ* (2004), digital effects were used to keep actor Jim Caviezel's makeup wounds consistent from day to day. Except for handles that were held by the actors, the sticks and whips used by the Roman soldiers to beat Jesus were also created in the computer. The effects crew can touch up makeup mistakes, correct makeup colors, or create the makeup, for example, for Imhotep's decomposed face in *The Mummy* or the demonic visions in *Emily Rose*.

Digital programs are used to erase wrinkles and bags under the eyes from aging actors and actresses as well as remove facial hair, birthmarks, scars, tattoos, and blemishes. They can sculpt muscles on an undersized actor or remove unflattering pounds. Computer-generated visual effects enable present-day actors to mingle with famous people of the past, as in the 1994 film *Forrest Gump,* or can digitally remove the legs of an actor portraying an amputee.

If a costume fades into the background when a scene is filmed, or if the director decides a room does not have emotional punch, visual effects artists can change the colors to match the filmmakers' vision. In the 1996 film *Jerry Maguire*, for example, the color of a car used for location shooting was digitally adjusted to match exactly the color of the car used in the rest of the movie. For *The Aviator*, complete sections of film were altered in post-production to reproduce the pastel shades of early two-strip Technicolor.

Director James Cameron thought a scene in *Terminator 2: Judgment Day* would look better if it were reversed from right to left. When the film was reversed, however, the words on the street signs were backward. These were digitally changed to read correctly.

Stunt performers usually stand in for box office stars when the action is dangerous or difficult. These stunts are often shot from a distance so the audience will not realize that the stars are not actually performing the feat. Digital technology can replace the stunt double's face with the star's, and identifying features such as tattoos can be added, allowing the camera to come much closer to the action. Strong, thick safety wires and cables make many stunts less hazardous, but traditionally, supports were kept as thin as possible so they would not be visible in the shot. Now that digital equipment can easily erase supports from the image, stronger, safer cables and wires can be employed.

Have your students read an action, fantasy or science fiction short story or part of a longer novel. Ask them to discuss what effects might be needed to make a film of the story. Then have your students read a more conventional story about characters like themselves. Ask them to list scenes where visual and physical effects might be used in this kind of movie, for example, to film a scene more safely or less expensively.

VISUAL EFFECTS BEGINNINGS

When the script calls for creatures that do not exist, activities that defy nature or locations that are too expensive or impossible to shoot, visual and physical effects artists step in. Visual effects have been around as long as the movies. After the invention of the movie camera, filmmakers like French magician Georges Méliès and American Edwin S. Porter discovered that they could fool the eye by manipulating the film frame. Early filmmakers turned objects into people or into different objects, substituted scenic landscapes for soundstage walls, or created imaginary worlds by building miniatures and animating models. Different techniques like rotoscoping, the Shuftan Process, traveling mattes, and matte paintings improved the realism of visual effects.

These stills from the silent film version of BEN-HUR (1925) illustrate the image as seen on screen and the distinction between the lower part of the frame, which was live-action actors and full-sized set pieces, and the upper part of the frame, which was a hanging minature placed in front of the camera. The miniature was built to scale so that it completed the look of the Coliseum without the cost of building it full size. Small dowels on each end were attached to pegs that, when raised and lowered, created movement in the "upper balconies," reinforcing the illusion. A similar dividing of the image used paintings on glass known as matte paintings. The development of the optical printer in the early 30s allowed the "real" and "created" images to be married in the film laboratory rather than in the camera. Photos courtesy of Warner Bros.

Because of "persistence of vision," when watching a quickly moving sequence of still images, the human eye retains each picture for just a moment after it disappears. This overlap lets the mind blend the images together into continuous movement. Persistence of vision makes visual effects possible.

A toy called a thaumatrope illustrates the way persistence of vision works. Begin by drawing a simple image on one side of a cardboard disk. On the other side, draw an image that goes with it. The most common thaumatrope has a bird on one side and a cage (upside down in relation to the bird) on the other, but you can use any combination of pictures. Next, punch a small hole on opposite edges of the disk. Attach one piece of string about eight inches long to each hole. Pull the strings tight and twirl them between your thumb and forefinger. As the disk spins, persistence of vision causes the two images to blend into one. In this case, the bird appears to be inside the cage.

What other pairs of images would be good choices for a thaumatrope?

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_____

Try making a thaumatrope using abstract shapes or words instead of representational images. How did you make the shapes or words on one side blend in with or contrast with the other side?

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List the ways a thaumatrope is like a movie.

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What do thaumatropes tell you about the way visual effects work?

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VISUAL EFFECTS TERMS

Forced perspective: An illusion that makes larger objects appear to be closer to the viewer than smaller objects.

Matte: A mask that prevents light from reaching and exposing a portion of the film.

Matte painting: A painting, traditionally done on glass, of a landscape or other background that is combined with other images in the finished film.

Persistence of vision: The illusion of movement created when a series of still pictures flashes by in rapid succession.

Rear projection: A way of combining previously filmed backgrounds with live-action foregrounds.

Rotoscoping: A process that enables filmmakers to trace live-action footage frame by frame.

Shuftan Process: A method of using mirrors to combine full-scale live action and miniatures.

Split screen: A process that combines two or more different actions, filmed separately, in the same film frame.

Traveling matte: Mattes used to combine two separately filmed scenes when the foreground element changes shape or position from frame to frame.

EFECTOS VISUALES PRINCIPIOS

Cuando el guión indica que hacen falta criaturas que no existen, actividades que desafían la naturaleza, o sitios que son demasiado caros o imposibles de filmar, se presentan los artistas de efectos visuales y físicos. Los efectos visuales han existido tanto tiempo como las películas. Después de la invención de la cámara fotográfica, cineastas como el mago francés Georges Méliès y el americano Edwin S. Porter descubrieron que podían engañar el sentido visual por medio de manipular el fotograma. Los primeros cineastas convirtieron objetos y los hicieron personas u otros objetos, substituyeron paisajes pintorescos por paredes del estudio para filmar con sonido, o crearon mundos imaginarios construyendo miniaturas y animando modelos. Técnicas diferentes como "Rotoscoping", el Proceso Shuftan, ocultadores móviles, y pinturas ocultadoras hicieron mayor el realismo de los efectos visuales.

Estas fotos fijas de la película muda BEN-HUR (1925) ilustran la imagen vista en la pantalla y la distinción entre la parte inferior del fotograma, que consistía de actores en directo y porciones de platós de tamaño normal, y la parte superior del fotograma, que era una miniatura colgante colocada frente a la cámara. La miniatura fue construida a escala para que completara la apariencia del Coliseo sin el costo de construirlo de tamaño normal. Se colocaron clavijas pequeñas en cada extremo juntadas a palitos que al subir o bajarlos crearon movimiento en "los balcones superiores", fortaleciendo la ilusión. Otra técnica es dividir la imagen similarmente usando pinturas en vidrio llamadas pinturas ocultadoras. El desarrollo del impresor óptico en los tempranos años 1930 permitió el uso de imágenes "verdaderas" y "creadas" unidas en el laboratorio en vez de en la cámara. Por cortesía de Warner Bros.

A causa de la "persistencia de la vista", cuando el ojo humano mira una sucesión de imágenes fijas que se mueven rápidamente, retiene cada una por un momento después de que la imagen desaparezca. Esta superposición permite que las imágenes se mezclen en la mente para producir movimiento continuo. La persistencia de la vista hace posible los efectos visuales.

Un juguete óptico llamado "thaumatrope" ilustra cómo funciona la persistencia de la vista. Se empieza dibujando una imagen sencilla en un lado de un disco de cartón. En el otro lado, se dibuja una imagen que hace juego con la primera imagen. El "thaumatrope" más común tiene un pájaro en un lado y una jaula (al revés en relación al pájaro) en el otro, pero se puede usar cualquier combinación de imágenes. Entonces, se hacen agujeros en los bordes opuestos del disco. Se junta un pedazo de cordel de aproximadamente ocho pulgadas a cada agujero. Se tira de los cordeles para apretarlos, y se hacen girar entre el pulgar y el dedo índice. Mientras que el disco gira, la persistencia de la vista causa que las dos imágenes se combinen para hacer una. En este caso, el pájaro parece estar dentro de la jaula.

¿Cuáles otros pares de imágenes serían buenas opciones para un "thaumatrope"?

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_____

Intente hacer un "thaumatrope" usando formas abstractas o palabras en vez de imágenes representativas. ¿Qué hizo para que las formas o palabras en un lado se combinaran o hicieran contraste con las del otro lado?

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Haga una lista de las maneras en que un "thaumatrope" se parece a una película.

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_____

¿Qué le indican los "thaumatropes" en cuanto al funcionamiento de los efectos visuales?

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TERMINOLOGÍA DE EFECTOS VISUALES

Perspectiva forzada: Una ilusión que hace que los objetos más grandes paracen estar más cerca al espectador que los objetos más pequeños.

Ocultador: Una máscara que impide que la luz alcance y exponga una porción de la película.

Pintura ocultadora: Una pintura, tradicionalmente hecha sobre vidrio, de un paisaje u otro fondo que se combina con otras imágenes en la película completada.

Persistencia de la vista: La ilusión de movimiento creada cuando una serie de cuadros inmóviles pasa rápida y sucesivamente.

Proyección trasera: Una manera de combinar fondos anteriormente filmados con acción en directo de primer plano.
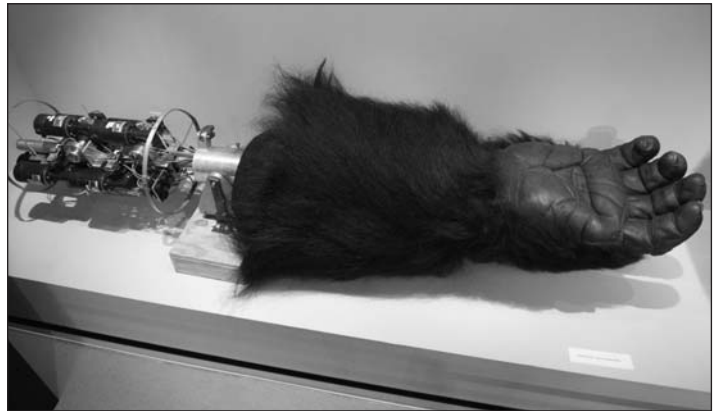
"Rotoscoping": Un proceso que les permite a los cineastas dibujar secuencias en directo fotograma por fotograma.

Proceso Shuftan: Un método de usar espejos para combinar acción en directo de tamaño natural con miniaturas.

Pantalla Dividida: Un proceso que combina dos o más acciones diferentes, filmadas Ocultador Móvil: Ocultadores utilizados para combinar dos escenas filmadas por separado cuando el elemento de primer plano cambia de forma o posición de fotograma a fotograma.

PHYSICAL EFFECTS

Rain, wind, fire, snow, smoke, car crashes and explosions are all physical effects, also called practical, mechanical or special effects. Mechanical creatures known as animatronics, prosthetic makeup like false limbs or noses, and stunts, such as actors smashing through a window or jumping from a burning building, are also considered physical effects. Although physical effects are created live in front of the camera using actual objects, they are a variety of movie magic. For instance, what looks like snow on screen might be a combination of torn paper, foam, painted glass, and falling ash. The building destroyed by a bomb could be a 20-inch miniature. A talking lion turns out to be a mechanical puppet. The star who appears to run into a burning building is actually a stunt performer. And the bullet holes from a gun battle were made by tiny explosions, not by real bullets.

Wind machines such as this one on the set of a 1940s western have been used since the silent film era. On-set physical effects are now usually supplemented with CGI effects to create even stronger visuals. Photo from the Margaret Herrick Library Collection.

Watch the movie your teacher has chosen. While you watch, try to identify the different physical effects in the scenes. Some, like explosions, will be obvious. Others, like weather, may not be.

What physical effects did you see?

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_____

PHYSICAL EFFECTS TERMS

Animatronics: Three-dimensional figures or parts powered by pumps, motors, hydraulics, computers or other electronic or mechanical means.

Prosthetics: Any three-dimensional item that is attached to an actor to change his or her appearance.

This oversized animatronic hand was used for close-ups in **MIGHTY JOE YOUNG (1998)**. Photo courtesy of Rick Baker.

Which of those effects were obvious?

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Which of those effects were not obvious?

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Why would a director choose to use physical effects instead of the real weather, for example?

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What other situations might prompt a director to use physical effects?

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Although many physical effects can be duplicated in the computer, why do you think a director would choose to use physical effects instead of digital effects?

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EFECTOS FISICOS

El viento, la nieve, el humo, los choques de coches, y las explosiones son todos efectos físicos, también llamados efectos prácticos, mecánicos o especiales. También se consideran efectos físicos las criaturas mecánicas conocidas como "animatronics"; construcciones de protética como extremidades o narices falsas; y escenas peligrosas, por ejemplo, actores lanzándose por una ventana de vidrio y destrozándola, o lanzándose de un edificio ardiente. Aunque los efectos físicos son creados en directo frente a la cámara usando objetos verdaderos, son una variedad de la magia del cine. Por ejemplo, lo que parece ser nieve en la pantalla podría ser una combinación de papel despedazado, espuma, vidrio pintado, y ceniza cayéndose. El edificio destruido por una bomba podría ser una miniatura de veinte pulgadas. Un león parlante resulta ser un títere mecánico. La estrella que parece entrar corriendo en un edificio ardiente es en realidad un doble especial. Y los agujeros de balas de una pelea a tiros fueron creados por pequeñas explosiones, no por balas verdaderas.

Esta mano animada de gran tamaño fue usada para fotos de primer plano en MIGHTY JOE YOUNG (1998). Por cortesía de Rick Baker.

Las máquinas de viento como ésta en el platò de una película del oeste de los años 1940 han sido utilizadas desde la época de las películas mudas. Los efectos físicos en el plano de hoy día generalmente son aumentados con efectos CGI para crear visuales aún más fuertes. Por cortesìa de Margaret Herrick Library Collection.

Observe la película que su maestro ha escogido. Mientras la observa, trate de identificar los diferentes efectos físicos en las escenas. Algunos, como las explosiones, serán evidentes. Otros, como el tiempo, no lo serán.

¿Cuáles efectos físicos vio?

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¿Cuáles de los efectos eran evidentes?

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¿Cuáles de los efectos no eran evidentes?

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¿Por qué optaría un director por usar efectos físicos en vez del tiempo verdadero, por ejemplo?

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¿Cuáles otras situaciones inspirarían a un director a usar efectos físicos?

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Aunque muchos efectos físicos pueden ser duplicados en la computadora, ¿por qué cree que un director optaría por usar efectos físicos en vez de efectos digitales?

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TERMINOLOGÍA DE EFECTOS FISICOS

"Animatronics": Figuras o partes tridimensionales animadas por bombas, motores, hidráulica, computadoras, o mecánica.

Protética: Cualquier artículo tridimensional que esté ligado a un actor para cambiar su apariencia.

COMPUTER-GENERATED EFFECTS

From very early computer-generated visual effects in films like *The Empire Strikes Back* (1980) and *Tron* (1982) to those in such recent movies as *The Matrix* and the *Harry Potter* films, computer-generated visual effects have become harder to distinguish from the real thing. Sometimes computer graphics (CG) effects are similar to traditional visual effects. For example, mattes can now be produced using special software. Fantastic or naturalistic backgrounds can be constructed in the computer, rather than painted on glass. Other times, advances in CG technology put things on screen that have never been seen before. Entire characters, such as Gollum in *The Lord of the Rings* trilogy, can be created using CG techniques. A man can slip between bullets as Neo does in *The Matrix*. And instead of wearing cumbersome prosthetics, makeup effects completed in the computer allow actors to perform in relative comfort.

While you watch scenes from the two films your teacher has chosen, pay attention to the different ways the filmmakers decided to tell the same or similar stories.

What visual effects did you notice?

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What differences were there between the traditional style of visual effects and the computer-generated visual effects?

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Can you spot which effects were filmed live and on the set?

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Which effects do you think were created digitally and added in post-production?

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Images from THE CHRONICLES OF NARNIA (2005).
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1) Screen shot of Aslan model using Rhythm & Hues' animation software. This is a typical computer screen that character animators would use to pose the character.
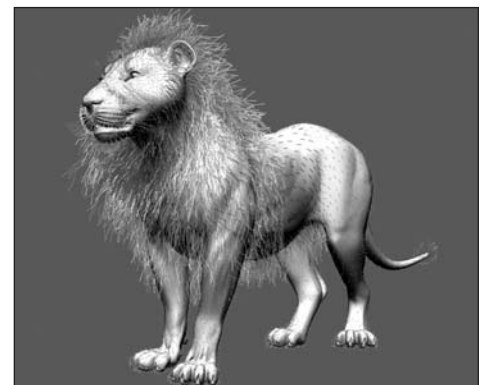
2) CG model of Aslan with guide hairs for fur and mane. The tech animation team uses these color-coded guides to control the movement of Aslan's mane.

3) Final rendered image of Aslan on neutral background. The lighters and compositors have applied the textures and light source, and now Aslan is ready to be placed in a scene.

COMPUTER-GENERATED EFFECTS TERMS

Blue- or green-screen: An optical process that allows subjects filmed in front of a blue or green background to be combined with a separately filmed background.

Bullet time: Uses multiple cameras to display the passage of time as extremely slow or completely frozen.
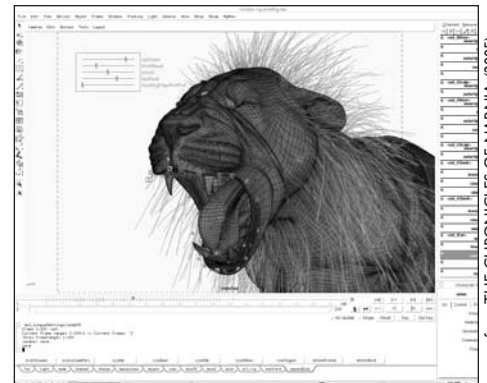
Computer Generated Imagery (CGI): Screen images that are created using mathematical formulas and computers.

Morphing: A process that makes one image transform seamlessly into another.

Motion capture: A technique that records the movement of bodies or faces so that it can be used for animation or computer-generated characters.

Motion control: A method of recording or programming the movements of a motion picture camera so that the shot can be repeated exactly.

Pre-visualization: Computer animated scenes that help filmmakers work out shots, camera angles and other visual problems before the scene is shot on the set with actors.

EFECTOS PRODUCIDOS *por* COMPUTADORA

Desde los efectos visuales producidos por computadora de hace tiempo en películas como *The Empire Strikes Back* (1980) y *Tran* (1982) a los de películas recientes como *The Matrix* y las películas de *Harry Potter*, los efectos visuales producidos por computadora se han hecho más difíciles de distinguir de la realidad. Algunas veces los efectos gráficos de computadora (CG) son parecidos a los efectos visuales tradicionales. Por ejemplo, ahora se pueden producir ocultadores usando software especial. Fondos fantásticos o naturalistas pueden ser construidos en la computadora, en vez de ser pintados en vidrio. En otras ocasiones, el progreso en la tecnología CG puede poner en la pantalla cosas que nunca se han visto antes. Personajes enteros, como Gollum en la trilogía *Lord of the Rings* pueden ser creados usando técnicas CG. Una persona puede evadir balas como lo hace Neo en *The Matrix*. Y los efectos cosméticos completados en computadora permiten que los actores puedan actuar más cómodamente en vez de tener que llevar prótesis pesados.

Mientras observe escenas de las dos películas que su maestro ha escogido, preste atención a las maneras diferentes en que los cineastas decidieron presentar el mismo cuento o uno similar.

¿Cúales efectos visuales observó?

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¿Qué diferencias había entre el estilo tradicional de efectos visuales y los producidos por computadora?

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¿Puede identificar los efectos que fueron filmados en directo y en el plató?

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¿Cuáles efectos cree que fueron producidos digitalmente y añadidos en postproducción?

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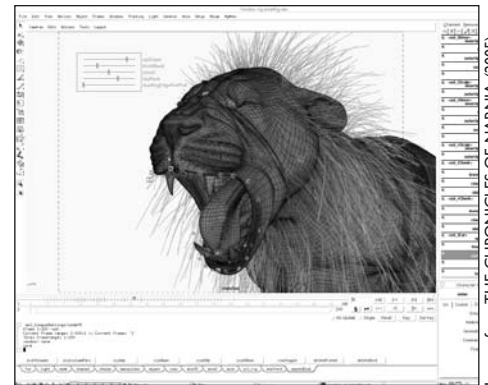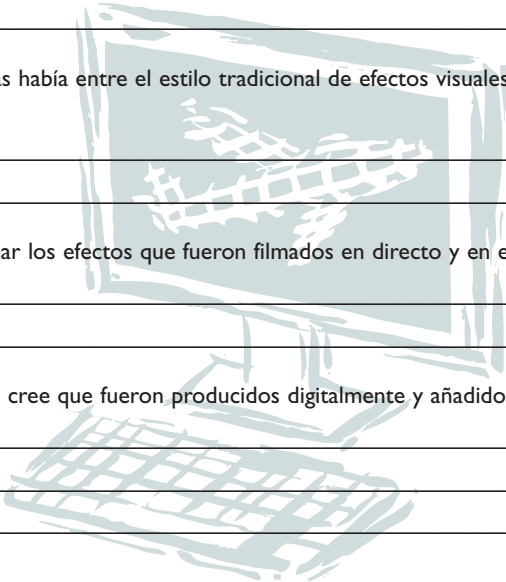
1) Foto de pantalla del modelo de Aslan usando software de animación de Rhythm & Hues. Esta es una pantalla de computadora típica usada por los animadores de personajes para posar un personaje.
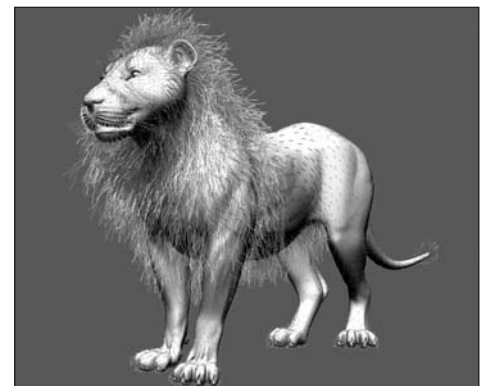
2) Modelo CG de Aslan usando pelos artificiales de guía en vez de piel y melena. El equipo técnico de animación usa estas guías codificadas por color para controlar el movimiento de la melena del león.

TERMINOLOGÍA DE EFECTOS PRODUCIDOS POR COMPUTADORA

Pantalla azul o verde: Un proceso óptico que permite que objetos filmados delante de un fondo azul o verde sean combinados con un fondo filmado por separado.

"Bullet time": Usa cámaras múltiples para mostrar que el tiempo pasa extremadamente despacio o que está completamente inmóvil.

Imágenes producidas por computadora (CGI): Imágenes de pantalla creadas usando fórmulas matemáticas y computadoras.

Metamorfosis "Morphing": Un proceso que logra que una imagen se convierta perfectamente en otra.

Captura de movimiento: Una técnica que graba el movimiento de cuerpos o caras para que pueda ser usado para animación o para personajes producidos por computadora.

Control de movimiento: Un método de grabar o programar los movimientos de una cámara fotográfica para que la foto pueda ser repetida exactamente.

Previsualización: Escenas animadas por computadora que sirven de ayuda a los cineastas con fotos, ángulos de cámara y otros problemas visuales antes de que la escena sea fotografiada en el plató con actores.

3) Imagen final de Aslan presentada en fondo neutral. Los técnicos de iluminación y los cajistas han aplicado las texturas y la fuente de luz, y ahora Aslan está listo para colocación en una escena.

VISUAL EFFECTS *in* NON-EFFECTS MOVIES

Although you might expect to see visual and special effects in fantasy, science fiction or action films, they are also used in non-effects films to erase telephone wires, neon signs and other similar unwanted elements from a scene. When filmmakers cannot find the ideal location for a scene, or if the real location would be too expensive to film, they may create it in the computer. For example, shots of a London neighborhood were digitally generated in *Bridget Jones: The Edge of Reason.*

Visual effects artists work together with cinematographers, makeup artists, costume designers and stunt performers to enhance their work. Flaws in lighting and color can be digitally corrected. Computer graphics are used to supplement or create makeup. Stunts can be performed more safely because digital technology makes it possible to remove strong cables and other supports from the image.

Read an action, fantasy or science fiction short story. While you read, think about how this story could be made into a film. Use more paper if you need it for your answers.

What effects might be needed if this story became a movie?

_____

_____

_____

What details bring this story to life?

_____

_____

Do any of these details require visual effects? Why?
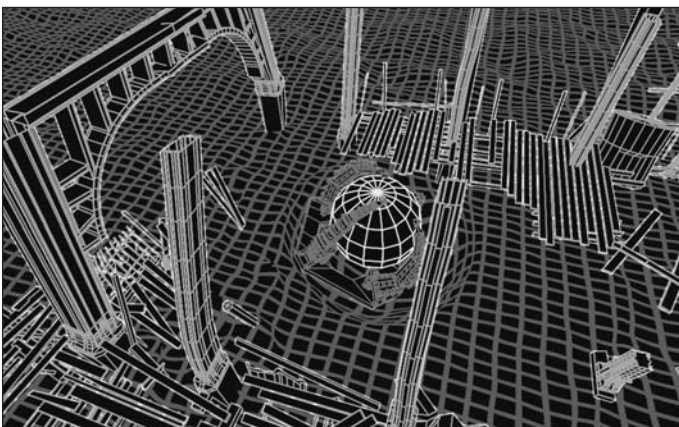
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This wirescreen computer image allows the visual effects animator to control an image point-by-point when creating the destruction of the "set" in SPIDER-MAN 2 (2004). Courtesy of Sony Entertainment.

The Real-Time Motion Capture process is demonstrated at an Academy lecture in Beverly Hills. Jeff Price, the actor in the center, is wearing a suit with white dots and sensors which allow computers to create a digital record of his movements, which can be applied to a digitally created character. Courtesy of Motion Analysis Studios.

Are there scenes in the story where you might not expect to see visual effects but where they could be used? Explain why you would use visual effects in these scenes.

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_____

Now read another story about people like you. Describe what is happening in the story.

_____

_____

_____

Keeping in mind such things as makeup, safety and budget, how could visual effects be used to enhance a film of this story?

_____

_____

_____

How would you plan to film the story without visual effects?

_____

_____
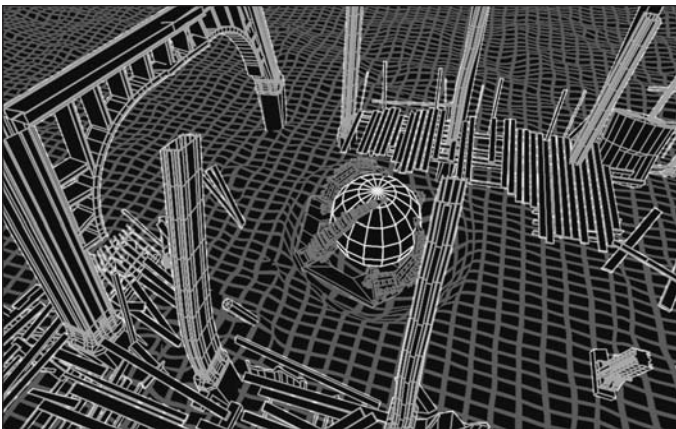
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EFECTOS VISUALES *en* PELICULAS SIN EFECTOS

Aunque se esperaría ver efectos especiales y visuales en películas de fantasía, ciencia ficción o acción, éstos se usan también en películas sin efectos para borrar de una escena líneas telefónicas, letreros de neón, y otros elementos similares no deseados. Cuando los cineastas no pueden encontrar un sitio perfecto para una escena, o si el sitio verdadero sería demasiado caro para filmar, pueden crearlo en la computadora. Por ejemplo, planos de un barrio de Londres fueron producidos digitalmente en *Bridget Jones: The Edge of Reason.*

Los artistas de efectos visuales trabajan en conjunto con los cinematógrafos, los artistas de maquillaje, los diseñadores de vestuarios, y los dobles especiales para dar realce a su obra. Los defectos de iluminación o de color pueden ser corregidos digitalmente. Se usan gráficas de computadora para realzar o crear maquillaje. Se pueden hacer escenas peligrosas con más seguridad porque la tecnología digital permite borrar cables fuertes y otros apoyos de la imagen. Lea un cuento de acción, fantasía o ciencia ficción. Mientras que esté leyéndolo, piense de la manera en que este cuento podría ser convertido en una película. Use más papel para sus respuestas si le hace falta.

¿Cuáles efectos serían necesarios si este cuento fuera una película?

_____
_____
_____

¿Cuáles detalles le dan vida a este cuento?

_____
_____

¿Requieren efectos visuales algunos de estos detalles? ¿Por qué?
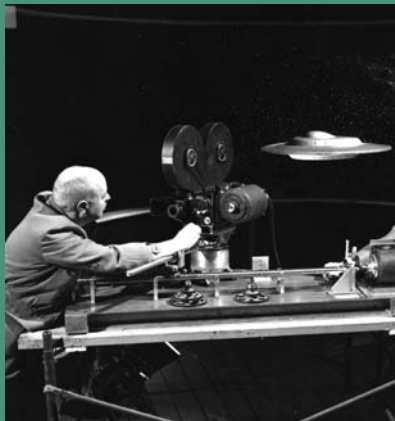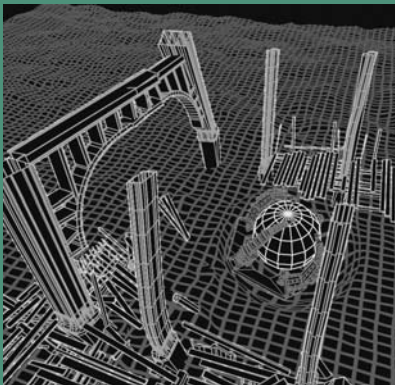
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El proceso de Captura de Movimiento en Tiempo Actual es demostrado en una conferencia de la Academia en Beverly Hills. Jeff Price, el actor en el medio, lleva un traje con puntos y sensores que permiten que las computadoras creen un récord digital de sus movimientos que podrán ser aplicados a un personaje creado digitalmente. Por cortesía de Motion Analysis Studios.

¿Hay escenas en el cuento donde no se esperaría ver efectos visuales pero donde podrían ser usados? Explique por qué usaría efectos visuales en estas escenas.

_____
_____
_____

Ahora lea otro cuento sobre personas que se parecen a Ud. Describa lo que está sucediendo en este cuento.

_____
_____
_____

Teniendo en cuenta cosas como maquillaje, seguridad y presupuesto, ¿cómo se podrían usar los efectos visuales para dar realce a una película de este cuento?

_____
_____
_____

¿Cómo proyectaría filmar el cuento sin efectos visuales?

_____
_____
_____

Esta imagen de computadora de modelo de alambre permite al animador de efectos visuales controlar una imagen punto por punto cuando crea la destrucción del plató en SPIDER-MAN 2 (2004). Por cortesía de Sony Entertainment.

ADDITIONAL RESOURCES

The Art of Ray Harryhausen, by Ray Harryhausen and Tony Dalton. Billboard Books, 2006.

Digital Domain: The Leading Edge of Visual Effects, by Piers Bizony. Billboard Books, 2001.

Industrial Light & Magic: Into the Digital Realm, by Mark Cotta Vaz and Patricia Rose Duigman. Ballantine Books, 1996.

The Invisible Art: The Legends of Movie Matte Painting, by Mark Cotta Vaz and Craig Barron. Chronicle Books, 2002.

No Strings Attached: The Inside Story of Jim Henson's Creature Shop, by Matt Bacon. MacMillan, 1997.

Secrets of Hollywood Special Effects, by Robert E. McCarthy. Focal Press, 1992.

Special Effects: An Oral History: Interviews with 37 Masters Spanning 100 Years, by Pascal Pinteau. Harry N. Abrams, 2004.

Special Effects: The History and Technique, by Richard Rickitt. Billboard Books, 2000.

Willis O'Brien: Special Effects Genius, by Steve Archer. McFarland, 1993.

WEB SITES

www.oscars.org or **www.oscar.com** 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

www.howstuffworks.com for clear explanations of some special effects techniques

www.ymiteacher.com to download more copies of this guide

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Cover photos: top to bottom

A young Ray Harryhausen, the master of visual effects for such films as JASON AND THE ARGONAUTS (1963) and CLASH OF THE TITANS (1981), paints a miniature dinosaur he sculpted for his unfinished stop-motion animated film EVOLUTION (1940s). Harryhausen sculpted all the dinosaurs, built and painted all the sets, and animated each creature frame by frame. Visual effects artists are often artists, technicians, mathematicians and storytellers all in one. From the Margaret Herrick Library Collection.

Technicans adjust the minature flying saucers and wired jets on the minature effects set of THIS ISLAND EARTH (1955). From the Margaret Herrick Library courtesy of Universal Studios.

Blue-screen technology allows whatever is a solid blue color to be replaced with another image. In this behind-the-scenes shot from SPIDER-MAN 2 (2004), actor Alfred Molina as Doc Ock has his mechanical tentacles operated by effects men who are dressed in blue standing against a blue background. The background and men will "disappear" when the blue elements are replaced with other images. Courtesy of Sony Entertainment.

Screen shot of Aslan model using Rhythm & Hues' animation software. This is a typical computer screen that character animators would use to pose the character. From THE CHRONICLES OF NARNIA (2005). © Disney Enterprises, Inc. and Walden Media, LLC.

Back cover photos: top to bottom

This 1940s photograph demonstrates the rear projection technique, where actors are placed in front of a previously photographed motion picture background. In this instance the studio setting provides better control than the difficult ocean location would allow. The boat is rocked by stagehands to coincide with the photographed waves as they are projected behind the actors. This technique has largely been replaced by blue-screen or green-screen technology, which allows for a more realistic background replacement. From the collection of the Margaret Herrick Library.

These head masks from HARRY AND THE HENDERSONS (1987) were worn by an actor, but the facial expressions were operated remotely off-camera by the effects team. The left head has been specially cut away to expose the underworkings of the head, designed by Rick Baker. Courtesy of Rick Baker and Universal Pictures.

This wirescreen computer image allows the visual effects animator to control an image point-by-point when creating the destruction of the "set" in SPIDER-MAN 2 (2004). Courtesy of Sony Entertainment.

Camera operator Jim King (left) adjusts the camera while head grip Wes Thompson operates the linear actuator for the miniature saucer "Fly-By" for an effects sequence in THIS ISLAND EARTH (1955). Courtesy of Universal Studios.

YM
YOUNG MINDS INSPIRED

ACADEMY OF MOTION PICTURE ARTS AND SCIENCES

BONUS MATERIAL RELATED *to the* 79th ANNUAL ACADEMY AWARDS® POSTER
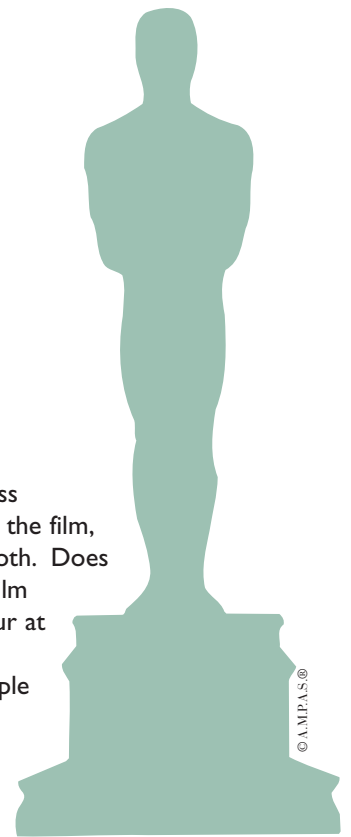
This year's Academy Awards poster, which features dozens of memorable quotes from Academy Award-winning or nominated films, might serve as an additional tool for sparking students' interest in film. The quotes could launch discussions on writing, film history, sociological or cultural influences, or even comparisons between films and their original source materials. Some possible approaches to using this poster include:

- What do these phrases tell you about the movie?
- Why do you think the phrases became popular?
- Which phrases make you want to see the movie?
- How many movies can you identify?

Show students one of the films represented by a quote. Discuss whether the phrase represents the film, the character who says it, or both. Does it reveal something about the film or the character? Does it occur at a major dramatic or emotional moment? Have you heard people around you using the phrase in general conversation? Did you realize that the phrase came from a movie?

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FOLLOWING IS A LIST OF THE QUOTES IN ALPHABETICAL ORDER, INCLUDING FILM SOURCE AND YEAR OF PRODUCTION.

"All right, Mr. DeMille, I'm ready for my closeup."
– SUNSET BLVD. (1950)

"All work and no play make Jack a dull boy."
– THE BRIDGE ON THE RIVER KWAI (1957)

"An Englishman never jokes about a wager, sir."
– AROUND THE WORLD IN 80 DAYS (1956)

"Attica! Attica!" – DOG DAY AFTERNOON (1975)

"Can't you see I have, you chump? Get me some viskey!"
– THE GREAT ZIEGFELD (1936)

"Come in, come in! We won't bite you – till we know you better." – WEST SIDE STORY (1961)

"Do I ice 'er? Do I marry 'er?" – PRIZZI'S HONOR (1985)

"Don't jive me, man." – RAY (2004)

"E.T. phone home." – E.T. THE EXTRA-TERRESTRIAL (1982)

"Follow the money." – ALL THE PRESIDENT'S MEN (1976)

"Frailty, thy name is woman!" – HAMLET (1948)

"Frankly, my dear, I don't give a damn!"
– GONE WITH THE WIND (1939)

"Frodo!" – THE LORD OF THE RINGS: THE FELLOWSHIP OF THE RING (2001)

"Gentlemen, you can't fight in here. This is the War Room."
– DR. STRANGELOVE OR: HOW I LEARNED TO STOP WORRYING AND LOVE THE BOMB (1964)

"Give 'em the old razzle dazzle." – CHICAGO (2002)

"Good evening, Clarice." – THE SILENCE OF THE LAMBS (1991)

"Greed is good." – WALL STREET (1987)

"Here's looking at you, kid." – CASABLANCA (1943)

"Hit me, Chief! I got the moves!"
– ONE FLEW OVER THE CUCKOO'S NEST (1975)

"Hope that was an empty bottle, George! You can't afford to waste good liquor, not on your salary!"
– WHO'S AFRAID OF VIRGINIA WOOLF? (1966)

"I am a dead man and buggered to boot."
– SHAKESPEARE IN LOVE (1998)

"I am not an animal. I am a human being. I am a man."
– THE ELEPHANT MAN (1980)

"I coulda had class. I coulda been a contender. I coulda been somebody, instead of a bum, which is what I am."
– ON THE WATERFRONT (1954)

"I love it when guys peel out." – AMERICAN GRAFFITI (1973)

"I wish I knew how to quit you."
– BROKEBACK MOUNTAIN (2005)

"If you build it, he will come." – FIELD OF DREAMS (1989)

"I'll get you, my pretty, and your little dog too!"
– THE WIZARD OF OZ (1939)

"I'm as mad as hell and I'm not going to take this anymore!"
– NETWORK (1976)

"I'm asking you to marry me, you little fool." – REBECCA (1940)

"I'm gonna make him an offer he can't refuse."
— THE GODFATHER (1972)

"I'm the king of the world!" — TITANIC (1997)

"I'm walking here! I'm walking here!"
— MIDNIGHT COWBOY (1969)

"In case I forget to tell you later, I had a really good time tonight." — PRETTY WOMAN (1990)

"It is widely held that too much wine will dull a man's desire. Indeed it will, in a dull man." — TOM JONES (1963)

"I've seen nothing. I should have stayed at home and found out what was really going on."
— THE BEST YEARS OF OUR LIVES (1946)

"My Momma always said life was like a box of chocolates. You never know what you're gonna get."
— FORREST GUMP (1994)

"My name is Gladiator." — GLADIATOR (2000)

"No, a golf course is nothing but a pool room moved outdoors." — GOING MY WAY (1944)

"No, if anyone orders Merlot, I'm leaving." — SIDEWAYS (2004)

"No prisoners! No prisoners!" — LAWRENCE OF ARABIA (1962)

"Off the record, on the QT, and very Hush-Hush."
— L.A. CONFIDENTIAL (1997)

"One's too many and a hundred's not enough!"
— THE LOST WEEKEND (1945)

"Open the pod bay doors, HAL."
— 2001: A SPACE ODYSSEY (1968)

"Remember those posters that said, 'Today is the first day of the rest of your life'? Well, that's true of every day except one – the day you die."
— AMERICAN BEAUTY (1999)

"Rosebud." — CITIZEN KANE (1941)

"Show me the money!" — JERRY MAGUIRE (1996)

"Shut up! Shut up and take the pain! Take the pain!"
— PLATOON (1986)

"Snap out of it!" — MOONSTRUCK (1987)

"Sometimes you're so beautiful it just gags me."
— YOU CAN'T TAKE IT WITH YOU (1938)

"Stanley, ya see this? This is this. This ain't something else. This is this. From now on, you're on your own."
— THE DEER HUNTER (1978)

"STELLA!" — A STREETCAR NAMED DESIRE (1951)

"Such stupidity is without equal in the entire history of human relations." — GIGI (1958)

"Ten minutes to Wapner." — RAIN MAN (1988)

"The Force is strong with this one!" — STAR WARS (1977)

"The horror. The horror." – APOCALYPSE NOW (1979)

"The truth, Helen, is always the right answer."
— SCHINDLER'S LIST (1993)

"The Von Trapp children don't play. They march."
— THE SOUND OF MUSIC (1965)

"They call me MISTER Tibbs!"
— IN THE HEAT OF THE NIGHT (1967)

"Think you used enough dynamite there, Butch?"
— BUTCH CASSIDY AND THE SUNDANCE KID (1969)

"This is Doyle. I'm sittin' on Frog One."
— THE FRENCH CONNECTION (1971)

"Wanna dance? Or would you rather just suck face?"
— ON GOLDEN POND (1981)

"Well, to tell ya the truth, I lied a little." — CHINATOWN (1974)

"Well, what am I? I'm a private no-class dogface. The way most civilians look at that, that's two steps up from nothin'."
— FROM HERE TO ETERNITY (1953)

"We're going to kick the hell out of him all the time and we're going to go through him like crap through a goose!"
— PATTON (1970)

"What we've got here is failure to communicate."
— COOL HAND LUKE (1967)

"When you're in love with a married man, you shouldn't wear mascara." — THE APARTMENT (1960)

"Who was the best pilot I ever saw? Well, uh, you're lookin' at 'im." — THE RIGHT STUFF (1983)

"Wind in the hair! Lead in the pencil!"
— TERMS OF ENDEARMENT (1983)

"You can break a man's skull. You can arrest him. You can throw him into a dungeon. But how do you control what's up here? How do you fight an idea?"
— BEN-HUR (1959)

"You can't handle the truth!" – A FEW GOOD MEN (1992)

"You don't throw a whole life away just 'cause it's banged up a little." — SEABISCUIT (2003)

"You don't want much. You just want the moon. …with parsley!" — GENTLEMAN'S AGREEMENT (1947)

"You had me at hello." — JERRY MAGUIRE (1996)

"You make me want to be a better man."
— AS GOOD AS IT GETS (1997)

"You throw money around like it was money."
— ALL THE KING'S MEN (1949)