FANTASIA 2000

THE IMAX EXPERIENCE®

EDUCATIONAL RESOURCE GUIDE: COMMUNICATION/TECHNOLOGY

X CORPORATION

Walt Disney Pictures Presents

FANTASIA 2000

THE IMAX EXPERIENCE®

DEAR TEACHER,

The Walt Disney Company is pleased to provide you with this curriculum resource guide. Please take a few minutes and look over its contents. You will find a Communication/Technology Guide complete with five reproducible activity masters. The teaching strategies contained in this guide will engage your students in active learning and discovery as they trace the evolution of communication from early drawings on the walls of caves to today's Internet and learn how state-of-the-art technology was used in *Fantasia/2000* to bring some of the world's finest music and art to life.

Fantasia, first released in 1940, was a daring feat, combining some of the world's greatest music with stunning visual interpretations that set the standard by which all animated films have been judged ever after. *Fantasia/2000* continues this tradition by combining musical masterpieces and the vision of a new generation of animators with the technology of the new millennium. *Fantasia/2000's* marriage of music and animation—both traditional and computer-generated—will awaken in your students an excitement and appreciation of the creative process and the scientific breakthroughs that have made this amazing film possible.

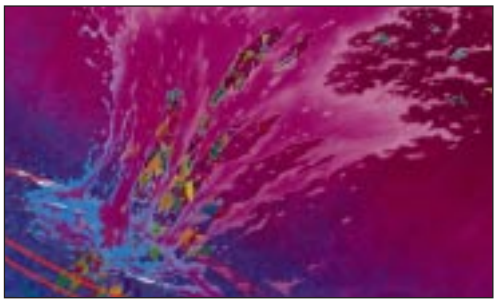
Fantasia/2000 continues the innovative legacy of *Fantasia*. When it makes its debut on January 1, 2000, exclusively at IMAX® theatres around the world, it will have the distinction of being the first animated theatrical feature-length film ever released in this giant-screen, IMAX large-format process. We know that you and your students will find the viewing of *Fantasia/2000* in the giant-screen IMAX format to be an unforgettable experience.

We encourage you to act now and arrange a class trip to your local IMAX theatre between January 1 and April 30, 2000, so your students can enjoy and learn from the magic of *Fantasia/2000*. But, whether or not you are able to take advantage of a special group screening at your local IMAX theatre, we hope you will use these free educational resource materials to enhance your curriculum and excite your students for many years to come.

Roberta Nusim
Publisher
Youth Media International

P.S. Please note that there are additional resource guides available for music and art classes. For more information on these materials and many more engaging classroom activities, check out our *Fantasia/2000* Web site at www.fantasia2000.com

ABOUT THIS COMMUNICATION/ TECHNOLOGY RESOURCE GUIDE



This Teacher's Guide for *Fantasia/2000* was prepared by professional educators like you and was designed to allow you and your students to enjoy an exciting educational experience tied directly to a major motion picture event. We hope that you will use these resource materials to enhance your general curriculum. The inspiration for the eight segments of *Fantasia/2000* includes myth, legend, poetry and the tales of Hans Christian Andersen. The stories the segments tell are communicated through a wonderful blend of great music and a wide array of state-of-the-art animation technologies.

The activities in this guide will engage students from the elementary grades through university in exploring the many aspects of communication in its verbal, written and technological forms. It also will give students an opportunity to look at the scientific and technological advances that affect how we communicate today. Some activities are suitable for use in the natural history curriculum as well. You may choose to use these activities on your own, or you may choose to do them as part of an interdisciplinary program with teachers from several different subject areas.

Each activity has been rated according to its level of difficulty. Because these ratings are only suggestions, we recommend that you review the activities to be sure they are appropriate for your students. Please feel free to modify the activities to suit your students' needs.

= grades 4-6 = grades 7-9 = grades 10-12 = university

Materials appearing in text boxes with this symbol A are designed for early elementary grades.

To amplify the materials in this program, you and your students will want to go to the state-of-the-art *Fantasia/2000* Web site at www.fantasia2000.com

Please note: Although viewing the film will enhance your students' learning experience, it is not necessary for your students to view *Fantasia/2000* in order to complete many of the activities.

TABLE OF CONTENTS

Walt Disney's 1940 landmark animated motion picture, *Fantasia,* represented Disney's boldest experiment and was the culmination of his desire to blend animated imagery with classical music. What had begun as a vehicle to bring new popularity to Mickey Mouse's career (with a short called *The Sorcerer's Apprentice*) blossomed into a full-blown feature that remains unique in the annals of animation. Walt had great ambitions for *Fantasia.* He envisioned it as the motion picture medium's first perpetual entertainment and talked of making a new version of *Fantasia* every year. He observed, *"Fantasia* is timeless. It may run 10, 20 or 30 years. It may run after I am gone. *Fantasia* is an idea in itself." The outbreak of World War II curtailed Disney's plans for the film and, in time, his interests shifted to other projects.

Roy notes, "One of the things that I've always felt that *Fantasia* accomplished was to move animation into a realm where it was accepted as an art form in a way that probably never could have been done without making *Fantasia.* It's a work that makes you think about possibilities. I think every animator that's ever lived since then has, in some way, been influenced by it."

ABOUT *FANTASIA/2000*

Fantasia/2000 was initiated and spearheaded by Roy E. Disney, vice chairman of The Walt Disney Company and Chairman of Feature Animation. He also served as executive producer for the project. Veteran Disney animator Hendel Butoy (who co-directed *The Rescuers Down Under*) came on board as the film's supervising director and went on to personally direct two of the new segments as well. Don Ernst, a veteran editor and co-producer of Disney's *Aladdin,* took on the assignment of producer. Don Hahn, one of the Studio's most successful producers (*Beauty and the Beast, The Lion King, The Hunchback of Notre Dame*) was enlisted to direct the film's live-action introductions. Supervising the direction of the film's other animated segments are Paul and Gaëtan Brizzi, Francis Glebas, Eric Goldberg, and Pixote Hunt.

More than 1,200 artists, animators and technicians worked on *Fantasia/2000* during the course of the production. Segments were painstakingly animated one at a time with a crew size never exceeding 250.

One of the key elements in making *Fantasia/2000* a reality was the involvement of a major musical talent as an active collaborator. Renowned maestro Leopold Stokowski had joined forces with Walt Disney to help create *Fantasia.* For this latest project, the filmmakers turned to acclaimed conductor James Levine, whose 28-year association with the New York Metropolitan Opera has earned him a special place in the musical world. Among the many highlights of Levine's career was a 20-year stint as music director of the Ravinia Festival, where he led the Chicago Symphony Orchestra. Based on that long-time connection, that great orchestra was selected to record the new musical selections for *Fantasia/2000* in state-of-the-art digital sound. Levine, who had been influenced by *Fantasia* as a young boy, was very eager to be a part of this latest Disney project.

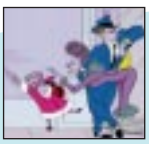
THE MUSICAL PROGRAM

BEETHOVEN'S SYMPHONY NO. 5, ALLEGRO CON BRIO

MUSIC: LUDWIG VAN BEETHOVEN
Director: PIXOTE HUNT
Art Director: PIXOTE HUNT

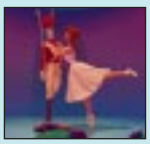
PINES OF ROME

Music: OTTORINO RESPIGHI
Director: HENDEL BUTOY
Art Directors: DEAN GORDON, WILLIAM PERKINS



RHAPSODY IN BLUE

Music: GEORGE GERSHWIN
Soloist: RALPH GRIERSON
Director: ERIC GOLDBERG
Art Director: SUSAN MCKINSEY GOLDBERG



SHOSTAKOVICH'S PIANO CONCERTO NO. 2, ALLEGRO, OPUS 102

Music: DMITRI SHOSTAKOVICH
Soloist: YEFIM BRONFMAN
Director: HENDEL BUTOY
Art Director: MIKE HUMPHRIES

Selecting the musical program for *Fantasia/2000* required a great deal of thought and consideration. Roy Disney observes, "It had to be descriptive music. It had to be something that had the sense of a story progression, somehow or another, and it had to be just appealing to us as music. We had a lot of fun picking the music." In making their choices for the musical program, the filmmakers listened to hundreds of pieces of music, including many that were suggested for the 1940 production.

THE IMAX EXPERIENCE®

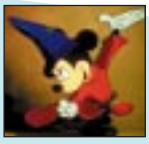
Like *Fantasia, Fantasia/2000* embraces all the latest technological tools and innovations to tell its stories and create breathtaking imagery. Each of the new segments uses a style or combination of approaches that is right for that particular story. For example, the animated whale characters in *Pines of Rome* were created with the help of cutting-edge software packages for computer-generated imagery. The ballerina in "The Steadfast Tin Soldier" (set to the music of Shostakovich's *Piano Concerto No. 2*) required the design of a new computer program that would allow the hair and costumes to move in response to the animators' hand-drawn efforts. A special particle system was implemented for the first time in the *Firebird* sequence to allow some spectacular movement and effects. Those sequences are in contrast to the *Rhapsody in Blue* number, which is an elemental kind of animation using stylized drawings on a flat plane; the rich classic 1940s' style animation of Donald Duck in *Pomp and Circumstance*; and the "painterly" look and traditional styling of Beethoven's *Symphony No. 5*.

Fantasia made motion picture history in 1940 when it became the first film to be recorded and released in stereophonic sound. The process was called Fantasound and the film traveled from city to city in special road show engagements. For the New York premiere, 36 speakers were installed behind the screen, with 54 others placed throughout the orchestra and balcony. The release of *Fantasia/2000* is similarly making motion picture history. When it debuts on January 1, 2000, exclusively at IMAX theatres around the world, it will be the first animated theatrical feature-length film ever released in this giant-screen, large-format process.

Fantasia/2000 will have its world premiere at Carnegie Hall on December 17, 1999, when the film will be shown with live accompaniment by the 120-piece Philharmonia Orchestra (of London) conducted by Maestro Levine. Similar live performances will follow in London, Paris and Tokyo before a spectacular *Fantasia/2000* Millennium Eve Gala unfolds at the Pasadena Civic Auditorium on December 31st.

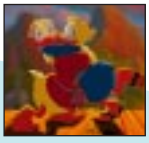
CARNIVAL OF THE ANIMALS (LE CARNAVAL DES ANIMAUX) FINALE

Music: CAMILLE SAINT-SAËNS
Director: ERIC GOLDBERG
Art Director: SUSAN MCKINSEY GOLDBERG



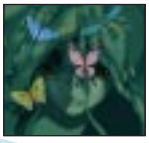
THE SORCERER'S APPRENTICE

Music: PAUL DUKAS
Director: JAMES ALGAR
Art Directors: TOM CODRICK, CHARLES PHILIPPI, ZACK SCHWARTZ



POMP AND CIRCUMSTANCE, MARCHES #1,2,3 AND 4

Music: SIR EDWARD ELGAR
Director: FRANCIS GLEBAS
Art Director: DANIEL COOPER



FIREBIRD SUITE-1919 VERSION

Music: IGOR STRAVINSKY
Directors: GAËTAN AND PAUL BRIZZI
Art Director: CARL JONES

OBJECTIVES

The student will

- learn about the history and traditions of storytelling
- consider the ways stories can be communicated and the influence technology has had on how stories are told
- review the essential elements of all good stories and develop an original story

THE ART OF STORYTELLING

TEACHING STRATEGIES

Part 1: Talk with your students about the history and evolution of storytelling. Explain how stories spread across the globe, passing from traveler to traveler and culture to culture, changing each time they were told to better reflect the culture and values of each new storyteller. Have students see how a story changes as it is transmitted by playing the "telephone" game: Write a three-sentence narrative. Whisper it to one student and have that student whisper it to the next student and so on. Ask the last student to relate the story to the class and discuss how it has changed in the transmission.

Part 2: Review with your students the essential elements of plot, character and setting that are common to all stories. Talk with them about their story concepts and the media in which they would like to tell them. Set aside a special class period when your students can perform or present their stories.

Part 3: On this, and the other activity sheets, there is a project that students can do at home with family and friends.

EXTENDED ACTIVITIES

The Walt Disney Company animators chose to base the story that accompanies Shostakovich's *Piano Concerto No. 2* in *Fantasia/2000* on "The Steadfast Tin Soldier," a story by Hans Christian Andersen. Tell your students about this famous storyteller, who was born on an island off the coast of Denmark in 1805. As a young boy, he was often on his own and, rather than go to school and study, he began to invent stories. He had an excellent memory and also enjoyed memorizing and reciting the dialog from plays. As his reputation grew he told his stories for the kings and queens of Europe. Divide your class into small groups. Have each group read a different Hans Christian Andersen story, then relate it to the class. Have students identify the qualities that make these stories timeless.

Ask your students to find other examples of stories that have a timeless quality and explain their choices in a class discussion. Then, have students pick one story from their list and create a modern-day version. Compile stories into a class literary magazine.

Ask your students to think about the stories they remember best from their childhood, and to talk with their parents and other family members about their favorite childhood stories. Are some of the stories the same? If so, have some of the details changed?

Invite a local storyteller to visit your class to talk about the oral storytelling tradition and to tell some stories.

Have your students create a timeline that includes milestones in the evolution of storytelling, beginning with 12,000 B.C.E., when stone-age people drew pictures on the walls of caves, and ending with the year 2000. Encourage your students to have fun with this project and to find little-known milestones as well as the better-known ones. Other information they might include: 3100 B.C.E.—the advent of written language; 1440-50—Gutenberg invents the printing press; 1906—the first known radio broadcast in the United States is made from an experimental station near Brant Rock, Mass.; 1937—the BBC televises the coronation of King George VI, etc.

DEFINITIONS

Character: A person portrayed in a story or play.
Plot: The plan or pattern of events of a story.
Setting: The time and place of the action of a story.

A In the *Pines of Rome* segment of *Fantasia/2000*, The Walt Disney Company animators tell the story of a family of humpback whales that can fly. Ask your students to share what they know about the "real-life story" of whales—where they live, what they eat and what their families are like, for example. Then, have your students visit the library to find books about whales and learn more about their "story."

For more activities and information related to *Fantasia/2000*, visit the *Fantasia/2000* Web site at www.fantasia2000.com or IMAX's Web site at www.imax.com

A Elementary Grades 4-6 Grades 7-9 Grades 10-12 University

Activity Master 1

THE ART OF STORYTELLING

There have been stories for as long as there have been people to tell them. Long before people could write, stories were a major source of entertainment, wisdom and history. From early cave drawings to the technological marvels of *Fantasia/2000*, the way we tell stories has changed dramatically through the ages.

Part 1: Technology has given us many new ways to communicate and tell our stories. What has remained the same? Do we still tell stories for the same reasons? As you fill in the chart below, think about how the early forms of storytelling have changed with the times. In column 1, list various forms of storytelling before the twentieth century. Then, in column 2, list ways technology has been used to tell stories in the past hundred years. (We've done the first one to help get you started.)

1. Storytelling Then	Why?	2. Storytelling Now	Why?
Pictures drawn on the walls of caves	To inform, entertain	E-Zines on the Internet	To inform, influence, entertain

Despite how the story is communicated, all great tales have certain elements in common. They have characters we care about, settings that are special, challenges that must be faced and outcomes that are based on the actions of the characters. From a family of humpback whales discovering the joys of flight, to Mickey Mouse as the Sorcerer's Apprentice finding himself over his head in trouble, to the brave Tin Soldier struggling against incredible odds to save the beautiful ballerina, each story in *Fantasia/2000* captivates and entertains us.

Part 2: Try your hand at writing your own great story. Who will your characters be? Where will your story take place? What challenges will your hero face? How will your story end? Make your notes in the space below.

Working Title: _____

_____

Characters: _____

_____

_____

Setting: _____

_____

_____

Plot: _____

_____

_____

Now that you have a great story to tell, think about the different ways you can communicate it to others. Stories can be told through spoken or written words, but there are other options, too—dance, painting, mime, cartoons and many more. Stories also can be told by combining different media for maximum effect, as seen in the large-format, giant-screen IMAX sight-and-sound experience of *Fantasia/2000*. To tell the story of the humpback whales, the Disney artists combined the newest computer-generated imagery with the dazzling music of Respighi's *Pines of Rome*. The ballerina in the "Steadfast Tin Soldier" segment was created with a special computer program that applied the laws of physics to ensure that her hair and the fabric of her costume moved in just the right way. You also will need to think about who you will tell your story to. Will your audience consist of one person or millions of people?

List three different ways you can communicate your story. Then, decide which will be most effective and create your story in the medium of your choice.

1. _____

2. _____

3. _____

After you've seen FANTASIA/2000

Part 3: Choose one of the eight segments of the film and, on another sheet of paper, analyze how each of the elements of storytelling—plot, character and setting—combined to leave a lasting impression. Then describe how the music, art and technology contributed to the storytelling process. Finally, ask your family members if they have seen *Fantasia*. If so, which segment left the most vivid impression?

Visit the *Fantasia/2000* Web site at www.fantasia2000.com for more information, exciting activities and cutting-edge graphics!

Walt Disney FANTASIA 2000 THE IMAX EXPERIENCE®

Section 2

BRINGING POETRY TO LIFE

OBJECTIVES

The student will

- consider different poetic forms and learn to appreciate poetry as a unique literary and sensory experience
- experiment with rhythm and meter
- look at the role technology plays in creating sensory experiences

TEACHING STRATEGIES

Part 1: Begin by discussing with students the role each of the senses plays in receiving information. Then, explain that poetry appeals to our senses of seeing and hearing. Talk with your students about the many different forms that poetry can take. Explain that some forms of poetry—such as the sonnet, the couplet and Japanese haiku—have set patterns, while other forms allow for flexibility. The humorous poems of Ogden Nash (1902-71), with their highly original rhyming schemes, display great flexibility. Nash even went so far as to mispronounce, misspell and coin new words in his poems. Introduce poetic measure, or meter. Explain that all poetry, except free verse, has a distinctive meter, or pattern of accented and unaccented syllables.

A Ogden Nash used animals as the subjects of many of his humorous poems. He described the sounds they make, how they look and even how they move, often using coined words. Ask your students to observe the way different animals move (for example: cats and dogs at home; squirrels and chipmunks in the park; bears and monkeys on nature videos or at the zoo). Then, have them try to imitate the various animals they have observed and create their own new words to describe how they move.

Note: While the verses Nash wrote to accompany *Carnival of the Animals* may be fairly difficult to locate, much of his work is readily available. See the Resources section on the back cover of this guide for suggestions.

Example for Part 1 of the Activity Master:

①2 3 4 ⑤6 7
Elephants are useful friends

Part 2: *(Requires students to view the film.)* Have students pay particular attention to the ways in which their senses are engaged as they view the film.

EXTENDED ACTIVITIES

To further emphasize the importance of meter in poetry, ask your students to set the Nash verses on the activity sheet to music.

Have students create verses that describe Saint-Saëns' animals using their own poetic style.

Have students research the basics of sound and acoustics and report their findings.

Paul Dukas based his music, *The Sorcerer's Apprentice*, a segment from *Fantasia* that is included in *Fantasia/2000*, on a poem by the German writer and statesman, Johann Wolfgang von Goethe (1749-1832). The German title is *Der Zauberlehrling* ("The Sorcerer's Apprentice"). The Walt Disney Company animators were faithful to the story the poem tells when they created their timeless segment featuring Mickey Mouse as the hapless apprentice. Have your students read the poem and learn more about Goethe, whose standing among the ranks of German authors is comparable to Shakespeare's ranking among English writers.

To help your students become more aware of the role of technology in creating sensory experiences, have them take a real (or imaginary) trip through the local shopping mall. Tell them to trace their trip from beginning to end, making a log of all the sensory experiences they have. The log should have three columns—what the sensory experience was, what senses were involved, and what technologies were used to create the experience. For example, they hear the background music that is piped throughout the mall and the buzzing of the computerized registers, they see the flashing neon signs in the arcade, they feel the coolness of the air conditioning, and they smell the aromas in the food court.

Have your students, individually or in groups, research the design of IMAX theatres and report back to class on the specific design elements that contribute to the unique sensory experience they provide.

DEFINITIONS

Couplet: The shortest stanza, containing two lines of rhyming verse.
Haiku: An unrhymed verse form of Japanese origin having three lines containing, usually, five, seven, and five syllables respectively.
Sonnet: A fixed-verse form of Italian origin consisting of fourteen lines. An Italian, or Petrarchan, sonnet has an eight-line stanza followed by a six-line stanza. An English, or Shakespearean, sonnet has three four-line stanzas and one two-line stanza.

For more activities and information related to *Fantasia/2000*, visit the *Fantasia/2000* Web site at www.fantasia2000.com or IMAX's Web site at www.imax.com

A Elementary Grades 4-6 Grades 7-9 Grades 10-12 University

Activity Master 2

BRINGING POETRY TO LIFE

Poetry is the earliest form of written literature that we have.

That's probably because its structure and rhythmic (sound) patterns are easier to remember than those of prose. Some poems entertained while others taught moral lessons or provided information. Poetry depends on choosing just the right words, in just the right order. As those "right words" are combined, they produce patterns of vowels and consonants and special rhythms that create a unique sensory experience similar to that of music. And, like music, poetry is best appreciated when it is performed well and when we can see the performer's facial and body gestures. Similarly, in *Fantasia/2000*, The Walt Disney Company animators enhance our sensory experience of great classical music by providing an enchanting, captivating visual accompaniment.

Part 1: Many poems are set to music. (Lyric poems got their name because an instrument known as a lyre often accompanied them.) Sometimes, the music inspires the poetry. That was the case when American humorist and poet Ogden Nash wrote a series of verses to enhance our experience of Saint-Saëns' *Carnival of the Animals*, the fifth segment in *Fantasia/2000*. (The Walt Disney Company animators illustrated this segment with amusing images of flamingos playing with a yo-yo in the same lighthearted tone Nash used in his delightful poetry.) In writing about the elephant, for example, Nash said: "Elephants are useful friends/Equipped with handles at both ends." In the first line below, write a number over each stressed syllable in Nash's poetry. (For example, in the word "elephants" the stress is on the first syllable.) Then do the same for the second line. Now circle the number of the syllables that are accented. If you have a question about where to put the circles, check a dictionary.

Elephants are useful friends

Equipped with handles at both ends.

How do the two lines compare? How many different ways can you read these lines?

On a separate sheet of paper try the same thing with these Nash lines: "The kangaroo can jump incredible/He has to jump because he's edible."

Now, in the box below, in the style of Ogden Nash, write your own description of one of the creatures depicted in another section of Saint-Saëns' music—the royal lion, the roosters and hens, fleet-footed animals, turtles, aquarium, cuckoo, aviary or the swan.

Part 2: Poetry provides us with one kind of sensory experience. The technologies that were used to create *Fantasia/2000* allow us to experience the film as a true feast for the senses. IMAX (Image Maximum) technology uses special cameras, special projectors, wide screens, specially designed theatres with digital sound systems, and film that is 10 times larger than the 35mm film you see in a normal movie theatre. Most IMAX screens are 80 feet (almost 8 stories) high and 100 feet wide. Because the screen fills your peripheral vision, you feel like you are right in the action. These incredible images are accompanied by an extraordinary sound experience. A six-channel sound system and special sound equipment located behind the lower part of the screen allow viewers to feel the sound as well as to hear it. (The vinyl screen is perforated with thousands of tiny holes to allow the sound to flow through.)

In IMAX *Dome* theatres, images are projected through a fisheye lens onto a giant dome screen, so the viewer feels completely enveloped by the film. When the film is about to start, the projector is lifted from the projection room into a concrete "doghouse," a box located inside the theatre. (The film reels and the operator remain below.)

After you've seen FANTASIA/2000

Think about those moments in the film where the emotional effect of the music and the technology of the IMAX experience combine with The Walt Disney Company's storytelling magic to create a memorable multi-sensory experience. In the space below, describe some of those special moments.

_____

_____

_____

Part 3: You may not remember what recorded music sounded like before the compact disc (CD), but your parents and older family members probably do. Talk with them about their memories. Do they remember monaural sound? The introduction of stereophonic music? Did they ever play eight-track tapes in their cars? Then, do some reading to find out about the origins of recorded music and how the technology developed since Edison's invention of the phonograph in 1877.

Visit the *Fantasia/2000* Web site at www.fantasia2000.com for more information, exciting activities and cutting-edge graphics!

Walt Disney Pictures Presents FANTASIA 2000 THE IMAX EXPERIENCE®

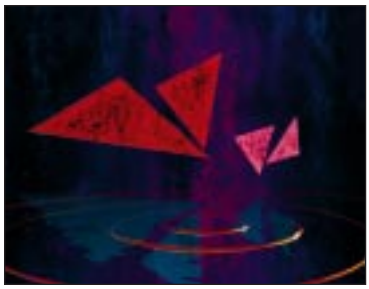
Section 3

EXTRAORDINARY STORIES

OBJECTIVES

The student will

- identify the elements that make a story memorable
- look at legends and consider how legends develop
- learn something about how films are digitally restored and about the giant-screen IMAX technology



TEACHING STRATEGIES

Part 1: After your students have filled in their charts, ask them to share what they have written. How many of their responses are similar? As a class, create a top 10 list of the most memorable stories ever written.

Part 2: *(Requires students to view the film.)* Before your students view *Fantasia/2000*, show the segment from *Fantasia*—*The Sorcerer's Apprentice*—in class. Discuss the remastering techniques described on the activity sheet.

EXTENDED ACTIVITIES

Some extraordinary figures become legends. Some, like Paul Bunyan, whose character and exploits grew from the stories told by lumberjacks as they sat around their evening campfires, are purely fictional. Others, like Daniel Boone and Davy Crockett, were real heroes who became larger than life as their legends grew. Ask your students to think of individuals today who might become legendary.

Have students work in small groups to develop modern-day legends. Then have them decide what technology they will use to communicate their tales. Students can make a list of all the different ways they can now tell their stories. Will they produce them in print using computer software? Share them on the Web? Record them on audio or video tape? After they complete this activity, have students compare and contrast the effectiveness of the techniques chosen.

Have your students work in groups to develop a class timeline tracing the evolution of film technology from the seventeenth-century magic lantern of Athanase Kircher, to George Eastman's nitrocellulose-based film in 1889, to *The Jazz Singer* in 1927, to today's giant-screen, state-of-the-art IMAX process. Each group can be responsible for a different topic. Where do they think film technology will go next?

DEFINITIONS

Digital image: An image that is created electronically on a computer by using varied combinations of two digits (1 and 0) to represent form, shape and color.

Pixel: One spot in a grid of thousands of spots that are individually created by computer to form an image. A pixel is the smallest picture element that a computer can manipulate.

Scanner: A device that creates electronic images of objects.

In the *Firebird Suite* segment of *Fantasia/2000*, The Walt Disney Company animators depict nature in the form of a Sprite. When the beauty of springtime is destroyed by the fury of the Firebird, who lives within an active volcano, the Sprite brings life back to the ravaged forest and reawakens what lies beneath the ashes. Talk with your students about the rebirth and reawakening that occurs in nature during springtime. Then, have them create their own "picture stories" to express these changes.

For more activities and information related to *Fantasia/2000*, visit the *Fantasia/2000* Web site at www.fantasia2000.com or IMAX's Web site at www.imax.com

Elementary · Grades 4-6 · Grades 7-9 · Grades 10-12 · University

Activity Master 3

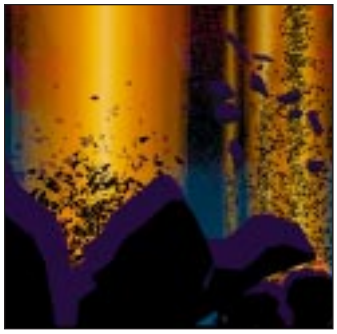
EXTRAORDINARY STORIES

Most of the stories that engage us and hold our attention—that stand out in our memories—tell about people and events that are extraordinary. Often, they are about larger-than-life characters. Consider the legend of Tarzan. It started in 1914 with a compelling story by Edgar Rice Burroughs and has been retold many times since then, most recently in The Walt Disney Company's exciting animated version. The story became larger than life because of Tarzan's extraordinary experiences when he was raised by a family of apes in the African jungle. In *Fantasia/2000*, The Walt Disney Company's animators weave extraordinary tales that also are designed to capture the imagination. There are stories about flying whales, flamingos playing with yo-yos, a toy soldier coming to life and a mouse who tries his hand at magic.

Part 1: Think about several stories you have heard, seen or read that stand out in your memory. Why does each story capture your imagination? Why are the characters or events memorable or larger than life? Write your responses in the chart below.

What the story is about	Why it is memorable or larger than life

Part 2: IMAX technology, with its giant screens and its six-channel multi-way digital sound, makes everything seem larger than life. IMAX cameras are extremely versatile—they have been used in space, on the ocean floor and at many locations around the globe (including on top of Mount Everest). Because the IMAX film is so big, IMAX projectors use special rollers and a patented Rolling Loop technology rather than the standard metal sprockets used on conventional projectors. The film is advanced horizontally in a wave-like motion. The film runs through the projector at 24 frames per second and is held absolutely steady by registration pins and a vacuum. The projection lamp emits a beam of light so powerful that it could be seen from the moon! The larger-than-life visual images of an IMAX film have amazing sharpness, clarity and brilliance. This is evident in the seven new segments in *Fantasia/2000* and the returning segment from *Fantasia*—*The Sorcerer's Apprentice*. This segment was remastered (restored) before it was included in this new film because today's technology allows the restored images to be sharper and clearer, and the colors brighter. Each frame in *Fantasia* was scanned and converted into digital images. This allowed the restorers to work with tiny picture elements called pixels. Dust and dirt were removed and each frame was cleaned. Color was carefully added to each spot where a bit of dust or dirt had been removed. This process is called "cloning"—the color information from one area on the frame is copied and transferred to another, like the cut-and-paste functions on a personal computer. In another restoration process known as a "reveal," a damaged frame is overlaid on a good frame. Any part of the image that is the same on both frames can pull through and "reveal" from the good frame to the bad frame. The experts who did the restoration were very careful not to change any of the artistic ideas in the segment from *Fantasia*. Roy Disney, Walt Disney's nephew, was personally involved in overseeing this whole process.



After you've seen FANTASIA/2000

After you have seen *The Sorcerer's Apprentice* from *Fantasia* on a small screen and the IMAX version of the same segment in *Fantasia/2000*, compare and describe your two viewing experiences. How did the size of the images in the IMAX version influence your reactions to the characters in the segment? How did the color vary? How was the sound different?

Part 3: Each culture has its own stories about legendary characters who have done extraordinary things. Interview your parents and other family members to learn about the legends of your heritage and report back to class.

Visit the *Fantasia/2000* Web site at www.fantasia2000.com for more information, exciting activities and cutting-edge graphics!

Walt Disney FANTASIA 2000 THE IMAX EXPERIENCE®

Section 4

ANIMATION AND TECHNOLOGY

OBJECTIVES

The student will

- consider how modern technology has changed the way we live
- learn about the history and evolution of animation
- learn about optical illusion, and how the mind and the eye work with projection technology to create the illusion of motion

TEACHING STRATEGIES

Part 1: After your students have completed their interviews, provide class time for sharing and discussion. Ask: What does the information you have collected tell you about the differences in lifestyles in the three generations?

Part 2: *(Requires students to view the film.)* Provide your students with some of the history of animation: Some people say that animation has its roots in the figures drawn on ancient Greek vases. Others say the foundation was laid in the seventeenth century, when a primitive kind of projector known as a magic lantern was developed. (Early missionaries used the device as a teaching aid as they told stories from the Bible.) During the next two centuries, elaborate slide shows called Phantasmagoria became popular. Shadow puppets, popular for a thousand years in the Orient, were introduced to Europe in the 1770s. In shadow-puppet shows, two-dimensional figures moved behind a backlit screen, telling a story with shadow images (silhouettes).

A major breakthrough happened in 1906, when J. Stuart Blackton, a British-born vaudeville performer, and his partner, Alfred E. Smith, produced what is believed to be the first animated film, *The Humorous Phases of Funny Faces.* In 1914, *Gertie the Dinosaur* was released, and the animation industry had begun for good. In 1914, Earl Hurd's cel process allowed animators to draw moving objects on sheets of celluloid that would be filmed against fixed backgrounds. Walt Disney's Mickey Mouse appeared in the first film shot with a multiplane camera, which brought proper perspective to animated films. Today, with the aid of computer technology, animation artists are able to create amazing special effects and incorporate even the tiniest of details into their work.

EXTENDED ACTIVITIES

Ask your students to think about this: Why does a film that contains nothing more than a series of still images appear to move? Explain that an animated film, like any other film (which also starts with a series of still images), creates the illusion of motion by tricking the eye and the brain into seeing something that isn't really there. Because each frame is only slightly different than the one before it, when the frames are projected at just the right speed (24 frames per second), the brain interprets the changing images as continuous motion. The way our eyes work causes us to see each image for a split second after it has disappeared. This is an optical illusion that is known as persistence of vision, and it is what causes the eye to connect the separate frames into one continuous motion.

Try this experiment to help your students see how easy it is to trick the brain: Print a large letter "a" on a plain white sheet of paper. Give each student a copy of the sheet. Ask your students to stare at the "a" for one minute and then look at another sheet of paper. They will see that the image is reversed—the "a" seems to be white and the paper seems to be dark. This happens because the retina of the eye tires as it stares at the bright white part of the paper. Because the letter "a" is not bright, the part of the retina that sees it is resting. When students look at the plain white sheet of paper, the light on the part of the retina that had been resting appears brighter, and the dark part of the image appears to be white. This is called an afterimage.

Challenge your students to find other examples of optical illusions. They can use books or the Internet. Many science museums also have such exhibits on display.

A Explain to your students that good animators are keen observers of the world around them—they notice every little detail. The Walt Disney Company animators incorporated many true-to-life details in *Fantasia/2000,* and those details were based on careful observations of the natural world. Challenge your students to become keen observers of their world, and to learn something new about nature. (For example, can they learn what a bird eats in winter, or where a squirrel lives? Can they learn where moss grows, or what plants have nuts and berries, or how a cat sips water?)

Explain to your students that, regardless of the amazing effects it allows animators to create, the computer is only a tool. The animator still must make sure the animation looks natural and believable. Good animators have been described as "good sponges." They are detail-oriented and keen observers of the real world, and they often record their observations in sketchbooks. Have your students practice "soaking up the details" of the scenes they view, noticing timing, textures, structural details, lighting, colors, etc. Ask them to keep a week-long "detail diary" with notes about the things they see.

Have your students try their hand at creating three-dimensional computer-generated objects. They can use commercial software if it is available, or they can download free software from the Internet at http://www.povray.org.

DEFINITIONS

Optical illusion: A misleading image designed to trick the eye into seeing something that does not actually exist.

Perspective: The technique or process of representing the spatial relation of objects as they might appear to the eye. In a drawing or painting, parallel lines are shown as converging at the horizon in order to give the illusion of depth and distance.

Phantasmagoria: An exhibition or display of optical effects and illustrations.

For more activities and information related to *Fantasia/2000,* visit the *Fantasia/2000* Web site at www.fantasia2000.com or IMAX's Web site at www.imax.com

A Elementary Grades 4-6 Grades 7-9 Grades 10-12 University

Activity Master 4

Once we become used to them, we almost always take our technologies for granted. Yesterday's miracles are today's expectations. Imagine life without a microwave oven, a ball point pen or a color television. None of these technologies were part of our homes in 1940, when *Fantasia* premiered.

Part 1: How do today's technologies compare with those available when your parents and grandparents were your age? Interview a member of your parents' and grandparents' generation and complete the chart below:

Technology used for:	Today	Parents' youth	Grandparents' youth
Food preparation			
Listening to music			
Writing class reports			
Playing games			
Adding numbers			
Entertainment			

ANIMATION AND TECHNOLOGY

Part 2: The art of animation has come a long way since Mickey Mouse's 1928 premier in *Steamboat Willie*. Both the traditional and the innovative computer graphics The Walt Disney Company animators use in *Fantasia/2000* combine with some of the best music of all time to create a film that begins the new millennium in a very special way.

In *The Firebird* segment the characters and the backgrounds that interpret the music were created by traditional animation techniques. But the dazzling special effects would not have been possible without special technology: A particle animation system allowed the animators to create the illusion of movement in the very tiniest of objects. (It took more than 1,000,000 computer-generated particles to create the final scene.) There are more than 8,000 feet of special-effects footage, and that footage includes 130,000 special-effects drawings—not counting the characters or the backgrounds!

Today's animator designs a computer model of the object to be animated by connecting a series of points and lines. The drawing that results is called a wireframe, because it looks like bent wire. After the wireframe is completed, the animator fills in the spaces between the points and lines with shades of gray. How the object is shaded depends on where the light source is, just as in real life. Then the animator applies a surface to the object. Once the computer model is completed, the animator must make the object move. Unlike early animation, where the artist drew a series of individual cels, each slightly different from the other, the computer animator creates key frames. These are the most significant points in an animation series—usually only 3 or 4 frames out of the 24 frames in each second of film. The computer fills in the other frames with the animation that is needed.

Good animators are keen observers of the world. They know that even the tiniest details are important to make their animated creations believable. More than 1,200 animators, artists and technicians worked on making *Fantasia/2000*, the first feature-length animated film ever released in this giant-screen format. As you watch the film, pay special attention to the importance that these amazing people gave to the many details of this extraordinary film.

After you've seen FANTASIA/2000

Think about the special details that contributed to the storytelling magic. For each segment record as many of those tiny, important details as you can recall.

Segment	Details
1. Beethoven's *Symphony No. 5*	
2. Respighi's *Pines of Rome*	
3. Gershwin's *Rhapsody in Blue*	
4. Shostakovich's *Piano Concerto No. 2*	
5. Saint-Saëns' *Carnival of the Animals*	
6. Dukas' *The Sorcerer's Apprentice*	
7. Elgar's *Pomp and Circumstance*	
8. Stravinsky's *The Firebird Suite*	

Part 3: In *Snow White*, the first feature-length animated film, The Walt Disney Company artists studied photos of a real dancer to ensure that their heroine moved like a real girl, and they created an animation effects department to make sure that even the background scenes were true to life. With your family, view the video of *Snow White*, or another celebrated animated film. Notice how the lifelike details contribute to the beauty of the film.

Visit the *Fantasia/2000* Web site at www.fantasia2000.com for more information, exciting activities and cutting-edge graphics!

Walt Disney FANTASIA 2000 THE IMAX EXPERIENCE®

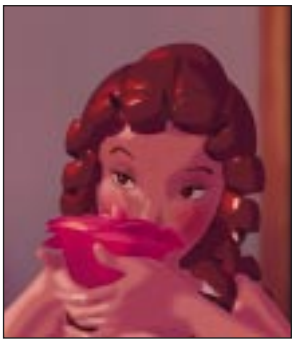
Section 5

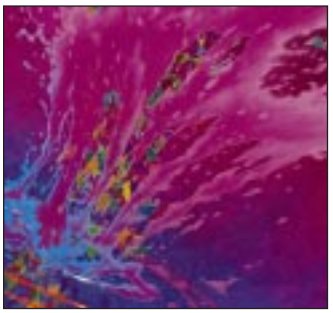
TECHNOLOGY AND THE INFORMATION AGE

OBJECTIVES

The student will

- consider why specific communication technologies were developed and the challenges their developers overcame in the process
- use the Internet to locate and gather information
- organize data and interpret it in visual and narrative formats





TEACHING STRATEGIES

Part 1: Use the exercise on the activity sheet as the basis for a class discussion about the technologies of communication—how they have changed and evolved and the impact they have on our lives. Then, have your students brainstorm about the technologies of the future.

Part 2: The *Fantasia/2000* Web site at www.fantasia2000.com is loaded with unique learning opportunities for your students. They have the chance to explore a virtual world based on material from the film and on the work of the people who created the film. Have your students go on a "treasure hunt" to collect their 10 favorite discoveries. Ask them to explain their choices in class.

A Talk with your students about the ways people can communicate with one another. As a class, brainstorm and create a list that includes as many communication methods as possible. The list might include talking, writing, sign language, telephones, the Internet, etc. Next, have your students think about the ways that animals communicate (for example: voice, body movements, scent) and make a second list. Then, ask your students to watch the animals they encounter often (wild birds at a feeder, their pet cat, etc.) to see how those animals communicate. Provide class time for students to share what they have observed. How are animals and people alike in the ways they communicate? How are they different?

Part 3: After students have combined their survey responses into one database and done their analysis, have them work in teams to develop a final report. Some teams will create charts and graphs that interpret the findings; others will develop the narrative that accompanies the visuals. One team will develop a brief "executive summary" of the findings.

EXTENDED ACTIVITIES

Lead a class discussion about modern communication technologies and the effect they have had on our lives. Then, ask your students to "invent" the next technological breakthrough. What will it be called? What will it allow us to do? How will it work? Allow class time for sharing and discussion.

With your students, plan a communications retrospective. Have students work in small groups to research and create exhibits that explain how some of the early communication devices worked. Older students might design and build models of such devices as an early radio, a zoetrope, etc.

Tell your students that they are going to become documentary filmmakers. Their assignment is to research and develop an outline for the script of a short film that details the evolution of one of the major communication technologies or industries, highlighting the major breakthroughs that have occurred to date, and speculating about what will occur in the next 25 years.

Provide your students with a list of questions about communication technologies they are to answer by using the Internet. (For younger students, you also may wish to provide a list of the URLs they will need.)

DEFINITIONS

Internet: A collection of millions of interconnected computers and computer networks around the world.

URL (Uniform, or Universal, Resource Locator): The term for an Internet site's address.

World Wide Web: An application that gathers and organizes resources from the Internet into a series of menu pages, or screens. The advent of the World Wide Web, with its relative ease of use, is one of the main reasons for the recent explosion in the number of home computers.

For more activities and information related to *Fantasia/2000,* visit the *Fantasia/2000* Web site at www.fantasia2000.com or IMAX's Web site at www.imax.com

A Elementary Grades 4-6 Grades 7-9 Grades 10-12 University

Technology is the use of science to extend the reach of human imagination. Each new development builds on previous achievements. The technology of animation wouldn't be what it is today without the pioneering efforts of Walt Disney and his talented animators and technicians. It was Walt Disney who, in 1932, first applied a new color process developed by Technicolor to film animation. This process allowed the three primary colors to be combined on film. The cartoon in which he introduced the technology, *Flowers and Trees*, won an Academy Award.

In 1940, with *Fantasia*, Walt Disney paired music with animation on a grand scale. According to the film's conductor, Leopold Stokowski, "...the music suggested the mood, the coloring, the design, the speed, that character of motion of what is seen on the screen." For 60 years, *Fantasia* was considered the greatest achievement in animation—that is, until the release of *Fantasia/2000*. Just as *Fantasia* made motion picture history as the first film to be recorded and released in stereophonic sound, *Fantasia/2000* is the first feature-length animated film ever released in the IMAX giant-screen format.

TECHNOLOGY AND THE INFORMATION AGE

Part 1: Exciting changes have occurred in other communication technologies as well. Today, in the information age, we enjoy the benefits of many inventions that only visionaries could have imagined a century ago. Some communication technologies have made things smaller. Not too long ago, for example, computers were giant machines that filled entire rooms. Today, many people can't imagine leaving home without their handheld model. Other technologies have made things bigger. The radio telescope as large as three football fields used by the SETI (Search for Extraterrestrial Intelligence) Institute to scan the universe is one example. Closer to home, giant screens in IMAX theatres bring a new level of excitement to our viewing experience. In the chart below, list some inventions in communication technology that are smaller than ever and some that are bigger than ever. Be prepared to discuss the challenges that were faced in creating each one and the need that prompted its invention. Then, identify ways in which each innovation has affected your life.

	Need	Effect on My Life
Small Innovations	_____	_____
	_____	_____
	_____	_____
Large Innovations	_____	_____
	_____	_____
	_____	_____

Part 2: The largest communication technology of all time is the Internet, which consists of millions of computers linked by a global telephone system. By using the power of the Internet we can send and receive information almost instantaneously on a scale unimaginable only a decade ago. The World Wide Web (www) is a virtual world filled with an incredible amount of information. By using a search engine, we can locate the URLs (addresses) of Web sites (home pages) relating to almost any subject.

The creative people at The Walt Disney Company didn't stop with the state-of-the-art technology they used to make *Fantasia/2000* a reality. They also created a groundbreaking new interactive Web site for the film. And, you are invited to come along on an exciting virtual visit to The Walt Disney Company in Burbank, California, for a behind-the-scenes peek at the technology and artistry that made *Fantasia/2000* a reality. When you arrive at the *Fantasia/2000* home page you will find yourself outside the Animation Building at the Disney Studios. A good place to go next is the office of Roy E. Disney, who is waiting to greet you. From there you can either go to the animation studio or the recording studio, or to any of the pages inspired by each of the eight segments of the film. At any point in your journey you can click on objects in the scene and link to fascinating other places. So, log onto the Internet at www.fantasia2000.com and explore a world created especially for you. As you proceed on your adventure you will find lots of things you'll want to share with classmates. Use the back of this sheet to make notes about 10 of the best and bring them to class.

Part 3: Conduct a communications survey. Your survey population should include at least 20 people, with the following groups represented: children aged 12 and under, teenagers and young adults under 25, adults under 49 and adults 50 and over. Ask each person the following questions: What is the most exciting invention that has occurred in your lifetime? What invention are you least comfortable with? What invention are you most comfortable with? Share your findings with those of your classmates and create a master list of responses. What response patterns can you find in the various age groups? Are any responses gender-specific? What do the responses tell you about people's attitudes about new kinds of technology?

Visit the *Fantasia/2000* Web site at www.fantasia2000.com for more information, exciting activities and cutting-edge graphics!

Walt Disney FANTASIA 2000 THE IMAX EXPERIENCE®

RESOURCES

WEB SITES

Disney's *Fantasia/2000* Web site: http://www.fantasia2000.com PART OF GO NETWORK
IMAX Web site: http://www.imax.com

INFORMATION ABOUT COMPUTER GRAPHICS

http://www.graphics.cornell.edu/online/tutorial
http://library.advanced.org/10015/data/info/reference/techniques/computer.animation.html
http://www.education.siggraph.org/materials/HyperGraph/animation/anim_intro.htm

BOOKS

Animation Tips and Tricks for Windows and Mac, by Don and Melora Foley. Berkeley, CA: Peachpit Press, 1997.
Computer Animation: A Whole New World, by Rita Street. Gloucester, MA: Rockport Publishers, 1998.
Disney's Art of Animation from Mickey Mouse to Hercules, by Bob Thomas. New York: Hyperion, 1997.
Food, by Ogden Nash. New York: Stewart, Tabori & Chang, 1989.
Parents Keep Out: Early Poems for Youngerly Readers, by Ogden Nash. Boston: Little, Brown and Company, 1951.
Versus, by Ogden Nash. Boston: Little, Brown and Company, 1947.

CREDITS

Teacher's Resource Guides for *Fantasia/2000* were created by Youth Media International, Ltd., Easton, CT
Roberta Nusim, Publisher
Stephen Jablonsky, Editor-in-Chief
Lead Writer: Carol Bruce
Editors: Jane E. Fieberts, Lindsay Behne
Art Director: Kathleen Giarrano
Production Coordinator: Beth E. McNeal

EDUCATIONAL ADVISORY PANEL