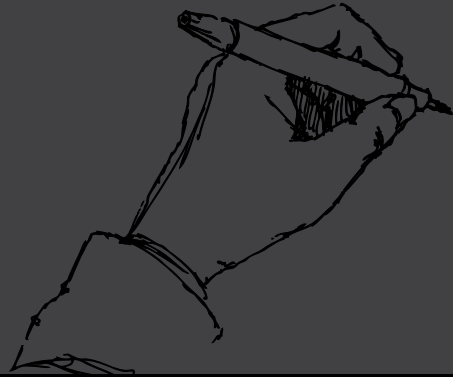


STOPMO

Studio

Stop-Motion Animation Workshop



LESSON
7

ANIMATION PRODUCTION



Introduction

The final teaching guide in this series provides information about the stop-motion animation production process. It introduces you to the appropriate software, hardware and related equipment to enable you to shoot your video, and includes information on creating special effects for animation. It also demonstrates how computers and technology have changed animated feature film production and encourages reflection on how society and culture have also been changed by technology.

Learning Objectives

After completing this guide, your group should be able to:

- Set up, shoot and edit a stop-motion animation production;
- Create an establishing shot and indicate its importance;
- Demonstrate how to effectively move a character on a set;
- Demonstrate special effects and tricks, e.g. how to make a character fly, disappear and change size;
- Discuss how computers and technology have changed animated feature film production and special effects capabilities;
- Reflect upon the direct influence that evolving technology has had, and continues to have, on individuals and society;
- Constructively critique the work of others in class;
- Complete a Peer Assessment to evaluate your group's collaborative effort;
- Use feedback from others to re-examine your own artwork.



ANIMATION PRODUCTION

An Overview of Stop-Motion Animation Production

Now that you have gathered knowledge about each component of the animation process, the following demo on stop-motion animation production will provide you with the “how to” of shooting your video.



Animation Production – Step by Step (3 min 30 s)

Specific Computer Requirements

Equipment for Stop-Motion Animation

Here is a list of equipment and software you will need to make stop-motion animation. Check to make sure you have everything you need before you start.

Hardware

- Camera to capture your images; this could be a video camera (low- or high-end), webcam or digital camera for still images
- Tripod (for camera stability)
- Computer (Mac or PC)
- Cable to connect the camera to the computer (firewire cable for Mac, USB cable for a PC)

Software

Note: This list is intended to help you create stop-motion animation. The NFB does not endorse, promote or partner with any of the organizations mentioned in this list.

Boinx Software’s iStopMotion:

boinx.com/istopmotion/overview

FrameThief:

framethief.com

Dragonframe:

dragonstopmotion.com

Tech4Learning’s Frames 4:

tech4learning.com/frames

DigiCel’s FlipBook:

digicelinc.com

Once you have your camera and computer set up, you can begin to animate your story. Start out with your establishing shot to help orient your audience and familiarize them with the scene. Then, based on your storyboard, begin moving your characters a little at a time, integrating the principles of animation. After each movement of the character, shoot one frame of animation.

In general, 12 consecutive frames make one second of animation. However, you can decide which frame rate, or frames per second (FPS), you will use. Very smooth animation uses 24 frames per second, while rougher animation uses eight frames per second or less. A lower frame rate is less time-consuming to make, while a higher frame rate can result in smoother animation. Twelve frames per second is a good compromise between the two. In almost all video editing and animation software, there will be an option to choose the frame rate that you would like to use.

While shooting, it is important not to shake or move your camera. Also, use the manual mode of your camera: this will prevent its settings from being automatically changed between each image.

If you wish to cut several scenes together or add sound, music or dialogue to your film, here is a list of free and/or easy-to-use editing software that you could use:

Apple iMovie (Mac):

apple.com/ca/ilife/imovie

Apple Final Cut Pro (Mac):

apple.com/ca/finalcutstudio/finalcutpro

Windows Movie Maker (PC):

pcworld.com/downloads/file/fid,22893-order,4/description.html

Adobe Premiere:

adobe.com/products/premiere

Adobe After Effects:

adobe.com/products/aftereffects

Online editing tools:

YouTube

For tips on how to set up your equipment to get started on creating stop-motion animation films, watch the following video:



More Creative Tips and Ideas (Clip 5): Basic Technical Equipment: How to Connect (1 min 45 s)

Special Effects and Tips

To view tips on how to create special effects and “tricks,” review the following:



More Creative Tips and Ideas (Clip 6): SPX – Special Effects (1 min 36 s)

How Computers and Technology Have Changed Animation

Class, Group Learning or Individual Learning Activity: A Trip Through Time with the Animation Experts

Watch all or parts of the films listed in *A Trip Through Time with the Animation Experts* to explore how technology has changed animated feature film production and special effects capabilities over time. Reflect on the ongoing impact of new technology on multiple aspects of our society, culture, science and art. Consider the following questions:

- How would you decide which animation technique to use when making animation? What differences are there between early animation and more recent animation? Can you tell when something in a movie was made with a computer?
- Why does animation made with a computer look different than animation made by hand?

Optional Class Learning Activity: The Future of Animation and Film?

As you watch the following video, consider the following questions:

- Will such progress continue?
- How will animation be improved?
- Will the frame speed change?
- Will we need 3D glasses in the future?

Avatar: What’s the Future of Film? (3 min 42 s):

youtube.com/watch?v=eFlsc0vyU6Y&NR=1

Note: Remember, no matter how much technology advances, it is not the foundation of an animated film. The experts agree: storytelling will *always* come first. A movie is only as good as its story.



ANIMATION PRODUCTION

Shoot and Edit Your Movie

GET READY FOR ACTION – TAKE 1

Learning Activity: Action! Shooting and Editing

This is what you've all been waiting for! Now that you know how the experts do it, it's time to shoot and edit your video. Your teacher will help. Please ensure that everyone has a turn animating the characters. As you shoot, try to maintain the continuity of character placement, volumes, sizes, lighting, etc. from scene to scene.

Note: This is a trial-and-error process that requires time and patience, so don't be discouraged if the final product is not perfect. As you have seen, even the experts don't always get it right on the first go.

Video Presentation and Evaluation

The presentation and evaluation of your video will include the following:

Learning Activity: Class Presentation

The video produced by each group will be presented in class. You will get the chance to critique each other's videos in a class discussion. The presentation will be graded with a simple Presentation Rubric.

Complete a Peer Assessment

At the end of the production phase, each student will complete a **Peer Assessment** for each member of their team. This will be submitted to the teacher.

Final Stop-Motion Animation Project Evaluation


The final project will be graded by the teacher using the Stop-Motion Animation Rubric.



A TRIP THROUGH TIME WITH ANIMATION EXPERTS

Animation represents a wide range of art forms and technologies. This list presents examples of animation over its entire history and demonstrates the diversity of techniques that are possible. As some of these examples are quite long, it may be advisable to view only sections of each. Some of the examples are highly advanced, and the technical concepts behind them are hard to understand, but we can see the results and imagine the possibilities.

1. Gertie the Dinosaur – 1914 – by Winsor McCay (7 min 37 s)

 [youtube/OiL4qplyi7Y?t=1m47s](https://www.youtube.com/watch?v=MYEmL0d0IZE)


- › The first animated personality.
- › 16,000 pencil and India ink drawings on rice paper.
- › Created a character with weight and mass.

Source:

Del Tredici, Robert. *History of Animated Film Resource Book*. Montreal: Concordia University, 2010.
Canemaker, John. *Winsor McCay – His Life and Art*. New York: Abbeville Press, 1988.



2. The Old Mill – 1937 – Disney Animation Studio (8 min 44 s)


 [youtube.com/watch?v=MYEmL0d0IZE](https://www.youtube.com/watch?v=MYEmL0d0IZE)

- › Before Disney set off to make *Snow White and the Seven Dwarfs*, the studio first made this film to develop new techniques in animated filmmaking.
- › Wind, water, fire, smoke, depth and reflections are a few of the special effects that helped bring not just the characters, but a whole animated world, to life.
- › The first use of the multiplane camera to create the illusion of depth.

Source:

Thomas, Frank, and Johnston, Ollie. *The Illusion of Life: Disney Animation*. New York: Abbeville Press, 1981.

3. Begone Dull Care – 1949 – by Evelyn Lambart and Norman McLaren (7 min 52 s)


 [nfb.ca/film/begone_dull_care_caprice_couleurs](https://www.nfb.ca/film/begone_dull_care_caprice_couleurs)

- › This film was created by painting and etching directly on the film, without the use of a camera.
- › The music was performed by the Oscar Peterson Trio.
- › “For myself, indeed, with an abstract film, the most pleasing forms are those which come closest to music. There must be visual equivalence.”
– Norman McLaren

Source:

Norman McLaren – *The Master’s Edition DVD*, 2006.

4. A Computer-Animated Hand – 1972 – by Ed Catmull (6 min 32 s)

 vimeo.com/16292363

- › This was one of the first computer animations.
- › Ed Catmull would later be part of the founding of Pixar Animation.
- › It took the computer two and a half minutes to render each frame.

Source:

First Digital 3D Rendered Film (from 1972) and My Visit to Pixar. Retrieved from <nerdplusart.com/first-3d-rendered-film-from-1972-and-my-visit-to-pixar>.

5. Hunger – 1973 – by Peter Foldes (11 min 22 s)

 nfb.ca/film/Hunger


- › *Hunger* was one of the world's first animation films to be made using a computer.
- › The filmmaker experimented on the Systems Engineering Laboratories Model SEL-840A at the National Research Council.
- › He drew the images using a Computek graphics tablet.

6. SANDDE – 2008 – by Munro Ferguson (5 min 35 s)

 nfb.ca/film/sandde

- › SANDDE stands for Stereoscopic ANimation Draw-ing DEvice.
- › It allows artists to draw and animate in a 3D virtual space instead of on a standard 2D surface.
- › It allows artists to express themselves more freely and naturally in three dimensions.
- › SANDDE was originally developed at IMAX Corporation and— with the encouragement and assistance of the National Film Board of Canada— was further developed and commercialized by Janro Imaging Laboratory, under licence from IMAX.


7. Benjamin Button – 2008 (18 min 5 s)

 ted.com/talks/ed_ulbrich_shows_how_benjamin_button_got_his_face.html

- › In this talk given by Ed Ulbrich, he explores the creation of the character Benjamin Button.
- › This is one of the most technologically advanced examples of animation, as a digital character is seamlessly integrated with live-action footage.




8. End Love – 2010 – by OK GO (4 min 30 s)

 youtube.com/watch?v=V2fpgpanZAw

- › Instead of using puppets or drawings to create animation, people can use their own bodies to create it one frame at a time.
- › This technique, called pixilation, was popularized by Norman McLaren and his NFB film *Neighbours*, viewable at nfb.ca/film/neighbours_voisins.

9. BioVisions – Inner Life of Cells – 2010 (1 min 30 s)


 multimedia.mcb.harvard.edu

This short animated clip produced by Harvard University demonstrates how computer animation can serve as a powerful and beautiful tool for representing scientific knowledge and understanding. In it, we see the processes that sustain life within living cells.

Computer Graphics Research


There are people around the world at universities and various companies working on research to find new techniques in the field of computer graphics. This research is often the foundation for new special effects and animation. Here are two examples of computer graphics research:

10. Locomotion Skills for Simulated Quadrupeds (6 min 5 s)

 cs.ubc.ca/~van/papers/2011-TOG-quadruped/index.html

This video shows a program designed to simulate the motion of four-legged animals such as dogs. The movement of the dog characters in the video has not been animated by a person or copied from a real dog. Instead, the program acts as the brain of the virtual dog to make it walk, run and jump realistically.

11. OverCoat (3 min 50 s)

 zurich.disneyresearch.com/OverCoat
(download the .mp4 file to view the video)

This research piece shows a new technique for painting characters in 3D. Instead of representing characters with flat surfaces, brush strokes are painted in 3D space to build the volumes. The results look like paintings but still have all the advantages of depicting 3D characters.

If you would like to explore more of this advanced research, go to the website kesen.realtimerendering.com. It is a collection of links to papers that have been presented at the largest computer graphics conferences in the world. Much of the material is at a university level, but many of the results are presented as videos or still images that allow readers to see what is possible in computer graphics even if they do not understand all of the mathematics and computer science that powers it.



PRESENTATION CHECKLIST FOR ANIMATION TEAMS

ANNEX 03

PRESENTING TEAM EVALUATION CRITERIA	
1. The members of the team introduced themselves.	
2. The team introduced the title of their work.	
3. The team explained why they chose their topic and theme.	
4. The team showed their production.	
5. The team answered questions and promoted class discussion about their project.	
	TOTAL /5



A PEER ASSESSMENT RUBRIC

Date: _____

Project Title: _____

My Name: _____

My Team Member's Name: _____

Please place a checkmark in the appropriate column to indicate how your team member performed during the creation of your Stop-Motion Animation Project.

	HE/SHE DID THIS VERY WELL. 3 POINTS	HE/SHE DID THIS ADEQUATELY. 2 POINTS	HE/SHE COULD HAVE DONE THIS BETTER. 1 POINTS
1. My team member was helpful when brainstorming ideas for project.			
2. My team member was helpful when storyboarding ideas.			
3. My team member had good suggestions when creating and building our characters.			
4. My team member was creative when making our set/background.			
5. My team member was helpful when shooting our movie.			
6. My team member was respectful of others' contributions.			
7. My team member worked well with everyone.			
8. My team member took responsibility for what was expected of us.			
9. My team member was committed to ensuring our team do a good job.			
10. My team member made working on this project fun.			
		TOTAL	/30

STOP-MOTION ANIMATION RUBRIC

REMEMBER, ALL GREAT STORIES START WITH A GREAT IDEA. GREAT STORIES MAKE GREAT ANIMATION.

	EXCELLENT	VERY GOOD	GOOD	NEEDS WORK	MARK %
Idea for story	The idea for the story was excellent. Message extremely clear.	The idea for the story was very good. Message very clear.	The idea for the story was good. Message fairly clear.	The idea for the story needs work. Message is unclear.	
Storyboard	Extremely well planned—excellent flow. Drawings extremely effective in conveying the actions and emotions of story.	Well planned—very good flow. Drawings very effective in conveying actions and emotions of story.	Fairly well planned—good flow. Drawings fairly effective in conveying actions and emotions of story.	More planning required—flow needs work. Actions and emotions of story not clearly conveyed in drawings.	
Characters	Characters are extremely interesting—excellent effort. Characters are extremely suitable to storyline.	Characters are very interesting—very good effort. Characters are very suitable to storyline.	Characters are interesting—good effort. Characters are suitable to storyline.	Characters are vague—more effort required. Characters' suitability to storyline is unclear.	
Set and Props	The set/props do an excellent job of enhancing the production's aesthetics and mood.	The set/props do a very good job of enhancing the production's aesthetics and mood.	The set/props do a fair job of enhancing the production's aesthetics and mood.	The set/props need effort to help enhance the production's aesthetics and mood.	
Design	Students display excellent knowledge of design elements.	Students display very good knowledge of design elements.	Students display fairly good knowledge of design elements.	Students' knowledge of design elements lacking.	
Movie Production	Movement in the movie is very smooth. An excellent attempt to incorporate "principles of animation" and/or "tricks" into movie.	Movement in the movie is smooth. A very good attempt to incorporate "principles of animation" and/or "tricks" into movie.	Movement in the movie is generally smooth. A good attempt to incorporate "principles of animation" and/or "tricks" into movie.	Movement in the movie is irregular/jumpy. The incorporation of the "principles of animation" and/or "tricks" is not apparent.	
Creativity	Extremely creative work.	Work is very creative.	Work is creative.	More thought and creative effort required.	
Teamwork	The team worked extremely well together—shared tasks and activities.	The team worked very well together—shared tasks and activities.	The team worked well together—shared most tasks and activities.	The team had difficulties working together and sharing tasks and activities.	