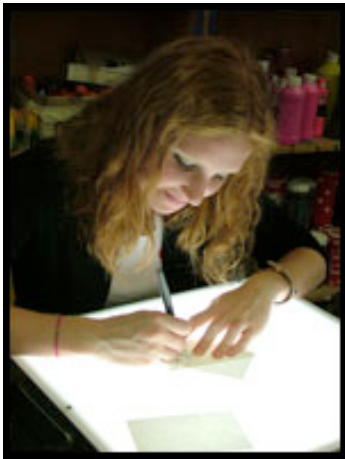


FLIPBOOKS

Flipbooks are a type of animation made with multiple sheets of paper, showing a series of pictures that change gradually from one page to the next. Flipping the pages creates the illusion of movement for the viewer because of the persistence of vision phenomenon. When the pages are seen in rapid succession, they become animated. Flipbooks evolved from thaumatropes, zoetropes and other early devices of nineteenth century that utilized the illusion of movement to delight and entertain.

Persistence of vision

As the eye sees a series of still images very quickly, our eyes have sensors that retain each image for a moment, making us perceive the series as one continuous image.



Registration

Flipbooks use the registration system to keep images perfectly aligned. Animation boards, paper, and pegs can be used to make sure each drawing is in line with those preceding and following it so that all parts of the image, including the changing and non-changing shapes, are smoothly coordinated.

Key Frames

Frames containing important changes in the subject of animation; i.e. changes in the drawing, changes in the set up, important stages of movement, etc.

Tweening

Tweening also known as “morphing” is filling in the frames between important key frames in an animation so that the transition is smooth and is correlated to the number of frames per second required for a particular scene.

LESSON PLAN

Objectives

Students will depict movement using simple flipbook techniques and will be able to define basic animation vocabulary: persistence of vision, registration, key frames, and tweening.

Introduction

Begin lesson by having students view Winsor McCay’s *Gertie the Dinosaur*. Gertie’s enormous bulk and her lovable, innocent nature won audiences’ hearts, establishing a beginning for the animated cartoon in 1914. Gertie is a delightful example of McCay’s beautiful, elaborately drawn characters and describes the journey into creating drawn animated Gertie the Dinosaur. After allowing a moment for reflection, lead a classroom discussion.

Ask students questions such as:

- Why is Winsor McCay considered one of the first true animators?
- Do you think that knowing how to draw makes someone a better animator?
- What do you think McCay would think about the uses of animation in contemporary media?
- Describe the scene where we see the stacks of paper that McCay used to draw his animated character. He needed so many drawings because to trick the eye into perceiving smooth movement, he had to draw about 10 different frames per second (FPS), meaning the viewer sees 10 different images every second.
- Have students view other examples of student-made flipbooks. You can also buy professional made flipbooks such as those found in Fliptomania (<http://www.fliptomania.com/>)



Materials

- Professional and/or student made flipbooks
- Long strips of paper (2 x 8 inches) for 2-page flipbooks
- Index cards (at least 10 per student)
- Pencils, markers
- Light table (to help view preceding image)
(Note: can also use window)
- Registration devices such as clips or envelope corners

Get the hang of making flipbooks by trying a simple 2-page one!

- Fold a long strip of paper, about 2 by 8 inches, in half.
- Lift up the top layer and draw an image near the bottom of the bottom layer. Using a fine tip black marker will make the images easier to see, but color pencil can also be added...
- Lay the top layer back down and look closely to see the image underneath. Trace it again, changing slightly its size, position or shape.
- Roll the top layer around a pencil and hold the paper down firmly at the top fold. Rolling the pencil back and forth will reveal the images in rapid succession to create a quick, easy animation!

CREATE MULTIPLE PAGE FLIPBOOKS WITH TWEENING

- Number all your sheets (I recommend 30 cards) and begin drawing on page one the first image of the flipbook.
- Draw final image of sequence and then stack the first and last together.
- Find the card that is numbered exactly halfway between the first and last images, and place it on top of these two, in a stack. Using a light source (window or light table) to see through all three cards, draw on the top card an image that approximates the midway point between the first and last images. These three cards (first, middle, last) are considered the keyframes that will be used to create the in between “morphing” stages.
- With each successive drawing, you will fill in the cards halfway between the ones you have already drawn, until all have been done. As you fill in the cards between the important keyframes, it is important to check your numbers and put cards back in order every now and then to make sure the images align well and the motion is progressing properly. The in-between cards represent the “morphing” stages and should have minor alterations to produce continuous movement.
- To see the results of your flipbook, place the cards back in sequential order, tap them gently on a surface to align them at a slight angle, then hold the book/ index cards in one hand so that you can flip through the pages with the other.

Evaluation

When the lesson involves learning new terminology the instructor should give a quiz to make sure students can correctly define these terms. In addition, to assess this initial exercise, consider asking the following questions:

- How well did the student depict movement in his/her flipbook?
- How effectively did the student use tweening in his/her multiple page flipbook?
- To what extent are students able to make connections between the tweening process and other animation concepts?