

Introduction to Stop Motion Animation

(Workshop)

Widely considered one of the most salient scientific treatises ever, Sir Isaac Newton's "Philosophiæ Naturalis Principia Mathematica" was published in 1686, and the world was introduced to what we commonly call Newton's Laws of Motion. Simply described as Inertia, Force, Action and Reaction, Newton's laws delineate the connection between an object and forces acting upon it. In this introduction to stop motion animation, students will use color coordinated found objects to animate one of Newton's laws or a combination. Animation is the illusion of movement. To create that illusion, animators consider whether an object is heavy or light, sluggish or fast. Working in pairs, students will learn basic shot composition, rough boards, animation framerate as well as frame placement.

Objective: To learn basic animation principles and teamwork

Number of students: 20

Grades: 8 (This example is for 8th grade but can be adapted for grades 8-12)

Primary Art Form: Animation

Class duration: 3 hours for 2 days.

Visual Art Standard:

Creating:

VA8.CR.3

Engage in an array of processes, media, techniques, and/or technology through experimentation, practice, and persistence.

- b. Demonstrate quality craftsmanship through proper care and use of tools, materials, and equipment
- c. Utilize and care for materials, tools, and equipment in a safe and appropriate manner

VA8.CR.4

Incorporate formal and informal components to create works of art.

- a. Organize the elements of art using the principles of design to compose original works.
- b. Create works of art synthesizing a range of concepts, ideas, and subject matter by incorporating specific elements and/or principles.
- c. Apply color theory to create visual effects and communicate ideas (e.g. color schemes, relationships, properties).

VA8.CR.5

Reflect on, revise, and refine works of art considering relevant traditional and contemporary practices as well as artistic ideation.

- a. Discover, define, and solve visual problems independently through experimentation with ideas, materials, and techniques.
- b. Revise works of art based on input from the critique process and group interaction.

Connecting:

VA8.CN.3

Utilize a variety of resources to understand how artistic learning extends beyond the walls of the classroom

- c. Make interdisciplinary connections, expanding upon and applying art skills and knowledge to enhance other areas of learning

Science Standard:

S8P3

Obtain, evaluate, and communicate information about cause-and effect relationships between force, mass, and the motion of objects.

- a. Analyze and interpret data to identify patterns in the relationships between speed and distance, and velocity and acceleration.
- b. Construct an explanation using Newton's Laws of Motion to describe the effects of balanced and unbalanced forces on the motion of an object.
- c. Construct an argument from evidence to support the claim that the amount of force needed to accelerate an object is proportional to its mass (inertia).

Materials:

- iPad with rig and Stop Motion Studio software.
- Found objects such as Legos, tinker toys, candy.
- Sticky tack
- Matte board, poster-board, or cardboard for backgrounds
- Index cards
- Pencils

Procedures:

1. Students will watch animated clips that demonstrate good animation. Prompt the students to discuss the animation using Newtonian terms. Isn't Roadrunner "an unstoppable force" until he gets hit with an anvil? And how does that anvil fall—does it accelerate as it falls? How does the ground reverberate when the anvil lands? Introduce the students to animation overlap, follow through, and anticipation—how do these techniques help create the illusion of physically convincing movement?
2. Divide the students into pairs. Each pair will work together to board and capture their animation.
3. Show example storyboards and explain how they work using labeling, shot composition, and shorthand. Explain that the storyboards for this project will be very simple. Pass out index cards and pencils, and have each team make rough boards of their chosen principle.
4. Students begin working on their boards. Each team works together to execute their chosen principle.
5. After the boards are done and have been reviewed by the teacher and the assistant, show the students iPad setup, discuss animation framerate, counting for animation, and placement.
6. Students shoot test shots and begin animating as ready.

Opening

- Icebreaker: name, favorite animation, have you ever animated before or attempted to?
- Animation clips and discussion
- Students choose which law they would like to animate.
- Students are divided into teams and begin making their boards together, discussing and critiquing each other's work as they go. When they are ready to animate, one student animates, and the other operates the camera. The camera operator is responsible for focus, lighting, and anything in the shot that shouldn't be there. (Students may take turns at these roles.)

Class 1:

Physics and Animation: Creating the Illusion of the World We Know

Students watch animation and discuss using terms from their lesson. After which they are divided into teams and choose the principle they want to animate.

Storyboards

Presentation and discussion of example storyboards. Teacher demonstrates how the boards are labeled, shot composition, rule of thirds, and timing. These are meant to be rough boards. Students should be using them as a shorthand guide for their animation. After the following prompts, students begin working on their boards.

- Animation is visual story telling—what kind of story are we telling today?
- It's not Roadrunner or Coraline--How do we make this interesting to viewer?
- What kinds of choices can you make as the animator to create interest—think about color relationships and shot composition?

As boards begin to wind down and students move into the testing stage, the teacher will instruct them on how to use iPad and Stop Motion Pro for animation.

iPad set-up:

- Stop Motion Studio has a slider that allows frame holds for as many as 30 frames. Discuss what this means and set the frame rate to 24 frames a second, manually shoot extra frames when needed.
- Lock focus so iPad doesn't recalibrate every shot.
- Lock the rig.
- Lock exposure and stay out of the light source.

Timing/Frame Rate

What is animation frame rate? Animation counting along with object placement determine how fast or slow something moves. The closer frames are together, the smoother the action.

Animation frame rate is 24 frames per second. So, when counting frames:

- One = 6 frames
- One-one = 12 frames
- One-one-thou = 18 frames
- One-one-thousand = 24 frames

By the end of Class 1, students should be at the testing stage for their animations.

Class 2:

Workday

Teacher and assistant help students set up their shots and begin/continue animating. Class concludes when everyone has finished their shots.

At the end of class, students present their animations and discuss which principle they chose and the process of creating an illusion of that principle.

Student Success:

The animation is a convincing illusion demonstrating of one or more of Newton's laws.

Choices in color and screen design work together to engage the audience.