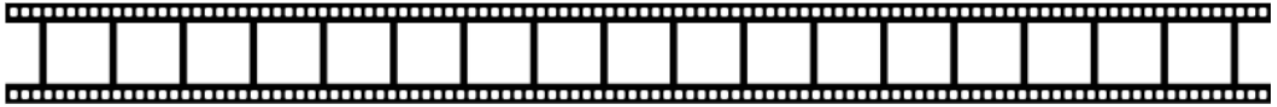


Students Teaching Students Scientific Concepts Through Stop-Motion Animation

By Jennifer Parks



Grade Level: 4th Grade (but easily adaptable to any grade level)

Subject: Science

Time Required: 5 class periods (45-60 minutes each)

Objectives:

- Students will choose or be assigned a Utah science content standard for 4th grade and create a 15-20 second stop motion video that explains the standard or answers a question.
- Students will collaborate in groups to plan, create, and present their stop motion videos.
- Students will develop their creativity, communication, and technology skills through the process of making stop motion videos.

Materials Needed:

- Kindles, ipads, or cameras with the Stop Motion Studio app installed.
- Tripods or stabilizers for cameras/smartphones
- Lights and/or light boxes
- Animation supplies (legos, colored paper, markers, clay, etc.)
- Plugs or electrical connections
- Graphic organizers and planning sheets
- Computers

Procedure:

This project can be done at the end of teaching all science standards, or it can be done to specifically accommodate one particular science strand. Each student group can work to answer the same question—thus getting multiple interpretations of one concept or phenomena, or each student can be assigned a different task.

This project will take at least 5 days to complete. An additional day or 2 may be necessary in order complete the project according to rubric standards.

Day 1: Introduction and Standard Selection/assignment

1. Start the lesson by introducing stop motion animation.
**** *One amazing resource to do this through is the Utah Film Center where they will have a guest speaker come to your class and introduce stop motion.*

They will give a hands-on demonstration where every student will get to try their hand at the process.

2. Discuss ways that Stop Motion can help in both the learning and teaching of scientific concepts—show some examples of relevant stop motions science videos (find appropriate ones on YouTube).
3. Review the Utah science content standards for 4th grade and divide students into small groups of 2-4 Assign each group one Utah science content standard or question based on the standard to focus on.

Day 2: Planning and Storyboarding

Teacher should model how to brainstorm and research ideas and how to complete the planning worksheets with an example of their own. Then, students should use this time to plan their animation and make sure they are answering their science standard question. Possible 4th grade science questions are listed at the end of this plan.

1. Give the groups time to research and discuss their assigned standard. Give students a graphic organizer to help them organize the most important concepts of that standard/phenomena.
2. Have each group brainstorm ideas and create a storyboard for their stop motion video, outlining the sequence of scenes and key elements. They should do this on their planning worksheets.

Day 3: Pre-Production

During this time, students should prep the items they will need for their stop-motion animation. Before letting students go off on their own, model how to do each of the steps listed below.

1. Provide art supplies and encourage students to create any props or characters needed for their animations. This could include legos, clay, paper, etc.
2. Students should make their pieces (cut out paper, write out signs, build clay of Lego creations, and collect any other props etc.)
3. Allow time for groups to plan and refine their storyboard and make sure it communicates the answer to their standard/question.

Day 4: Production

During this stage, students will begin filming their animations. Be sure that you are modeling every step listed below with your own example before students work with their groups.

1. Review the basics of creating stop motion videos, including camera setup and framing and model how to use the chosen camera or smartphone or tablet app for capturing stop motion frames.
2. Assist students in setting up their scenes and capturing the individual frames for their videos as needed. (It is a good idea to have the 'filming stations' already set up for your students—especially if you are using extra plug-in items such as lights. This will ensure your students are spaced around the room more

efficiently and that the supplies are better accounted for before students begin filming).

3. Encourage students to experiment with camera angles, lighting, and composition to enhance their videos.
4. Circulate among groups to provide guidance and support as they work on their stop motion sequences.

Day 5: Editing, Presentation, and Reflection

Once again, the teacher should be modeling each of the steps/requirements in the editing process using their own sample animation.

1. Allow groups to add narration or captions to explain the chosen Utah science content standard.
2. Invite groups to present their stop motion videos to the class, allowing time for questions.
3. Lead a class discussion about the process of creating stop motion videos and what students learned about the selected science standard.

Assessment

Assess each video using a rubric, evaluating creativity, clarity of explanation, and alignment with the chosen Utah science content standard.

Possible Questions/Topics based on 4th Grade Utah Standards

Standard 4.1.1

Explain from evidence that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

Standard 4.1.1

How do internal and external structures support a plant and animal's survival within the same and across multiple Utah environments?

Standard 4.1.2

How do animals receive different types of information from their environment through their senses, process the information in their brain, and respond to the information?

Standard 4.1.2

How might animals use their perceptions and memories to guide their actions? (think systems)

Standard 4.1.3

What data do we get from fossils to provide evidence of the stability and change in organisms and environments from long ago

Standard 4.2.1

What is the relationship between the speed of an object and the energy of that object? Think about the relationship between speed and energy in terms of fast, slow, strong, or weak.

Standard 4.2.2

What changes in energy occur when objects collide?

Standard 4.2.3

How can energy be transferred from place to place by sound, light, heat, and electrical currents?

Standard 4.3.1

Create a model to describe the regular patterns of waves including amplitude and wavelength.

Standard 4.3.2

How are visible light waves reflected from objects so that when they enter the eye, they cause objects to be seen. Think about the reflection and movement of light.

Standard 4.3.3

How can information be transferred using wave patterns?

Standard 4.4.1

Why does the Sun, which is a star, appear larger and brighter than other stars

Standard 4.4.1

Explain the differences in the apparent brightness of the Sun compared to other stars in terms of relative distance (scale) of stars from Earth.

Standard 4.4.2

What observable patterns show that Earth rotates on its axis and revolves around the Sun?