

Unit 7 (Mechanisms): Pop-Up Moving Scenes

Concept

Cams can be used to push levers that illustrate a scene.

Content Objective

Student teams make pop-up pictures that use cams, levers, or other simple machines to illustrate a scene.

Language Objective

Use prior knowledge of a story to discuss motion in the story.

Describe motion using adverbs.

Explain pop-up pictures using declarative sentences in a cohesive paragraph.

Standards

- **NGSS:**

- **K-2-ETS1-1.** Ask questions, make observations, and gather information about a situation people want to change to define problem that can be solved with a new or improved object or tool.
- **K-2-ETS1-2.** Make a drawing or physical model to illustrate how the shape of an object helps it to solve a problem.
- **K-2-ETS1-3.** Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses.

- **TEKS:**

- **2E** communicate observations and justify explanations using student-generated data from simple descriptive investigations (justify explanations of own data)
- **3A** identify and explain a problem in his/her own words and propose a task and solution for the problem such as lack of water in a habitat (explain prob and solution)
- **4A** collect, record, and compare information using tools, including computers, hand lenses, rulers, primary balances, plastic beakers, magnets, collecting nets, notebooks, and safety goggles; timing devices, including clocks and stopwatches; weather instruments such as thermometers, wind vanes, and rain gauges; and materials to support observations of habitats of organisms such as terrariums and aquariums (use tools)
- **6D** compare patterns of movement of objects such as sliding, rolling, and spinning (compare patterns of movement)

- **ELPS:**

- **1A** use prior knowledge and experiences to understand meanings in English (prior knowledge)
- **2C** learn new language structures, expressions, and basic and academic vocabulary heard during classroom instruction and interactions (understand new language structures)

- **3B** expand and internalize initial English vocabulary by learning and using high-frequency English words necessary for identifying and describing people, places, and objects, by retelling simple stories and basic information represented or supported by pictures, and by learning and using routine language needed for classroom communication (expand and internalize English vocabulary, retell)
- **5B** write using newly acquired basic vocabulary and content-based grade-level vocabulary (write using content-based vocabulary)
- **5G** narrate, describe, and explain with increasing specificity and detail to fulfill content area writing needs as more English is acquired (narrate, describe, explain in writing)

Materials:

Access to all construction and craft materials, glue gun and glue, Copy of the design problem on a chart

Suggested Literature Connections

“Mechanics” by Cari Melster

Day 1: Engage Mechanisms-Pop-Up Moving Scenes

Teacher Says/Does	Student Says/Does	Language requirements
<p>1. Read aloud a book or talk about a story everyone knows. As you go through the story, ask the children to raise their hands whenever they know something described in the story is moving. Write their ideas on the chart tablet.</p> <p>2. Ask the students if they could use cams and levers to make a picture from the story that moves like the story describes. Have them close their eyes and imagine what a pop-up scene like one on the list would look like, and what materials they would need.</p> <p>3. Show the video: <i>Mi Primer Libro Pop-Up</i> https://www.youtube.com/watch?v=plFyQ0cHmvs or <i>How to Make a Pop-Up Book</i> https://www.youtube.com/watch?v=xelKPqJ9Kos</p> <p>4. Have students think of different adverbs to describe motion, and have them safely act out the motion behind their desks.</p> <p>5. Explain to students how to complete the exit slip that is in handout (2.7.1).</p>	<p>Students listen and raise hands for movement.</p> <p>Students turn and talk to their classmates.</p> <p>Students act out the motion according to the adverb.</p> <p>Students draw three scenes and write a caption about the movement.</p>	<p>Abverbs: quickly, slowly, rapidly, lazily, quietly</p> <p>The _____ moves _____.</p>

Day 2: Explore Mechanisms-Pop-Up Moving Scenes

[illegible]

Day 3: Explain/Elaborate Mechanisms-Pop-Up Moving Scenes

Teacher Says/Does	Student Says/Does	Language requirements
<p>1. While students are working, look for groups that are discussing the ideas below; ask them to present their work to their classmates later in the class.</p> <p>2. When they have finished, they should evaluate their teamwork, their designs, and whether they have met the specifications in the design problem. Also ask the following questions:</p> <ul style="list-style-type: none"> • <i>Where have you used natural materials in your construction?</i> • <i>Where have you used synthetic materials?</i> • <i>Are natural materials easier to work with than synthetic materials?</i> • <i>Did you have to think about balance in your project?</i> • <i>Did you have a problem with the project not having stability? What did you do about it?</i> • <i>What types of mechanisms are present in your design? (wheels, axles, levers, cams, etc)</i> <p>3. Discuss additional uses and interesting features about the unit vocabulary, such as: 'Work' in this case doesn't mean a job, or employment. Instead it means using energy, like moving something, etc.</p>	<p>Student teams complete their models.</p> <p>Students orally present their work using simple past tense.</p> <p>Students take notes in their vocabulary notebooks.</p>	<p>For the _____, we used _____ materials.</p>

Day 4: Evaluate Mechanisms-Pop-Up Moving Scenes

Teacher Says/Does	Student Says/Does	Language requirements
<ol style="list-style-type: none">1. Model writing a paragraph explaining the process of making the models. The cohesive paragraph should describe the process, materials, and challenges that the students encountered.2. Let the students use the graphic organizer on handout (2.7.3) to describe their scene. They should explain:<ul style="list-style-type: none">• How the team planned together• Where the work and the forces are shown in operating their models	<p>Students think-pair-share about important words from the project.</p> <p>Student teams write paragraphs using the graphic organizer.</p>	<p>Cohesive paragraph for art gallery display.</p>

Exit Slip

Name _____ Date _____

Draw three scenes and write a caption about the movement in each scene.

The _____ moves _____. _____.	The _____ moves _____. _____.	The _____ moves _____. _____.

Exit Slip

Name _____ Date _____

Draw three scenes and write a caption about the movement in each scene.

The _____ moves _____. _____.	The _____ moves _____. _____.	The _____ moves _____. _____.

Name: _____ **Date:** _____

Design Brief: Experiments for Properties of Materials

Design Problem	Words to Remember/ Palabras para recordar
Make a pop-up or movable scene from ...	

Drawing or Model of Our Plan (You can use the back of the page, too!):

Steps	
Task	Person Responsible

Graphic Organizer for Art Gallery Paragraph

Names _____ **Date** _____

Write a cohesive paragraph describing the process, materials, and challenges that you encountered while making your pop-up moving scene.

Topic Sentence:

Process:

Materials:

Challenges:

Closing Sentence: