

Putting on a Show with Light & Sound

Unit Overview



DESIGN CHALLENGE:

How can we communicate through musical instruments and shadow puppet shows?

ANCHORING PHENOMENON:

We can see and hear the story of the Three Little Pigs in a movie.

STORYLINE

How do humans use sound and light to communicate? The Crosscutting Concepts of Cause and Effect and Patterns are featured prominently in this unit as students explore how vibrating materials cause sound and the presence of light enables them to see. The unit begins by introducing the students to the design challenge, to create a shadow puppet show by engineering a musical instrument out of recycled materials and making shadow puppets. Before building the instrument, students learn how vibrations become sound, sounds are made of vibrations and sound can cause materials to vibrate. Next, the students learn how to incorporate pitch and volume into their instruments and consider how to create rhythm.

Next, students design a tool to send sound across the room and learn how humans use devices to communicate over a long distance. Students are introduced to technology used for this purpose and use coding to communicate to a partner about a design for a shadow puppet. Students apply their knowledge of sound to design a musical instrument.

Finally, students explore light, darkness, and shadows to figure out that light is needed for us to see and that light interacts with objects to create shadows. They investigate how changing materials or changing distance between the light source and the object changes the shadow. The unit culminates in a puppet show where students put on a show using the instruments and puppets they designed in order to communicate a story to their class.

OVERVIEW

Section 1 <i>How do engineers solve problems?</i>	Section 2 <i>What is sound?</i>	Section 3 <i>How do we describe sound?</i>	Section 4 <i>How is sound used to communicate?</i>	Section 5 <i>How do we describe light?</i>
<i>Total Time: 2 days</i> LESSON 1 What kinds of problems can we solve by making instruments out of recycled materials?	<i>Total Time: 3 days</i> LESSON 2 How do we make sound? LESSON 3 What are vibrations? LESSON 4 How do we hear sound?	<i>Total Time: 5 days</i> LESSON 5 What is volume? LESSON 6 What is pitch? LESSON 7 What is rhythm?	<i>Total Time: 6 days</i> LESSON 8 How can we use sound to communicate with people who are far away? LESSON 9 How does musical instrument design affect the sound?	<i>Total Time: 7 days</i> LESSON 10 How do we interact with darkness? LESSON 11 What do you need to have in order to make a shadow? LESSON 12 How can you change a shadow? LESSON 13 How can we communicate through musical instruments and shadow puppet shows?

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