

Facilitation Guide

Echo Foldable SABES Lesson 9



EXPERIENCE OVERVIEW

In this activity, students will utilize visual arts to create an art piece that models the behavior of sound waves during echolocation.

Standards

SCIENCE

- SEP2: Developing & Using Models. PS4: Develop a simple model based on evidence to represent a proposed object or tool.
- PS4.A: Wave Properties. PS1: Sound can make matter vibrate and vibrating matter can make sound.
- CCC2: Cause and Effect. PS1 Simple tests can be designed to gather evidence to support or refute student ideas about causes.

MARYLAND STATE ARTS STANDARDS

- I:P-2:2: Experiment with design elements/principles such as; colors, line, and shapes.
- I:P-2:1: Act on creative ideas to create images and forms from observation, memory, imagination, and feelings.
- E:P-2:2: Evaluate works demonstrating content-specific literacy.

Getting Ready

SABES LEARNING OBJECTIVES:

- Unit Goal 2 - Students will record observations to describe the effects of vibrations through different mediums and explain how the vibration of objects creates the sounds we hear.

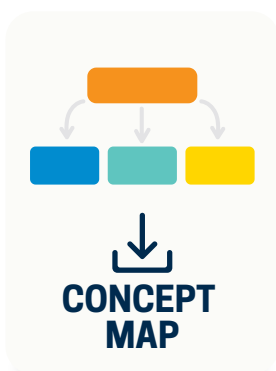
MATERIALS:

- Construction paper or cardstock paper
- Paint (acrylic or tempera)
- Paintbrush
- Coloring utensils (crayons, colored pencils, or markers)

PHYSICAL SPACE CONSIDERATIONS

- The physical space has the potential to strongly amplify student learning and understanding in this lesson. If possible, a **physical space in which echoes can be easily produced should be utilized** for the engage portion of this activity. A suitable area for this could be an empty gymnasium or auditorium (preferably with wood flooring), or an outdoor courtyard with surrounding walls. This will give students the opportunity to physically experience the production of echoes as engagement and connection to the content and activity of this lesson.
- As **liquid paint** will be used for this activity, practical considerations for the physical space should be used. Decide on a space and arrangement that allows students ample space to create their pieces and the opportunity to get a little messy without damaging class materials or spaces.

ARTS INTEGRATION MATERIALS



TEACH

Engage

- Start the lesson by facilitating a discussion of a time a student has heard an echo.
- Allow students to share with the class their examples of echoes they have heard/experienced.
- If possible, take students to a location where echoes can be created, like an enclosed courtyard, gym, etc, and have students create and listen to their own echoes.
- If none of these options apply or students have had little experience with echos, a video online exhibiting echos can be used to begin this activity.

Experience

- Students will choose an example of a situation in which an echo would be produced and create an “Echo Foldable” art piece.
- Using a piece of construction paper or cardstock folded in half and a small amount of tempera paint, students will model the creation of an echo. On one side of the folded paper, students will paint the type of soundwave that would be produced in this situation (high volume, low volume, high pitch, low pitch) on the left side of their folded paper. They will then create their “echo” by folding the page over and pressing down, creating a mirrored image of their soundwave. See the video associated with this activity for modeling of the activity!
 - *Note: This is intended to visually model and reinforce the concept of an echo being a sound wave that travels away from the listener, bounces off of an object, and then returns to the listener.*
- Once their sound waves are dried, students may add to their pieces by drawing in the scene in which the sound wave and echo were created. For example, if a student is representing a child’s clap bouncing off of a wall, they would draw the student clapping on the left side of the paper at the beginning of their sound wave and the wall on the far right side of the paper behind the echo wave.
- Formative Assessment: To assess student understanding using this activity, students may provide written or oral explanations of what their piece represents.



VIDEO TUTORIAL