

# The Boy Who Used Light and Sound

1<sup>st</sup> Grade

## Science Unit 3: Waves: Light and Sound

ELA Unit 3 Text Connections: *The Boy Who Cried Wolf* by B.G. Hennessy; *My Light* by Molly Bang

### Design Challenge Summary

**Challenge:** What will the students be required to do?

The shepherd boy needs another way to communicate with the towns people. Your challenge is to use the tools to communicate what the boy wants to say to your team. He can't scream it because the people won't listen to him anymore.

Challenge 1: **Students will use materials to design a way to communicate with sound.**

Challenge 2: **Students will use materials to design a way to communicate with light.**

(Each challenge has a separate task card)

**Standards:** What standards are addressed?

**Science:**

1PS4-4 Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.

**Math:**

Mathematical Practice Standards

1.MD.2 Express the length of an object as a whole number of length units...

**ELA:**

W.1.3 Write narratives in which they recount two or more appropriately sequenced events, include some details regarding what happened, use temporal words to signal event order, and provide some sense of closure.

SL.1.1 Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups

SL.1.6 Produce complete sentences when appropriate to task and situation.

**Result:** What will students know, value, and be able to do as a result of the lesson? What's the big idea?

Know and apply the engineering design loop process.

Demonstrate ability to modify designs based on observations and predictions.

Work collaboratively on solving a problem.

Understand how people use devices to communicate over long distances.

**Assessment:** What evidence will be used to determine student learning?

Did they communicate the message using sound and/or light?

Did they follow the design loop process?

Did they work collaboratively?

**Prior Knowledge/Experiences:** What prior content knowledge and skills will the students need?

Experiences with the Engineering Design Loop process

Connections to the Mathematical Practices

Investigations/inquiry in Science

Understand of materials that allow light to pass through, block light, or create shadows and that light travels.

Understand that sound can make matter vibrate and vibrating matter can make sound and that sound travels.

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**Summary/Connections:** How will this design challenge connect with new/future learning, other content areas, real world experiences, etc.?

This lesson will help students develop problem solving skills and collaboration skills that are essential in succeeding in the 21<sup>st</sup> century. It will allow student the opportunity to transfer and apply skills from various content areas within one task.

**Summary Activities:**

**Writing:** Writing options: students write about the process of their design; students write about how they communicated with sound or light.

**W.1.3** Write narratives in which they recount two or more appropriately sequenced events, include some details regarding what happened, use temporal words to signal event order, and provide some sense of closure.

**Math:** measure the distance their communication traveled (MD.2)

Read aloud *My Light* by Molly Bang for connections with ideas about Light

**Materials/Equipment/Preparation:** What materials and equipment will students need to successfully complete this design challenge?

Materials needed per group:

*These are suggested items...you can always add to or replace with other items.*

**Light Challenge:**

Flashlights (if available 2 per group)

Tissue paper (not red or green)

Mirrors

Materials that are transparent, opaque, or translucent

*Teacher materials:* note cards with a simple message for each group (run, dog, stop, cat, jump,)

**Sound Challenge:**

Keys

Jingle bells

At least 2 Styrofoam cups

String at least the length of a table

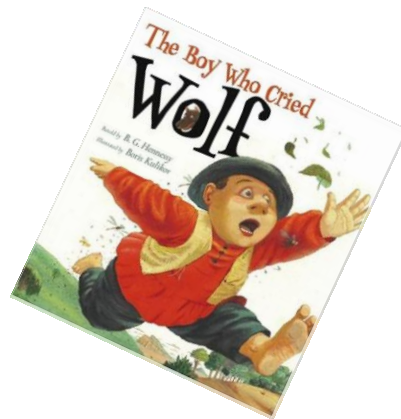
Pencils

Whistles

Any musical instruments-Kazoo, recorders, chimes, xylophone, etc.

*Teacher materials:* note cards with simple message for each group

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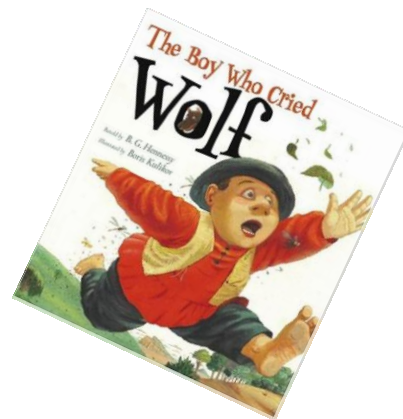


The shepherd boy needs another way to communicate with the towns people. Your challenge is to use the tools to communicate what the boy wants to say to your team. He can't scream it because the people won't listen to him anymore. Design a way for him to communicate with sound.

### Suggested Materials:

Keys  
Jingle bells  
Styrofoam cups  
String (the length of a table)  
Pencils  
Whistles  
Musical Instruments

## The Boy Who Used light and Sound



The shepherd boy needs another way to communicate with the towns people. Your challenge is to use the tools to communicate what the boy wants to say to your team. He can't scream it because the people won't listen to him anymore. Design a way for him to communicate with light.

### Suggested Materials:

Flashlights

Tissue paper

Mirrors

Materials that are transparent, opaque, or translucent