

## 1-PS4-4 Waves and Their Applications in Technologies for Information Transfer

Students who demonstrate understanding can:

- 1-PS4-4. Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.\*** [Clarification Statement: Examples of devices could include a light source to send signals, paper cup and string “telephones,” and a pattern of drum beats.] [Assessment Boundary: Assessment does not include technological details for how communication devices work.]

The performance expectation above was developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

### Science and Engineering Practices

#### Constructing Explanations and Designing Solutions

Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions.

- Use tools and materials provided to design a device that solves a specific problem.

### Disciplinary Core Ideas

#### PS4.C: Information Technologies and Instrumentation

- People also use a variety of devices to communicate (send and receive information) over long distances.

### Crosscutting Concepts

#### Connections to Engineering, Technology, and Applications of Science

#### Influence of Engineering, Technology, and Science, on Society and the Natural World

- People depend on various technologies in their lives; human life would be very different without technology.

### Observable features of the student performance by the end of the grade:

1	Using scientific knowledge to generate design solutions	
	a	Students describe a given problem involving people communicating over long distances.
	b	With guidance, students design and build a device that uses light or sound to solve the given problem.
2	Describing specific features of the design solution, including quantification when appropriate	
	a	Students describe that specific expected or required features of the design solution should include:
		i.
b	Students use only the materials provided when building the device.	
3	Evaluating potential solutions	
	a	Students describe whether the device:
		i.
b	Provides a solution to the problem involving people communicating over a distance by using light or sound.	
	b	Students describe how communicating over long distances helps people.