Unless otherwise specified, "descriptions" referenced in the evidence statements could include but are not limited to written, oral, pictorial, and kinesthetic descriptions.

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.
	c	With guidance, students describe* the scientific information they use to design the solution.
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. The device is able to send or receive information over a given distance.
		ii. The device must use light or sound to communicate.
	b	Students use only the materials provided when building the device.
3	Evaluating potential solutions	
	a	Students describe* whether the device:
		i. Has the expected or required features of the design solution,
		ii. 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.