

HS-PS4-5 Waves and Their Applications in Technologies for Information Transfer

California Alternate Assessment for Science—Item Content Specifications

# HS-PS4-5 Waves and Their Applications in Technologies for Information Transfer

| California Science Connector | Focal Knowledge, Skills, and Abilities | Essential Understanding |
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| Describe how a device operates using the principles of wave behavior by identifying steps in a model that show how a device uses waves to transmit and capture information and transmit energy. | 1. Ability to describe how a device operates using the principles of wave behavior by identifying steps in a model that show how a system uses waves to transmit and receive information. 2. Ability to describe how a device operates using the principles of wave behavior by identifying steps in a model that show how a system uses waves to transmit and receive energy. | Identify common devices that use light or sound waves to transmit information. |

## **CA NGSS Performance Expectation**

Students who demonstrate understanding can:

**Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.** [Clarification Statement: Examples could include solar cells capturing light and converting it to electricity; medical imaging; and communications technology.] *[Assessment Boundary: Assessments are limited to qualitative information. Assessments do not include band theory.]*

## Mastery Statements

Students will be able to:

* Identify devices which use light or sound waves to transmit information
* Identify steps in models in which devices use waves to transmit or capture information
* Identify steps in models in which devices use waves to transmit energy
* Recognize that light, sound, and energy are transmitted in waves

## Possible Phenomena or Contexts

*Note that the list in this section is not exhaustive or prescriptive.*

**Possible contexts include the following:**

* Students using cell phones to send and receive messages
* Students watching television or listening to the radio
* Students talking on the phone
* Students using a computer

## Additional Assessment Boundaries

* None listed at this time

## Additional References

California Science Test Item Specification for HS-PS4-5

<https://www.cde.ca.gov/ta/tg/ca/documents/itemspecs-hs-ps4-5.docx>

Environmental Principles and Concepts <http://californiaeei.org/abouteei/epc/>

The *2016 Science Framework for California Public Schools Kindergarten through Grade Twelve* <https://www.cde.ca.gov/ci/sc/cf/cascienceframework2016.asp>

Appendix 1: Progression of the Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts in Kindergarten through Grade Twelve

<https://www.cde.ca.gov/ci/sc/cf/documents/scifwappendix1.pdf>

Appendix 2: Connections to Environmental Principles and Concepts

<https://www.cde.ca.gov/ci/sc/cf/documents/scifwappendix2.pdf>

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