

DCI: Waves and Their Applications in Technologies for Information Transfer

4.PS4.A: Wave Properties

Waves, which are regular patterns of motion, can be made in water by disturbing the surface. When waves move across the surface of deep water, the water goes up and down in place; there is no net motion in the direction of the wave except when the water meets a beach. (4-PS4-1)

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4.PS4.B: Electromagnetic Radiation

An object can be seen when light reflected from its surface enters the eyes. (4-PS4-2)

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4.ETS1.C: Optimizing the Design Solution

Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (4-PS4-3)

Science and Engineering Practice

Developing and Using Models

Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions. **Develop a model to describe phenomena.** (4-PS4-2)

Crosscutting Concept

Patterns

Similarities and differences in patterns can be used to sort and classify natural phenomena. (4-PS4-1)

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4.PS4.A: Wave Properties

Waves of the same type can differ in amplitude (height of the wave) and wavelength (spacing between wave peaks). (4-PS4-1)

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4.PS4.C: Information Technologies and Instrumentation

Digitized information can be transmitted over long distances without significant degradation. High-tech devices, such as computers or cell phones, can receive and decode information—convert it from digitized form to voice—and vice versa. (4-PS4-3)

Science and Engineering Practice

Developing and Using Models

Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions. **Develop a model using an analogy, example, or abstract representation to describe a scientific principle.** (4-PS4-1)

Science and Engineering Practice

Constructing Explanations and Designing Solutions

Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems. **Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution.** (4-PS4-3)

Crosscutting Concept

Patterns

Similarities and differences in patterns can be used to sort and classify designed products. (4-PS4-3)

Crosscutting Concept

Cause and Effect

Cause and effect relationships are routinely identified. (4-PS4-2)