MS-PS4

DCI: Waves and Their Applications in Technologies for Information Transfer

MS.PS4.A: Wave Properties

A simple wave has a repeating pattern with a specific wavelength, frequency, and amplitude. (MS-PS4-1)

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MS.PS4.A: Wave Properties

A sound wave needs a medium through which it is transmitted. (MS-PS4-2)

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MS.PS4.B: Electromagnetic Radiation

When light shines on an object, it is reflected, absorbed, or transmitted through the object, depending on the object's material and the frequency (color) of the light. (MS-PS4-2)

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MS.PS4.B: Electromagnetic Radiation

The path that light travels can be traced as straight lines, except at surfaces between different transparent materials (e.g., air and water, air and glass) where the light path bends. (MS-PS4-2)

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MS.PS4.B: Electromagnetic Radiation

A wave model of light is useful for explaining brightness, color, and the frequency-dependent

bending of light at a surface between media. (MS-PS4-2)

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MS.PS4.B: Electromagnetic Radiation

However, because light can travel through space, it cannot be a matter wave, like sound or water waves. (MS-PS4-2)

DCI: Waves and Their Applications in Technologies for Information Transfer

MS.PS4.C: Information Technologies and Instrumentation

Digitized signals (sent as wave pulses) are a more reliable way to encode and transmit information. (MS-PS4-3)

Science and Engineering Practices

Developing and Using Models

Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems. Develop a model to describe phenomena. (MS-PS4-2)

Science and Engineering Practices

Using Mathematics and Computational Thinking

Mathematical and computational thinking at the 6–8 level builds on K–5 experiences and progresses to identifying patterns in large data sets and using mathematical concepts to support explanations and arguments. Use mathematical representations to describe and/or support scientific conclusions and design solutions. (MS-PS4-1)

Science and Engineering Practices

Obtaining, Evaluating, and Communicating Information

Obtaining, evaluating, and communicating information in 6–8 builds on K–5 experiences and progresses to evaluating the merit and validity of ideas and methods. Integrate qualitative scientific and technical information in written text with that contained in media and visual displays to clarify claims and findings. (MS-PS4-3)

Crosscutting Concepts

Patterns

Graphs and charts can be used to identify patterns in data. (MS-PS4-1)

Crosscutting Concepts

Structure and Function

Structures can be designed to serve particular functions by taking into account properties of different materials, and how materials can be shaped and used. (MS-PS4-2)

Crosscutting Concepts

Structure and Function

Structures can be designed to serve particular functions. (MS-PS4-3)