

# Science Unit 2: Waves and Information Transfer (Grade 4)

Content Area: **Science**  
Course(s): **Science 4**  
Time Period: **Marking Period 1**  
Length: **2 weeks**  
Status: **Published**

## **Established Goals/Standards**

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Please choose the appropriate Goals/Standards from the Standards tab above.

SEL.PK-12.2.2	Recognize the skills needed to establish and achieve personal and educational goals
SEL.PK-12.2.3	Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals
SEL.PK-12.3.1	Recognize and identify the thoughts, feelings, and perspectives of others
SEL.PK-12.3.2	Demonstrate and awareness of the differences among individuals, groups, and others' cultural backgrounds
SEL.PK-12.3.3	Demonstrate an understanding of the need for mutual respect when viewpoints differ
SEL.PK-12.3.4	Demonstrate an awareness of the expectations for social interactions in a variety of settings
SEL.PK-12.4.1	Develop, implement and model effective problem-solving, and critical thinking skills
SEL.PK-12.4.2	Identify the consequences associated with one's actions in order to make constructive choices
SEL.PK-12.4.3	Evaluate personal, ethical, safety, and civic impact of decisions
SEL.PK-12.5.1	Establish and maintain healthy relationships
SEL.PK-12.5.2	Utilize positive communication and social skills to interact effectively with others
SEL.PK-12.5.4	Demonstrate the ability to prevent and resolve interpersonal conflicts in constructive ways
SEL.PK-12.5.5	Identify who, when, where, or how to seek help for oneself or others when needed
CAEP.9.2.4.A.1	Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.
CAEP.9.2.4.A.2	Identify various life roles and civic and work - related activities in the school, home, and community.
CAEP.9.2.4.A.3	Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.
CAEP.9.2.4.A.4	Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.
4-PS4-1	Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.
4-PS4-1.1.1	Similarities and differences in patterns can be used to sort and classify natural phenomena.
4-PS4-3.1.1	Similarities and differences in patterns can be used to sort and classify designed products.
4-PS4-2.2.1	Cause and effect relationships are routinely identified.
4-PS4-2.2.1	Develop a model to describe phenomena.
4-PS4-1.2.1	Develop a model using an analogy, example, or abstract representation to describe a

scientific principle.

4-PS4-3.6.1	Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution.
4-PS4-1.PS4.A.1	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.PS4.A.2	Waves of the same type can differ in amplitude (height of the wave) and wavelength (spacing between wave peaks).
4-PS4-2.PS4.B.1	An object can be seen when light reflected from its surface enters the eyes.
4-PS4-3.PS4.C.1	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.

## Essential Questions

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Please add your Essential Questions by clicking on the Lists tab above.

- How can you determine how much energy is traveling through a wave?
- How has information transfer changed over the years?
- How is digitized information transmitted over long distances?
- What are the different parts of a wave?
- What are waves?
- What is the difference between reflection and refraction?
- What is the difference between wavelength and amplitude?
- What kind of energy is required for sight?

## Core Ideas

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Please add your Enduring Understandings by clicking on the Lists tab above.

- Similarities and differences in patterns can be used to sort and classify natural phenomena.
- An object can be seen when light reflected from its surface enters the eyes.
- Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints.
- 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.
- Waves of the same type can differ in amplitude (height of the wave) and wavelength (spacing between wave peaks).
- 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.

## **Content**

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Students will be able to:

- Understand that magnetism and electricity are related effects. Static electricity is the build up of electrons or electric charge. Electrons are parts of atoms and have a negative charge.
- learn that like charges repel each other, while opposite charges attract.
- learn that current electricity flows in a complete circuit. A complete circuit can be constructed in more than one way using the same materials.
- identify conductors and insulators by using a simple circuit to test the conductivity of various materials.
- learn how conductors allow electricity to flow and how insulators do not allow electricity to flow.
- understand that a series circuit is a simple circuit. If one light bulb goes out in a series circuit, all bulbs will go out because the only path for electricity to travel has been interrupted. Switches open and close circuits.

## **Resources**

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- HMH Science Dimensions textbook
- ActivBoard flipcharts
- Labs Activities
- United Streaming videos
- Brainpop
- Newsela