

**Physical Science: Waves, Codes
and Communication**

Washington University in St. Louis
Institute for School Partnership



unit 19

*Wave After
Wave*



hands on science for elementary students



Unit 19 | Wave After Wave

DESIGN CHALLENGE:

How can we design a device that uses patterns to communicate a secret message?

section 1

What is a wave and how does it move?

Total Time: 10 days

LESSON 1

What is a wave?

LESSON 2

How can we model wave motion?

LESSON 3

How can a spring show different kinds of wave motion?

LESSON 4

How does water help us understand wave motion?

LESSON 5

How is pendulum motion similar to wave motion?

section 2

Why are waves important to people?

Total Time: 4 days

LESSON 6

What evidence do we have to prove that sound is a wave?

LESSON 7

What can a computer simulation show us about waves?

LESSON 8

How is a tsunami (tidal wave) different from the other waves we have studied?

section 3

How do we use waves and codes to communicate?

Total Time: 9 days

LESSON 9

How have humans used waves to communicate?

LESSON 10

What is a code?

LESSON 11

How can we design a device that uses patterns to communicate a secret message?

STORYLINE

The goals of this unit are to understand different kinds of waves and ways that waves are important to humans. This unit emphasizes the Crosscutting Concepts of Energy and Matter and Patterns. First, students share what they already think and know about waves and then participate in a whole-class activity to model the two main types of waves: transverse and compression. Then they explore waves in water by using slinkies to model wavelength and amplitude.

Next, students explore the applications of waves to humans, including sounds, earthquakes and tsunamis. Finally, students explore the use of waves and codes in communication, including activities based on binary code and computer programming. For the design challenge, students create and use their own secret code with a partner.