

Fourth Grade Science

Waves - Sound

The following learning activities were backwards planned to facilitate the development of students' knowledge and skills for mastery of these NGSS Performance Expectations. Not all of the dimensions and CCSS are covered in the following activities and teachers are encouraged to address them where possible.

4-PS4-1

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. [Clarification

1. Statement: Examples of models could include diagrams, analogies, and physical models using wire to illustrate wavelength and amplitude of waves.] [Assessment Boundary: Assessment does not include interference effects, electromagnetic waves, non-periodic waves, or quantitative models of amplitude and wavelength.]

The performance expectation above was developed using [the following elements from the NRC document *A Framework for K-12 Science Education*](#):

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)

Connections to Nature of Science

Scientific Knowledge is Based on Empirical Evidence

Science findings are based on recognizing patterns. (4-PS4-1)

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. (Note: This grade band endpoint was moved from K–2.) (4-PS4-1)
Waves of the same type can differ in amplitude (height of the wave) and wavelength (spacing between wave peaks). (4-PS4-1)

Patterns

Similarities and differences in patterns can be used to sort, classify, and analyze simple rates of change for natural phenomena. (4-PS4-1)

Connections to other DCIs in fourth grade:

4.PS3.A (4-PS4-1); **4.PS3.B** (4-PS4-1)

Articulation of DCIs across grade-levels:

K.ETS1.A (4-PS4-3); **1.PS4.C** (4-PS4-3); **2.ETS1.B** (4-PS4-3); **2.ETS1.C** (4-PS4-3);
3.PS2.A (4-PS4-3); **MS.PS4.A** (4-PS4-1); **MS.PS4.C** (4-PS4-3); **MS.ETS1.B** (4-PS4-3)

Common Core State Standards Connections:

ELA/Literacy -

SL.4.5 Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes. (4-PS4-1)

Mathematics -

MP.4 Model with mathematics. (4-PS4-1)

4.G.A.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures. (4-PS4-1)