Washington Science

Fourth Grade

Physical Science

What can energy do and how can we use it?

3 Use evidence, data, and investigation to explain energy transfer and the energy of objects in motion; apply these understandings to design and build a device that converts energy. WA 4.PS3

- 1 Use evidence to construct an explanation relating the speed of an object to the energy of that object. 4-PS3-1
- 2 Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents. 4-PS3-2
- 3 Ask questions and predict outcomes about the changes in energy that occur when objects collide. 4-PS3-3
- 4 Apply scientific ideas to design, test, and refine a device that converts energy from one form to another. [Engineering] 4-PS3-4

4 Use investigation, evidence and modeling to show and explain how energy behaves, including as waves; design and evaluate solutions that use energy in patterns to communicate. WA 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
- 2 Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen. 4-PS4-2
- 3 Generate and compare multiple solutions that use patterns to transfer information. [Engineering] 4-PS4-3

Life Science

How do internal and external structures help living things function and survive?

1 Use modeling to show and explain internal and external structures of plants and animals that help them live successfully. WA 4.LS1

- 1 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. 4-LS1-1
- 2 Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways. 4-LS1-2

Earth and Space Sciences

What are Earth's features and how do they change?

1. Use evidence to show and explain how Earth's features have changed over time. WA 4.ESS1
    1. Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time. [Climate] 4-ESS1-1
2. Use investigation, evidence, and data to show and explain patterns in Earth's features and what causes those features to change. WA 4.ESS2
    1. Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation. [Climate] [ESE] 4-ESS2-1
    2. Analyze and interpret data from maps to describe patterns of Earth's features. [ESE] 4-ESS2-2

How do humans and the Earth affect each other?

3. Research to understand and explain human impacts on the environment and design solutions to lessen impacts of environmental events on humans. WA 4.ESS3
    1. Obtain and combine information to describe that energy and fuels are derived from natural resources and that their uses affect the environment. [ESE] 4-ESS3-1
    2. Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans. [Engineering] [ESE] 4-ESS3-2

3–5 Engineering, Technology, and Applications of Science

How do we engineer solutions to a problem?

1. Use modeling, investigation, and data to design, test, and improve solutions to problems that can be solved through engineering; include criteria, constraints, and elements of fair tests. WA 4.ETS1
    1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. 3-5-ETS1-1
    2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. 3-5-ETS1-2
    3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved. 3-5-ETS1-3

Environmental and Sustainability Education

How do we work together to ensure a healthy environment and sustainable economy for future generations?

1. Through project-based learning, synthesize evidence using information from multiple sources about local ecological, social, and economic systems to collaborate with community partners and tribes in ways that foster solutions to local environmental problems. WA.4.ESE.1
    1. Cite multiple sources and perspectives in an analysis of and presentation about environmental sustainability in the community, considering values at the individual, community, and tribal level. 4.ESE.1-1
    2. Design an investigation on school grounds to make observations and/or measurements that provide evidence of the built environment's effect on environmental quality (e.g. impacts on/benefits to water quality, air quality, biodiversity, waste). 4.ESE.1-2
    3. Apply scientific ideas to solve design problems related to environmental sustainability, demonstrating the knowledge, attitudes, and understanding needed for personal and civic responsibility related to tribal sovereignty in Washington. 4.ESE.1-3