



Energy Content Standards

Grade One

Physical Sciences

Nature of Energy

7. Explore how energy makes things work (e.g., batteries in a toy and electricity turning fan blades.)
8. Recognize that the sun is an energy source that warms the land, air, and water.
9. Describe that energy can be obtained from many sources in many ways (e.g., food, gasoline, electricity, or batteries.)

Grade Two

Scientific Inquiry

1. Ask "how can I/we" questions.
2. Ask "how do you know" questions (not "why" questions) in appropriate situations and attempt to give reasonable answers when others ask questions.
3. Explore and pursue student-generated "how" questions.

Grade Four

Physical Sciences

Nature of Energy

5. Compare ways the temperature of an object can be changed (e.g., rubbing, heating, and bending of metal.)

Grade Five

Physical Sciences

Nature of Energy

1. Define temperature as the measure of thermal energy and describe the way it is measured.
2. Trace how thermal energy can transfer from one object to another by conduction.
3. Describe that electrical current in a circuit can produce thermal energy, light, sound, and/or magnetic forces.
4. Trace how electrical current travels by creating a simple electric circuit that will light a bulb.

Grade Six

Physical Sciences

Nature of Energy

5. Explain that the energy found in nonrenewable sources such as fossil fuels (e.g., oil, coal, and natural gas) originally came from the sun and may renew slowly over millions of years.
6. Explain that energy found in nonrenewable sources such as wind and water is assumed to be available indefinitely.
7. Describe how electric energy can be produced from a variety of sources (e.g., sun, wind, and coal.)
8. Describe how renewable and nonrenewable energy resources can be managed (e.g., fossil fuels, trees, and water.)

Grade Seven

Physical Sciences

Nature of Energy

2. Describe how an object can have potential energy due to its position or chemical composition and can have kinetic energy due to its motion.
3. Identify different forms of energy (e.g., electrical, mechanical, chemical, thermal, nuclear, radiant, and acoustic.)
4. Explain how energy can change forms but the total amount of energy remains constant.
5. Trace energy transformation in a simple closed system (e.g., a flashlight.)

Grade Eight

Physical Sciences

Nature of Energy

4. Demonstrate that waves transfer energy.
5. Demonstrate that vibrations in materials may produce waves that spread from the source in all directions (e.g., earthquake waves and sound waves.)

Grade Nine

Physical Sciences

Nature of Energy

12. Explain how an object's kinetic energy depends on its mass and its speed. ($KE = \frac{1}{2}mv^2$).
15. Trace the transformation of energy within a system (e.g., chemical to electrical to mechanical) and recognize that energy is conserved. Show that these transformations involve the release of some thermal energy.