

Appendix

North Carolina Essential Standards 6th – 9th Grade Science

Physical Science (P) Earth Science (E) Earth/Environmental (EE)

6th Grade Essential Standard

6. P.3 Understand characteristics of energy transfer and interactions of matter and energy.

The curriculum unit applies to this standard with Activity 2. Students creating an energy foldable allows them to understand how energy is transferred from one object to another. The energy transferred allows the object to perform work.

6th Grade Clarifying Objectives

6. P.3.1 Illustrate the transfer of heat energy from warmer objects to cooler ones using examples of conduction, radiation and convection and the effects that may result.

6. P.3.3 Explain the suitability of materials for use in technological design based on a response to heat (to include conduction, expansion, and contraction) and electrical energy (conductors and insulators).

7th Grade Essential Standard

7. P.2 Understand forms of energy, energy transfer and transformation and conservation in mechanical systems.

7. E.1 Understand how the cycling of matter (water and gases) in and out of the atmosphere relates to Earth's atmosphere, weather and climate and the effects of the atmosphere on humans.

The unit can be used for these standard with Activity 1 through 6.

Essential Standard 7.P.2 can be used for Activity 1. This teaches students about work, kinetic and potential energy. Activity 2 allows students to create the energy foldable which provides them knowledge of the various forms of energy.

Essential Standard 7.E.1 will apply to Activity 3 through 6. Activity 3 allows students to understand the difference between renewable vs. nonrenewable energy. The emissions produced from nonrenewable energy releases carbon dioxide into the atmosphere.

Activity 4 students calculate their carbon footprint. Students will calculate how much carbon dioxide they are emitting into the atmosphere. Activity 5 allows the students to be creative by finding solutions for the energy crisis. Activity 6 is a written assessment for the knowledge learned throughout the unit.

7th Grade Clarifying Objectives

7.P.2.3 Recognize that energy can be transferred from one system to another when two objects push or pull on each other over a distance (work) and electrical circuits require a complete loop through which an electrical current can pass.

7.E.1.1 Compare the composition, properties and structure of Earth's atmosphere to include: mixtures of gases and differences in temperature and pressure within layers.

7.E.1.6 Conclude that good health of humans requires: monitoring the atmosphere, maintaining air quality and stewardship.

8th Grade Essential Standard

8. P.2 Explain the environmental implications associated with the various methods of obtaining, managing, and using energy resources.

Activity 3 applies to this standard by teaching students about nonrenewable and renewable energy. Activity 4 gives students the opportunity to understand their role in contributing to the excessive release of carbon dioxide into the atmosphere. Activity 5 allows students to deal with budgeting energy because of the depletion of nonrenewable energy.

8th Grade Clarifying Objectives

8. P.2.1 Explain the environmental consequences of the various methods of obtaining, transforming and distributing energy.

8. P.2.2 Explain the implications of the depletion of renewable and nonrenewable energy resources and the importance of conservation.

9th Grade Essential Standard

EEn.2.8 Evaluate human behaviors in terms of how likely they are to ensure the ability to live sustainably on Earth.

Activities 4 and 5 apply to these standards. Activity 4 allows students to calculate their carbon footprint. Students will understand how their lifestyle contributes to the release of carbon dioxide into the atmosphere. Activity 5 promotes conservation and the ability to reduce, reuse and recycle natural resources.

9th Grade Clarifying Objectives

EEn.2.8.3 Explain the effects of uncontrolled population growth on the Earth's resources.

EEn.2.8.4 Evaluate the concept of "reduce, reuse, and recycle" in terms of impact on natural resources.