Alignment
of
Project Learning Tree
Energy & Society
Program Materials

to
California Content Standards

Science
Grades K-8
Visual/Performing Arts
Grades PreK-5

Introduction

Project Learning Tree's (PLT) *Energy & Society* program is designed to help PreK-8 students learn about their relationship with energy and investigate the environmental issues related to energy's role in society. In addition to hands-on learning activities described in the *Energy & Society Activity Guide*, the program includes an *Energy & Me* music CD from singer/songwriter, Billy B, and an *Energy & Me* music and dance video. The program complements PLT's *PreK-8 Environmental Education Activity Guide*, which consists of 96 activities that focus on a variety of environmental topics and issues, including energy.

This document provides California educators with an easy reference for how the *Energy & Society* program aligns to the *Content Standards for California Public Schools for Science* and *the Visua/Performing Arts*. As part of the national movement to reform education, the California State Board of Education has adopted criteria to measure the skills, knowledge and ability that all students should be able to master within life, physical and earth sciences, including investigation and experimentation. It is the goal of this document to help teachers provide students with lessons that reinforce critical and creative thinking while also exploring the required science topics.

These alignments are organized in two different ways. The Correlation by Standard lists each science standard that is addressed through the program, and lists the specific activities and songs that address the standard. The Correlation by Activity or Song lists each program activity or song and the standards it addresses. The document includes correlations of the six activities outlined in the *Energy & Society Guide*, the 15 songs on the *Energy & Me* music CD, and the 15 activities from PLT's *PreK-8 Environmental Education Guide* listed in Appendix V of the *Energy & Society Guide* as addressing energy or energy issues.

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For more information about Project Learning Tree in California, contact Kay Antunez, California Project Learning Tree Coordinator, California Department of Forestry and Fire Protection, PO Box 944246, Sacramento, California 94244-2460, or call (916) 653-7958.

A copy of *Science Content Standards for California Public Schools Kindergarten through Grade 12* can be obtained at: www.cde.ca.gov/be/st/ss .

Kindergarten

Science

PHYSICAL SCIENCES

1. Properties of materials can be observed, measured and predicted. As a basis for understanding this concept:
   a. Students know objects can be described in terms of the materials they are made of (clay, cloth, paper, etc.) and their physical properties (color, size, shape, weight, texture, flexibility, attraction to magnets, floating and sinking, etc.).

      Energy & Society Activity Guide
      May the Source Be with You (2)

      Energy and Me CD
      What, What Is (9)

   b. Students know water can be liquid or a solid and can be made to change back and forth from one form to the other.

      Energy and Me CD
      It is the Energy, It is the Sun (1)

LIFE SCIENCES

2. Different types of plants and animals inhabit the Earth. As a basis for understanding this concept:

   a. Students know how to observe and describe similarities and differences in the appearance and behavior of plants and of animals (e.g., seed-bearing plants, birds, fish, insects).

      Energy and Me CD
      Ecosystem (4)

   c. Students know how to identify major structures of common plants and animals (e.g., stems, leaves, roots, arms, wings, legs).

      Energy and Me CD
      The Rock and Roll of Photosynthesis (2); Yummy Yummy (15)

EARTH SCIENCES

3. Earth is composed of land, air, and water. As a basis for understanding this concept:
   c. Students know to identify resources from Earth that are used in everyday life and understand that many resources can be conserved.

      Energy and Me CD
      What, What Is (9); Resources (10); On the Move (11)

INVESTIGATION AND EXPERIMENTATION

4. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept, and to address the content in the other three strands, students should develop their own questions and perform investigations.
   a. Students will observe common objects by using the five senses.

      Energy & Society Activity Guide
      Energy Detectives (1)

d. Students will communicate observations orally and in drawings.

Energy & Society Activity Guide
Energy Detectives (1)

Visual/Performing Arts Standards

0.0 Artistic Perception

Students perceive and respond, using the elements of dance. They demonstrate movement skills, process sensory information, and describe movement, using the vocabulary of dance.

Development of motor skills and technical expertise.

0.1 Build the range and capacity to move in a variety of ways.

Development of dance vocabulary

1.3 Perform simple movements in response to oral instructions (e.g., walk, run, reach.) **Energy & Me video – "Energy & Me" and "Water Cycle" dances**

1.0 Creative Expression

Students apply vocal and instrumental musical skills in performing a varied repertoire of music. They compose and arrange music and improvise melodies,variations, and accompaniments, using digital/electronic technology when appropriate.

Apply vocal and instrumental skills.

1.1 Sing age-appropriate songs from memory.
Lyrics to Billy B's songs are found in the Activity Guide, pages 69-75.

Students apply choreographic principles, processes, and skills to create and communicate meaning through the improvisation, composition, and performance of dance.

Creation/Invention of dance movements.

1.2 Respond spontaneously to different types of music, rhythms, and sounds.
Use the *Energy & Society* video and CD

2.0 Historical and Cultural Context

Students analyze the role of music in past and present cultures throughout the world, noting cultural diversity as it relates to music, musicians, and composers.

Diversity of music.

3.4 Use developmentally appropriate movements in responding to music from various genres and styles (rhythm, melody).
Energy & Me video "Energy & Me" and "Water Cycle"

3.0 Aesthetic Valuing

Students apply vocal and instrumental musical skills in performing a varied repertoire of music. They compose and arrange music and improvise melodies, variations, and accompaniments, using digital/electronic technology when appropriate.

Apply vocal and instrumental skills.

3.1 Create movements that correspond to specific music.
Energy & Me CD and Video – "Water Cycle"

3.2 Identify, talk about, sing, or play music written for specific purposes (eg. Work song, lullaby).
Lyrics to Billy B's songs are found in the Activity Guide, pages 69-75.

Students critically assess and derive meaning from works of dance, performance of dancers, and original works based on the elements of dance and aesthetic qualities.

Description, analysis, and criticism of dance

4.1 Explain basic features that distinguish one kind of dance from another (e.g., speed, force/energy use, costume, setting, music)

Compare dances from the Energy & Me Video

4.0 Connections, Relationships, Applications

Students apply what they learn in music across subject areas. They develop competencies and creative skills in problem solving, communication, and management of time and resources that contribute to lifelong learning and career skills. They learn about careers in and related to music.

Connections and applications

4.1 Use music, together with dance, theatre, and the visual arts, for storytelling.

Lyrics to Billy B's songs are found in the Activity Guide, pages 69-75.
(read lyrics and discuss about their "story")

Grade One

Science

PHYSICAL SCIENCES

1. Materials come in different forms (states), including solids, liquids, and gases. As a basis for understanding this concept:
   a. Students know the properties of substances can change when the substances are mixed, cooled, or heated.

      Energy & Me CD
      The Water Cycle (3)

   b. Students know the properties of substances can change when the substances are mixed, cooled, or heated.

      Energy & Society Activity Guide
      Energy Detectives (1)

LIFE SCIENCES

2. Plants and animals meet their needs in different ways. As a basis for understanding this concept:
   a. Students know different plants and animals inhabit different kinds of environments and have external features that help them thrive in different kinds of places.

      Energy and Me CD
      Ecosystem (4)

   b. Students know plants and animals both need water; animals need food, and plants need light.

      Energy and Me CD
      Yummy Yummy (15)

   e. Students know roots are associated with the intake of water and soil nutrients, green leaves with making food from sunlight.

      Energy & Me CD
      The Rock and Roll of Photosynthesis (2); Yummy Yummy (15)

EARTH SCIENCES

3. Weather can be observed, measured and described. As a basis for understanding this concept:
   c. Students know the sun warms the land, air, and water.

      Energy & Me CD
      It is the Energy, It is the Sun (1); The Water Cycle (3)

INVESTIGATION AND EXPERIMENTATION

4. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept, and to address the content the other three strands, students should develop their own questions and perform investigations.

   a. Students will draw pictures that portray some features of the thing being described.

      Energy & Society Activity Guide
      May the Source Be with You (2)

   b. Students will record observations and data with pictures, numbers, and/or written statements.

      Energy & Society Activity Guide
      Energy Detectives (1)

Visual/Performing Arts

2.0 Creative Expression

Students apply choreographic principles, processes, and skills to create and communicate meaning through the improvisation, composition, and performance of dance.

Creation/Invention of dance movements.

2.2 Respond in movement to a wide range of stimuli (e.g., music, books, pictures, rhymes, fabrics, props.

Use objects illustrated in "Where's the Energy" posters from Energy Detectives (Activity 1) to communicate an idea of how it moves.

Application of choreographic principles and processes to creating a dance

2.5 Imitate simple movement patterns.

Use *Energy & Me* Video "Energy & Me" or "Water Cycle"

Communication of meaning in dance

2.6 Perform improvised movement ideas for peers.

Use *Energy & Me* CD – "Yummy Yummy" to improvise movements.

Students apply vocal and instrumental musical skills in performing a varied repertoire of music. They compose and arrange music and improvise melodies, variations, and accompaniments, using digital/electronic technology when appropriate.

Apply vocal and instrumental skills.

1.1 Sing with accuracy in a developmentally appropriate range.

1.2 Sing age-appropriate songs from memory.

Use *Energy & Me* CD to teach "Energy & Me", "Water Cycle"and "Yummy Yummy".

4.0 Aesthetic Valuing

Students apply vocal and instrumental musical skills in performing a varied repertoire of music. They compose and arrange music and improvise melodies, variations, and accompaniments, using digital/electronic technology when appropriate.

Apply vocal and instrumental skills.

2.1 Create movements to music that reflect focused listening.

2.2 Describe how ideas or moods are communicated through music.

Use *Energy & Me* CD to teach "Energy & Me" and "Water Cycle"

Students critically assess and derive meaning from works of dance, performance of dancers, and original works based on the elements of dance and aesthetic qualities.

Description, analysis, and criticism of dance

4.1 Use basic dance vocabulary to identify and describe a dance observed or performed (e.g., shapes, levels, directions, tempo/fast-slow).

Meaning and impact of dance

4.2 Describe how they communicate an idea or a mood in a dance (e.g., with exaggerated everyday gestures or emotional energies)

Use *Energy & Society* video to observe and identify dance vocabulary and communication techniques.

5.0 <u>Connections, Relationships, Applications</u>

Students apply what they learn in music across subject areas. They develop competencies and creative skills in problem solving, communication, and management of time and resources that contribute to lifelong learning and career skills. They learn about careers in and related to music.

Careers and career-related skills

5.2 Describe how the performance of songs and dances improves after practice and rehearsal.

Use "Energy & Me" or "Water Cycle" in a class performance.

Students apply what they learn to dance to learning across subject areas. They develop competencies and create skills in problem solving, communication, and management of time and resources that contribute to lifelong learning and career skills. They also learn about careers in and related to dance.

Connections and applications across disciplines.

5.1 Demonstrate curricular concepts through dance (e.g., growth cycle, animal movement).

Use *Energy & Me* video to view "Water Cycle". Use music CD "Yummy Yummy" to create a dance.

5.2 Give examples of how dance relates to other subjects (e.g., mathematics – shape, counting, language arts – beginning, middle and end.).

Relate songs to grade level science concepts dealing with the water sources of energy (refer to PLT's correlations to CA Science Standards for example)

Grade 2

Science

PHYSICAL SCIENCES

1. The motion of objects can be observed and measured. As a basis for understanding this concept:
   c. Students know the way to change how something is moving is by giving it a push or a pull. The size of the change is related to the strength, or the amount of force, of the push or pull.

      Energy & Society Activity Guide
      What Powers the Move? (4)

   d. Students know tools and machines are used to apply pushes and pulls (forces) to make things move.

      Energy & Me CD
      On the Move (11)

LIFE SCIENCES

2. Plants and animals have predictable life cycles. As a basis for understanding this concept:
   e. Students know the germination, growth, and development of plants can be affected by light, gravity, touch, or environmental stress.

      Energy & Me CD
      Our Changing World (13)

EARTH SCIENCES

3. Earth is made of materials that have distinct properties and provide resources for human activities. As the basis for understanding this concept:
   e. Students know rock, water, plants and soil provide many resources including food, fuel, and building materials that humans use.

      Energy & Me CD
      Energy & Me (6); Energia y Yo (7); What, What Is (9); Resources (10)

Visual/Performing Arts

1.0 Artistic Expression

Students perceive and respond, using the elements of dance. They demonstrate movement skills, process sensory information, and describe movement, using the vocabulary of dance.

Development of motor skills and technical expertise

1.1 Show a variety of combinations of basic locomotor skills (e.g., walk and run, gallop and jump, hop and skip, slide and roll.

1.2 Show a variety of combinations of axial movements (e.g., swing and balanced shapes, turn and stretch, bend and twist.

Use any of the Billy B songs to practice these skills.

2.0 Creative Expression

Students apply vocal and instrumental musical skills in performing a varied repertoire of music. They compose and arrange music and improvise melodies, variations, and accompaniments, using digital/electronic technology when appropriate.

Apply vocal and instrumental skills.

2.1 Sing with accuracy in a developmentally appropriate range

2.2 Sing age-appropriate songs from memory.

Lyrics to Billy B's songs are found in the Activity Guide, pages 69-75.

3.0 Historical and Cultural Context

Students analyze the role of music in past and present cultures throughout the world, noting cultural diversity as it relates to music, musicians, and composers.

Role of music

3.1 Identify the uses of specific music in daily or special events.

Use Billy B's lyrics to identify how music addresses special events.

4.0 Aesthetic Valuing

Students critically assess and derive meaning from works of music and the performance of musicians according to the elements of music, aesthetic qualities, and human responses.

Derive meaning

4.3. Identify how musical elements communicate ideas or moods.

Use "Water Cycle" and "Rock and Roll of Photosynthesis" to analyze how music communicates ideas.

Students critically assess and derive meaning from works of dance, performance of dancers, and original works based on the elements of dance and aesthetic qualities.

Description, analysis and criticism of dance

4.1 Use basic dance vocabulary to name and describe a dance observed or performed (e.g., levels, rhythm patterns, type of energy).

4.2 Describe how the movement in dances of peers communicates ideas or moods to the viewer (e.g., ocean environment or a sad or joyous dance).

4.3 Describe the similarities and differences in performing various dances (e.g., direction changes, steps, type of energy and tempo).

Use the *Energy & Me* video to observe dances and follow with a discussion of these standards.

Grade 3

Science

PHYSICAL SCIENCES

1. Energy and matter have multiple forms and can be changed from one form to another. As a basis for understanding this concept:
   a. Students know energy comes from the sun to the Earth in the form of light.

Energy & Society Activity Guide

What Powers the Move? (4)

b. Students know sources of stored energy take many forms, such as food, fuel, and batteries.

Energy & Society Activity Guide
Energy Detectives (1); May the Source Be with You (2); What Powers the Move? (4)

Energy & Me CD
Energy & Me (6); Energia y Yo (7)

c. Students know machines and living things convert stored energy to motion and heat.

Energy & Society Activity Guide
Energy Detectives (1); May the Source Be with You (2); What Powers the Move? (4)

Energy & Me CD
Energy (5); Energy & Me (6); Energia y Yo (7); On the Move (11)

e. Students know matter has three forms: solid, liquid, and gas.

Energy & Me CD
It is the Energy, It is the Sun (1); The Water Cycle (3)

f. Students know evaporation and melting are changes that occur when the objects are heated.

Energy & Me CD
It is the Energy, It is the Sun (1); The Water Cycle (3)

g. Students know that when two or more substances are combined, a new substance may be formed with properties that are different from those of the original materials.

Energy & Me CD
It is the Energy, It is the Sun (1); Energy (5)

h. Students know all matter is made of small particles called atoms, too small to see with the naked eye.

Energy & Me CD
It is the Energy, It is the Sun (1); Energy (5)

LIFE SCIENCES

3. Adaptations in physical structure or behavior may improve an organism's chance for survival. As a basis for understanding this concept:

a. Students know plants and animals have structures that serve different functions in growth, survival, and reproduction.

Energy & Me CD
The Rock and Roll of Photosynthesis (2); The Water Cycle (3); Yummy Yummy (15)

b. Students know examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.

Energy & Me CD
Ecosystem (4)

c. Students know living things cause changes in the environment where they live; some of these changes are detrimental to the organism or other organisms, whereas others are beneficial.

Energy & Me CD
Resources (10); On the Move (11); Reduce, Reuse, Recycle Engine Oil (12); Our Changing World (13)

INVESTIGATION AND EXPERIMENTATION

5. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept, and to address the content the other three strands, students should develop their own questions and perform investigations.
   e. Students will collect data in an investigation and analyze them to develop a logical conclusion.

Energy & Society Activity Guide
Energy Detectives (1)

Visual/Performing Arts

1.0 Artistic Expression

Students perceive and respond, using the elements of dance. They demonstrate movement skills, process sensory information, and describe movement, using the vocabulary of dance.

Development of motor skills and technical expertise

1.1 Combine and perform basic locomotor skills, moving on a specific pathway (eg., skip in circles, slide in zigzags, run in a variety of linear paths). Combine and perform locomotor and axial movements (e.g., walk and turn, stretch and slide).

Comprehension and analysis of dance elements

1.2 Perform short movement problems, emphasizing the element of force/energy (e.g., swing, melt, explode, quiver)

Use songs and dance from *Energy & Me* video to view and try out these skills.

2.0 Creative Expression

Students apply vocal and instrumental musical skills in performing a varied repertoire of music. They compose and arrange music and improvise melodies, variations, and accompaniments, using digital/electronic technology when appropriate.

Apply vocal and instrumental skills.

2.1 Sing with accuracy in a developmentally appropriate range

2.2 Sing age-appropriate songs from memory, including rounds, partner songs and ostinatos.

Lyrics to Billy B's songs are found in the Activity Guide, pages 69-75.

4.0 Aesthetic Valuing

Students critically assess and derive meaning from works of music and the performance of musicians according to the elements of music, aesthetic qualities, and human responses.

Analyze and critically assess

4.1 Select and use specific criteria in making judgments about the quality of a musical performance.

Derive meaning

4.4 Describe how specific musical elements communicate particular ideas or moods in music.

Use *Energy & Me* CD and video to accomplish these standards.

Students critically assess and derive meaning from works of dance, performance of dancers, and original works based on the elements of dance and aesthetic qualities.

Description, analysis and criticism of dance

4.1 Name specific criteria to assess the quality of a dance performance of peers (e.g., focus, level of personal involvement, physical control).

Meaning and impact of dance

4.3 Explain how a performer's dance skills contribute to communication of ideas and moods when performing a dance (e.g., focus, strength, coordination).

Use *Energy & Me video to address these standards.*

Grade 4

Science

PHYSICAL SCIENCES

1. Electricity and magnetism are related effects that have many useful applications in everyday life. As a basis for understanding this concept:

   c. Students know electric currents produce magnetic fields and know how to build a simple electromagnet.

   Energy & Me CD
   Energy Now, Energy Then (8)

   e. Students know students know electrically charged objects attract or repel each other.

   Energy & Me CD
   Energy Now, Energy Then (8)

   g. Students know electrical energy can be converted to heat, light, and motion.

   Energy & Society Activity Guide
   Energy Detectives (1); May the Source Be with You (2)

   Energy & Me CD
   Energy Now, Energy Then (8); We Can Save Energy (14)

LIFE SCIENCES

2. All organisms need energy and matter to live and grow. As a basis for understanding this concept:

   a. Students know plants are the primary source of matter and energy entering most food chains.

   Energy & Society Activity Guide
   May the Source Be with You (2); Energy Challenge Game (6)

   PLT PreK-8 Activity Guide
   Web of Life (45)

   b. Students know producers and consumers (herbivores, carnivores, omnivores, and decomposers) are

related in food chains and food webs, and may compete with each other for resources in an ecosystem.

Energy & Me CD
Ecosystem (4)

c. Students know decomposers, including many fungi, insects, and microorganisms, recycle matter from dead plants and animals.

Energy & Me CD
Ecosystem (4)

3. Living organisms depend on one another and on their environment for survival. As a basis for understanding this concept:
   a. Students know ecosystems can be characterized in terms of their living and nonliving components.

Energy & Me CD
Ecosystem (4)

EARTH SCIENCES

5. Waves, wind, water, and ice shape and reshape the Earth's land surface. As a basis for understanding this concept:
   c. Students know moving water erodes landforms, reshaping the land by taking it away from some places and depositing it as pebbles, sand, silt, and mud in other places (weathering, transport, and deposition).

PLT PreK-8 Activity Guide
Water Wonders (44)

INVESTIGATION AND EXPERIMENTATION

6. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept, and to address the content the other three strands, students should develop their own questions and perform investigations.
   a. Students will differentiate observation from inference (interpretation), and know that scientists' explanations come partly from what they observe and partly from how they interpret their observations.

PLT PreK-8 Activity Guide
Pollution Search (36)

c. Students will formulate predictions and justify predictions based on cause and effect relationships.

PLT PreK-8 Activity Guide
Water Wonders (44)

e. Students will conduct multiple trials to test a prediction and draw conclusions about the relationships between results and predictions.

PLT PreK-8 Activity Guide
Water Wonders (44)

Visual/Performing Arts

1.0 Artistic Expression

Students perceive and respond, using the elements of dance. They demonstrate

movement skills, process sensory information, and describe movement, using the vocabulary of dance.

Development of motor skills and technical expertise

1.1 Demonstrate mental concentration and physical control in performing dance skills.

1.2 Demonstrate the ability to use smooth transitions when connecting one movement phrase to another.

Use song-dances from the *Energy & Society* video to teach a dance performance that accomplish these standards.

2.0 <u>Creative Expression</u>

Students apply choreographic principles, processes, and skills to create and communicate meaning through the improvisation, composition, and performance of dance.

Communication of meaning in dance

2.5 Convey a range of feelings through shape/postures and movements when performing for peers.

2.6 Perform improvised movement and dance studies with focus and expression.

Use song-dances from the *Energy & Society* video to teach a dance performance that accomplish these standards.

4.0 <u>Aesthetic Valuing</u>

Students critically assess and derive meaning from works of dance and the performance of dancers and original works based on the elements of dance, and aesthetic qualities.

Meaning and impact of dance.

4.4 Describe ways in which a dancer effectively communicates ideas and moods (strong technique, projection, and expression).

Use song-dances from the *Energy & Society* video to teach a dance performance that accomplish these standards.

Grade 5

Science

<u>PHYSICAL SCIENCES</u>

1. Elements and their combinations account for all the varied types of matter in the world. As a basis for understanding this concept:

   a. Students know that during chemical reactions the atoms in the reactants rearrange to form products with different properties.

   <u>Energy & Me CD</u>
   It is the Energy, It is the Sun (1); Energy (5)

   b. Students know all matter is made of atoms, which may combine to form molecules.

   <u>Energy & Me CD</u>
   It is the Energy, It is the Sun (1); Energy (5)

LIFE SCIENCES

2. Plants and animals have structures for respiration, digestion, waste disposal, and transport of materials. As a basis for understanding this concept:

   a. Students know many multicellular organisms have specialized structures to support the transport of materials.

      Energy & Me CD
      The Rock and Roll of Photosynthesis (2); The Water Cycle (3); Energy (5); Yummy Yummy (15)

   e. Students know how sugar, water, and minerals are transported in a vascular plant.

      Energy & Me CD
      The Rock and Roll of Photosynthesis (2); The Water Cycle (3); Energy (5); Yummy Yummy (15)

   f. Students know plants use carbon dioxide (CO_2) and energy from sunlight to build molecules of sugar and release oxygen.

      PLT PreK-8 Activity Guide
      Web of Life (45)

   g. Students know plant and animal cells break down sugar to obtain energy, forming carbon dioxide (CO_2) and water (respiration).

      PLT PreK-8 Activity Guide
      Web of Life (45)

EARTH SCIENCES

3. Water on Earth moves between the oceans and land through the processes of evaporation and condensation. As a basis for understanding this concept:

   b. Students know when liquid water evaporates, it turns into water vapor in the air and can reappear as a liquid when cooled or as a solid if cooled below the freezing point of water.

      Energy & Society Activity Guide
      Energy Chains (3)

      Energy & Me CD
      It is the Energy, It is the Sun (1); Water Cycle(3)

      PLT PreK-8 Activity Guide
      Water Wonders (44)

   c. Students know water vapor in the air moves from one place to another and can form fog or clouds, which are tiny droplets of water or ice, and can fall to Earth as rain, hail, sleet, or snow.

      Energy & Me CD
      The Water Cycle (3)

      PLT PreK-8 Activity Guide
      Water Wonders (44)

4. Energy from the Sun heats Earth unevenly, causing air movements that result in changing weather patterns. As a basis for understanding this concept:

b. Students know the influence that the ocean has on the weather and the role that the water cycle plays in weather patterns.

Energy & Me CD
The Water Cycle (3); Our Changing World (13)

INVESTIGATION AND EXPERIMENTATION

6. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept, and to address the content the other three strands, students should develop their own questions and perform investigations

a. Students will classify objects (e.g., rocks, plant, leaves) based on appropriate criteria.

PLT PreK-8 Activity Guide
A Few of My Favorite Things (15)

d. Students will identify the dependent and controlled variables in an investigation.

Energy & Society Activity Guide
Energy Detectives (1)

e. Students will identify a single independent variable in a scientific investigation and explain what will be learned by collecting data on this variable.

PLT PreK-8 Activity Guide
Water Wonders (44)

f. Students will select appropriate tools (e.g., thermometers, meter sticks, balances, and graduated cylinders) and make quantitative observations.

PLT PreK-8 Activity Guide
Water Wonders (44)

h. Students will draw conclusions based on scientific evidence and indicate whether further information is needed to support a specific conclusion.

Energy & Society Activity Guide
In the Driver's Seat (5)

PLT PreK-8 Activity Guide
Water Wonders (44)

Visual/Performing Arts

1.0 Artistic Expression

Students perceive and respond, using the elements of dance. They demonstrate movement skills, process sensory information, and describe movement, using the vocabulary of dance.

Development of dance vocabulary

1.5 Use appropriate vocabulary to describe dances.

Use one of the dances from the *Energy & Me* video to accomplish this standard.

2.0 Creative Expression

Students apply choreographic principles, processes, and skills to create and communicate meaning through the improvisation, composition, and performance of dance.

Creation/invention of dance movement

2.1 Create, memorize, and perform complex sequences of movement with greater focus, force/energy, and intent.

2.2 Invent multiple possibilities to solve a given movement problem and analyze problem-solving strategies and solutions.

Communication of meaning in dance

2.5 Convey a wide range of feelings and expression through gestures, posture, and movement.

After viewing one of the dances performed in the *Energy & Me* video, create a new dance with attention to these standards.

4.0 Aesthetic Valuing

Students critically assess and derive meaning from works of music and the performance of musicians according to the elements of music, aesthetic qualities, and human responses.

Analyze and critically assess

4.1 Identify and analyze differences in tempo and dynamics in contrasting music selections.

Derive meaning

4.2 Develop and apply appropriate criteria to support personal preferences for specific musical styles.

Use songs from the *Energy & Society* CD to teach to analyze and derive meaning from different music styles offered and that accomplish these standards.

Students critically assess and derive meaning from works of dance and the performance of dancers and original works based on the elements of dance, and aesthetic qualities.

5.0 Connections, Relationships, Applications

Students apply what they learn in music across subject areas. They develop competencies and creative skills in problem solving, communication, and management of time and resources that contribute to lifelong learning and career skills. They learn about careers in and related to music.

Connections and applications

5.1 Explain the role of music in community events.

Use the *Energy & Me CD or video to learn a song for a community event. Discuss the role of music in community events.*

Grade 6

Science (Focus on Earth Science)

HEAT (THERMAL ENERGY) (PHYSICAL SCIENCE)

3. Heat moves in a predictable flow from warmer objects to cooler objects until all the objects are at the same temperature. As a basis for understanding this concept:

   a. Students know energy can be carried from one place to another by heat flow or by waves, including water, light and sound waves, or by moving objects.

   Energy & Society Activity Guide
   Energy Chains (3); Energy Challenge Game
   Energy & Me CD
   The Water Cycle (3)

   b. Students know when fuel is consumed, most of the energy released becomes heat energy.

   Energy & Society Activity Guide
   Energy Chains (3); In the Driver's Seat (5); Energy Challenge Game (6)

   Energy & Me CD
   Energy (5); Energy Now, Energy Then (8); Our Changing World (13)

   d. Students know heat energy is also transferred between objects by radiation (radiation can travel through space).

   Energy & Society Activity Guide
   Energy Chains (3); Energy Challenge Game (6)

ENERGY IN THE EARTH SYSTEM

4. Many phenomena on Earth's surface are affected by the transfer of energy through radiation and convection currents. As a basis for understanding this concept:

   a. Students know the sun is the major source of energy for phenomena on Earth's surface; it powers winds, ocean currents, and the water cycle.

   Energy & Society Activity Guide
   Energy Detectives (1); Energy Challenge Game (6)

   Energy & Me CD
   It is the Energy, It is the Sun (1); The Water Cycle (3); Energy & Me (6); Energia y Yo (7); Resources (10)

ECOLOGY (LIFE SCIENCE)

5. Organisms in ecosystems exchange energy and nutrients among themselves and with the environment. As a basis for understanding this concept:

   a. Students know energy entering ecosystems as sunlight is transferred by producers into chemical energy through photosynthesis and then from organism to organism through food webs.

Energy & Me CD
It is the Energy, It is the Sun (1); The Rock and Roll of Photosynthesis (2); Ecosystem (4); Yummy Yummy (15)
PLT PreK-8 Activity Guide
Web of Life (45)

b. Students know matter is transferred over time from one organism to others in the food web and between organisms and the physical environment.

Energy & Me CD
It is the Energy, It is the Sun (1); The Rock and Roll of Photosynthesis (2); The Water Cycle (3)

PLT PreK-8 Activity Guide
Web of Life (45)

c. Students know populations of organisms can be categorized by the functions they serve in an ecosystem.

PLT PreK-8 Activity Guide
Web of Life (45)

e. Students know the number and types of organisms an ecosystem can support depends on the resources available and on abiotic factors, such as quantities of light and water, a range of temperatures, and soil composition.

Energy & Me CD
Ecosystem (4)

PLT PreK-8 Activity Guide
Web of Life (45)

RESOURCES

6. Sources of energy and materials differ in amounts, distribution, usefulness, and the time required for their formation. As a basis for understanding this concept:
   a. Students know the utility of energy sources is determined by factors that are involved in converting these sources to useful forms and the consequences of the conversion process.

Energy & Society Activity Guide
Energy Chains (3); What Powers the Move? (4); Energy Challenge Game (6)

Energy & Me CD
Energy Now, Energy Then (8); Resources (10); On the Move (11); We Can Save Energy (14)

PLT PreK-8 Activity Guide
Renewable or Not? (14); A Few of My Favorite Things (15); Energy Sleuths (39); A Look at Aluminum (52); On the Move (53); Waste Watchers (73); Resource-Go-Round (82); Our Changing World (86)

b. Students know different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and classify them as renewable or nonrenewable.

Energy & Society Activity Guide
May the Source Be with You (2); Energy Chains (3); What Powers the Move? (4); In the Driver's Seat (5); Energy Challenge Game (6)

Energy & Me CD
It is the Energy, It is the Sun (1); The Rock and Roll of Photosynthesis (2); The Water Cycle (3); Energy & Me (6); Energia y Yo (7); Energy Now, Energy Then (8); What, What Is (9); Resources (10); On the Move (11); Reduce, Reuse, Recycle Engine Oil (12); We Can Save Energy (14)

PLT PreK-8 Activity Guide
Renewable or Not? (14); A Few of My Favorite Things (15); Energy Sleuths (39); On the Move (53); Waste Watchers (73); Resource-Go-Round (82); Our Changing World (86)

c. Students know natural origin of the materials used to make common objects.

Energy & Me CD
What, What Is (9); Resources (10); Reduce, Reuse, Recycle Engine Oil (12); We Can Save Energy (14)

PLT PreK-8 Activity Guide
Renewable or Not? (14); A Few of My Favorite Things (15); A Look at Aluminum (52); On the Move (53); Resource-Go-Round (82)

INVESTIGATION AND EXPERIMENTATION

7. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept, and to address the content the other three strands, students should develop their own questions and perform investigations.
   e. Students will recognize whether evidence is consistent with a proposed explanation.

PLT PreK-8 Activity Guide
Energy Sleuths (39)

Grade 8

Science (Focus on Physical Science)

REACTIONS

5. Chemical reactions are processes in which atoms are rearranged into different combinations of molecules. As a basis for understanding this concept:
   c. Students know chemical reactions usually liberate heat or absorb heat.

Energy & Society Activity Guide
Energy Chains (3)

Alignment by Activity or Song

Energy & Society Activity Guide

Energy Detectives (1)

Kindergarten

Investigation and Experimentation 4a: Students will observe common objects by using the five senses.
Investigation and Experimentation 4d: Students will communicate observations orally and in drawings.

Grade 1

Physical Science 1b: Students know the properties of substances can change when the substances are mixed, cooled, or heated.
Investigation and Experimentation 4b: Students will record observations and data with pictures, numbers, and/or written statements.

Grade 3

Physical Sciences 1b: Students know sources of stored energy take many forms, such as food, fuel, and batteries.
Physical Sciences 1c: Students know machines and living things convert stored energy to motion and heat.
Investigation and Experimentation 5e: Students will collect data in an investigation and analyze them to develop a logical conclusion.

Grade 4

Physical Sciences 1g: Students know electrical energy can be converted to heat, light, and motion.

Grade 5

Investigation and Experimentation 6d: Students will identify the dependent and controlled variables in an investigation.

Grade 6

Energy in the Earth System 4a: Students know the sun is the major source of energy for phenomena on Earth's surface; it powers winds, ocean currents, and the water cycle.

May the Source Be with You (2)

Kindergarten

Physical Science1a: Students know objects can be described in terms of the materials they are made of (clay, cloth, paper, etc.) and their physical properties (color, size, shape, weight, texture, flexibility, attraction to magnets, floating and sinking, etc.).

Grade 1

Investigation and Experimentation 4b: Students will draw pictures that portray some features of the thing being described.

Grade 3

Physical Sciences 1b: Students know sources of stored energy take many forms, such as food, fuel, and batteries.
Physical Sciences 1c: Students know machines and living things convert stored energy to motion and heat.

Grade 4

Physical Sciences 1g: Students know electrical energy can be converted to heat, light, and motion.
Life Sciences 2a: Students know plants are the primary source of matter and energy entering most food chains.

Grade 6

Resources 6b: Students know different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and classify them as renewable or nonrenewable.

Energy Chains (3)

Grade 5

Earth Sciences 3b: Students know when liquid water evaporates, it turns into water vapor in the air and can reappear as a liquid when cooled or as a solid if cooled below the freezing point of water.

Grade 6

Heat (Thermal Energy) 3a : Students know energy can be carried from one place to another by heat flow or by waves, including water, light and sound waves, or by moving objects.

Heat (Thermal Energy) 3b: Students know when fuel is consumed, most of the energy released becomes heat energy.

Heat (Thermal Energy) 3c: Students know heat energy is also transferred between objects by radiation (radiation can travel through space).

Energy in the Earth System 4a: Students know the sun is the major source of energy for phenomena on Earth's surface; it powers winds, ocean currents, and the water cycle.

Resources 6a: Students know the utility of energy sources is determined by factors that are involved in converting these sources to useful forms and the consequences of the conversion process.

Resources 6b: Students know different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and classify them as renewable or nonrenewable.

Grade 8

Reactions 5c: Students know chemical reactions usually liberate heat or absorb heat.

What Powers the Move? (4)

Grade 2

Physical Sciences 1c: Students know the way to change how something is moving is by giving it a push or a pull. The size of the change is related to the strength, or the amount of force, of the push or pull.

Grade 3

Physical Sciences 1a: Students know energy comes from the sun to the Earth in the form of light.

Physical Sciences 1b: Students know sources of stored energy take many forms, such as food, fuel, and batteries.

Physical Sciences 1c: Students know machines and living things convert stored energy to motion and heat.

Grade 6

Resources 6a: Students know the utility of energy sources is determined by factors that are involved in converting these sources to useful forms and the consequences of the conversion process.

Resources 6b: Students know different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and classify them as renewable or nonrenewable.

In the Driver's Seat (5)

Grade 5

Investigation and Experimentation 6h: Students will draw conclusions based on scientific evidence and indicate whether further information is needed to support a specific conclusion.

Grade 6

Heat (Thermal Energy) 3b: Students know when fuel is consumed, most of the energy released becomes heat energy.

Resources 6b: Students know different natural energy and material resources, including air, soil, rocks,. minerals, petroleum, fresh water, wildlife, and forests, and classify them as renewable or

nonrenewable.

Energy Challenge Game (6)

Grade 4

Students know plants are the primary source of matter and energy entering most food chains.

Grade 6

Heat (Thermal Energy) 3a : Students know energy can be carried from one place to another by heat flow or by waves, including water, light and sound waves, or by moving objects.

Heat (Thermal Energy) 3b: Students know when fuel is consumed, most of the energy released becomes heat energy.

Heat (Thermal Energy) 3c: Students know heat energy is also transferred between objects by radiation (radiation can travel through space).

Resources 6a: Students know the utility of energy sources is determined by factors that are involved in converting these sources to useful forms and the consequences of the conversion process.

Resources 6b: Students know different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and classify them as renewable or nonrenewable.

Energy & Me CD

It is the Energy, It is the Sun (1)

Kindergarten

Physical Sciences 1b: Students know water can be liquid or a solid and can be made to change back and forth from one form to the other.

Grade 1

Earth Sciences 3c: Students know the sun warms the land, air, and water.

Grade 3

Physical Sciences 1e: Students know matter has three forms: solid, liquid, and gas.

Physical Sciences 1f: Students know evaporation and melting are changes that occur when the objects are heated.

Physical Sciences 1g: Students know that when two or more substances are combined, a new substance may be formed with properties that are different from those of the original materials.

Physical Sciences 1h: Students know all matter is made of small particles called atoms, too small to see with the naked eye.

Grade 5

Physical Sciences 1a: Students know that during chemical reactions the atoms in the reactants rearrange to form products with different properties.

Physical Sciences 1b: Students know all matter is made of atoms, which may combine to form molecules.

Earth Sciences 3b: Students know when liquid water evaporates, it turns into water vapor in the air and can reappear as a liquid when cooled or as a solid if cooled below the freezing point of water.

Grade 6

Energy in the Earth System 4a: Students know the sun is the major source of energy for phenomena on Earth's surface; it powers winds, ocean currents, and the water cycle.

Ecology 5a: Students know energy entering ecosystems as sunlight is transferred by producers into chemical energy through photosynthesis and then from organism to organism through food webs.

Ecology 5b: Students know matter is transferred over time from one organism to others in the food web and between organisms and the physical environment.

Resources 6b: Students know different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and classify them as renewable or nonrenewable.

The Rock and Roll of Photosynthesis (2)

Kindergarten

Life Sciences 1c: Students know how to identify major structures of common plants and animals (e.g., stems, leaves, roots, arms, wings, legs).

Grade 1

Life Sciences 2e: Students know roots are associated with the intake of water and soil nutrients, green leaves with making food from sunlight.

Grade 3

Life Sciences 3a: Students know plants and animals have structures that serve different functions in growth, survival, and reproduction.

Grade 5

Life Sciences 2a: Students know many multicellular organisms have specialized structures to support the transport of materials.

Life Sciences 2e: Students know how sugar, water, and minerals are transported in a vascular plant.

Grade 6

Ecology 5a: Students know energy entering ecosystems as sunlight is transferred by producers into chemical energy through photosynthesis and then from organism to organism through food webs.

Ecology 5b: Students know matter is transferred over time from one organism to others in the food web and between organisms and the physical environment.

Resources 6b: Students know different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and classify them as renewable or nonrenewable.

The Water Cycle (3)

Grade 1

Physical Sciences 1a: Students know the properties of substances can change when the substances are mixed, cooled, or heated.

Earth Sciences 3c: Students know the sun warms the land, air, and water.

Grade 3

Physical Sciences 1e: Students know matter has three forms: solid, liquid, and gas.

Physical Sciences 1f: Students know evaporation and melting are changes that occur when the objects are heated.

Life Sciences 3a: Students know plants and animals have structures that serve different functions in growth, survival, and reproduction.

Grade 5

Life Sciences 2a: Students know many multicellular organisms have specialized structures to support the transport of materials.

Life Sciences 2e: Students know how sugar, water, and minerals are transported in a vascular plant.

Earth Sciences 3b: Students know when liquid water evaporates, it turns into water vapor in the air and can reappear as a liquid when cooled or as a solid if cooled below the freezing point of water.

Earth Sciences 3c: Students know water vapor in the air moves from one place to another and can form fog or clouds, which are tiny droplets of water or ice, and can fall to Earth as rain, hail, sleet, or snow.

Earth Sciences 4b: Students know the influence that the ocean has on the weather and the role that the water cycle plays in weather patterns.

Grade 6

Heat (Thermal Energy) 3a : Students know energy can be carried from one place to another by heat flow or by waves, including water, light and sound waves, or by moving objects.

Energy in the Earth System 4a: Students know the sun is the major source of energy for phenomena on

Earth's surface; it powers winds, ocean currents, and the water cycle.

Ecology 5b: Students know matter is transferred over time from one organism to others in the food web and between organisms and the physical environment.

Resources 6b: Students know different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and classify them as renewable or nonrenewable.

Ecosystem (4)

Kindergarten

Life Sciences 2a: Students know how to observe and describe similarities and differences in the appearance and behavior of plants and of animals (e.g., seed-bearing plants, birds, fish, insects).

Grade 1

Life Sciences 2a: Students know different plants and animals inhabit different kinds of environments and have external features that help them thrive in different kinds of places.

Grade 3

Life Sciences 3b: Students know examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.

Grade 4

Life Sciences 2b: Students know producers and consumers (herbivores, carnivores, omnivores, and decomposers) are related in food chains and food webs, and may compete with each other for resources in an ecosystem.

Life Sciences 2c: Students know decomposers, including many fungi, insects, and microorganisms, recycle matter from dead plants and animals.

Life Sciences 3a: Students know ecosystems can be characterized in terms of their living and nonliving components.

Grade 6

Ecology 5a: Students know energy entering ecosystems as sunlight is transferred by producers into chemical energy through photosynthesis and then from organism to organism through food webs.

Ecology 5c: Students know the number and types of organisms an ecosystem can support depends on the resources available and on abiotic factors, such as quantities of light and water, a range of temperatures, and soil composition.

Energy (5)

Grade 3

Physical Sciences 1g: Students know that when two or more substances are combined, a new substance may be formed with properties that are different from those of the original materials.

Physical Sciences 1h: Students know all matter is made of small particles called atoms, too small to see with the naked eye.

Grade 5

Life Sciences 2a: Students know many multicellular organisms have specialized structures to support the transport of materials.

Life Sciences 2e: Students know how sugar, water, and minerals are transported in a vascular plant.

Grade 6

Heat (Thermal Energy) 3b: Students know when fuel is consumed, most of the energy released becomes heat energy.

Energy & Me (6)

Grade 2

Earth Sciences 3e: Students know rock, water, plants and soil provide many resources including food, fuel, and building materials that humans use.

Grade 3

Physical Sciences 1b: Students know sources of stored energy take many forms, such as food, fuel, and batteries.

Physical Sciences 1c: Students know machines and living things convert stored energy to motion and heat.

Grade 6

Energy in the Earth System 4a: Students know the sun is the major source of energy for phenomena on Earth's surface; it powers winds, ocean currents, and the water cycle.

Resources 6b: Students know different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and classify them as renewable or nonrenewable.

Energia y Yo (7)

Grade 2

Earth Sciences 3e: Students know rock, water, plants and soil provide many resources including food, fuel, and building materials that humans use.

Grade 3

Physical Sciences 1b: Students know sources of stored energy take many forms, such as food, fuel, and batteries.

Physical Sciences 1c: Students know machines and living things convert stored energy to motion and heat.

Grade 6

Energy in the Earth System 4a: Students know the sun is the major source of energy for phenomena on Earth's surface; it powers winds, ocean currents, and the water cycle.

Resources 6b: Students know different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and classify them as renewable or nonrenewable.

Energy Now, Energy Then (8)

Grade 4

Physical Sciences 1c: Students know electric currents produce magnetic fields and know how to build a simple electromagnet.

Physical Sciences 1e: Students know students know electrically charged objects attract or repel each other.

Physical Sciences 1g: Students know electrical energy can be converted to heat, light, and motion.

Grade 6

Heat (Thermal Energy) 3b: Students know when fuel is consumed, most of the energy released becomes heat energy.

Resources 6a: Students know the utility of energy sources is determined by factors that are involved in converting these sources to useful forms and the consequences of the conversion process.

Resources 6b: Students know different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and classify them as renewable or nonrenewable.

What, What Is (9)

Kindergarten

Physical Science1a: Students know objects can be described in terms of the materials they are made of (clay, cloth, paper, etc.) and their physical properties (color, size, shape, weight, texture, flexibility, attraction to magnets, floating and sinking, etc.).

Earth Science 2c: Students know to identify resources from Earth that are used in everyday life and understand that many resources can be conserved.

Grade 2

Earth Sciences 3e: Students know rock, water, plants and soil provide many resources including food, fuel, and building materials that humans use.

Grade 6

Resources 6b: Students know different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and classify them as renewable or nonrenewable.

Resources 6c: Students know natural origin of the materials used to make common objects.

Resources (10)

Kindergarten

Earth Sciences 2c: Students know to identify resources from Earth that are used in everyday life and understand that many resources can be conserved.

Grade 3

Life Sciences 3c: Students know living things cause changes in the environment where they live; some of these changes are detrimental to the organism or other organisms, whereas others are beneficial.

Grade 6

Energy in the Earth System 4a: Students know the sun is the major source of energy for phenomena on Earth's surface; it powers winds, ocean currents, and the water cycle.

Resources 6a: Students know the utility of energy sources is determined by factors that are involved in converting these sources to useful forms and the consequences of the conversion process.

Resources 6b: Students know different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and classify them as renewable or nonrenewable.

Resources 6c: Students know natural origin of the materials used to make common objects.

On the Move (11)

Kindergarten

Earth Sciences 2c: Students know to identify resources from Earth that are used in everyday life and understand that many resources can be conserved.

Grade 2

Physical Sciences 1d: Students know tools and machines are used to apply pushes and pulls (forces) to make things move.

Grade 3

Physical Sciences 1c: Students know machines and living things convert stored energy to motion and heat.

Life Sciences 3c: Students know living things cause changes in the environment where they live; some of these changes are detrimental to the organism or other organisms, whereas others are beneficial.

Grade 6

Resources 6a: Students know the utility of energy sources is determined by factors that are involved in converting these sources to useful forms and the consequences of the conversion process.

Resources 6b: Students know different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and classify them as renewable or nonrenewable.

Reduce, Reuse, Recycle Engine Oil (12)

Grade 3

Life Sciences 3c: Students know living things cause changes in the environment where they live; some of these changes are detrimental to the organism or other organisms, whereas others are beneficial.

Grade 6

Resources 6b: Students know different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and classify them as renewable or nonrenewable.
Resources 6c: Students know natural origin of the materials used to make common objects.

Our Changing World (13)

Grade 2

Life Sciences 2e: Students know the germination, growth, and development of plants can be affected by light, gravity, touch, or environmental stress.

Grade 3

Life Sciences 3c: Students know living things cause changes in the environment where they live; some of these changes are detrimental to the organism or other organisms, whereas others are beneficial.

Grade 5

Earth Sciences 4b: Students know the influence that the ocean has on the weather and the role that the water cycle plays in weather patterns.

Grade 6

Heat (Thermal Energy) 3b: Students know when fuel is consumed, most of the energy released becomes heat energy.

We Can Save Energy (14)

Grade 4

Physical Sciences 1g: Students know electrical energy can be converted to heat, light, and motion.

Grade 6

Resources 6a: Students know the utility of energy sources is determined by factors that are involved in converting these sources to useful forms and the consequences of the conversion process.
Resources 6b: Students know different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and classify them as renewable or nonrenewable.
Resources 6c: Students know natural origin of the materials used to make common objects.

Yummy Yummy (15)

Kindergarten

Life Sciences 1c: Students know how to identify major structures of common plants and animals (e.g., stems, leaves, roots, arms, wings, legs).

Grade 1

Life Sciences 2b: Students know plants and animals both need water; animals need food, and plants need light.
Life Sciences 2e: Students know roots are associated with the intake of water and soil nutrients, green leaves with making food from sunlight.

Grade 3

Life Sciences 3a: Students know plants and animals have structures that serve different functions in growth, survival, and reproduction.

Grade 5

Life Sciences 2a: Students know many multicellular organisms have specialized structures to support the transport of materials.
Life Sciences 2e: Students know how sugar, water, and minerals are transported in a vascular plant.

Grade 6

Ecology 5a: Students know energy entering ecosystems as sunlight is transferred by producers into

chemical energy through photosynthesis and then from organism to organism through food webs.

PLT PreK-8 Activity Guide

Renewable or Not? (14)

Grade 6

Resources 6a: Students know the utility of energy sources is determined by factors that are involved in converting these sources to useful forms and the consequences of the conversion process.

Resources 6b: Students know different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and classify them as renewable or nonrenewable.

Resources 6c: Students know natural origin of the materials used to make common objects.

A Few of My Favorite Things (15)

Grade 5

Investigation and Experimentation 6a: Students will classify objects (e.g., rocks, plant, leaves) based on appropriate criteria.

Grade 6

Resources 6a: Students know the utility of energy sources is determined by factors that are involved in converting these sources to useful forms and the consequences of the conversion process.

Resources 6b: Students know different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and classify them as renewable or nonrenewable.

Resources 6c: Students know natural origin of the materials used to make common objects.

Pollution Search (36)

Grade 4

Investigation and Experimentation 6a: Students will differentiate observation from inference (interpretation), and know that scientists' explanations come partly from what they observe and partly from how they interpret their observations.

Energy Sleuths (39)

Grade 6

Resources 6a: Students know the utility of energy sources is determined by factors that are involved in converting these sources to useful forms and the consequences of the conversion process.

Resources 6b: Students know different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and classify them as renewable or nonrenewable.

Investigation and Experimentation 7c: Students will recognize whether evidence is consistent with a proposed explanation.

Water Wonders (44)

Grade 4

Earth Sciences 5c: Students know moving water erodes landforms, reshaping the land by taking it away from some places and depositing it as pebbles, sand, silt, and mud in other places (weathering, transport, and deposition).

Investigation and Experimentation 6c: Students will formulate predictions and justify predictions based on cause and effect relationships.

Investigation and Experimentation 6e: Students will conduct multiple trials to test a prediction and draw conclusions about the relationships between results and predictions.

Grade 5

Earth Sciences 3b: Students know when liquid water evaporates, it turns into water vapor in the air and can reappear as a liquid when cooled or as a solid if cooled below the freezing point of water.
Earth Sciences 3c: Students know water vapor in the air moves from one place to another and can form fog or clouds, which are tiny droplets of water or ice, and can fall to Earth as rain, hail, sleet, or snow.
Investigation and Experimentation 6e: Students will identify a single independent variable in a scientific investigation and explain what will be learned by collecting data on this variable.
Investigation and Experimentation 6f: Students will select appropriate tools (e.g., thermometers, meter sticks, balances, and graduated cylinders) and make quantitative observations.
Investigation and Experimentation 6h: Students will draw conclusions based on scientific evidence and indicate whether further information is needed to support a specific conclusion.

Web of Life (45)

Grade 4

Life Sciences 2b: Students know plants are the primary source of matter and energy entering most food chains.

Grade 5

Life Sciences 2f: Students know plants use carbon dioxide (CO_2) and energy from sunlight to build molecules of sugar and release oxygen.
Life Sciences 2g: Students know plant and animal cells break down sugar to obtain energy, forming carbon dioxide (CO_2) and water (respiration).

Grade 6

Ecology 5a: Students know energy entering ecosystems as sunlight is transferred by producers into chemical energy through photosynthesis and then from organism to organism through food webs.
Ecology 5b: Students know matter is transferred over time from one organism to others in the food web and between organisms and the physical environment.
Ecology 5c: Students know the number and types of organisms an ecosystem can support depends on the resources available and on abiotic factors, such as quantities of light and water, a range of temperatures, and soil composition.

A Look at Aluminum (52)

Grade 6

Resources 6a: Students know the utility of energy sources is determined by factors that are involved in converting these sources to useful forms and the consequences of the conversion process.
Resources 6c: Students know natural origin of the materials used to make common objects.

On the Move (53)

Grade 6

Resources 6a: Students know the utility of energy sources is determined by factors that are involved in converting these sources to useful forms and the consequences of the conversion process.
Resources 6b: Students know different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and classify them as renewable or nonrenewable.
Resources 6c: Students know natural origin of the materials used to make common objects.

Planning the Ideal Community (55)

Waste Watchers (73)

Grade 6

Resources 6a: Students know the utility of energy sources is determined by factors that are involved in converting these sources to useful forms and the consequences of the conversion process.
Resources 6b: Students know different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and classify them as renewable or nonrenewable.

Resource-Go-Round (82)

Resources 6b: Students know different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and classify them as renewable or nonrenewable.

Resources 6c: Students know natural origin of the materials used to make common objects.

In the Driver's Seat (85)

Grade 6

Resources 6a: Students know the utility of energy sources is determined by factors that are involved in converting these sources to useful forms and the consequences of the conversion process.

Our Changing World (86)

Grade 6

Resources 6a: Students know the utility of energy sources is determined by factors that are involved in converting these sources to useful forms and the consequences of the conversion process.

Resources 6b: Students know different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and classify them as renewable or nonrenewable.