

**Correlations of**

**Project Learning Tree's**

*Energy & Society*  
**Program Materials**

to the

*Science Content Standards  
for California Public Schools*



# 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 correlates to the *Science Content Standards for California Public Schools*. 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 correlations are organized in two different ways. The Correlation by Standard lists each science standard that is addressed through the program, as well as the specific activities and songs that teach toward 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.

This document was researched and developed by Leslie Comnes, education writing consultant, and Marianne Chang, Project Learning Tree Facilitator and teacher. Funds for this project were provided by an *Energy & Society* grant from the National Project Learning Tree program with additional funds from the California Community Forests Foundation.

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A copy of Science Content Standards for California Public Schools Kindergarten through Grade 12 can be obtained at: [www.cde.ca.gov/board/science.html](http://www.cde.ca.gov/board/science.html).

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# Correlation by Standard

## KINDERGARTEN

### 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)

## **GRADE 1**

### **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)

## GRADE 2

### 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)

## GRADE 3

### 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)

**GRADE 4**

**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)

## GRADE 5

### PHYSICAL SCIENCES

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.

#### Energy & Me CD

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.

#### Energy & Me CD

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<sub>2</sub>) 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<sub>2</sub>) 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)

## **GRADE 6**

### **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:
- 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 (6)

Energy & Me CD  
The Water Cycle (3)

- 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)

- 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:
- 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  
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)

# Correlation 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 Science 1a: 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 Science 1a: 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.

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### **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<sub>2</sub>) 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<sub>2</sub>) 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.

**A Look at Lifestyles (92)**