Project WET Activity Correlations

to the

Science Content Standards for California Public Schools

and the

Principles & Concepts of the California Environmental Education Initiative Model Curriculum

Introduction

The purpose of this document is to provide California educators who use Project WET materials with a cross reference to the Grade and Discipline-specific, standards-based learning objectives for K-12 Science and History/Social Science in context to the California Environmental Principles and Concepts develop as part of the Environmental Education Initiative.

The Environmental Principles and Concepts (EP&C) and Standards-based learning objectives were developed as a template for the development of a "model curriculum" to support the mandate described in Assembly Bill 1548 (Pavley, Chapter 665, Statutes of 2003 and AB 1721 and Pavley, Chapter 581, Statutes of 2005) called the "Environmental Education Initiative (EEI). Information about the "EEI" can be obtained at: http://www.calepa.ca.gov/Education/EEI. January 2012

*** Denotes an activity with California specific adaptations or materials.**

For more information about the California Project WET program, contact Brian Brown, Water Education Foundation at (916) 444-6240 ext. 22 – or- projectwet@watereducation.org

In creating this document, the previous Project WET correlations to the Science and History/ Social Science Content Standards were reviewed, as well as comments received from California educators using Project WET activities, the intent of the Content Standards as described in the 'Framework for Public Schools' published by the California Department of Education and the EEI learning objectives. We invite comments, critiques and suggestions from any California educator to help refine these correlations for all future users of the Project WET program.

Kindergarten

Academic Content Standards	Project WET Activities	Environmental Education Initiative Learning Objectives
Physical Sciences (Kindergarten) ***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 (e.g., clay, cloth, paper) and their physical properties (e.g., color, size, shape, weight, texture, flexibility, attraction to magnets, floating, sinking).	· **Aqua Bodies (p. 45)** · **Blue Planet (p. 130)** · **Stream Sense (Portal)**	
b. Students know water can be a liquid or a solid and can be made to change back and forth from one form to the other.	· **Water Match (Portal)** · **Molecules in Motion (p. 33)**	
c. Students know water left in an open container evaporates (goes into the air) but water in a closed container does not.	· **A-Maze-ing Water (p: 236)**	

Life Science (Kindergarten) ***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 animals (e.g., seed-bearing plants, birds, fish, insects).	· **Aqua Bodies (p. 45)** · **Stream Sense (Portal)** · **Water Address (Portal)**	• Recognize that the similarities and differences in the appearance and behavior of plants and animals are related to their use of similar resources to meet their needs (e.g., food).
b. Students know stories sometimes give plants and animals attributes they do not really have.		
Earth Sciences (Kindergarten) ***3. Earth is composed of land, air, and water. As a basis for understanding this concept:***		
a. Students know characteristics of mountains, rivers, oceans, valleys, deserts, and local landforms.	· **A-Maze-ing Water (p: 236)** · **Blue Planet (p: 130)** · **Branching Out (Portal)** · **Discover the Waters of Our National Parks (p: 500)** · **Idea Pools (p: xxiii)** · **Stream Sense (Portal)**	• List different habitats (ecosystems) that are found in mountains, rivers, oceans, valleys, deserts, and in their local area. • Name some of the plants and animals that live in their local area.
b. Students know changes in weather occur from day to day and across seasons, affecting Earth and its inhabitants.	· **A-Maze-ing Water (p: 236)** · **A House of Seasons (Portal)** · **The Thunderstorm (p: 209)**	
c. Students know how to identify resources from Earth that are used in everyday life and understand that many resources can be conserved.	· **Aqua Bodies (p. 45)** · **Blue Planet (p: 130)** · **Common Water (p: 253)** · **Discover the Waters of Our National Parks (p: 500)** · **A House of Seasons (Portal)** · **Idea Pools (p: xxiii)** · **Pass the Jug (p: 450)** · **Water Audit (p: 475)** · **Water Inspirations (p: 451)**	• Identify resources (goods and ecosystem services) that people use in everyday life (e.g., food, air, water, clothing). • Describe the origins of everyday resources (e.g., food comes from plants and animals, air comes from the atmosphere, water from lakes and rivers). • Recognize that all of the everyday resources they use come from natural systems. • Provide examples of how these resources are gathered, harvested or extracted from natural systems. • List ways these resources can be conserved.

Investigation and Experimentation (Kindergarten)

4. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:	
a. Observe common objects by using the five senses.	· **A-Maze-ing Water (p: 236)** · **Aqua Bodies (p. 45)** · **Life Box (The) (p. 69)** · **Stream Sense (Portal)** · **Water Inspirations (p: 541)**
b. Describe the properties of common objects.	· **Aqua Bodies (p. 45)** · **Cold Cash in the Icebox (Portal)** · **Life Box (The) (p. 69)** · **Stream Sense (Portal)** · **Water Inspirations (p: 541)**
c. Describe the relative position of objects by using one reference (e.g., above or below).	· **A-Maze-ing Water (p: 236)** · **Stream Sense (Portal)**
d. Compare and sort common objects by one physical attribute (e.g., color, shape, texture, size, weight).	· **Aqua Bodies (p. 45)** · **Aqua Notes (p. 51)** · **House of Seasons (Portal)** · **Idea Pools (p: xxiii)** · **Life Box (The) (p. 69)** · **Stream Sense (Portal)** · **Water Address (Portal)** · **Water Inspirations (p: 541)**

The environmental principles and concepts provide fertile ground for the development of investigations and experiments that are directly related to achieving mastery of California's science content standards. As stated by the California State Board of Education, such "activities must be cohesive, connected and build on each other to lead students to a comprehensive understanding of the California Science Content Standards."

Environment-based investigations and experiments can also help teachers conform to recommendations of the California State Board of Education that "hands-on activities compos) at least 20 to 25 percent of the science instructional program (as specified in the California Science Framework."

e. Communicate observations orally and through drawings.	· **A-Maze-ing Water (p: 236)** · **Aqua Bodies (p. 45)** · **Aqua Notes (p. 51)** · **Blue Planet (p: 130)** · **Discover the Waters of Our National Parks (p: 500)** · **House of Seasons (Portal)** · **Idea Pools (p: xxiii)** · **Life Box (The) (p. 69)** · **Stream Sense (Portal)** · **Water Inspirations (p: 541)**	

First Grade

Academic Content Standards	Project WET Activities	Environmental Education Initiative Learning Objectives
Physical Sciences (1st Grade) ***1. Materials come in different forms (states), including solids, liquids, and gases. As a basis for understanding this concept:***		
a. Students know solids, liquids, and gases have different properties.	· **Cold Cash in the Icebox (Portal)** · **The Incredible Journey (p. 155)** · **Molecules in Motion (p. 33)** · **Water Match (Portal)** · **Water Inspirations (p: 541)**	
b. Students know the properties of substances can change when the substances are mixed, cooled, or heated.	· **Cold Cash in the Icebox (Portal)** · **The Incredible Journey (p. 155)** · **Molecules in Motion (p. 33)** · **Water Match (Portal)** · **Water Inspirations (p: 541)**	
Life Sciences (1st Grade) ***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.	· **Discover the Waters of Our National Parks (p: 500)** · **Irrigation Interpretation (Portal)** · **Water Address (Portal)**	• Recognize that natural systems (environments) provide the resources (goods and ecosystem services) for survival for plants and animals. • Provide examples of the external features of plants and animals that help them live in a particular environment and obtain the resources they need to survive there. • Describe human activities that can influence the functioning of natural systems and the availability of resources for plants and animals. • Explain that if there are significant changes to natural systems (environments) plants and animals may not be able to survive in those areas.
b. Students know both plants and animals need water, animals need food, and plants need light.	· **Aqua Bodies (p. 45)** · **Aqua Notes (p: 51)** · **Common Water (p: 253)** · **Life Box (The) (p: 69)** · **Pass the Jug (p: 450)** · **Water Audit (p: 475)**	• Recognize that to survive, plants and animals (including humans) need resources including water, food, air, and light. • List the resources that plants need to survive. • List the resources animals (including humans) need to survive. • Explain that the resources that plants and animals (including humans) need to survive are produced by natural systems. • Provide examples of things that humans do that can influence the availability of resources needed by plants and animals (including humans).

e. Students know roots are associated with the intake of water and soil nutrients and green leaves are associated with making food from sunlight.	· **Irrigation Interpretation (Portal)**	• Recognize that plants make their own food using sunlight, air, soil nutrients and water. • Identify that natural systems provide the water, air and soil nutrients, and the Sun provides the light necessary for plants to survive. • Recognize that the survival of plants depends on the supply of clean water and nutrients in the soil. • Provide examples of human activities that can affect the supply of clean water, soil nutrients, and plants' roots.
Earth Sciences (1st Grade) ***3. Weather can be observed, measured, and described. As a basis for understanding this concept:***		
a. Students know how to use simple tools (e. g., thermometer, wind vane) to measure weather conditions and record changes from day to day and across the seasons.	· **The Thunderstorm (p: 209)**	
b. Students know that the weather changes from day to day but that trends in temperature of rain (or snow) tend to be predictable during a season.	· **The Thunderstorm (p: 209)** · **House of Seasons (Portal)**	• Describe how weather changes that occur day to day and seasonally affect natural systems.
c. Students know the sun warms the land, air, and water.	· **Incredible Journey (p:155)**	• Recognize that the Sun's warming of the land, air, and water is necessary for the survival of humans and all other living things.

Investigation and Experimentation (1st Grade)

4. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:		The environmental principles and concepts provide fertile ground for the development of investigations and experiments that are directly related to achieving mastery of California's science content standards. As stated by the California State Board of Education, such "activities must be cohesive, connected and build on each other to lead students to a comprehensive understanding of the California Science Content Standards." Environment-based investigations and experiments can also help teachers conform to recommendations of the California State Board of Education that "hands-on activities compos) at least 20 to 25 percent of the science instructional program (as specified in the California Science Framework."
a. Draw pictures that portray some features of the thing being described.	· **A-maze-ing Water (p: 231)** · **Aqua Bodies (p. 45)** · **Incredible Journey (The) (p. 155)** · **Life Box (The) (p: 69)** · **Molecules in Motion (p. 33)** · **Stream Sense (Portal)** · **Thunderstorm (The) (p: 209)** · **Water Inspirations (p: 541)** · **Water Match (Portal)**	
b. Record observations and data with pictures, numbers, or written statements.	· **A-maze-ing Water (p: 231)** · **Aqua Bodies (p. 45)** · **Blue Planet (p: 130)** · **Cold Cash in the Icebox (Portal)** · **House of Seasons (Portal)** · **Incredible Journey (The) (p. 155)** · **Irrigation Interpretation (Portal)** · **Life Box (The) (p: 69)** · **Long Haul (The) (p: 273)** · **Molecules in Motion (p. 33)** · **Pass the Jug (p: 450)** · **Stream Sense (Portal)** · **Thunderstorm (The) (p: 209)** · **Water Concentration (Portal)** · **Water Inspirations (p: 541)**	
c. Record observations on a bar graph.	· **The Incredible Journey (p. 155)** · **The Thunderstorm (p: 209)**	

2nd Grade

Academic Content Standards	Project WET Activities	Environmental Education Initiative Learning Objectives
Life Sciences (2nd Grade)		
2. Plants and animals have predictable life cycles. As a basis for understanding this concept:		
e. Students know light, gravity, touch, or environmental stress can affect the germination, growth, and development of plants.	· **Discover the Waters of Our National Parks (p: 500) *** · **Life Box (The) (p: 69)** · **House of Seasons (Portal)** · **Irrigation Interpretation (Portal)**	• Recognize that changes to conditions in the environment (e.g., light, water, environmental stress) may affect the germination, growth and development of plants. • Explain how the environment may affect a plant's ability to reproduce. • Predict what happens to a plant when a specific change in the environment occurs (e.g., there is suddenly no water).
Earth Sciences (2nd Grade)		
3. Earth is made of materials that have distinct properties and provide resources for human activities. As a basis for understanding this concept:		
c. Students know that soil is made partly from weathered rock and partly from organic materials and that soils differ in their color, texture, capacity to retain water, and ability to support the growth of many kinds of plants.	· **The Life Box (p: 69)**	• Describe the importance of soil to plants and natural systems. • Identify different soils by their color, texture, and capacity to retain water. • Identify the role of decomposition in returning organic materials to soil. • Explain the role of soil in providing the water, minerals and organic materials that are necessary for plant growth. • Recognize that a plant's roots help it take up water and other chemicals from the soil, some of which can affect the germination, growth and development of the plants in beneficial, neutral, or harmful ways.
e. Students know rock, water, plants, and soil provide many resources, including food, fuel, and building materials, that humans use.	· **A-Maze-ing Water (p: 236)** · **Aqua Bodies (p: 45)** · **Aqua Notes (p: 51)** · **Common Water (p: 253)** · **The Life Box (p. 69)** · **Pass the Jug (p: 450)** · **Water Audit (p: 475)**	• Recognize rocks, water, plants and soil as components of natural system. • Identify that humans use and depend upon the components of natural system for goods and ecosystem services (e.g., food, fuel, building materials). • Identify the origins of everyday resources as coming from natural systems (e.g., food, air, water). • Explain that the quantity, quality and reliability of goods produced by natural systems are influenced by the health and functioning of those systems (e.g., healthy forests produce more trees). • Provide examples of human activities that can influence the health of a natural system.

Investigation and Experimentation (2nd Grade)

4. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:	
a. Make predictions based on observed patterns and not random guessing.	· **Color Me a Watershed, Option 1 (p: 239)** · **Common Water (p: 249)*** · **House of Seasons (Portal)** · **Irrigation Interpretation (Portal)** · **Thunderstorm (The) (p: 209)**
b. Measure length, weight, temperature, and liquid volume with appropriate tools and express those measurements in standard metric system units.	· **Aqua Bodies (p: 45)** · **Long Haul (The) (p: 273)** · **Thunderstorm (The) (p: 209)**
c. Compare and sort common objects according to two or more physical attributes (e.g., color, shape, texture, size, weight).	· **A-Maze-ing Water (p: 236)** · **Color Me a Watershed, Option 1 (p: 239)** · **Life Box (The) (p: 69)** · **Water Address (Portal)**
d. Write or draw descriptions of a sequence of steps, events, and observations.	· **A-Maze-ing Water (p: 236)** · **Color Me a Watershed, Option 1 (p: 239)** · **House of Seasons (Portal)**
e. Construct bar graphs to record data, using appropriately labeled axes.	· **Thunderstorm (The) (p: 209)**
g. Follow oral instructions for a scientific investigation.	· **A-Maze-ing Water (p: 236)** · **Color Me a Watershed, Option 1 (p: 239)** · **Irrigation Interpretation (Portal)** · **Wetland Soils in Living Color (p: 217)**

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3rd Grade

Academic Content Standards	Project WET Activities	Environmental Education Initiative Learning Objectives
Physical Sciences (3rd Grade) ***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 Earth in the form of light.	· **Imagine (Portal)** · **Incredible Journey (p: 155)** · **Piece It Together (Portal)** · **The Life Box (p: 69)**	• Recognize that the Sun is the primary source of energy for Earth. • Provide examples of the role of the Sun's energy in natural systems and human communities (e.g., growth of plants, lighting and warming of Earth).
b. Students know sources of stored energy take many forms, such as food, fuel, and batteries.	· **Energetic Water (Portal)** · **Water In Motion (Portal)** · **Molecules in Motion (p: 33)**	• Provide examples of energy storage in natural systems and human communities (e.g., plants, food, fuel, batteries). • Recognize that the energy in our food ultimately comes from the Sun. • Explain that energy in fuels such as wood, coal, oil, and natural gas originated from the Sun.
c. Students know machines and living things convert stored energy to motion and heat.	· **Energetic Water (Portal)** · **Water In Motion (Portal)** · **Molecules in Motion (p: 33)**	• Identify that natural systems and human communities operate by converting stored energy to motion and heat.
d. Students know energy can be carried from one place to another by waves, such as water waves and sound waves, by electric current, and by moving objects.	· **Energetic Water (Portal)** · **Water in Motion (Portal)**	• Recognize that energy can be carried from one place to another by moving objects including those that come from natural systems such as food, wood, coal, oil, and natural gas.
e. Students know matter has three forms: solid, liquid, and gas.	· **Cold Cash in the Icebox (Portal)** · **Incredible Journey (The) (p: 155)** · **Molecules in Motion (p: 33)** · **Poetic Precipitation (Portal)** · **Water Inspirations (p: 541)** · **Water Match (Portal)**	

f. Students know evaporation and melting are changes that occur when the objects are heated.	· **Molecules in Motion (p: 33)** · **Incredible Journey (p: 155)** · **Cold Cash in the Icebox (Portal)** · **Imagine (Portal)** · **Poetic Precipitation (Portal)** · **Water Inspirations (p: 541)** · **Water Match (Portal)**	

Life Sciences (3rd Grade)

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.	· **Aqua Bodies (p: 45)** · **Invaders (p: 263)** · **Irrigation Interpretation (Portal)** · **Life in the Fast Lane (Portal)** · **Macroinvertebrate Mayhem (p: 343)** · **Ocean Habitats (p: 73)** · **Salt Marsh Players (Portal)** · **Water Address (Portal)**	• Identify that plants and animals have different structures that allow them to grow, survive, and reproduce by using/consuming the goods and ecosystem services provided by natural systems. • Recognize that growth, survival, and reproduction are necessary for the survival of plants and animals, as well as the survival of humans and human communities. • Provide examples of how the functioning of structures plants and animals (including humans) have for growth, survival, and reproduction depends on the health of those plants and animals and the health of natural systems. • Explain that the growth, survival, and reproduction of plants and animals processes can be influenced by human activities.
b. Students know examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.	· **Discover the Waters of Our National Parks (p: 500)** · **Life in the Fast Lane (Portal)** · **Macroinvertebrate Mayhem (p: 343)** · **Ocean Habitats (p: 73)** · **Salt Marsh Players (Portal)** · **Water Address (Portal)**	• Identify the characteristics of various natural systems (e.g., ocean, desert, tundra, forest, grassland and wetland environments). • Give examples of diverse life forms in ocean, desert, tundra, forest, grassland and wetland environments. • Explain that different kinds of organisms are adapted for living in different environments.
c. Students know living things cause changes in the environment in which they live: some of these changes are detrimental to the organism or other organisms, and some are beneficial.	· **Invaders (p: 263)** · **Germ Busters (p: 57)** · **Humpty Dumpty (p: 335)** · **Just Passing Through (p: 163)** · **Life in the Fast Lane (Portal)** · **Macroinvertebrate Mayhem (p: 343)** · **Ocean Habitats (p: 73)** · **Old Water (Portal)** · **Storm Water (p: 395)** · **Irrigation Interpretation (Portal)** · **Life in the Fast Lane (Portal)** · **Salt Marsh Players (Portal)** · **Water Address (Portal)**	

d. Students know when the environment changes, some plants and animals survive and reproduce; others die or move to new locations.	· **Germ Busters (p: 57)** · **Humpty Dumpty (p: 335)** · **Invaders (p: 263)** · **Just Passing Through (p: 163)** · **Life in the Fast Lane (Portal)** · **Macroinvertebrate Mayhem (p: 343)** · **Ocean Habitats (p: 73)** · **Old Water (Portal)** · **Irrigation Interpretation (Portal)** · **Life in the Fast Lane (Portal)** · **Salt Marsh Players (Portal)**	• Recognize that when the environment changes, some plants and animals will die or move to new locations because the natural system can no longer meet their needs. • Explain that not all organisms respond to environmental changes in the same way. • Provide examples of animals or plants that have not survived as the result of a change to their environment. • Describe habitat restoration as a process that can sometimes be used to make it possible for plants and animals to survive and reproduce in areas where they once could not.

e. Students know that some kinds of organisms that once lived on Earth have completely disappeared and that some of those resembled others that are alive today.	· **Life in the Fast Lane (Portal)** · **Old Water (Portal)**	• Define the term extinction. • Provide examples of organisms that have become extinct over Earth's geologic time. • Provide examples of organisms that have become extinct in recent times. • Recognize that organisms that are extinct are gone from the Earth forever. • Describe extinction as a natural process that can also be caused or accelerated by human activities.
Investigation and Experimentation (3rd Grade)		
5. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:		The environmental principles and concepts provide fertile ground for the development of investigations and experiments that are directly related to achieving mastery of California's science content standards. As stated by the California State Board of Education, such "activities must be cohesive, connected and build on each other to lead students to a comprehensive understanding of the California Science Content Standards." Environment-based investigations and experiments can also help teachers conform to recommendations of the California State Board of Education that "hands-on activities compos) at least 20 to 25 percent of the science instructional program (as specified in the California Science Framework."
a. Repeat observations to improve accuracy and know that the results of similar scientific investigations seldom turn out exactly the same because of differences in the things being investigated, methods being used, or uncertainty in the observation.	· **Hitting the Mark (p: 327)** · **Irrigation Interpretation (Portal)**	
c. Use numerical data in describing and comparing objects, events, and measurements.	· **Healthy Habits (p: 63)** · **Hitting the Mark (p: 327)** · **Incredible Journey (The) (p: 155)*** · **Invaders (p: 263)** · **Irrigation Interpretation (Portal)** · **Life in the Fast Lane (Portal)** · **Macroinvertebrate Mayhem (p: 343)** · **My Water Footprint (p: 441)** · **Salt Marsh Players (Portal)** · **Water Audit (p: 475)**	

d. Predict the outcome of a simple investigation and compare the result with the prediction.	· **A-maze-ing Water (p: 231)** · **Cold Cash in the Icebox (Portal)** · **Hitting the Mark (p: 327)** · **Irrigation Interpretation (Portal)** · **My Water Footprint (p: 441)** · **Storm Water (p: 395)** · **Water Audit (p: 475)**	
e. Collect data in an investigation and analyze those data to develop a logical conclusion.	· **A-maze-ing Water (p: 231)** · **Cold Cash in the Icebox (Portal)** · **Hitting the Mark (p: 327)** · **Humpty Dumpty (p: 335)** · **Invaders (p: 263)** · **Irrigation Interpretation (Portal)** · **Life in the Fast Lane (Portal)** · **My Water Footprint (p: 441)** · **Water Audit (p: 475)** · **Water Crossings (p: 487)**	

4th Grade

Academic Content Standards	Project WET Activities	Environmental Education Initiative Learning Objectives
Life Sciences (4th Grade)		
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.	· **Life Box, (The) (p: 69)** · **Life In The Fast Lane (Portal)** · **Macroinvertebrate Mayhem (p: 343)** · **Salt Marsh Players (Portal)** · **Water Address (Portal)**	• Recognize that living things have needs that must be met for survival (including energy). • Recognize that plants are the primary source of energy for living things in an ecosystem. • Explain how living things meet their needs and survive by using resources (e.g., matter and energy) from their environment. • Identify that humans are living things and therefore have needs essential to their survival. • Identify that the needs of humans are met by using resources (goods and ecosystem services) from natural systems (e.g., matter and energy). • Recognize that everything humans need was originally derived from a natural system including the matter and energy that plants produce.
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.	· **Life In The Fast Lane (Portal)** · **Macroinvertebrate Mayhem (p: 343)** · **Salt Marsh Players (Portal)**	• Recognize that plants and animals, including humans, can be classified by the sources of energy and matter (food) they consume. • Classify organisms from a terrestrial, freshwater, coastal or marine ecosystem as producers and consumers and explain their roles in that system. • Define ecosystems as interacting assemblages of organisms, non-living components that support those organisms and the interactions among them. • Recognize that some resources within an ecosystem, including those upon which humans depend, are readily available and others are limited in supply. • Describe how organisms compete for limited resources. • Explain potential consequences when a component of an ecosystem is changed or eliminated (e.g., when components of a food chain or food web are affected by competition for resources or other changes, whether natural or human-caused). • Describe factors that can adversely affect the health of an ecosystem (e.g., loss of organisms, disruption of food webs).

c. Students know decomposers, including many fungi, insects, and microorganisms, recycle matter from dead plants and animals.	· **Macroinvertebrate Mayhem (p: 343)** · **Ocean Habitats (p: 73)** · **Salt Marsh Players (Portal)**	• Give examples of organisms that are decomposers. • Explain the role of decomposers in an ecosystem. • Recognize that the cycles and processes involving recycling of matter and transfer of energy among organisms are essential to the functioning of natural systems (ecosystem). • Provide examples of human practices that directly depend on the cycles and processes involving decomposers in terrestrial, freshwater, coastal and marine ecosystems (e.g., their role in food production and waste management). • Describe the dependence of human practices on the cycles and processes that occur in terrestrial, freshwater, coastal and marine ecosystems (e.g., the role of decomposers in: food production through soil formation and fertility; waste management through the decay of waste products).
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 by their living and nonliving components.	· **Discover the Waters of Our National Parks (p: 493)*** · **Humpty Dumpty (p: 335)** · **Incredible Journey (The) (p: 155)** · **Just Passing Through (p: 163)** · **Life Box (The) (p: 69)** · **Life In The Fast Lane (Portal)** · **Macroinvertebrate Mayhem (p: 343)** · **Ocean Habitats (p: 73)** · **Piece It Together (Portal)** · **Salt Marsh Players (Portal)** · **Stream Sense (Portal)** · **Water Address (Portal)** · **Water Models (Portal)**	• Categorize the components of natural systems as living and non-living. • Describe the living and nonliving components from terrestrial, freshwater, coastal or marine ecosystems that have similar roles. • Recognize that the living and nonliving components of an ecosystem and the interactions among them produce the resources that are required for the survival of the living components of the ecosystem. • Identify that the needs of humans are met by using resources (goods and ecosystem services) from natural systems.

b. Students know that in any particular environment, some kinds of plants and animals survive well, some survive less well, and some cannot survive at all.	· **Discover the Waters of Our National Parks (p: 493)*** · **Humpty Dumpty (p: 335)** · **Just Passing Through (p: 163)** · **Life Box (The) (p: 69)** · **Life In The Fast Lane (Portal)** · **Macroinvertebrate Mayhem (p: 343)** · **Ocean Habitats (p: 73)** · **Piece It Together (Portal)** · **Salt Marsh Players (Portal)** · **Stream Sense (Portal)** · **Water Address (Portal)** · **Water Models (Portal)**	• Recognize that living things meet their needs by using resources (goods and ecosystem services) from the environment around them. • Recognize that some resources within an ecosystem are finite in supply; others are less limited. • Explain how the health of an ecosystem affects the ability of plants and animals to survive in any particular environment. • Provide examples of how the health of an ecosystem influences the quality, quantity, and reliability of the goods and ecosystem services it produces. • Recognize that changes to the environment caused by humans and other animals influence the survival of some kinds of plants and animals. • Identify that some changes to the environment caused by humans and other animals affect the cycles and processes that occur naturally in ecosystems and in turn affect the survival of some kinds of plants and animals. • Provide examples of how human practices have altered the cycles and process that occur naturally in terrestrial, freshwater, coastal and marine ecosystems.
d. Students know that most microorganisms do not cause disease and that many are beneficial.	· **Germ Busters (p: 57)** · **Healthy Habits (p: 63)** · **Ocean Habitats (p: 73)**	• Give examples of microorganisms. • Describe the roles of microorganisms in natural systems including the human body. • Recognize that microorganisms are involved in many natural system processes that are used by humans and human communities and that such processes are considered “ecosystem services” (e.g., processes involving microorganisms such as fermentation, decomposition, etc.). • Describe the role of ecosystem services involving microorganisms in human communities and societies (e.g., food production, waste treatment, production of pharmaceuticals). • Recognize that some microorganisms can cause changes to living things that may be harmful.

Earth Sciences (4th Grade) ***5. Waves, wind, water, and ice shape and reshape Earth's land surface.***		
a.Students know some changes in the earth are due to slow processes, such as erosion, and some changes are due to rapid processes, such as landslides, volcanic eruptions, and earthquakes.	· **Discover the Waters of Our National Parks (p: 493)*** · **Just Passing Through (p: 163)** · **Old Water (Portal)** · **Seeing Watersheds (p: 187)** · **Rainy-Day Hike (p: 169)** · **Wetland Soils in Living Color (p: 217)**	• Provide examples of how geologic processes (erosion, landslides, volcanic eruptions, and earthquakes) affect humans, human communities and natural systems. • Describe how human activities can magnify the impacts of some geologic processes, such as increasing the rate of erosion or landslide occurrence.
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).	· **Color Me a Watershed (p: 239)** · **Discover the Waters of Our National Parks (p: 493)*** · **Get the Ground Water Picture (p: 143)** · **Just Passing Through (p: 163)** · **Seeing Watersheds (p: 187)** · **Rainy-Day Hike (p: 169)** · **Storm Water (p: 395)** · **Sum of the Parts (p: 283)**	• Provide examples of how moving water erodes landforms and the reshaping of the land affect humans, human communities and natural systems. • Describe how human activities can affect the flow of water and therefore affect the natural erosion of landforms, and the weathering, transport, and deposition of pebbles, sand, silt, and mud.
Investigation and Experimentation (4th Grade) ***6. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:***		The environmental principles and concepts provide fertile ground for the development of investigations and experiments that are directly related to achieving mastery of California's science content standards. As stated by the California State Board of Education, such "activities must be cohesive, connected and build on each other to lead students to a comprehensive understanding of the California Science Content Standards." Environment-based investigations and experiments can also help teachers conform to recommendations of the California State Board of Education that "hands-on activities compos) at least 20 to 25 percent of the science instructional program (as specified in the California Science Framework."
a. Differentiate observation from inference (interpretation), and know that scientifists' explanations come partly from what they observe and partly from how they interprest their observations.	· **Back to the Future (p: 307)** · **Blue Planet (p: 125)** · **Get the Ground Water Picture (p: 143)** · **Hitting the Mark (p: 327)** · **Life Box (The) (p: 69)** · **Life In The Fast Lane (Portal)** · **Seeing Watersheds (p: 187)** · **Storm Water (p: 395)** · **Stream Sense (Portal)** · **Water Models (Portal)** · **Wetland Soils in Living Color (p: 217)**	
b. Measure and estimate weight, length, or volume of objects.	· **Blue Planet (p: 125)** · **Storm Water (p: 395)**	

c. Formulate predictions and justify predictions based on cause and effect relationships.	· **Back to the Future (p: 307)** · **Blue Planet (p: 125)** · **Get the Ground Water Picture (p: 143)** · **Storm Water (p: 395)**	

d. Conduct multilmple trials to test a prediction and draw conclusions about the relationships between results and predictions.	· **Blue Planet (p: 125)** · **Get the Ground Water Picture (p: 143)** · **Hitting the Mark (p: 327)** · **Incredible Journey (The) (p: 155)** · **Storm Water (p: 395)** · **Water Models (Portal)**	
e. Construct and interpret graphs from measurements.	· **Back to the Future (p: 307)** · **Blue Planet (p: 125)** · **Blue River (p: 135)** · **High Water History (p: 321)**	
f. Follow a set of writtren instructions for a scienfic investigation.	· **Blue Planet (p: 125)** · **Hitting the Mark (p: 327)** · **Humpty Dumpty (p: 335)** · **Life In The Fast Lane (Portal)** · **Piece It Together (Portal)** · **Salt Marsh Players (Portal)** · **Seeing Watersheds (p: 187)** · **Storm Water (p: 395)** · **Water Models (Portal)** · **Wetland Soils in Living Color (p: 217)**	

5th Grade		
Academic Content Standards	**Project WET Activities**	**Environmental Education Initiative Learning Objectives**
Physical Sciences (5th Grade) ***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.	· **Adventures in Density (p: 3)** · **Hangin Together (p: 19)** · **What's The Solution? (p: 37)**	
b. Students know all matter is made of atoms, which may combine to form molecules.	· **Hangin Together (p: 19)** · **The Incredible Journey (p: 155)** · **Molecules In Motion (p: 33)** · **What's The Solution? (p: 37)**	
f. Students know differences in chemical and physical properties of substances are used to separate mixtures and identify compounds.	· **Adventures in Density (p: 3)** · **Hangin Together (p: 19)** · **Let's Even Things Out (Portal)** · **What's The Solution? (p: 37)**	
g. Students know properties of solid, liquid, and gaseous substances, such as sugar (C6H12O6), water (H2O), helium (He), oxygen (O2), nitrogen (N2), and carbon dioxide (CO2).	· **Adventures in Density (p: 3)** · **A-maze-ing Water (p: 231)** · **H2Olympics (p: 13)** · **Hangin Together (p: 19)** · **Just Passing Through (p: 163)** · **Incredible Journey (The) (p: 155)** · **Let's Even Things Out (Portal)** · **Molecules In Motion (p: 33)** · **Thirsty Plants (Portal)** · **wAteR in moTion (Portal)** · **What's the Solution? (p: 37)**	
h. Students know living organisms and most materials are composed of just a few elements.	· **Aqua Bodies (p: 45)** · **Life Box (The) (p: 69)**	

i. Students know the common properties of salts, such as sodium chloride (NaCl)	· **Adventures in Density (p: 3)** · **What's The Solution? (p: 37)**	

Life Sciences (5th Grade)		
2. Plants and animals have structures for respiration, digestion, waste disposal, and transport of materials. As a basis for understanding this concept:		•Describe how respiration, digestion, waste disposal, and transport of materials result in byproducts. • Recognize that movement of matter and energy through ecosystems generates byproducts. • Describe how matter and energy flow in ecosystems. • Describe and discuss the concept of boundary in natural systems. • Recognize that natural systems are not separated by impermeable or permanent boundaries. • Provide examples of how the byproducts of human activities (e.g., carbon dioxide [CO2]) enter natural systems (terrestrial, freshwater, coastal and marine ecosystems).
a. Students know many multicellular organisms have specialized structures to support the transport of materials.	· **Aqua Bodies (p: 45)** · **Aqua Notes (p: 51)** · **Let's Even Things Out (Portal)** · **Ocean Habitats (p: 73)** · **Thirsty Plants (Portal)** · **Water Address (Portal)***	
b. Students know how blood circulates through the heart chambers, lungs, and body and how carbon dioxide (CO2) and oxygen (O2) are exchanged in the lungs and tissues.	· **Aqua Notes (p: 51)**	
d. Students know the role of the kidney in removing cellular waste from blood and converting it into urine, which is stored in the bladder.	· **Aqua Notes (p: 51)**	
e. Students know how sugar, water, and minerals are transported in a vascular plant.	· **Incredible Journey (The) (p: 155)** · **Thirsty Plants (Portal)** · **Water Address (Portal)**	• Provide examples of the role of materials transport in vascular plants on the movement of the byproducts of human activities (e.g., contaminants) into natural systems (e.g., entering plant tissue, soil).
f. Students know plants use carbon dioxide (CO2) and energy from sunlight to build molecules of sugar and release oxygen.	· **Life Box (The) (p: 69)** · **Salt Marsh Players (Portal)**· · **Thirsty Plants (Portal)**	• Explain the role of photosynthesis in the functioning of terrestrial, freshwater, coastal and marine ecosystems. • Explain why photosynthesis is essential to the survival of humans and human communities. • Provide examples of how humans and human communities can influence the process of photosynthesis and thus the flow of matter and energy within natural systems.

g. Students know plant and animal cells break down sugar to obtain energy, a process resulting in carbon dioxide (CO_2) and water (respiration).	· **Aqua Notes (p: 51)** · **Incredible Journey (The) (p: 155)** · **Salt Marsh Players (Portal)** · **Thirsty Plants (Portal)**	

Earth Sciences (5th Grade)

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

a. Students know most of Earth's water is present as salt water in the oceans, which cover most of Earth's surface.	· **Adventures in Density (p: 3)** · **Blue Planet (p: 125)** · **Drop in the Bucket (A) (p: 257)** · **Incredible Journey (The) (p: 155)*** · **Imagine! (Portal)** · **Make a Mural (p: 515)** · **Seeing Watersheds (p: 187)** · **Water Inspirations (p: 535)**	• Identify that humans are living things and clean fresh water is essential to their survival. • Recognize that because most of Earth's water is salt water located in the oceans, the vast majority of water is not available for human consumption. • Describe freshwater, coastal and marine ecosystems and compare the chemical characteristics of the water in these systems. • Provide examples of the goods that are produced by freshwater, coastal and marine ecosystems (e.g., clean fresh water, oxygen, food, energy resources). • Explain how humans and human communities can influence the quantity, distribution and chemical characteristics of the water in freshwater, coastal and marine ecosystems (e.g., global climate change, water management practices).
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.	· **Hanging Together (p: 19)** · **Imagine! (Portal)** · **Incredible Journey (The) (p: 155)*** · **Molecules in Motion (p: 33)** · **Poetic Precipitation (Portal)** · **Snow and Tell (p: 387)** · **Thirsty Plants (Portal)** · **Water Inspirations (p: 535)** · **Water Models (Portal)**	• Describe the roles of evaporation, liquefaction and freezing in the water cycle. • Describe the role of the water cycle, evaporation, liquefaction and freezing in the functioning of natural systems. • Provide examples of the roles these cycles and processes play in human life and human communities.
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.	· **Discover the Waters of Our National Parks- CA (p: 493)*** · **Incredible Journey (The) (p: 155)*** · **Poetic Precipitation (Portal)** · **Snow and Tell (p: 387)** · **Thunderstorm (The) (p: 209)** · **Water Inspirations (p: 535)** · **Wet Vacation - CA (p: Portal)*** · **Water Models (Portal)**	• Identify the role of precipitation (rain, hail, sleet, or snow) in terrestrial, freshwater, coastal and marine ecosystems). • Provide examples of how humans and human communities directly and indirectly depend on precipitation (rain, hail, sleet, or snow) and the water cycle (e.g., agricultural systems, water delivery systems). • Provide examples of how human activities can influence the quantity, distribution and chemical characteristics of precipitation.

d. Students know that the amount of fresh water located in rivers, lakes, underground sources, and glaciers is limited and that its availability can be extended by recycling and decreasing the use of water.	**· 8-4-1, One for All (p: 299)** **· Blue River (p: 135)** **· Common Water (p: 249)** **· Drop in the Bucket (A) (p: 257)** **· Get The Groundwater Picture (p: 143)** **· Incredible Journey (The) (p: 155)*** **· Make a Mural (p: 515)** **· Money Down The Drain (p: 351)** **· My Water Address, Take Action!- Warm Up (p: 433)** **· My Water Footprint (p: 441)** **· Pass the Jug (p: 447)** **· Piece It Together (Portal)** **· Super Bowl Surge (p: 405)** **· Virtual Water (p: 289)** **· Water Audit (p: 469)** **· Water Concentration (Portal)** **· Water Inspirations (p: 535)** **· Wet Vacation - CA (p: Portal)***	• Identify sources of fresh water and describe the reservoirs of Earth's water. • Recognize that water moves from one reservoir to another over time. • Describe the ways in which humans, human communities and their practices use water. • Recognize that the supply of fresh water is limited at any given time and discuss how some resources within an ecosystem are finite in supply while others are less limited. • Describe the methods by which wastewater can be treated and cycled back into the environment. • Provide examples of how water use can be decreased by humans and human communities. • Explain potential consequences when the quantity, distribution or chemical characteristics of water are changed (e.g., contamination of an aquifer can compromise the use of the groundwater supply by humans and other organisms). • Describe how changes to the quantity, distribution and chemical characteristics of water in natural systems can influence the functioning of terrestrial, freshwater, coastal and marine ecosystems (e.g., acid precipitation affecting the growth of trees).
e. Students know the origin of the water used by their local communities.	**· Blue River (p: 135)** **· Discover the Waters of Our National Parks- CA (p: 493)*** **· Get The Groundwater Picture (p: 143)** **· Incredible Journey (The) (p: 155)*** **· My Water Address, Take Action!- Warm Up (p: 433)** **· River Talk (p: 175)** **· Seeing Watersheds (p: 187)** **· Snow and Tell (p: 387)** **· Springing Into Action (p: 203)** **· Stream Sense (Portal)**	• Identify sources of fresh water in their local community. • Describe the process by which water is supplied to students' homes and their community. • Identify the steps used to make water potable in their community. • Describe the ways in which humans use water in their local community. • Provide examples of how human activities can influence the quantity, quality and reliability of water supplies. • Explain how changes to the quantity, quality and reliability of water supplies can influence humans, human communities and their practices.

4. Energy from the Sun heats Earth unevenly, causing air movements that result in changing weather patterns.		
a. Students know uneven heating of Earth causes air movements (convection currents).	· **Imagine! (Portal)** · **Incredible Journey (The) (p: 155)*** · **Thunderstorm (The) (p: 209)**	
b.Students know the influence that the ocean has on the weather and the role that the water cycle plays in weather patterns.	· **Adventures in Density (p: 3)** · **Blue River (p: 135)** · **Imagine! (Portal)** · **Incredible Journey (The) (p: 155)*** · **My Water Address, Take Action! (p: 433)** · **Thunderstorm (The) (p: 209)** · **Wet Vacation (Portal)***	
c. Students know the causes and effects of different types of severe weather.	· **Dust Bowls and Failed Levees (Portal)** · **High Water History (p: 321)** · **Incredible Journey (The) (p: 155)*** · **My Water Address, Take Action! (p: 433)** · **Nature Rules! (p: 277)** · **Thunderstorm (The) (p: 209)**	• Provide examples of how human practices can influence weather. • Identify the potential consequences of severe weather on human communities and natural systems.
d. Students know that weather forecasts depend on many variables.	· **My Water Address, Take Action! (p: 433)** · **Nature Rules! (p: 277)** · **Thunderstorm (The) (p: 209)**	
Investigation and Experimentation (5th Grade)		
6. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:		The environmental principles and concepts provide fertile ground for the development of investigations and experiments that are directly related to achieving mastery of California's science content standards. As stated by the California State Board of Education, such "activities must be cohesive, connected and build on each other to lead students to a comprehensive understanding of the California Science Content Standards." Environment-based investigations and experiments can also help teachers

a. Classify objects (eg. rocks, plants, leaves) based on appropriate criteria.	· **A-maze-ing Water (p: 231)** · **Adventures in Density (p: 3)** · **Aqua Bodies (p: 45)** · **Get The Groundwater Picture (p: 143)** · **Hangin' Together (p: 19)** · **Incredible Journey (The) (p: 155)*** · **Let's Even Things Out (Portal)** · **Life Box (The) (p: 69)** · **Make a Mural (p: 515)** · **Molecules in Motion (p: 33)** · **My Water Address, Take Action! (p: 433)** · **My Water Footprint (p: 441)** · **Ocean Habitats (p: 73)** · **Piece It Together (Portal)** · **Seeing Watersheds (p: 187)** · **Springing Into Action (p: 203)** · **Thirsty Plants (Portal)** · **Thunderstorm (The) (p: 209)** · **Water Address (Portal)*** · **Water Audit (p: 469)** · **Water Concentration (Portal)** · **Water Inspirations (p: 535)** · **Water Models (Portal)** · **Wet Vacation (Portal)***	conform to recommendations of the California State Board of Education that "hands-on activities compos) at least 20 to 25 percent of the science instructional program (as specified in the California Science Framework."

b. Develop a testable questions.	· **A-maze-ing Water (p: 231)** · **H2Olympics (p: 13)** · **Hangin' Together (p: 19)** · **Money Down The Drain (p: 351)** · **My Water Footprint (p: 441)** · **Thunderstorm (The) (p: 209)** · **Water Audit (p: 469)** · **Water Models (Portal)** · **What's the Solution? (p: 37)**	
f. Select appropriate tools (eg. Thermometers, meter sticks, balances, and graduated cylinders) and make quantitative observations).	· **Adventures in Density (p: 3)** · **Drop in the Bucket (A) (p: 257)** · **H2Olympics (p: 13)** · **My Water Footprint (p: 441)** · **Money Down The Drain (p: 351)** · **Thirsty Plants (Portal)** · **Thunderstorm (The) (p: 209)** · **Water Audit (p: 469)** · **Wet Vacation (Portal)***	
g. Record data using appropriate graphic representation (including charts, graphs, and labeled diagrams), and make inferences based on those data.	· **A-maze-ing Water (p: 231)** · **Adventures in Density (p: 3)** · **Aqua Bodies (p: 45)** · **Blue Planet (p: 125)** · **Blue River (p: 135)** · **Drop in the Bucket (A) (p: 257)** · **Get The Groundwater Picture (p: 143)** · **High Water History (p: 321)** · **Incredible Journey (The) (p: 155)*** · **Irrigation Interpretation (Portal)** · **Get The Groundwater Picture (p: 143)** · **Make a Mural (p: 515)** · **My Water Address, Take Action! (p: 433)** · **My Water Footprint (p: 441)** · **Stream Sense (Portal)** · **Thunderstorm (The) (p: 209)** · **Water Audit (p: 469)** · **Water Crossings (p: 487)**	

h. Draw conclusions based on scientific evidence and indicate whether further information is needed to support a specific conclusion.	· **A-maze-ing Water (p: 231)** · **Adventures in Density (p: 3)** · **Aqua Bodies (p: 45)** · **Blue Planet (p: 125)** · **Discover the Waters of Our National Parks (p: 493)*** · **Drop in the Bucket (A) (p: 257)** · **Get The Groundwater Picture (p: 143)** · **H2Olympics (p: 13)** · **Hangin' Together (p: 19)** · **Incredible Journey (The) (p: 155)*** · **Just Passing Through (p: 163)** · **Let's Even Things Out (Portal)** · **Life Box (The) (p: 69)** · **Molecules in Motion (p: 33)** · **Money Down The Drain (p: 351)** · **My Water Footprint (p: 441)** · **Ocean Habitats (p: 73)** · **Seeing Watersheds (p: 187)** · **Snow and Tell (p: 387)** · **Thirsty Plants (Portal)** · **Water Address (Portal)*** · **Water Audit (p: 469)** · **Water Crossings (p: 487)** · **Water Models (Portal)** · **Wet Vacation (Portal)*** · **What's the Solution? (p: 37)**	

Sixth Grade

Academic Content Standards	Project WET Activities	Environmental Education Initiative Learning Objectives
Plate Tectonics and Earth's Structure (6th Grade) ***1. Plate tectonics accounts for important features of Earth's surface and major geologic events. As a basis for understanding this concept:***		• Describe how geologic events and processes affect the distribution of terrestrial, freshwater and coastal ecosystems. • Provide examples of the direct and indirect influences of these geologic events and processes on humans and human communities. • Explain how these geologic events and processes affect the distribution of goods and ecosystems services from natural systems (e.g., water supply).
a Students know evidence of plate tectonics is derived from the fit of the continents; the location of earthquakes, volcanoes, and midocean ridges; and the distribution of fossils, rock types, and ancient climatic zones.	· **Discover the Waters of Our National Parks (p: 493)*** · **Great Stoney Book (The) (Portal)**	
e.Students know major geologic events, such as earthquakes, volcanic eruptions, and mountain building, result from plate motions.	· **Discover the Waters of Our National Parks (p: 493)*** · **High Water History (p: 321)** · **My Water Address, Take Action! (p: 433)** · **Nature Rules! (p: 277)**	
f. Students know how to explain major features of California geology (including mountains, faults, volcanoes) in terms of plate tectonics.	· **Discover the Waters of Our National Parks (p: 493)*** · **Get the Ground Water Picture (p: 143)** · **Great Stoney Book (The) (Portal)** · **Just Passing Through (p: 163)** · **My Water Address, Take Action! (p: 433)** · **Nature Rules! (p: 277)** · **Seeing Watersheds (p: 187)** · **Springing Into Action (p: 203)**	
Shaping Earth's Surface (6th Grade) ***2. Topography is reshaped by the weathering of rock and soil and by the transportation and deposition of sediment. As a basis for understanding this concept:***		

a. Students know water running downhill is the dominant process in shaping the landscape, including California's landscape.	· **Blue River (p: 135)** · **Branching Out! (Portal)** · **Discover the Waters of Our National Parks (p: 493)*** · **Get the Ground Water Picture (p: 143)** · **Great Stoney Book (The) (Portal)** · **Imagine! (Portal)** · **Incredible Journey (The) (p: 155)** · **Just Passing Through (p: 163)** · **My Water Address, Take Action! (p: 433)** · **Nature Rules! (p: 277)** · **Rainy-Day Hike (p: 169)** · **Seeing Watersheds (p: 187)** · **Springing Into Action (p: 203)** · **Wetland Soils In Living Color (p: 217)**	
b. Students know rivers and streams are dynamic systems that erode, transport sediment, change course, and flood their banks in natural and recurring patterns.	· **Back to the Future (p: 307)** · **Blue River (p: 135)** · **Branching Out! (Portal)** · **Color Me A Watershed, (p: 239)** · **High Water History (p: 321)** · **Just Passing Through (p: 163)** · **My Water Address, Take Action! (p: 433)** · **Nature Rules! (p: 277)** · **River Talk (p: 175)** · **Seeing Watersheds (p: 187)** · **Storm Water (p: 395)**	• Identify how humans and human communities benefit from the dynamic nature of rivers and streams in ways that are essential to human life and to the functioning of our economies and cultures (e.g., deposition of fertile sediment). • Describe how humans and human communities are influenced by soil erosion, sediment transport, course changes and flooding of rivers and streams (e.g., food production, housing construction). • Provide examples of how human activities can influence the flow of rivers and streams. • Describe how changes to the flow of rivers and streams can influence the functioning of terrestrial, freshwater, coastal and marine ecosystems (e.g., spawning of salmon).
c. Students know beaches are dynamic systems in which the sand is supplied by rivers and moved along the coast by the action of waves.	· **Color Me A Watershed, (p: 239)** · **Just Passing Through (p: 163)** · **Seeing Watersheds (p: 187)** · **Storm Water (p: 395)** · **Sum of the Parts (p: 283)**	• Identify how humans and human communities benefit from the dynamic systems of beaches in ways that support our economies and cultures (e.g., housing development, sand supplies). • Describe how human communities are influenced by the sand that is supplied by rivers and moved along the coast by the action of waves. • Provide examples of how human activities can influence the movement of sand and the formation of beaches. • Describe how changes in the movement of sand and the formation of beaches can influence the functioning of terrestrial, freshwater, coastal and marine ecosystems (e.g., nesting habitat for shorebirds).

d. Students know earthquakes, volcanic eruptions, landslides, and floods change human and wildlife habitats.	· **Back to the Future (p: 307)** · **Blue River (p: 135)** · **Branching Out! (Portal)** · **Discover the Waters of Our National Parks (p: 493)*** · **Color Me A Watershed, (p: 239)** · **Get the Ground Water Picture (p: 143)** · **High Water History (p: 321)** · **Just Passing Through (p: 163)** · **My Water Address, Take Action! (p: 433)** · **Nature Rules! (p: 277)** · **Springing Into Action (p: 203)** · **Seeing Watersheds (p: 187)** · **Storm Water (p: 395)**	• Describe how earthquakes, volcanic eruptions, landslides, and floods can influence the distribution of terrestrial, freshwater and coastal ecosystems and thus change wildlife habitats. • Provide examples of the direct and indirect influences of earthquakes, volcanic eruptions, landslides, and floods on humans and human communities. • Provide examples of how human practices can compound or lessen the impacts of earthquakes, volcanic eruptions, landslides, and floods on human communities and wildlife habitats.

Heat (Thermal Energy) (Physical Science- 6th Grade)		
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.	· **Adventures in Density (p: 3)** · **Energetic Water (Portal)** · **Cold Cash in the Icebox (Portal)** · **Water Models (Portal)**	
c. Students know heat flows in solids by conduction (which involves no flow of matter) and in fluids by conduction and by convection (which involves flow of matter).	· **Adventures in Density (p: 3)** · **Water Models (Portal)**	
d. Students know heat energy is also transferred between objects by radiation (radiation can travel through space).	· **Hangin' Together (p: 19)** · **Incredible Journey (The) (p: 155)** · **Molecules in Motion (p: 33)** · **Water Models (Portal)**	
Energy in the Earth System (6th Grade)		
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:		• Describe how the energy-related phenomena on Earth's surface (i.e., those affected by the transfer of energy through radiation and convection currents) influence the distribution of terrestrial, freshwater and coastal ecosystems. • Provide examples of the direct and indirect influences of these energyrelated phenomena on Earth's surface on humans and human communities. • Explain how these energy-related phenomena on Earth's surface affect the distribution of goods and ecosystem services from natural systems (e.g., water supply).
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.	· **Imagine! (Portal)** · **Incredible Journey (The) (p: 155)*** · **Molecules in Motion (p: 33)** · **Ocean Habitats (p: 73)** · **Piece It Together (Portal)** · **Poetic Precipitation (Portal)** · **Water Inspirations (p: 535)** · **Water Models (Portal)**	• Recognize that wind and ocean currents can be harvested to generate electricity. • Provide examples of the advantages and disadvantages related to the use of energy generated from wind and ocean currents.

b. Students know solar energy reaches Earth through radiation.	· **Imagine! (Portal)** · **Incredible Journey (The) (p: 155)*** · **Molecules in Motion (p: 33)** · **Water Models (Portal)**	
d. Students know convection currents distribute heat in the atmosphere and oceans.	· **Adventures in Density (p: 3)** · **Great Water Journeys (Portal)** · **Piece It Together (Portal)** · **Thunderstorm (The) (p: 209)** · **Water Models (Portal)**	• Humans depend on convection currents because they provide ecosystem services and the conditions for the production of goods for human use (e.g., the distribution of organisms). • Ocean currents along California's coasts are a major factor in determining what organisms live in coastal waters, as well as California's weather and climate.
e. Students know differences in pressure, heat, air movement, and humidity result in changes of weather.	· **Discover the Waters of Our National Parks (p: 493)*** · **Imagine! (Portal)** · **Piece It Together (Portal)** · **Raining Cats and Dogs (p: 521)** · **Thunderstorm (The) (p: 209)** · **Water Inspirations (p: 535)** · **Water Models (Portal)** · **Wet Vacation (Portal)**	
Ecology (Life Science- 6th Grade) ***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.	· **Incredible Journey (The) (p: 155)*** · **Life Box (The) (p: 69)** · **Life in the Fast Lane (Portal)** · **Macroinvertebrate Mayhem (p: 343)** · **Ocean Habitats (p: 73)** · **Water Inspirations (p: 535)**	• Describe how sunlight is transferred by producers into chemical energy through photosynthesis. • Recognize that plants are the primary source of energy for living things in an ecosystem. • Describe how energy and matter are transferred from organism to organism, including humans, through food webs. • Provide examples of human practices (e.g., ranching) that directly depend on the transfer of energy and matter through food webs.

b. Students know matter is transferred over time from one organism to others in the food web and between organisms and the physical environment.	· **A-Maze-ing Water (p: 231)** · **Grave Mistake (A) (p: 315)** · **Healthy Habits (p: 63)** · **Incredible Journey (The) (p: 155)*** · **Life Box (The) (p: 69)** · **Life in the Fast Lane (Portal)** · **Macroinvertebrate Mayhem (p: 343)** · **Ocean Habitats (p: 73)** · **Poison Pump (p: 107)** · **Pucker Effect (The) (p: 363)** · **Super Bowl Surge (p: 405)** · **Virtual Water (p: 289)** · **Where Are The Frogs? (Portal)**	• Recognize that matter is transferred over time between organisms in an ecosystem. • Describe the role of food webs in the flow of matter within natural systems. • Explain how the transfer of matter results in the movement of energy to organisms on different levels of the food web. • Describe different means through which humans get matter and energy from food webs (e.g., food consumption and respiration). • Recognize that the transfer of matter through an ecosystem generates byproducts (e.g., matter and heat energy are dissipated during transfers between levels in the food web). • Describe the effects of human practices (e.g., agriculture, forestry) and resulting byproducts, on the transfer of matter through natural systems (e.g., food chains and webs).
c. Students know populations of organisms can be categorized by the functions they serve in an ecosystem.	· **8-4-1, One for All (p: 299)** · **Incredible Journey (The) (p: 155)*** · **Healthy Habits (p: 63)** · **Incredible Journey (The) (p: 155)*** · **Invaders! (p: 263)** · **Life in the Fast Lane (Portal)** · **Macroinvertebrate Mayhem (p: 343)** · **Ocean Habitats (p: 73)** · **People of the Bog (Portal)** · **Super Sleuths (p: 113)** · **Virtual Water (p: 289)** · **Water Quality? Ask the Bugs! (p: 421)** · **Where Are The Frogs? (Portal)**	• Define a population. • Give examples of the functions (producer, consumer, and decomposer) populations of organisms serve in an ecosystem. • Explain how energy is transferred in an ecosystem and how the amount of available energy varies at the level of consumption (primary, secondary and tertiary consumers). • Identify humans as consumers within ecosystems. • Identify and describe byproducts generated by the human consumption of goods (matter) produced by natural systems (ecosystems). • Describe the effects of human practices on the transfer of matter through natural systems. • Provide examples of how the quantities of resources consumed, and the quantity and characteristics of the resulting byproducts can affect natural systems.

d. Students know different kinds of organisms may play similar ecological roles in similar biomes.	· **8-4-1, One for All (p: 299)** · **Color Me a Watershed (p: 239)** · **Discover the Waters of Our National Parks (p: 493)*** · **Dust Bowls and Failed Levees (Portal)** · **Humpty Dumpty (p: 335)** · **Invaders! (p: 263)** · **Life in the Fast Lane (Portal)** · **Macroinvertebrate Mayhem (p: 343)** · **Ocean Habitats (p: 73)** · **People of the Bog (Portal)** · **Storm Water (p: 395)** · **Super Sleuths (p: 113)** · **Water Address (Portal)*** · **Water Quality? Ask the Bugs! (p: 421)**	• Recognize different biomes. • Identify the characteristics of various biomes. • Provide examples of different organisms playing similar ecological roles (herbivores, carnivores, omnivores, and decomposers) in similar biomes. • Explain how human practices make use of and/or have similar effects on organisms that play similar roles in different biomes. • Describe the effects of human practices on the transfer of matter through natural systems (e.g., the effects of agriculture and forestry on organisms with similar ecological roles are comparable in similar biomes).

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.	· **Discover the Waters of Our National Parks (p: 493)*** · **Dust Bowls and Failed Levees (Portal)** · **Humpty Dumpty (p: 335)** · **Invaders! (p: 263)** · **Common Water (p: 249)** · **Irrigation Interpretation (Portal)** · **Life in the Fast Lane (Portal)** · **Macroinvertebrate Mayhem (p: 343)** · **People of the Bog (Portal)** · **Piece It Together (Portal)** · **Raining Cats and Dogs (p: 521)** · **Reaching Your Limits (p: 371)** · **Snapshot in Time (p: 377)** · **Water Address (Portal)*** · **Wetland Soils in Living Color (p: 217)** · **Wet Vacation (Portal)*** · **Where Are The Frogs? (Portal)**	• Identify abiotic factors that affect ecosystems. • Classify components of ecosystems as either living (biotic) or non-living (abiotic). • Explain the effects of changing biotic and abiotic factors on an ecosystem (e.g., the effects of changing: quantities of light or water, and soil composition on plant growth; range of temperatures on the species composition of animals and plants). • Provide examples of how human practices and rates of consumption affect the biotic and abiotic components (e.g., the availability of resources) in a natural system, thus influencing the number and types of organisms an ecosystem can support. • Provide examples of how the quantities of resources consumed, and the quantity and characteristics of the resulting byproducts can affect natural systems (e.g., as a result of overgrazing by cattle, the ecological characteristics of rangeland can change making it less productive).
Resources (6th Grade) ***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.	· **8-4-1, One for All (p: 299)** · **Energetic Water (Portal)** · **Whose Problem Is It? (Portal)**	• Identify the various forms and uses of energy in students' communities. • Describe different methods of producing energy (including using fuel, converting solar energy to electricity, using hydro or wind power). • Recognize that when fuel is used (consumed) most of the energy released becomes heat, a byproduct that transfers to the surrounding environment. • Describe other byproducts of energy production and consumption (e.g., liquids, gases and solids that may have varied effects). • Provide examples of how the byproducts of converting energy sources into useful forms enter natural systems. • Describe how the quantities of energy resources consumed, and the quantity and characteristics of the resulting byproducts, affect natural systems. • Explain that the "usefulness" of energy sources is determined by weighing the benefits of their use against the costs of conversion and the generation and release of byproducts.

b. Students know different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and know how to classify them as renewable or nonrenewable.	· **8-4-1, One for All (p: 299)** · **Blue Planet (p: 125)** · **Common Water (p: 249)** · **Discover the Waters of Our National Parks (p: 493)*** · **Drop in the Bucket (p: 257)** · **Energetic Water (Portal)** · **Get the Groundwater Picture (p: 143)** · **Humpty Dumpty (p: 335)** · **Invaders! (p: 263)** · **Life Box (The) (p: 69)** · **Long Haul (The) (p: 273)** · **My Water Footprint (p: 441)** · **Ocean Habitats (p: 73)** · **Pass The Jug (p: 447)** · **Snow and Tell (p: 387)** · **Springing Into Action (p: 203)** · **There is No Away! (p: 453)** · **Virtual Water (p: 289)** · **Water Audit (p: 469)**	• Identify different energy and material resources (e.g. air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests) that are provided by natural systems. • Explain that: renewable resources are replaced over a relatively short time period (e.g., fresh water, hydroelectric power, or living resources); nonrenewable resources accumulate over such a long period of time that they must be considered as fixed (e.g., minerals or fossil fuels); and, inexhaustible resources have no practical limits (e.g., solar or hydrothermal energy). • Classify energy and material resources as renewable, non-renewable, or inexhaustible. • Identify energy and material resources that are essential to human life. • Provide examples of how human practices and rates of consumption can affect the availability (quality, quantity and reliability) of energy and material resources that are essential to human life.
c. Students know the natural origin of the materials used to make common objects.	· **8-4-1, One for All (p: 299)** · **Choices and Preferences, Water Index (Portal)** · **Common Water (p: 249)** · **Discover the Waters of Our National Parks (p: 493)*** · **Energetic Water (Portal)** · **Get the Groundwater Picture (p: 143)** · **Humpty Dumpty (p: 335)** · **Invaders! (p: 263)** · **My Water Footprint (p: 441)** · **Ocean Habitats (p: 73)** · **Pass The Jug (p: 447)** · **Seeing Watersheds (p: 187)** · **Sum of the Parts (p: 283)** · **Super Bowl Surge (p: 405)** · **There is No Away! (p: 453)** · **Urban Waters (p: 413)** · **Virtual Water (p: 289)**	• Identify the natural origin of the materials used to make common objects. • Provide examples of the goods that are produced by natural systems that are used to make common objects used by humans. • Explain the methods used to make common objects (useable products) from natural resources. • Describe the methods used to extract, harvest and transport the materials used to make common objects from natural resources. • Provide examples of how the methods used to extract, harvest and transport natural resources, and consume them (or make useable products) affect natural systems.

Investigation and Experimentation (6th Grade)

7. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:		The environmental principles and concepts provide fertile ground for the development of investigations and experiments that are directly related to achieving mastery of California's science content standards. As stated by the California State Board of Education, such "activities must be cohesive, connected and build on each other to lead students to a comprehensive understanding of the California Science Content Standards." Environment-based investigations and experiments can also help teachers conform to recommendations of the California State Board of Education that "hands-on activities compos) at least 20 to 25 percent of the science instructional program (as specified in the California Science Framework."
a. Develop a hypothesis.	· **Adventures in Density (p: 3)** · **A-Maze-ing Water (p: 231)** · **Back to the Future (p: 307)** · **Blue Planet (p: 125)** · **Cold Cash in the Icebox (Portal)** · **Get the Groundwater Picture (p: 143)** · **Grave Mistake (A) (p: 315)** · **Irrigation Interpretation (Portal)** · **People of the Bog (Portal)** · **Piece It Together (Portal)** · **Poison Pump (p: 107)** · **Pucker Effect (The) (p: 363)** · **Rainy-Day Hike (p: 169)** · **Water Audit (p: 469)**	

b. Select and use appropriate tools and technology (including calculators, computers, balances, spring scales, microscopes, and binoculars) to perform tests, collect data, and display data.	· **Adventures in Density (p: 3)** · **A-Maze-ing Water (p: 231)** · **Cold Cash in the Icebox (Portal)** · **Drop in the Bucket (p: 257)** · **Grave Mistake (A) (p: 315)** · **Irrigation Interpretation (Portal)** · **Life in the Fast Lane (Portal)** · **My Water Footprint (p: 441)** · **People of the Bog (Portal)** · **Piece It Together (Portal)** · **Poison Pump (p: 107)** · **Pucker Effect (The) (p: 363)** · **Rainy-Day Hike (p: 169)** · **Reaching Your Limits (p: 371)** · **Seeing Watersheds (p: 187)** · **Snapshot in Time (p: 377)** · **Snow and Tell (p: 387)** · **Springing Into Action (p: 203)** · **Storm Water (p: 395)** · **There is No Away! (p: 453)** · **Thunderstorm (The) (p: 209)** · **Water Audit (p: 469)** · **Water Models (Portal)** · **Water Quality? Ask the Bugs! (p: 421)** · **Wet Vacation (Portal)*** · **Wetland Soils in Living Color (p: 217)** · **Where Are The Frogs? (Portal)**	

c. Construct appropriate graphs from data and develop qualitative statements about the relationships between variables.	· **Adventures in Density (p: 3)** · **Back to the Future (p: 307)** · **Blue Planet (p: 125)** · **Blue River (p: 135)** · **Choices and Preferences, Water Index (Portal)** · **Cold Cash in the Icebox (Portal)** · **Drop in the Bucket (p: 257)** · **Incredible Journey (The) (p: 155)*** · **Invaders! (p: 263)** · **Irrigation Interpretation (Portal)** · **Macroinvertebrate Mayhem (p: 343)** · **My Water Footprint (p: 441)** · **Snapshot in Time (p: 377)** · **Water Audit (p: 469)** · **Where Are The Frogs? (Portal)** · **Your Hydrologic Bank Account (p: 223)**	

d. Communicate the steps and results from an investigation in written reports and oral presentations.	· **Adventures in Density (p: 3)** · **Cold Cash in the Icebox (Portal)** · **Hangin' Together (p: 19)** · **Invaders! (p: 263)** · **Irrigation Interpretation (Portal)** · **Life in the Fast Lane (Portal)** · **My Water Address, Take Action! (p: 433)** · **My Water Footprint (p: 441)** · **Rainy-Day Hike (p: 169)** · **Snow and Tell (p: 387)** · **Springing Into Action (p: 203)** · **Storm Water (p: 395)** · **Super Bowl Surge (p: 405)** · **There is No Away! (p: 453)** · **Water Audit (p: 469)** · **Water Models (Portal)** · **Where Are The Frogs? (Portal)**	

e. Recognize whether evidence is consistent with a proposed explanation.	· **Adventures in Density (p: 3)** · **Back to the Future (p: 307)** · **Blue Planet (p: 125)** · **Blue River (p: 135)** · **Cold Cash in the Icebox (Portal)** · **Color Me a Watershed (p: 239)** · **Drop in the Bucket (p: 257)** · **Get the Groundwater Picture (p: 143)** · **Grave Mistake (A) (p: 315)** · **Hangin' Together (p: 19)** · **High Water History (p: 321)** · **Humpty Dumpty (p: 335)** · **Invaders! (p: 263)** · **Irrigation Interpretation (Portal)** · **Just Passing Through (p: 163)** · **Macroinvertebrate Mayhem (p: 343)** · **Molecules in Motion (p: 33)** · **Ocean Habitats (p: 73)** · **Piece It Together (Portal)** · **Poison Pump (p: 107)** · **Pucker Effect (The) (p: 363)** · **Raining Cats and Dogs (p: 521)** · **Rainy-Day Hike (p: 169)** · **Seeing Watersheds (p: 187)** · **Snapshot in Time (p: 377)** · **Springing Into Action (p: 203)** · **Storm Water (p: 395)** · **There is No Away! (p: 453)** · **Water Audit (p: 469)** · **Water Models (Portal)** · **Water Quality? Ask the Bugs! (p: 421)** · **Wet Vegetation (Portal)**	
f. Read a topographic map and a geologic map for evidence provided on the maps and construct and interpret a simple scale map.	· **Seeing Watersheds (p: 187)** · **Snapshot in Time (p: 377)**	

g. Interpret events by sequence and time from natural phenomena (e.g., the relative ages of rocks and intrusions).	· **Get the Groundwater Picture (p: 143)** · **Great Stoney Book (The) (Portal)** · **High Water History (p: 321)** · **Life in the Fast Lane (Portal)** · **Rainy-Day Hike (p: 169)** · **Snapshot in Time (p: 377)** · **Snow and Tell (p: 387)** · **Springing Into Action (p: 203)** · **Thunderstorm (The) (p: 209)** · **Water Quality? Ask the Bugs! (p: 421)** · **Wet Vacation (Portal)*** · **Wetland Soils in Living Color (p: 217)** · **Where Are The Frogs? (Portal)**	
h.Identify changes in natural phenomena over time without manipulating the phenomena (e.g., a tree limb, a grove of trees, a stream, a hillslope).	· **Adventures in Density (p: 3)** · **Back to the Future (p: 307)** · **Discover the Waters of Our National Parks (p: 493)*** · **Dust Bowls and Failed Levees (Portal)** · **Get the Groundwater Picture (p: 143)** · **Great Stoney Book (The) (Portal)** · **High Water History (p: 321)** · **Irrigation Interpretation (Portal)** · **Life in the Fast Lane (Portal)** · **Macroinvertebrate Mayhem (p: 343)** · **Molecules in Motion (p: 33)** · **My Water Address, Take Action! (p: 433)** · **Rainy-Day Hike (p: 169)** · **Snapshot in Time (p: 377)** · **Wet Vacation (Portal)*** · **Wetland Soils in Living Color (p: 217)** · **Where Are The Frogs? (Portal)**	

7th Grade

Academic Content Standards	Project WET Activities	Environmental Education Initiative Learning Objectives
Evolution (7th Grade)		
3. Biological evolution accounts for the diversity of species developed through gradual processes over many generations. As a basis for understanding this concept:		• Recognize that living and non-living things change. • Recognize that living things, including humans, cause changes in their environment. • Recognize factors that influence populations of organisms and biological diversity. • Describe the effects of demographics and distribution of human populations and their consumption rates on natural systems (e.g., their geographic extent, composition, biological diversity, and viability). • Provide examples of how the methods used to extract, harvest, and transport natural resources, and consume natural resources (or make useable products) affect natural systems (e.g., their geographic extent, composition, biological diversity, and viability). • Compare historic and present day geographic extents of natural systems (terrestrial, freshwater, coastal and marine ecosystems). • Describe how the activities related to the expansion and operation of human communities influence natural systems.
a. Students know both genetic variation and environmental factors are causes of evolution and diversity of organisms.	· **Discover the Waters of Our National Parks (p: 493)*** · **Humpty Dumpty (p: 335)** · **Invaders! (p: 263)** · **Life in the Fast Lane (Portal)** · **Macroinvertebrate Mayhem (p: 343)** · **Ocean Habitats (p: 73)** · **Old Water (Portal)** · **People of the Bog (Portal)** · **Water Quality? Ask the Bugs! (p: 421)** · **Wetland Soils in Living Color (p: 217)** · **Where Are the Frogs? (Portal)**	• Define evolution and identify its causes. • Describe the influence of genetic variation on the evolution and diversity of organisms. • Identify the role of environmental factors on the evolution and diversity of organisms, and the long-term functioning and health of natural systems. • Provide examples of how human population growth and human activities (e.g., expansion of communities, production and consumption of natural resources, the operation and expansion of human communities, and generation of byproducts) can affect both genetic variation and environmental factors). • Describe how human activities can affect reproductive cycles and genetic diversity, and thus, the evolution and diversity of species.

e. Students know that extinction of a species occurs when the environment changes and the adaptive characteristics of a species are insufficient for its survival.	· **Discover the Waters of Our National Parks (p: 493)*** · **Humpty Dumpty (p: 335)** · **Invaders! (p: 263)** · **Life in the Fast Lane (Portal)** · **Macroinvertebrate Mayhem (p: 343)** · **Ocean Habitats (p: 73)** · **Old Water (Portal)** · **People of the Bog (Portal)** · **Water Address (Portal)** · **Water Quality? Ask the Bugs! (p: 421)** · **Where Are the Frogs? (Portal)**	• Define and give examples of adaptation in living things. • Explain the effects of changing environmental factors in a natural system on species (e.g., changing biotic and abiotic factors including the availability of resources). • Identify factors that can cause extinction of a species and explain that some extinctions are natural while others are human-induced. • Recognize that throughout the history of life on Earth, some plants and animal species have died out completely in response to environmental changes. • Provide examples of how human population growth and expansion of communities, production and consumption of natural resources, and the operation and expansion of human communities can influence rates of extinction. • Describe how the capacity of natural systems to adjust to human-caused alterations depends on the scope, scale, and duration of the activity, and on the nature and health of the natural system. • Identify that in cases where species cannot respond to the degree of change, extinction may occur.
Earth and Life History (Earth Sciences- 7th Grade)) ***4. Evidence from rocks allows us to understand the evolution of life on Earth. As a basis for understanding this concept:***		
a. Students know Earth processes today are similar to those that occurred in the past and slow geologic processes have large cumulative effects over long periods of time.	· **Adventures in Density (p: 3)** · **Blue River (p: 135)** · **Discover the Waters of Our National Parks (p: 493)*** · **Get the Ground Water Picture (p: 143)** · **Incredible Journey (The) (p: 155)*** · **Just Passing Through (p: 163)** · **My Water Address, Take Action! (p: 433)** · **Old Water (Portal)** · **People of the Bog (Portal)** · **Seeing Watersheds (p: 187)** · **Springing Into Action (p: 203)** · **Wetland Soils in Living Color (p: 217)**	• Define and distinguish the terms cycles and processes. • Describe the cycles and processes that occur in natural systems. • Explain that the effects of geologic processes on natural systems that are observed today are similar to those that occurred in the past. • Provide examples of how the functioning of natural systems is dependent upon geologic processes that operate over long periods of time. • Provide examples of how the cycles and processes that occur in natural systems today are similar to those that occurred in the past.

b. Students know the history of life on Earth has been disrupted by major catastrophic events, such as major volcanic eruptions or the impacts of asteroids.	· **Adventures in Density (p: 3)** · **Old Water (Portal)** · **Nature Rules! (p: 277)**	• Describe the ways that major catastrophic events, such as major volcanic eruptions or the impacts of asteroids, can disrupt the processes and cycles that occur in natural systems. • Provide examples of how the disruption of these processes and cycles by major catastrophic events can influence the geographic extent, composition, biological diversity, and viability of natural systems. • Explain how the disruption of these processes and cycles by major catastrophic events can influence the geographic extent, composition, biological diversity, and viability of natural systems.
c. Students know that the rock cycle includes the formation of new sediment and rocks and that rocks are often found in layers, with the oldest generally on the	· **The Great Stony Book (Portal)** · **Just Passing Through (p: 163)**	
e. Students know fossils provide evidence of how life and environmental conditions have changed.	· **Discover the Waters of Our National Parks (p: 493)*** · **The Great Stony Book (Portal)**	• Explain that fossils provide useful evidence of how life and environmental conditions have changed over geological time since the effects of the changes that are observed today are similar to those that occurred in the past. • Provide examples of how recent major catastrophic events have influenced the geographic extent, composition, biological diversity, and viability of natural systems.
g. Students know how to explain significant developments and extinctions of plant and animal life on the geologic time scale.	· **Discover the Waters of Our National Parks (p: 493)*** · **The Great Stony Book (Portal)** · **Old Water (Portal)**	• Identify changes to biotic and abiotic factors in natural systems that can result in the extinction of species. • Explain how extinction occurs. • Give examples of extinctions on Earth in geologic time. • Describe how natural systems can change gradually on a geologic time scale or rapidly (e.g., changes to biogeochemical cycles, system processes, species composition, and capacity to yield goods and ecosystem services). • Provide examples of human activities, and the resulting byproducts, that can cause rapid and/or significant changes to plant and animal life that might result in extinction. • Describe the effects when natural systems cannot adjust to human-caused alterations and how these effects are influenced by the nature of the system as well as the scope, scale, duration and byproducts of the activity.

Structure and Function in Living Systems (7th Grade)		
5. The anatomy and physiology of plants and animals illustrate the complementary nature of structure and function. As a basis for understanding this concept:		
a. Students know plants and animals have levels of organization for structure and function, including cells, tissues, organs, organ systems, and the whole organism.	· **Thirsty Plants (Portal)** · **Let's Even Things Out (Portal)**	• Describe how the components, processes, and cycles that occur in natural systems are analogous to the structures and functions that occur in whole organisms. • Provide examples of components and processes that occur in terrestrial, freshwater, coastal and marine systems that parallel the functions served by cells, tissues, organs, organ systems, and whole organisms.
b. Students know organ systems function because of the contributions of individual organs, tissues, and cells. The failure of any part can affect the entire system.	· **Healthy Habits (p: 63)** · **On Track with Hydration (p: 95)** · **Super Sleuths (p: 113)**	
Investigation and Experimentation (7th Grade)		
7. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:		The environmental principles and concepts provide fertile ground for the development of investigations and experiments that are directly related to achieving mastery of California's science content standards. As stated by the California State Board of Education, such "activities must be cohesive, connected and build on each other to lead students to a comprehensive understanding of the California Science Content Standards." Environment-based investigations and experiments can also help teachers

a. Select and use appropriate tools and technology (including calculators, computers, balances, spring scales, microscopes, and binoculars) to perform tests, collect data, and display data.	· **Adventures in Density (p: 3)** · **Let's Even Things Out (Portal)** · **People of the Bog (Portal)** · **Piece It Together (Portal)** · **Poison Pump (p: 107)** · **Pucker Effect (The) (p: 363)** · **Rainy-Day Hike (p: 169)** · **Seeing Watersheds (p: 187)** · **Snapshot in Time (p: 377)** · **Snow and Tell (p: 387)** · **Storm Water (p: 395)** · **Thirsty Plants (Portal)** · **Thunderstorm (The) (p: 209)** · **Water Audit (p: 469)** · **Water Models (Portal)** · **Water Quality? Ask the Bugs! (p: 421)** · **Wetland Soils In Living Color (p: 217)** · **Where Are the Frogs? (Portal)**	conform to recommendations of the California State Board of Education that "hands-on activities compos) at least 20 to 25 percent of the science instructional program (as specified in the California Science Framework."
b. Use a variety of print and electronic resources (including the World Wide Web) to collect information and evidence as part of a research project.	· **Adventures in Density (p: 3)** · **Blue River (p: 135)** · **Discover the Waters of Our National Parks (p: 493)*** · **Humpty Dumpty (p: 335)** · **Invaders! (p: 263)** · **My Water Address, Take Action! (p: 433)** · **Ocean Habitats (p: 73)** · **People of the Bog (Portal)** · **Piece It Together (Portal)** · **Super Sleuths (p: 113)** · **There is No Away! (p: 453)** · **Wet Vacation (Portal)***	

c. Communicate the logical connection among hypotheses, science concepts, tests conducted, data collected, and conclusions drawn from the scientific evidence.	· **Adventures in Density (p: 3)** · **Let's Even Things Out (Portal)** · **Poison Pump (p: 107)** · **Pucker Effect (The) (p: 363)** · **Rainy-Day Hike (p: 169)** · **Snapshot in Time (p: 377)** · **Storm Water (p: 395)** · **Super Sleuths (p: 113)** · **Water Audit (p: 469)** · **Water Quality? Ask the Bugs! (p: 421)** · **Wet Vacation (Portal)*** · **Wetland Soils In Living Color (p: 217)** · **Where Are the Frogs? (Portal)**	
d. Construct scale models, maps, and appropriately labeled diagrams to communicate scientific knowledge (e.g., motion of Earth's plates and cell structure).	· **Invaders! (p: 263)** · **My Water Address, Take Action! (p: 433)** · **Old Water (Portal)** · **Pucker Effect (The) (p: 363)** · **Rainstick (The) (p: 529)** · **Rainy-Day Hike (p: 169)** · **Snow and Tell (p: 387)** · **Springing Into Action (p: 203)** · **Thunderstorm (The) (p: 209)** · **Water Models (Portal)**	

8th Grade

Academic Content Standards	Project WET Activities	Environmental Education Initiative Learning Objectives
Forces (8th Grade) ***2. Unbalanced forces cause changes in velocity. As a basis for understanding this concept:***		
b. Students know when an object is subject to two or more forces at once, the result is the cumulative effect of all the forces.	· **H2O Olympics (p: 13)**	
d. Students know how to identify separately the two or more forces that are acting on.a single static object, including gravity, elastic forces due to tension or compression in matter, and friction.	· **H2O Olympics (p: 13)** · **Energetic Water (Portal)**	
e. Students know that when the forces on an object are unbalanced, the object will change its velocity (that is, it will speed up, slow down, or change direction).	· **H2O Olympics (p: 13)** · **Energetic Water (Portal)**	
Structure of Matter (8th Grade) ***3. Each of the more than 100 elements of matter has distinct properties and a distinct atomic structure. All forms of matter are composed of one or more of the elements. As a basis for understanding this concept:***		
a. Students know the structure of the atom and know it is composed of protons, neutrons, and electrons.	· **Hangin' Together (p:19)** · **What's the Solution? (p: 37)** · **Where Are the Frogs (Portal)**	

b. Students know that compounds are formed by combining two or more different elements and that compounds have properties that are different from their constituent elements.	· **Hangin' Together (p:19)** · **H2Olympics (p: 13)** · **Is There Water on Zork?** · **What's the Solution? (p: 37)** · **Where Are the Frogs (Portal)**	
d. Students know the states of matter (solid, liquid, gas) depend on molecular motion.	· **Adventures in Density (p: 3)** · **Hangin' Together (p: 19)** · **Incredible Journey (The) (p: 155)*** · **What's the Solution? (p: 37)**	
e. Students know that in solids the atoms are closely locked in position and can only vibrate; in liquids the atoms and molecules are more loosely connected and can collide with and move past one another; and in gases the atoms and molecules are free to move independently, colliding frequently.	· **Adventures in Density (p: 3)** · **Incredible Journey (The) (p: 155)***	
Reactions (8th Grade) ***5. Chemical reactions are processes in which atoms are rearranged into different combinations of molecules. As a basis for understanding this concept:***		
a. Students know reactant atoms and molecules interact to form products with different chemical properties.	· **Hangin' Together (p: 19)** · **Is There Water on Zork? (p: 27)**	
c. Students know chemical reactions usually liberate heat or absorb heat.	· **Hangin' Together (p: 19)** · **Is There Water on Zork? (p: 27)**	
d. Students know physical processes include freezing and boiling, in which a material changes form with no chemical reaction.	· **Adventures in Density (p: 3)** · **Hangin' Together (p: 19)** · **Water Models (Portal)** · **What's the Solution? (p: 37)**	
e. Students know how to determine whether a solution is acidic, basic, or neutral.	· **Is There Water on Zork? (p: 27)** · **Pucker Effect (The) (p: 363)** · **Where Are the Frogs (Portal)**	

Density and Buoyancy (8th Grade) ***8. All objects experience a buoyant force when immersed in a fluid. As a basis for understanding this concept:***		
a. Students know density is mass per unit volume.	· **Adventures in Density (p: 3)**	
d. Students know how to predict whether an object will float or sink.	· **Adventures in Density (p: 3)** · **Is There Water on Zork? (p: 27)**	
Investigation and Experimentation (8th Grade)		
9. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:		The environmental principles and concepts provide fertile ground for the development of investigations and experiments that are directly related to achieving mastery of California's science content standards. As stated by the California State Board of Education, such "activities must be cohesive, connected and build on each other to lead students to a comprehensive understanding of the California Science Content Standards." Environment-based investigations and experiments can also help teachers conform to recommendations of the California State Board of Education that "hands-on activities compos) at least 20 to 25 percent of the science instructional program (as specified in the California Science Framework."
a. Plan and conduct a scientific investigation to test a hypothesis.	· **Adventures in Density (p: 3)** · **H2O Olympics (p: 13)** · **Is There Water on Zork? (p: 27)** · **Pucker Effect (The) (p: 363)** · **Water Models (Portal)** · **What's the Solution? (p: 37)** · **Where Are the Frogs (Portal)**	
b. Evaluate the accuracy and reproducibility of data.	· **Adventures in Density (p: 3)** · **H2O Olympics (p: 13)** · **Is There Water on Zork? (p: 27)** · **Pucker Effect (The) (p: 363)** · **What's the Solution? (p: 37)** · **Where Are the Frogs (Portal)**	
c. Distinguish between variable and controlled parameters in a test.	· **H2O Olympics (p: 13)** · **Is There Water on Zork? (p: 27)** · **Where Are the Frogs (Portal)**	

High School -- Chemistry

Academic Content Standards	Project WET Activities	Environmental Education Initiative Learning Objectives
Chemical Bonds (High School Chemistry) ***2. Biological, chemical, and physical properties of matter result from the ability of atoms to form bonds from electrostatic forces between electrons and protons and between atoms and molecules. As a basis for***		
a. Students know atoms combine to form molecules by sharing electrons to form covalent or metallic bonds or by exchanging electrons to form ionic bonds.	· **Hangin' Together (p: 19)** · **H2Olympics (p: 13)** · **What's the Solution? (p: 37)**	
d. Students know the atoms and molecules in liquids move in a random pattern relative to one another because the intermolecular forces are too weak to hold the atoms or	· **Adventures In Density (p: 3)** · **What's the Solution? (p: 37)**	
h.* Students know how to identify solids and liquids held together by van der Waals forces or hydrogen bonding and relate these forces to volatility and boiling/ melting point temperatures.	· **Adventures in Density (p: 3)** · **Hangin' Together (p: 19)** · **Is There Water on Zork? (p: 27)** · **What's the Solution? (p: 37)**	
Acids and Bases (High School Chemistry) ***5. Acids, bases, and salts are three classes of compounds that form ions in water solutions. As a basis for understanding this concept:***		
a. Students Know the observable properties of acids, bases, and salt solutions.	· **Is There Water on Zork? (p: 27)** · **Where Are the Frogs? (Portal)**	
d. Students know how to use the pH scale to characterize acid and base solutions.	• **Is There Water on Zork? (p: 27)** • **Pucker Effect (The) (p: 363)** • **Where Are the Frogs? (Portal)**	
Solutions (High School Chemistry) ***6. Solutions are homogeneous mixtures of two or more substances. As a basis for understanding this concept:***		

d. Students know how to calculate the concentration of a solute in terms of grams per liter, molarity, parts per million, and percent composition	· **Reaching Your Limits (p: 371)**	

High School -- Biology/Life Science.

Academic Content Standards	Project WET Activities	Environmental Education Initiative Learning Objectives
Ecology (High School- Biology/Life Science) ***6. Stability in an ecosystem is a balance between competing effects. As a basis for understanding this concept:***		
a. Students know biodiversity is the sum total of different kinds of organisms and is affected by alterations of habitats.	· **8-4-1, One for All (p: 299)** · **Color Me a Watershed (p: 239)** · **Discover the Waters of Our National Parks (p: 493)*** · **Invaders! (p: 263)** · **Sum of the Parts (p: 283)** · **Water Quality? Ask the Bugs! (p: 421)**	• Define biodiversity (biological diversity) as a measure of the different kinds of organisms in an ecosystem. • Explain the importance of biodiversity to human lives, communities and societies in terms of the goods and ecosystem services natural systems provide. • List the direct and indirect changes to natural systems that can affect biodiversity (e.g., alterations of habitats). • Describe the implications of loss of biodiversity to natural systems and human societies. • Provide examples of human activity that can influence the biodiversity of natural systems (e.g., methods used extract, harvest, transport and consume natural resources; expansion and operation of human communities; and, laws, regulations, policies, and incentives that govern management of natural resources). • Explain the influence of human activities on biodiversity is directly related to population growth, the quantities of resources consumed and the quantity and characteristics of the byproducts of those activities.

b. Students know how to analyze changes in an ecosystem resulting from changes in climate, human activity, introduction of nonnative species, or changes in population size.	· **8-4-1, One for All (p: 299)** · **Back To The Future (p: 307)** · **Color Me A Watershed (p: 239)** · **Discover the Waters of Our National Parks (p: 493)*** · **Grave Mistake (p: 315)** · **Invaders! (p: 263)** · **Make a Mural (p: 515)** · **Snapshot in Time (p: 377)** · **Storm Water (p: 395)** · **Super Bowl Surge (405)** · **Sum of the Parts (p: 283)** · **Water Quality? Ask the Bugs! (p: 421)** · **Whose Problem Is It? (Portal)** · **Your Hydrologic Bank Account (p: 223)**	• List variables that can cause changes to ecosystems (e.g., climate change and human activities such as the introduction of nonnative species and the conversion of land [loss of habitat]). • Provide examples of how each of these variables can lead to changes in ecosystems. • Categorize the effects on ecosystems as short-term, long-term or not determined • Determine if these variables have cumulative and/or synergistic effects on ecosystems. • Catalog the factors that influence the scope, scale and duration of these effects on ecosystems. • Explain the spectrum of factors and the processes that are involved in analysis and decision-making regarding the management of ecosystems.
c. Students know how fluctuations in population size in an ecosystem are determined by the relative rates of birth, immigration, emigration, and death.	· **Water Quality? Ask the Bugs! (p: 421)** · **Where Are The Frogs? (Portal)**	• Describe human activities that can directly and indirectly cause fluctuations in population size in an ecosystem. • Identify how fluctuations in population size in an ecosystem can influence the biodiversity, composition and viability of natural systems. • Provide examples of fluctuations in population size in an ecosystem that have been caused by human activities.
d. Students know how water, carbon, and nitrogen cycle between abiotic resources and organic matter in the ecosystem and how oxygen cycles through photosynthesis and respiration.	· **8-4-1, One for All (p: 299)** · **Color Me A Watershed (p: 239)** · **People of the Bog (Portal)** · **Storm Water (p: 395)** · **Super Bowl Surge (405)** · **Sum of the Parts (p: 283)**	• Analyze the roles of water, carbon, nitrogen, and oxygen cycles and processes in the functioning of terrestrial, freshwater, coastal and marine ecosystems. • Describe the roles of cycles and processes in yielding the goods and ecosystem services upon which humans depend. • Appraise how human practices benefit from the cycles and processes that occur in terrestrial, freshwater, coastal and marine ecosystems. • Analyze how various human practices can alter the cycles and processes that affect the functioning of natural systems.

e. Students know a vital part of an ecosystem is the stability of its producers and decomposers.	· **People of the Bog (Portal)** · **Where Are The Frogs? (Portal)** · **Macroinvertebrate Mayhem (p: 343)**	• Analyze the role of producers and decomposers in transferring energy and matter through natural systems. • Provide examples of how producers and decomposers produce goods and ecosystem services that are essential to all organisms, including humans. • Describe how humans and their practices benefit from the stability of producers and decomposers in natural systems. • Evaluate how various human practices can alter the stability of producers and decomposers in natural systems. • Identify what can happen to an ecosystem if the stability of its producers and decomposers is compromised.

High School -- Earth Science		
Academic Content Standards	**Project WET Activities**	**Environmental Education Initiative Learning Objectives**
Energy in the Earth System (High School- Earth Science)		
5. Heating of Earth's surface and atmosphere by the sun drives convection within the atmosphere and oceans, producing winds and ocean currents. As a basis for understanding this concept:		• Explain how the production of winds and ocean currents through convection within the atmosphere and oceans (resulting from heating of Earth's surface and atmosphere) influences the distribution of terrestrial, freshwater and coastal ecosystems. • Provide examples of the direct and indirect influences of how the convection within the atmosphere and oceans influences humans and human communities. • Explain how the convection within the atmosphere and oceans affects the distribution of goods and ecosystem services from natural systems (e.g., water supply, ocean currents).
a. Students know how differential heating of Earth results in circulation patterns in the atmosphere and oceans that globally distribute the heat.	· **Adventures In Density (p: 3)**	• Describe the influence of atmospheric and oceanic circulation patterns on weather and weather patterns. • Explain how the circulation patterns and resulting weather patterns influence the distribution of terrestrial, freshwater and coastal ecosystems. • Provide examples of the direct and indirect influences of atmospheric and oceanic circulation patterns on humans and human communities. • Explain how of atmospheric and oceanic circulation patterns affect the distribution of goods and ecosystem services from natural systems (e.g., water supply).
b. Students know the relationship between the rotation of Earth and the circular motions of ocean currents and air in pressure centers.	· **Piece It Together (Portal)**	• Recognize that the circular motion of ocean currents and air in pressure centers influences the distribution of nutrients and organisms, thus influencing the goods and ecosystem services provided by coastal and marine systems. • Describe how the rotation of Earth results in circulation patterns in the atmosphere and ocean that govern the flow of energy within and between natural systems. • Explain that fluctuations in climate and weather conditions resulting from the rotation of Earth and the circular motions of ocean currents affect ocean temperature, thereby changing the distribution of organisms (e.g., fish and algae) on which humans depend.

d. Students know properties of ocean water, such as temperature and salinity, can be used to explain the layered structure of the oceans, the generation of horizontal and vertical ocean currents, and the geographic distribution of marine organisms.	· **Adventures In Density (p: 3)** · **Ocean Habitats (p: 73)**	• Identify the properties of ocean water that can affect the geographic distribution of coastal and marine organisms. • Describe how the layered structure of the oceans and, horizontal and vertical ocean currents influence the geographic distribution of coastal and marine organisms. • Explain the importance of coastal and marine organisms to human lives and communities. • Provide examples of human practices that can locally influence the layered structure of the oceans or horizontal and vertical ocean currents. • Explain how changes to the geographic distribution of marine organisms can influence coastal and marine ecosystems, and human communities and economies.
e. Students know rain forests and deserts on Earth are distributed in bands at specific latitudes.	· **Piece It Together (Portal)**	• Describe the properties of rain forests and map their locations on Earth. • Describe the properties of deserts and map their locations on Earth. • Identify factors that affect the geographic distribution of rain forests and desert ecosystems on Earth. • Explain the importance of rain forests and desert ecosystems to human lives and communities. • Provide examples of human practices that can influence the functioning or geographic distribution of rain forests and desert ecosystems. • Explain how changes to the geographic distribution of rain forests and desert ecosystems can influence humans and human communities, economies and cultures. • Describe the role of scientific knowledge on making policy and management decisions about human activity related to rain forests and desert ecosystems.
f.* Students know the interaction of wind patterns, ocean currents, and mountain ranges results in the global pattern of latitudinal bands of rain forests and deserts.	· **Piece It Together (Portal)**	

6. Climate is the long-term average of a region's weather and depends on many factors. As a basis for understanding this concept:		
a. Students know weather (in the short run) and climate (in the long run) involve the transfer of energy into and out of the atmosphere.	· **Discover the Waters of Our National Parks (p: 493)*** · **Piece It Together (Portal)** · **Wet Vacation (Portal)***	• Describe effects of weather and climate on the functioning of natural systems and the production of goods and ecosystem services by these systems. • Provide examples of direct and indirect effects of weather and climate on humans and human communities, economies and cultures.
b. Students know the effects on climate of latitude, elevation, topography, and proximity to large bodies of water and cold or warm ocean currents.	· **Discover the Waters of Our National Parks (p: 493)*** · **Piece It Together (Portal)** · **Wet Vacation (Portal)***	• Provide examples of direct and indirect effects of latitude, elevation, and topography on the functioning of natural systems and the production of goods and ecosystem services by natural systems.
c. Students know how Earth's climate has changed over time, corresponding to changes in Earth's geography, atmospheric composition, and other factors, such as solar radiation and plate movement.	· **Old Water (Portal)**	• Identify how changes to Earth's climate, geography, and atmospheric composition influence the functioning of natural systems and the production of goods and ecosystem services by natural systems. • Provide examples of direct and indirect effects of changes to Earth's climate, geography, and atmospheric composition on humans and human communities, economies and cultures. • Identify how human activities can contribute to changes in climate and atmospheric composition. • Describe the effects of changes to Earth's climate, geography, and atmospheric composition on evolutionary processes.

California Geology (High School- Earth Science) ***9. The geology of California underlies the state's wealth of natural resources its natural hazards. As a basis for understanding this concept:***		
a. Students know the resources of major economic importance in California and their relation to California's geology.	· **8-4-1, One for All (p: 299)** · **Discover the Waters of Our National Parks (p: 493)*** · **Get the Ground Water Picture (p: 143)** · **Snow and Tell (p: 387)**	• List natural resources of major economic importance to California and describe how they are economically important. • Identify the sources and locations of these major natural resources in California. • Correlate the sources and locations of these major natural resources with California's geological features. • Classify these resources as renewable, non-renewable, or effectively inexhaustible. • Describe the methods used to extract, harvest, transport and consume the major natural resources and explain the effects of these practices on the geographic extent, composition, biological diversity, and viability of natural systems. • Identify the byproducts of extracting, harvesting, transporting and consuming these natural resources and describe the direct and indirect effects of those byproducts on natural systems, human life and human communities, economies and cultures. • Describe the factors that limit knowledge about the scope and potential environmental impacts resulting from extracting, harvesting, transporting and consuming the major natural resources. • Describe the role of scientific knowledge on making policy and management decisions about human activity related to extracting, harvesting, transporting and consuming the major natural resources.

c. Students know the importance of water to society, the origins of California's fresh water, and the relationship between supply and need.	· **8-4-1, One for All (p: 299)** · **Choices and Preferences (Portal)** · **Color Me A Watershed (p: 239)** · **Discover the Waters of Our National Parks (p: 493)*** · **Get the Ground Water Picture (p: 143)** · **Pass The Jug (p: 447)** · **Snow and Tell (p: 387)** · **Virtual Water (p: 289)** · **Water Audit (p: 469)** · **Your Hydrologic Bank Account (p: 223)**	• List major uses of water in California and describe their importance to society. • Identify the sources and locations of major water supplies in California (e.g., surface water, reservoirs, and aquifers). • Describe the methods used to collect, transport and consume water in California. • Provide examples of the direct and indirect effects of the growing human demand for water on the geographic extent, composition, biological diversity, and viability of natural systems. • Describe the spectrum of considerations that are involved in decisions about California's supplies of fresh water. • Describe the factors that limit knowledge about the scope and potential environmental impacts of water resource policies (e.g., economics, environmental costs and benefits, public health, historical and cultural implications, and personal views). • Describe the role of scientific knowledge on making policy and management decisions about human activity related to California's water supply.

High School -- Investigation & Experimentation

Academic Content Standards	Project WET Activities	Environmental Education Initiative Learning Objectives
1. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other four strands, students should develop their own questions and perform investigations. Students will:		
a. Select and use appropriate tools and technology (such as computer-linked probes, spreadsheets, and graphing calculators) to perform tests, collect data, analyze relationships, and display data.	· **Adventures in Density (p: 3)** · **Back To The Future (p: 307)** · **Color Me a Watershed (p: 239)** · **H2Olympics (p: 13)** · **Is There Water on Zork? (p: 27)** · **Pucker Effect (The) (p: 363)** · **Reaching Your Limits (p: 371)** · **Snow and Tell (p: 387)** · **Storm Water (p: 395)** · **Water Audit (p: 469)** · **Water Quality? Ask the Bugs! (p: 421)** · **What's the Solution? (p: 37)** · **Where Are The Frogs? (Portal)**	The environmental principles and concepts provide fertile ground for the development of investigations and experiments that are directly related to achieving mastery of California's science content standards. As stated by the California State Board of Education, such "activities must be cohesive, connected and build on each other to lead students to a comprehensive understanding of the California Science Content Standards." Environment-based investigations and experiments can also help teachers conform to recommendations of the California State Board of Education that "hands-on activities compos) at least 20 to 25 percent of the science instructional program (as specified in the California Science Framework."
c. Identify possible reasons for inconsistent results, such as sources of error or uncontrolled conditions.	· **Grave Mistake (p: 315)** · **H2Olympics (p: 13)** · **Hangin' Together (p: 19)** · **Is There Water on Zork? (p: 27)** · **Pucker Effect (The) (p: 363)** · **Snapshot in Time (p: 377)** · **Snow and Tell (p: 387)** · **Storm Water (p: 395)** · **Water Audit (p: 469)** · **Water Quality? Ask the Bugs! (p: 421)** · **Wet Vacation (Portal)*** · **What's the Solution? (p: 37)** · **Where Are The Frogs? (Portal)**	

d. Formulate explanations by using logic and evidence.	· **8-4-1, One for All (p: 299)** · **Adventures in Density (p: 3)** · **Back To The Future (p: 307)** · **Color Me a Watershed (p: 239)** · **Get the Ground Water Picture (p: 143)** · **Grave Mistake (p: 315)** · **H2Olympics (p: 13)** · **Invaders! (p: 263)** · **Is There Water on Zork? (p: 27)** · **People of the Bog (Portal)** · **Piece It Together (Portal)** · **Pucker Effect (The) (p: 363)** · **Reaching Your Limits (p: 371)** · **Snapshot in Time (p: 377)** · **Snow and Tell (p: 387)** · **Super Bowl Surge (405)** · **Super Sleuths (p: 113)** · **Water Audit (p: 469)** · **Water Quality? Ask the Bugs! (p: 421)** · **Wet Vacation (Portal)*** · **What's the Solution? (p: 37)**	
h. Read and interpret topographic and geologic maps.	· **Color Me A Watershed (p: 239)** · **Snapshot in Time (p: 377)**	
l. Analyze situations and solve problems that require combining and applying concepts from more than one area of science.	· **Adventures in Density (p: 3)** · **Back To The Future (p: 307)** · **Color Me a Watershed (p: 239)** · **Grave Mistake (p: 315)** · **Invaders! (p: 263)** · **Is There Water on Zork? (p: 27)** · **Make a Mural (p: 515)** · **People of the Bog (Portal)** · **Pucker Effect (The) (p: 363)** · **Snapshot in Time (p: 377)** · **Snow and Tell (p: 387)** · **Storm Water (p: 395)** · **Super Bowl Surge (405)** · **Water Audit (p: 469)** · **Where Are The Frogs? (Portal)**	

m. Investigate a science-based societal issue by researching the literature, analyzing data, and communicating the findings. Examples of issues include irradiation of food, cloning of animals by somatic cell nuclear transfer, choice of energy sources, and land and water use decisions in California.	· **Adventures in Density (p: 3)** · **Back To The Future (p: 307)** · **Color Me a Watershed (p: 239)** · **Grave Mistake (p: 315)** · **Invaders! (p: 263)** · **Make a Mural (p: 515)** · **Storm Water (p: 395)** · **Super Bowl Surge (405)** · **Super Sleuths (p: 113)** · **Virtual Water (p: 289)** · **Water Audit (p: 469)** · **Where Are The Frogs? (Portal)** · **Whose Problem Is It? (Portal)**	
n. Know that when an observation does not agree with an accepted scientific theory, the observation is sometimes mistaken or fraudulent (e. g., the Piltdown Man fossil or unidentified flying objects) and that the theory is sometimes wrong (e.g., the Ptolemaic model of the movement of the Sun, Moon, and planets)	· **Super Sleuths (p: 113)**	