

WALDEN WEST OUTDOOR SCHOOL CURRICULUM GUIDE INTRODUCTION

The Walden West Outdoor School program is designed to teach fifth and sixth grade students about the natural sciences while helping teachers fulfill state science standard requirements. The Walden West program consists of four and five day resident programs that run from September to June at two separate locations.

The Sanborn site, which is owned by the County Office of Education, is located four miles southwest of Saratoga, and is situated on 32 acres of redwood and Douglas fir forest. It is surrounded by Sanborn County Regional Park, which provides an additional 3500 acres of thickly forested land and over 70 miles of wooded trails.

The second site operates out of Camp Costanoan and is located in Stevens Creek County Park. This Cupertino foothills facility offers 1000 acres of parkland that provides numerous learning opportunities in an oak woodland setting. A variety of communities including forest, chaparral, meadow, and riparian are easily accessible and provide ideal study areas at both locations.

All correspondence should be addressed to:

**WALDEN WEST CENTER
15555 Sanborn Road
Saratoga, California 95070**

Phone (408) 867-5950
Fax (408) 867-9667

WALDEN WEST OUTDOOR SCHOOL PHILOSOPHY

Our continued well being depends upon the health of our planet. In order to have a continuous supply of energy, clean water and air we must understand the Earth's natural processes. We have removed ourselves from contact with the natural environment. People seldom hunt or grow their own food. Instead we live in a world of convenience. With the flip of a switch we have energy for lights, cooking appliances, power tools, VCR's and CD's. We have indoor plumbing, powered transportation and 24-hour grocery stores. Unfortunately it is easy to neglect the importance of the balance of nature while enjoying these conveniences.

Walden West Outdoor School emphasizes three major components, people, the environment, and education. Our goal is to provide the best possible outdoor science program through the use of hands-on learning, science processes, and a curriculum focused on children and nature. Our environmental emphasis weaves itself throughout the standards based curriculum.

In traditional education, educators assemble material for children to study in the classroom. The Walden West program allows students to see and be a part of what they are studying. The natural environment provides for the perfect classroom when studying about the natural sciences.

Through their experiences at Walden West, students will develop an awareness and appreciation for the natural environment. It is our goal that this new understanding will help to empower students to make sound ecological decisions and motivate them to care for their communities when they return to school.

WALDEN WEST OUTDOOR SCHOOL

THEMES AND CONTENT AREAS

The Walden West curriculum is rich in the life and Earth sciences and is closely aligned to the Science Standards developed by the California Academic Standards Commission. The following curriculum details subject areas that are Walden West's focus and shows the alignment to current content standards.

In addition to the academic core content of science, the Standards Commission recognizes that students must build connections to issues such as population, natural resources, environmental quality, and global challenges. Walden West's environmental focus helps students' do that.

The Walden West Outdoor School program achieves much more than fulfilling the state science standards. Exposure to the magnificence of nature, the joy of meeting new friends, the enhancement of a child's personal responsibility and sense of independence, and the feelings of accomplishment after a week away from home create a once in a lifetime experience. Not only is science learned, but social skills that are acquired will help them throughout their life.

Our program emphasizes hands on activities and a high level of student involvement in order to strengthen the feeling of responsibility that children have for the environment.

The six themes studied at Walden West help to organize students' learning so they can make connections as they link one subject to another.

In summary the following standards are addressed:

<u>4th grade</u>	<u>5th grade</u>	<u>6th grade</u>
Life 2 a, b, c	Life 2 e, f, g	Earth 1 d, e, f
3 a, b, c	Earth 3 a, b, c, d, e	2 a, b
Earth 5 b, c	4 a, b, d	Physical 4 a, e
	5 a, b, c	Ecology 5 a, b, c, d, e
	Invest. 6 a, b, f, g, h, i	Resources 6 b, c
		Invest. 7 a, b, c, d, e, g, h

1. **SYSTEMS** - Systems are made of interacting or independent groups that form a whole. An ecosystem and our solar system are examples.
 - A. **COMMUNITIES/ECOSYSTEMS** - Communities are made up of plants, animals and other organisms that live in a particular area and depend on each other for survival. An ecosystem consists of all organisms in a community as well as the environmental factors with which they interact. (4th Life 3a,c) Broad factors such as sunlight, temperature, and precipitation dictate the kinds and numbers of plants and other living things in a community.
 1. Communities studied at Walden West include the forest, chaparral, meadow, and riparian (ponds and streams.)
 2. Habitat is the environment in which an animal lives that provides food, water, shelter, and space.
 3. Niche is an organism's role or job within an ecosystem. (6th Ecology 5d)
 4. Populations are the number of animals and plants within a community.
 - a. Species is a group of like animals or plants that can reproduce fertile offspring.
 - b. Carrying Capacity is the greatest number of animals that can live in a given area. (6th Ecology 5e)
 - c. Fluctuations are increases and decreases of populations and are caused by: (6th Ecology 5e)
 1. Limiting Factors: Available food, water, shelter, and space
 2. Reproduction rate
 3. Disease and predation
 4. Human intervention
 - B. **SOLAR SYSTEM** - Our solar system is in the Milky Way, which consists of planets, moons, and asteroids that orbit around our sun. (5th Earth 5b) The path that planets take around the sun is due to the gravitational force between the sun and planet. (5th Earth 5c)
 1. Galaxies - Galaxies contain a billion to a trillion stars as well as huge gas and dust clouds. Our own galaxy is the Milky Way.
 2. Constellations - Constellations are groups of stars identified by various patterns.
 3. Stars - Stars are glowing balls of gas that give off light. (5th Earth 5a)
 - a. Star distances are measured in light years.
 - b. A star's brightness is not necessarily a factor of proximity.
 - c. Stars shine from their own light, while planets and the moon shine from reflected light.
 - d. Our sun is the largest body in the solar system and is composed primarily of hydrogen and helium.

4/5 th grade California Content Standards	6 th Grade California Content Standards
<ul style="list-style-type: none"> • Many plants depend on animals for pollination and seed dispersal and animals depend on plants for food and shelter. (4th Life 3c) • Ecosystems can be characterized by their living and nonliving components. (4th Life 3a) • The Solar System includes the planet Earth, the Moon, the Sun, eight other planets and their satellites, and smaller objects, such as asteroids and comets. (5th Earth 5b) • The path of a planet around the sun is due to the gravitational force between the sun and planet. (5th Earth 5c) • The Sun, an average star, is the central and largest body in the solar system and is composed primarily of hydrogen and helium.(5th Earth 5a) 	<ul style="list-style-type: none"> • Different kinds of organisms may play similar ecological roles in similar biomes. (6th Ecology 5d) • 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. (6th Ecology 5e)

2. **ENERGY FLOW/NUTRIENT CYCLE** - Energy comes in the form of natural gas, petroleum, wind water and solar power. Energy passes from the sun to the plants, and then to animals through a food chain.
- A. **ENERGY FORMS** - Energy comes in the form of natural gas, petroleum, wind, hydro, and solar power, all of which can be used to provide energy for our use. (4th Physical 1a)
- B. **PHOTOSYNTHESIS** - Photosynthesis is the process by which plants convert sun, carbon dioxide, water, and nutrients from the soil to produce sugar and oxygen.
1. Vascular Transport - Sugar, water, and minerals are transported in plants in a vascular network. (5th Life 2e)
 2. Energy Conversion - Carbon dioxide and sun energy are used by plants to produce sugar for growth and maintenance. In doing so, oxygen and water are released. (5th Life 2f),(6th Ecology 5a)
 3. Chlorophyll - Plants have the ability to photosynthesize because they have light trapping cells called chlorophyll in their leaves.
 4. Producers - Plants are called producers because they are the beginning of the food chain and can convert sunlight energy to a form of energy useable to animals. All animals are consumers. (4th Life 2a),(6th Ecology 5a)

4/5 th Grade California Content Standards	6 th Grade California Content Standards
<ul style="list-style-type: none"> • How to design and build simple series and parallel circuits by using components such as wires, batteries and bulbs. (4th Physical 1a) • Plants are the primary source of matter and energy entering most food chains. (4th Life 2a) • How sugar, water, and minerals are transported in a vascular plant. (5th Life 2e) • Plants use carbon dioxide and energy from sunlight to build molecules of sugar and release oxygen. (5th Life 2f) 	<ul style="list-style-type: none"> • Energy entering ecosystems as sunlight is transferred by producers into chemical energy through photosynthesis and then from organism through food webs. (6th Ecology 5a)

3. **CYCLES** - Cycles are a series of changes, which return to a starting point. Examples are the nutrient, life, rock and water cycle.

A. **ENERGY CYCLE** - Organisms in ecosystems exchange energy and nutrients among themselves and with the physical environment. Energy is transferred to different trophic levels of the food chain. Plants begin this cycle through the conversion of sun energy to a form of energy animals can use. (4th Life 2a) Populations of organisms can be categorized by the function they serve in the ecosystem. (6th Ecology 5c)

1. Energy Transfer - Over time matter is transferred from one organism to others in the food web, and between organisms and the physical environment. (6th Ecology 5a,b),(6th Physical 3d)
2. Energy Loss - As energy moves through the cycle, some is lost at each level of transfer.
3. Energy Movement - Energy moves through the system beginning with producers (plants) transferring to consumers (animals), scavengers, and decomposers, then back to the soil for plants to reuse. (5th Life 2g)

B. **WATER CYCLE** - Water on Earth moves between the oceans and land through the process of evaporation, condensation, and precipitation. (5th Earth 3 a,b,c,d),(6th Physical 4a)

Energy from the sun heats the Earth unevenly, causing air movements that result in changing weather patterns. (5th Earth 4 a,b,d) These patterns are influenced by differences in pressure, heat, air movement and humidity. (6th Physical 4e)

4/5 th Grade California Content Standards	6 th Grade California Content Standards
<ul style="list-style-type: none"> • Plants are the primary source of matter and energy entering the food chains. (4th Life 2a) • Plant and animal cells break down sugar to obtain energy, a process resulting in carbon dioxide and water (respiration). (5th Life 2g) • Most of the Earth's water is present as salt water in the oceans, which cover most of the Earth's surface. (5th Earth 3a) • 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. (5th Earth 3b) • 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 fall to Earth as rain, hail, sleet, or snow. (5th Earth 3c) • 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. (5th Earth 3d) • Uneven heating of the Earth causes air movement (5th Earth 4a) • The ocean influences weather, and plays a role in the water cycle (5th Earth 4b) • Weather maps and forecasts predict local weather, and that prediction depends on many changing variables (5th Earth 4d) 	<ul style="list-style-type: none"> • Sun is a major source of energy for phenomena on the Earth's surface; it powers winds, ocean currents and the water cycle. (6th Physical 4a) • Energy entering ecosystems as sunlight is transferred by producers into chemical energy through photosynthesis and then from organisms to organism through food webs. (6th Ecology 5a) • Matter is transferred over time from one organism to others in the food web and between organisms and the physical environment. (6th Ecology 5b) • Differences in pressure, heat, air movement and humidity result in changes of weather. (6 Physical 4e)

4. **CHANGE** - Our natural world is always changing. Some changes take many years, others happen quickly. Through evolution, plants and animals may change to survive in their environment. Land changes due to earthquakes and weathering, which is part of the erosion process.
- A. **SUCCESSION** - Succession is the gradual change of dominant plants and animals in a given area. This transition creates new communities. An example is a pond changing to a meadow and later to a forest.
- B. **ADAPTATIONS** - Adaptations are special characteristics that enable plants and animals to survive in the environment. These characteristics are attained through evolution and are not acquired during an animal's lifetime. (4th Life 3b)
- C. **GEOLOGIC PROCESSES** - The Earth's geologic features are constantly changing. Plate tectonics is the vehicle for much of this change and explains important features of the Earth's surface and major geologic events. (6th Earth 1f)
1. The Earth's surface is reshaped by weathering of rock and soil, and by the transportation and deposition of sediment. (6th Earth 2a,b) Wind, Water, and the combination of heat and cold all contribute to the wearing away of the Earth's surface. Human impact is a contributing factor. (4th Earth 5a,b,c)
 2. Earthquakes are sudden movements along breaks in the crust. Where this movement occurred is called a fault. (4th Earth 5a) (6th Earth 1d,e)

4/5 th Grade California Content Standards	6 th Grade California Content Standards
<ul style="list-style-type: none"> • In any particular environment, some kinds of plants and animals survive well, some survive less well and some cannot survive at all. (4th Life 3b) • 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. (4th Earth 5a) • Natural processes, including freezing and thawing and the growth of roots, cause rocks to break down into smaller pieces. (4th Earth 5b) • 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, deposition). (4th Earth 5c) 	<ul style="list-style-type: none"> • Earthquakes are sudden motion along breaks in the crust called faults and that volcanoes and fissures are locations where magma reaches the surface. (6th Earth 1d) • Major geologic events, such as earthquakes, volcanic eruptions and mountain building, result from plate motions. (6th Earth 1e) • Plate Tectonics explain major features of California geology (including mountains, faults, volcanoes) in terms of plate tectonics. (6th Earth 1f) • Water running downhill is the dominant process in shaping the landscape, including California's landscape. (6th Earth 2a) • Rivers and Streams are dynamic systems that erode and transport sediment, change course, and flood their banks in natural and recurring patterns. (6th Earth 2b)

5. **RELATIONSHIPS** - All living things depend on other living and non-living things for survival. We are connected and what happens to one living thing affects all others.

A. **CLASSIFICATION** - The classification process gives order to the vast array of plant and animal species. It also helps us to see the process of evolution and gives information about a specific plant or animal.

Fish, Amphibians, Reptiles, Birds, and Mammals are animal classes discussed at Walden West.

B. **RELATIONSHIPS** - All organisms depend on other living and non-living things for survival.

1. Predation - The process of one animal feeding upon another is predation.

2. Prey - An animal that is a food source for another animal is prey

3. Food Chain - The linear connection of predator/prey relationships is a food chain. It is part of a much larger structure known as the food web. (4th Life 2b,c)

4. Food Web - The food web is composed of interconnected food chains. (6th Ecology 5b)

5. Human Impact - Our actions have a direct impact upon the environment and the survival of all things.

4/5 th Grade California Content Standards	6 th Grade California Content Standards
<ul style="list-style-type: none"> • Producers and consumers (herbivores, carnivores, omnivores, decomposers) are related in food chains and food webs and may compete with each other for resources in an ecosystem. (4th Life 2b) • Decomposers, including many fungi, insects and microorganisms, recycle matter from dead plants and animals. (4th Life 2c) 	<ul style="list-style-type: none"> • Matter is transferred over time from one organism to others in the food web and between organisms and the physical environment. (6th Ecology 5b)

6. **RESPONSIBILITY** - Each individual must make an effort to live lightly on the Earth in order to keep it a safe and healthy place to live. This responsibility is ours to own and not pass to the next generation or blame the last. If we all act now, we can protect our future.
- A. **CONSERVATION** - The way in which we use the Earth's resources determines how long they will last. Being aware of our resource usage and learning to use those resources wisely is called conservation.
1. Useable energy – Energy in the home comes in the form of gas and electricity. By being aware of the amount of energy we use, we can reduce the amount of energy wasted.
 2. Limited Resources – Some resources such as wind, solar and hydropower are unlimited because we will never run out. Others such as coal, steel, and oil are limited. To ensure a continued supply, we must conserve our use of limited resources and use unlimited resources wisely.
 3. Watershed Stewardship - Water from our neighborhood communities flows from creeks to rivers before making its way to the bay and ocean. Through the use of reservoirs, aquifers, and aqueducts, water is stored for future use. Our limited usage ensures the continued supply of water. It is our responsibility to maintain the quality of our water. (5th Earth 3e)
- B. **RENEWABLE/NON-RENEWABLE** - Some of our natural resources are renewable, other natural resources that take millions of years to form and accumulate are non-renewable. Non-renewable resources are in limited supply. To ensure their longevity, we must conserve them by considering alternatives. (6th Resources 6b)
- C. **PRE-CYCLING/RECYCLING** - By pre-cycling, using products that have little packaging waste, or recycling, we not only save resources but cut down on waste as well. (6th Resources 6c)
- D. **ENDANGERED SPECIES** - Habitat loss is the largest contributing factor to species endangerment or loss. With awareness and proper habitat management, we can ensure the protection of both plants and animals.
- E. **APPRECIATION** - Through education we will understand the importance of caring for our environment and be more knowledgeable in making decisions that affect our environment

4/5 th Grade California Content Standards	6 th Grade California Content Standards
<ul style="list-style-type: none"> • The origin of the water used by their local communities. (5th Earth 3e) 	<ul style="list-style-type: none"> • There are different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, forests and know how to classify them as renewable or nonrenewable. (6th Resources 6b) • Understand the natural origin of the materials used to make common objects. (6th Resources 6c)