



CALIFORNIA SEQUOIAS

Giant of the Earth

By Lee-Jean Lin

"The clearest way into the universe is through a forest wilderness."

-John Muir, Naturalist and Conservationist

Motivation

Students will learn about the life of Giant Sequoias, John Muir, and the history of Sequoia National Park. They will create their own vision of Giant Sequoias forest from a worm's eye view (1-point perspective), using the combination of watercolor and acrylic paint.

Life of Sequoias

Giant sequoias are nature's skyscrapers. These enormous trees exist primarily in Northern California. Giant sequoias can grow to be about 30 feet in diameter and more than 250 feet tall. One giant sequoia, known as General Sherman, is the world's largest tree, found in Sequoia National Park. General Sherman stands 275 feet tall, has a 102-foot circumference, and weighs an incredible 2.7 million pounds. Giant sequoias can live to 3,000 years, with the oldest on record living more than 3,500 years.

Sequoias grow naturally along the western slope of the Sierra Nevada Mountains, between 5,000 and 7,000 feet above sea level and far inland. That elevation provides the trees with dry mountain air necessary for their cones to open and release seeds. The snowpack from the Sierra Nevada provides sequoias with the thousands of gallons of water they drink every day. Sequoias have shallow roots and require well-drained soil. Originally, sequoias could be found throughout the Northern Hemisphere. Today, they are found only in 77 scattered groves in Northern California. Among the places that preserve giant sequoias are [Sequoia National Forest](#), Sequoia National Park, and [Giant Sequoia National Monument](#).

Mature sequoias lack branches on the lower half of their trunks. Sequoia trunks taper as they rise, forming a rounded top where individual branches sweep downward. Their green leaves are small, prickly, scale-like, and arranged in spirals. Both male and female cones are carried on the same tree.

Wood from mature giant sequoias is highly resistant to decay. Because of its brittle texture, the sequoia is not a valuable lumber species. It was, nevertheless, logged extensively around the turn of the 20th century.

Giant sequoias are in many ways adapted to forest fires. Their cinnamon-colored bark contains no flammable pitch or resin and is extremely thick. They also require periodic wildfire to clear competing vegetation and soil humus before successful regeneration can occur. Fires also bring hot air high into the canopy, which in turn dries and opens the cones. Repeated fires over the centuries sear through the bark of a tree's base and produce an ever-enlarging scar.

Old giant sequoias most commonly die by toppling. Weakening of the roots and lower bole by fire and decay is primarily responsible. The extreme weight of the trees, coupled with their shallow roots, increases the effects of this weakening, especially in leaning trees. Other causative factors include wind, water-softened soils, undercutting by streams, and heavy snow loads. In addition, fire scars have been cited as the main cause of dead tops, so common in older trees.

Human History in Sequoias

Humans have traveled or lived in the Southern Sierra for at least 6-7,000 years. In the late 1700s and early 1800s, Spanish agents began exploring the edge of the Sierra Nevada Range. Within 50 years or so, trappers, sheepherders, miners, and loggers poured into the Sierra seeking to use the mountains' resources. By the end of the 19th century, San Joaquin Valley communities increasingly looked to the Sierra for water and recreation. In the struggle between all these competing interests, two national parks were born that became known as Sequoia and Kings Canyon National Parks. Today, the parks together

protect well over 500 Native American archeological sites and over 100 historic sites. The number of recorded sites grows each year because of project surveys.

The saviour of the original sequoia forest of California was pioneer environmentalist **John Muir**, who wrote of the species in 1870:

“Do behold the King in his glory, King Sequoia! Behold! Behold! seems all I can say. Some time ago I left all for Sequoia and have been and am at his feet, fasting and praying for light, for is he not the greatest light in the woods, in the world? Where [else] are such columns of sunshine, tangible, accessible, terrestrialized?” [letter to Jean Carr]

John Muir (1838-1914) was America’s most famous and influential naturalist and conservationist. His letters, essays, and books telling of his adventures in nature, especially in the Sierra Nevada mountains of California, have been read by millions. He is one of California’s most important historical personalities. His activism helped to preserve the Yosemite Valley, Sequoia National Park and other wilderness areas. He was called "Father of the National Parks," "Wilderness Prophet," and "Citizen of the Universe." He founded The Sierra Club and there is a hiking trail in the Sierra Nevada, named in his honor – The 211 miles long "John Muir Trail". He has profoundly shaped the way Americans understand and envision their relationships with the natural world

Additional quotes from John Muir about the forest and the nature:

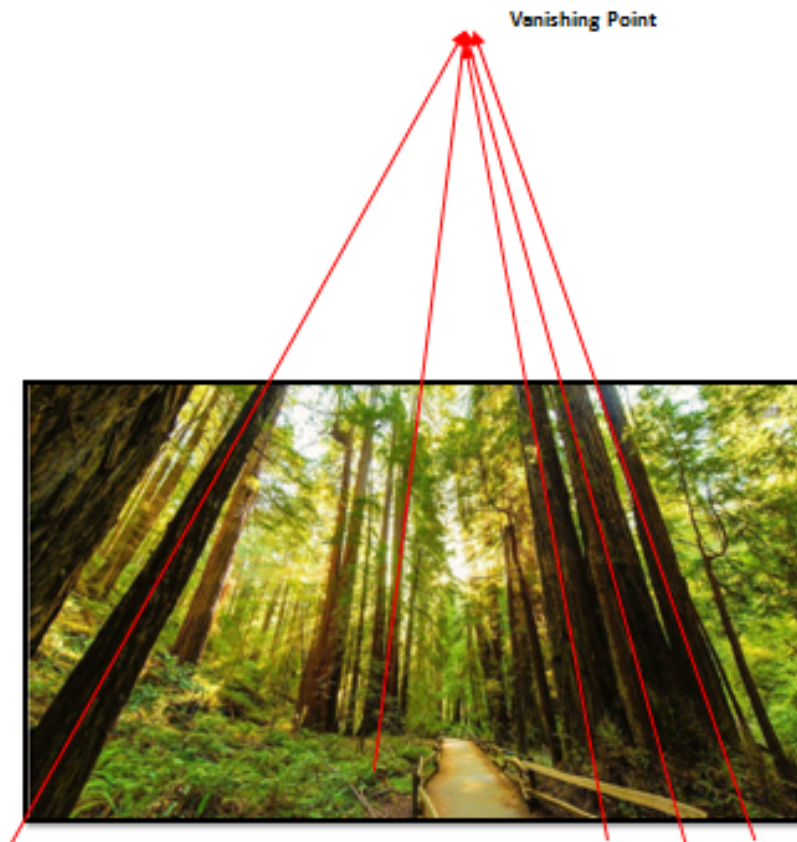
“Keep close to Nature's heart... and break clear away, once in a while, and climb a mountain or spend a week in the woods. Wash your spirit clean.”

“When one is alone at night in the depths of these woods, the stillness is at once awful and sublime. Every leaf seems to speak.”

“I only went out for a walk, and finally concluded to stay out till sundown, for going out, I found, was really going in.”

One-Point Perspective: Worm's Eye View

As things get further away, from us, they seem smaller and closer together. When they get far enough away, distances become ever tinier and so form a single point, i.e. Vanishing Point. Therefore, all lines getting farther from the viewer will have an angle towards a "Vanishing Point." A worm's-eye view is a view of an object from below, as though the observer were a worm; the opposite of a bird's-eye view. A worm's-eye view is often used in filming to look up to something to make an object look tall, strong and mighty.



Materials:

Supplies
Watercolor paper (Strathmore, 140#, 9x12")
Pencils, Erasers, Rulers, Water cups, Paper Towels
Blick liquid watercolors (Turquoise OR orange & magenta) – several drops per kid, diluted 50%. Store in sauce cup with lid.
Acrylic paint: • Dark brown-dime size; brick brown-nickel size; golden brown-dime size (e.g. Burnt Umber, Burnt Siena; yellow Ochre.) • Dark green-dime size, green-dime size, yellow-dime size, (e.g. Phthalo Green, green oxide)
Round nylon brushes (#12, #8) for watercolor and acrylic (Or use two brushes for watercolor and acrylic, respectively)
Foam plates for mixing.

Procedures:

Preparation

Dilute one part of liquid watercolor with one part of water and store in a sauce cups. Dispense acrylic brown and green paint when they need it.

Sketch

1. Explain worm's eye view (one-point perspective), vanishing point, show them various possible locations of a vanishing point (VP), e.g. center of the page, off-center, off the page on the table. Have students draw the vanishing point on the paper or on the table. (Tape the watercolor paper on the table if the VP is on the table.)

Adaptation: Young kids (K-2nd graders) tend to keep the VP inside the watercolor paper. You can help them by extending the height of the watercolor paper with a piece of sketch paper. Connect both papers with a tape on the back. They can draw the vanishing point on the sketch paper.

2. Draw 4 or 5 lines from the VP to the end of the paper. (USE A RULER.). Draw a second line next to each line to form a tree trunk. Make a combination of thick and thin trunks.

Note: Draw a check mark on tree trunk to separate the positive space (tree) from the negative space (sky). It looks better when the negative space is larger than the positive space.

3. Modify the height of each tree. Not all trees need to reach the VP. Trees with thinner trunks are younger trees and should be shorter than others.

Painting the Sky

4. Paint the sky (areas without check marks, negative space) with watercolor. Dip the end of brush handle and drip water on the sky to create clouds when it's still wet. If the sky is already dry, drip water on the sky, and dry with paper towel to lift the color. For morning or sunset theme, paint the sky orange and drip water or some magenta to create variation.

Note: Scrape excess paint off the brush on the edge of the cup before painting to avoid puddles on the paper.

Break - Story of Sequoias. While waiting for the sky to dry, tell them the life cycle of Giant Sequoia, human history with Sequoia, and the contribution of John Muir. Dispense acrylic paints at this time.

Painting Tree Trunks

5. Paint all tree trunks with brick brown (e.g. Burnt Siena)
6. Add and paint several tree branches. Keep in mind that matured sequoias lack branches on the lower half of their trunks)

7. Determine the direction of light source, dry brush the light side of the trunks and branches with Yellow Ochre. (Use short strokes to create texture of the tree barks. Let the base color show through.)
8. Wipe the paint brush with paper towel, mix with dark brown (e.g. Burnt Umber) and dry brush the dark side of the trunks and branches. (Use short strokes to create texture of the tree bark. Let Burnt Siena show through.)

Painting Leaves

9. Dot leaves with green (e.g. Green Oxide.) Use brushes or fingerpaint.
Note: Leaves should be smaller and closer together when they are further away from the bottom of the trunk.
10. Dot yellow on top and sunny side of the leaves.
11. Dot dark green on the shady side of the leaves.

Vocabulary

Negative Space: Negative space is the space around and between the subject(s) of an image (i.e. Positive Space). Negative space may be most evident when the space around a subject, and not the subject itself, forms an interesting or artistically relevant shape. The sky area in this project is the negative space.



One-Point Perspective: Vanishing Point: As things get further away, from us, they seem smaller and closer together. When they get far enough away, distances become ever tinier and so form a single point, i.e. Vanishing Point.

Texture: Texture is one of the elements of design which include line, shape, direction, size, value, and color. Texture is the surface quality of a shape - rough, smooth, soft, hard, glossy, etc. Texture can be physical (tactile) or visual. For example, Giant Sequoia bark is rough, thick, and spongy in texture.

