



California Nature Art Museum

Inspiring a love of nature

Acorn to Oak Tree

K-2 Grade Valley Oak Curriculum

Sponsored by the Goodall Family Charitable Foundation

Objectives:

- Explore oak trees, including the Valley Oak.
- Recognize that there are many different types of oak trees.
- Identify an oak tree by its leaves, bark and acorns.
- Recognize the acorn as the seed of an oak.
- Understand the life cycle of an oak tree.

California State Standards:

Kindergarten Standards:

Physical Sciences 1:a

Life Sciences 2:a-c

Investigation and Experimentation 4:d-e

Grade 1 Standards:

Life Sciences 2:a,b,c, and e

Investigation and Experimentation 4:a,b,d,e

Grade 2 Standards:

Physical Sciences 1:e

Life Sciences 2:a-f

Investigation and Experimentation 4:a-d,f,g



Teacher Background Knowledge:

Trees

To begin with the basics, what is a tree? **A tree is a plant.** Some trees can grow bigger than any other plant and live longer than any animal on earth. Their roots extend deep underground and hold the soil in place. Trees “drink” huge amounts of water each day through their roots. Some of that water passes through the leaves into the air to give us moisture. Trees also help **clean our air** by taking the part of it we can’t breathe (carbon dioxide) to make their own food. As they do this, **they make oxygen**, which is the air we breathe. Their leaves release the oxygen. Without trees, life on our planet would be hard to survive.

They **provide food and shelter** for thousands of living things. Many animals would be without homes and food if there were no trees. Birds, squirrels, insects, and mice are just a few of the animals that live in and around trees. These animals and others get much of their food from trees. Bark, nuts, and leaves, are tasty treats for many animals. Trees cover about one-third of the earth and are **the largest plants** in our world.

The Mighty Oak: Identify Parts

An oak tree is one type of tree. Oak trees are a prominent feature of California's landscape. Oak trees are found on rolling hills, along rivers, creeks and in valleys of 52 of California’s 58 counties. Here at the Wildling, we have a beautiful mural of a Valley oak tree painted by local artist John Iwerks.

Valley Oaks are the royalty of trees in California by virtue of their size, beauty, and age. The Valley oak tree is the largest oak tree found in California. It can grow to be over a hundred feet tall. The Valley oak can also live a long time, up to 300 years old!

Oak trees have three main parts: the **roots**, **trunk**, and **crown**. As they grow tall above the ground, exciting things are happening underground, too. Below the soil where we can’t see them, roots are spreading far out from the tree in all directions. The **roots** are creeping through the soil looking for water and nutrients (food). They’re also helping hold the tree in place so it doesn’t blow over. The tree’s main stem—called the **trunk**—keeps growing from year to year. The **trunk** keeps the tree standing strong and tall. It holds up the top part of the tree (the **crown**) and is a passageway for water and other fluids to move up and down the tree. The rough outer skin of the trunk is called **bark**. Valley oak trees are shielded by a thick gray bark

that has the texture of an alligator hide. The woody center inside the trunk is called **inner wood**. Humans stop growing bigger when they become adults, but trees grow all their lives. The **crown** of the tree is the **branches** and **leaves**. It has the important job of making food for the tree. The **leaves** are tiny “factories” that make food. To do this, they need water, air, minerals from the soil, and energy from the sun.

Life Cycle of an Oak

Like many other plants, trees grow from seeds. A Valley oak tree’s life begins with an acorn. **Acorns** contain the seeds of an oak tree. Inside the acorn’s hard shell is the seed. Acorns grow on an oak’s **branches**.



In the fall, acorns drop to the ground. In the spring, an acorn’s shell cracks open. A tiny root pushes out of the shell and down into the soil. The **root** brings water and food up from the soil. A small shoot, or **stem**, pushes up from the acorn. Tiny leaves unfold on the shoot. The stem brings water up from the root to the other parts of the tree. If the seedling continues to survive, the small shoot will grow into a young tree. It is called a **sapling**. The tree has very thin branches and just a few leaves. Each year, the oak tree grows bigger and bigger. More leaves appear. The tree’s trunk and branches become thicker.

In the fall, triggered by colder weather, some oak tree leaves change colors and then the leaves drop to the ground. Trees that lose their leaves in winter are called **deciduous**. Valley oaks, like the one in our mural, are deciduous. Many oaks (like Live Oak) keep their leaves all year round. But if they’ve lost their leaves, in the spring, buds form on the branches of the oak tree. New leaves will open from the buds. In the summer, flowers grow on adult oak trees. The flowers are called catkins. Catkins are long, slender flowers. They help the tree make new acorns. Young



acorns are green and as they mature (get older), they turn brown. In late summer they start falling off the tree, and the cycle continues. A fully grown oak tree can produce more than 50,000 acorns! Squirrels, birds, deer, and other animals eat many acorns. About one out of every 10,000 acorns will become an oak tree.

Photo by Marc Kummel

Review of Oak Tree Life Cycle

1. An oak tree grows from a seed called an acorn.
2. In Spring, the acorn grows a root into the ground. A stem pushes upward.
3. The stem grows into a young tree called a sapling.
4. About 20 years later, the oak is an adult tree. Its flowers make new acorns.

Lesson Approach for the Valley Oak Mural

Begin by encouraging the children to share what they know about trees: Where can we find trees? What do trees look like? Do all trees look the same? Explain that trees are plants. Talk about the ways that trees and other plants are alike. Look at the Valley Oak Mural and help the children identify its parts. Explain the jobs of the roots, trunk, branches, and leaves. Discuss the life cycle of a Valley Oak. Explain how the mighty tree begins with a tiny acorn.

Point out the Acorn Woodpeckers on the tree and the “granary” where they store acorns in the tree. Usually one older tree in a group is chosen to be the granary tree. Point out the squirrel who has an acorn in its mouth and is off to bury it somewhere. Ask if they think the squirrel will find it later. Many don’t—so what happens to the acorns that have been buried? Maybe they sprout and become a new tree! Or maybe a deer will come along and eat it.

Ask museum staff if they have any acorns, leaves or branches available for the class to touch and compare.

Optional: A looping video shows the process of how the artist, John Iwerks, created the mural. He first made many drawings which the staff picked from based on his observations of real Valley Oak trees in the area. He then created a grid system on the wall in order to create a proportionally accurate rendition on the large curved wall. He started with a layer of lighter colors as he “roughed in” the tree and then added more and more colors and various animals that can be found in our own area. He also hid an alligator in the tree! It is his own pun because the bark of Valley Oaks are described as being like alligator skin. Ask the class to see if they can find the alligator! (Ask a staff person or volunteer for assistance and for a laser pointer—it is up high and difficult to point out without a laser pointer).

Optional: Read children’s storybook *Little Acorn Grows Up* by Edward Gibbs

Leaf and Acorn Investigation (Classroom)

Materials Needed:

- Tree illustration for each student
- Sketching and drawing materials for each student
- Acorn, leaves, and bark samples
- Laminated reference pictures/descriptions for each oak leaf and acorn
- Hand lenses and measuring tape

Guided Lesson:

Review with students what the seed of an oak tree is called. Ask them to remember what happens to an acorn as it grows. Discuss with class again how an oak tree makes new acorns. Discuss the characteristics of oaks from your region, the Valley Oak. Create a list of adjectives that describe the characteristics of the leaves and acorns of the Valley Oak.

Divide the class into small groups of three or four students. Give each group an assortment of leaves and acorns and ask them to work together, using their tree charts, to determine which type of oak each leaf and acorn fell from.

Guide students to notice the difference in acorn caps. Some are “warty,” while others are scaly like “shingles” on a roof. These are useful characteristics that can be used to identify oak species. If you have them, distribute hand lenses to the students for closer examination of leaf edges and surfaces. Encourage the children to look at the bark. Ask: Can you describe how it feels? Remind students that the Valley Oak trees have alligator bark.

Pass tree rounds to the children and explain to them that the rounds are slices of a tree’s trunk. Use magnifying tools to look closely at the rounds. Draw their attention to the rings on the tree rounds. Explain that a tree forms a new ring every year, so the age of a tree can be determined by counting the tree rings. Remind students that the oak trees can live for a very long time. Another way to find the age of the tree is to wrap a tape measure around the trunk of the tree about three feet from the ground. The distance they would be measuring around the middle of the tree is called the girth. Every inch in the girth equals about one year in a tree’s growth. Have students try measuring around the tree rounds. Ask how old they think the tree is. Compare how old the tree is to their age. Have students compare the age of the tree from counting tree rings to measuring the girth.

Students may sketch the leaves and acorns. Students may also do leaf and bark rubbings/prints.

Extension (Optional): Sink or Float Experiment

Aim: Students will perform a test to see whether the oak acorn is healthy and will be able to grow into a tree.

Introduction:

Review with students the life cycle of an oak tree. Remind them that oak trees begin with an acorn, however only about one out of 10,000 acorns actually becomes a tree. This is the case for many reasons.

Not all acorns will be healthy. Some may not be completely formed or may have insect damage. Visually inspect the acorns for holes. Pinholes may indicate insect activity inside. These acorns may still grow, but may not be as healthy or have as much stored energy to help them sprout. Squeeze the acorns to make sure they are solid and shake them to ensure they don't rattle. (Squishy and rattling acorns may be set aside and dissected to explore what is wrong with them.) The acorn "sink & float" test can be an easy way to sort a large quantity of acorns quickly.

Activity:

Take caps off the acorns, place them in a container, and cover them with water. Immediately remove any acorns that float (Note: keep all "floater" acorns for the investigation activity). Remove seeds that have floated to the top of the container.

Drain off the water of "sinker" acorns and place these in storage containers. These acorns can be used for potential planting. (Allow class to plant one in pot to take home and another to watch grow in their classroom.)

Using the "floater" acorns, ask students to propose ideas or hypotheses about what may have caused these seeds to float. Allow students break open the seed to investigate its contents. Ask them to record their observations on the activity sheet.