



Lesson 7

Forest Families

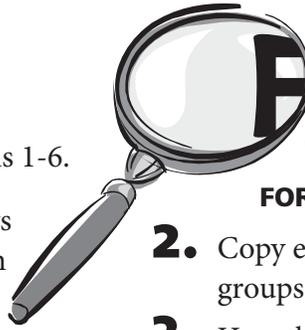
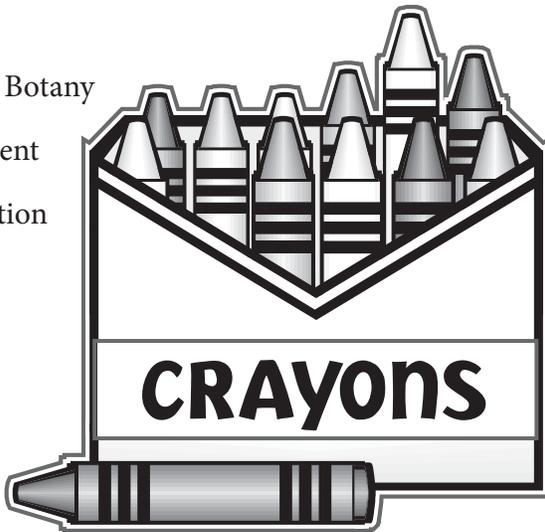


Objectives:

1. To reinforce the material presented in Lessons 1-6.
2. To provide an entertaining activity that allows for enrichment and expansion of information on the forest.

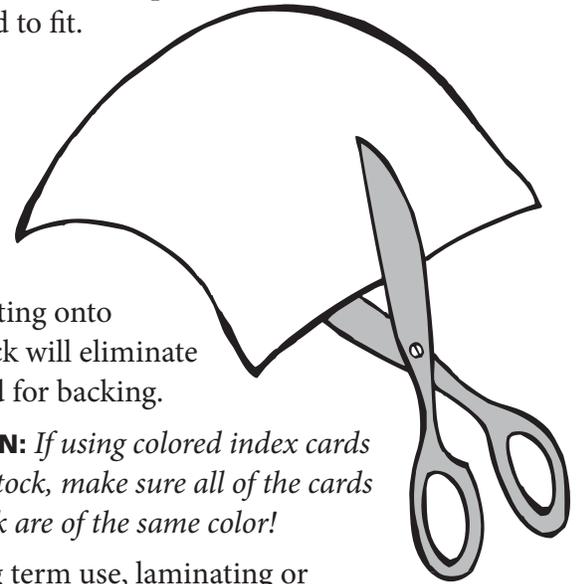
Subjects:

1. Art
2. Ecology / Botany
3. Government
4. Classification



Focus:

1. There are 36 cards in each deck, 6 **FOREST FAMILIES** with 6 members in each.
2. Copy enough decks so that students can play in groups of four to six per deck.
3. Have the students work in groups to cut apart the individual components of the game, **FOREST FAMILIES**.
4. If the cards have been duplicated on regular paper, they will need to be pasted onto index cards and trimmed to fit.



5. Duplicating onto cardstock will eliminate the need for backing.
CAUTION: *If using colored index cards or cardstock, make sure all of the cards in a deck are of the same color!*
6. For long term use, laminating or covering with clear contact paper is recommended.
7. **NORMAL PLAY:** The dealer hands out all the cards among four players (9 cards each) or six players (6 cards each)
8. **ALTERNATE PLAY:** For 3 or 5 players, the dealer should only hand out 5 cards to each player and place the rest of the cards in a draw pile. As the game progresses and a player loses his turn, he will draw from the pile and then discard a card from his own hand.

It is not recommended that the game be played with less than 3 players.

VOCABULARY

Review the vocabulary from Lessons 1-6



Forest Families



DIRECTIONS & RULES

Objectives:

To collect **FOREST FAMILIES** sets.
The player with the most number of sets is the winner.

Rules

1. The dealer shuffles the cards then passes them all out, face down, to all the players (If playing with 3 or 5, see the suggestions for alternate play.)
2. Players organize their hand in sets made from the **FOREST FAMILIES** that they were dealt.
3. The player to the right of the dealer begins the play. This “lead” player chooses a “target” player to question in order to collect more cards to add to the partial sets he already has in his hand.
4. The first question on every player’s turn is always to find out whether the target player has cards in a particular forest family that the lead player wishes to collect.

Example: “Tommy, do you have **Parts of a Tree** family?” If Tommy doesn’t have one of the cards in that set, he answers “No.” The first player then loses his turn.

5. If Tommy does have one or more in the chosen category, he answers the lead player, “Yes, I do.” He should not tell which card or cards he has. The lead player then can ask a question about a particular member of that family.

Example: “Tommy, do you have the Sapwood? If Tommy doesn’t have that particular card, the first player loses his turn. If Tommy has that card, he must hand over the card, and the first player gets to continue with his turn. He can now ask Tommy or another player about a forest family of his choice. The forest family may be a different one, or it may be in the same family he was collecting before.

6. Players take turns asking questions as they try to collect all the cards in a particular family until all the cards in the deck are collected in sets by the different players in that group.
7. Additional information about members of **FOREST FAMILIES** are on each card to allow players to review and add to what they have learned in the previous lessons.



Workers of the Forest

Workers of the Forest

GEOLOGIST



1. A geologist is an earth scientist.
2. Geologists make certain that when trees are harvested there won't be landslides or erosion problems.
3. Geologists work with a RPF to produce a timber harvest plan.

Workers of the Forest

HYDROLOGIST



1. A hydrologist is a water scientist.
2. Hydrologists protect rivers, streams, and other bodies of water during harvesting.
3. Hydrologists work with a RPF on timber harvest plans.

Workers of the Forest

BOTANIST



1. A botanist is a plant scientist.
2. Botanists protect all forms of plant life as an area is harvested.
3. Botanists work with a RPF to plan for replanting after harvesting.

Workers of the Forest

R. P. F



1. In California, a registered professional forester is the only person allowed to write a timber harvest plan.
2. A RPF checks with other forest specialists about where trees can be harvested, how harvesting is to be done, and what rules have to be followed to protect the forest.
3. Like a doctor or a lawyer, a RPF must first pass a very comprehensive test in order to get a license.

Workers of the Forest

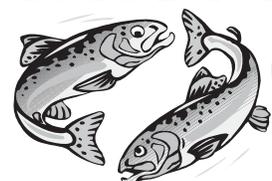
WILDLIFE BIOLOGIST



1. Makes sure that when trees are harvested, animals that live in the forest are protected.
2. Checks to see that animals have plenty of places to find food, hide, and take care of their young.
3. Works with a RPF to produce a timber harvest plan.

Workers of the Forest

FISHERIES BIOLOGIST



1. Checks to see that during harvesting, water will be kept clean.
2. Checks to see that fish will have many places in which to live and reproduce.
3. Works with a RPF to produce a timber harvest plan.

Forest Safeguards

Forest Safeguards

TIMBER HARVEST PLAN



1. Before a landowner in California can harvest timber, a written timber harvest plan must be approved by the Department of Forestry and Fire Protection.
2. A timber harvest plan describes in detail how the harvest will be done, how the area will be replanted, and what will be done to prevent erosion, keep water pure, and protect habitat.
3. A timber harvest plan can only be written by a registered professional forester.

Forest Safeguards

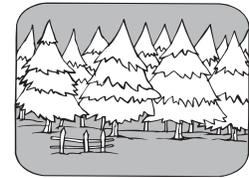
CLEAN WATER ACT



1. The Clean Water Act protects against watershed erosion that might clog rivers and streams.
2. The CWA regulates areas around city and county water supplies to maintain water quality.
3. About 85% of California's water comes from the forests by means of creeks, streams, and rivers.

Forest Safeguards

FOREST PRACTICES ACT



1. Controls all harvest-related activities on private lands in the state.
2. The California Forest Practices Act is the most comprehensive regulation in the nation.
3. It encourages private forest landowners to do whatever is necessary to protect and improve forest health.

Forest Safeguards

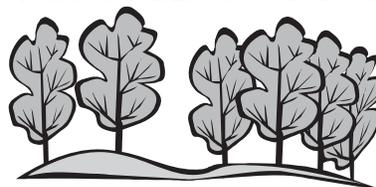
CONTROLLED BURNS



1. Controlled fires are usually set during the rainy season, when they can be more easily regulated.
2. Controlled burns reduce the amount of brush and debris on the ground.
3. California Native Americans set fires to open up the forests for crops, to make it easier to hunt, and to protect their villages.

Forest Safeguards

MANAGED THINNING



1. Thinning protects the forest by preventing overcrowding.
2. Thinned trees can be chipped for use by pulp and paper mills.
3. Thinned trees can be used as fuel to produce electricity at biomass power plants.

Forest Safeguards

SUSTAINED YIELD HARVESTING



1. Sustained yield means never harvesting more wood than the forest is currently growing.
2. California foresters plant 20-30 million seedlings every year!
3. Sustained yield harvesting provides the forest products we need and also makes sure that California's forests will be here today, tomorrow, and forever.

Types of Trees

Types of Trees

DOUGLAS-FIR



1. It has small, bristly cones that hang down from branches.
2. It has short, blunt needles.
3. It grows along the coast and inland areas of California.

Types of Trees

WHITE FIR



1. It has blue-green needles.
2. It has beehive-looking olive-green or purple cones that point up on the branch.
3. It grows at higher elevations.

Types of Trees

SUGAR PINE



1. It grows to 200 feet!
2. It has long, thin needles.
3. It has very long pine cones.

Image © Br. Alfred Brousseau, Saint Mary's College

Types of Trees

REDWOOD



1. It has short, flat needles.
2. It is found along the coast.
3. Its cone is the size of a large button.

Types of Trees

PONDEROSA PINE



1. It has long, dark yellow-green needles.
2. It grows to 180 feet tall.
3. It is common in the West, especially in the Sierras of California.

Image © Br. Alfred Brousseau, Saint Mary's College

Types of Trees

INCENSE CEDAR



1. Its branches are flattened with short, overlapping scales.
2. It grows along the western slopes of the Sierras.
3. Its strong, fragrant oils help make it insect and decay resistant.

Forest Products

Forest Products

ENERGY



1. Wood is a natural resource that is renewable, recyclable, and biodegradable.
2. Products made from fossil fuels, like coal and petroleum, are not renewable.
3. Wood scraps are burned at very high temperatures to provide the electricity needed to power our mills and homes.

Forest Products

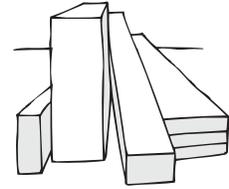
PAPER PRODUCTS



1. Machines at paper mills filter leftover paper-making ingredients to keep water clean.
2. Vacuums at paper mills filter out 99.9% of pollutants from the air.
3. Oxygen is added to the water around paper mills so that plants and fish stay healthy.

Forest Products

BUILDING MATERIALS



1. At the mill, lumber is stacked and left to dry out. This drying is called "seasoning".
2. Fresh wood has a lot of moisture in it. If it is not "seasoned", it may warp later on.
3. If lumber is too dry, it may crack.

Forest Products

RECREATION



1. National forests in California cover an area larger than the state of South Carolina.
2. Roads built by forest products companies make it easy to get to campsites, ski areas, and trailheads.
3. California has more than 300 state parks, 7 national parks, and 4 million acres of wilderness. National forests of California offer 13,000 miles of fishing rivers, 10,000 miles of trails, 2,400 lakes and reservoirs, and 22 major ski areas.

Forest Products

ANIMAL HABITAT



1. California forests are home to almost 650 species of fish and wildlife.
2. Strict state and federal laws require that forest products companies protect not just wildlife but also their habitat.
3. The word "habitat" comes from the Latin word for "home".

Forest Products

CLEAN AIR & WATER



1. Forests are oxygen factories. An acre of trees that grows 4,000 pounds of wood also produces 4,280 pounds of oxygen for us to breathe.
2. When forests get overcrowded, they quit growing. Trees then start to use oxygen instead of producing it.
3. Water that trees add to the air is important for rainfall patterns.

Natural Disasters of the Forest

Natural Disasters of the Forest

VOLCANOES



1. They cause forest fires when burning lava covers forests.
2. Mount St. Helens destroyed forests up to 20 miles from its mouth.
3. The wood destroyed could make a board that reaches to the moon and back and wraps around the earth ten more times.

Natural Disasters of the Forest

WINDS



1. Hurricanes are powerful enough to destroy a whole forest.
2. Large trees in overcrowded stands are often uprooted by severe storms because of their size and weak condition.
3. Our word "hurricane" comes from the Arawak word "jurakan", meaning a bad and destructive spirit.

Natural Disasters of the Forest

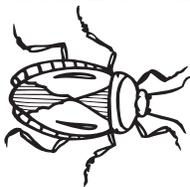
WILDFIRES



1. Wildfires often get so hot that they bake the soil and destroy all the biota in it.
2. Large wildfires can be prevented by reducing fuels through harvesting of trees and prescribed burns.
3. Controlled burns imitate Mother Nature by preventing the unhealthy effects of overcrowding and excess build-up of fuels.

Natural Disasters of the Forest

INSECTS



1. Bark beetles eat a circle around a tree and prevent nutrients and water from reaching all parts of the tree.
2. Insects can more easily attack and destroy trees that are stressed from overcrowding.
3. Insects do more damage than forest fires and diseases put together.

Natural Disasters of the Forest

DISEASE



1. A fungus takes nutrients away from the tree's cells.
2. Mistletoe and Dutch elm disease are examples of diseases.
3. Overcrowded trees are stressed and are more likely to be attacked by fungus and other diseases.

Natural Disasters of the Forest

STRESS

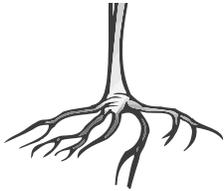


1. Competition for nutrients and water in overcrowded forests causes trees to become stressed.
2. Stressed trees are more likely to be killed or harmed by diseases, insects, drought, and violent acts of nature.
3. Overcrowded trees do not make good homes for most wildlife because their shade prevents the growth of ground plants that animals need.

Parts of a Tree

Parts of A Tree

ROOTS



1. Most trees have very large root systems.
2. Roots draw water and nutrients from below ground to cause growth above ground.
3. Because of root growth, the tree may be almost as large below the ground as above it.

Parts of A Tree

LEAVES/NEEDLES



1. Once they sprout, trees make their own food in their leaves or needles.
2. Chlorophyll is the substance that gives needles and leaves their green color.
3. Needles and leaves convert energy from the sun, water drawn from their roots, and carbon dioxide from the air to produce the sugars they use for "food".

Parts of A Tree

BARK



1. Outer bark protects the tree from weather, insects, disease, fire, and animals.
2. Inner bark (phloem) carries nutrients down from the leaves to the branches, the trunk, and the roots for growth.
3. Bark can be thick or thin: birch bark may be 1/4 of an inch thick; giant sequoia bark may be 2 feet thick.

Parts of A Tree

CAMBIUM



1. Cambium is made up of layers of cells that divide and grow, producing new layers of wood.
2. These layers of cells allow us to "read the rings" to tell a tree's age.
3. A dark ring and a light ring are produced each spring and summer. We count the dark rings to tell a tree's age.

Parts of A Tree

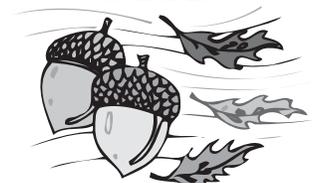
SAPWOOD



1. Sapwood (xylem) transports minerals and water from the roots to the crown of the tree.
2. Chemicals in the sap determine the color the leaves turn in the fall.

Parts of A Tree

SEED



1. Seeds carry the beginnings of life for a tree and also its food supply.
2. Seeds can be found in cones, nuts, or fruits.
3. Seeds fall in the autumn and are covered with a blanket of needles and leaves for the winter. They then sprout in the spring.