

TREE OF LIFE* CARPET EDUCATIONAL GUIDE

Carpet based on the Tree of Life poster from the
Carolina Biological Supply Company

Teacher Background Information

Why the “tree of life?” Trees are one of our most important natural resources, supplying fruit, lumber and paper pulp. In addition, the leaves release oxygen into the air as a by-product of photosynthesis. Trees provide homes and food for wildlife as well.

The Tree of Life poster is designed to promote a sense of the significance of trees and how important they are to the survival of many other organisms. Use any or all of the activities provided to help students explore the Tree of Life.

Black line masters include the following:

Tree of Life Scavenger Hunt

Tree of Life Word Search

Key to the Tree of Life poster, for identification and/or coloring

Tree of Life carpet insets outline drawings, for identification and/or coloring

To begin the Tree of Life study, brainstorm about the different kinds of trees the students are familiar with and the many uses of trees. Ask questions such as:

- “Why is a tree important?”
- “Does it hurt anything to cut down just one tree?”
- “What trees do you have in your yard?”
- “What animals or insects do you see on, in, or around the tree?”
- “If we didn’t have trees, would it matter?”
- “What do you like about trees, and how have you and your family used trees?”

Save the initial brainstorming list. Do a similar activity at the end of the study, and compare results.

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SUGGESTIONS FOR USING THE TREE OF LIFE* CARPET IN THE CLASSROOM

With the Tree of Life carpet, a teacher can make studying trees, animals, biology, and ecology the focus of her classroom for the year. Wonderful group times can spring from discussions concerning the sharing of our earth with others and the responsibility of humanity to care for the planet and life that inhabits it.

Much of the classroom curriculum can be related in some way to the themes of animals and trees. Teachers may choose to focus completely on trees, animals, or both. The following are suggestions concerning how a teacher may incorporate these themes in her classroom throughout the year. The possibilities are limitless, and these are only a few suggestions to jump-start the imagination.

Children may be asked to claim an animal early in the year, and that animal can designate the child's seat on the carpet and belongings, such as their cubby, for the whole year; or the teacher can choose to rotate the children around the animal circle, so each child can become familiar with all the animals.

The teacher may choose to teach a unit on animals, asking the children to research their "personal" animal and share the information with the class. Children can bring a stuffed animal from home to cuddle during individual reading time on the rug. The children will look forward to quiet, independent reading with their "friend."

The teacher can have the students study the habitats of the animals, make dioramas of the animal in its natural habitat, report on its habits, reproductive cycle, eating habits, whether it is endangered, becoming too prolific, etc. Perhaps the class can take a field trip to a nature center or zoo if possible to view some of these animals.

For art class, students can trace the outline of their animal on the rug, then paint, draw, or color their picture to display in the classroom. Clay or papier-mâché replicas can line the shelves with books borrowed from the library for the students to read on a comfortable corner of the carpet. The teacher can invite other classes to visit the room for a tour and oral presentations from the children.

Perhaps some animals could be kept in the classroom for the children to tend. Of course, no classroom should be without the mandatory gerbil or hamster. A turtle, newt, or fish are relatively easy classroom companions. Hatching baby chicks from eggs is extremely exciting for elementary grades, watching tadpoles develop into frogs never loses its appeal; and with a parent or friend's help, children can catch small amphibians, insects, reptiles, and spiders to put in gallon glass jars to create an enclosed ecological environment for observation.

Individual animals can be chosen for an entire unit. For instance, a unit can be created relating to owls. Children will enjoy going to a local nature center for an owl prowl. They can learn about the different types of owls, learn to identify them by their calls, study their habits, and open owl pellets to discover what they eat. Perhaps an ornithologist can visit the classroom and bring some stuffed species for a close examination.

Math activities can be related to the animals on the Tree of Life carpet. The children can count the animals. They can take measurements of the animal shapes on the rug and compare them to the actual measurements of the real animal. They can discuss the population of a particular animal, how many young it gives birth to, how many feet it has, whether it is a social animal that lives in a community, how many are in the community, etc.

Depending on the age of the student, the teacher can give directed questions to the children. For instance, go and stand on the bear circle. What is the name of the animal that is seven circles away? What is the name of the animal that is four circles minus two circles away? What is the name of the animal five circles behind you? As you can see, these questions can be adjusted to the age and capability of the student.

The teacher may choose to focus on the study of trees and decorate her classroom accordingly. Design one of your bulletin boards to have a large tree on it with bare limbs. Cut leaf shapes from construction paper in fall colors using the shapes of tree leaves common to your region. Put a child's name on each leaf and pin the leaves to the tree limbs on the bulletin board tree. Put a similar leaf on the child's desk or cubby.

Discuss with the children the names of the trees their leaves represent. Help them to learn to identify the trees by looking at their leaves. During winter, drop the leaves from the limbs of the tree to the bottom of the bulletin board. Discuss the seasons with the children, how this affects the trees, why the leaves fall, and observe the trees outside. In the spring, change the leaves to green construction paper. Put them back on the limbs of the tree. Discuss what is happening inside the tree and why.

Ask the children to choose a favorite tree in the yard at school or home. The tree can be observed weekly for the entire year. Children can make a booklet dedicated to their observations. Have them draw how the tree looks in each season. Trace a leaf. Record the animals they see in and around the tree. Each month have them break off a small tip of a branch and tape it on a piece of construction paper to record how the branches change with the seasons. Of course, use discretion not to abuse or overuse a particular tree.

Ask your Urban Forester to visit the classroom and discuss trees in your area. Perhaps some of the trees in your area hold records, such as the oldest tree of its type. Request he bring a cut section from a recently cut tree for the children to examine and count the rings to determine the age. Ask him to show the children how to measure the girth of trees and estimate the height using simple geometry. Then have the children measure their own trees, and record the findings in their booklets. Perhaps the science teacher can allow the children to examine the leaves under a microscope, and draw what they see. Also, have them look for seeds or pods to put in their books.

If possible, plant a tree near your school for the children to tend during the year. Fall or early winter is an excellent time to establish a tree's root system. Ask a local garden center employee

to visit and explain to the children the importance of the proper size hole, good soil, fertilizer, and the right amount of water to get the new tree off to a good start.

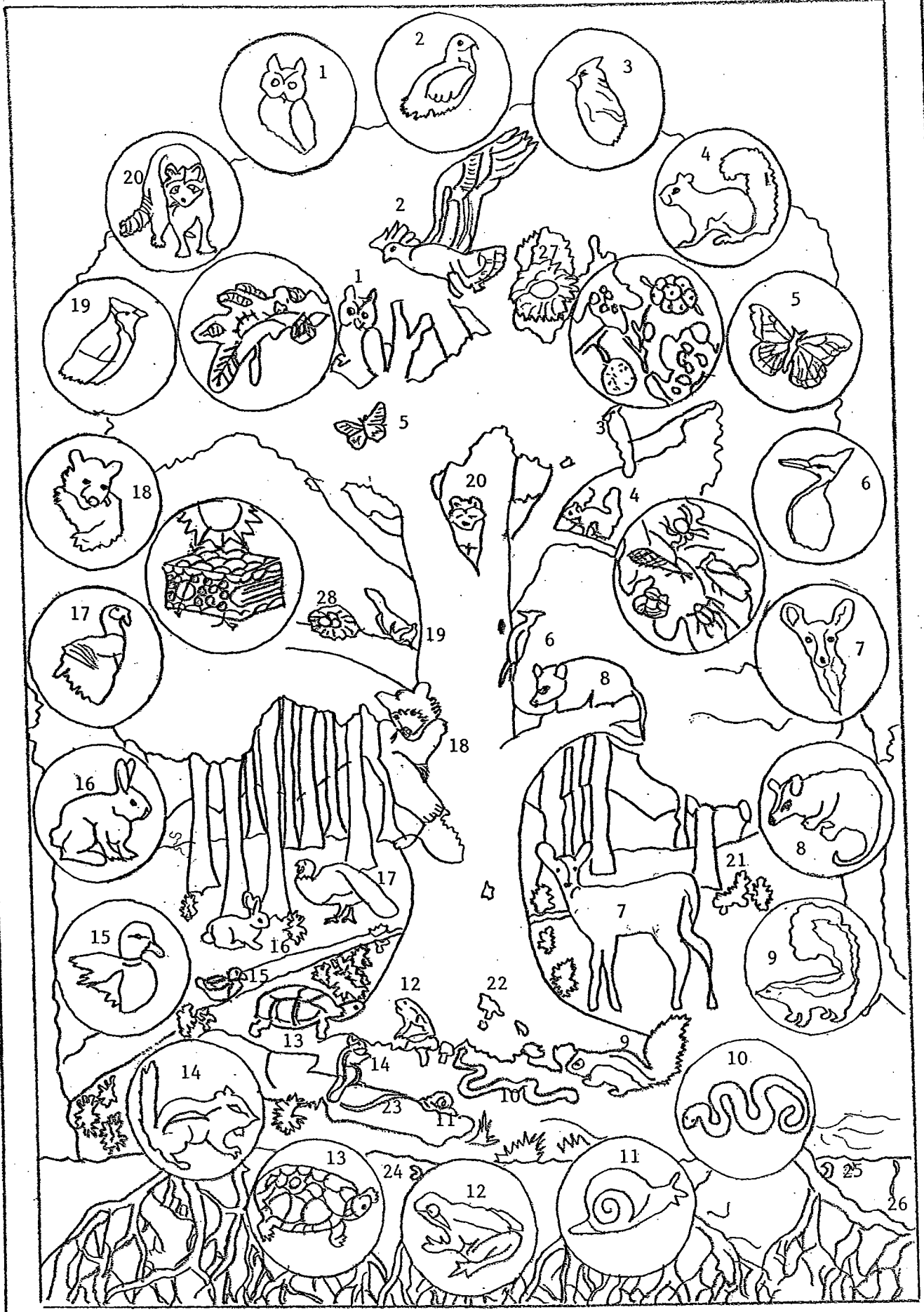
Collect acorns for the children to plant in paper cups. Put the cups on a tray in a sunny window and observe what happens. Explain that not all the acorns may root, but this is nature's way. Discuss the role of the squirrels in distributing and planting seeds.

Bring an old log from the woods to put outside your classroom for the children to observe occasionally. Have them turn the log over and look for insects under the log or inside the log that may be feeding on the wood. Discuss how decay and insects break down the wood. Observe the moss and lichens that may form. Have the children sketch pictures of what they see in their booklets.

If possible, take the children on a nature walk in the spring. Invite a class of younger children to go with your class on the walk. Let the children in your class discuss with the younger children all the things they have learned and observed during the year about trees and animals. Let them have the pleasure of being the teachers.

With the Tree of Life Learning Center, you can make the study of trees and animals the focus of your classroom for the whole year. The carpet can be the impetus for all types of discussions and educational opportunities while making the classroom a fun yet comfortable place. We hope you will derive a great deal of pleasure from owning and using your Tree of Life carpet.

*Based on the Tree of Life poster from the Carolina Biological Supply Company



Key to the Tree of Life* Carpet Black Line Drawing

1. Owl
2. Hawk
3. Cardinal
4. Squirrel
5. Butterfly
6. Woodpecker
7. Whitetail Deer
8. Opossum
9. Skunk
10. Snake
11. Snail
12. Frog
13. Turtle
14. Chipmunk
15. Duck
16. Rabbit
17. Turkey
18. Bear
19. Blue Jay
20. Raccoon
21. Cardinal Flower
22. Lichen
23. Centipede
24. White grub
25. Skipjack beetle
26. Earthworm
27. Squirrel's nest
28. Bird's nest

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TREE OF LIFE* CARPET ACTIVITIES

1. Who Am I? Game

The teacher or the student gives clues about the chosen animal, bird, or insect. The others must guess the identity.

Example: I am large, black, and furry. I hibernate in the winter.

2. Have the students group (classify) the animals according to similar characteristics.

Examples: Can fly

Blue jay	Owl	Cardinal	Cicada
Woodpecker	Turkey	Butterfly	Lacewing
Duck	Hawk	Cockchafer	

Example: Cold-blooded creatures

Turtle	Frog	Snake
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Example: Creatures with fur

Raccoon	Rabbit	Deer
Squirrel	Bear	Opossum
Chipmunk	Skunk	

3. Have students name all of the birds on the carpet.

Blue jay	Owl	Duck
Woodpecker	Turkey	Cardinal
Hawk		

4. Name the reptiles. (Any of a group of cold-blooded vertebrates that crawl on their bellies, as snakes, or creep on short stubby legs, as lizards, crocodiles, alligators, and turtles.)

Snake	Turtle
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5. Name the amphibians. (Any animal that lives both on land and in water.)

Frog	Turtle
------	--------

6. Which animals can run fast? Which animals move slowly? Discuss these qualities and why speed or lack of it is important to each animal.

7. Discuss camouflage or other methods of protection exhibited by the animals.

8. Why are trees important to these animals?

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Name: _____

Date: _____

Tree of Life* Scavenger Hunt

Find and name examples of the following on the Tree of Life Carpet.

1. A producer
2. 3 consumers
3. An example of symbiosis
4. Three (3) insects
5. Three (3) mammals
6. Three (3) birds
7. An amphibian
8. A nocturnal animal
9. An organism that uses camouflage
10. Three (3) predator/prey relationships
11. How many animals can you find and name that make their home in the tree?
12. How many animals can you find and name that use the tree for food?
13. Give an example of something that is nonliving.

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Answer Key to the Tree of Life* Scavenger Hunt

1. An example of a producer could be leaves that produce chlorophyll or the tree that produces oxygen or another answer.
2. Consumers could be any of the animals, and even the tree because it consumes water, soil nutrients, etc.
3. Symbiosis is the living together of two dissimilar organisms in close association or union, especially where this is advantageous to both, as in parasitism.
An example would be the lichens growing on the tree.
4. Insects are cicada, cross spider, nut weevil, cockchafer, lacewing, butterfly, aphid, or others.
5. Mammals are deer, skunk, bear, chipmunk, rabbit, raccoon, squirrel, opossum, or other.
6. Birds are the blue jay, owl, hawk, cardinal, woodpecker, duck, or turkey.
7. The frog and turtle are examples of amphibians that live both on land and in water.
8. Examples of nocturnal animals are the raccoon, the owl, the opossum, and the snail.
9. An organism that uses camouflage may be the turtle, the rabbit, the turkey, the frog, or others.
10. Three predator/prey relationships may be the hawk/rabbit, the snake/chipmunk or frog, the owl/snake, the hawk/snake, or others.
11. Animals that make their home in the tree are the owl, the hawk, the cardinal, the squirrel, the woodpecker, the opossum, the blue jay, or others.
12. Animals that use the tree for food are the deer, the chipmunk, the turkey, the bear, the blue jay, the cardinal, the squirrel, and the woodpecker, or others.
13. An example of something that is non-living is the dead log.

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Name: _____

Date: _____

TREE OF LIFE ANIMAL SEARCH



Find the names of all the animals on the carpet.

Name: _____

Date: _____

TREE OF LIFE WORD SEARCH



Determine the word that best fits the definition. Then, find the word in the puzzle.

_____ The green pigment or coloring found in a plant

_____ Part of a plant in which most of the photosynthesis takes place

_____ Process by which plants are able to make their own food

_____ Parts of a plant that grow mainly underground and absorb nutrients

_____ Part of a plant that transports water and minerals from the roots to the leaves

_____ Pore in the leaf that allows the loss of water and where carbon dioxide and oxygen are exchanged

_____ Green plants; organisms that make their own food

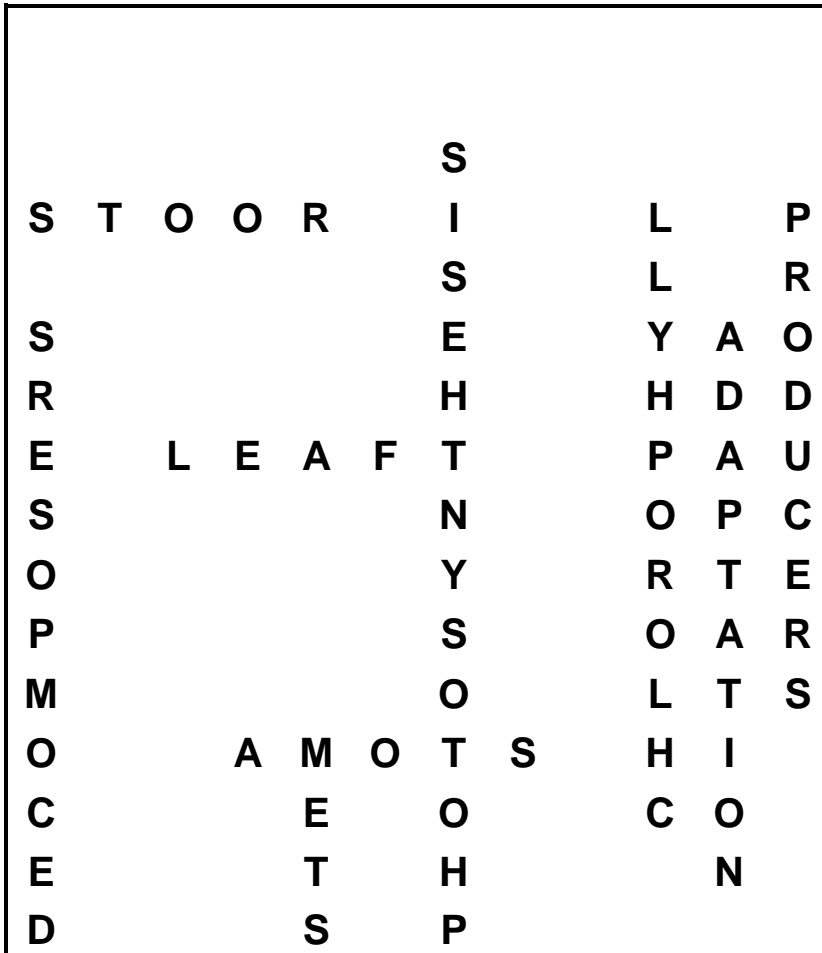
_____ Organisms that break down once-living things

_____ An animal or plant species' ability to adjust over generations to its environment

Name: _____

Date: _____

TREE OF LIFE WORD SEARCH



Determine the word that best fits the definition. Then, find the word in the puzzle.

chlorophyll The green pigment or coloring found in a plant

leaf Part of a plant in which most of the photosynthesis takes place

photosynthesis Process by which plants are able to make their own food

roots Parts of a plant that grow mainly underground and absorb nutrients

stem Part of a plant that transports water and minerals from the roots to the leaves

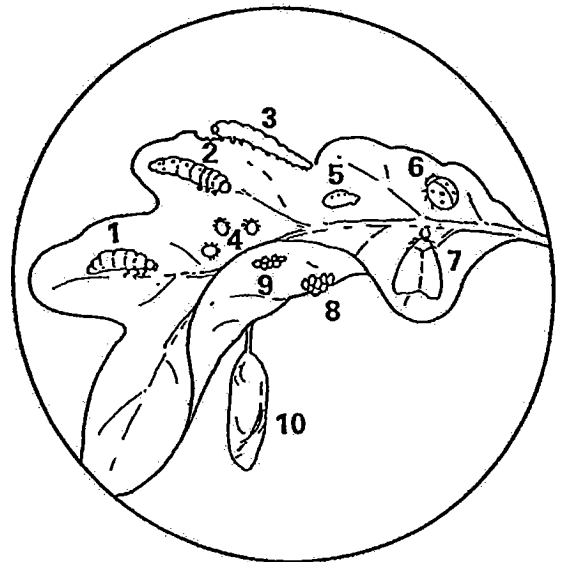
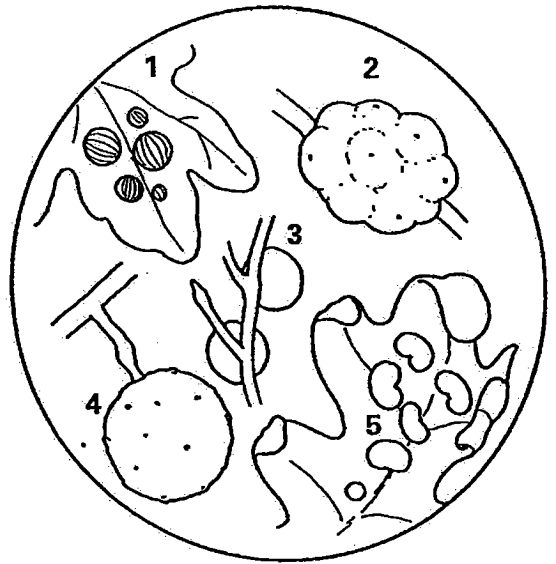
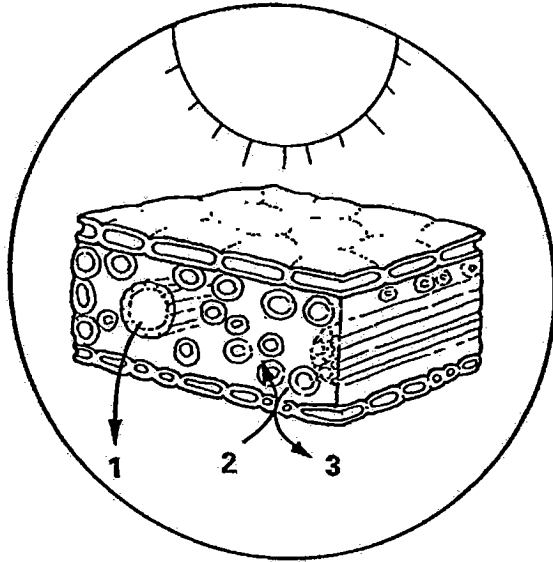
stoma Pore in the leaf that allows the loss of water and where carbon dioxide and oxygen are exchanged

producers Green plants; organisms that make their own food

decomposers Organisms that break down once-living things

adaptation An animal or plant species' ability to adjust over generations to its environment

Tree of Life Poster Insets



Information About the Insects on the Tree of Life Poster

A. Photosynthesis

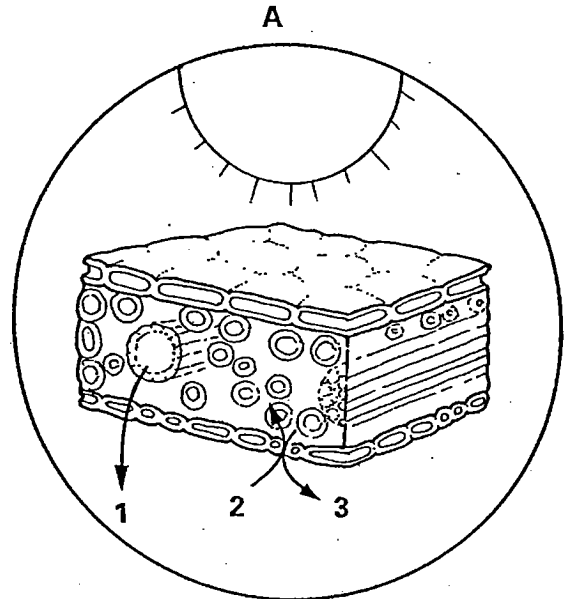
Photosynthesis is the process by which green plants make their own food. By making their own food, plants make food for other organisms as well. In addition, photosynthesis produces oxygen molecules, the oxygen that we breathe.

The word *photosynthesis* comes from two roots, *photo* (which means "light") and *synthesis* (which means "to put together"). Through photosynthesis, light energy is converted into chemical energy.

Carbon dioxide and water are the raw materials needed for photosynthesis. The green pigment chlorophyll found in the chloroplasts of plant cells captures the light, fueling the chemical process through which carbon dioxide (CO₂) and water (H₂O) combine to form oxygen (O₂) and sugar (glucose).

Most photosynthesis takes place in the leaves. The epidermis, or outer layer of the leaf, prevents excess water loss. A stoma is an opening in the epidermis that allows carbon dioxide to enter and water and oxygen to exit.

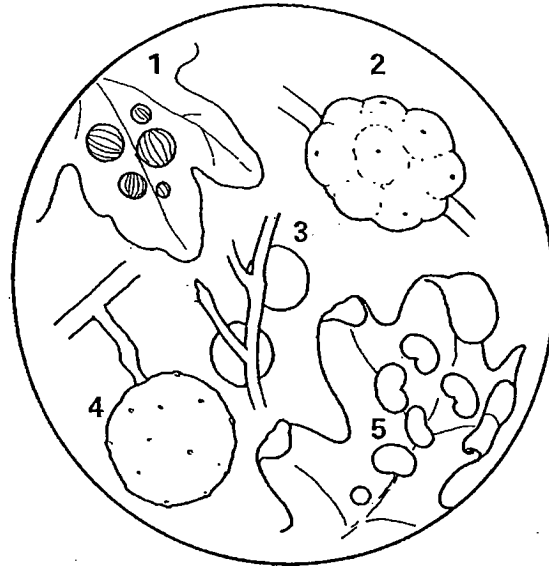
1. The vascular system transports water and minerals, as well as sap.
2. Air rich in CO₂ enters a stoma.
3. Air rich in O₂ exits.



B. Galls

Some insects pierce plants and lay their eggs inside the plant tissue. In many cases, the plant then develops an abnormal growth called a gall at that damaged point. Inside the protective and food-rich gall, the insect's larva develops. Usually, the adult emerges from the gall. If you find a plant gall with a hole in it, the insect has left. If there is no hole, you may be able to find the tiny larva (or nymph) by carefully cutting into the gall. Specific gall-forming insects stimulate the development of specific galls on specific plants. Gall insects rarely kill a plant, but a large number of galls can stunt a plant's growth. There are many types of gall insects, occurring among several groups: wasps, flies, moths, and aphids.

B



1. striped galls
2. wasp galls
3. oak galls
4. cherry gall
5. kidney galls

C. Arthropods

Arthropods include a huge number of organisms, including the insects, spiders, and mites. Arthropods are characterized by external skeletons and jointed legs. Many arthropods can be seen on the Tree of Life poster. The inset gives a close-up view of several examples. Arthropods of one species or another live in or feed on practically every part of a tree. Some eat leaves, some eat roots, some tunnel under bark and eat the sapwood, some live in the seeds, some live on dead branches, some eat fungus that lives on dead branches or on decaying leaves under the tree, some chew tunnels between the upper and lower layers of leaves, and some eat the others. Of the examples in the inset, cicadas feed on root sap as nymphs, cockchafers feed on leaves and flowers, nut weevils feed on nuts, lacewings feed on aphids and other tiny insects, and spiders feed on various other arthropods. When you look at a tree, you may see many signs of arthropods without actually seeing the animals themselves: galls, leaf mines, pathways under loose bark, chewed leaves, webs, cocoons, molted exoskeletons.

C



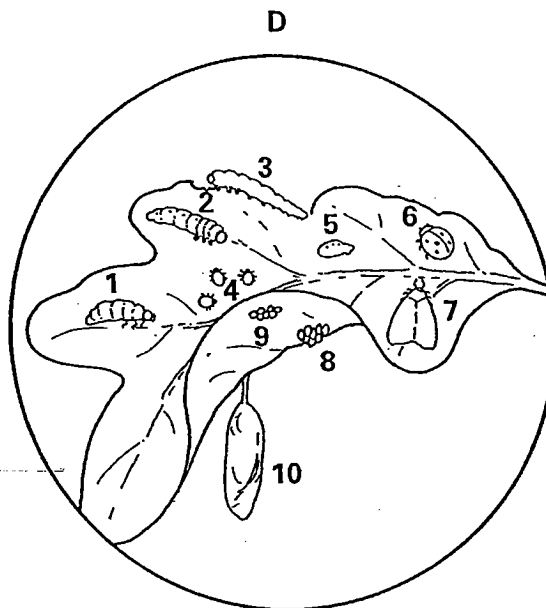
1. cross spider
2. cicada
3. cockchafer
4. nut weevil
5. lacewing

D. Insect Life Cycles

Several life cycle stages are depicted. Insects with incomplete metamorphosis* (egg, nymph, adult) are represented by aphids. Insects with complete metamorphosis (egg, larva, pupa, adult) are represented here by ladybugs, lacewings, and moths.

*Elsewhere on the poster, you can find other insects with incomplete metamorphosis, including cicadas (nymph in the soil, adult in the Arthropod inset) and termites.

1. ladybug larva
2. lacewing larva
3. moth larva
4. aphid nymphs
5. aphid (wingless adult)
6. ladybug
7. tortix moth
8. eggs of imperial moth
9. eggs of carpet moth
10. cocoon of promethea moth



Extension and Discussion Questions or Activities

1. How do trees take care of animals?
2. How do trees take care of us?
3. Name as many uses for trees as you can.
4. How do seeds travel? How do you think that the Tree of Life's seeds may be dispersed?
5. How do the organisms protect themselves in the different seasons?
6. What would happen to the other organisms depicted if the tree were cut down? What if the entire forest were cut down or otherwise destroyed?
7. Any of the following may be discussed in relation to the poster:
 - life cycles
 - ecological relationships; e.g., symbiosis, predator/prey
 - ecological roles; e.g., producer, consumer, decomposer, food chains and webs
 - environmental sciences
 - photosynthesis
 - galls
 - differences between living and nonliving things