Trees and Forest Vocabulary

Forest- tress and their environment

Succession- the changes in a forest over time

Deciduous Trees- loose their leaves in the fall

Coniferous Trees – evergreen trees- do not loose their leaves in the fall

Levels of the Forest

Upper Canopy- top of the forest formed by leaves and branches of the tallest tress. Birds (owl, orioles, and insects (aphids, tent caterpillars) make homes here.

Understory- level below the canopy. Smaller trees and larger shrubs. Provides sheltered space for birds and small mammals (squirrels, woodpeckers, insects)

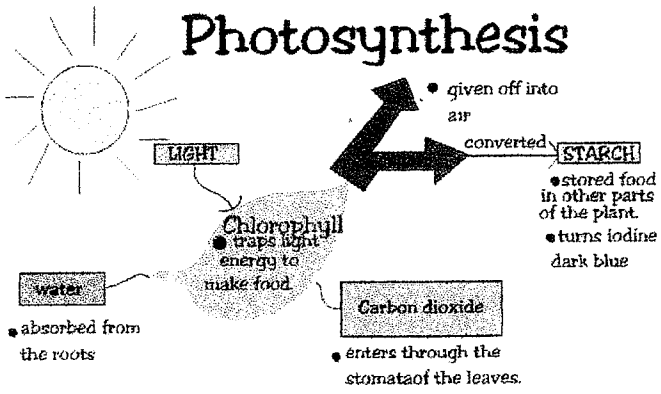
Underbrush- level before the forest floor. Ferns, wildflowers stem plants, insects, butterflies, small mammals like mice, larger mammals like deer, skunks.

Forest Floor- bottom level of the forest- groundcover and soil: where you find decomposers (worms, bacteria, soil insects, tree roots) and dead materials.

Tree processes

Transpiration- moisture given off by plants through their leaves

Photosynthesis- plants convert sunlight, water, and carbon dioxide into oxygen and nutrients (sugars) for the plant to use.

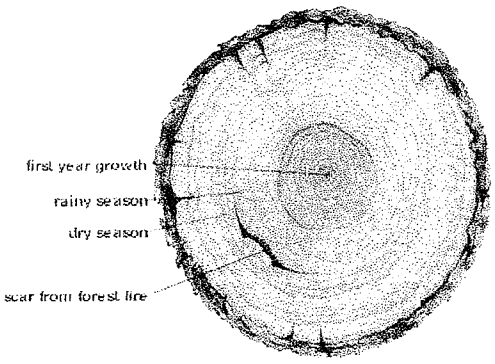


Chlorophyll- part in the plant cell that makes the plant green; needed for photosynthesis.

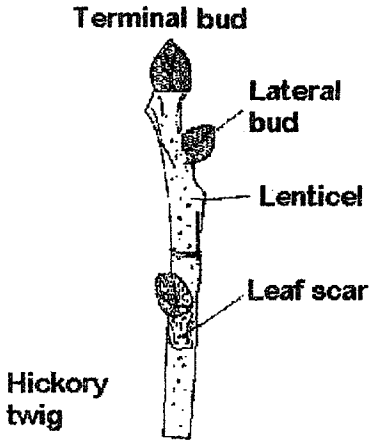
Stomata- tiny openings on the underside of a plant's leaves. Place where gases are exchanged

Examining a Tree

Tree cookie- cross section of a tree. Helps to show the life story of a tree.



Leaf- the flat green part of a plant that makes food (photosynthesis)



Leaf Scar- the scar left by a leaf of deciduous trees when the leaf falls off in the autumn.

Girdle- a scar on the branch of a tree showing one year of the branches growth.

Bark- outside covering of a tree. Function – protection and insulation

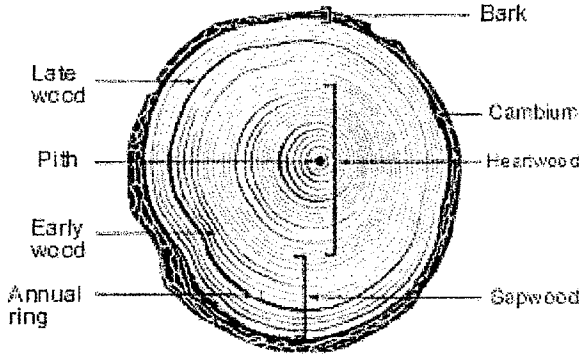
Cambium- inside of the trunk where the tree grows. Function- to produce new wood and bark

Sapwood (xylem)- the softer living part of the wood around the heartwood. Function- to move sap from the roots to the leaves

Phloem- the inner part of the tree. Function- carries food from the branches and leaves to the roots

Heartwood- the older dead part of wood near the middle of a tree. Function- for support

Pith- central core of the tree



The Environment of a forest

Ecosystem- interactions that link the living things and the non-living things in an environment.

Habitat- the natural home of an organism

Abiotic- the non-living parts of the environment. Soil, air, water, sunlight, temperature, wind, terrain.

Biotic- the living parts of the environment. Plants, animals and microorganisms.

Producer - plants that produce their own food through photosynthesis

Consumer- organisms that must get their food from their environment (do not make their own)

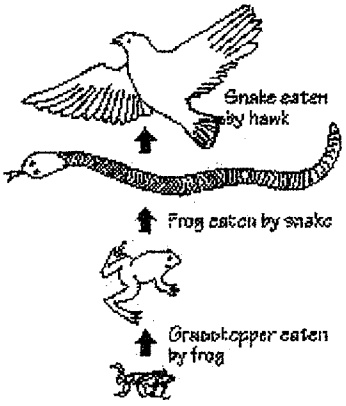
Primary consumer- eats producers

Secondary consumer- eats primary consumer
Tertiary consumers- eat secondary consumers

Decomposers- feed on dead materials and put nutrients back into the soil

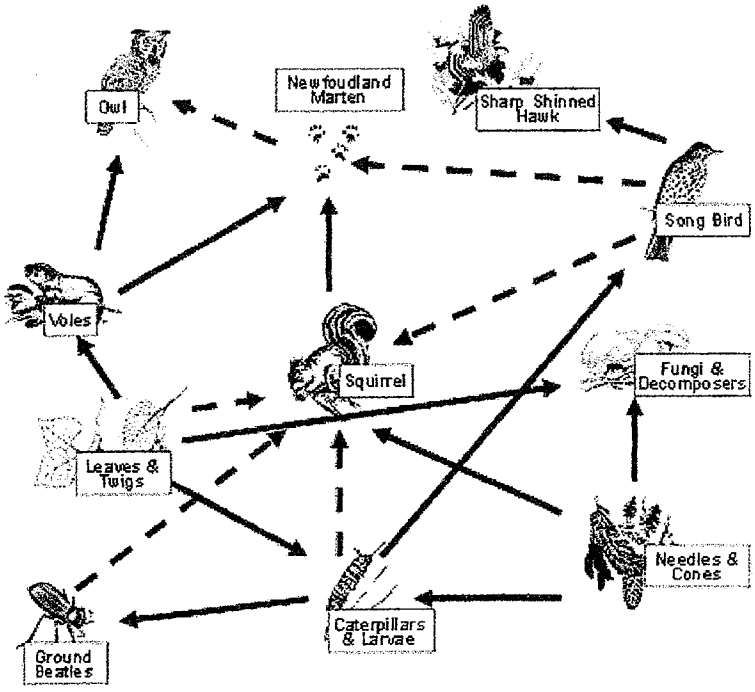
- Fungi- organisms that lack rots, stems and leaves. Cannot photosynthesize to makes their own food. Examples- mildews, rusts, smuts, mushrooms, conks, molds
- Conks- fungus found attached to tree trunks. Grow like steps or shelves and have growth rings like trees.
- Lichens- a fungus and algae working together. The fungus absorbs water and nutrients and the algae produces the food
- Mycorrhizal fungi- grow on the roots of trees. Some help the tree by gathering nutrients and water, some harm trees.

Food chain- the movement of food energy through the different levels of consumers. Single chain.



Food web- a lot of food chains intertwined forming a network of interactions.

Nutrient cycle- how nutrients are cycled between the biotic and abiotic parts of the environment.



Trees and Forest Study Guide

Trees and forests are valued for a number of reasons:

- Forests serve as a habitat for a variety of living things (animals and plants)
- Forests are important to humans for recreation (camping, hiking),
- We get raw materials (wood, fruit) from trees
- Forests provide jobs (forest ranger, loggers)
- Forests create a life-supporting environment (provide food, provides oxygen and exchanges carbon dioxide)

The difference between plants and trees:

Trees	Plants
♦ Are perennials	♦ Are perennials, annuals or biannuals
♦ Are tall	♦ Have a stem
♦ Made of woody materials	♦ Are woody or non-woody
♦ Have leaves or needles	♦ Have leaves
♦ Produce flowers, fruits or seeds	♦ Produce flowers fruit or seeds

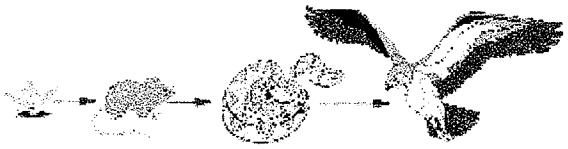
Trees and forests are affected by the living parts of the forest environment (biotic) and the non-living parts of the environment (the abiotic). Some examples are

Abiotic (non-living)	Biotic (living)
Sunlight	plants
Climate	animals
Rocks	microorganisms
Water	
Wind	
Soil	

There are many different types of plants and animals that live in the forest. These include:

- Producers (plants)
- Consumers
- Decomposers

All of these plants and animals interact to create **food chains** and food webs. An example of a food chain is:



The nutrient cycle shows how nutrients flow throughout an ecosystem. The nutrient cycle starts with the producer and ends with the decomposers.

Common decomposers include:

- Fungus- they lack roots, stems and leaves and cannot photosynthesis. Some examples are rusts, mildews, mushrooms, conks, yeasts, molds
- Conks- are a special type of fungus attached to tree trunks. They are very hard and look like steps on the trunk of a tree
- Lichens- are made up of two plants- a fungus and an algae. The fungus absorbs water and the algae produce food because it can photosynthesize.

The water cycle describes how water moves through the forest ecosystem. Some points to the water cycle are:

- Plants need water to live.
- Plants lose water through **transpiration** from their leaves
- Plants take up water from their roots.
- All water in an ecosystem is recycled- water goes into soil (precipitation), taken up by trees, given off by trees (transpiration), goes into the air as water vapor, condenses in the air and falls as precipitation.

If one part of an ecosystem is threatened or does not function, the rest of the forest ecosystem is affected

Example: If a forest is clear-cut, the soil will loose valuable nutrients. It will run off into a river if there is a heavy rain because nothing is able to keep the soil anchored. The stream may become full of silt and affect the fish and insects that use the river. The animals (consumers) that had used the forest before it was clear-cut will have to find new sources of food and protection.

Trees and plants produce oxygen and sugars in a process called **photosynthesis**. The trees take in carbon dioxide, water and energy from the sun and produce oxygen and sugar. Photosynthesis takes place in the leaves.

Trees can be classified into 2 main types- coniferous and deciduous.

Deciduous trees	Coniferous trees
• Lose their leaves every fall • Often produce flowers and fruit • Broad leaves • Examples native to Alberta include the aspen and poplar	• Do not lose leaves in fall • Cone bearing trees • Needle leaves • Example native to Alberta include the Lodgepole pine and jackpine

To classify trees, we can look at several different characteristics. A **dichotomous key** (classification key) can help us to find the name of the tree.

To classify leaves, we can look at:

- Leaf shape
- Margins
- Leaf arrangement
- Leaf type

To classify bark, we can look at

- Color
- Texture
- Pattern

We can classify trees by their general shape or silhouette.

We can look at the **growth patterns of a tree** by looking at tree cookies. We can look at the pattern of the rings and determine:

- Differences in coloration and texture of new growth and old growth
- If scars are present from fire or mechanical damage (very dark area)
- If enough nutrients were present (nice even ring growth)
- If nutrients were not present (close together ring growth)
- Crowed conditions (close together ring growth)
- Trauma damage (smaller lighter scars) from torn branches or bark
- Evenness of rings (roundness) indicating that it didn't grow on a slope or wasn't leaning in any way.

Humans have used the forest in a number of ways in the past and present and will in the future. These have included logging, recreation and might include some new future use.

Humans have enhanced the forest through protection of areas (National and Provincial parks) and have set up laws that protect animals and plants in the forest.

Humans have threatened the forests by over logging, cutting down areas for new house construction, and not taking care of the forest when using it for recreation.