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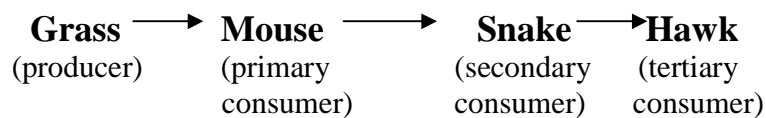
Trees and forests are affected by the living parts of the forest environment (biotic) and the non-living parts of the environment (the abiotic). Some examples are

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:

Grass →	**Mouse** →	**Snake** →	**Hawk**
(producer)	(primary consumer)	(secondary consumer)	(tertiary consumer)

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.

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 (branch broken) (very dark area)
- If enough nutrients were present (nice even ring growth)
- If nutrients were not present (close together ring growth)
- Crowded 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.

There are various <u>interest groups</u> in the forest.

Tourist	Would like to see the forest preserved because they might like to camp, hike, sightsee **or** would like to see more development of recreational areas in the forest so they can do more in the forest (ski, hike, etc.) **(recreational focus)**
Forest Industry (Logging, pulp and paper)	Would like to see more trees cut down to produce more products for people to use (wood products, paper, etc.) **(economic focus)**
Environmentalist	Would like to see the forest preserved because of the impact that cutting down the forest would have on wildlife and ecosystems. **(environmental focus)**

Clear cutting- involves completely cutting down an area of trees
Advantage- you get a lot more trees for use in manufacturing from an area.
Disadvantage- you will ruin an area for a long time. If you replant trees they will take 25-50 years to grow back to a mature tree. Animals and other plant species would loose their habitat.

Selective harvesting- involves cutting down only a certain number of trees in an area
Advantage- you do not completely destroy an area. Animals and plants will not be displaced.
Disadvantage- you do not get as many trees from an area.

To help you study you need to review your diagrams
- Levels of the forest
- Fungus, lichens and conks
- The nutrient cycle
- The water cycle
- Cross section of a tree
- Leaf classification   *leaf parts
                           *leaf types
                           *leaf shapes and margins
                           *leaf and needle arrangements
- Bark classification
- Tree shapes
- Buds
- Tree cookies