

Grade 6

# Trees & Forest Study Guide



Name: \_\_\_\_\_



# Unit I - Trees and Forests

## I. Identify reasons why trees and forests are valued.

Forests serve as habitat for a variety of living things

Human needs - recreation, raw materials, life supporting environment

**Habitat** - an environment where something lives

**Ecosystem** - a living community that depends on each member and its surrounding environment (cooperating together to survive)

Living things in the forest (biotic) -

- **Producers** - living things that use energy from the sun to produce their food.
- **Consumers** - living things that eat the producers
  - Three types of consumers - herbivores, carnivores and omnivores
- **Decomposers** - living things which feed off dead plants and animals
  - They reduce the remains to nutrients and minerals for the soil
  - Examples - mushrooms (fungi) and bacteria

Non-living things (abiotic) in the forest - water, rocks, sunlight, air, soil and chemicals.

*Illustrate a food chain to describe the relationship.*

## 2. Describe the kinds of plant and animals found living on, under and among the trees.

- **Forest Layers**
  - **Upper canopy:** top layer of the forest
    - Captures more than 90% of the sunlight
    - Where most of the photosynthesis occurs
    - A Lot of flying animals can be found here.
    - Humming bird, owl, and insects(butterfly, caterpillars).

- **Understory:** Many small trees, larger bushes and shrubs.
  - Provides shelter for many forest animals
- **Shrubbery layer:** Home to many forest wildflowers, ferns, deer skunks and rabbits
  - These animals find their food on this level.
- **Forest Floor:** Dark and damp. Only plants that can live with very little light grow here.
  - Fungi decompose dead plant material here
  - Fungi are not green because they don't have chlorophyll and cannot produce food through photosynthesis.
  - Fungi eat dead plant material. Mushrooms, conks and lichens are examples of fungi.
  - Decomposers such as worms, bacteria, millipedes, and centipedes are examples of decomposers.
  - Inhabitants of the forest floor are toads, mushrooms, and insects.

Name of Forest Level	Plants	Animals

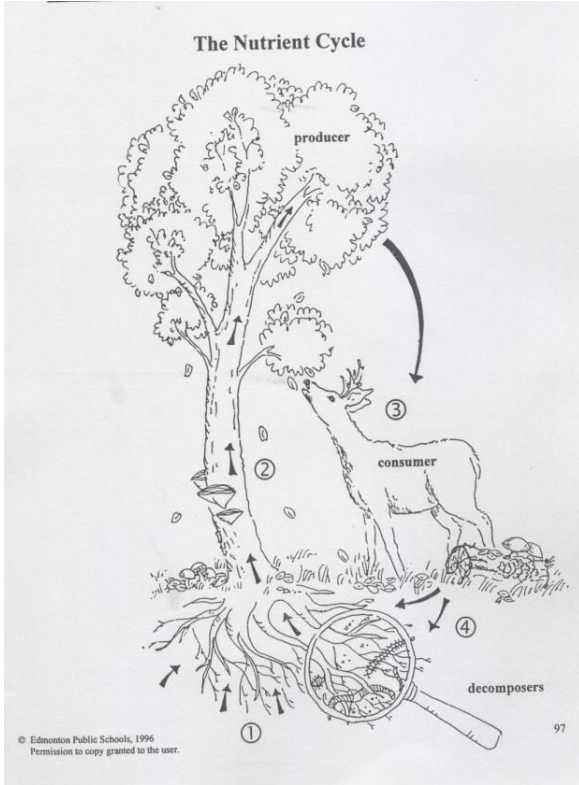
3. Describe how trees affect AND are affected by those living things.

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4. Describe the role of trees in nutrient cycles and in the production of oxygen.



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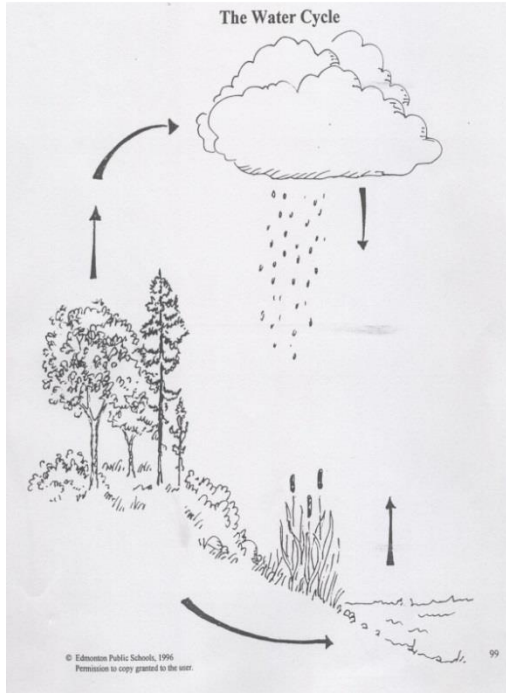
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### Nutrient Cycle

1. Decomposers break down the dead matter from trees or animals break down plant leaves
2. Nutrients are released back into the soil
3. Roots of trees absorb the nutrients
4. Nutrients travel up the trunk of the tree and are used as energy for growth.
5. Consumers eat the leaves of trees or the dead leaves fall back to the ground



Label the diagram of the Water Cycle and describe what happens at each stage.

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## Water Cycle

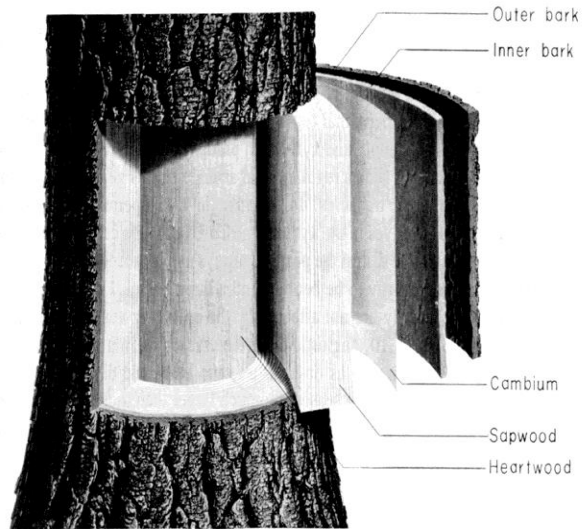
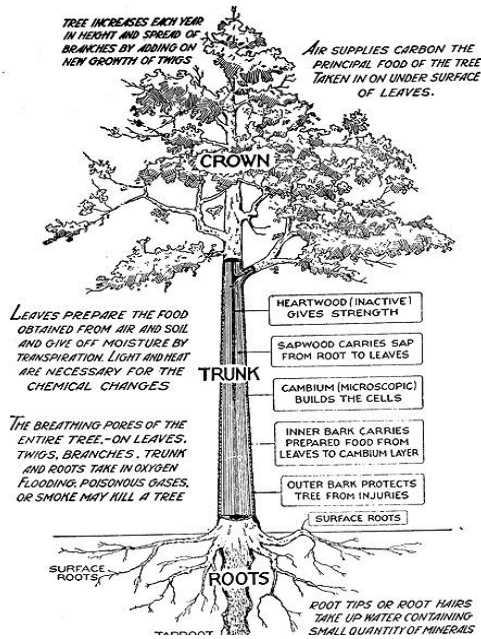
1. Trees take in water through their roots
2. Water is transported up through the trunk to the leaves
3. Leaf endings release water vapor (transpiration)
4. Water which is transpired by plants enters the atmosphere and cools (forming clouds)
5. Water also enters the atmosphere by the process of evaporation.
6. Dirt particles and various chemicals are left behind as vapor rises
7. Cooling of water vapor (condensation) forms precipitation
8. Precipitation falls to Earth as rain, sleet, snow or hail.
9. Precipitation lands on the ground or remains on the surface and collects in streams, rivers, and lakes.
10. Plants use water as part of the process of photosynthesis.
11. The cycle repeats over and over.



**Photosynthesis:** The process by which leaves make food for the plant.

- Leaves make food from **water** and **carbon dioxide**
- **Sunlight** captured by chlorophyll traps light energy. Chlorophyll is what makes the leaves green.
- Chlorophyll molecules use light energy to change carbon dioxide and water into oxygen, sugars, and starches.
- Leaves release the oxygen they don't need into the air and keep the sugar for food.
- Plants give off almost all the free oxygen in the atmosphere.

5. Distinguish trees from other plants, and characteristics that distinguish deciduous from coniferous trees.




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**Cross-Section of Tree Stem**

Label the tree cookie using the following terms:

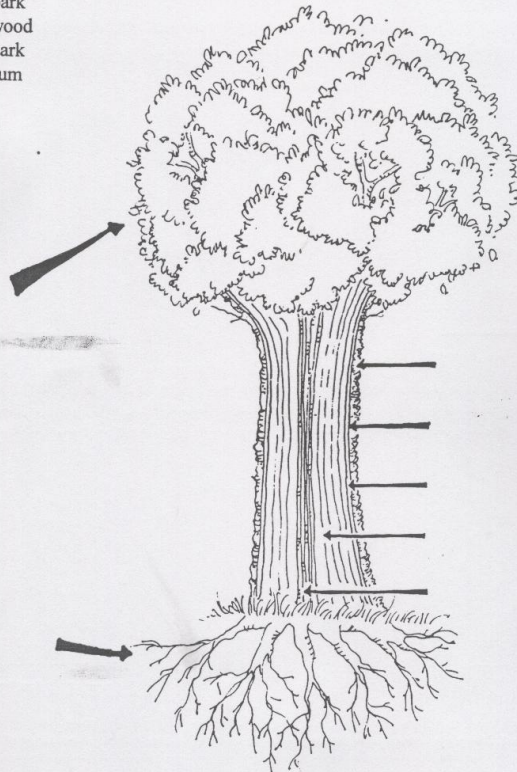
- sapwood
- inner bark
- heartwood
- outerbark
- cambium



## What is a Tree?

Label the parts of the tree using the following terms:

- sapwood
- innerbark
- heartwood
- outerbark
- cambium
- roots
- crown

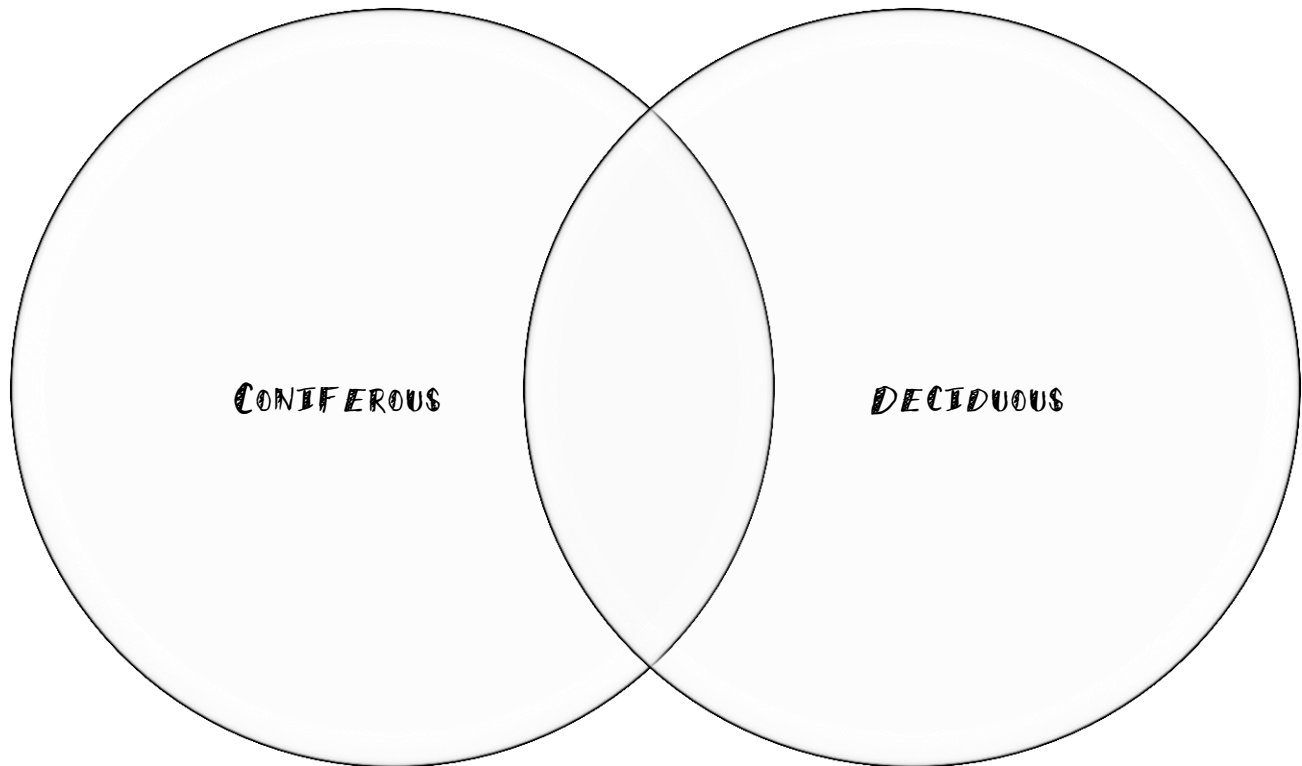


### 6. Parts of a tree

- **Roots**
  - Absorb water and nutrients from soil
  - Store sugar and anchor the tree in the ground
- **Trunk/stem**
  - Supports the crown and gives the tree its shape and strength
  - Consists of a network of tubes that run between the roots and leaves
  - This is how nutrients from the soil reach the leaves
- **Crown**
  - Leaves and branches at the top of the tree
- **Bark - Outer bark and Inner Bark**
  - Outer Bark protects the tree from insects extreme temperature, disease and storms

- Inner barks (phloem): Carries sugar and nutrients (sap) from the leaves to the rest of the tree.
- **Cambium** - Between the outer bark and the inner bark
  - A very thin layer of growing tissue that produces new cellsxyclem, phloem or more cambium.
- **Xylem or sapwood** has a network of thick walled cells that bring water and nutrients up from the roots to the leaves and other parts of the tree.
- **Heartwood:** As the tree grows, Xylem cells die to form the heartwood.
  - The heartwood supports the tree to give it its strength.

7. Distinguish the difference between deciduous and coniferous trees. List 2 examples of each.



Types of Trees: **Coniferous** or **Deciduous**

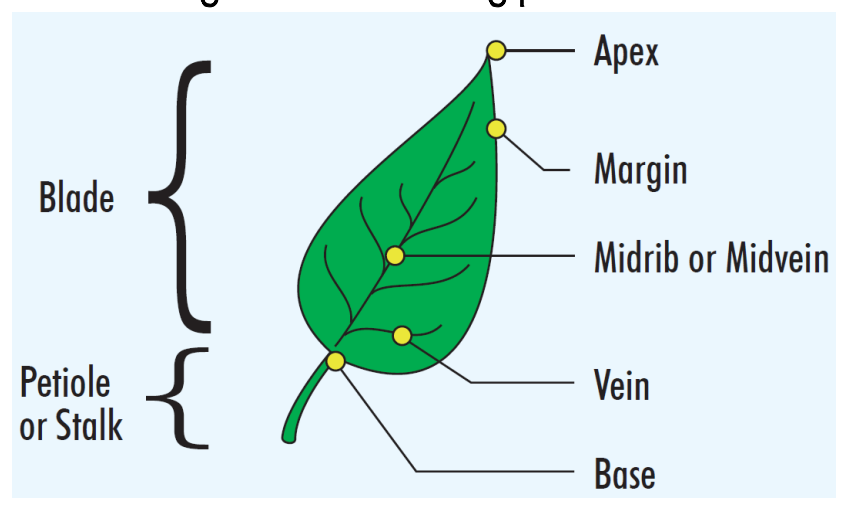
Deciduous trees shed their leaves before the cold or dry season. Coniferous trees have needle-shaped leaves. Needles are green all year long. Cone bearing trees. Tamarack is both coniferous and deciduous



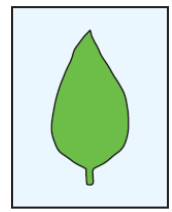
8. Identify characteristics of at least four trees found in the local environment.

- Spruce -
- Birch -
- Poplar -
- Pine -
- Crab apple -

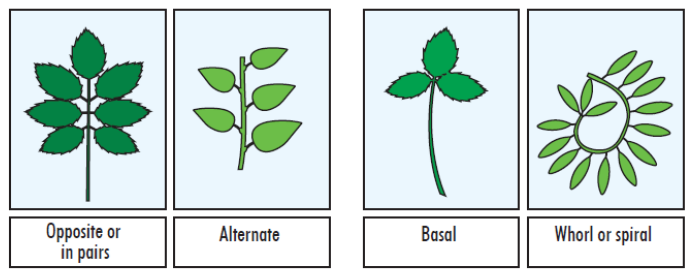
9. Leaf shapes, leaf arrangements, branching patterns and the overall form of a tree.



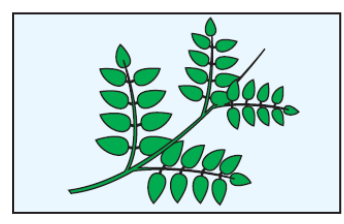
Simple:



Compound:



Double Compound:



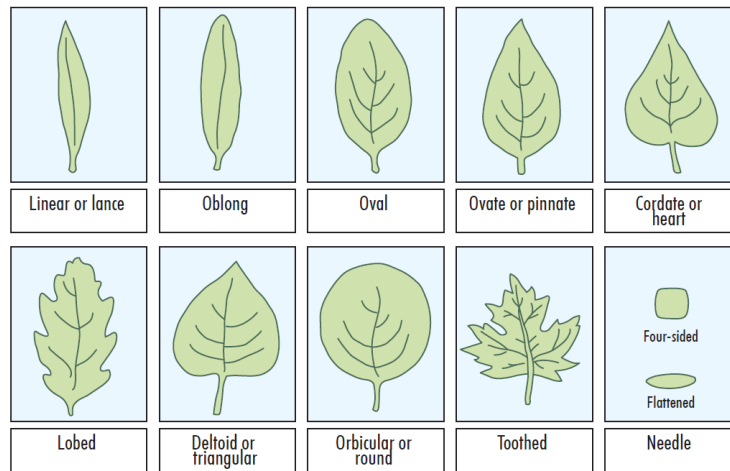
Simple leaf shape - one leaf on each petiole.

Compound leaf shape - more than one blade on each petiole.

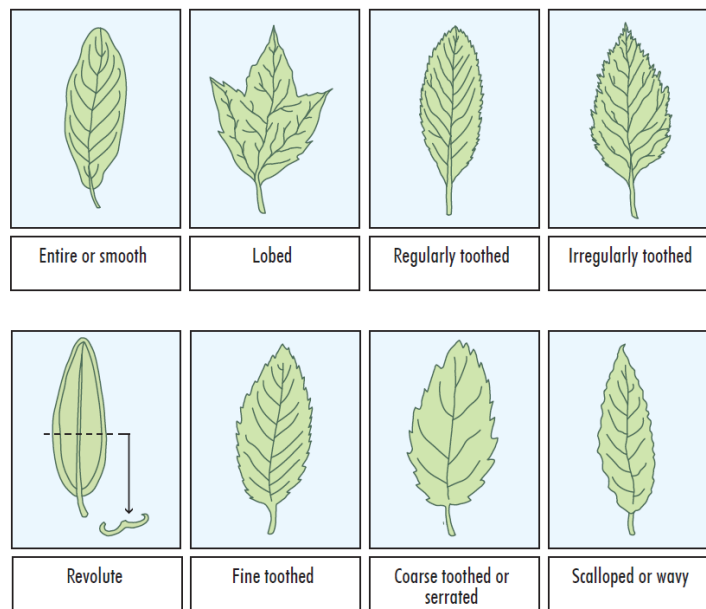
Double compound shape - several blades attached to several petioles.

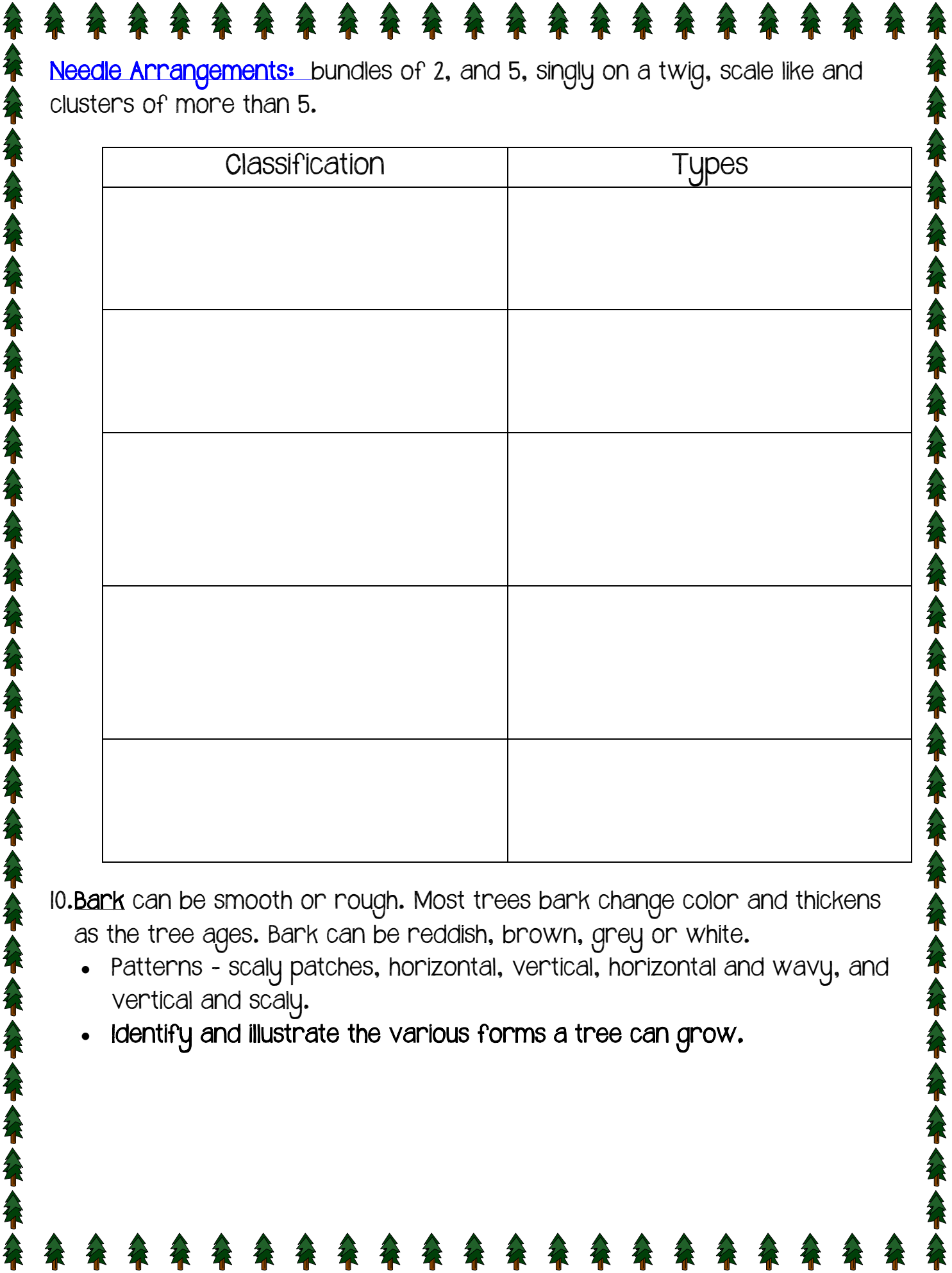
Leaves can be classified by their arrangement on a twig: Opposite, alternate, whorl and basal.

Leaf Shapes - What does the general shape of the leaf look like?



Leaf Margins - What do the edges of the leaf look like? Smooth, wavy, course tooth, fine tooth.





**Needle Arrangements:** bundles of 2, and 5, singly on a twig, scale like and clusters of more than 5.

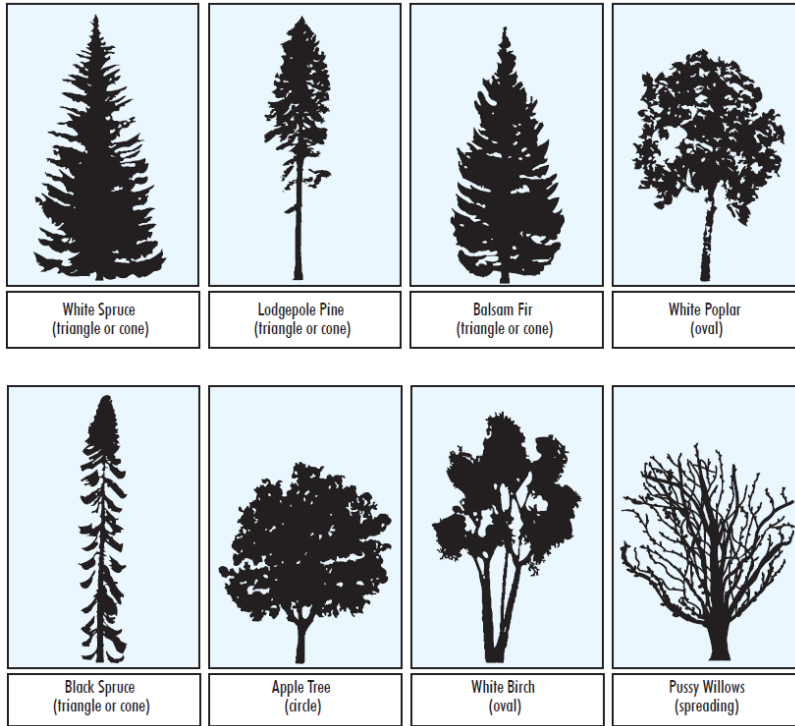
Classification	Types

10. **Bark** can be smooth or rough. Most trees bark change color and thickens as the tree ages. Bark can be reddish, brown, grey or white.

- Patterns - scaly patches, horizontal, vertical, horizontal and wavy, and vertical and scaly.
- Identify and illustrate the various forms a tree can grow.

## Tree shapes

Triangle or cone shape, oval shape, circle shape, spreading shape, rectangular shape.



- Describe the branching patterns of a tree.

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Branching patterns - illustrate each example.

Upward

Outward

Downward

Whorled

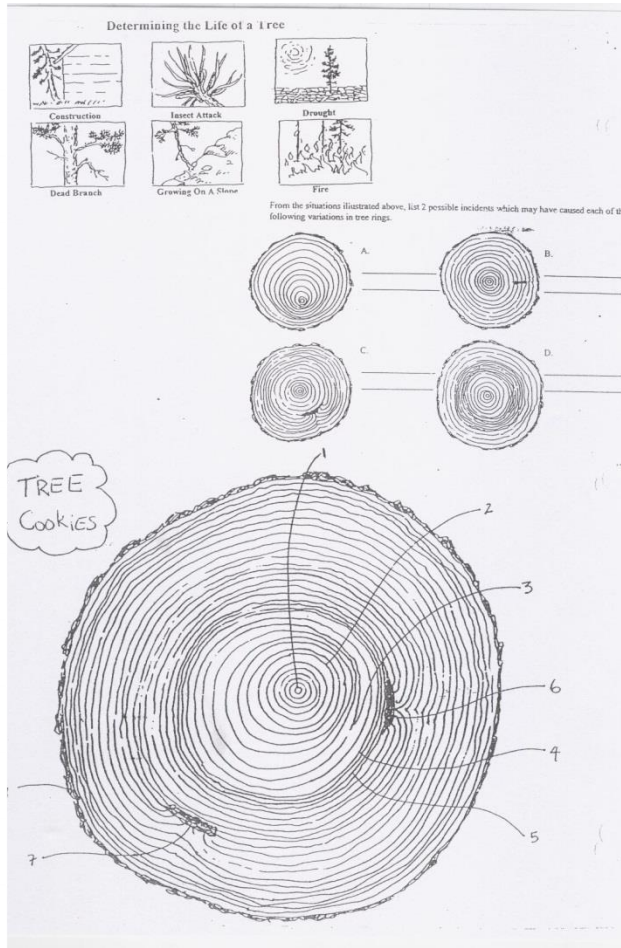
Opposite,

Alternate

Spiral



Tree shape may be influenced by being in lots of wind, not a lot of water, on a slope, etc.



- Interpret the growth of a young tree, examine each year's growth, locate scars that separate old and new growth.

Tree rings (annual rings)

Close tree rings - poor growing conditions

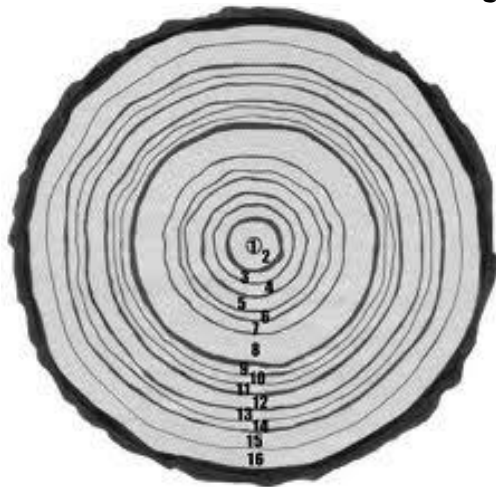
Far tree rings - good growing conditions.

Trees form new wood in the spring and summer

Springwood is lighter than summerwood

Growth of rings is affected by weather, amount of growing space, soil condition, insect attacks, fire.

Know how to read the tree rings to tell the history of the tree.



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