**Classifying Plants**

**Chapter 4 Lesson 2**

**Vocabulary**

* **Nonvascular plant-** plants that lack vascular tissue for transporting materials
* **Rhizoids-** thin, rootlike structures that anchor moss and absorb water and nutrients
* **Vascular Plant-** plants with true vascular tissue
* **Phloem-** the vascular tissue through which food moves
* **Xylem-** the vascular tissue through which water and minerals travel
* **Fronds-** a fern’s leaves are divided into many smaller parts that resemble smaller leaves
* **Pollen-** produced by seed plants; tiny structures that contain the cells that will later become sperm cells
* **Seed-** a structure that contains a young plant inside a protective covering
* **Gymnosperm-** a seed plant that produces naked seeds
* **Angiosperm-** a flowering plant that produces seeds enclosed in fruits
* **Cotyledon-** a seed leaf that provides food for the embryo
* **Monocots-** angiosperms that have only one seed leaf
* **Dicots-** angiosperms that have two seed leaves

**What Are Characteristics of Nonvascular Plants?**

* Plants that lack vascular tissue for transporting materials are known as nonvascular plants.
* Nonvascular plants are low-growing, have thin cell walls, and do not have roots for absorbing water from the ground.
* They obtain water and minerals directly from their surroundings. These materials pass from one cell to the next.
* These plants mostly live in damp, shady places.
* Their thin cell walls are why they cannot grow more than a few centimeters tall.

**Mosses**

* Mosses can be seen growing in the cracks of a sidewalk or in a shady spot
* There are more than 10,000 species of mosses.
* Moss looks like tiny leaves with a long, slender stalk and a capsule at the end.
* Rhizoids are thin, root like structures that anchor the moss and absorb water and nutrients

**Liverworts**

* There are more than 8,000 species of liverworts.
* Named for the shape of the plants body being shaped like a human liver.
* Often found growing as a thick crust on moist rocks or soil along the sides of a stream.
	+ Wort is an old English word for “plant”

**Hornworts**

* There are fewer than 100 species of hornworts.
* Hornworts usually live in moist soil, often mixed in with grass plants.

**Book Work: Figure One pg. 117, Data Table pg. 118, and Assess Your Understanding pg. 118**

**What Are Characteristics of Seedless Vascular Plants?**

* Plants that have vascular tissue but do not produce seeds, instead of seeds they reproduce by releasing spores.
* These include ferns, club mosses, and horsetails.

**Ferns**

* There are more than 12,000 species of ferns today.
* Ferns live in shaded areas with moist soil.
* The stems of most ferns are underground and leaves grow upward while roots grow downward.
* The fern’s leaves, or fronds, are divided into many smaller parts that look like small leaves.

**Club Mosses and Horsetails**

* There are very few species of club mosses and horsetails alive today.
* Club mosses usually grow in moist woodlands and near streams.
* Horsetails used to be used to scrub pots and pans in colonial times due to the gritty substance called silica found in their stems.

**Book Work: Apply It pg. 120, and Assess Your Understanding pg. 121**

**Vascular Tissue**

* Vascular plants can grow tall because their vascular tissue provides an effective way of transporting materials throughout the plant.
* Vascular tissue also provides strength to the plant’s bodies.
	+ There are two types of vascular tissue:
		- Phloem (FLOH um)
			* Allows the food to travel downward from the leaves to the rest of the plant.
		- Xylem (ZY lum)
			* Allows water and minerals to travel upward from the roots to the rest of the plant.

**What Are the Characteristics of Seed Plants?**

* Seed plants outnumber seedless plants by more than 10:1
* Seed plants produce many foods we eat, provide you with clothes to wear and materials to build our homes
* Seed plants all have vascular tissue, roots, stems, and leaves.
* They use pollen and seeds to reproduce.
	+ Seed plants do not need water for sperm to swim to the eggs.
	+ Instead, they produce pollen that become sperm cells.
	+ After sperm cells fertilize the eggs, a seed is formed.
* Seed plants are classified as gymnosperms or angiosperms

**Gymnosperms**

* A gymnosperm is a seed plant that produces naked seeds.
	+ These seeds are referred to as “naked” because they are not enclosed by a protective fruit.
	+ Most gymnospserms have needlelike or scalelike leaves and deep-growing root systems
	+ These are the oldest type of seed plant, appearing on Earth about 360 million years ago
* There are four types of gymnosperms:
	+ Cycads (look like palm trees with cones the size of footballs)
	+ Conifers (cone-bearing plants)
	+ Ginkgoes (Ginkgo biloba trees)
	+ Gnetophytes (live in hot deserts and tropical rain forests)

**Angiosperms**

* A angiosperm is a seed plant that produces flowers and seeds enclosed in fruits.
	+ Angiosperms love almost everywhere on Earth: from frozen Artic areas, to tropical jungles, and barren deserts!
* Angiosperms are divided into two major groups:
	+ Monocots
		- Angiosperms that only have one seed leaf
		- Includes grasses, corn, wheat, rice, lilies and tulips
	+ Dicots
		- Angiosperms that produce seeds with two seed leaves
		- Includes roses, violets, dandelions, oak trees, beans, and apples
	+ “Cot” is short for cotyledon or seed leaf.

**Book Work: Do the Math! Pg. 125**