

Name _____

Date _____

Botany

Botany is the study of plants. There are many subdivisions of this science, including: plant anatomy, plant ecology, and plant taxonomy. All of these subdivisions fall under the general heading of botany. The actual word botany is derived from the ancient Greek word meaning plant or pasture. The scientists that study this science are called botanists.

The section of botany called plant anatomy studies the structure and parts of plants. By studying the parts of plants, botanists are able to understand how the plant functions; that is, how it grows, how it reproduces, and how it changes. Botanists have discovered that plants, like everything else, are made up of living cells. These cells differ from the cells found in animals because they have walls made out of cellulose that provides the cells the strength that they need to form the major parts of the plant. These cells make up various tissues like xylem tissue, which conducts water throughout the plant, and phloem tissue, which conducts food-like materials (like minerals) throughout the plant.

Another important system of a plant is its root system. The root system has several functions, including providing an anchor for the entire plant and absorption of water and minerals from the soil. Various plants have different types of root systems. Alfalfa plants have roots that grow very deeply into the soil, sometimes as deep as 20 feet. Cactus plants, however, have roots that grow very shallow and spread out underground as far as 50 feet. Carrots and beets are actually the roots of plants that humans have found to be edible and healthful.

Leaves form a familiar and obvious sign of the plant world. Leaves are highly complex systems that handle most of the plant's life functions. Leaves are perfectly designed receptors of solar energy. They capture the light and heat of the sun and thereby photosynthesize. The process of photosynthesis is dependent on the leaf's ability to pull in moisture and carbon dioxide from the atmosphere and diffuse out the plant's waste and oxygen back into the atmosphere. In this manner, the plant is "breathing." The leaves are also the plant's cooling system.

Plant ecology studies the relationships between a plant and its environment. In this field of botany, botanists study why certain plants thrive in certain areas and also how the environment affects the health and status of plant life. Botanists calculate the population and densities of plants living in a certain area and determine if that plant is being harmed by artificial factors or is blossoming because of careful stewardship. Artificial factors like hazardous waste and water contamination negatively affect plants in an ecosystem and can cause harm to larger systems like the food chain and the carbon cycle.

Name _____

Date _____

Botany (Cont'd)

Plant taxonomists are the botanists who study and organize the naming of plants. The first such botanist was an ancient Greek student named Theophrastus who classified almost 500 different plants based on the characteristics of their stems, leaves, and flowers. This worked for many centuries until the 1700's when a Swedish botanist named Carolus Linnaeus devised the naming system that is still in use today. Plants are given two names. One name is a two-part Latin scientific name. The other name is a common name, which can be different in many languages. For example, the *Rosa carolina* is a rose that is also known as the Carolina Rose or the Pasture Rose. However, botanists use the Latin name so that no one is confused as to which plant is being studied. There are some plants, like the Plantain, that have as many as 300 common names. Over 300,000 plants have been identified, so it is important to have a classification system that organizes all these different plants in an efficient way.

Horticulture is the science of plant cultivation. Generally, this refers to understanding farming and gardening, however, every farmer and gardener understands many of the principles of botany in order to successfully cultivate various plants.

Name _____

Date _____

Botany Questions

Multiple Choice:

1. Botany is the study of:
 - a. Science
 - b. Animals
 - c. Plants
 - d. Planets
2. This tissue conducts water through a plant:
 - a. Xylem
 - b. Phloem
 - c. Plantain
 - d. Oxygen
3. Plant cells differ from animal cells because they have walls made out of:
 - a. Chlorophyll
 - b. Cellulose
 - c. Carbon
 - d. Water

True or False:

- ___ 4. Theophrastus classified almost 500 different plants based on the characteristics of their stems, leaves, and flowers.
- ___ 5. Leaves are highly complex systems that handle most of the plant's life functions.
- ___ 6. The actual word "botany" is derived from Latin.

Fill Ins:

7. These are the botanists who study and organize the naming of plants: _____.
8. Plant ecology studies the relationships between a plant and its _____.
9. _____ and _____ are actually the roots of plants that humans have found to be edible and healthful.
10. A Swedish botanist named _____ devised the naming system for plants that is still in use today.
11. The process of _____ is dependent on the leaf's ability to pull in moisture and carbon dioxide from the atmosphere and diffuse out the plant's waste and oxygen back into the atmosphere.

Botany Answers

Multiple Choice:

1. Botany is the study of:
 - a. Science
 - b. Animals
 - c. **Plants**
 - d. Planets
2. This tissue conducts water through a plant:
 - a. **Xylem**
 - b. Phloem
 - c. Plantain
 - d. Oxygen
3. Plant cells differ from animal cells because they have walls made out of:
 - a. Chlorophyll
 - b. **Cellulose**
 - c. Carbon
 - d. Water

True or False:

- T** 4. Theophrastus classified almost 500 different plants based on the characteristics of their stems, leaves, and flowers.
- T** 5. Leaves are highly complex systems that handle most of the plant's life functions.
- F** 6. The actual word "botany" is derived from Latin.

Fill Ins:

7. These are the botanists who study and organize the naming of plants: **plant taxonomists**
8. Plant ecology studies the relationships between a plant and its **environment** .
9. **Carrots** and **beets** are actually the roots of plants that humans have found to be edible and healthful.
10. A Swedish botanist named **Carolus Linnaeus** devised the naming system for plants that is still in use today.
11. The process of **photosynthesis** is dependent on the leaf's ability to pull in moisture and carbon dioxide from the atmosphere and diffuse out the plant's waste and oxygen back into the atmosphere.