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This paper is about the evolution of plants. The phylogenetic tree is a diagram that shows how plants evolved trait by trait and what exactly they gained. It is a family tree in simpler terms. The characteristics of plants are chloroplasts, cell wall, and photosynthesis. This basically what its main traits are. The plants need all 3 of these traits to be alive. Chloroplasts are organelle inside plants and causes photosynthesis to occur. It also makes the plant green. Cell Wall supports and protects the cell. It has a cell membrane. Photosynthesis makes the energy for the plant. It also makes sugar and oxygen. The plants are at the bottom of the food web. The food web is a more accurate and complex chart than as the food chain. Plants are the producers, they are to be eaten and do not eat things, instead they use sunlight CO<sub>2</sub> and water to produce food for free! What would happen without them? Well, everything would die. To be more specific first life will 1. starve, depending on food stores and then 2. suffocate. Either can happen first but it all depends on the organism.

A common name often used for Charophytes is Green Algae. Charophytes are not true plants in the sense that they are theorized to be the ancestors of all plants. You might ask what is a true plant then? A true plants are the ones that have many or all of the characteristics more than Charophytes. Charophytes typically live in the water because of their lack of vascular tissue. In the exception to the non water dwelling charophyte called Lichen. Lichen is when algae and a certain fungus create a symbiotic relationship where the algae provides extra food for the fungus and fungus provides housing for the Green Algae. Charophytes are non vascular. This means that they cannot transport water throughout themselves like most land dwelling plants. They do not need to have this function to survive because they have a extra thin layer of cells that have direct access to the water outside so they don't need it. Another form of Charophytes is Spirogyra. Spirogyra, just like all Charophytes is not a true plant but, thats not what makes it interesting. Spirogyra is a funny little plant; it looks like a tube with string wrapped around it in a spiral. Spirogyra gets its spiral because of the chloroplast that just happened to form like that during evolution. For obvious reasons it is called spirogyra for its incredible, awesome looks.

Bryophytes are commonly known as Moss, Liverworts and Hornworts. Bryophytes are theorised to be the first ones to inhabit the land as a plant. Bryophytes have to live in moist/wet climates to survive. This is because they lack vascular tissue. Vascular tissue basically transports water around the body of a plant or animal. To get around this hardship Bryophytes have developed their shape to be short and fat. Getting as much surface area as they can compared to their volume to survive. The plant parts in Bryophytes are not called roots, leaves, stems unlike regular plants. They are called Phylid, Rhizoid, Seta, Capsule. This is because they are non vascular plants and the regular names for reserved to vascular plants.

Pterophytes also know as Fern and Horse Tail are vascular plants. These plants are the

next step up from bryophytes. Mosses and ferns are alike because they need moist environments to live and reproduce. They live in moist places like mosses but not for the same reasons. Also they can handle more dry places than most if not all mosses. They reproduce much like mosses, thus they need a wet environment. These pores that they have are called Sori which are located under the leaves of a ferns. Spores are different than seeds because they do not come with much resources unlike seeds to survive the harsh growth process. Why do these plants rely on water for reproduction? The answer is because they are on a lower level of the evolutionary scale than other plants and still use that primitive method of reproduction.

Commonly known as Pines and conifers, Gymnosperms are the next step up from Pterophytes. These two are similar because they are both land dwelling and are both vascular. The main difference between the two is the improved vascular tissue and the newly improved reproduction system. Gymnosperms developed seeds to cope with the lack of water in the environment and to provide their offspring with nutrients to give them a head start unlike the nutrient lacking spores. Another helpful reproduction feature is the pine cone, which shelters the developing seeds. The vascular system also no longer constrains the shape of the plant so it can grow freely.

Angiosperms are the product of improved Gymnosperms. Angiosperms are like conifers because they live on land, same vascular system and have seeds. Angiosperms are different from conifers only reproduction wise. They have developed flowers (sometimes disguised to trick pollinators. They also dropped the cone and provide a shell for their seeds to protect them. Fruits are also a product of this process, Providing animals with a nice juicy fruit packed with seeds so when an animal needs to do their business, they go out with it and get free fertilizer and transportation. You might be wondering why attract pollinators? Plants want pollinators to come to them to collect their genes and have a more diverse gene pool when reproducing. Flowers attract pollinators by being pretty, smelling good, UV light and trickery. Being pretty is useful because some pollinators are attracted to certain colors and smelling good is good for the same reason but just with smells. UV light on a flower often reveals sort of a runway looking thing made of UV colors that provide a landing pad for pollinators, guiding them into the flower. Orchids and other plants use trickery, these flowers are shaped to look like a female of a certain species and this way the males try to breed with the flowers but while doing so get pollen onto them and then spread it around that way.

Plants are amazing at adapting (shaping to surroundings) to land. Through evolution (the development of characteristics over many, many generations) plants have adapted to their surroundings to survive and thrive in their local environment. Each new plant derived from the ancestral (aka predecessor) plant, while still retaining most of their ancestor's characteristics (aka becoming more awesome).

Something Extra:

MS DOS is like the charophytes of plants, old outdated and definitely hard to maintain. Bryophytes are the UNIX of plants, closed and super hard to use, but up from MS DOS but still lacking programs. Pterophytes are the Mac OS Leopard of plants, most programs not supported and still lots of glitches. Gymnosperms are the Snow Leopard of plants, Easy to use and most programs supported but there is still something missing. Angiosperms are the Mountain Lion, Windows 7 of plants almost all programs are compatible and they are powerful plowing the lead for future plants, os.