Pteridophytes (chapter 17)

Pteridophyte characteristics

They are vascular (they have roots, stems, and leaves)

The cells are cylindrical or elongated, and network throughout the plant

Xylem moves water and ions (positive and negative) around the plant

Phloem moves organic molecules, like sugars, around the plants

The sporophyte is the dominant phase in the life cycle

Pteridophytes (chapter 17)

Club mosses - the Lycophytes	*Selaginella* is the only genus of the family Selaginellaceae	Most are found in tropical areas, and a few (seven genera) are found in the US and Canada	The club mosses are homosporous
Selaginella has an herbaceous sporophyte that bears microphylls. Its sporophylls are arranged in strobili	*Selaginella* has a ligule (small, scalelike outgrowth) with unisexual gametophytes	The club mosses have sporangia, which are modified leaves (or leaf-like organs) that bear the spore-producing sporangia	Each sporophyte of *Selaginella* has a single sporangium

Pteridophytes (chapter 17) (cont)

In the US and Canada, nonphotosynthetic sporophylls are grouped into strobili (cones) at the ends of the aerial branches	Megasporophylls produce megasporangia	Spores of club mosses bring bisexual gametophytes about during germination	Microsporophylls produce microsporangia
Megasporangia and microsporangia occur in the same strobilus	The sperm of *Selaginella* require water to swim to the archegonia and fertilize the eggs. Fertilization occurs after the gametophytes have been shed from the strobilus	*Isoetes*, the quillworts, is the only genus of the family Isoetaceae	*Isoetes* is heterosporus

Pteridophytes (chapter 17)

Ferns - the Monilophytes	The phylum Monilophyta is made up of the ferns and horsetails	There are four major lineages of the Monilophytes: the Psilotopsida, the Marattiopsida, the Polypodiopsida, and the Equisetopsida
In a eusporangium, the parent cells (or initials) are located at the surface of the tissue from which the sporangium is produced	Leptosporangia come from a single superficial parent cell, which divides transversely or obliquely	Sporangia are stalked, and each has a special layer of unevenly thick--walled cells called an **annulus**

Pteridophytes (chapter 17) (cont)

The ferns are the only seedless vascular plants to have well-developed megaphylls	The fronds are compound; the lamina is divided into **pinnae** (leaflets), which are attached to the **rachis** (extension of the leaf stalk)	In almost all ferns, the young leaved are circinate (coiled), and they're referred to as "-fiddle-heads"	Circinate venation refers to the type of leaf develo-pment in which leaves of young ferns are curled
In many genera of ferns, young sori are covered by specialized outgrowths of the leave called the **indusia** (singular: indusium)	The sporangia occur in clusters called sori (singular: sorus)	Gameto-phytes typically develop rapidly into a flat, heart--shaped structure called the **prot-hallus**	The water ferns are hetero-sporous, leptos-por-angiate ferns

Pteridophytes (chapter 17) (cont)

The rhizomes of the water ferns grow in the mud, in damp soil, or often with the leaves floating on the surface of the water	The leaves of *Marsilea* resemble the leaves of a four-leaf clover	*Azolla* and *Salvinia* are small ferns that float on top of the water

Gymnosperms: chapter 18

Coni-fer-ophyta (the conife-rs)	**Cyca-dophyta (the cycads)**	**Gink-gophyta (ginkgo, or maidenhair tree**	**Gnet-ophyta (the gneto phyt-es)**

Gymnosperms

Characteristics of gymnosperms

Seeded, vascular plants

There are extinct and living gymnosperms

The extinct gymnosperms are the seed ferns and the cordaites

There are four phyla of living gymnosperms. They are: Coniferophyta (the conifers), Cycadophyta (the cycads), Gingkophyta (the gingko, or maidenhair, tree), and Gnetophyta (the gnetophytes)

Their seeds and ovules are exposed on sporophylls (modified leaves)

Microgametophytes (male gametophytes) develop as pollen grain. Water isn't required as a medium for transporting the sperm to the egg

Gymnosperms (cont)

Pollination is when the pollen grain (partly developed microgametophyte) is transferred bodily to the vicinity of a megagametophyte (female gameto-phyte) within an ovule

Angiosperms

Angiosperms