

Pteridophytes (chapter 17)				Pteridophytes (chapter 17) (cont)				Pteridophytes (chapter 17)			
Pteridophyte characteristics				In the US and Canada, nonphotosynthetic sporophylls are grouped into strobili (cones) at the ends of the aerial branches are				Ferns - the Monilophytes			
They are vascular (they have roots, stems, and leaves)				Megasp-orophylls produce megasp-orangia				The phylum Monilophyta is made up of the ferns and horsetails			
The cells are cylindrical or elongated, and network throughout the plant				Spores of club mosses bring bisexual gametophytes about during germination				There are four major lineages of the Monilophytes: the Psilotopsida, the Marattiopsida, the Polypodiopsida, and the Equisetopsida			
Xylem moves water and ions (positive and negative) around the plant				Microsporophylls produce microsporangia				Fertilization occurs after the gametophytes have been shed from the strobilus			
Phloem moves organic molecules, like sugars, around the plants				The club mosses are homosporous				In a eusporangium, the parent cells are located at the surface of the tissue from which the sporangium is produced			
The sporophyte is the dominant phase in the life cycle				Megasporangia and microsporangia occur in the same strobilus				Leptosporangia come from a single superficial parent cell, which divides transversely or obliquely			
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Club mosses - the Lycophytes	<i>Selaginella</i> 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	Megasporangia and microsporangia occur in the same strobilus	The sperm of <i>Selaginella</i> require water to swim to the archegonia and fertilize the eggs. Fertilization occurs after the gametophytes have been shed from the strobilus	<i>Isoetes</i> , the quillworts, is the only genus of the family Isoetaceae	<i>Isoetes</i> is heterosporous	In a eusporangium, the parent cells 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	The leaves are fronds, the Polypodiopsida are called fronds. The fronds are megaphylls, and they're most conspicuous of the sporophyte
<i>Selaginella</i> has an herbaceous sporophyte that bears microsporophylls. Its sporophylls are arranged in strobili	<i>Selaginella</i> 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 <i>Selaginella</i> has a single sporangium								



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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 many genera of ferns, young sori are covered by specialized outgrowths of the leaf called the **indusia** (singular: indusium)

The sporangia occur in clusters called sori (singular: sorus)

Gametophytes typically develop rapidly into a flat, heart-shaped structure called the **prothallus**

Pteridophytes (chapter 17) (cont)

Circinate venation refers to the type of leaf development in which leaves of young ferns are curled

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

Coniferophyta (the conifers)	Cycadophyta (the cycads)	Ginkgoophyta (ginkgo, or maidenhair tree)	Gnetophyta (the gnetophytes)

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), Ginkgoophyta (the ginkgo, 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 gametophyte) within an ovule

Angiosperms

Angiosperms

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