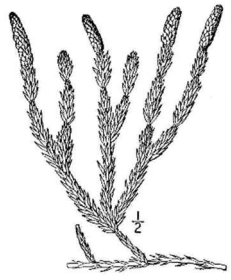
LIFE SCIENCES 11
SEEDLESS VASCULAR PLANTS

Tracheophytes
- considered true land plants because they are much less dependent upon water
- have developed vascular tissue, which aids in the transport of water and nutrients
  - xylem is the tissue that is responsible for transporting water from the roots to all other tissues; has strong-walled cells that supports the body of the plant
  - phloem is the tissue that is responsible for transporting the products of photosynthesis to all cells from the leaf
- have true roots, stems, and leaves
- leaves are covered by a waxy cuticle
  - tiny pores on underside of leaves called stoma (pl. stomata) can be opened or closed to regulate water loss
- sporophyte generation is dominant

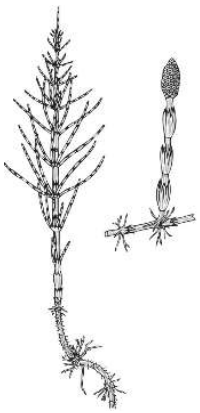
Seedless Vascular Plants
- still dependent on water for sexual reproduction
  - flagellated sperm swim to archegonia to fertilize the egg
- spore dispersal by wind
- gametophyte and sporophyte generations independent of each other
  - both sporophyte and gametophyte generations can photosynthesize
  - gametophyte only lives for a short time and is non-vascular
- made up dense jungles during the Carboniferous period; formed the large coal deposits mined today

Whisk Ferns (Psilotophyta)
- thin erect stem that branches many times
- anchored to the ground by a rhizome (a horizontal stem)
- no leaves or roots → photosynthesis done in branches
- sporangia located at ends of short branches

Club Mosses (Lycopodophyta)
- also known as ground pines
- many aerial stems grow off a branching rhizome → max 30 cm tall
- stems and branches covered by tightly packed, scale-like leaves
- sporangia are found at top of plant on club-shaped strobili
- most live as epiphytes in tropics and subtropics



Horsetails (Equisetophyta)



- only one genus still in existence (*Equisetum*) with 15 species
- tall, slender, aerial stem grows off rhizome (up to 1.3 m tall)
- stem looks jointed
- small, scale-like leaves
- contain silica – used to scrub dishes
- most have spores found in strobili located at the top of the stem

Ferns (Pteridophyta)

- have true leaves (called fronds), stems and roots
- sporophyte dependent on gametophyte until first fronds appear
- sporophyte have creeping underground rhizomes
  - asexual reproduction
  - over-winter food storage
- still linked somewhat to a damp environment due to the sperm having to swim to the egg
- range in size from low growing plants resembling mosses to tall trees
- fiddlehead – new leaf growing off a rhizome

The Fern Life Cycle