

*Extinction gave rise to gymnosperms, then radiation of angiosperms

Gymnosperms

- Ovary open to air (microphyte)
- Seeds take more energy to produce than spores
- Relatively long life cycle
- Wind-born pollen
 - Angiosperms have animal pollen relationship; key distinction from gymnosperms

Angiosperms (flowering plants)

- Most successful in terms of number of species
- Have evolved fruit, and therefore unique seed type
 - Angiosperm name comes from 'seed in a container'
 - Seeds develop from ripened ovary in the base of the flower
- Leaf distinctions - veins and number of points
- Most important for crops/food (rice, corn)

Flowers & Reproductive Cycle

- **4 kinds of leaves**
 - 2 are sterile; not involved in reproduction (sepals)
 - Petals (taxonomic differences between flowers)
 - 2 are reproductive
 - Filaments
 - Carpels (female)
- Distinctions from gymnosperms - seed **buried within flower**, not exposed to air like gymnosperms; **double fertilization**, as opposed to single in gymnosperms; **survival of all male microsporocytes**; zygote growth happens in ovary; 3 generations in seed, same; triploid rather than haploid in gymnosperms.
 - Pollen has a long way to go
 - Female tissue serves to prevent self-fertilization
 - Chemical recognition in female plant to prevent self-fertilization
 - Pollen delivered to flower by various means
 - Close animal relationships (from attraction, symbiotic)
- Development of Gametophytes –
 - *figure in slides
 - Microsporocytes; 4 haploid produced
 - On the male side, each survive (contrast to gymnosperms, where 1 female megaspore survives)
 - Species recognition by pollen grains; both by scientists and plants themselves
 - Another cell makes tube cell; in tube cell, the generative cell makes 2 sperm, which travel down tube cell (grows out of male gametophyte) and then to ovary
 - 2 polar nuclei