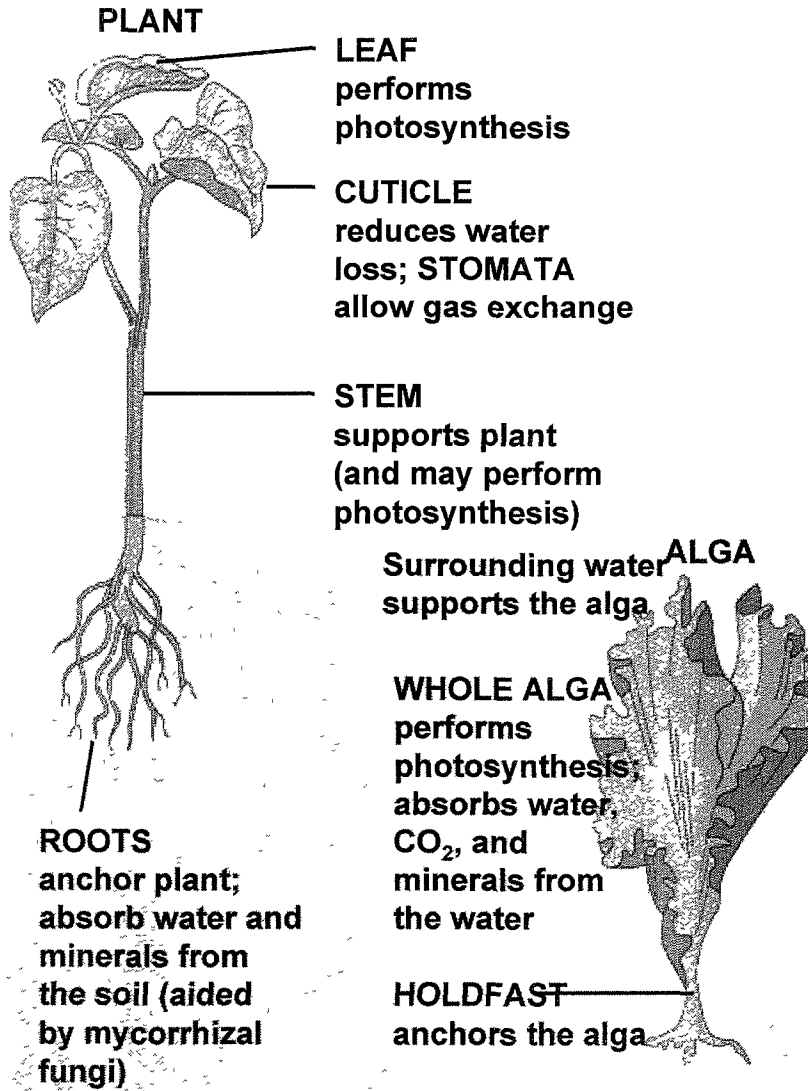
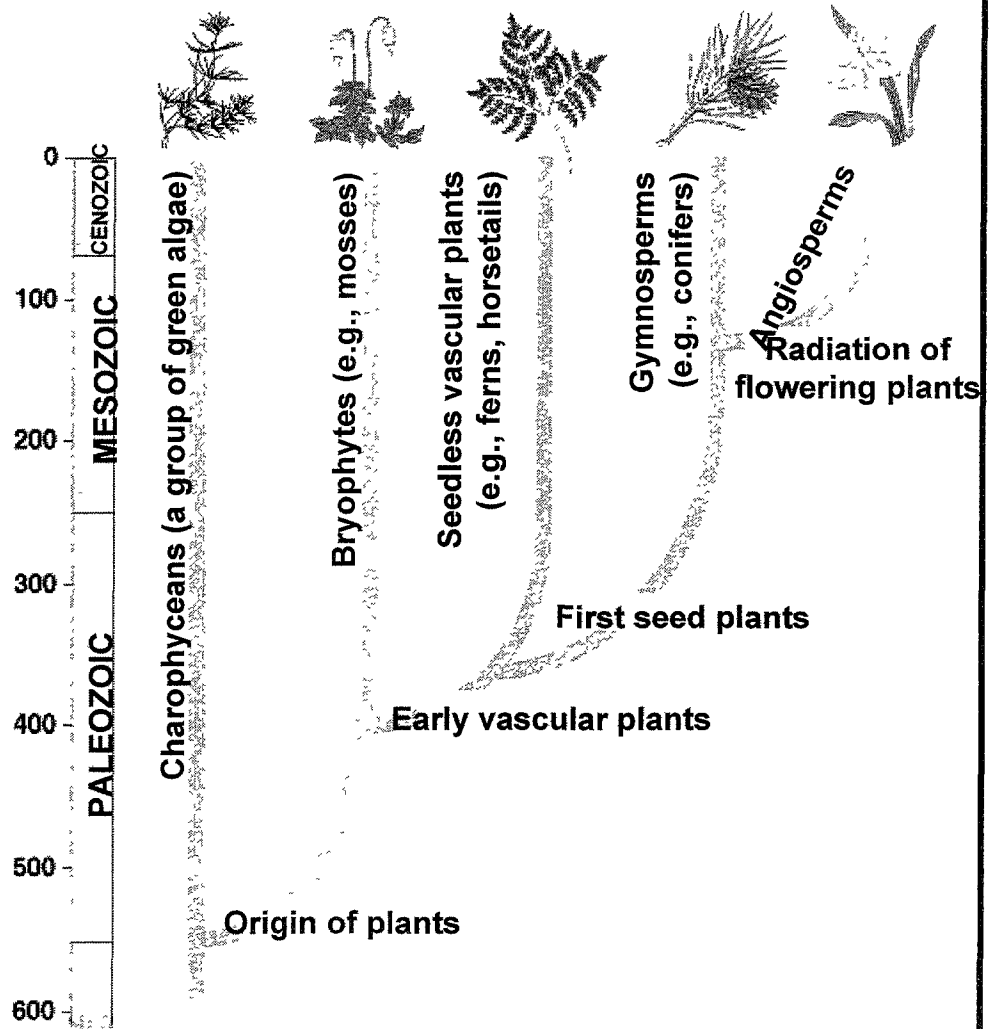
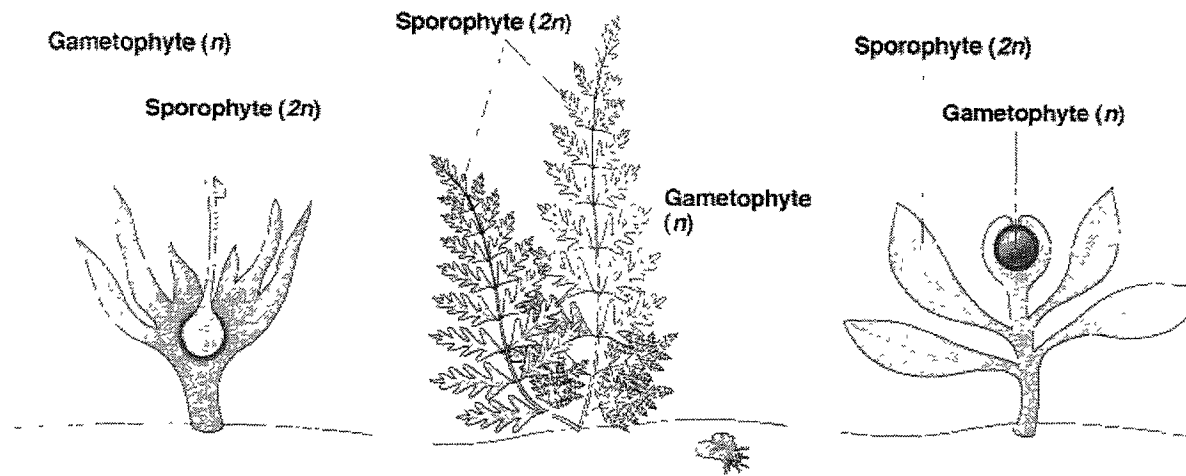


## Land adaptations



## Plant phylogeny



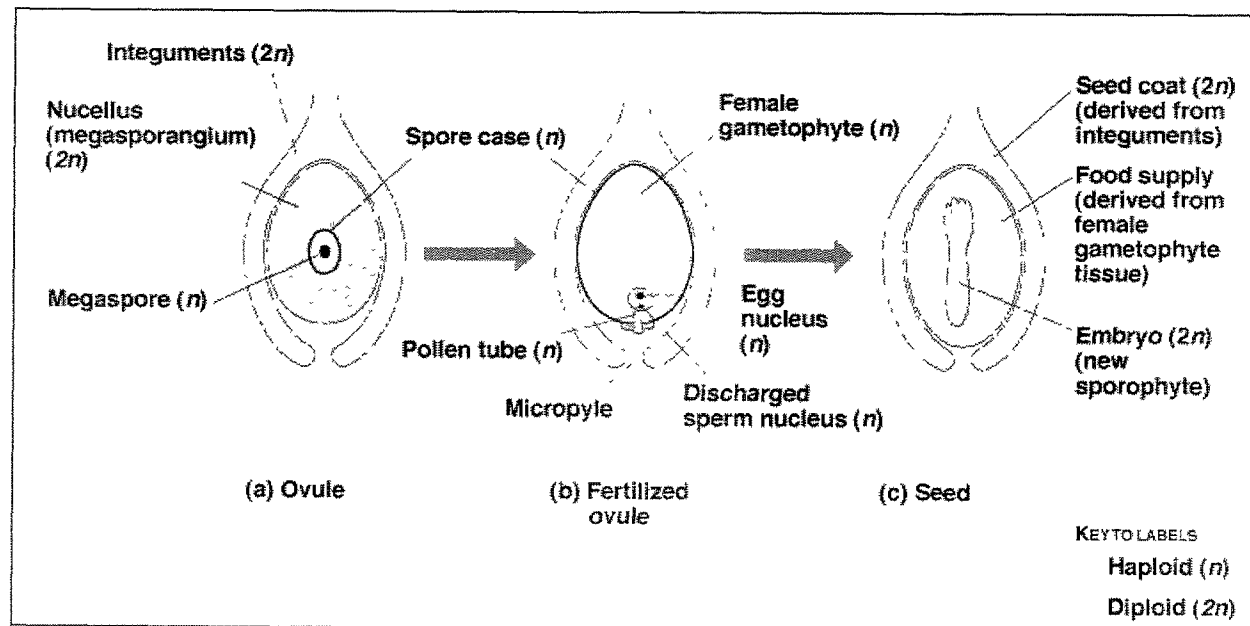


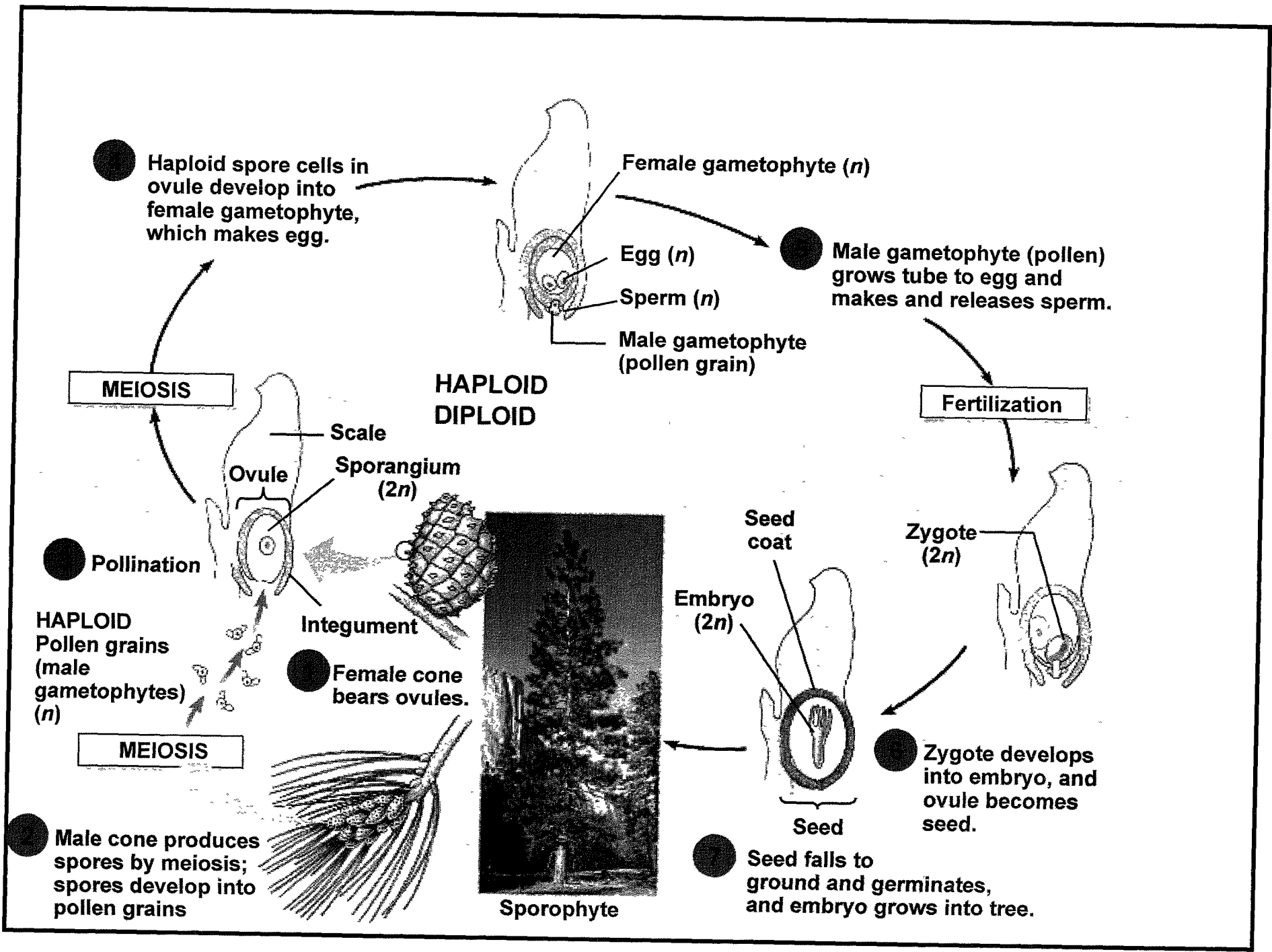
(a) Sporophyte dependent on gametophyte (e.g., bryophytes)

(b) Large sporophyte and small, independent gametophyte (e.g., ferns)

(c) Reduced gametophyte dependent on sporophyte (seed plants)

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● Haploid spore cells in ovule develop into female gametophyte, which makes egg.

● Male gametophyte (pollen) grows tube to egg and makes and releases sperm.

**MEIOSIS**

**Fertilization**

**HAPLOID  
DIPLOID**

**Pollination**

**HAPLOID  
Pollen grains  
(male  
gametophytes)  
(n)**

**MEIOSIS**

● Male cone produces spores by meiosis; spores develop into pollen grains

● Female cone bears ovules.

● Zygote develops into embryo, and ovule becomes seed.

● Seed falls to ground and germinates, and embryo grows into tree.



**Sporophyte**