

GYMNOSPERM REPRODUCTION

4 April 1997, 28 April 99 (for Jan Carter's class), 30 Mar 01, 31Mar04, 1April 09, 30Mar10
 (See also Young's *Botany Coloring Book*, plate 79 & 80.) Campbell's 6th: p 597-605, 7th: 584-597, Sadava: 630-638

SPERMATOPHYTINA Seed producing: protective structure, houses dormant embryo, food store, seed coat

Seeds protect embryonic stage within seed structure
 de-emphasize gametophytic stage
 fertilization no longer requires water for swimming gametes
 Provided nutrients, protection for partially developed embryo

avoids desiccation
 diploid less sensitive to mutations
 pollination via air, animal vectors
 less dependant on rich., moist environ

Gymnosperms appeared 300-350 million years ago

Divisions: p 635

- Cycadophyta cypads
- Ginkgophyta **ginkgo**
- Gnetophyta Ephedra, etc
- Coniferophyta 550 species p 636

REPRODUCTION OF GYMNASPERMS: (p. 637)

I. Early Spring

male cone microsporophyll
 microsporangium (meiosis occurs here)
 pollen grains (*microspore*), borne by wind to female cone (not yet haploid)

female cone (1/4" tall) ovuliferous cone:
 megasporophyll (ovuliferous scale)
 sterile bract
 ovule: (megasporangium)
 megaspore
 integument
 micropyle

sticky fluid on micropyle. Drying of fluid draws in pollen.
 scales of cone grow together after pollination.

II. Early summer

pollen tube begins to grow.

III. Mid summer

meiosis in female takes place

IV. Late following spring

archegonium forms, **pollen tube arrives**, fertilization

V. Autumn of 2nd year

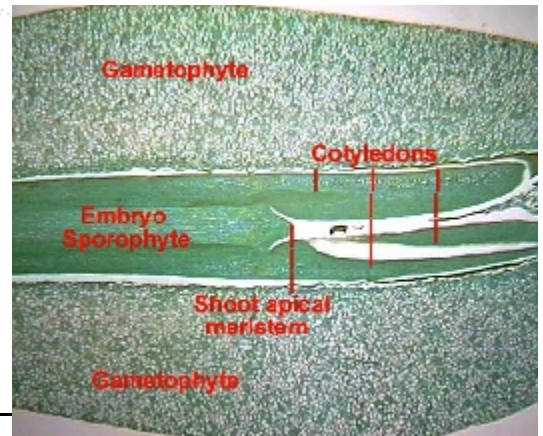
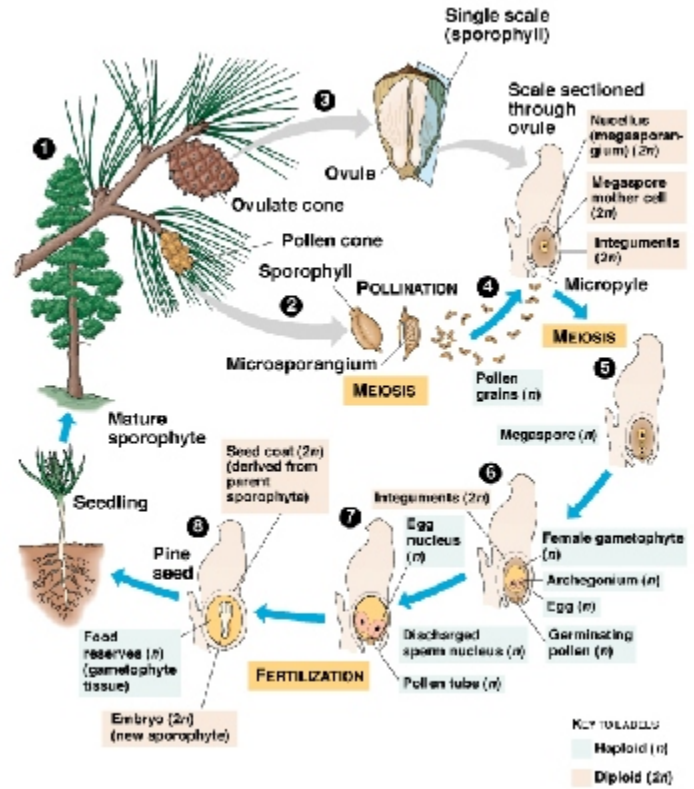
mature seeds shed

(Some seeds released only after fire)

Called Conifer due to cone shaped reproductive structures in these plants

seed with embryo:

cotyledons, superior (shoot) apical meristem, hypocotyl-root axis, inferior (root) apical meristem, radicle, female gametophyte (houses the embryo)



Name	Needles	Cones
Pine	needle like leaves, in bundles (fascicles)	pendant when mature
Spruce	sessile, rigid, 4 sided, prickly, persistent peg-like bases.	pendant cones from behind tip of branch
Hemlock	lacy foliage, dropping tips.	cone hangs from tip of branch, not sticky
Fir	sessile needles, sticky buds	cones upright, disintegrate at maturity
Juniper	needles small and scale-like, rounded branches	berry-like in some