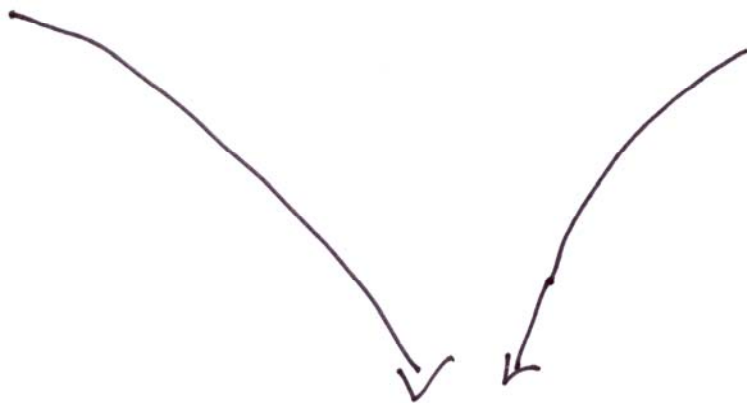


Development of megasporangium + megagametophyte in generalized seed plants.



Pollination



Fertilization



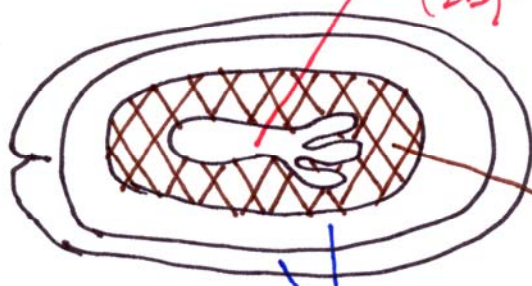
Zygote



Embryo (young sporophyte)



SEED



embryo: new sporophyte generation
(2n)

megagametophyte
(n)

Seed coat
(2n; remnants of old sporophyte generation - nucellus + integument)

Introduction to Seed Plants

Cryptogams

Free-living gametophyte

Motile sperm requiring water for reproduction

Sperm must swim through an open environment

Seed Plants

Mechanism for fertilization without water

Sperm do not swim through an open environment

New method for dispersal

Animals, wind, water, etc.

Dormancy

Nutrition

All seed plants are heterosporous, and both spore and gametophyte types are modified.

The microgametophyte is modified into what we call *pollen*.

Pollen is delivered to the immediate vicinity of the megagametophyte

POLLINATION

A pollen tube grows to meet the egg and deliver the sperm

FERTILIZATION

The megasporangium has a protective layer surrounding it

INTEGUMENT

An OVULE is an *integumented megasporangium*

The megagametophyte becomes the nutritive tissue encased in parts of the old sporophyte (seed coat).

A SEED is an embryo (young sporophyte) encased in the megagametophyte (nutritive tissue), all of which is enclosed by the seed coat (remnants of nucellus and integument of old sporophyte generation). Thus, a seed contains three generations in one.