

REPRODUCTION IN PLANTS**19 FEBRUARY 2014****Lesson Description**

In this lesson, we:

- Look at different types of reproduction
- Look at the reproductive mechanisms in bryophytes, pteridophytes and gymnosperms

**Summary****Types of Reproduction****Asexual / Vegetative Reproduction**

Haploid spores (n) are produced in the sporophyte ($2n$) by meiosis

- Only one parent or individual is required and there are three types of asexual reproduction - sideways shoots, lateral buds on underground storage organs and stems that produce new roots when cut from the main plant
- Advantages of asexual reproduction is that it is quick and efficient and desirable genetic characteristics are not lost (this can be a disadvantage too)
- Disadvantages of asexual reproduction are that competition for resources occurs and there is no genetic variation

Sexual Reproduction

Fusion of male and female gametes. The gametophyte grows and releases haploid gametes (n).

- More than 1 parent plant is required
- Advantages of sexual reproduction are: genetic variation occurs and so there is a reduction in the chances of parasites and diseases moving from parents to offspring and new species can develop because of the genetic variation.
- Disadvantages of sexual reproduction are that half the population can produce offspring because a mate is required and wind or animals are needed for pollination. The desirable genetic characteristics are not guaranteed to be passed on and the populations take a long time to build up

notes for...

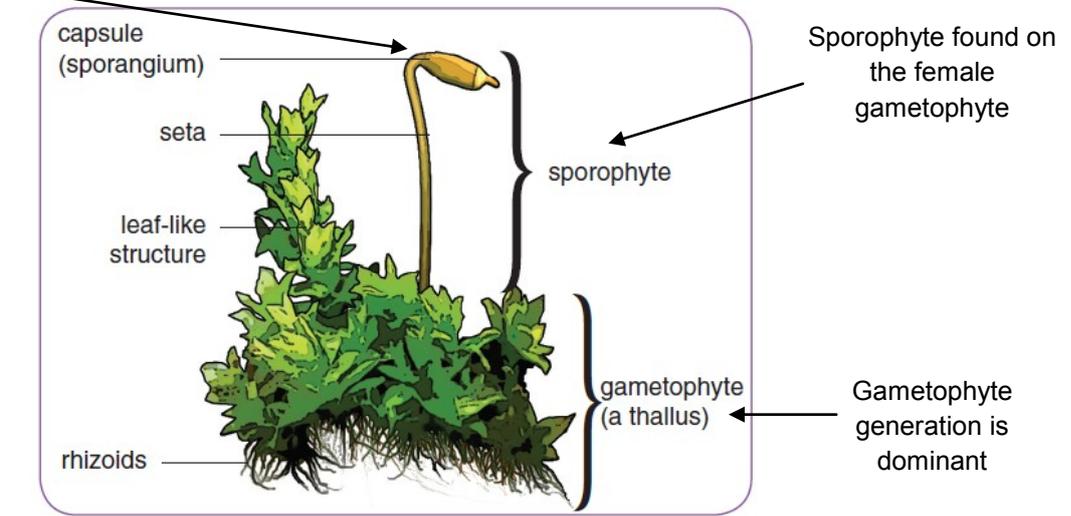
Types of Reproduction in Plants

Bryophytes

Homosporous

Male and female shoots are separate

Male sperm swims to the eggs in the female shoot



Sporophyte found on the female gametophyte

Gametophyte generation is dominant

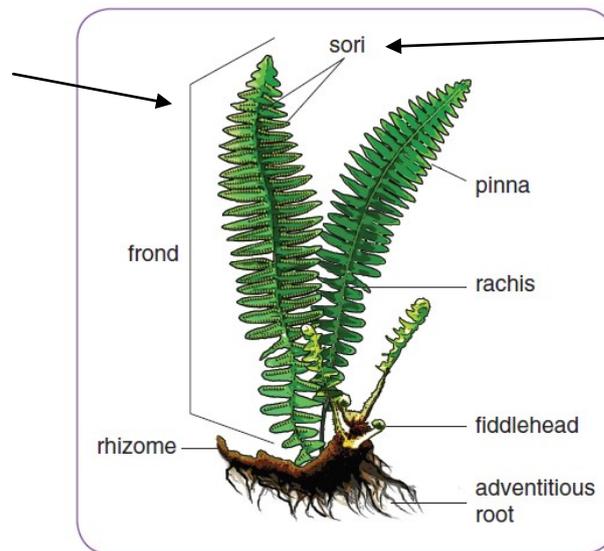
Fig. 2.4 A moss gametophyte generation with sporophyte generation attached

(Solutions for all Life Sciences, Macmillan, p58)

Pteridophytes

Homosporous

Sporophyte develops from diploid embryo



Sori under leaves contain haploid spores

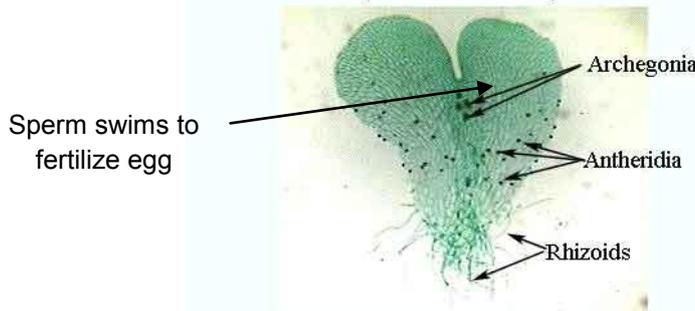
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Spores develop into thallus

Fig. 2.5 Structure of the sporophyte generation of a typical fern

(Solutions for all Life Sciences, Macmillan, p60)

notes for...

Fern Gametophyte (Prothallus)



Sperm swims to fertilize egg

Reproductive organs under thallus

40x

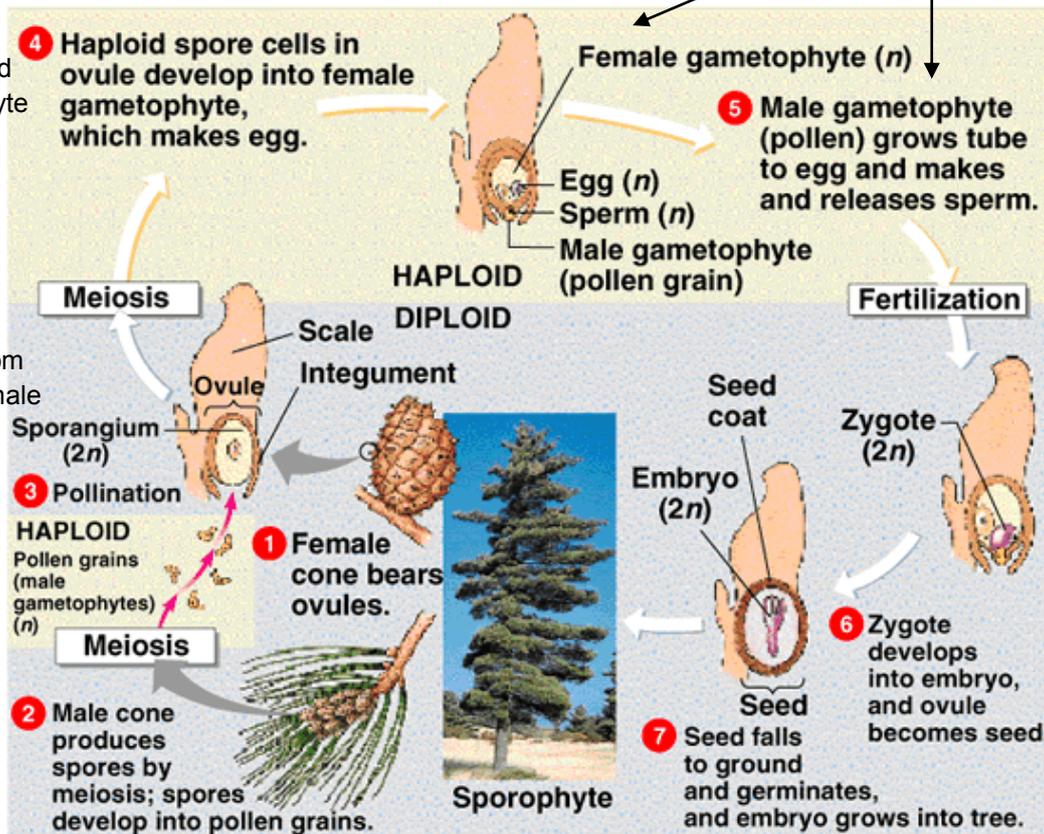
(<http://www.studyblue.com/notes/note/n/fml-lab/deck/8224045>)

Gymnosperms

Gymnosperms are heterosporous (produce both gametes)

Gametophyte generation housed entirely in sporophyte generation

Wind carries microspores from male cone to female cone



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(http://web.dbs.umt.edu/dbs/courses/sci226/lab4_plantsanimals.htm)

**Test Yourself****Question 1**

Which one of the following structures in the pine divides by the process of meiosis?

- A. Zygote
- B. Macrospore
- C. Endosperm
- D. Microspore mother cell

Question 2

How many male gametes are normally formed in the pollen grain of the pine?

- A. 1
- B. 2
- C. 2
- D. 4

Question 3

Which one of the following is a distinctive characteristic of the Gymnospermae?

- A. The seeds always have only one cotyledon.
- B. Only one archegonium per ovule occurs.
- C. The cones are always bi-sexual
- D. The ovule usually has only one integument.

Question 4

Pollination is best defined as a process in which ...

- A. any agent disperses pollen
- B. pollen unites with an ovule
- C. a male gamete fuses with a female gamete
- D. insects carry pollen from one flower to another

Question 5

The female gametophyte in *Pinus* spp. is embedded in the...

- A. integuments
- B. ovuliferous scale
- C. nucellus
- D. archegonium

Question 6

Needle-like leaves of Gymnosperms ...

- A. protect the stem against change of temperature
- B. cannot transpire
- C. do not synthesis organic food
- D. photosynthesise

Question 7

In pteridophytes the sporophyte is ...

- A. a semi-parasite
- B. capable of producing gametes
- C. differentiated into roots, stems and leaves
- D. much smaller than the gametophyte

Question 8

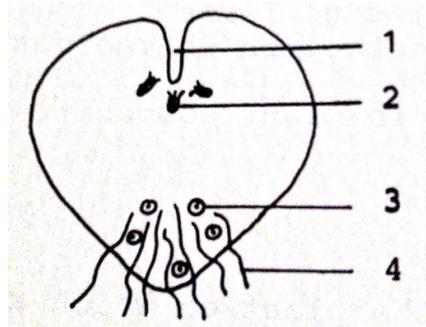
A sorus is a collection of ...

- A. sporangia
- B. seeds
- C. spores
- D. antheridia and archegonia



Improve your Skills

Question 1



- 1.1 What is this structure called? (1)
- 1.2 Name the plant in whose life cycle this structure forms a part. (1)
- 1.3 Is this structure haploid or diploid? (1)
- 1.4 Identify the parts numbered 1 to 3. (3)
- 1.5 Identify the part numbered 4 and state its function. (2)
- 1.6 Describe how fertilisation takes place in this structure. (3)
- 1.7 Is this method of reproduction suitable for a successful survival on land? Explain (3)
- 1.8 There are no stomata on the gametophyte. Why is this not detrimental to this organism? (2)

Question 2

- 2.1 In what way do the sperm of mosses and ferns differ from those of spermatophytes? (3)
- 2.2 Why do gymnosperms and grasses produce more pollen than the rest of the spermatophytes? (2)
- 2.3 Explain the terms 'sexual' and 'asexual' (2)
- 2.4 Draw up a table of comparison between sexual and asexual reproduction. (8)

Question 3



- 3.1 Under which division of spermatophytes is Pinus spp. Classified? (1)
- 3.2 State an observed reason for your answer. (1)
- 3.3 The part numbered 1 represents the _____ 3.3.1 _____ and the part numbered 5 the _____ 3.3.2 _____ (2)
- 3.4 Write down the number of the structure in which
 - 3.4.1 seeds are produced
 - 3.4.2 microspores are found. (2)
- 3.5 Identify the part numbered 4. (1)



Links

- <http://science.howstuffworks.com/life/30702-assignment-discovery-plant-reproduction-video.htm>