PLANT BIODIVERSITY

INTRODUCTION

Algae has had its present form since 570 mya.

Land plants have been around since 480 mya.

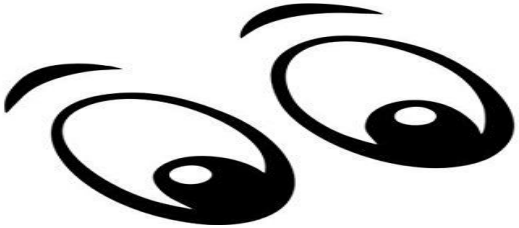
Theory: Plants were simple originally, but adaptations led to them becoming increasingly complex.

Classification of plants is based on FIVE factors:

1. Presence of cuticle, stoma, xylem, phloem.
2. Presence of true root, true stem, true leaf.
3. Reproduction with spores, or seeds.
4. Fruit to protect, feed, and disperse seed.
5. Is it still dependent on water to reproduce?

FORMAT in this Section

For each group of plants in this section we will look at the following:



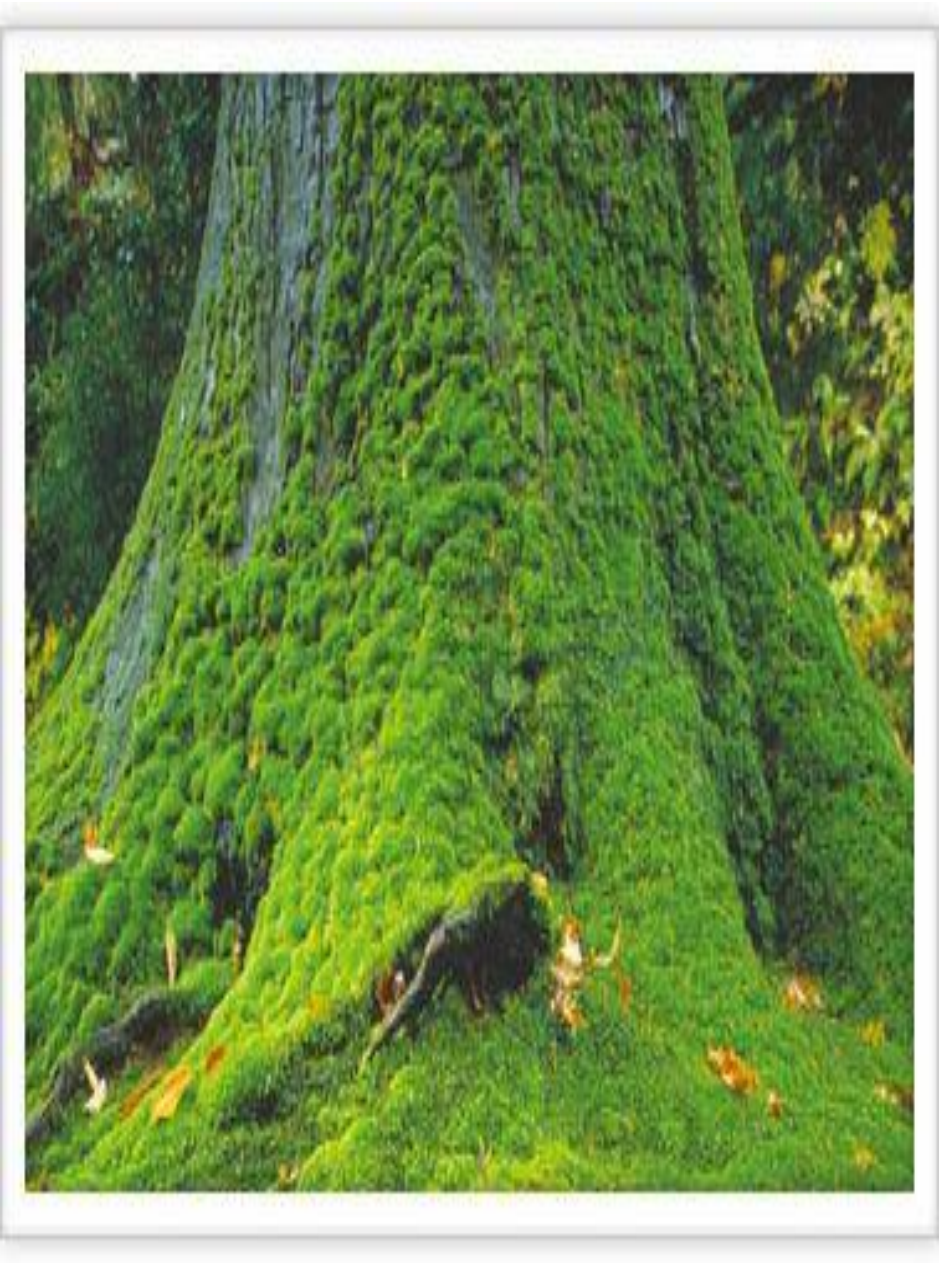
- **Characteristics** – interesting details of the example plant.
- **Structure** – a labelled diagram explaining what it looks like.
- **Reproduction** – the details on how that plant reproduces itself.

DIVISION: *BRYOPHYTA*

EXAMPLE:

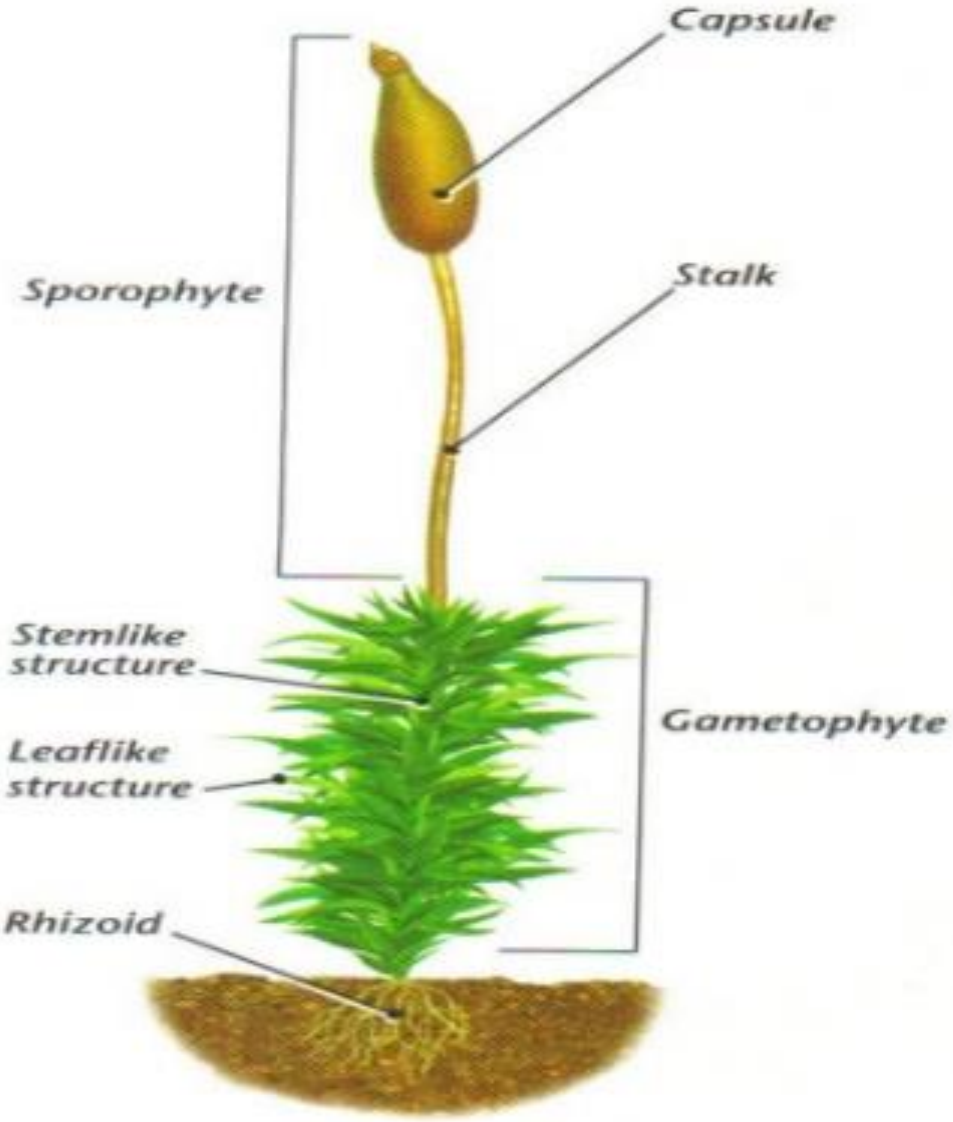
MOSSES

MOSS: What it looks like

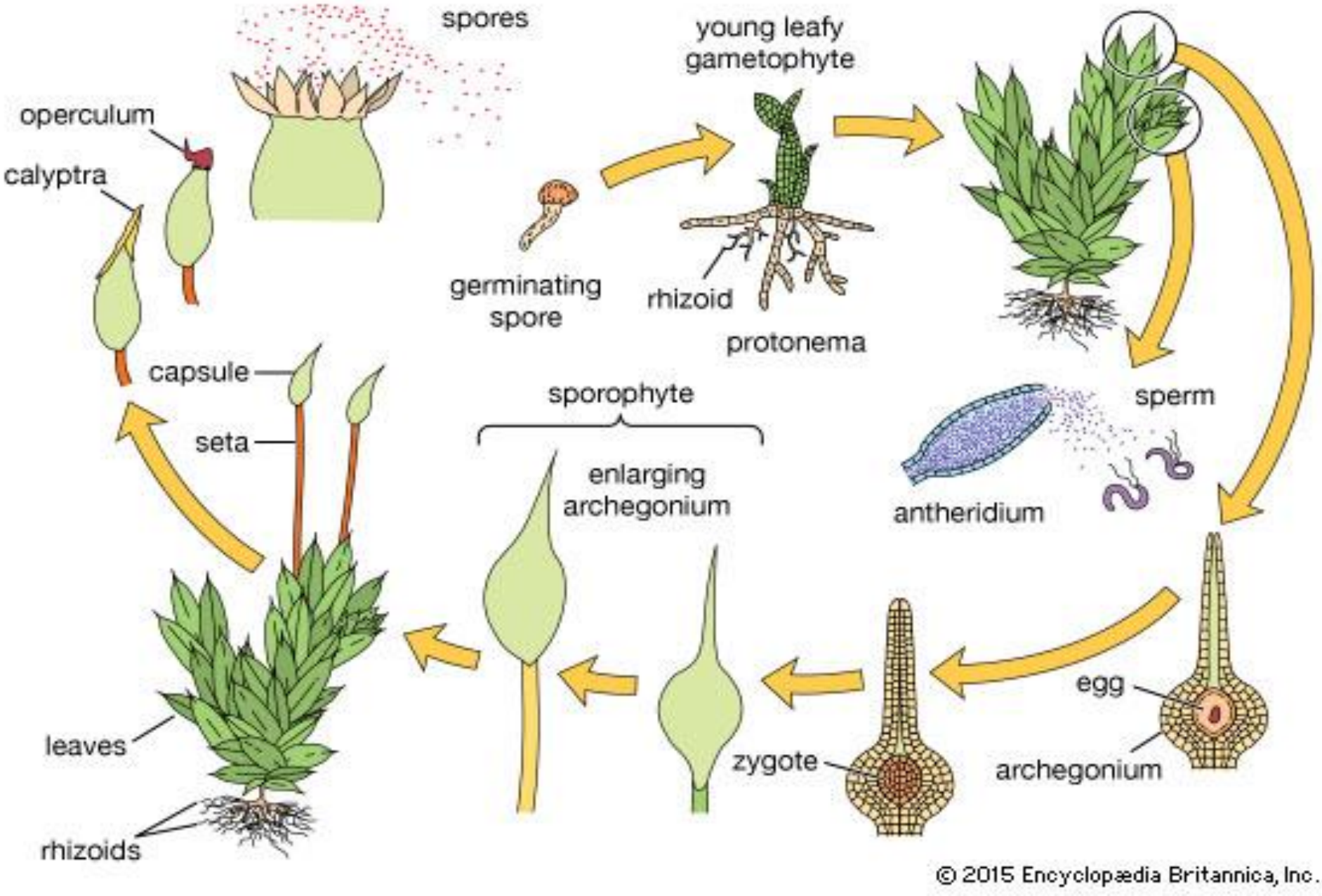


Moss CHARACTERISTICS

- Primitive plants in damp, shady areas.
- Thallus = no true plant features of root, stem or leaf. Rhizoids act as roots. Simple Untrue leaves make its food.
- No vascular tissue (xylem or phloem) – it relies on diffusion for movement of foods and waters.
- Generates gametophytes to make sperms and ova. Water puts these together. Sporophyte grows (is *generated*) from here. Produces spores. Each of these *generates* into a gametophyte.



STRUCTURE of a MOSS PLANT



REPRODUCTION of MOSSES

QUESTIONS Page 16

Question 1

10 X [1] = [10]

1. Thallus
2. Vascular
3. Rhizoids
4. PhotoSynthesis
5. GametoPhyte
6. SporoPhyte
7. Protonema
8. Calyptra
9. Seta
10. Water

Question 2

4 X [2] = [8]

1. C
2. D
3. D
4. A

Question 3

1. 

Calyptra
Capsule
Seta
“Leaf” (female)
“Stem” – axis
Rhizoid (“root”) [6]

2. B contains spores. C holds capsule. D is site for female fertilisation, and also makes food. [3]

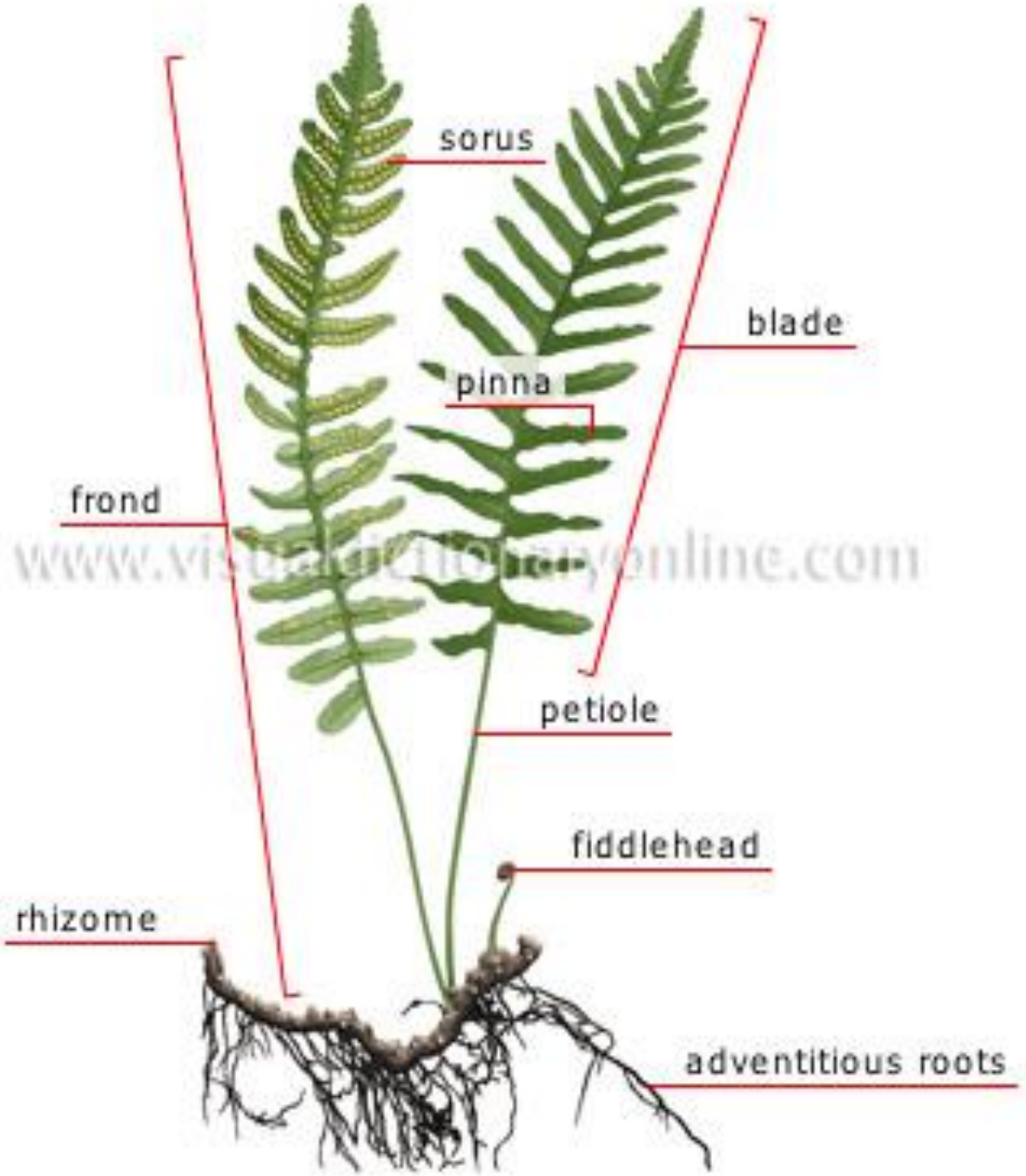
Question 4

1. Sporophyte [1]
2. Anchor plant. Take up water. [2]
3. Need damp: rely on water for reproduction, and has no place to store water. Need shady: do not want to be dried out by sun. [2]

FERNS

DIVISION: *PTEROPHYTA*

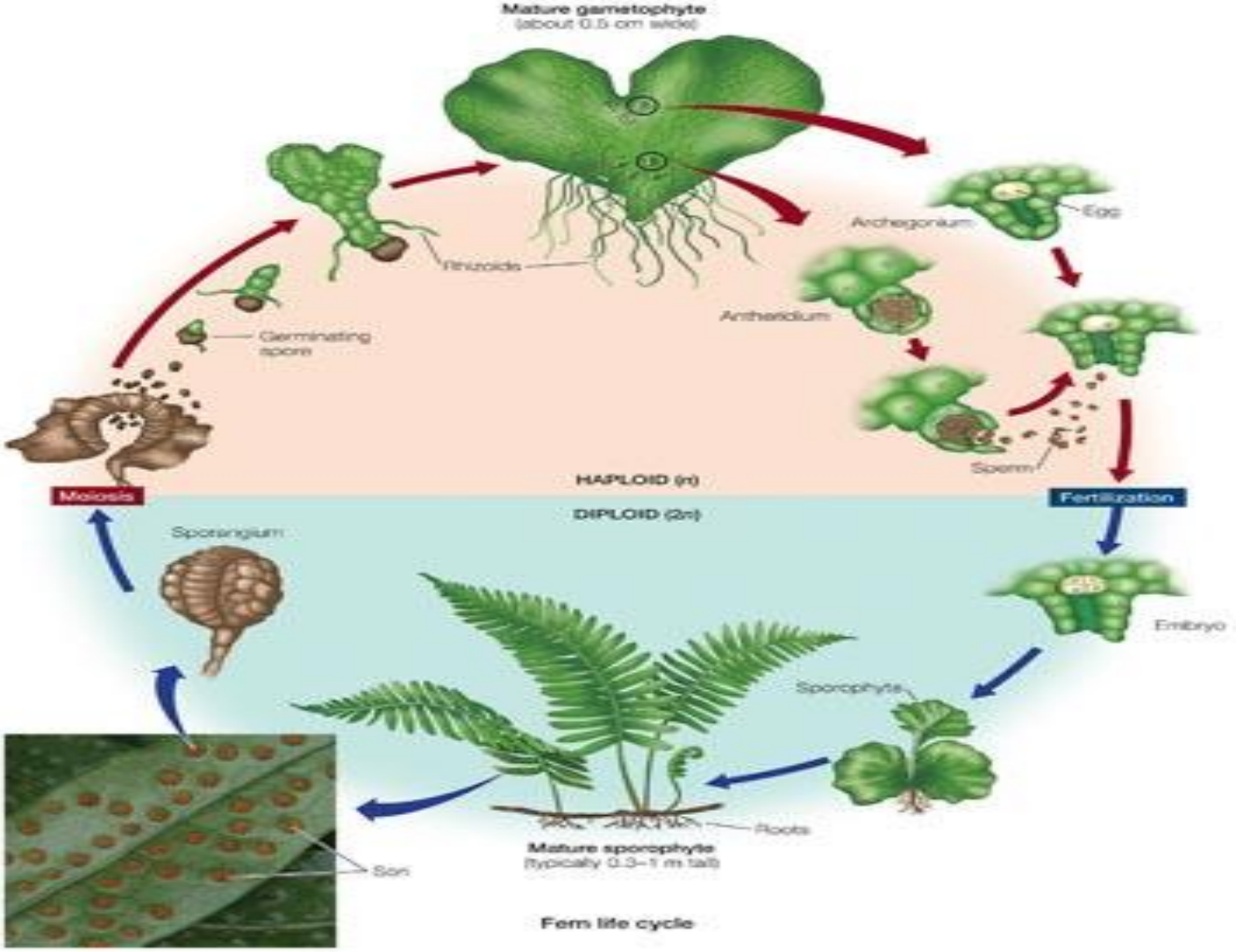
EXAMPLE: FERNS


sorus
blade
pinna
frond
petiole
fiddlehead
rhizome
adventitious roots

Fern

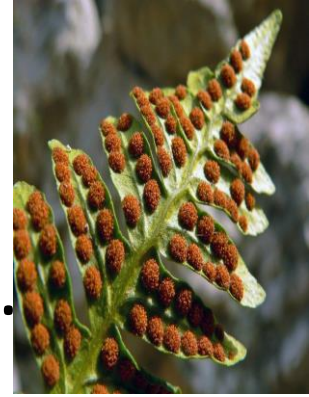
CHARACTERISTICS

- Roots, stems and leaves are all true.
- Have phloem, xylem, and a waxy cuticle.
- Live in cool moist areas – are water-dependent.
- Spore grows into a small gametophyte (ProThallus).
- Sperm swims to ovum in water – fertilization.
- Sporophyte is generated, producing spores.
- It is the largest group of vascular non-seeding plants.



Fern life cycle

***PTEROPHYTE* REPRODUCTION**



- Under the leaf surface are many sori (sorus).
- Each sorus has sporangia, that produce spores.
- When they burst, the spores are carried by wind to moist areas.
- **Spore** grows into ProThallus **gametophyte**. Male and Female organs grow on it to produce sperms and ova.
- Sperm swims to ovum on thin film of water.
- This grows into the fern **sporophyte** that we know.

QUESTIONS Page 18

Question 1

10 X [1] = [10]

1. Frond 2. Cuticle 3. Rhizome 4. SporoPhyte
5. ProThallus 6. ArchaeGonium 7. Adventitious
8. Frond 9. Antheridium 10. ProThallus

Question 2

4 X [2] = [8]

1. C 2. C 3. C 4. A

Question 3

1.

	Frond (leaf)	Pinna (leaflet)
	Stem	Rachis
	Root	Young leaf

[6]

2. C anchors plant and sucks up water.
   D photosynthesises and is site for spores on sori. [2]

Question 4

1. SporoPhyte – **entire** fern plant. (GametoPhyte is just a tiny beginning point.) [3]

2. Male cells need to swim to female cells on the tiny ProThallus. Are short plants, close to the ground – depend on water. [5]

3. Ferns are structured to have xylem for transport, cuticle to control water loss, control of stomata, and a coiled and hairy young leaf. [4]