*KINGDOM PLANTAE*
**CONCEPT 3: ANALYZING THE DIVERSITY OF PLANTS**

Chapter 29 and 30: Biological Diversity Continued…

Learning Intentions – Concept 3

*You must know:*

* Why land plants are thought to have evolved from green algae.
* Some of the disadvantages and advantages of life on land.
* That plants have a unique life cycle termed alternation of generations with a gametophyte generation and a sporophyte generation.
* The role of antheridia and archegonia in gametophytes.
* The major characteristics of bryophytes.
* The major characteristics of seedless vascular plants.
* Key adaptations to life on land unique to seed plants.
* The evolutionary significance of seeds and pollen.
* The role of flowers and fruits in angiosperm reproduction.
* The role of stamens and carpels in angiosperm reproduction.

Review: Biological Diversity



Kingdom Plantae

*What makes a plant, a plant?*

* Produce cellulose for **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** have enzymes that reduce the toxic

effects of photosynthesis

* Produce **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** during cell division
* Life cycle highlights**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, with a

gametophyte stage (haploid) and a sporophyte stage (diploid), while

the zygote develops within the tissues of the female parent!

The Evolution of Land Plant

Land plants evolved from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_more than 500 million years ago.

Plants supply oxygen and are the ultimate provider of most of the food eaten or absorbed by animals or fungi.

The evolution of land plants from the green algae group known as the\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Structure of algae sperm and plant sperm is similar.

Evidence of the Evolution:

1. Rosette shaped cellulose synthesizing complexes
2. Peroxisome enzymes - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Flagellated \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(pollen produces sperm)
4. Formation of a phragmoplast (beginning of a cell plate)

Movement of plants from water to land

Advantages:

Challenges:

How did each group adapt?

1. Nonvascular (Bryophytes example: Mosses)

No xylem or phloem, although some mosses have simple vascular tissue.

Lack of vascular tissue accounts for a\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

All bryophytes have the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_as the dominate stage of the life cycle: they are larger and longer-living than the sporophytes.

1. Seedless Vascular (example: Ferns)

Vascularization!

First plants to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ gaining sunlight. Require a film of ­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_for the sperm to reach the egg.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the dominant stage.

Not only is the stage where there was the evolution of xylem and phloem but also the evolution of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Roots → the organs that absorb water and nutrients from the soil.  Roots also \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_plants allowing them to\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Leaves → Increase the\_\_\_\_\_\_**\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of the plant and serve as the primary organ for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Gymnosperms (example: Pine tree)

Development of Seeds. Seeds are plant \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_packaged with a food supply in a protective coat

.

Naked means → not enclosed in ovaries.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on modified leaves that form cones.

**Five adaptations led to the success of seed plants**

*Reduced Gametophytes*.

Mostly microscopic which allowed for gametophytes to develop from spores retained \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of the parental sporophyte.  This \_\_\_\_\_\_\_\_\_\_\_the egg...mostly from drying out.

*Heterospory.*

Production of 2 types of spores.  This allows for both \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_parts that each have a single function.

*Ovules and the production of eggs*

Increase protection of the egg and developing \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Pollen and production of sperm.*

Sperm (pollen) grain has a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_that protects it from wind or by hitchhiking on animals.  Most have lost their flagellum.

*Seeds*.

If a sperm fertilizes an egg, the zygote grow into a sporophyte embryo.  The whole ovule develops into a seed: the embryo along with a food supply, packaged in a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_coat.

**What advantage do seeds have over spores?**



1. Angiosperm (example: Rose)

Development of Flowers & fruits. 90% of all plants species!

Reproductive adaptation is the flower

* Insects or other animals transfer pollen from one flower to the sex organs on another flower, which makes pollination more \_\_\_\_\_\_\_\_\_\_\_than gymnosperms.

**What is the fruit?**

The fruit is the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**(although it can be other parts as well).

As seeds develop from ovules after fertilization, the wall of the ovary\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Fruits protect dormant seeds and aid in their\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Angiosperm Classification**

*Monocot* → only have one \_\_\_\_\_\_\_\_\_\_\_\_\_\_in the seed, \_\_\_\_\_\_\_\_\_\_\_\_\_\_leaf venation, and flowering parts in multiples of\_\_\_\_\_\_\_\_\_\_\_\_\_\_.   Examples:  orchids, lilies, grasses

*Eudicots* →  have two \_\_\_\_\_\_\_\_\_\_\_\_\_\_in the seed, \_\_\_\_\_\_\_\_\_\_\_\_\_leaf venation, and flowering parts usually in multiples of\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.  Examples: roses, peas, beans, oak