

# Introduction to Plants

Section 23-1

# What Is A Plant?

**Key Idea:** Plants are **multicellular eukaryotes** whose cells have cell walls. Most plants produce their own food through **photosynthesis**.

# What Is A Plant?

- The Kingdom Plantae is a very diverse group of organisms.
- Plants comprise the dominant group of organisms on land, based on mass.
- Most plants are *autotrophs*.
- Plants produce their own food through photosynthesis.

# Establishment of Plants on Land

**Key Idea:** In order to thrive on land, plants had to absorb nutrients from their surroundings, to survive dehydration or avoid drying out, and to have a means of dispersal that did not require water.

- A **cuticle** is a watertight, waxy layer that reduces water loss and makes it possible for plants to live in dry habitats.
- A **spore** is a reproductive structures that are resistant to environmental conditions.
- The word **transport** means to carry from one place to another.

# Absorbing Nutrients

- *Vascular plants* have specialized tissue that transports water and nutrients throughout the plant.
- Most vascular plants absorb nutrients from the soil through their roots.
- Fungi may have helped early plants get nutrients from Earth's rocky surface through a symbiotic relationship called *mycorrhizae*.

# Preventing Water Loss

- A watertight covering, which reduces water loss, made it possible for plants to live in dry habitats.
- Roots obtain water from the soil and allow vascular plants to replace water lost to the atmosphere.

# Dispersal on Land

- Some plants are still dispersed to distant locations by wind.
- Seed plants produce a special kind of spore called pollen that is scattered across land by wind or by animals.
- Pollen transports sperm cells to eggs.
- After a sperm fertilizes an egg, the zygote becomes an embryo that is dispersed in a seed.



# Plants Life Cycles

**Key Idea:** Plants have life cycles in which **haploid gametophytes** alternate with **diploid sporophytes**. A life cycle in which a **gametophyte** alternates with a **sporophyte** is called *alternation of generations*.

- A **sporophyte** is the diploid ( $2n$ ) individual or generation that produces haploid ( $n$ ) spores.
- A **gametophyte** is a haploid individual ( $n$ ) that produces gametes.

# Basic Life Cycle of a Plant

**Step 1: Meiosis** - haploid spores are produced in the diploid sporophyte.

**Step 2: Mitosis** - the haploid gametophyte produces haploid gametes.

**Step 3: Fertilization** - haploid gametes fuse to form the diploid zygote.