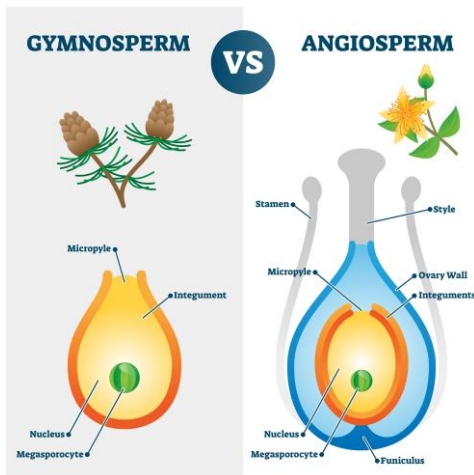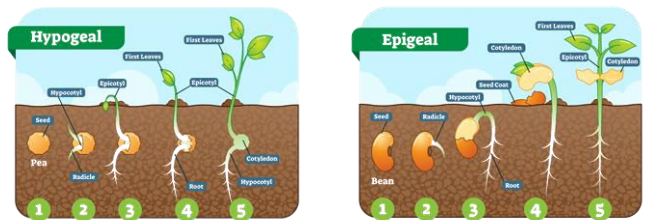# Plants

Section 3: Seed Plants

Seed plants are important organisms to life on earth and have two fundamental characteristics. They have vascular tissue, and they use pollen and seeds to reproduce. Examining the parts of seed plants help to understand how and where reproduction occurs. The **pollen grain** develops in the anther and contains the male gametophyte, which consists of sperm cells, nutrients, and a protective outer coating. **Ovules** develop in the ovaries and are the sporophytic structure that contains the female gametophyte, which produces the egg cell. The ovule forms the seed after fertilization. The **seed** has three main parts – the embryo, stored food, and a seed coat. The **embryo** is the young plant that develops from the **zygote** or fertilized egg. In all seeds, the embryo has one or more seed leaves, or **cotyledons**, which sometimes store food. The seed coat protects the embryo.

The seed then germinates. **Germination** occurs when the embryo begins to grow and pushes out of the seed. For a plant to thrive, seeds must be dispersed, ensuring a better chance for survival. Organisms, water, wind, and a self–ejection method can aid seed dispersal.

Seed plants are divided into two groups. **Gymnosperms** are plants with seeds that are not protected by fruit. The direct transfer of pollen allows fertilization to occur without gametes needing to swim through water. The four types of gymnosperms are confers, cycads, ginkgoes, and entophytes. They have needle–like or scale–like leaves and deep–growing root systems. **Angiosperms**, or flowering plants, are the most successful seed plants. They reproduce sexually utilizing a reproductive organ called the flower. After fertilization, they often produce **fruit,** the mature, ripened ovary of a flower. The fruit protects the seed, and the wall of the fruit helps disperse the seeds.

Review:
1. What are the three main parts of a seed?
2. How are seeds dispersed?
3. Compare gymnosperms to angiosperms.