

Chapter 38 - Plant reproduction and Development**Sexual Reproduction**

1. In general terms, explain how the basic plant life cycle with alternation of generations is modified in angiosperms.
2. List four floral parts in order from outside to inside a flower.
3. From a diagram of an idealized flower, correctly label the following structures and describe the function of each structure:
 - a. sepals
 - b. petals
 - c. stamen (filament and anther)
 - d. carpel (style, ovary, ovule, and stigma)
4. Distinguish between:
 - a. complete and incomplete flowers
 - b. bisexual and unisexual flowers
 - c. monoecious and dioecious plant species
5. Explain by which generation, structure, and process spores are produced.
6. Explain by which generation, structure, and process gametes are produced.
7. Name the structures that represent the male and female gametophytes of flowering plants.
8. Describe the development of an embryo sac and explain the fate of each of its cells.
9. Explain how pollen can be transferred between flowers.
10. Distinguish between pollination and fertilization.
11. Describe mechanisms that prevent self-pollination.
12. Outline the process of double fertilization. Explain the adaptive advantage of double fertilization in angiosperms.
13. Explain how fertilization in animals is similar to that in plants.
14. Describe the fate of the ovule and ovary after double fertilization. Note where major nutrients are stored as the embryo develops.
15. Describe the development and function of the endosperm. Distinguish between liquid endosperm and solid endosperm.
16. Describe the development of a plant embryo from the first mitotic division to the embryonic plant with rudimentary organs.
17. From a diagram, identify the following structures of a seed and state a function for each:
 - a. seed coat
 - b. proembryo
 - c. suspensor
 - d. hypocotyls
 - e. radicle
 - f. epicotyl
 - g. plumule
 - h. endosperm
 - i. cotyledons
 - j. shoot apex

18. Explain how a monocot and dicot seed differ.
19. Explain how fruit forms and ripens.
20. Distinguish among simple, aggregate, and multiple fruit. Give an example of each type of fruit.
21. Explain how selective breeding by humans has changed fruits.
22. Explain how seed dormancy can be advantageous to a plant. Describe some conditions for breaking dormancy.
23. Describe the process of germination in a garden bean.

24. Asexual Reproduction

25. Describe the natural mechanisms of vegetative reproduction in plants, including fragmentation and apomixis.
26. Explain the advantages and disadvantages of reproducing sexually and asexually.
27. Explain various methods that horticulturalists use to propagate plants from cuttings.
28. Explain how the technique of plant tissue culture can be used to clone and genetically engineer plants.
29. Describe the process of protoplast fusion and its potential agricultural impact.

30. Plant Biotechnology

31. Compare traditional plant-breeding techniques and genetic engineering, noting similarities and differences.
32. Describe two transgenic crops.
33. Describe some of the biological arguments for and against genetically modified crops.