

**NCERT Solutions for Class 12 Biology Chapter 1:** NCERT Solutions for Class 12 Biology Chapter 1 Sexual Reproduction in Flowering Plants provide detailed and clear answers to all the exercise questions, helping students understand the complex process of sexual reproduction in plants.

The chapter covers key topics such as the structure of reproductive organs, pollination (self and cross-pollination), the process of fertilization, and the development of seeds and fruits. It also explains the concept of double fertilization and the role of various agents like wind, water, and insects in pollination.

By studying these solutions students gain a thorough understanding of the mechanisms behind plant reproduction and how it contributes to genetic diversity and evolution in flowering plants. These solutions include helpful diagrams and step-by-step explanations that make learning easier and more comprehensive.

## NCERT Solutions for Class 12 Biology Chapter 1 Overview

Chapter 1 of Class 12 Biology titled Sexual Reproduction in Flowering Plants is a fundamental chapter that focuses on the reproductive processes in plants. This chapter introduces students to the intricacies of how flowering plants reproduce sexually, covering various stages and aspects of reproduction, from the formation of gametes to seed development. Here is an overview of the key topics covered in the chapter:

**Key concepts covered in the chapter include:**

**Reproductive Structures:**

- **Male reproductive organ:** The stamen, consisting of the anther and filament, which produces pollen grains (male gametes).
- **Female reproductive organ:** The pistil, consisting of the stigma, style, and ovary, where ovules (female gametes) are produced.

**Pollination:**

- The transfer of pollen from the anther to the stigma. This can occur through **self-pollination** (within the same flower or plant) or **cross-pollination** (between different plants). Various pollinating agents, such as wind, insects, and animals, play a role in this process.

**Fertilization:**

- After pollination, fertilization takes place, where the male gamete (pollen) fuses with the female gamete (ovule). The chapter explains the process of **double fertilization**, which

is unique to angiosperms, where one sperm fuses with the egg cell to form the zygote, and another sperm fuses with two polar nuclei to form the endosperm.

#### **Seed and Fruit Formation:**

- Following fertilization, the zygote develops into a seed, while the ovary transforms into a fruit. The chapter also discusses the structure of seeds, including the embryo, cotyledons, and seed coat.

#### **Significance of Sexual Reproduction:**

- Sexual reproduction in plants contributes to genetic variation, which is essential for the evolution of plant species.

## **NCERT Solutions for Class 12 Biology Chapter 1 PDF**

The PDF link is available below for NCERT Solutions for Class 12 Biology Chapter 1 Sexual Reproduction in Flowering Plants.

Download the PDF to enhance your preparation and strengthen your understanding of plant reproduction.

### **NCERT Solutions for Class 12 Biology Chapter 1 PDF**

## **NCERT Solutions for Class 12 Biology Chapter 1 Sexual Reproduction in Flowering Plants**

Here are the NCERT Solutions for Class 12 Biology Chapter 1 titled Sexual Reproduction in Flowering Plants:

**1. Name the parts of an angiosperm flower in which the development of male and female gametophytes take place.**

*Answer:* In an angiosperm flower, the male gametophytes develop inside the anthers, while the female gametophytes develop inside the ovules.

**2. Differentiate between microsporogenesis and megasporogenesis. Which type of cell division occurs during these events? Name the structures formed at the end of these two events.**

*Answer:*

- **Microsporogenesis:** This process occurs in the anthers, where a diploid microspore mother cell undergoes meiosis to form haploid microspores. This results in the formation of pollen grains.
- **Megasporogenesis:** This process occurs in the ovules, where a diploid megaspore mother cell undergoes meiosis to produce haploid megaspores. Only one of the four megaspores formed is functional, giving rise to the embryo sac.  
Both processes involve meiosis, which is a type of cell division that reduces the chromosome number by half.

**Structures formed:**

- Microsporogenesis: Pollen grain
- Megasporogenesis: Embryo sac

**3. Arrange the following terms in the correct developmental sequence: Pollen grain, sporogenous tissue, microspore tetrad, pollen mother cell, male gametes.**

*Answer:* The correct developmental sequence is:

Sporogenous tissue → Pollen mother cell → Microspore tetrad → Pollen grain → Male gametes.

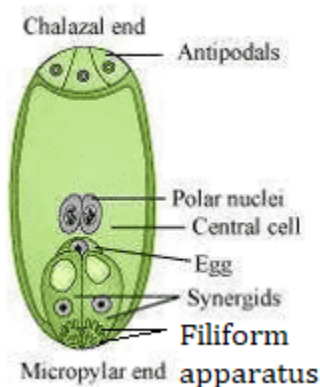
The process begins with the sporogenous tissue, which gives rise to pollen mother cells. These cells divide and form microspore tetrads. The tetrads separate to form individual pollen grains, which later mature to produce male gametes.

**4. What is meant by monosporic development of female gametophyte?**

*Answer:* Monosporic development refers to the formation of a female gametophyte from a single functional megaspore. After meiosis, four megaspores are produced, but only one of them remains functional and develops into the female gametophyte, while the other three degenerate.

**5. With a neat diagram, explain the 7-celled, 8-nucleate nature of the female gametophyte.**

*Answer:*



The development of a 7-celled, 8-nucleate female gametophyte occurs as follows:

- After the first mitotic division of the megaspore, two nuclei form and migrate to opposite ends.
  - These nuclei undergo further divisions to produce a total of eight nuclei, four at each end.
  - At the micropylar end, three of these nuclei differentiate into the egg cell and two synergids.
  - At the chalazal end, three nuclei differentiate into antipodal cells.
  - The remaining two nuclei from each end form the polar nuclei at the center.
- Thus, the female gametophyte consists of seven cells and eight nuclei.

**6. What are chasmogamous flowers? Can cross-pollination occur in cleistogamous flowers? Give reasons for your answer.**

*Answer:*

- **Chasmogamous flowers** are flowers that are open and expose their reproductive organs, allowing cross-pollination.
- **Cleistogamous flowers**, on the other hand, are small and closed with unexposed reproductive organs, preventing cross-pollination. These flowers typically undergo self-pollination because the stigma and anther are in close proximity to each other.

**7. Mention two strategies evolved to prevent self-pollination in flowers.**

*Answer:*

1. **Dichogamy:** This occurs when the male and female reproductive organs mature at different times, preventing self-fertilization.
2. **Self-incompatibility:** A genetically controlled mechanism where the pollen from the same flower is unable to fertilize its own ovule.

**8. What is self-incompatibility? Why does self-pollination not lead to seed formation in self-incompatible species?**

*Answer:* Self-incompatibility is a genetic mechanism that prevents self-pollination, ensuring cross-pollination. In self-incompatible species, the pollen from the same flower cannot fertilize its own ovule, so no seed formation occurs.

**9. What is the bagging technique? How is it helpful in a plant breeding programme?**

*Answer:* The bagging technique involves covering a flower with a protective bag to prevent unwanted pollen from reaching the stigma. This ensures that only the desired pollen fertilizes the flower. It is useful in plant breeding as it helps control pollination and ensures that only specific traits are passed on to the next generation.

**10. What is triple fusion? Where and how does it take place? Name the nuclei involved in triple fusion.**

*Answer:* Triple fusion is the fusion of one male gamete with two polar nuclei in the central cell of the embryo sac. This occurs after the pollen tube enters the ovule and releases two male gametes. One male gamete fertilizes the egg cell, forming the zygote, while the other fuses with the two polar nuclei to form the triploid endosperm. The nuclei involved in triple fusion are:

- One male gamete nucleus
- Two polar nuclei

**11. Why do you think a zygote is dormant for some time in a fertilized ovule?**

*Answer:* The zygote remains dormant temporarily because the endosperm, which provides nutrients to the developing embryo, must first form through triple fusion. The endosperm nourishes the zygote until it is ready to develop into a mature embryo.

**12. Differentiate between the following pairs:**

- **Epicotyl and hypocotyl**
- **Coleoptile and coleorrhiza**
- **Integument and testa**
- **Perisperm and pericarp**

*Answer:*

**Epicotyl vs. Hypocotyl:**

- **Epicotyl** is the part of the embryo above the cotyledons and becomes the upper part of the stem.
- **Hypocotyl** is below the cotyledons and develops into the part of the stem that forms the roots.

**Coleoptile vs. Coleorrhiza:**

- **Coleoptile** is a protective sheath that covers the plumule (young shoot) in grasses.
- **Coleorrhiza** is a protective sheath that surrounds the radical (young root) in grasses.

**Integument vs. Testa:**

- **Integument** is the outer covering of the ovule before fertilization.
- **Testa** is the seed coat formed after fertilization, providing protection to the seed.

**Perisperm vs. Pericarp:**

- **Perisperm** is the part of the seed that provides nutrition, derived from the nucellus.
- **Pericarp** is the part of the fruit that surrounds the seed and protects it.

**13. Why is an apple called a false fruit? Which part of the flower forms the fruit?**

*Answer:* An apple is called a false fruit because it is derived from the thalamus (a part of the flower) rather than just the ovary. The fruit is formed from the thalamus and the ovary.

**14. What is meant by emasculation? When and why does a plant breeder employ this technique?**

*Answer:* Emasculation is the removal of stamens from bisexual flowers before the anther matures. Plant breeders use this technique to prevent self-pollination and ensure that only desired pollen fertilizes the flowers, thereby controlling the traits of the offspring.

**15. If one can induce parthenocarpy through the application of growth substances, which fruits would you select to induce parthenocarpy and why?**

*Answer:* Fruits like watermelon and muskmelon, which are usually seedless, would be ideal candidates for inducing parthenocarpy. This is because seedless fruits are in high demand, and parthenocarpy would allow for the production of such fruits without fertilization.

**16. Explain the role of tapetum in the formation of pollen grain walls.**

*Answer:* The tapetum is the inner layer of the microsporangium that provides nutrition to developing pollen grains. It helps in the formation of the exine layer of the pollen grain, which is important for its protection and structural integrity. The tapetum also produces essential proteins, enzymes, and hormones needed for pollen maturation.

**17. What is apomixis and what is its importance?**

*Answer:* Apomixis is the process where seeds form without fertilization. This process is useful in plant breeding because it allows for the production of hybrid seeds without the need for sexual reproduction. Apomixis ensures that hybrid characteristics are retained, making seed production more cost-effective.

## **Benefits of Solving NCERT Solutions for Class 12 Biology Chapter 1**

Solving NCERT Solutions for Class 12 Biology Chapter 1 on Sexual Reproduction in Flowering Plants provide several key benefits that can significantly enhance students understanding and performance. Here are the benefits:

**1. Comprehensive Understanding of Sexual Reproduction**

- The chapter focuses on the process of sexual reproduction in flowering plants, covering key aspects like the structure of flowers, formation of gametes, pollination, fertilization,

and seed development. Solving NCERT solutions helps students thoroughly understand these processes step by step.

## 2. Clear Explanation of Key Concepts

- Concepts such as **anthers, stigma, style, ovary, ovules, pollination, fertilization, and double fertilization** are explained clearly in the NCERT solutions. This helps students grasp the underlying biological principles and their significance in plant reproduction.

## 3. Boosting Problem-Solving Skills

- The NCERT solutions provide a wide range of problems, from basic to advanced, which encourage critical thinking and problem-solving. By solving these questions students improve their analytical skills and ability to answer both theoretical and application-based questions in exams.

## 5. Clear Understanding of Pollination Mechanisms

- The chapter discusses different types of pollination such as **self-pollination** and **cross-pollination**, along with the factors influencing them. The NCERT solutions help clarify these concepts, which are important for understanding how plants reproduce and the role of pollinators in nature.

## 6. Preparation for Higher Studies

- A solid understanding of sexual reproduction in flowering plants is essential for more advanced topics in biology, such as genetics, plant breeding, and agricultural science. These solutions lay the groundwork for more complex subjects that students will encounter in higher education.

## 7. Strengthens Understanding of Fertilization and Seed Formation

- The solutions guide students through the detailed process of fertilization, including **double fertilization**, which is unique to angiosperms. Understanding this process is crucial for understanding plant growth, seed development, and genetic inheritance.

## 8. Improves Retention through Practice

- Solving various types of questions and referring to the NCERT solutions repeatedly helps students retain information. The solutions reinforce important concepts, ensuring that students are able to recall key processes when needed.

## 9. Reduces Doubts and Confusion

- Students often have doubts regarding complex processes like fertilization and gametogenesis in plants. By practicing with NCERT solutions they can clarify these doubts, ensuring a clear understanding of the topic and better conceptual clarity.

#### **10. Time Management and Efficient Learning**

- NCERT solutions help students focus on the most important aspects of the chapter, which aids in better time management. By practicing with these solutions, students can cover the entire chapter efficiently, allowing for ample time for revision and preparation.

#### **11. Increases Confidence in Answering Exam Questions**

- Regular practice with NCERT solutions builds confidence in students. As they become more familiar with the question formats and the required answers, they will feel more prepared and confident during their exams.