

UNIT: REPRODUCTION (Class 12 Biology) – FULL STUDY GUIDE

CHAPTER 1: Reproduction in Organisms

(Simple Theory + Visuals + Key Points + Mnemonics)

1. What is Reproduction?

 *The process by which living organisms produce young ones.*
Think of it like photocopying yourself, but with variation.

Types of Reproduction

Asexual Reproduction	Sexual Reproduction
One parent	Two parents
No gametes	Gametes involved
Rapid	Slow
Clones produced	Variation present
Uniparental	Biparental

2. Asexual Reproduction Types (Flowchart)

- Asexual Reproduction
 - |— Binary Fission (Amoeba)
 - |— Budding (Yeast, Hydra)
 - |— Fragmentation (Spirogyra)
 - |— Regeneration (Planaria)
 - |— Spore Formation (Fungi)
 - |— Vegetative Propagation (Plants)

Memory Trick:

Baby Bees Fly Round Sweet Violets

→ Binary, Budding, Fragmentation, Regeneration, Spores, Vegetative propagation

3. Sexual Reproduction – Very Simple Explanation

Three Major Events

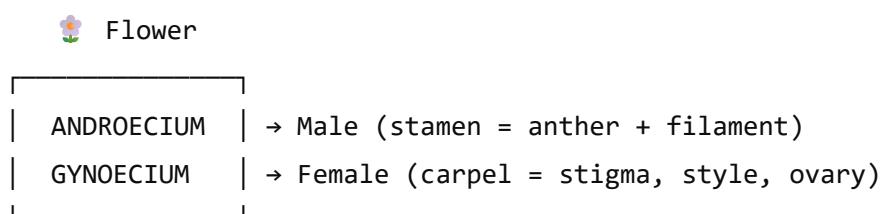
1. Pre-fertilization
 - Gamete formation (gametogenesis)
 - Gamete transfer
 2. Fertilization
 - Fusion of male & female gametes
 3. Post-fertilization
 - Zygote → Embryo
 - Seed/fruit formation
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4. Life Span & Senescence

- Fruit fly: 30 days
 - Parrot: 140 years
 - Banyan tree: 200+ years
-  **Key point:** *Reproduction is not essential for survival but essential for species continuity.*
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CHAPTER 2: Sexual Reproduction in Flowering Plants

1. Flower Structure: Super Easy Visual



2. Microsporogenesis (Pollen Formation)

Flowchart:

Microsporangium (Pollen sac)

↓ Meiosis

Microspore tetrad

↓

Pollen grain (2-celled)

- Vegetative cell
- Generative cell

Mnemonic: MVPG

→ Microsporangium → Vegetative cell → Pollen → Generative cell

✿ 3. Megasporogenesis (Embryo Sac Formation)

Megaspore mother cell

↓ Meiosis

4 Megaspores (only 1 functional)

↓

Embryo sac (7-celled, 8-nucleate)

Embryo Sac Structure (Very Easy Image):

```
[ Synergids | Egg ]  
[      (3 cells at micropylar end) ]  
|  
[ 2 Polar nuclei ]  
|  
[ Antipodals (3 cells) ]
```

✿ 4. Double Fertilization (VERY IMPORTANT)

- One male gamete + egg → zygote
- Other male gamete + polar nuclei → endosperm (3n)

👉 Invented by S.G. Nawaschin

Short Trick:

"One marries the egg, one feeds the baby"

👩 CHAPTER 3: Human Reproduction

❤ 1. Reproductive Systems at a Glance

Male Reproductive System (Simple Table)

Organ	Function
Testes	Sperm production
Epididymis	Sperm storage
Vas deferens	Sperm transport
Seminal vesicle	Fructose rich fluid
Prostate	Milky fluid
Penis	Ejaculation

Female Reproductive System

Organ	Function
Ovaries	Ovum + hormones
Fallopian tubes	Fertilization site
Uterus	Embryo grows
Cervix	Birth canal
Vagina	Copulatory organ

🟡 2. Gametogenesis Overview

Spermatogenesis

Spermatogonia → Primary spermatocyte
 → Secondary spermatocyte → Spermatid → Sperm

Oogenesis

Oogonia → Primary oocyte
 (Meiotic arrest till puberty)
 → Secondary oocyte → Ovum

3. Menstrual Cycle (28 Days)

Phase	Days	Key Event
Menstrual	1–5	Shedding of endometrium
Follicular	6–14	Estrogen ↑, follicle matures
Ovulation	14	LH surge
Luteal	15–28	Progesterone ↑, endometrium thickens

Memory Trick:

"My Funny Owl Laughs"

→ Menstrual, Follicular, Ovulation, Luteal

4. Fertilization → Implantation → Pregnancy

Fertilization (Ampulla of oviduct)

↓

Zygote

↓ Cleavage

Morula → Blastocyst

↓

Implantation (Day 7)

CHAPTER 4: Reproductive Health

1. What is Reproductive Health?

A state of complete physical, emotional & social well-being in reproductive processes.

2. Birth Control Methods (Exam Favorite!)

Table:

Method	Example
Natural	Withdrawal, Rhythm method
Barrier	Condoms
Hormonal	Pills, injections
IUDs	Cu-T, Copper-7
Surgical	Vasectomy, Tubectomy

3. Infertility Treatment

- IVF
- ICSI
- ZIFT
- GIFT

SOLVED NUMERICALS (CBSE-Style)

(Reproduction doesn't have many numerical problems; here are typical logic-based ones)

Q1. If 1024 pollen grains are formed, how many meiotic divisions occurred?

Solution:

1 meiosis → 4 pollen grains

$$1024 \div 4 = 256$$

👉 256 meiotic divisions

Q2. A plant produces 80 ovules but only 20 seeds. What is the percent success of fertilization?

$$\text{Success \%} = (20/80) \times 100 = 25\%$$

PREVIOUS YEARS' BOARD QUESTIONS (Solved)

1. Define double fertilization. (Repeated 6+ times)

Answer: Fusion of one male gamete with egg (zygote) and another with polar nuclei (endosperm). Occurs only in angiosperms.

2. Draw and label a sperm.

(Provide simple diagram if needed)

3. Explain menstrual cycle phases.

(4 marks – frequently repeated)

4. Differences between spermatogenesis & oogenesis.

5. What are STDs? Mention any two.



QUICK REVISION NOTES (SUPER IMPORTANT)

On One Page:

- Asexual reproduction → fast → no variation
 - Embryo sac → 7 cell, 8 nucleus
 - Pollen grain → 2-celled (vegetative + generative)
 - Double fertilization unique to angiosperms
 - Ovulation → Day 14
 - Fertilization → Ampulla
 - Implantation → Day 7
 - Cu-T prevents fertilization
 - IVF → test tube baby
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PREDICTED QUESTIONS 2025

Short Answer (2 marks)

1. What is parthenocarpy?
2. Define cleistogamy.
3. Why does only one megasporangium become functional?

Long Answer (5 marks)

1. Describe human menstrual cycle.
 2. Explain double fertilization with diagram.
 3. Describe spermatogenesis.
 4. Explain methods of contraception.
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EXAM TIPS & TRICKS

- ✓ Always draw labeled diagrams (even if not asked) → FREE marks
 - ✓ Use flowcharts for processes
 - ✓ Underline keywords: zygote, amphimixis, LH surge, IUD
 - ✓ For long answers: Write in steps + diagrams
 - ✓ Avoid common errors:
 - Don't write "6-celled" for embryo sac → It's 7-celled, 8-nucleate
 - Fertilization DOES NOT happen in uterus → Happens in ampulla
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Kid-Friendly Visual Memory Aids

Flower Parts Mnemonic:

"AS GO" → Androecium, Stamen, Gynoecium, Ovary

Human Reproduction Hormone Trick:

"FEEL P" → FSH, Estrogen, LH, Progesterone

Asexual Reproduction:

Imagine a factory where clones roll out on a conveyor belt = fast & identical.