



Introduction

This is a learning as well as an exam preparation video.

At the end of the video are practice assignments for you to attempt.

Please go to www.eastpoint.intemass.com/ or click on the link at the bottom of this video to do the assignments for this topic.

MEGAForte

Innovate. Educate.

Chapter 3: How Do Organisms Reproduce?

Chapter 3: How Do Organisms Reproduce?

Reproduction

Reproduction is the ability of living organisms to produce living beings similar to themselves.

The two modes of reproduction, i.e. asexual reproduction and sexual reproduction can be seen in animals.

Chapter 3: How Do Organisms Reproduce?

Importance of Variation

- Sexual reproduction provides great scope for variation.
- Variation is important for the survival of a species.
- Variation helps a species to adapt to different environmental changes.

Chapter 3: How Do Organisms Reproduce?


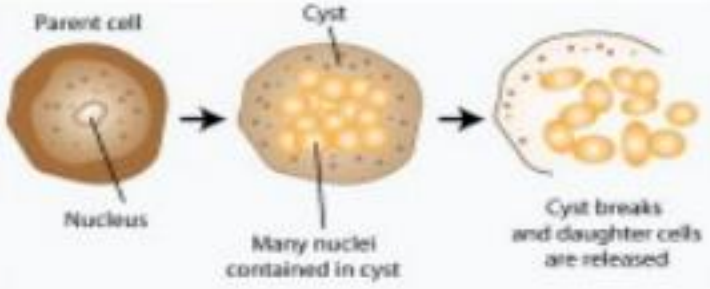
Reproduction and its Kinds

Sexual Reproduction	Asexual Reproduction
<ul style="list-style-type: none">• It involves the formation of special reproductive cells called gametes.	<ul style="list-style-type: none">• It does not involve the formation of gametes.
<ul style="list-style-type: none">• Male and female gametes fuse to form the zygote which develops into a new individual.	<ul style="list-style-type: none">• New organisms are formed either by the division of the parent body or by the differentiation of the parent body.

Chapter 3: How Do Organisms Reproduce?

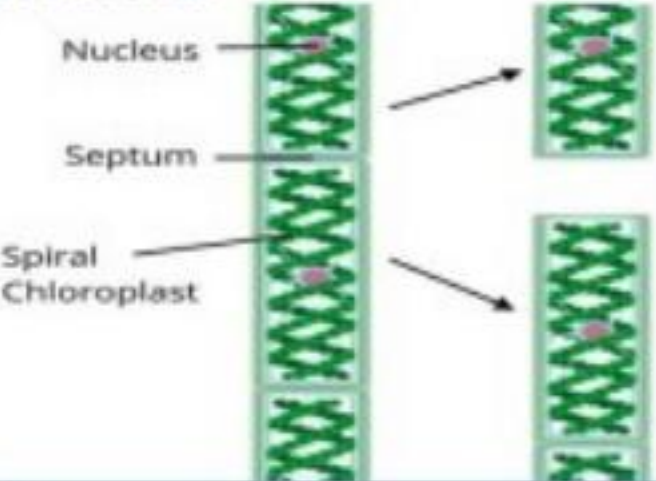
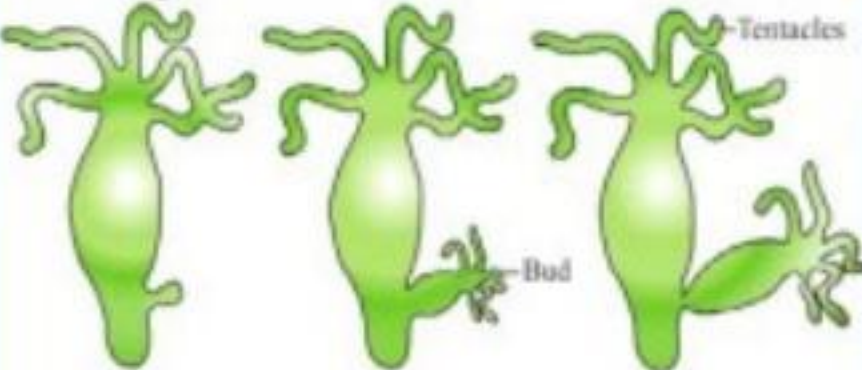
Modes of Asexual Reproduction

Plants and animals from lower classes reproduce by asexual methods.

Method	Description	Example
Binary Fission 	<ul style="list-style-type: none">• Most common method in unicellular organisms.• It is division of the parent cell into two identical daughter organisms.	Amoeba, Paramecium, bacterium
Multiple Fission 	<ul style="list-style-type: none">• Parent cell divides to produce many identical new individuals.	<i>Plasmodium vivax</i> , <i>Leishmania</i>

Chapter 3: How Do Organisms Reproduce?

Modes of Asexual Reproduction

<p>Fragmentation</p> 	<ul style="list-style-type: none">• Adult organisms, on maturation, break up into smaller fragments. Each fragment develops into a new individual.	Spirogyra
<p>Budding</p> 	<ul style="list-style-type: none">• A small outgrowth called a bud arises on the parent body.• The bud grows by repeated cell divisions.• It then breaks off from the parent body and develops into a new individual.	Hydra, sponges, corals, yeast

Chapter 3: How Do Organisms Reproduce?

Modes of Asexual Reproduction

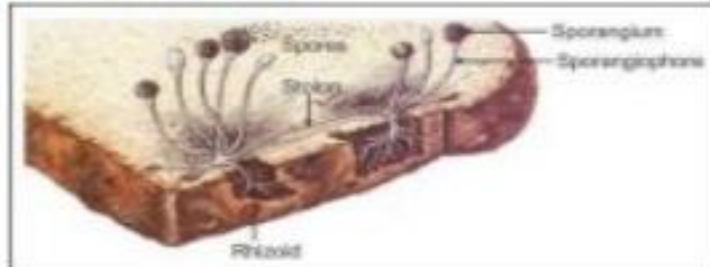
Regeneration



- Regeneration is the ability of organisms to generate lost or damaged body parts.
- Regeneration is carried out by specialised cells.
- These form a mass of cells which undergo changes to form cells specialised in different functions.
- If planaria is cut into small pieces, then each piece develops into a new planaria.

Lizard,
starfish,
planaria,
hydra

Spore Formation



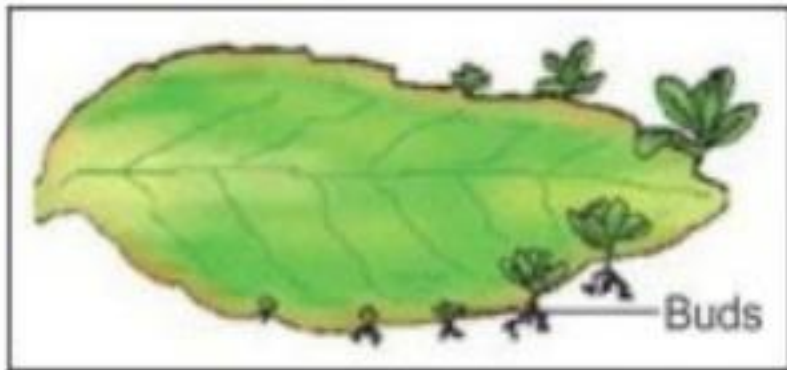
- Spores are special structures produced in sacs called sporangia.
- When spores mature, sporangia burst and spores are carried by air or water to different places.
- When spores fall on a suitable ground, they germinate and give rise to new plants.

Moss, Fern,
Fungi

Chapter 3: How Do Organisms Reproduce?

Modes of Asexual Reproduction

Vegetative Propagation



Vegetative propagation in *Bryophyllum*

- Several plants are capable of producing naturally through their roots, stems and leaves. Such type of reproduction is called vegetative propagation.

Sweet potato (by roots)
Bryophyllum (by leaves)
Ginger (by stem)

Chapter 3: How Do Organisms Reproduce?

Modes of Asexual Reproduction

Different methods used to develop plants which can bears fruits and flowers by vegetative propagation are as follows:

- **Stem cutting:** This involves cutting a part of the stem and planting it in the soil to allow the growth of roots and buds into shoots. Examples: sugarcane, pear, china rose
- **Grafting:** In grafting, the stem or bud of two best quality plants is combined to form a new plant. Examples: guava, apple, mango
- **Layering:** In this, the lower branch of a plant is bent and covered with soil. Once new roots start developing on the branch, it is cut from the parent plant and allowed to grow as an individual plant. Examples: rose, jasmine

Chapter 3: How Do Organisms Reproduce?

Tissue Culture

- Cells from the growing tip of a plant are separated and are grown on a nutrient medium containing all nutrients and hormones necessary for plant growth.
- These cells form a mass called callus.
- The callus develops plantlets.
- These plantlets are transferred to the soil and grow as new individuals.

Chapter 3: How Do Organisms Reproduce?

Tissue Culture

Advantages of Vegetative Reproduction

New plants show the exact characteristics as those of the parent plant.

This method is faster and certain.

Plants not capable of producing sexually can be produced by this method.

Examples: Seedless bananas and grapes

Disadvantages of Vegetative Reproduction

There is no possibility of variation.

The new plant grows in the same area as the parent plant which leads to competition for resources.

Chapter 3: How Do Organisms Reproduce?

Sexual Reproduction

- The sexual mode of reproduction involves two organisms, a male and a female to create a new organism or offspring.
- The sexual reproduction allows greater variations in a species as the two individuals involved in producing the offspring would have different patterns of variations. This
- process includes the combination of DNA of two different individuals and the resultant combination and variation would be unique.
- Hence this ensures a mixing of the gene pool of the species within a population and it also ensures the survival of the species as this process generates more variations due to
- the genetic recombination.

Chapter 3: How Do Organisms Reproduce?

Sexual Reproduction

- The process of combining DNA of two different individuals during sexual reproduction will lead to an offspring with twice the amount of DNA than their previous generation.
- The solution to this lies in the fact that there are certain specialised cells in such organisms called germ cells or gametes. These have half the number of chromosomes and, therefore half the amount of DNA in comparison to the other non-reproductive cells. The combination of these germ cells from two different individuals during the process of sexual reproduction restores the original number of chromosomes and DNA content in the new offspring.

Chapter 3: How Do Organisms Reproduce?

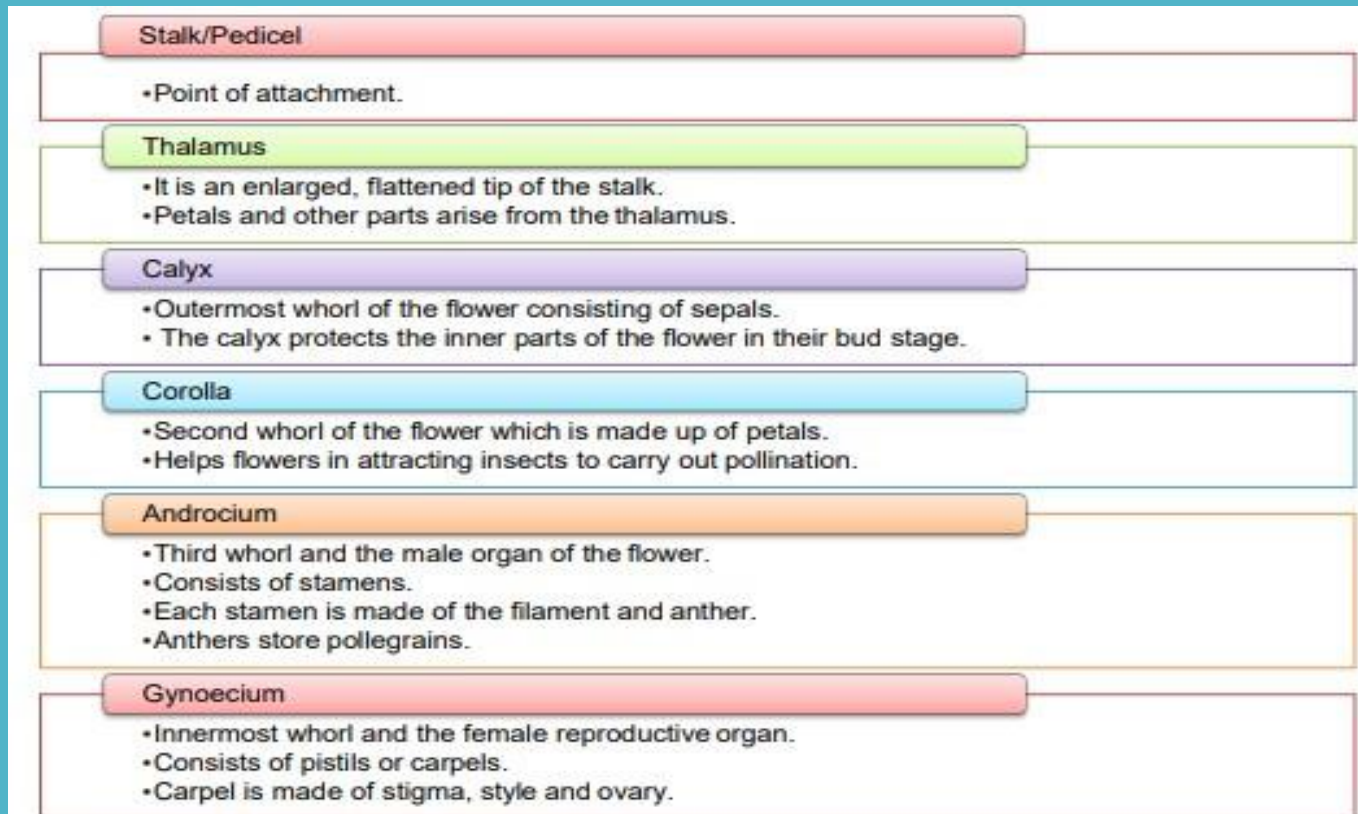
Sexual Reproduction

- The germ cells may be similar and not much different from each other in simple organisms. With the complexity of the organisms the germ cell also becomes specialised. One of the germ cells becomes large and stores food. This is known as the female gamete. The other germ cell which is small and motile is called the male gamete. These gametes lead to the differences in the bodies and reproductive systems of males and females.

Chapter 3: How Do Organisms Reproduce?

Sexual Reproduction in Flowering Plants

A flower is the reproductive organ in angiosperms.



Chapter 3: How Do Organisms Reproduce?

Pollination

- The process of sexual reproduction in plants starts with the transfer of pollen grains from the anther of the stamen to the stigma of the pistil. This process is termed as pollination.
- This is facilitated by pollinating agents like wind, birds, animals, water etc. which transfer the pollen grains.

Chapter 3: How Do Organisms Reproduce?

Pollination

- There can be two types of pollination as follows:

Self-pollination	Cross-pollination
This involves the transfer of pollen grains from the anther to the stigma of the same flower. Example - wheat, peanut, etc.	This type of pollination involves the transfer of the pollen grains from the anther of one flower to the stigma of another flower of the same species. Example - apples, pumpkin etc.

- Different agents help to bring about cross pollination. They are insects, wind, water, etc.

Chapter 3: How Do Organisms Reproduce?

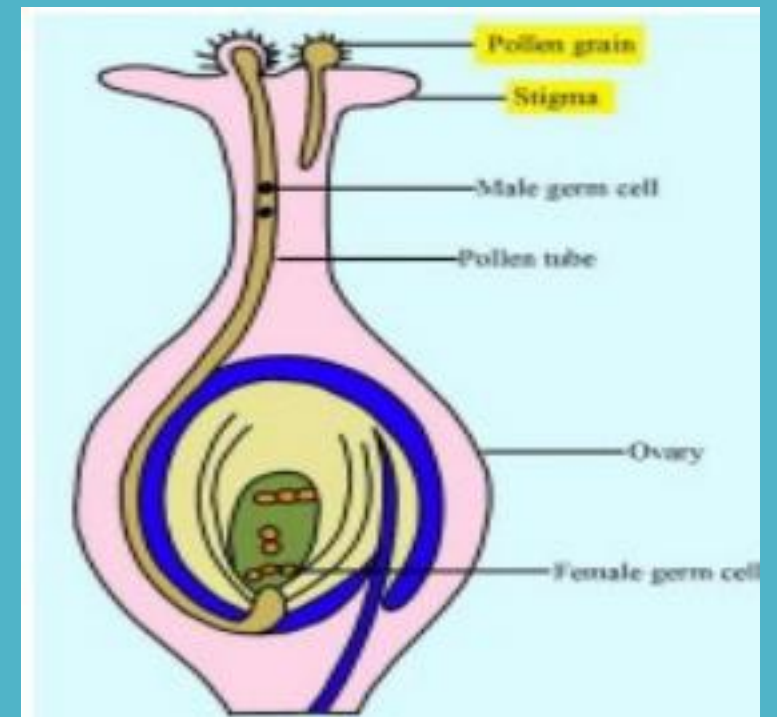
Fertilisation

Through the process of pollination, the pollen is deposited in the style of the pistil. For the next process in reproduction, it needs to reach the female germ-cells which are present in the ovary. To facilitate this, a tube grows out of the pollen grain and reaches the ovule in the ovary of the pistil. Here in the ovule the male germ-cell fuses with a female germ-cell to form a zygote. This process of fusion of the gametes is termed as fertilisation. After the process of fertilization, the zygote thus formed, divides repeatedly to form an embryo inside the ovule. The ovule later develops into a seed.

Chapter 3: How Do Organisms Reproduce?

Fertilisation

And meanwhile the ovary grows and ripens into a fruit and the other parts of the flower, namely the petals, sepals, stamens, style and stigma may be shed off. The seed present inside the fruit encloses the future plant in its embryo.



Chapter 3: How Do Organisms Reproduce?

Fruit and Seed Formation

- The seed that contains the new plant or embryo develops into a seedling when the conditions are suitable. This process is termed as germination. Certain conditions like nutrients, water and proper temperature are necessary for the process of germination.
- The embryo gets its food from the reserve food material stored in the cotyledons. It also has a protective outer covering known as seed coat.

Chapter 3: How Do Organisms Reproduce?

Reproduction in Human Beings

The mode of reproduction in human beings is sexual mode. The reproductive phase of an individual is that phase of life when the individual is ready to reproduce an offspring. Changes are noticed at every phase of growth right from birth.

But there are some changes that begin in the teenage age that start to prepare us for the reproductive phase of life. This period of adolescence leads to sexual maturation. The body needs to create specialised germ-cells to take part in the sexual reproduction. The period of maturation of the reproductive tissues in the body is termed as puberty.

Chapter 3: How Do Organisms Reproduce?

Reproduction in Human Beings

Numerous changes are noticed in both boys and girls during this period. The boys start to have hair growth on their face and body, voice change, active functioning of sweat and sebaceous glands, enlargement of penis etc. The changes in the girls include growth of pubic hair, enlargement of breasts, oily skin leading to pimples, onset of menstruation etc. Both of them undergo changes in their body appearance and they become more conscious of these bodily changes.

The process of fusion of germ-cells in sexual reproduction, the actual transfer of these germ-cells needs to be done. For the same special organs need to be present like penis in males and uterus in females for carrying the baby.

Chapter 3: How Do Organisms Reproduce?

Reproduction in Human Beings

Numerous changes are noticed in both boys and girls during this period. The boys start to have hair growth on their face and body, voice change, active functioning of sweat and sebaceous glands, enlargement of penis etc. The changes in the girls include growth of pubic hair, enlargement of breasts, oily skin leading to pimples, onset of menstruation etc. Both of them undergo changes in their body appearance and they become more conscious of these bodily changes.

The process of fusion of germ-cells in sexual reproduction, the actual transfer of these germ-cells needs to be done. For the same special organs need to be present like penis in males and uterus in females for carrying the baby.

Chapter 3: How Do Organisms Reproduce?

Reproduction in Human Beings

Growth and Development

- Growth and development are gradual and irreversible processes.
- Size and complexity of the body increase gradually.
- Growth in humans is divided into the following stages:

Chapter 3: How Do Organisms Reproduce?

Reproduction in Human Beings

Growth and Development

Infant	<ul style="list-style-type: none">• Children between 1 month and 1 year of age are called infants.
Toddler	<ul style="list-style-type: none">• Children between 1 to 4 years of age.• Growth is fast.• Children learn to balance the body.
Adolescent	<ul style="list-style-type: none">• Children between the ages of 11 to 19 years.• The period of transition from childhood to adulthood is called adolescence
Adulthood	<ul style="list-style-type: none">• It is from the age of 18 years onwards.• An individual attains full growth and emotional stability.• Career and shouldering responsibilities are priorities.

Chapter 3: How Do Organisms Reproduce?

Reproduction in Human Beings

Growth and Development

Puberty is the period during which the reproductive system matures in boys and girls.

- In girls, puberty begins at the age of 11 years.
- In boys, it begins at the age of 12–14 years.
- Puberty continues till the age of 18 years.

Chapter 3: How Do Organisms Reproduce?

Reproduction in Human Beings

Changes Which Occur At the Time of Puberty

Changes in Boys	Changes in Girls
Testes mature and start producing sperms.	Ovaries mature and start producing ovum. The menstrual cycle begins.
Pectoral girdle (shoulder girdle) grows.	Pelvic girdle (hip girdle) becomes broad.
Hair growth in the pubic region.	Hair growth in the pubic region.
The skin in the pubic region becomes darker.	The skin in the pubic region becomes darker.
Development of moustache and beard.	Enlargement of breasts.
Development of a deep voice.	The voice becomes shrill.

Chapter 3: How Do Organisms Reproduce?

Reproduction in Human Beings

Problems Related to Adolescence

Adolescence is a period of physical, mental and emotional changes.

- The spurt of growth in certain body parts creates confusion in teenagers. They start worrying about it. They start feeling lonely and do not feel comfortable to share their problems with others.
- Teenagers become highly sensitive about someone's opinion.
- They tend to become angry or upset very easily.

Chapter 3: How Do Organisms Reproduce?

Reproduction in Human Beings

Problems Related to Adolescence

- They prefer the company of persons their age.
- Due to hormonal changes, they experience depression.
- They feel the urge to become independent but are unsure about themselves.
- They have many questions about sex.
- This makes it important to counsel them in the right manner.

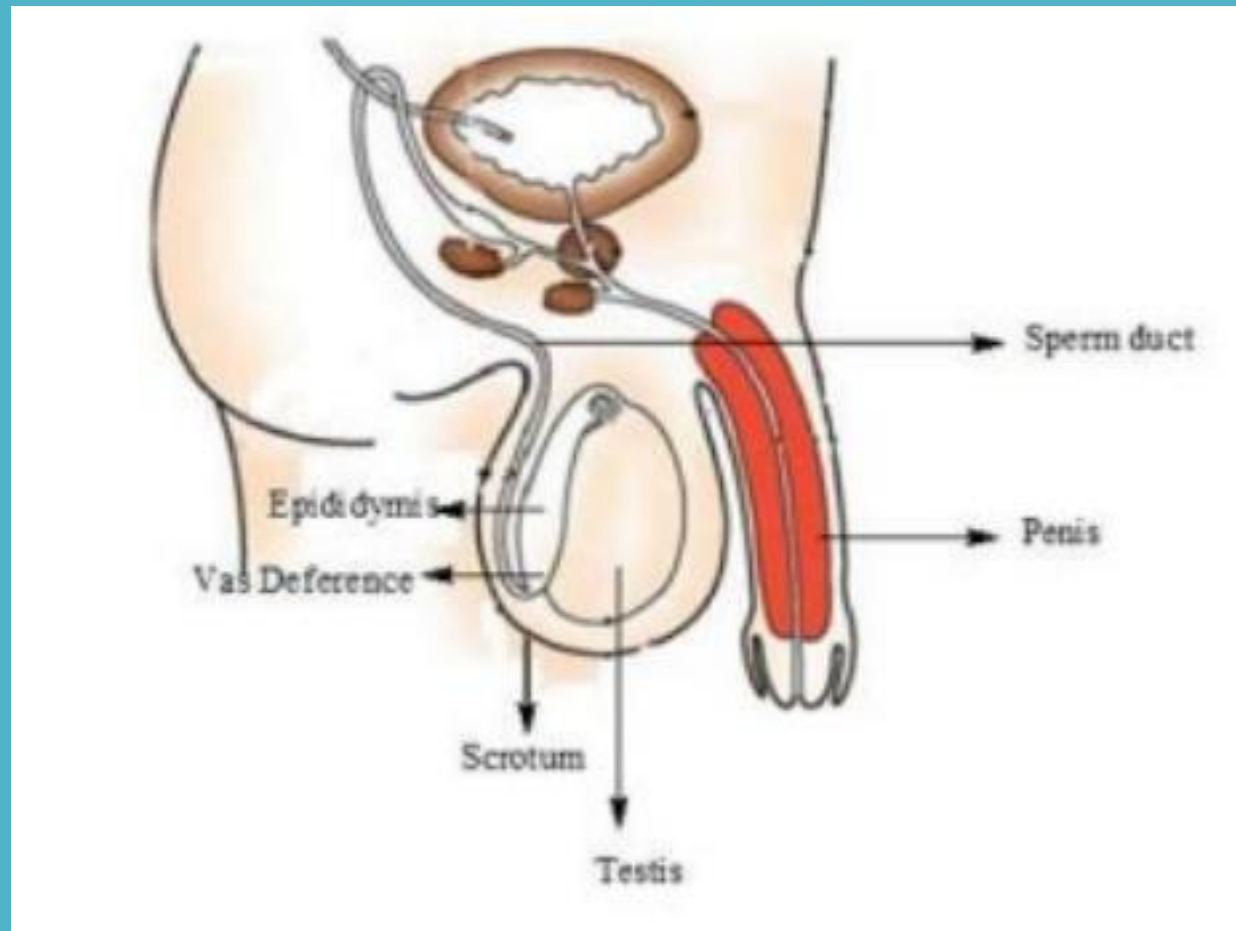
Chapter 3: How Do Organisms Reproduce?

Menstrual Cycle

- Menstruation is the cyclic event of the release of the ovum from the ovary and its removal from the body when fertilization does not happen.
- During menstruation, the blood-rich endometrium of the uterus also breaks down while the ovum is being removed from the body.
- Two pituitary hormones, LH and FSH and two ovarian hormones, estrogen and progesterone, all have their roles in menstruation.
- In humans, the cycle repeats every 28 days.

Chapter 3: How Do Organisms Reproduce?

Male Reproductive System



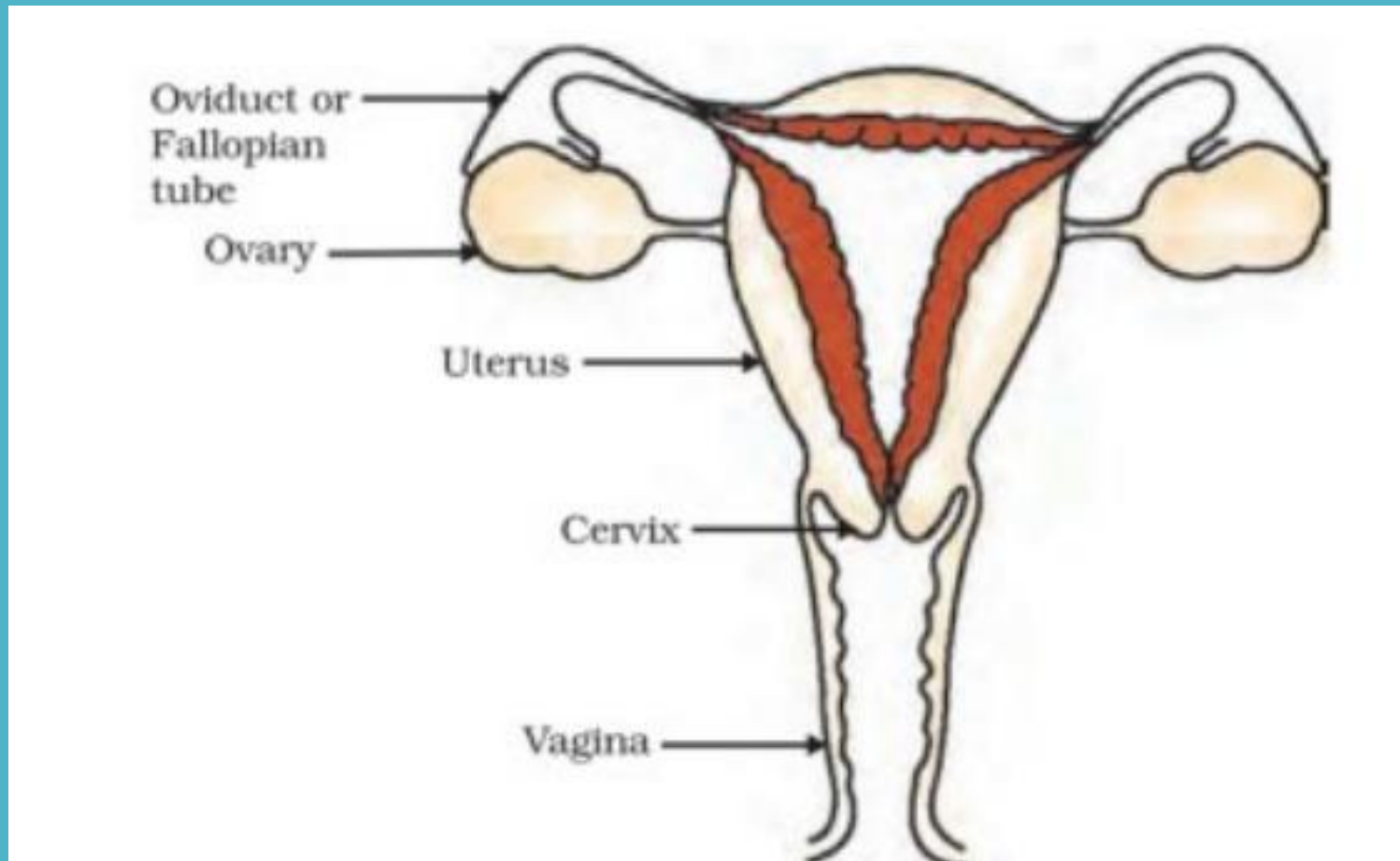
Chapter 3: How Do Organisms Reproduce?

Male Reproductive System

1. Testes (Testicles)	<ul style="list-style-type: none">• A pair of testes is located below the abdomen in the scrotal sac or scrotum.• The testes produce male gametes or sperms (germ cells).• To maintain the temperature 2–3°C below the body temperature, the scrotum is located outside the body cavity.
2. Epididymis	<ul style="list-style-type: none">• Tubes present in the testes join to form the epididymis.• The epididymis stores sperms temporarily.
3. Vas deferens (sperm duct)	<ul style="list-style-type: none">• Each epididymis continues further as the sperm duct or vas deferens.• Each vas deferens unites with a tube coming from the urinary bladder on either side.• Thus, the urethra is the common passage for sperms and urine.
4. Seminal vesicles	<ul style="list-style-type: none">• The seminal vesicles produce a secretion which is responsible for the transport of sperms.
5. Prostate gland	<ul style="list-style-type: none">• It is a bilobed structure which surrounds the urethra.• It pours an alkaline secretion into the semen.
6. Cowper's gland	<ul style="list-style-type: none">• These are two small ovoid glands.• They open into the urethra.• Their secretion serves as a lubricant.
7. Penis	<ul style="list-style-type: none">• The urethra passes through the penis.• It carries either urine or semen at a time.

Chapter 3: How Do Organisms Reproduce?

Female Reproductive System



Chapter 3: How Do Organisms Reproduce?

Female Reproductive System

1. OVARIES	<ul style="list-style-type: none">• Two ovaries are present in the pelvic cavity, one on each side of the uterus.• Ovaries produce ova which are female gametes.• One ovum is released by one ovary every month.
2. OVIDUCTS (Fallopian tube)	<ul style="list-style-type: none">• Two oviducts or fallopian tubes are present, each close to one ovary of its side.• When the egg is released by the ovary, it passes down to the uterus through the oviduct.
3. UTERUS (Womb)	<ul style="list-style-type: none">• The uterus is a hollow pear-shaped, muscular organ.• The inner lining of the uterus called endometrium protects and nourishes the developing embryo.
4. VAGINA (Birth canal)	<ul style="list-style-type: none">• The uterus opens into the vagina.• The vagina is a muscular, narrow tube.
5. VULVA	<ul style="list-style-type: none">• The vagina and urethra both open into the vulva.

Chapter 3: How Do Organisms Reproduce?

Fertilisation

The process of fusion of the male gamete with the female gamete is called fertilisation.

The process of fertilization of a male and female gamete or sperm and egg starts when the sperm enters the female reproductive system through the vaginal passage during a sexual intercourse. From the vaginal passage they move up through the uterus towards the fallopian tubes.

The eggs are present in the fallopian tube, meet the sperm and get fertilized.

Chapter 3: How Do Organisms Reproduce?

Fertilisation

The fertilized egg, which is known as the zygote, starts dividing repeatedly and travels down the fallopian tube to the uterus.

The ball of cells or embryo gets implanted in the endometrial lining of the uterus and continues to grow into a foetus. The embryo gets its nourishment from the mother through a special tissue called the placenta which acts as a connection between the mother and the developing embryo. It helps to transport glucose and oxygen to the embryo and remove the wastes generated by the embryo.

Chapter 3: How Do Organisms Reproduce?

Fertilisation

It takes about nine months for the complete development of the child inside the mother's body. The child is born due to the rhythmic contractions of the uterine muscles.

Chapter 3: How Do Organisms Reproduce?

What Happens If The Egg Is Not Fertilized?

An egg is released by the ovary every month in anticipation of it getting fertilised. In case the egg does not get fertilized, it can survive for only a day. Similar to the ovary releasing an egg every month, every month, the uterus too prepares itself to the fertilized egg by creating a thick and spongy lining in order to provide nourishment to the embryo.

When the fertilization does not occur, this lining too is not required and this lining and the egg is shed as blood and mucous through the vagina. This is called menstruation. This cycle occurs every month and lasts for about 2 - 8 days roughly.

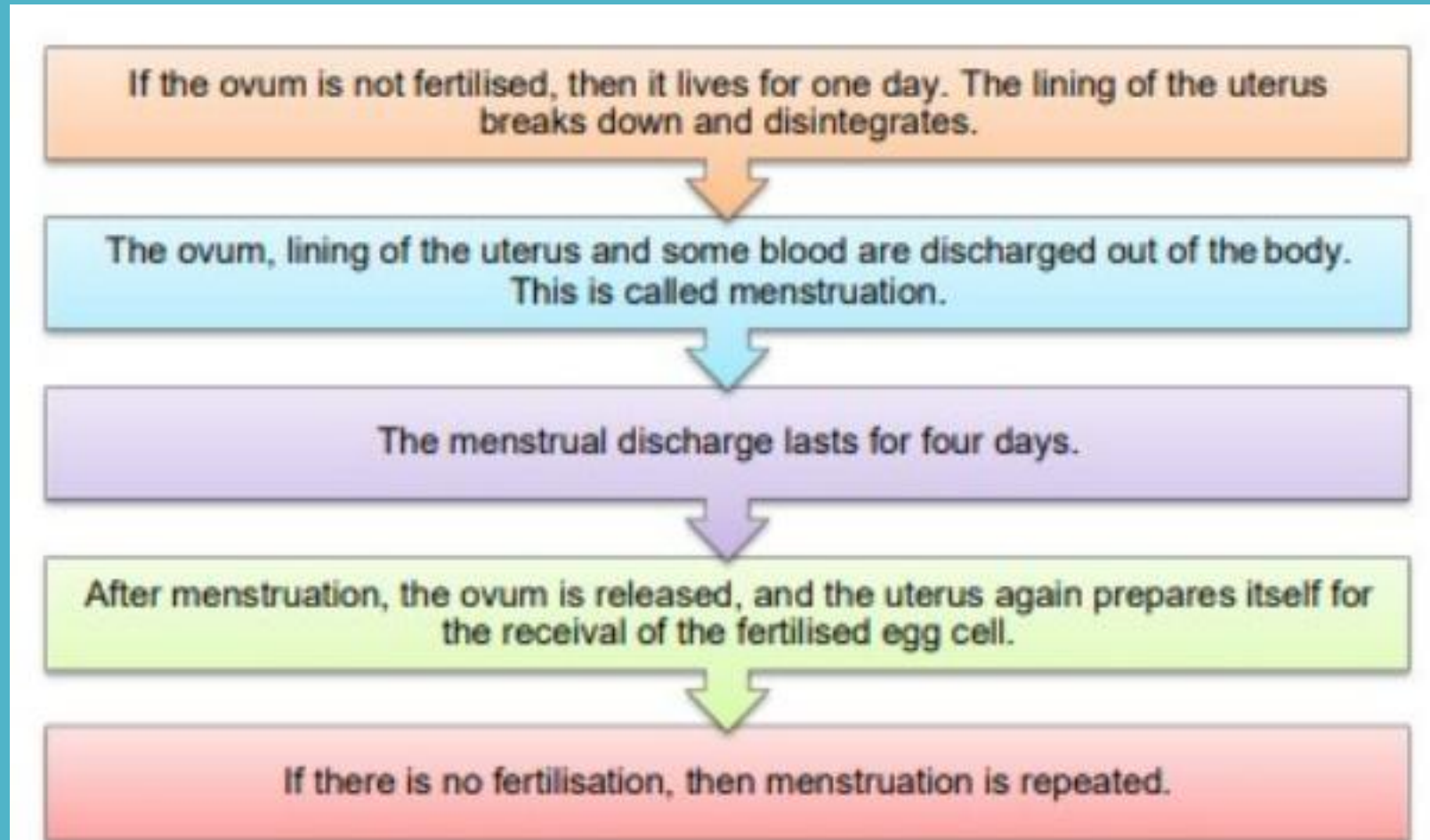
Chapter 3: How Do Organisms Reproduce?

Implantation

- As soon as the zygote is formed, it starts developing.
- By the time it reaches the uterus, it is a mass of cells known as an embryo.
- It remains attached to the wall of the uterus throughout its development.
- The period of development of the embryo inside the uterus is called the gestation period.
- In humans, the gestation period is of 9 months, i.e. about 280 days.
- The embryo after completing three months of development is called the foetus.
- The placenta is a special tissue which provides food and oxygen to the foetus.

Chapter 3: How Do Organisms Reproduce?

Implantation



Chapter 3: How Do Organisms Reproduce?

Reproductive Health

Sexually Transmitted Diseases

1. AIDS (Acquired Immuno Deficiency Syndrome): The most common and chronic sexually transmitted disease is AIDS. It is caused by HIV (Human Immunodeficiency Virus). Generally, the immune system is destroyed by HIV, and the body becomes weak. When a person is infected by AIDS, he is susceptible to various other diseases. Direct sexual contact is the most probable way of transmission of HIV.

Chapter 3: How Do Organisms Reproduce?

Reproductive Health

Sexually Transmitted Diseases

The initial symptoms of HIV are headache, swollen lymph nodes, rashes, fever and chills, and nausea. No cure for AIDS has been found so far, but effective treatment can increase the lifetime of the patient for a few years. AIDS can be prevented by ensuring protective sexual intercourse.

Chapter 3: How Do Organisms Reproduce?

Reproductive Health

Sexually Transmitted Diseases

2. Gonorrhoea: The bacteria, *Neisseria gonorrhoeae*, is the agent of this STD. In this disease, both males and females can be affected. The urogenital pathway, including the rectum, urethra, and cervix (in females only), are mostly affected. Gonorrhoea, like other STDs, is majorly transmitted through direct sexual contact. Oral and anal sex are also the ways through which gonorrhoea is transmitted.

Chapter 3: How Do Organisms Reproduce?

Reproductive Health

Sexually Transmitted Diseases

The symptoms of gonorrhoea are- discharge of pus from the penis, burning sensation during urination (in males), and similarly discharge of pus from the vagina, pelvic or abdominal pain (in females). Gonorrhoea can be prevented by protected sexual intercourse.

Chapter 3: How Do Organisms Reproduce?

Reproductive Health

Sexually Transmitted Diseases

3. Syphilis: The bacteria, *Treponema pallidum*, is the causative agent of this STD. The bacteria find their path in the body through various wounds. Syphilis can also be transmitted from infected pregnant mothers to their children. The early symptoms include a sore that is termed as 'Chancre'. The other symptoms include headache, loss of weight, fatigue, rashes, fever, etc. In the later stages, it may lead to a complete stop of mental growth, loss of vision, heart disease, etc. Syphilis can be prevented by avoiding unprotected sexual contact and other steps as taken for any STD.

Chapter 3: How Do Organisms Reproduce?

Reproductive Health

Sexually Transmitted Diseases

4. HPV (Human Papillomavirus): As the name suggests, it is a viral disease. The most common symptoms include warts on the buccal cavity, throat, and external genitals. If left untreated, HPV may lead to other chronic diseases like cervical cancer, oral cancer, rectal cancer, etc. No treatment has been found for HPV so far.

Chapter 3: How Do Organisms Reproduce?

Reproductive Health

Different methods are available in order to prevent pregnancy:

1. **Hormonal Method:** Various hormonal preparations come in the form of tablets or pills, commonly called contraceptive pills.
2. **Barrier Methods:** Condoms, diaphragms and spermicidals are used, Condoms are used by males while diaphragms and spermicidals are used by females.

Chapter 3: How Do Organisms Reproduce?

Reproductive Health

Different methods are available in order to prevent pregnancy:

3. **Intra-uterine Devices (IUDs):** IUDs such as Lippe's loop and copper – T are fitted in the uterus. They prevent fertilisation.
4. **Surgical Methods:** In females, the fallopian tubes are ligated. This is called tubectomy. In males, the vas deferentia are ligated. This is called vasectomy.

Chapter 3: How Do Organisms Reproduce?

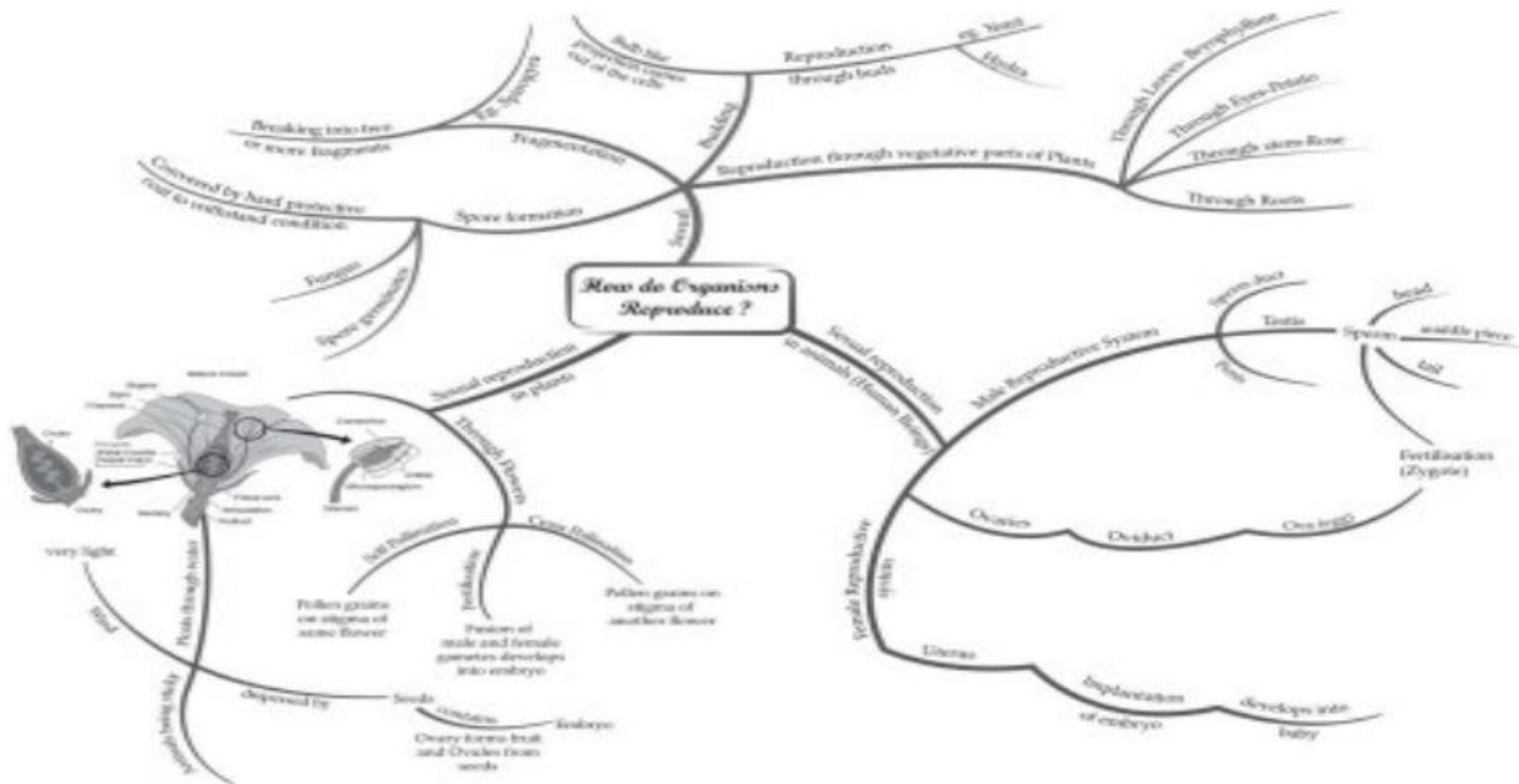
Reproductive Health

Different methods are available in order to prevent pregnancy:

5. **Induced Abortion:** It is also known as Medical Termination of Pregnancy (MTP).

If a woman becomes pregnant and the couple is not willing to have a baby, then the option of induced abortion is chosen.

MIND MAP : LEARNING MADE SIMPLE



Practice Assignments, Exam Prep Assignments for The CBSE Business Studies

1. You may now proceed to try out the exam preparation assignments.
2. **ALL** assignments will be marked and feedback will be given.
3. Should you need to speak to one of our tutors send your email to **administration@intemass.com**
4. Please proceed to the link **www.eastpoint.intemass.com** at the bottom of this video to commence with your practice.



Please click **subscribe** to our video if you find the content useful.

ALL THE BEST WITH YOUR ASSIGNMENTS

