

HOW DO ORGANISMS REPRODUCE

Reproduction is the process by which living organism produce new individuals of the same species

KYU ZAROORI HAI?

- It ensures the continuity of a particular species on earth
- Population stable



It is Not an essential Life Process



VARIATION

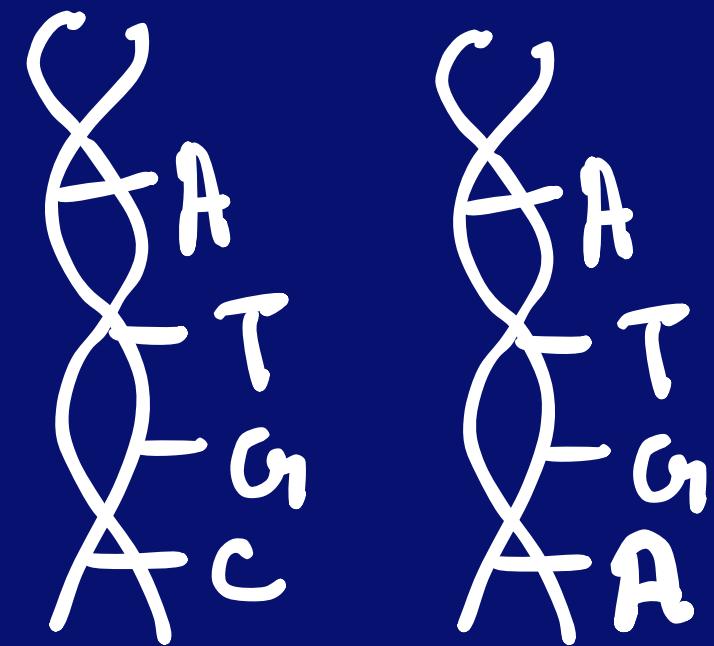
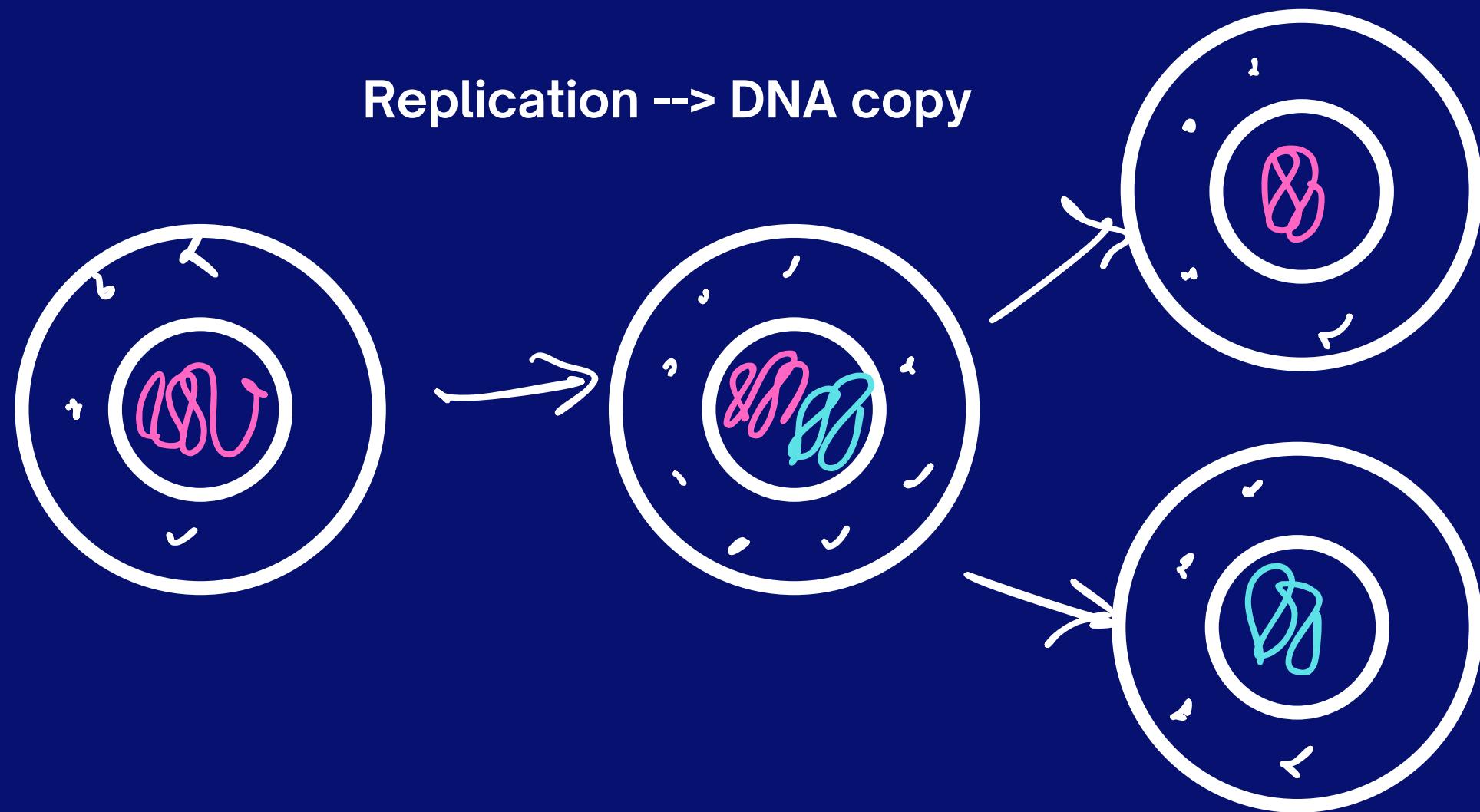
Variations are the differences present between the individuals of the same species

Variation Occurs due to- Changes in Genetic material present in Nucleus of cell

Cell--> Nucleus--> Chromosomes --> contain information in form of DNA (Deoxyribo Nucleic Acid)



Replication --> DNA copy

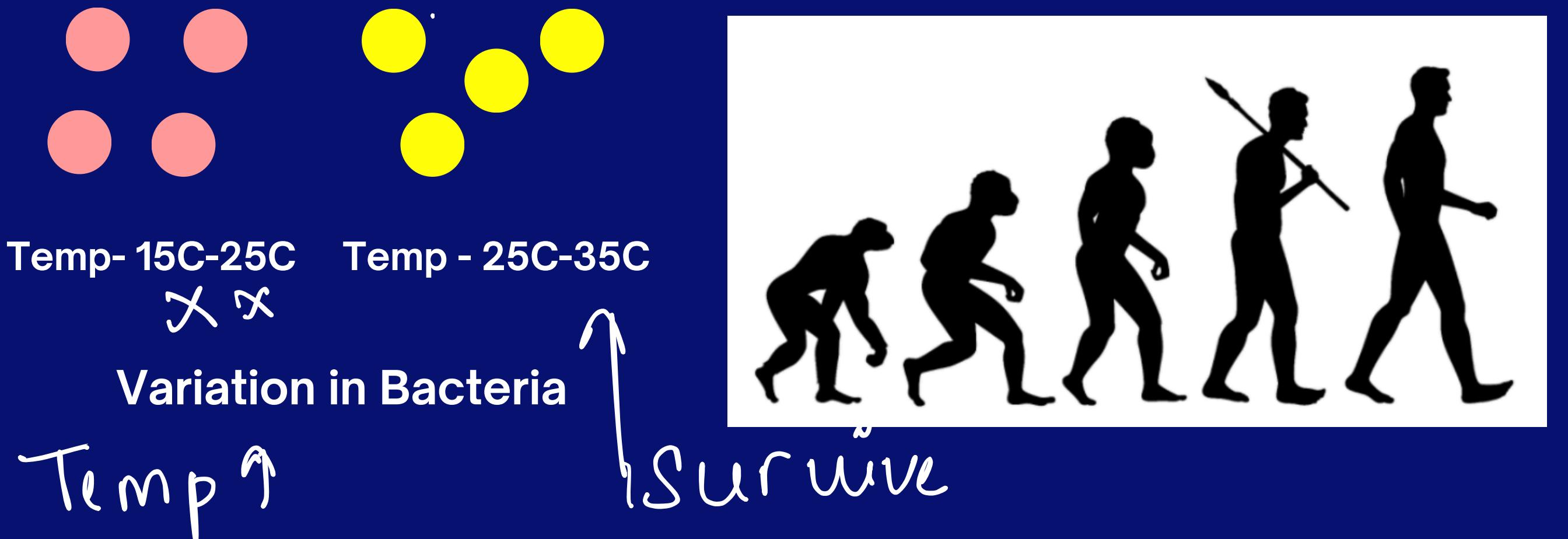


DNA -->Information source for making proteins--> Characteristics

Information changed --> Proteins changed --> Altered body designs

IMPORTANCE OF VARIATION

- 1) Variation helps organisms to adapt to the changing environment. i.e., provides stability to a species
- 2) Helps in Evolution of species
- 3) Variation in DNA results in the varieties of a species and formation of new species.



importance of Reproduction

1) Continuity of species (Population Stability)

2) Evolution

3) Variation

ASEXUAL REPRODUCTION

- Single parent is involved
- No Gamete formation
- No Fertilisation
- Offsprings formed are usually genetically similar

SEXUAL REPRODUCTION

- Two parents are involved
- Gamete formation occurs
- Fertilisation occurs
- Offsprings formed are genetically dissimilar

Fission

Fragmentation

Regeneration

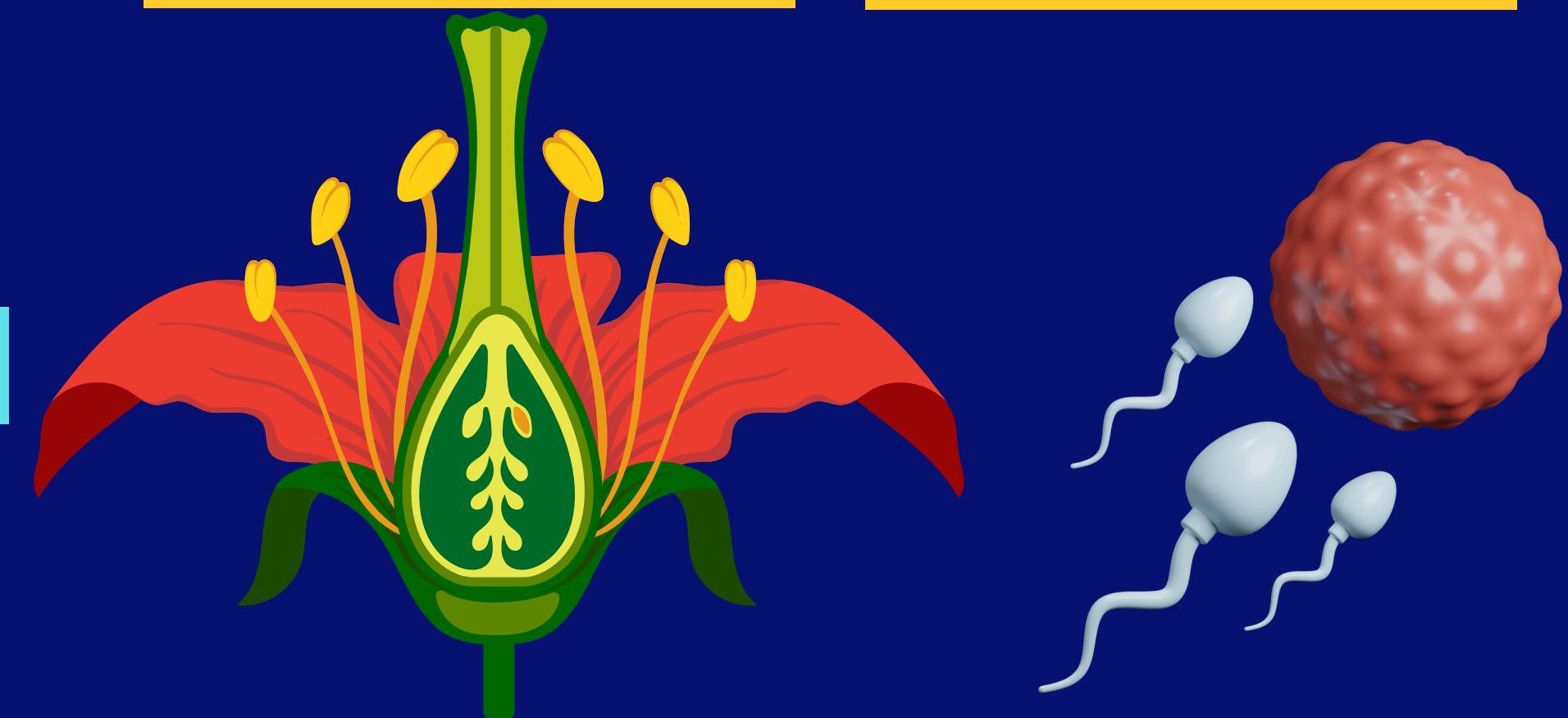
Budding

Vegetative Propagation

Spore formation

Reproduction in
flowering plants

Reproduction in
human beings



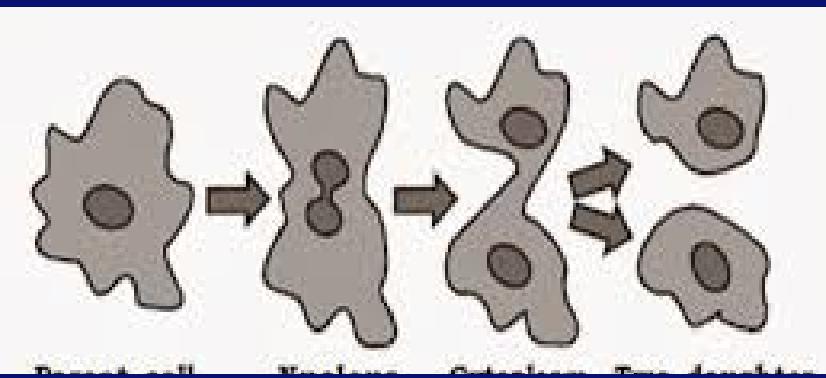
ASEXUAL REPRODUCTION

FISSION

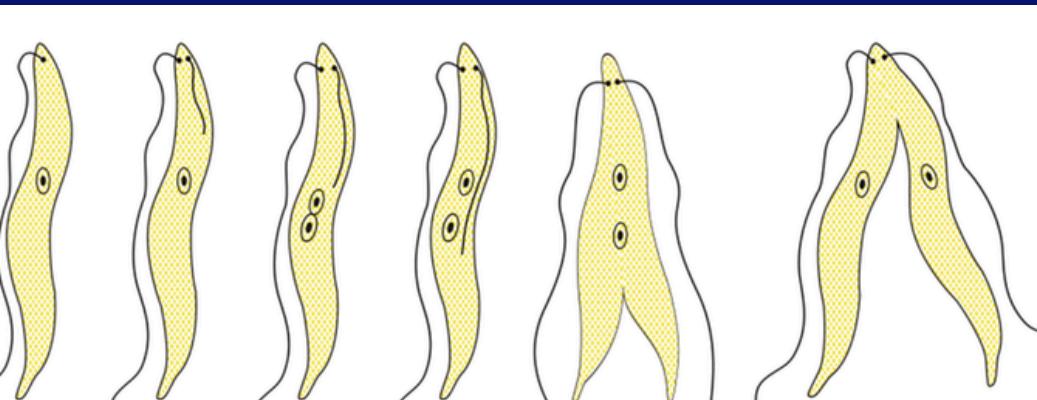
Unicellular organisms - Cell division (Fission)

Occurs in many bacteria and protozoa

- Amoeba - unicellular organism
- Binary fission in amoeba
- Splitting of cells can take place in any plane
- Parent cell divides into two daughter cells

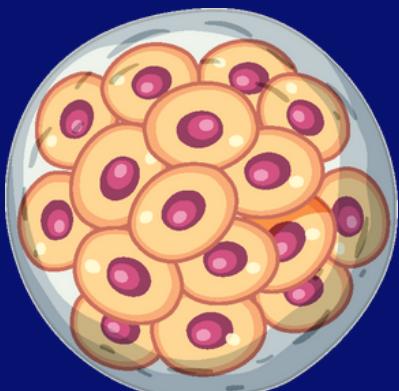


Binary fission in Amoeba



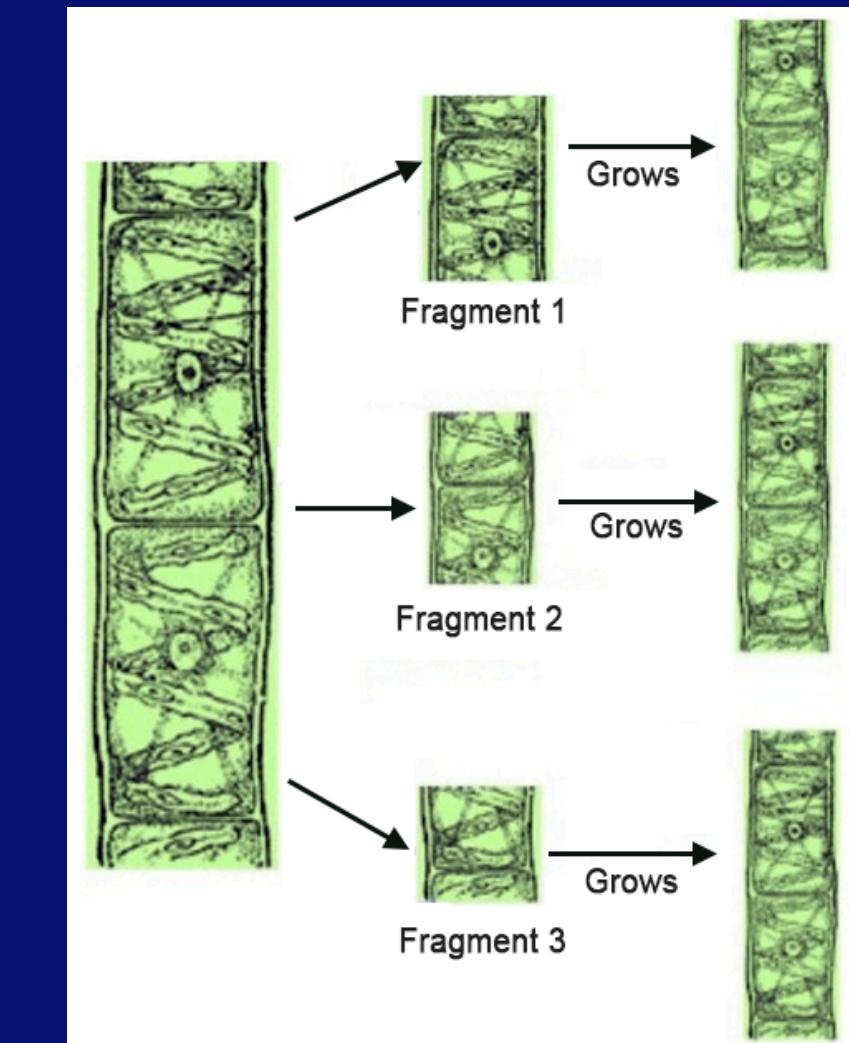
Binary fission in Leishmania

- Leishmania - unicellular organism
- has a whip-like structure at one end of cell
- binary fission occurs in fixed plane (in relation to whip-like structure - Longitudinal fission)
- causes kala-azar



Multiple fission in plasmodium

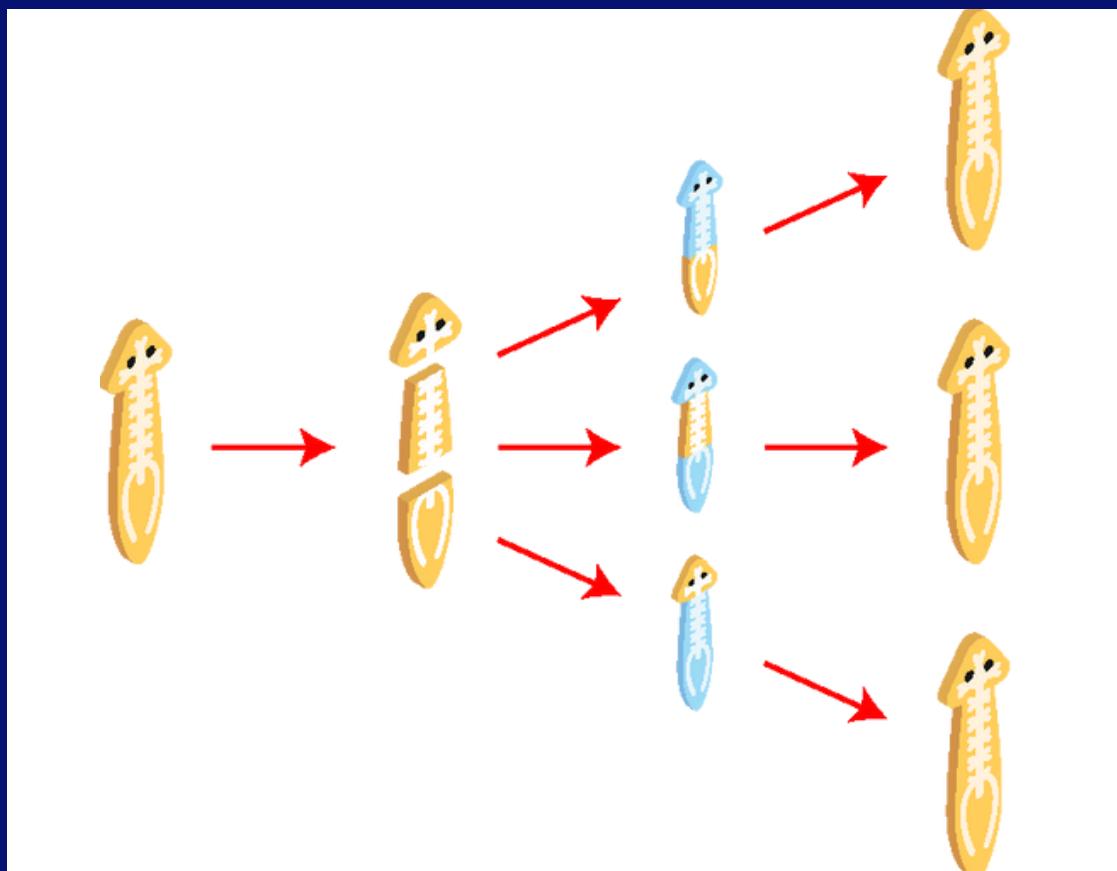
FRAGMENTATION



- multicellular organism - spirogyra
- breaks into smaller pieces upon maturation
- These pieces (fragments) grow into new individuals

REGENERATION

If the individual is cut or broken up into many pieces, many of these pieces grow into separate individuals.
e.g. Planaria and hydra (multicellular organisms)



Regeneration in planaria

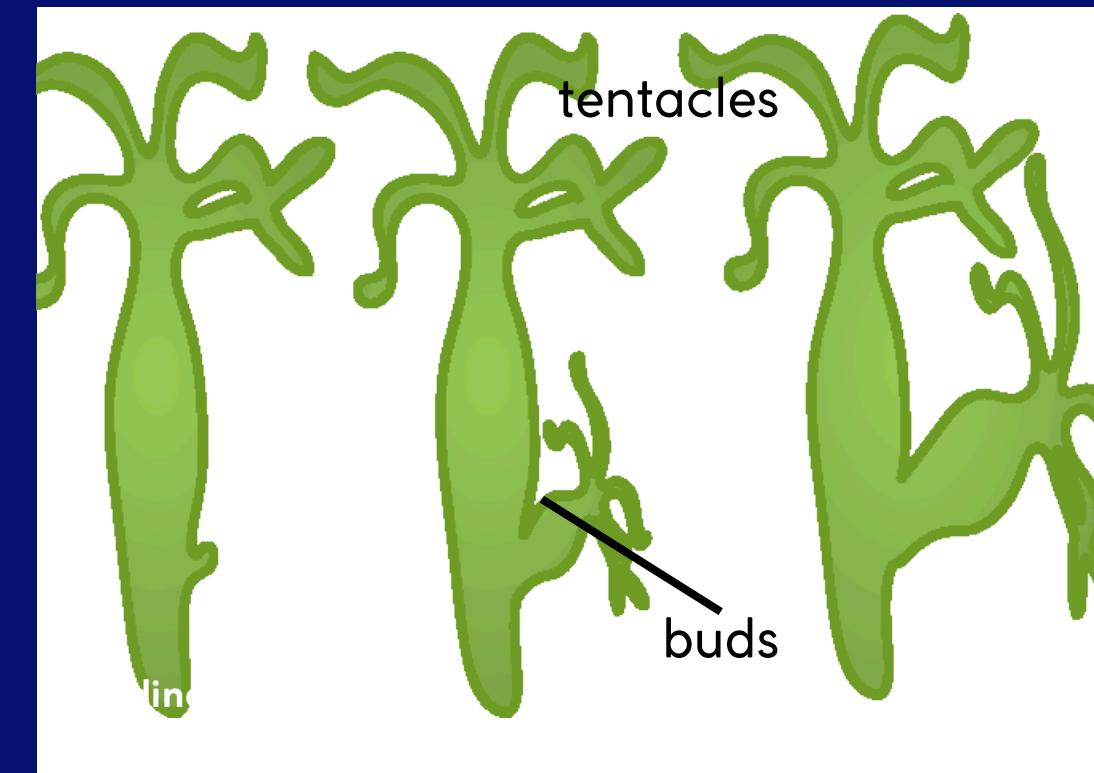
- carried out by specialized cells

REGENERATION REPRODUCTION

BUDDING

e.g. hydra, yeast

Hydra - Aquatic animal



Budding in hydra

- hydra - use regenerative cells for reproduction
- repeated cell division at one specific site
→ outgrowth --> bud develops
- buds develop into tiny individuals
- detach from the parent body on maturation
- become new independent individuals

Define asexual reproduction and state two advantages of this mode of reproduction. Explain the difference between binary fission and multiple fission, providing one example for each.

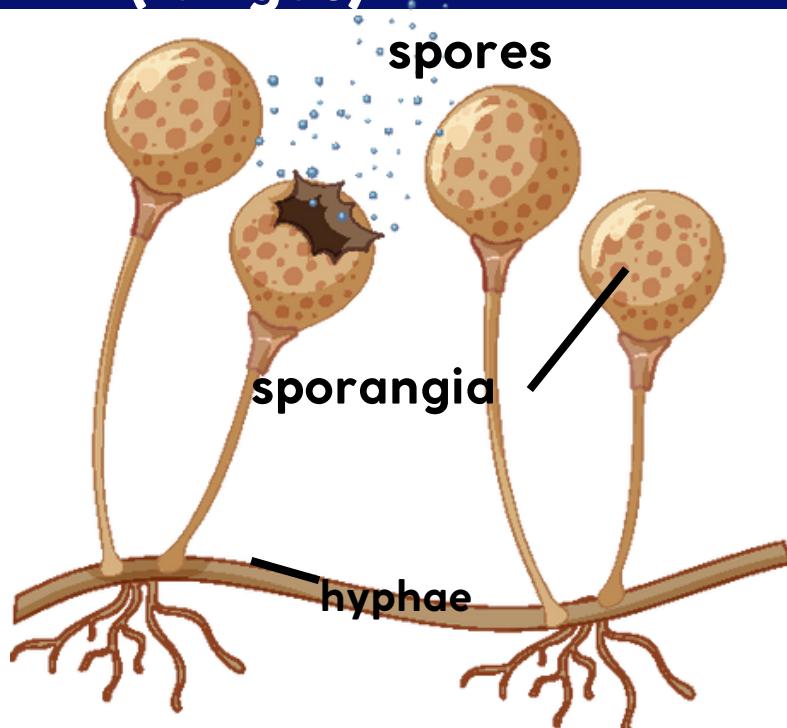
(CBSE 2015,2016,2017,2019,2021,2022,2024)

Describe budding in Hydra with the help of a labeled diagram.

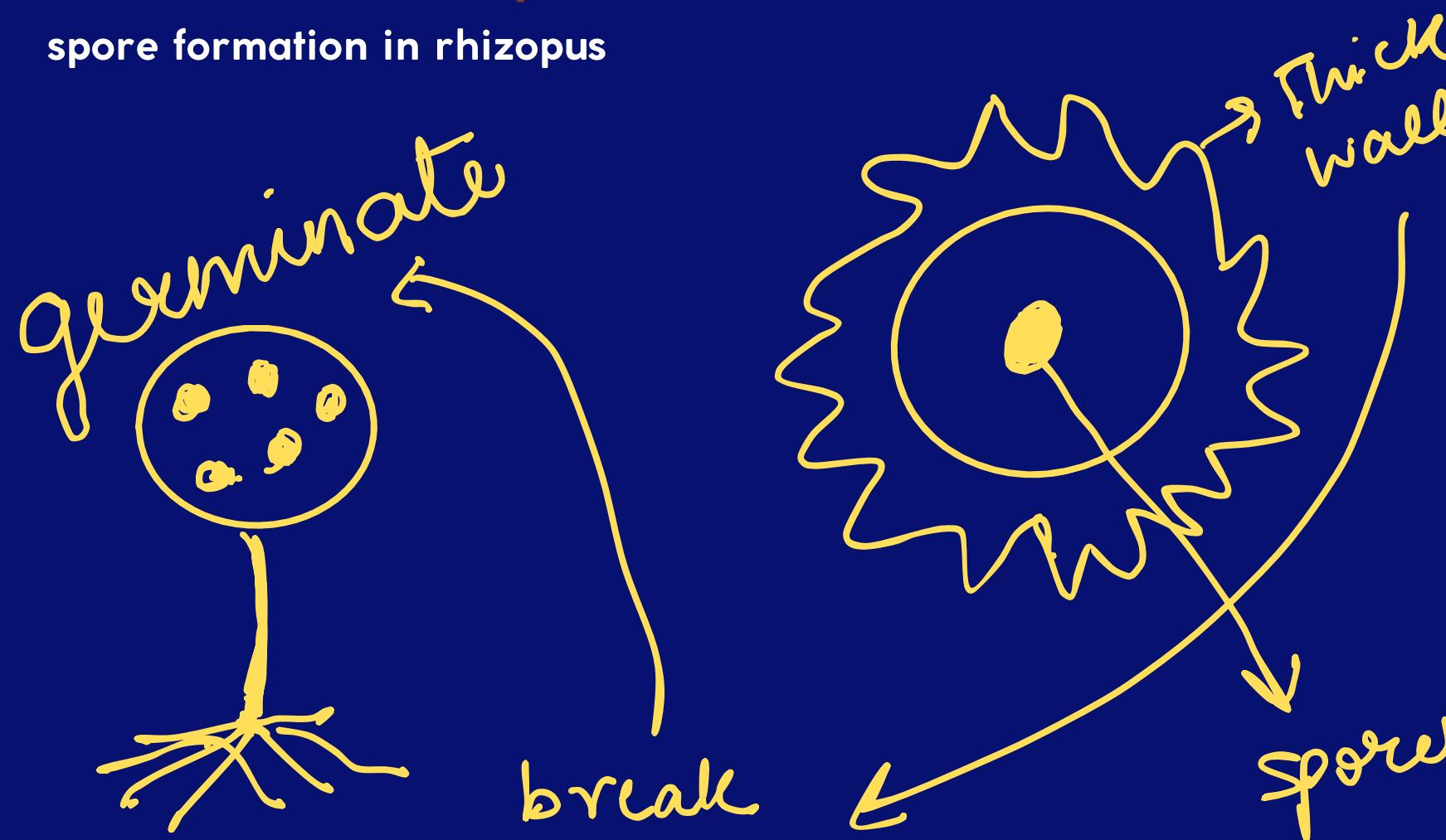
(CBSE 2015,2016,2017,2019,2021,2022,2024)

SPORE FORMATION

rhizopus (bread mould) --> multicellular organism (fungus)

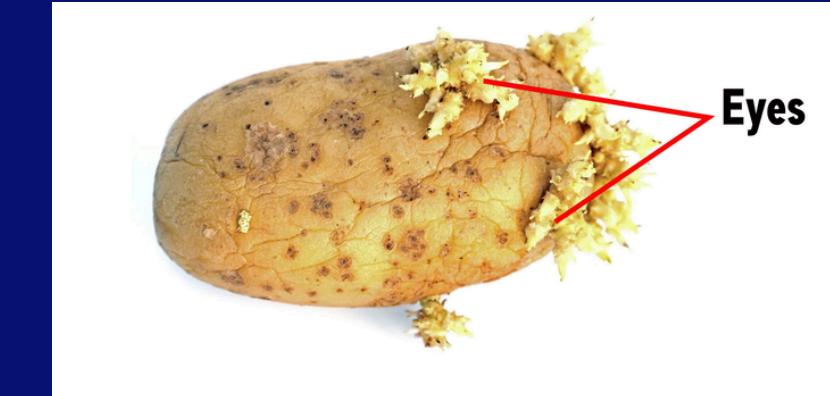


spore formation in rhizopus

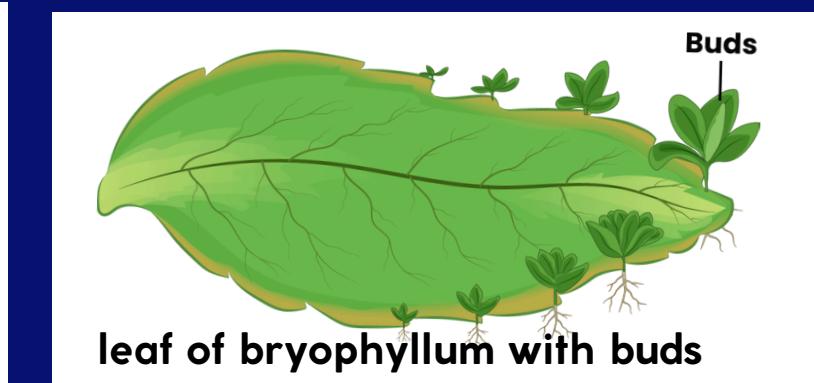


VEGETATIVE PROPAGATION

parts like roots, stems, and leaves develop into new plants



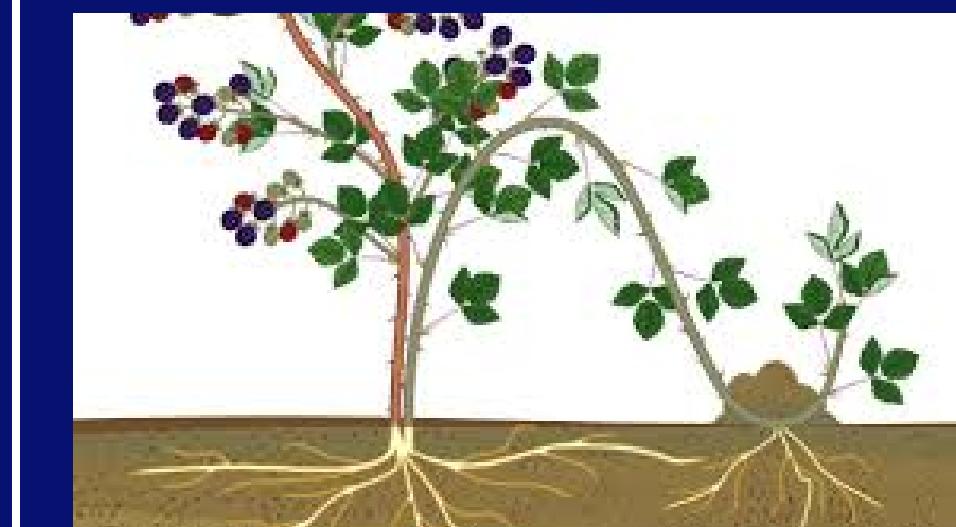
Potato- Underground stem



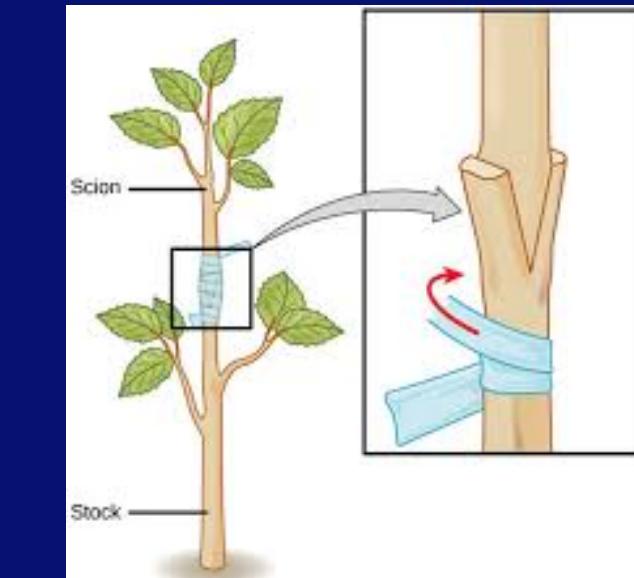
Buds produced in the notches along the leaf margin of Bryophyllum fall on the soil and develop into new plants

Advantages

- Used in layering or grafting to grow plants like sugarcane, roses, grapes
- propagation of plants that have lost the capacity to produce seeds (banana, orange, rose, and jasmine)
- bear fruits and flowers earlier than those produced from seeds
- Plants produced are genetically similar to the parent plant & its characteristics



Layering



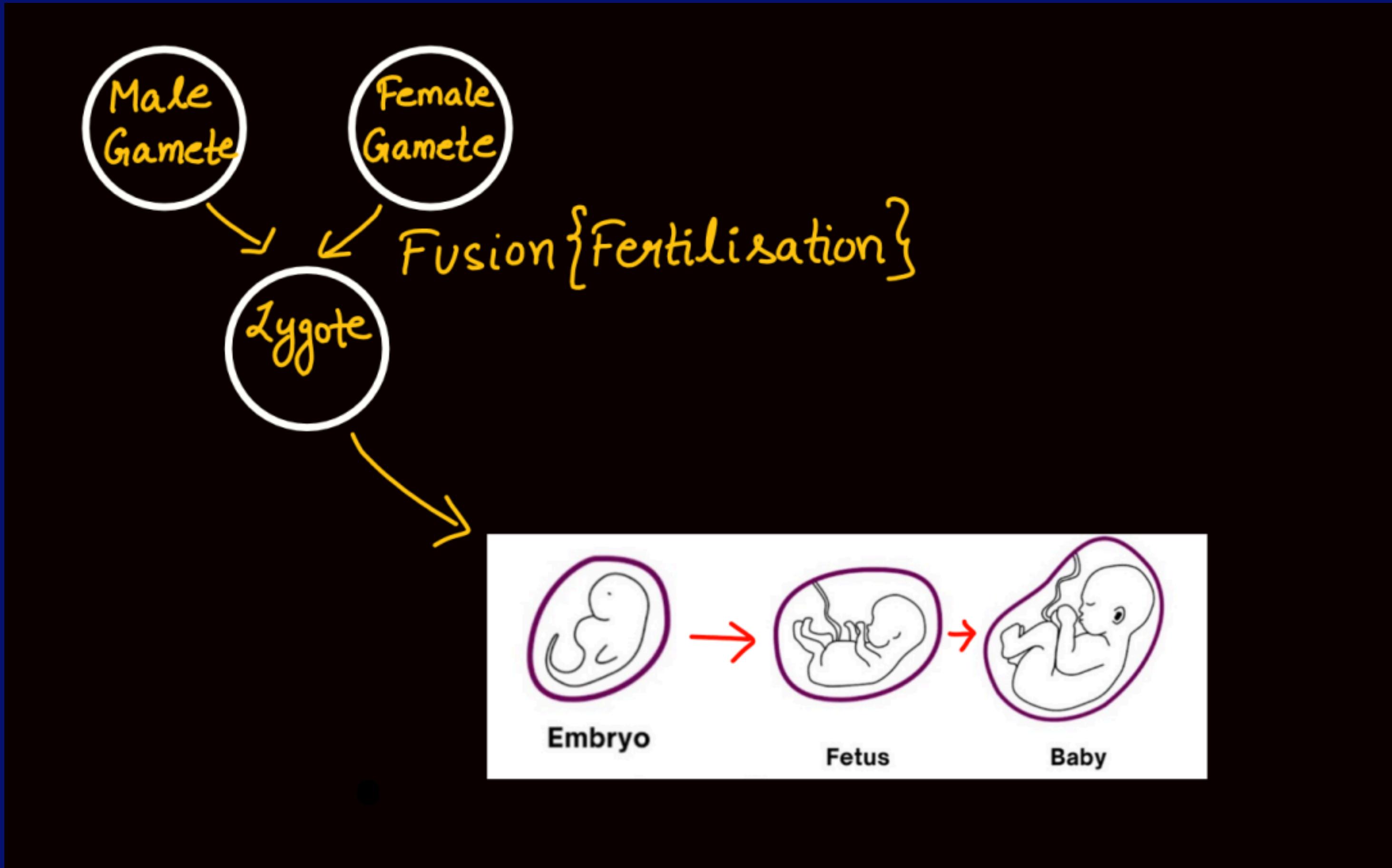
Grafting

Explain the process of spore formation in Rhizopus with a labeled diagram. Why does Rhizopus not multiply on a dry slice of bread? List two conditions required for its growth.

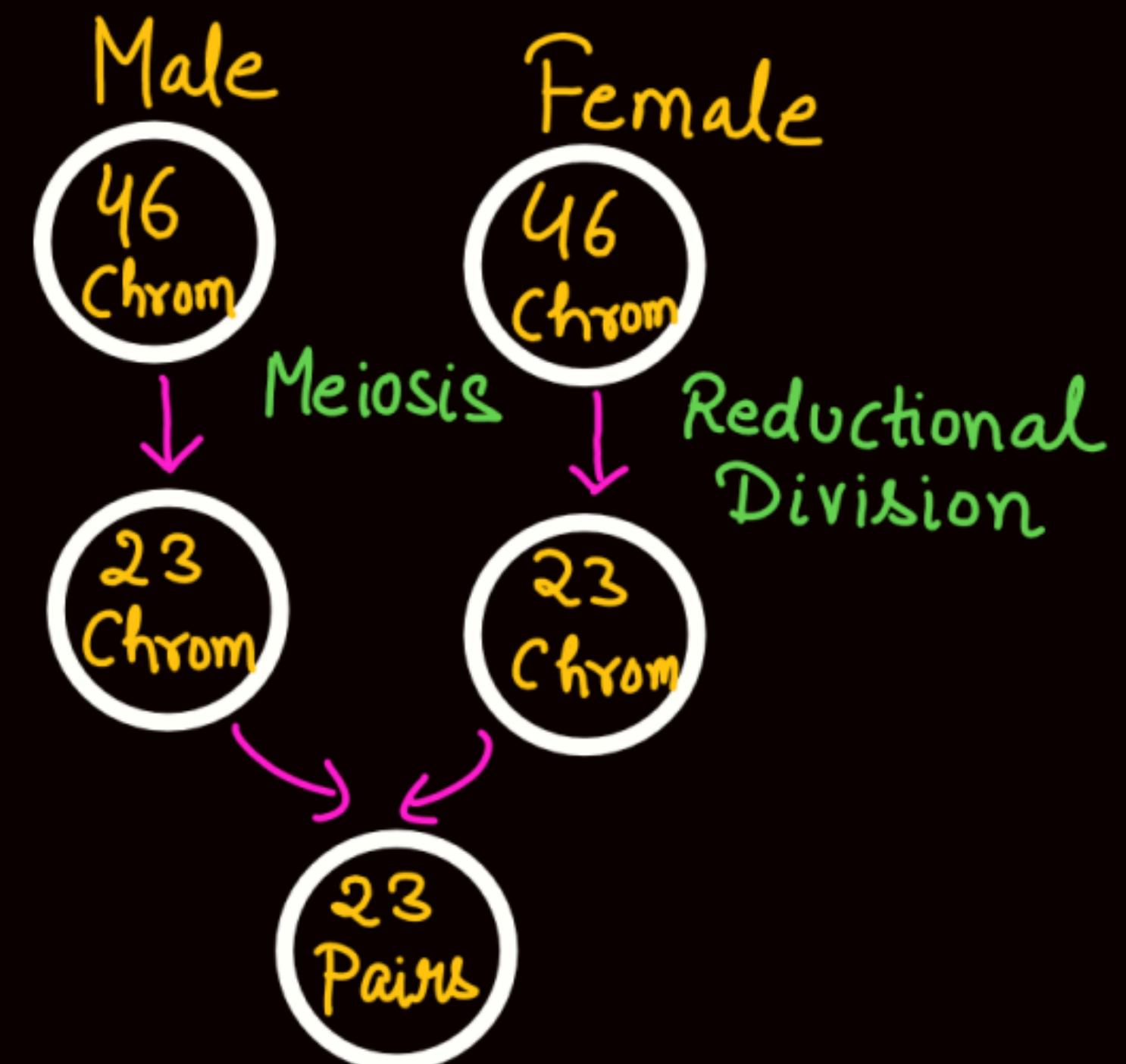
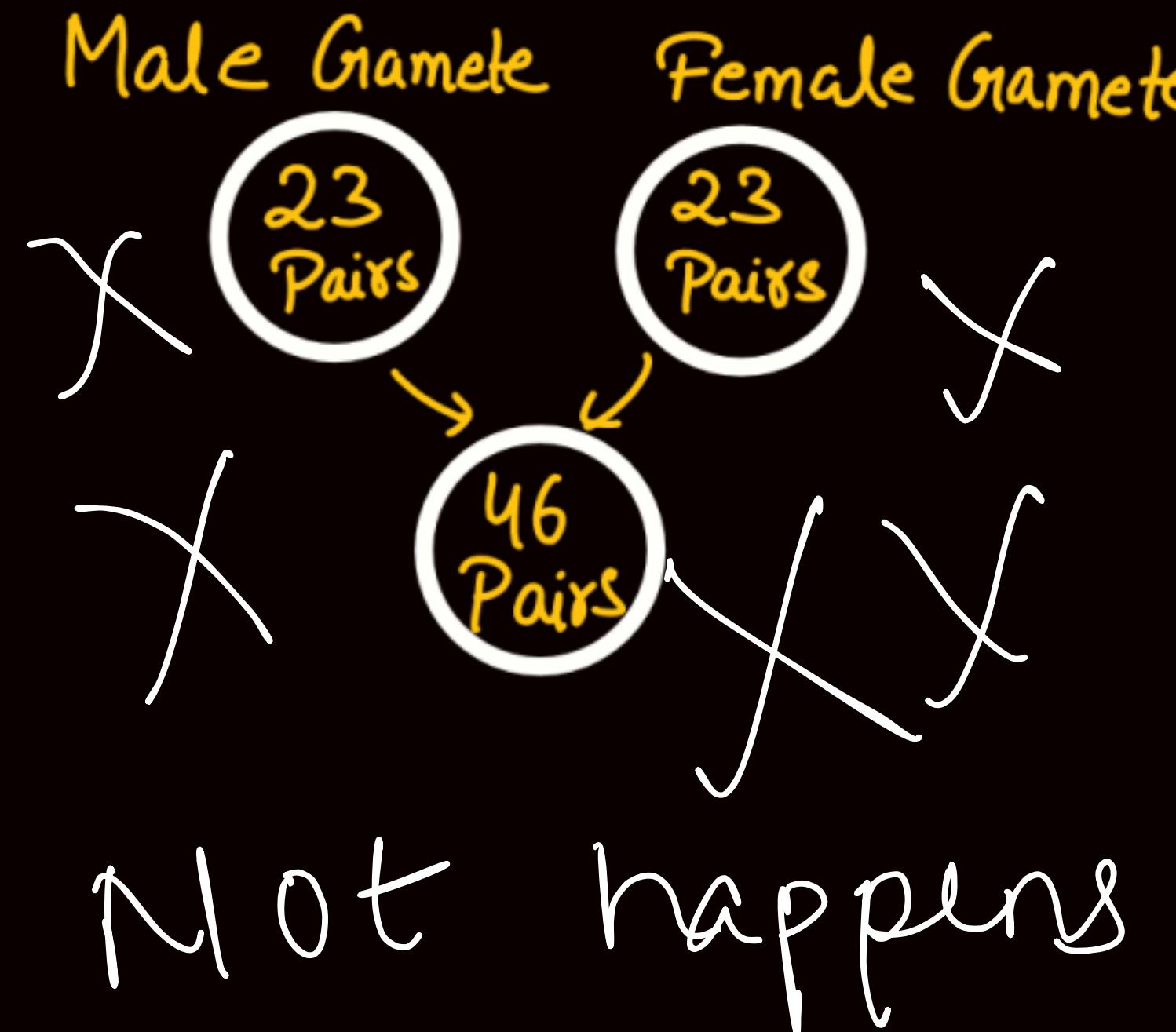
(CBSE 2015,2016,2017,2021,2024)

Organism	Cellularity	Mode of reproduction	Disease
Amoeba	Unicellular	Binary fission (any plane)	
Leishmania	Unicellular	Binary fission (Fixed plane)	Kala azar
Plasmodium	Unicellular	Multiple fission	Malaria
Spirogyra	Multicellular	Fragmentation	
Planaria	Multicellular	Regeneration	
Hydra	Multicellular	Budding, Regeneration	
Yeast		Budding	
Rhizopus	Multicellular	spore formation	

sexual reproduction

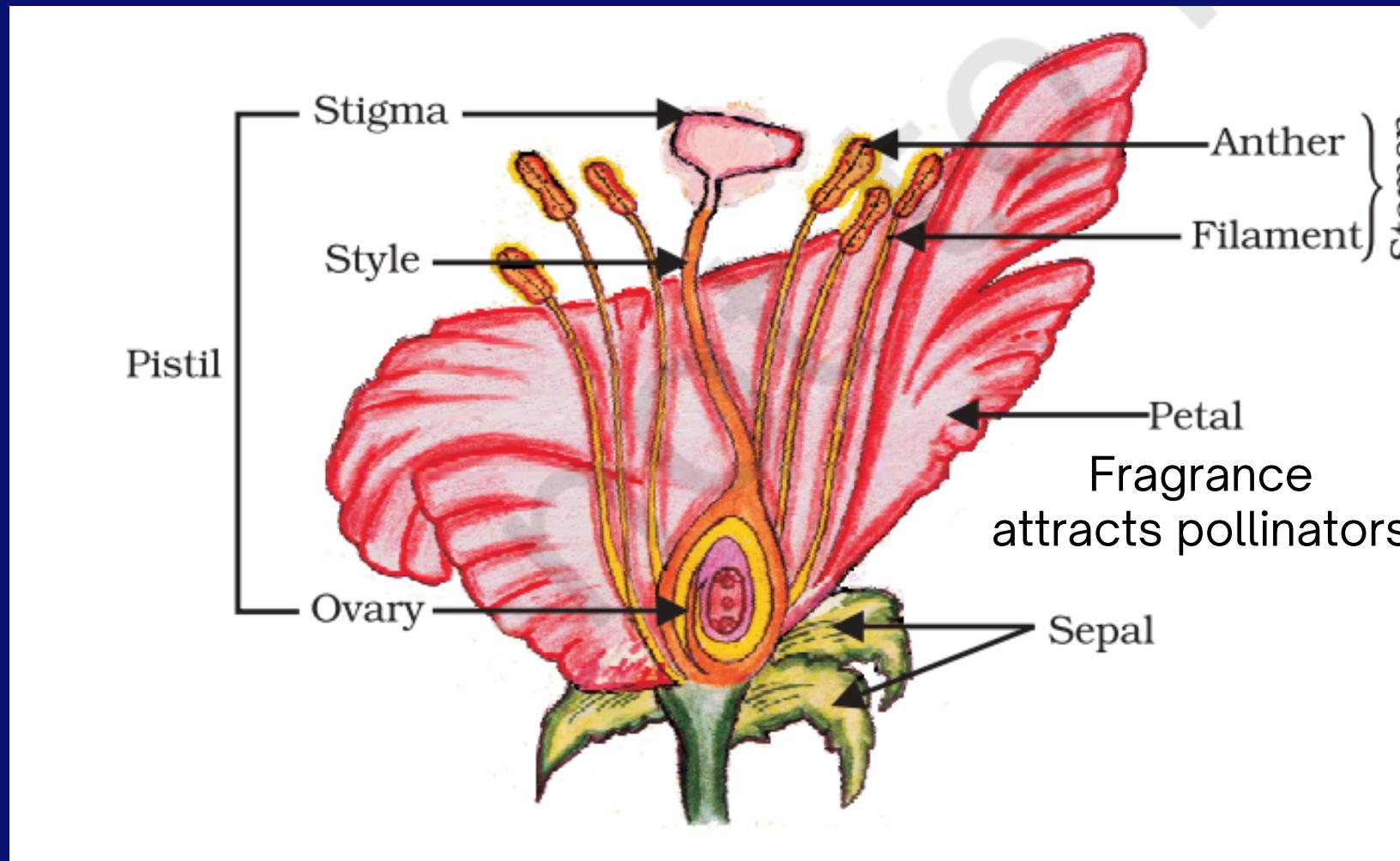


1) Human cells have 23 pairs of Chromosomes
1 pair → 2 chromosomes



SEXUAL REPRODUCTION IN FLOWERING PLANTS (ANGIOSPERMS)

- male reproductive part - stamen (produces pollen grains)
- female reproductive part - pistil



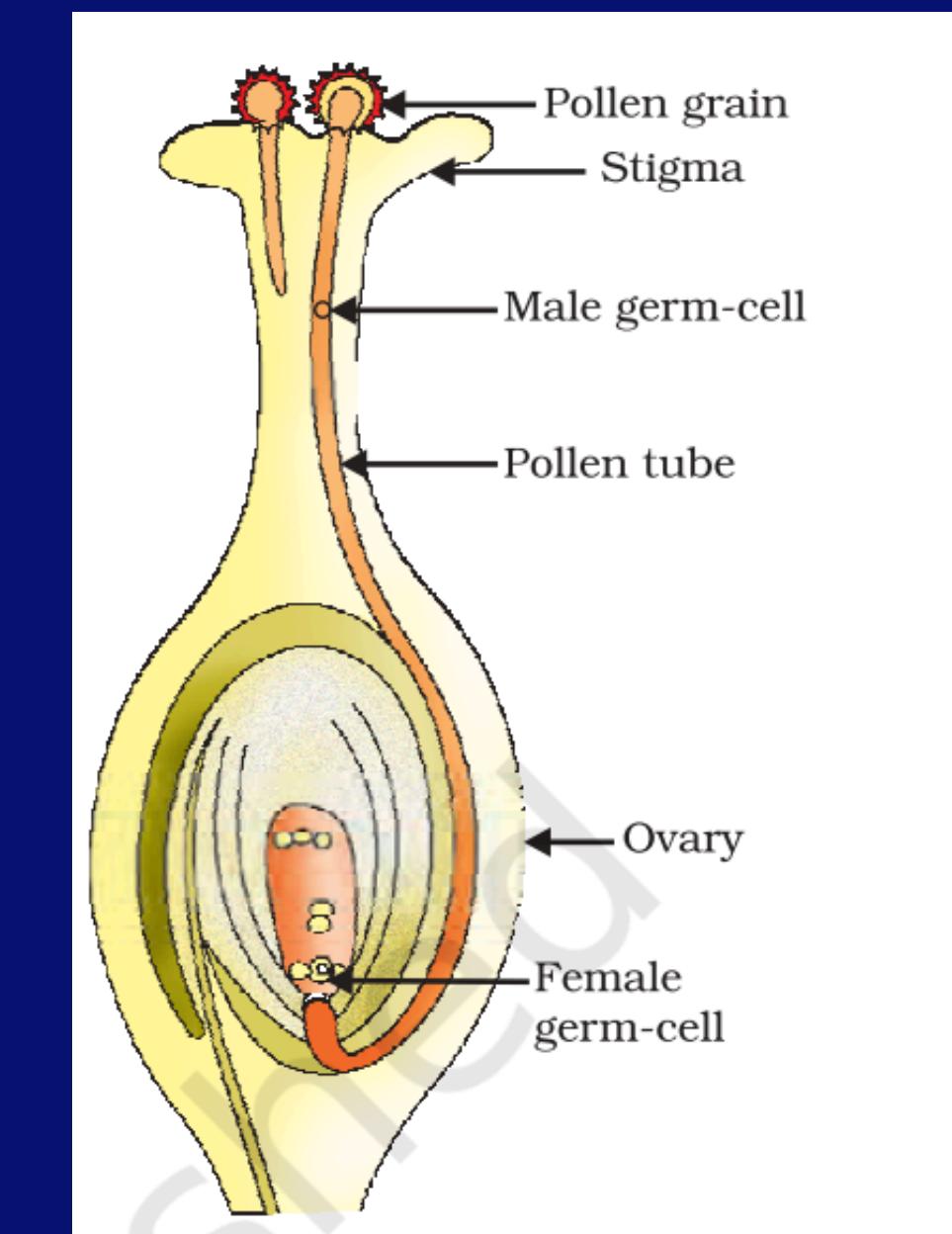
PISTIL

- Stigma - sticky terminal part
- Style - middle elongated part
- Ovary - swollen bottom part

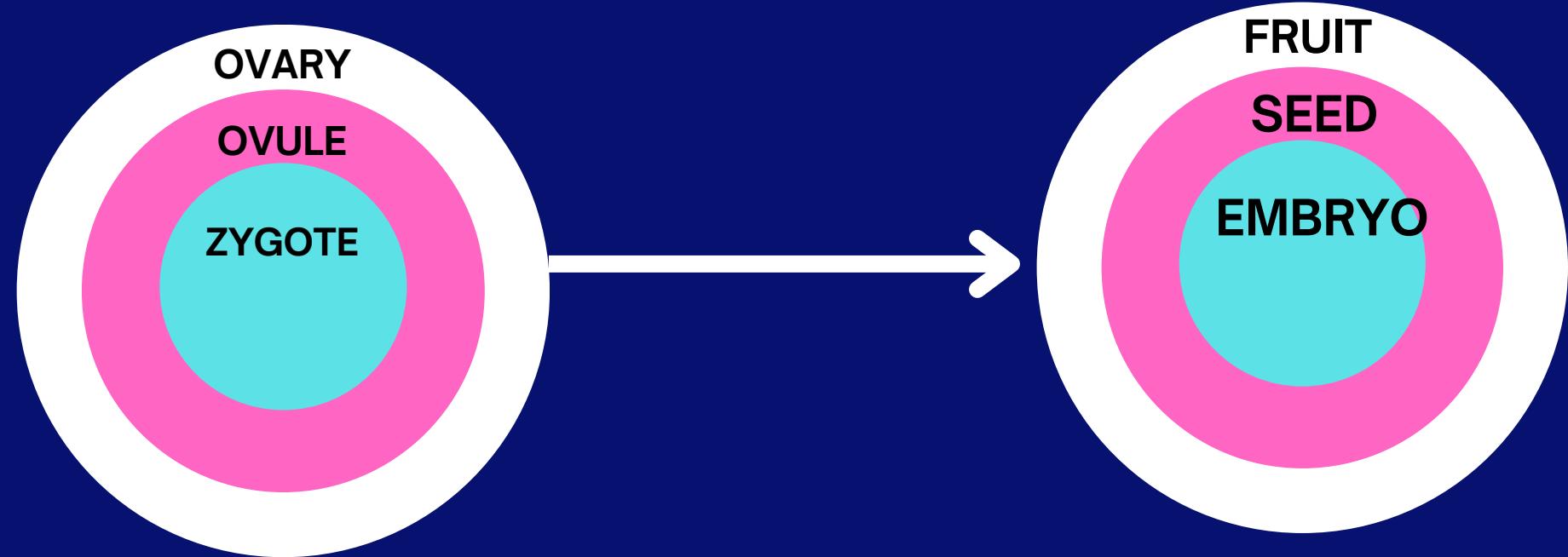
OVARY

- contains ovules
 - contains eggcell

- unisexual flowers - contain either stamen or pistil (papaya or watermelon)
- bisexual flowers - contains both stamens and pistil (hibiscus, mustard)



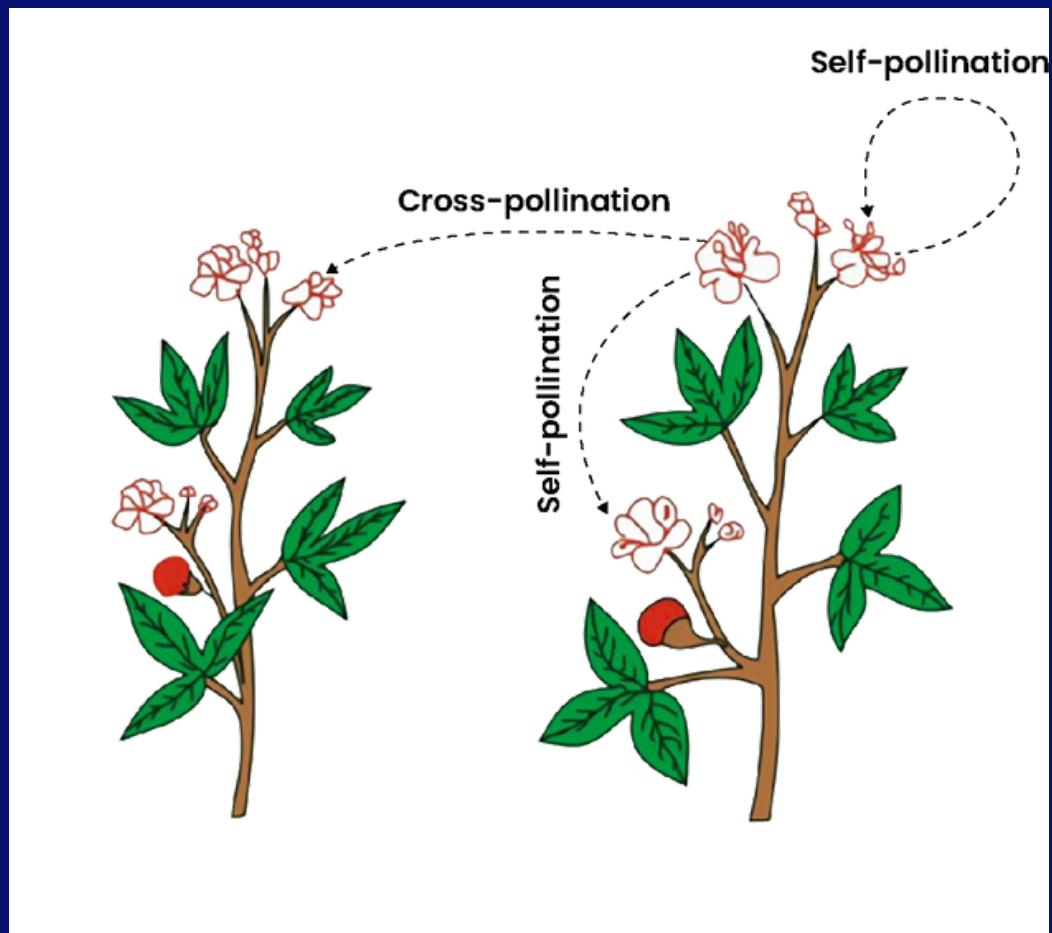
Anther contains pollen sac
↓
pollen sacs contain pollen grains
↓
pollen lands on stigma
↓
a tube grows out of the pollen grain
↓
male germ cell + female germ cell
Fertilisation ↓
zygote
↓ multiple division in zygote)
embryo (within ovule)



zygote --> embryo
ovule --> seed
ovary --> fruit
petals, sepals, stamen, style --> shrivel and fall off

Pollination - transfer of pollen from anther to stigma of a flower

Self pollination	Cross pollination
Transfer of pollen in the same flower or another flower in the same plant	Transfer of pollen from one flower to another

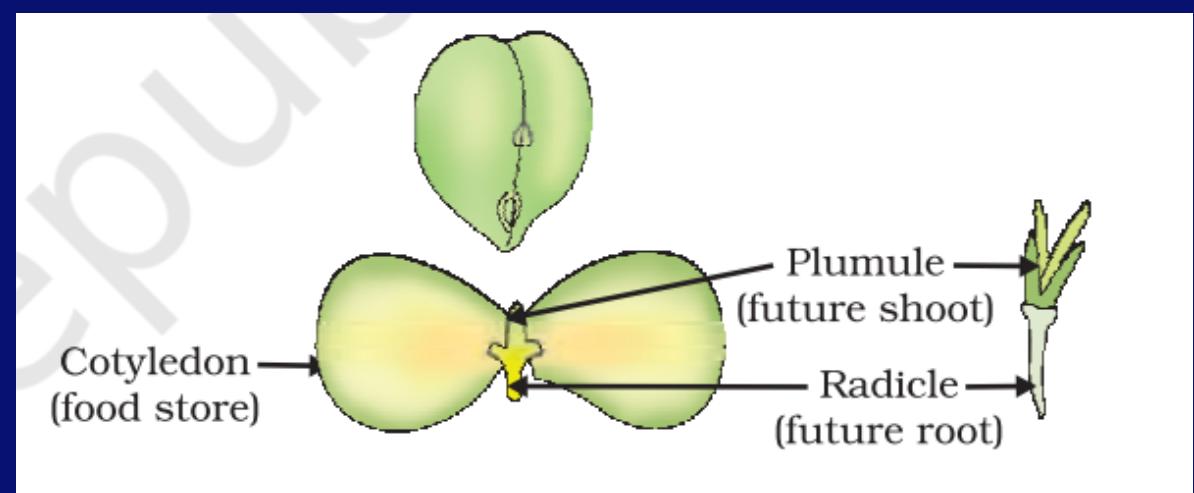


Agents of pollination

- wind, water, animals

GERMINATION

development of seed into seedlings under appropriate conditions



**Draw a neat diagram showing fertilisation in a flower and label (i) pollen tube (ii) Male germ cell (iii) Female germ cell (iv) Pollen grain (v) Ovary and (vi) Stigma on it.
(CBSE 2020,2023)**

Pollination is an important process in sexual reproduction of plants. It is an essential process that facilitates fertilisation in plants. Pollinating agents can be wind, water, insects and birds. Several changes take place in the flower after the fertilisation has taken place.

(a) Write the main difference between self-pollination and cross-pollination.

(b) Name the part of the flower which attracts insects for pollination. What happens to this part after fertilisation?

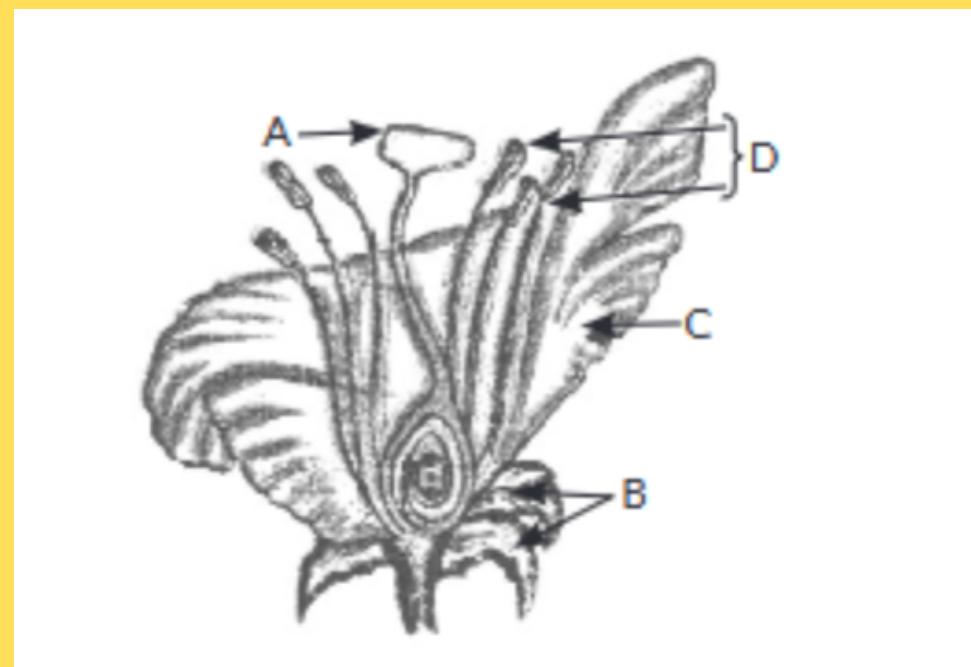
(c) (i) Define fertilisation in plants. What is the fate of ovules and the ovary in a flower after fertilisation?

(ii) What is germination? In a germinating seed, which parts are known as future shoot and future root? Mention the function of cotyledon.

(2020, 2021-22, 2023, 2024).

(a) List two unisexual flowers

(b) In the given diagram, name the parts where (i) pollen grains are produced, and (ii) pollen grains are transferred.



(2020, 2021-22,2023)

SEXUAL REPRODUCTION IN HUMAN BEINGS

SEXUAL MATURATION OF THE BODY

Adolescence - the phase of life between childhood and adulthood

Puberty - The time in life , when a boy or girl becomes sexually mature. It is a process that usually happens between ages 10 and 14 for girls and ages 12 and 16 for boys. It causes physical changes, and affects boys and girls differently . This period during adolescence , general rate of growth decreases .

Common changes in boys and girls

- thick hair growing in new parts of the body (armpits and genital areas)
- darkening of these parts
- thinner hair on legs, arms, and face
- skin becomes oily, develop pimples

Changes in boys

- thick hair growth on face
- voice begins to crack
- penis occasionally begins to becomes enlarged and erect

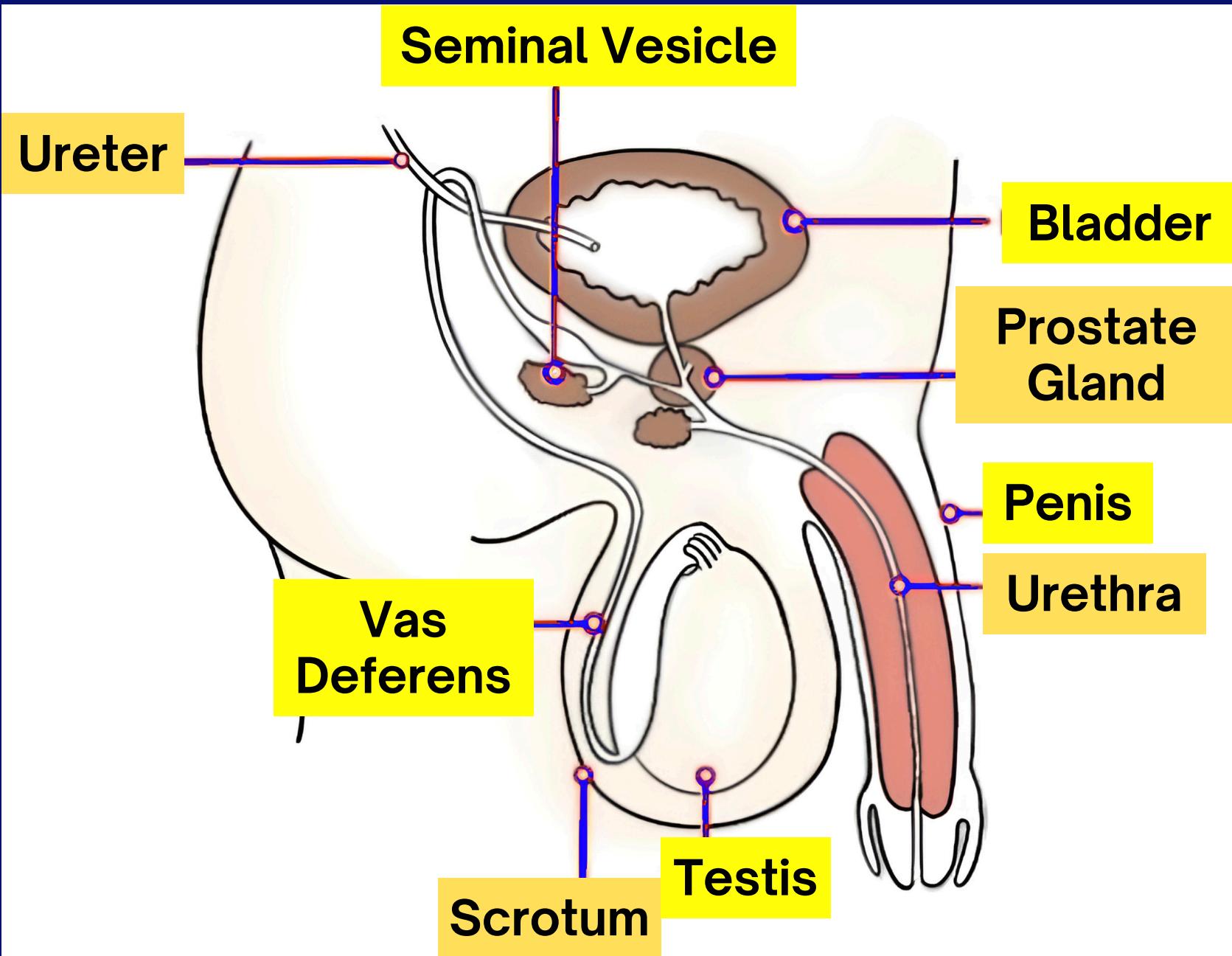
Changes in girls

- breast size increases
- darkening of nipples
- menstruation

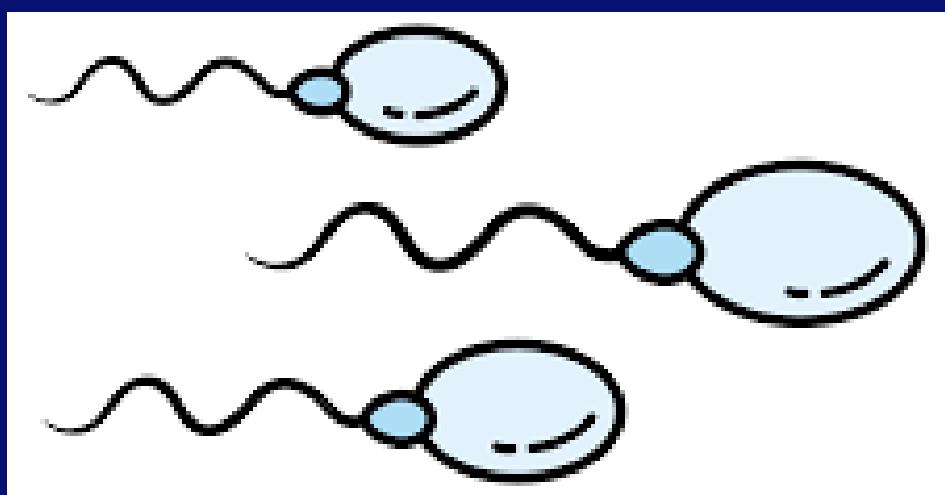
- All of these changes take place slowly, over a period of months and years.
- They do not happen all at the same time in one person, nor do they happen at an exact age.
- In some people, they happen early and quickly, while in others, they can happen slowly

male germ cell - sperm
female germ cell - eggs / ovum

MALE REPRODUCTIVE SYSTEM



Scrotum	Maintain the low temperature of the testes (2-2.5°C lower than the normal internal body temperature
Testis	<ul style="list-style-type: none"> Produce sperm cells Produce the hormone testosterone <ul style="list-style-type: none"> regulates formation of sperms changes at the time of puberty
Vas deferens	Carries sperm towards urethra
Urethra	common passage for both semen (sperm) and urine
Seminal vesicle and Prostate gland	<ul style="list-style-type: none"> Add their secretions Put sperms in a fluid which makes their transport easier Provides nutrition.
penis	deposits sperm into the vagina during insemination
sperm	sperms are tiny bodies that consist of mainly genetic material and a long tail that helps them to move towards the female germ-cell.



FEMALE REPRODUCTIVE SYSTEM

Ovary

- site of ovum (egg cell) development
- contain thousands of immature eggs, some of these start maturing on reaching puberty
- one egg is released every month by one of the ovaries

FALLOPIAN TUBES (oviducts)

- carry the ovum from the ovary to the uterus
 - site of fertilization
- If the egg is not fertilised, it lives for about one day.

UTERUS (WOMB)

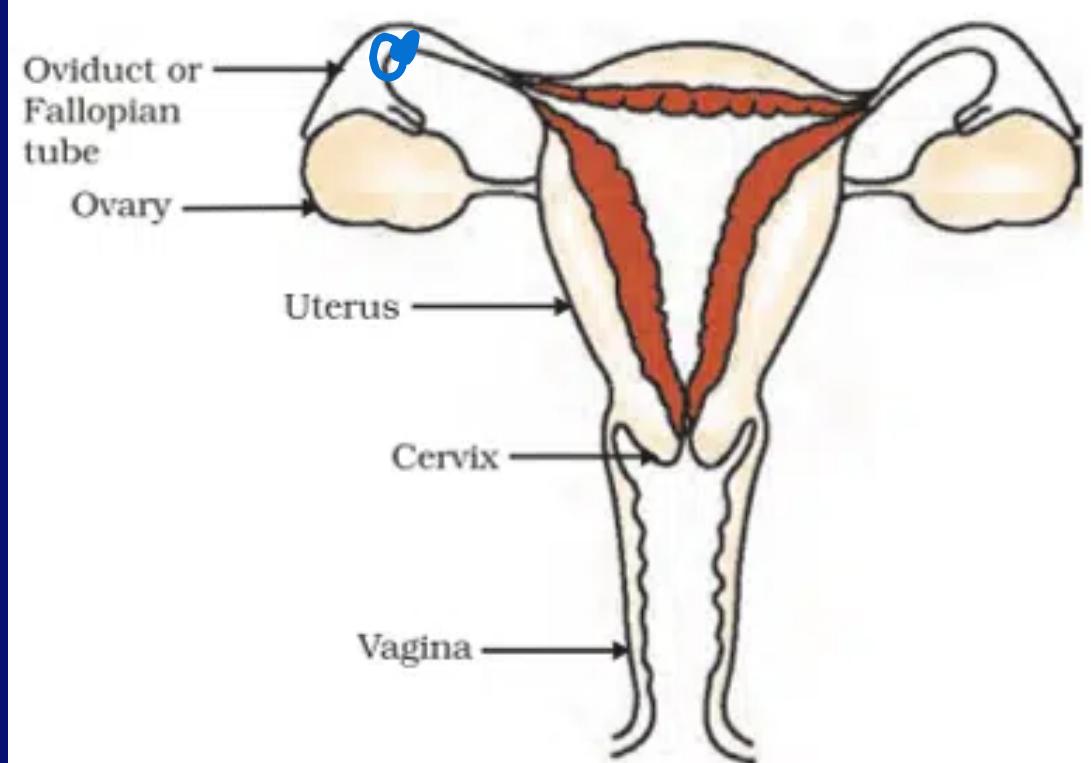
- elastic bag like structure in which the embryo and foetus develop
- involved in menstruation

cervix

- Separates the vagina from the uterus
- dilates during birth to allow the fetus to leave the uterus

vagina

- provides a passageway for sperm and menstrual flow
- functions as the birth canal



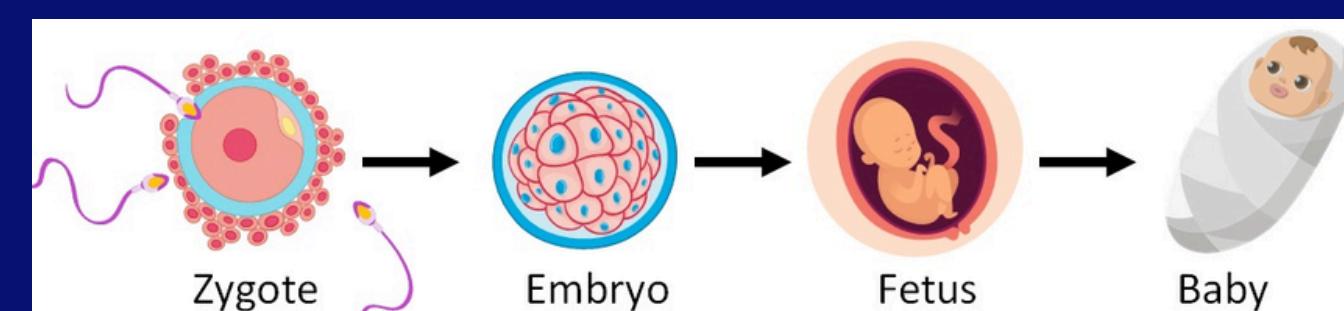
SEXUAL INTERCOURSE

sperm --> enter through the vaginal passage --> travel upwards --> reaches ovary duct --> encounters egg --> Fertilization

FERTILIZATION

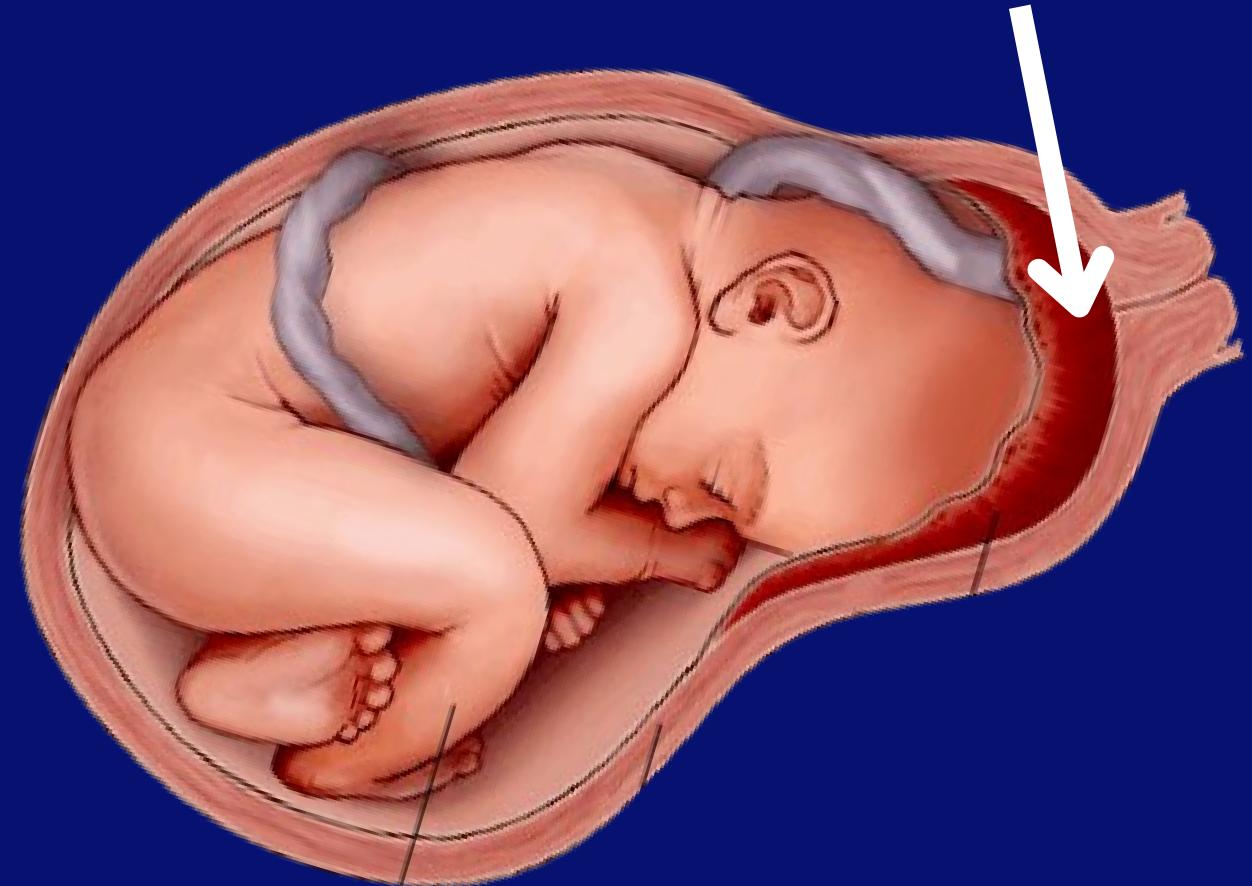
fertilized egg (zygote) --> divides to form a ball of cells (embryo)
--> implanted in the lining of the uterus --> grow and develop organs to become foetus

The uterus prepares itself every month to receive the embryo. The lining thickens and is richly supplied with blood to provide nutrition to embryo.



PLACENTA

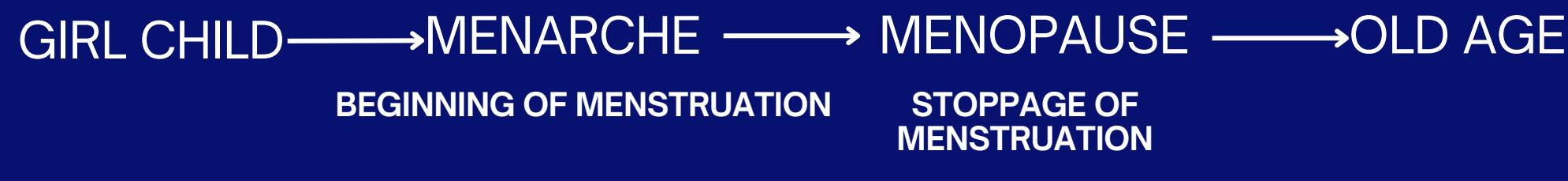
- disc embedded in the uterine wall
 - provides nutrition to embryo from mother's blood
 - Villi on placenta (embryo side) provides a large surface area for
 - glucose and oxygen to pass from the mother to the developing embryo
 - wastes to pass from the embryo to the mother through the placenta.



MENSTRUATION

The process of shedding the uterine lining leading to vaginal bleeding on a regular monthly basis

- the ovary releases one egg every month
 - the uterus also prepares itself every month to receive a fertilised egg.
 - Thus its lining becomes thick and spongy for nourishing the embryo if fertilisation had taken place.
 - however, the lining is not needed any longer if fertilisation does not occur



(a) Mention the changes which the uterus undergoes, when

- (i) it has to receive a zygote.**
- (ii) no fertilisation takes place.**

(b) State how sperms move towards the female germ cell.

(c) What is placenta? Explain its function in humans.

(d) Mention the functions of :-

(i) Fallopian tubes (ii) Uterus and (iii) Ovary in the human female reproductive system

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REPRODUCTIVE HEALTH

CONTRACEPTIVE METHODS

Physical/ Mechanical Barrier

To prevent union of sperm & egg.

Protection from sexually transmitted diseases (STD) such as(gonorrhoea, syphilis, HIV-AIDS, warts)

eg- Condoms

Hormonal Barrier

Oral contraceptive (OCPs)
- changes the hormonal balance to prevent the egg release in females.

Taken orally

Oral contraceptive cause side effect.

IUCD

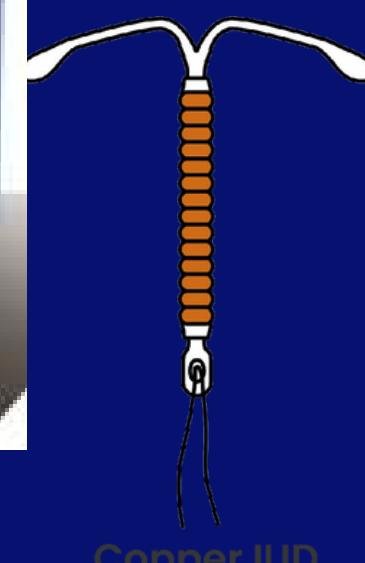
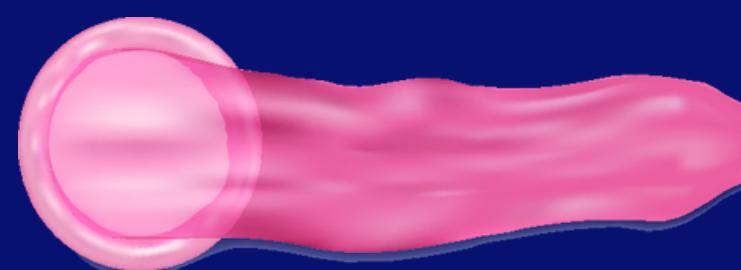
Intrauterine contraceptive device (Copper-T or loop) is placed in uterus to prevent pregnancy.

Can cause irritation of uterus

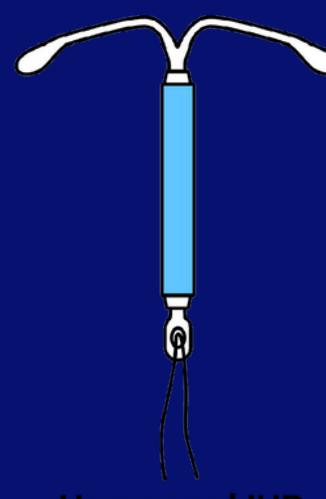
Surgical barrier

in Vasectomy, the vas deferens of male is blocked to prevent sperm transfer.

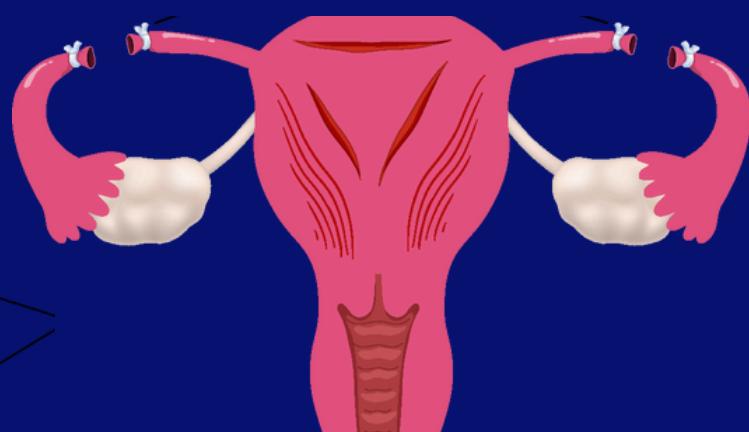
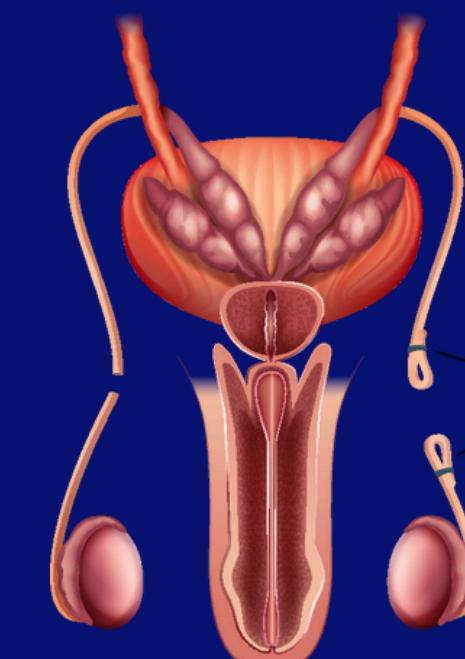
In Tubectomy, the fallopian tube of female is blocked to prevent egg to reach uterus.



Copper IUD



Hormonal IUD



- a) Name three contraceptive techniques/devices used by human females to avoid pregnancy.**
- (b) Under which category of contraceptive methods, is the use of condom kept? In what way, its use better as compared to other methods of contraception?**

In which of the following organisms, multiple fission is a means of asexual reproduction?

- (a) Yeast**
- (b) Leishmania**
- (c) Paramecium**
- (d) Plasmodium**

(2024)

The part of seed which is a source of food during germination of seed is

- (a) cotyledon**
- (b) radicle**
- (c) plumule**
- (d) embryo.**

(2024)

The stamen contains

- (a) stigma**
- (b) pollen grain**
- (c) sepal**
- (d) ovule.**

(2020)

Which one of the following is not a part of the human female reproductive system?

- (a) Ovary**
- (b) Oviduct**
- (c) Uterus**
- (d) Seminal vesicle**

(2020)