ALAKH sir ke FARREY

How do Organisms Reproduce

REPRODUCTION :-

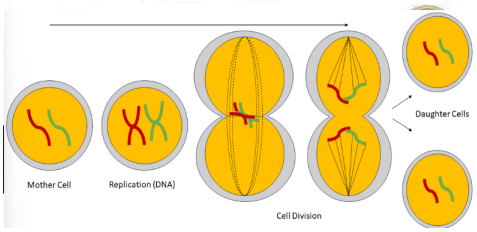
- Reproduction is the process by which living organism produce new individuals of the same species.

KYU ZAROORI HAI?

it ensures the continuity of a particular species on earth.

VARIATION :-

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



Importance of variation :-

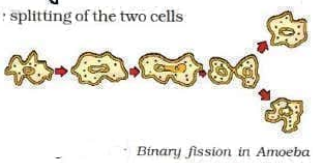
- Variation helps organisms to adopt to the changing environment.
- Variation provides stability to a species and thereby helps in evolution.
- Variation in DNA results in the varieties of a species and formation of new species.

ASEXUAL REPRODUCTION :-

- ✓ single parent is involved.
- ✓ No gamete formation.
- ✓ No fertilisation.
- ✓ offsprings formed are usually genetically similar.

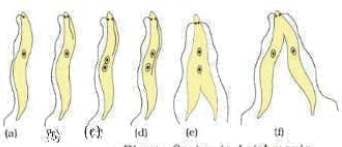
Fission :-

- Unicellular organisms – cell division (fission)
- Amoeba – unicellular organism
- Binary fission in amoeba.
- splitting of cells can take place in any plane.



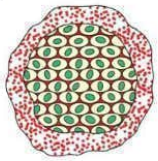
Binary fission in Amoeba

- 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.



Binary fission in Leishmania

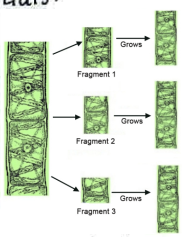
- Plasmodium – unicellular organism
- divides by multiple fission.
- malarial parasite.



multiple fission in plasmodium

FRAGMENTATION :-

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



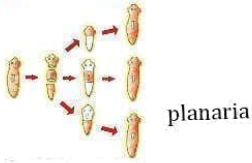
Regeneration :-

If the individual is cut or broken up into many pieces, many of these pieces grow into separate individuals.

e.g Hydra and planaria (multicellular organisms)

- carried out by specialized cells.
- regenerated cells proliferate and make a large number of cells.
- occurs in an organized sequence.

Regeneration ≠ Reproduction

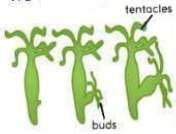


planaria

Budding :-

e.g Hydra, yeast

- Hydra – use regenerative cells for reproduction.
- a bud develops as an outgrowth due to repeated cell division at one specific site.
- Buds develops into tiny individuals detach from the parent body on maturation.
- become new independent individuals



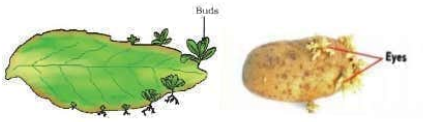
hydra

Vegetative propagation :-

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

Advantages –

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

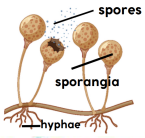


Buds produced in the notches along the leaf margin of Bryophyllum fall on the soil and develop into new plants.

Spore formation :-

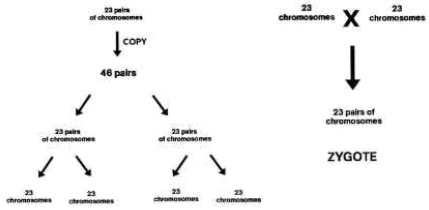
Rhizopus (bread mould) – multicellular organism.

- thread like structure – hyphae
- blob on a stick structure – sporangia.
- spores develop into new individuals
  - → covered by thicks walls that protects them in unfavourable conditions
  - → favourable condition – moist surface spores begin to grow).



SEXUAL REPRODUCTION :-

- ✓ Two parents are involved
- ✓ Gamete formation occurs.
- ✓ fertilisation occurs.
- ✓ offsprings formed are genetically dissimilar.



Conventionally motile germ cell – male gamete

germ cell containing stored food – female gamete.

Sexual Reproduction in Flowering plants :-

Pollination – transfer of pollen grains from anther to stigma of a flower.

- ✓ male reproductive part – stamens (produces pollen grains)
- ✓ female reproductive part – pistil
- ✓ Unisexual flowers – contain either stamen or pistil (papaya or watermelon).
- ✓ Bisexual flowers – contains both stamens and pistil (hibiscus, mustard)

Self-pollination – Transfer of pollen in the same flower.

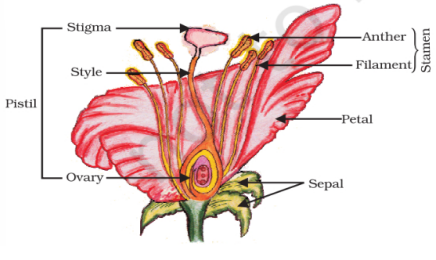
Cross-pollination – Transfer of pollen from one flower to another.

Pistil

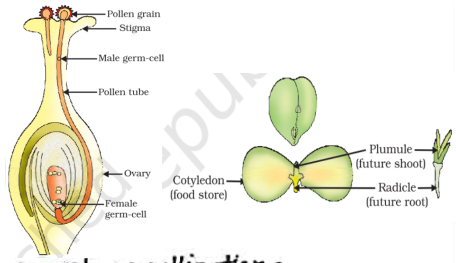
- → stigma – sticky terminal part
- → style – middle longated part.
- → ovary – swollen bottom part.

Ovary

- → contains ovules
- contains eggcell



Germination - development of seed into seedlings under appropriate conditions.



Agents of pollination :-

Wind, water, animals

pollen lands on stigma

↓

a tube grows out of the pollen grain.

↓

male germ cell + female gamete

↓ fertilisation

zygote

↓ division in zygote

Embryo (within ovule)

- zygote → embryo
- ovule → seed
- Ovary → fruit
- petals, sepals, stamen, style → shrivel and fall off

SEXUAL REPRODUCTION IN HUMAN BEINGS

sexual maturation of the Body:-

Adolescence - the phase of life between childhood and adulthood.

Puberty - as the rate of general body growth begins to slow down, reproductive tissues begin to mature. This period during adolescence is called puberty.

commons 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 becomes enlarged and erect.

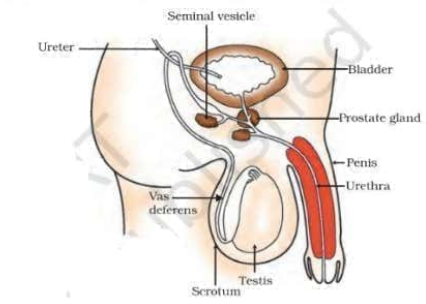
changes in girls

- Breast size increases.
- darkening of nipples
- menstruation.

Male germ cell - sperm

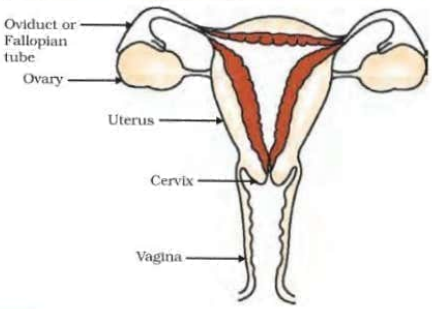
Female germ cell - eggs/ovum.

Male reproductive system



Scrotum	Maintain the low temperature of the testes (2-2.5°C lower than the normal internal body temperature
Testis	• Produce sperm cells • Produce the hormone testosterone ○ 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	Secretes fructose into the semen, which provides energy for the sperm
prostate gland	secretes an alkaline buffer into the semen to protect the sperm from the acidic environment of the vagina
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



OVARIES	• produce the hormones estrogen and progesterone • site of ovum (egg cell) development and ovulation • contain thousands of immature eggs, on reaching puberty some of these start maturing • one egg is produced every month by one of the ovaries
FALLOPIAN TUBES (OVIDUCTS)	• carry the ovum from the ovary to the uterus • site of fertilization
UTERUS (WOMB)	• elastic bag like strucure 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 :-

fertilized egg (zygote) → divides to form a ball of cells (embryo) → implanted in the lining of the uterus → grows & develop organs to become foetus

The uterus prepares itself every month to receive and nurture the growing embryo. The lining thickens and is richly supplied with blood to nourish the growing 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 placenta.

GIRL CHILD → MENARCHE (Beginning of menstruation) → MENOPAUSE (stoppage of Menstruation) → OLD AGE

MENSTRUATION :-

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

Reproductive Health

CONTRACEPTIVE METHODS :-

Physical Barrier :-

- ✓To prevent union of sperm and egg.
- ✓Protection from sexually transmitted disease (STD)
- ✓ Use of condoms, Diaphragm & cervical caps

Hormonal Barrier :-

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

- ✓Also called sterilization 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.

CURRENT YEAR QUESTIONS

Question-1) (a) What is reproduction? Explain how it helps in providing stability to the population of a species. Why is reproduction considered one of the most important characteristics of living beings? Give three reasons in support of this statement.

(b) What is DNA? What happens to DNA when a cell reproduces? Define DNA copying and explain its importance. Newly formed DNA copies may not always be identical- state one reason for this variation.

(c) Name the life process of an organism that helps in the growth of its population. How do the modes of reproduction differ in unicellular and multicellular organisms?

(d) 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.

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

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

Question-2) (a) What is vegetative propagation? List two advantages and two disadvantages of this method. Name two plants that reproduce by vegetative propagation & describe how they do so. Why vegatative propagation is practised for growing only some type of plants?

(b) What is regeneration? Explain the process of regeneration in planaria.

(c) Differentiate between binary fission in Amoeba and leishmania. Name the disease caused by *Leishmania*.

(d) 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, 2021, 2022, 2024

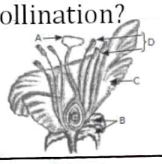
Question-3) (a) What are organisms called that bear both male and female reproductive organs in the same individual? Give one example.

(b) List two unisexual flowers and name the reproductive structure found in the stamen

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

(d) Which of the following flowers will have a higher possibility of self-pollination? Mustard, Papaya, watermelon, Hibiscus. (CBSE 2021-22, 2023)

(e) What is tissue culture? Write its advantages?



Question-4) 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 & birds. several changes take place in the flower after the fertilisation has take 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 know as future shoot and future root? Mention the function of cotyledon.

(d) seeds are called products of sexual Reproduction because they.

(A) give rise to new plants
(B) are formed by fusion of gametes
(C) are formed by the fusion of pollen tubes.
(D) can survive for a longer period.

(e) "Pollination may occur without fertilisation but fertilisation will not take place without pollination". Explain this statement.

(CBQ) (CBSE 2021-22, 2023, 2024)

Question-5) (a) Give reason for the following.
(i) During reproduction inheritance of different proteins will lead to altered body designs (ii) All multicellular organisms cannot give rise to new individuals through fragmentation or regeneration.
(iii) The parents and off-springs of organisms reproducing sexually have the same number of chromosomes.
(b) Draw a neat diagram showing fertilisation in a flower and label (1) pollen tube (2) Male germ cell (3) female germ cell (4) Pollen grain (5) ovary and (6) stigma on it.
(CBSE 2020, 2023)

Question-6) (a)(i) What is puberty? Mention any two changes that are common to both boys and girls in early teenage years. (CBSE 2020, 2021, 2023, 2024)
(ii) During adolescence, reproductive phase starts and
(A) General growth rate begins to slow down (B) height becomes less (C) the body weight is reduced.
(D) hair growth decrease.
(b) Describe in brief the functions of the following parts in the human male reproductive systems (i) Testes (ii) seminal vesicles (iii) Vas deferens (iv) urethra
(c) Why are testes located outside the abdominal cavity? What provides nutrition to human sperms? state the genetic consitution of a sperm.

Question-7) (a) Mention the functions of (i) fallopian tubes (ii) uterus & (iii) ovary in the human female reproductive system. (b) Draw a well labelled diagram of the male reproductive system or Draw a well labelled diagram of the female reproductive system.
(CBSE 2021, 2022, 2023, 2024)

Question-8) (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 moves towards the female germ cell. (c) identify the organ in the human female reproductive system where the sperm encounters the egg cell. what will happen if it is blocked? Name the technique by which it can be blocked.
(d) What is placenta? Explain its function in humans (e) Mention the chromosome pair present in a zygote which determines the sex of (i) a female child & (ii) a male child
(CBSE 2020, 2021, 2022, 2023, 2024)

Question-9) (a) Name three contraceptive techniques/devices used by human females to avoid pregnancy. Mention the side effects caused by each.
(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?
(c) The growing size of the human population is a cause of concern for all people. The rate of birth and death in a given population will determine its size.
the process sexual maturation for reproduction is gradual and takes place while general body growth is still going on.
maturation does not necessarily mean that the mind or body is ready for sexual acts or for having and bringing up children. various contraceptive devices are being used by human beings to control the size of the population
(i) List two common signs of sexual maturation in boys & girls.
(ii) What is the result of reckless female foeticides.
(iii) Which contraceptive method changes the hormonal balance of the body?
(iv) Write two factors that determines the size of a population.
CBQ (CBSE 2020, 2021, 2022, 2023, 2024)

Question-10) (a) List three different categories of contraceptive methods.
(b) Why has the Government of India prohibited prental sex determination by law? state its benefits in the long run.
(c) What are STDs? Name two bacterial & two viral infections caused due to unsafe sex.
(2020) (CBQ)