Reproduction

Importance of Reproduction:

1. To create next generation. Unique property of a particular organism is transferred from one generation to the next generation through genes, which are situated in the DNA (Deoxyribonucleic Acid).

2. During Meiosis number of chromosomes become half of that in the parent cells. As a result when both male and female gametes fuse to form zygote, the number of chromosomes becomes adequate for the species involved.

3. Every animal cell has fixed number of chromosomes. Human cell contain 23 pairs or 46 chromosomes. After meiosis egg and sperm cells contain 23 chromosomes. After zygote formation the number of chromosomes is once again 23 pairs. This is necessary to maintain the unique identity of a species.

4. To create variations in species. As no two individuals are same, so genetic characters from both parents will help make a slightly different copy of themselves. These small variations accumulate over hundreds of years resulting in formation of new species.

5. New species facilitate evolution of organisms. Evolution is necessary for survival as environmental conditions keep on changing from time to time. As per Darwin nature has a method of selecting the best fit species for survival.

Types of Reproduction:

1. Asexual Reproduction

2. Sexual Reproduction

Asexual Reproduction:

In unicellular plants and animals and some multicellular organisms as well the mode of reproduction is asexual. In this case the organism doesn't make zygote. There are following types of asexual reproduction:

1. Binary Fission: As the name suggests, the organism breaks into two parts by cell division. Unicellular organism like Amoeba and bacteria reproduce in this way.

2. Budding: Some multicellular organisms like Hydra and Yeast make a bud outside their body. The bud, after growing to certain extent detaches from the parent body and goes on living like an independent organism.

3. Vegetative Reproduction in Plants: Certain plants have capacity to make a new plant from their vegetative parts. For example if you plant a stem of rose it will develop root and ultimately a new plant is born. Leaves of Bryophyta grow roots at the margins of their leaves, which ultimates gives birth to a separate plant.

4. Reproduction in Virus: Virus enters the nucleus of the host cells. After that it manipulates the DNA of the host to reproduce a new virus.

5. Parthenogenesis: Some lower plants and animals, like some bees and wasps reproduce in this way. An organism develops embryo without fertilization. The embryo ultimately gives birth to a new generation.

6. Spore Formation: Some fungi and algae make spores. You must have noticed white cotton like growth on stale bread and food. These are spores of fungi. These spores, during favourable environmental conditions give birth to the new generation.

Sexual Reproduction:

Sexual reproduction involves formation of zygote or embryo to facilitate transfer of genetic information from both parents, and development of embryo in a developed offspring.

Sexual Reproduction in Plants:

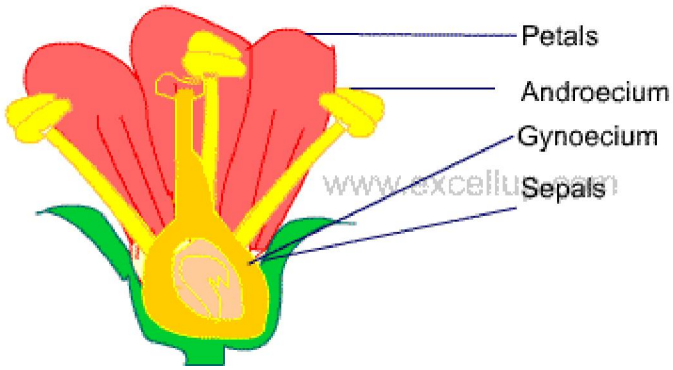
Flower can be termed as the sexual organ of a plant. All the parts of a flower are arranged around an axis. These are as follows:

1. Sepals: Green leaf like structure.

2. Petals: Colourful structures, which add attraction to a flower. This attraction is not only having ornamental value, but a more important role in facilitating reproduction. Insects and birds, attracted by the colour, help transfer pollen grains or male gametes from male flower to female flower. This helps in pollination.

3. Androecium.

4. Gynoecium.



Male Reproductive Organ of Plant: Androecium

The flower of a plant contains tube like structures called stamen. At the top of stamen is a chambered structure called Androecium. Androecium is responsible for the production of male gamete also called pollen grains.

Female Reproductive Organ of Plant: Gynoecium

Usually at the centre of a flower you can notice Gynoecium. Gynoecium is pitcher shaped structure with a long tube protruding out of it. The gynoecium produces female gamete also called eggs.

Pollination: The process of transfer of pollen grains from androecium to gynoecium is called pollination. This can happen in same flower, or between different flowers of the same plant. When only one plant is involved the process is called self-pollination. When flowers of two different plants are involved, then it is called cross pollination. Cross pollination can be facilitated by insects, birds, animals, air or water.

Zygote Formation: Once pollen grains enter the androecium, one of them enters the egg to fertilize it to form a zygote. Seeds are the zygote or embryo of the plant. To survive and to germinate seeds need source of food. In all seeds there is abundance of food. That is why for our daily need we depend on so many seeds like rice, wheat, groundnut for food. During germination the food in the cotyledon is used to grow a new plant. Once green leaves come out, they take care of further food production.

Reproductive System in Humans:

Male Reproductive System:

1. Testis: Testis is a galndular organ made up of fine tubules. Testis produces sperm or male gamete.

2. Seminal Vesicle: Once sperm is produced it is stored in seminal vesicle.

3. Vas Deferens: Vas deference is the tube through which semen containing sperm is transferred out.

Apart from producing sperm, testis also produces certain hormones, like tetosterone which are responsible for secondary sexual characters in humans. These are deep male voice, hair growth in pubic area and under armpits, and facial hair.

Female Reproductive Organs:

1. Ovary: Ovaries are situated on left and right side of the uterus. Ovaries have an inner epithelial lining called endometrium, which is responsible for the production of eggs.

2. Fallopian Tubes: Fallopian tubes extends on both sides of the uterus in transverse direction. Fallopian tubes have finger like structures which catch the eggs to transfer them to the uterus.

3. Uterus: Uterus is a bag like structure, with an opening in the vagina. Once eggs reach uterus, a layer of soft tissues develops to support the embryo. This layer is called corpus luteum. If fertilization takes place, then the embryo develops into a foetus and ultimately to a fully developed child over a period of about 9 months.

Menstrual Cycle in Females: If no fertilization takes place then after about two weeks the dead eggs and corpus luteum gets expelled out of the uterus through vagina. This process takes place over a period of about three to four days. This clears the way for new batch of eggs to come in the uterus. The whole cycle from egg production to the expulsion of eggs takes about four weeks. This cycle is known as Menstrual Cycle. Apart from humans, some primates like Chimpanzee and Gorilla also show same phenomenon.

Ovary secretes one of the important hormones estrogen, which is responsible for secondary sexual characters in female, like thin voice and breast enlargement.