

CHAPTER 8
HOW DO ORGANISMS REPRODUCE?
MODULE 1

KEY POINTS

DEFINITION OF REPRODUCTION
IMPORTANCE OF REPRODUCTION
BASIC EVENT OF REPRODUCTION
CREATION OF VARIATIONS DURING REPRODUCTION
IMPORTANCE OF VARIATION
TYPES OF REPRODUCTION

1. Reproduction – Making more individuals of its own kind by an organism/similar copies of its own kind

2. Why do organisms reproduce?

Reproduction is not necessary to maintain the life of an individual organism unlike the essential life processes such as nutrition, respiration etc. **On the other hand if an organism has to create more individuals a lot of energy is spent in the process. Still reproduction is carried out so that individuals of a species do not come to an end or species continue to survive.**

Importance- It is important for-

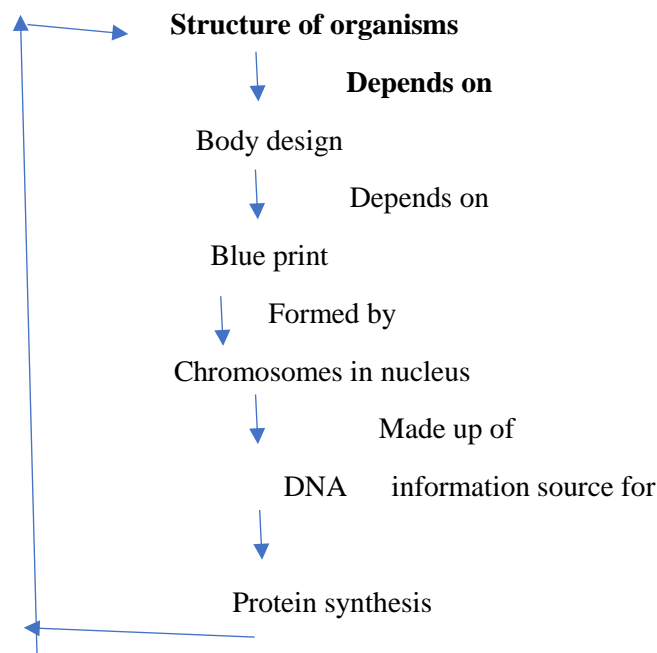
1. continuity of species/ continuity of life on earth.

2. It helps in bringing variations(explained below) leading to better adaptation

3. evolution(change in the characteristics of a species over thousands of years due to various factors)

3. Basic event in reproduction- Organisms look similar because their body designs are similar. If body designs are similar then blue print for these body designs should be similar. **This blue print is DNA**(present in nucleus and inheritance of features takes place through this) **Blue print is something which acts as a base to create whole structure.**

Thus most basic event in reproduction is the creation of a DNA copy. DNA is the information source for making proteins. Proteins decide body design. If Information in DNA is changed different proteins and hence different body designs will be made.(Organisms will not look similar)



DO ORGANISMS CREATE EXACT COPIES OF THEMSELVES?

To create a copy of DNA cells use chemical reactions. This produces two copies of the DNA in a reproducing cell and they will need to be separated from each other. After copying of DNA there is creation of additional cellular apparatus(cytoplasmic contents) and then the DNA copies separate each with its own cellular apparatus and a cell divides to give rise to two new cells(cell division)

NOTE: In cell division first there is karyokinesis(division of nucleus of a cell) followed by division of cytoplasm(cytokinesis)

The biochemical reactions used to create DNA copy is not absolutely reliable(or accurate).Thus it is to be expected that the process of Copying DNA will have some variations each time. Hence DNA copies generated will be similar but not identical to the original cell. If variations are drastic the new born cell will not survive. Thus there can be many variations in the DNA copies (not drastic) and new cell will be similar but not identical. This inbuilt tendency for variation during reproduction (or DNA copying) is the basis of evolution

4.Importance of variation: It promotes survival of species which can be explained in the following manner.

Due to external factors like change in temperature, water level, meteorite hit etc. the niches(HABITAT) may change and due to these drastic changes the population of a species may be wiped out(MAY DIE) altogether.

But If variants are present(who would tolerate these changes) there would be some chances for them to survive and species will not come to an end. (RECALL THAT VARIATIONS ARE PRODUCED DURING REPRODUCTION)

Eg: If there is population of bacteria living in temperate waters and if temperature of water increases suddenly due to global warming most of bacteria would die but a few bacteria resistant to heat would survive and grow further. Variation is thus useful for survival of species over time.

Note: Due to consistency of DNA copying similar body design features are made which allow the organisms to use a particular habitat(niche). Reproduction is thus linked to the stability of populations of species. (population remains stable in terms of basic body design)

TYPES OF REPRODUCTION

ASEXUAL	SEXUAL
1. ONLY SINGLE PARENT IS NEEDED	1. TWO PARENTS AARE NEEDED
2. NO FORMATION AND FUSION OF GAMETES	2. FORMATION AND FUSION OF GAMETES
3. OFFSPRINGS SHOW LESS VARIATIONS	3. OFFSPRINGS SHOW MORE VARIATIONS

NOTE: 1. Gametes are sex cells eg: male gamete is sperm in human beings and female gamete is ovum/egg

2. variations means deviations from the parent(how different the new organisms are from parents)

Reference: NCERT