

# 18. HEREDITY

## Learning Objectives














At the end of this lesson the students will be able to:

- ❖ Know about Mendelian laws.
- ❖ Differentiate between phenotype and genotype.
- ❖ Understand the process of monohybrid and dihybrid cross.
- ❖ Differentiate between a chromosome, DNA and gene.
- ❖ Understand the structure of chromosome.
- ❖ Classify the chromosomes based on the position of centromere.
- ❖ Understand the structure and replication of DNA.
- ❖ Define mutation and classify the chromosomal and gene mutation.
- ❖ Identify the chromosomal abnormality of Down's syndrome .

## Important Notes and Key Points

- Punnett square is a checker board form devised by a British geneticist R.C.Punnett for study of genetics. It is a graphical representation to calculate the probability of all possible genotypes of off springs in a genetic cross.
- T.H. Morgan was awarded Nobel Prize in 1933 for determining the role of chromosomes in heredity.
- **Telomeres act as aging clock in every cell.**

- Telomeres are protective sequences of nucleotides found in chromosomes. As a cell divides every time, they become shorter. Telomeres get too short to do their job, causing our cells to age.
- **Chargaff rule of DNA base pairing**
- **Erwin Chargaff** states that in DNA, the proportion of adenine is always equal to that of thymine. and the proportion of guanine always equal to that of cytosine.
- **Sickle cell anaemia** is caused by the mutation of a single gene. Alteration in the gene brings a change in the structure of the protein part of haemoglobin molecule. Due to the change in the protein molecule, the red blood cell (RBC) that carries the haemoglobin is sickle shaped.
- Contrasting characters of pea plant used by Mendel

Characteristic studied	Dominant character	Recessive character
Seed shape	Round 	Wrinkled 
Seed colour	Yellow 	Green 
Seed-coat colour	Coloured 	White 
Pod shape	Inflated 	Constricted 
Pod colour	Green 	Yellow 
Flower Position	Axillary 	Terminal 
Stem length	Long 	Short 