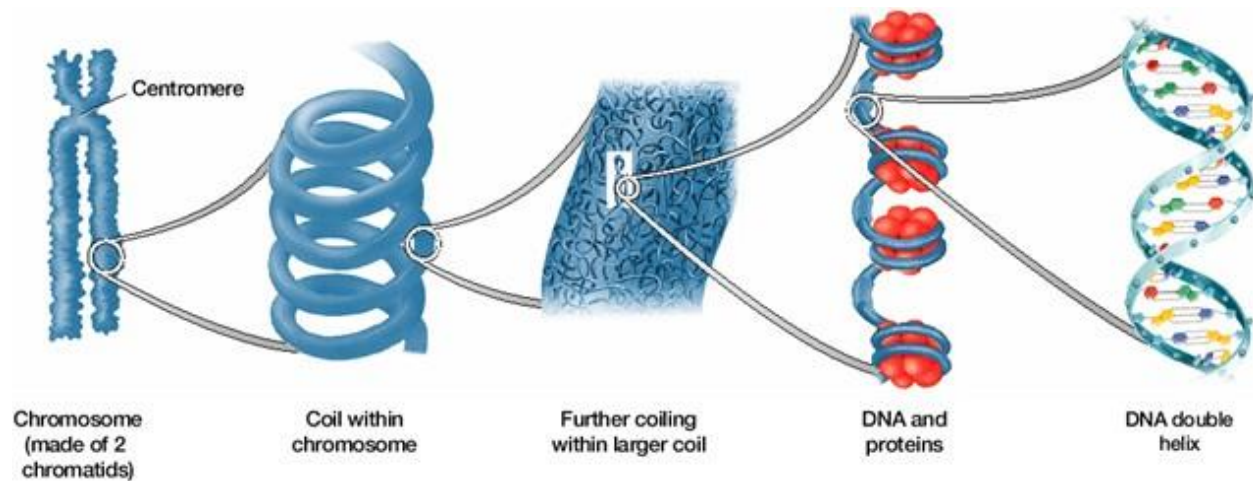


Chromosomes



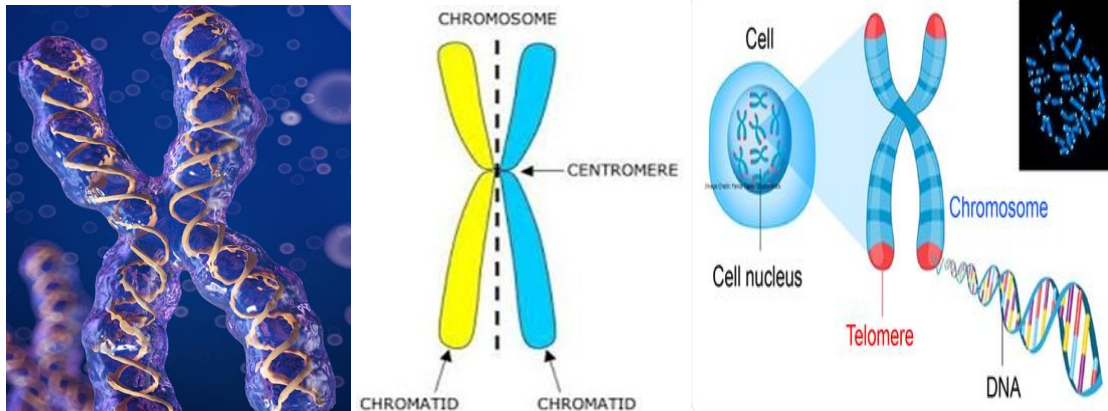
Chromosomes are threadlike structures made of a single molecule of DNA and protein that serve to carry the genomic information from cell to cell. In humans, animal and plants, chromosomes reside in the nucleus of cells.

Chromosome is consist of 3 parts:-

1- **Centromere** : a constricted region of a chromosome and plays a key role in helping the cell divide up its DNA during division (mitosis and meiosis).

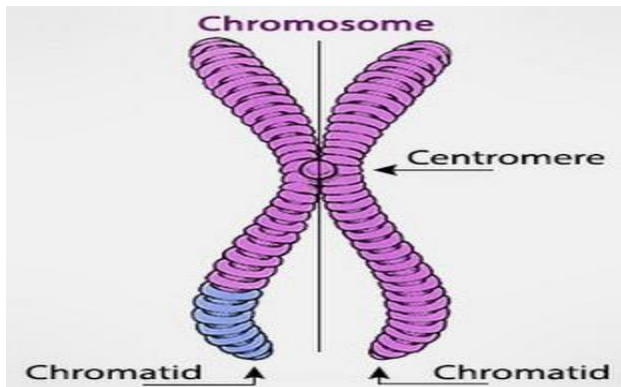
2-**Arm** : Each chromosome is divided into two sections (arms) based on the location of a narrowing called the centromere. the shorter arm is called p, and the longer arm is called q.

3-Telomere: a region of repetitive nucleotide sequences associated with specialized proteins at the ends of linear chromosomes.



Chromosome

A **chromatid** is one of the two identical halves of a chromosome that has been replicated in preparation for cell division.



Function of Chromatids

It authorizes cells to store two copies of their information in preparation for cell division.

Humans typically have **23 pairs** of chromosomes, or **46 chromosomes** in total. Chromosomes are made up of long strands of DNA, which contain all the body's genes.

Two of the chromosomes (the X and the Y chromosome) determine your sex as male or female when you are born. They are called sex chromosomes: **Females have 2 X chromosomes. Males have 1 X and 1 Y chromosome**

Q/ Can a girl have an XY chromosome?

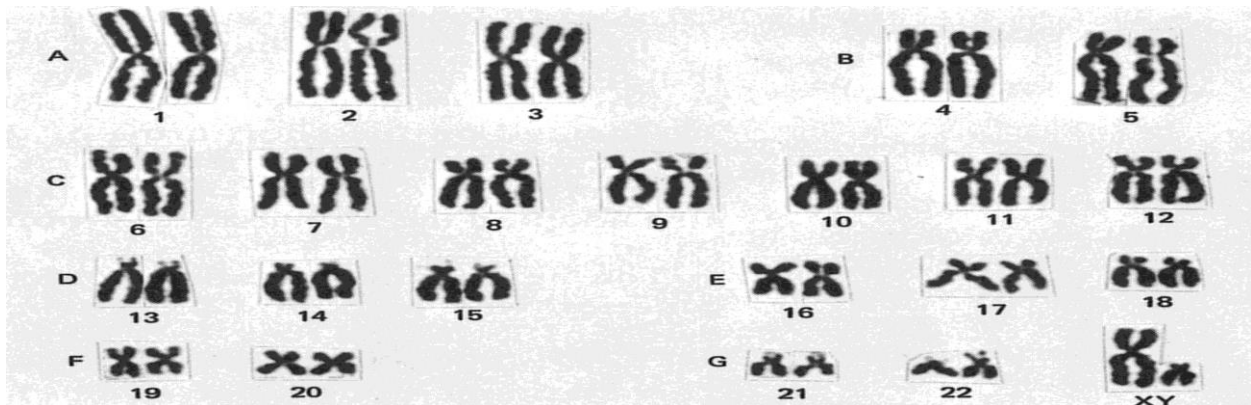
Answer/ Girls born with XY chromosomes are genetically boys but for a variety of reasons – mutations in genes that determine sexual development – the male characteristics are never expressed. They live their lives as girls and then women.

There are **two** basic types of chromosomes:

1-Sex chromosomes

2.Autosomes.

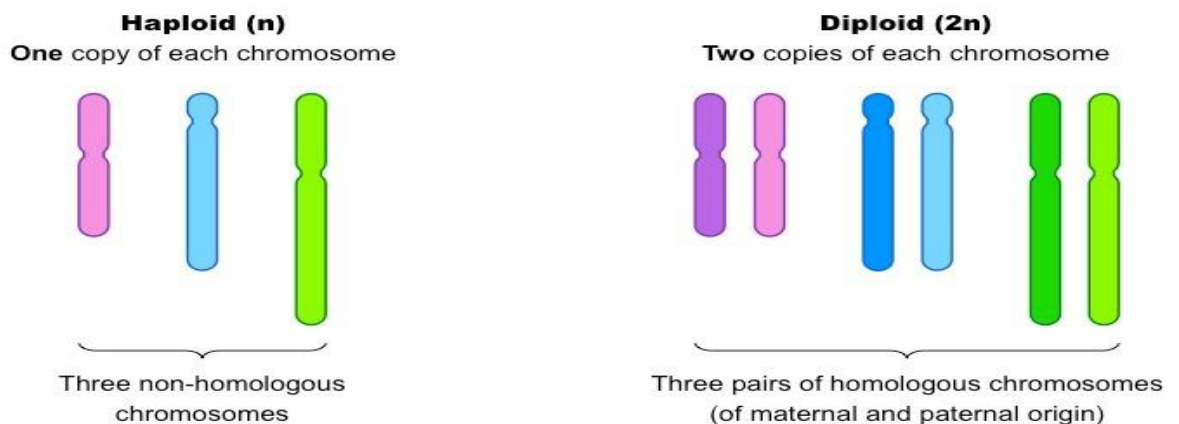
Autosomes control the inheritance of all the characteristics except the sex-linked ones, which are controlled by the sex chromosomes. Humans have **22 pairs of autosomes** and **one pair of sex chromosomes**.



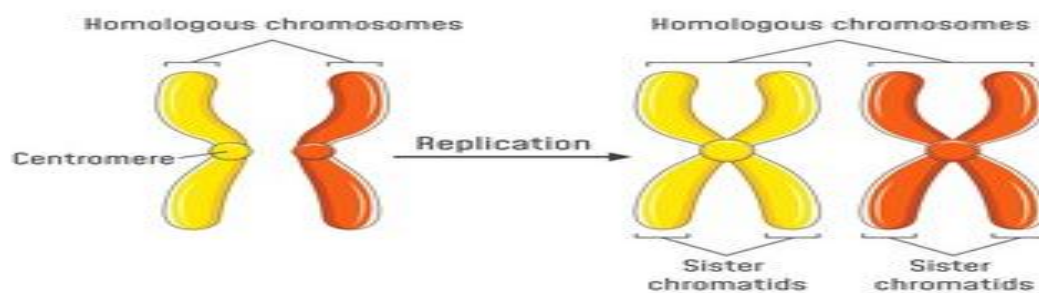
Organism	Number (2n) of chromosomes
<i>Penicillium</i>	1-4
<i>Saccharomyces</i> (yeast)	16
Mosquito	6
Housefly	12
Garden pea	14
Corn	20
Adder's tongue fern	480-1,020
Frog	26
Human	46
Orangutan	48
Dog	78

What is the difference of **haploid** and **diploid**?

Diploid refers to the number of complete chromosome sets present in each cell of an organism: **diploid cells contain two complete sets.** **Haploid organisms, on the other hand, only contain one complete chromosome set.** Chromosome sets can be altered in meiosis, and occasionally in mitosis



Homologous chromosomes are chromosome pairs containing a maternal and a paternal chromatid that are similar in length, gene position, and are joined at the **centromere**. The position of the genes on each homologous chromosome is the same, however, they may contain different alleles of the genes.



Function of a Chromosome

The chromosome holds the genetic code, its complex form and structure dictate how often genes can be translated into proteins, cellular molecules that regulate genes and transcription often work by activating or deactivating these proteins, which can contract or expand the chromosome. During cell division, all the proteins are activated and the chromatin becomes densely packed into distinct chromosomes. These dense molecules have a better chance of withstanding the pulling forces that occur when chromosomes are separated into new cells.

- **Sister Chromatid** – The still connected copies of a chromosome, which will be separated into individual chromosomes during anaphase of mitosis or anaphase II of meiosis.
- **Sister Chromosome** – One of the two new chromosomes created during DNA replication, which are now separated from each other and will soon be in different cells.

