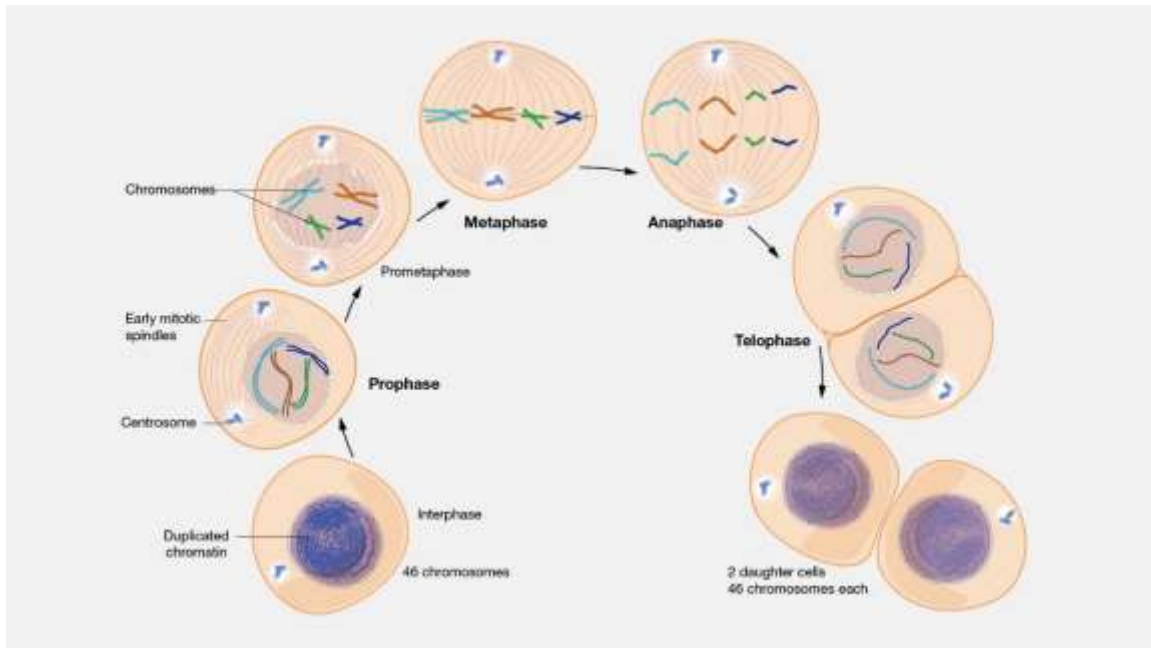


Mitosis:

is the process by which a cell replicates its chromosomes and then segregates them, producing two identical nuclei in preparation for cell division. Mitosis is generally followed by equal division of the cell's content into two daughter cells that have identical genomes.



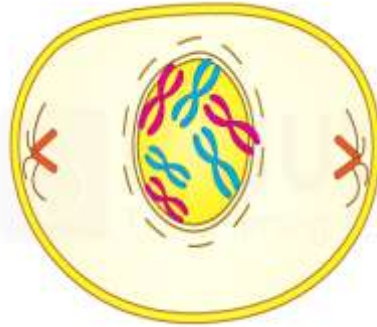
Stages of Mitosis

Interphase

Before entering mitosis, a cell spends a period of its growth under interphase. It undergoes the following phases when in interphase:

- **G1 Phase:** This is the period before the synthesis of DNA.
- **S Phase:** This is the phase during which DNA synthesis takes place.
- **G2 Phase:** This is the phase between the end of DNA synthesis and the beginning of the prophase.
- **Prophase**
- Prophase immediately follows the S and G2 phases of the cycle and is marked by condensation of the genetic material to form compact mitotic chromosomes composed of two chromatids attached at the centromere.

- The completion of the prophase is characterised by the initiation of the assembly of the mitotic spindle, the microtubules and the proteinaceous components of the cytoplasm that help in the process.
- The nuclear envelope starts disintegrating.



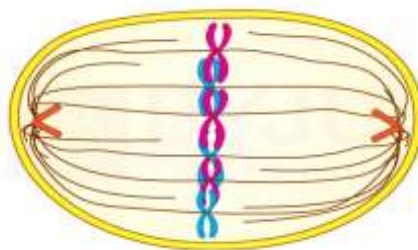
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- **Prometaphase**

- In the prometaphase, the nuclear envelope disintegrates. Now the microtubules are allowed to extend from the [centromere](#) to the chromosome. The microtubules attach to the kinetochores which allow the cell to move the chromosome around.

- **Metaphase**

- At this stage, the microtubules start pulling the chromosomes with equal force and the chromosome ends up in the middle of the cell. This region is known as the metaphase plate. Thus, each cell gets an entire functioning genome.

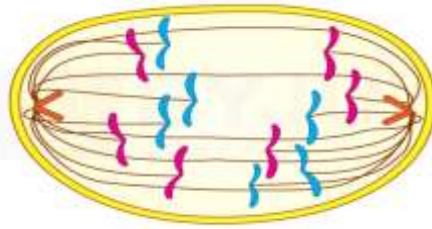


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Anaphase

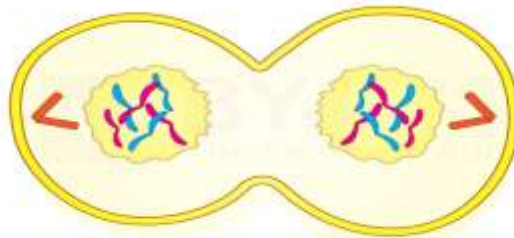
The splitting of the sister chromatids marks the onset of anaphase. These sister chromatids become the chromosome of the daughter nuclei. The chromosomes are then pulled towards the pole by the fibres attached to the kinetochores of

each chromosome. The centromere of each chromosome leads at the edge while the arms trail behind it.



Telophase

The [chromosomes](#) that cluster at the two poles start coalescing into an undifferentiated mass, as the nuclear envelope starts forming around it. The nucleolus, Golgi bodies and ER complex, which had disappeared after prophase start to reappear.



Functions of Mitosis

Following are the two important functions of mitosis:

1. Mitosis helps in the development of an organism. In single-celled organisms, mitosis is the process of asexual reproduction.
2. Mitosis helps in the replacement of damaged tissues. The cells near the damaged cells begin mitosis when they do not sense the neighbouring cells. The dividing cells reach each other and cover the damaged cells.