

# Chromosomes and Mitosis

## **Introduction:**

Chromosomes in eukaryotes perform a useful function during mitosis, the process in which cells replicate their genetic material and then divide into two new cells (also called daughter cells). Because the DNA is packaged within chromosomes, the distribution of the correct amount of genetic material to the daughter cells is maintained during the complex process of cell division.

Before a cell divides, the chromosomes are replicated within the nucleus. In a human cell, the nucleus just prior to cell division contains 46 pairs of chromosomes. When the cell divides, the sister chromatids from each duplicated chromosome separate. Each daughter cell ends up with 23 pairs of chromosomes and after DNA replication, the daughter cells will have a diploid number of chromosomes.

In meiosis, the type of cell division that leads to the production of sex cells, the division process is more complicated. Two rounds of cell division occur in meiosis. Before meiosis, the chromosomes replicate, and the nucleus has 46 pairs of chromosomes. In the first round of meiotic cell division, the homologous chromosomes pair separate as in mitosis (a stage called meiosis I). In the second round of cell division (meiosis II), the sister chromatids of each chromosome separate at the centromere, so that each of the four daughter cells receives the haploid number of chromosomes.

**Take a look at the video below to learn more:**

[https://www.youtube.com/watch?v=IRqxofKwfpg&feature=emb\\_logo](https://www.youtube.com/watch?v=IRqxofKwfpg&feature=emb_logo)