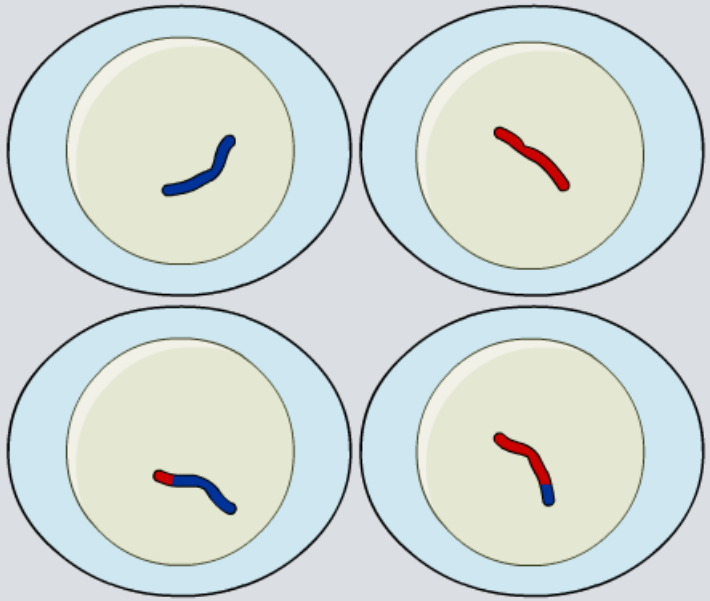
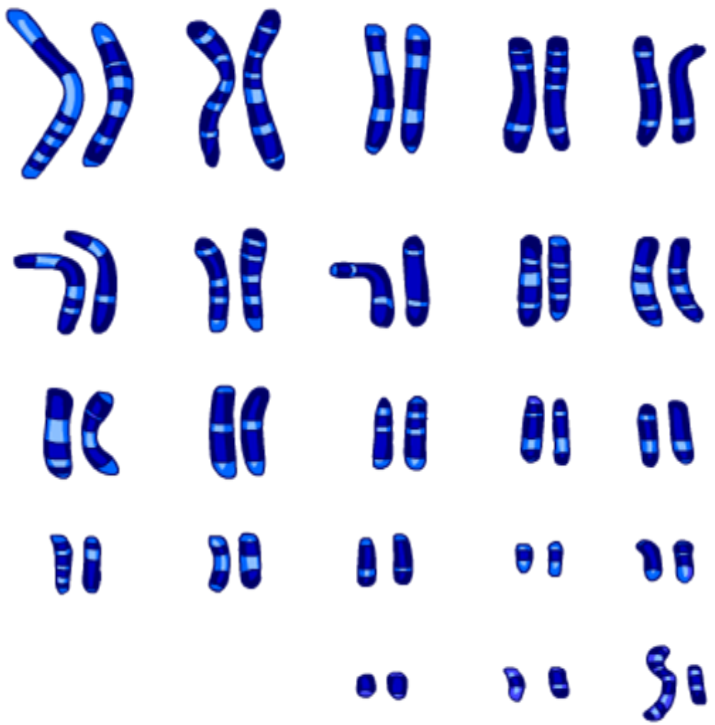
The Stages of Meiosis



Chromosome number

A human **somatic** (body) cell contains 46 chromosomes. These consist of 23 pairs of **homologous chromosomes**.



Each pair contains one chromosome from each parent. Other species have different numbers of these homologous pairs.

Sex cells, or **gametes**, have only one copy of each chromosome: they are **haploid**. A somatic cell, containing two of each, is called **diploid**.

Haploid gametes

All somatic cells in a multicellular organism are genetically identical because they are the result of **mitosis**.

They are all descended from a single cell – a **zygote**.

A zygote is formed when two haploid gametes fuse.

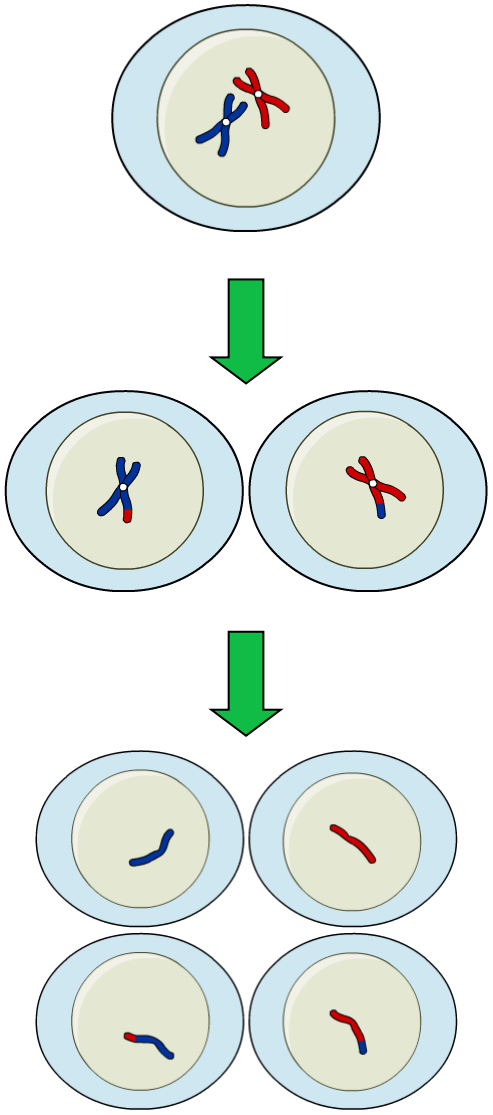
These gametes are genetically unique because, unlike somatic cells, they were formed by a special form of cell division called **meiosis**.

Meiosis I and II

Meiosis is the process of cell division underlying sexual reproduction. It is a two-stage process:

- **Meiosis I** introduces genetic diversity by randomly dividing a cell's genes in two. It results in two haploid cells.

- **Meiosis II** is similar to mitosis. It splits each chromosome into its two chromatids and places one in each daughter cell. It results in four **haploid gametes**.



Genetic variation

Sexual reproduction creates genetic diversity within a population, which is vital to a species' survival.

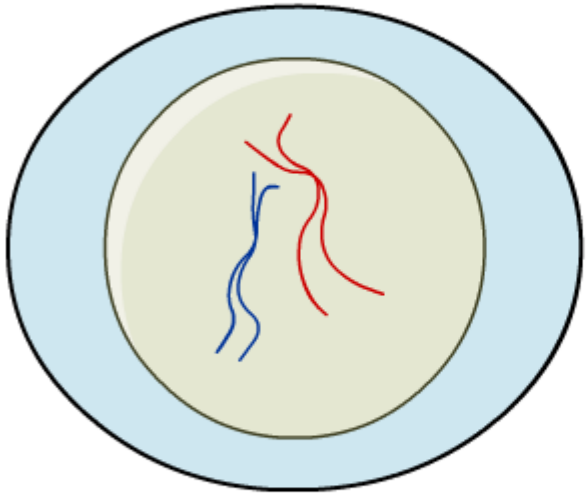
Two processes during meiosis determine the unique genetic make-up of the four daughter cells:

- During meiosis I, homologous pairs of chromosomes swap parts of their genetic material. This is **crossing over**.
- The chromosomes from each pair are randomly allotted to the daughter cells by **independent assortment**.

What happens during meiosis?

Meiosis can be broken down into two stages: the first is where genetic diversity is introduced, while the second is very similar to mitosis.

Click "**play**" or the cell to see what happens.



Meiosis: true or false?

Variation from meiosis