Meiosis

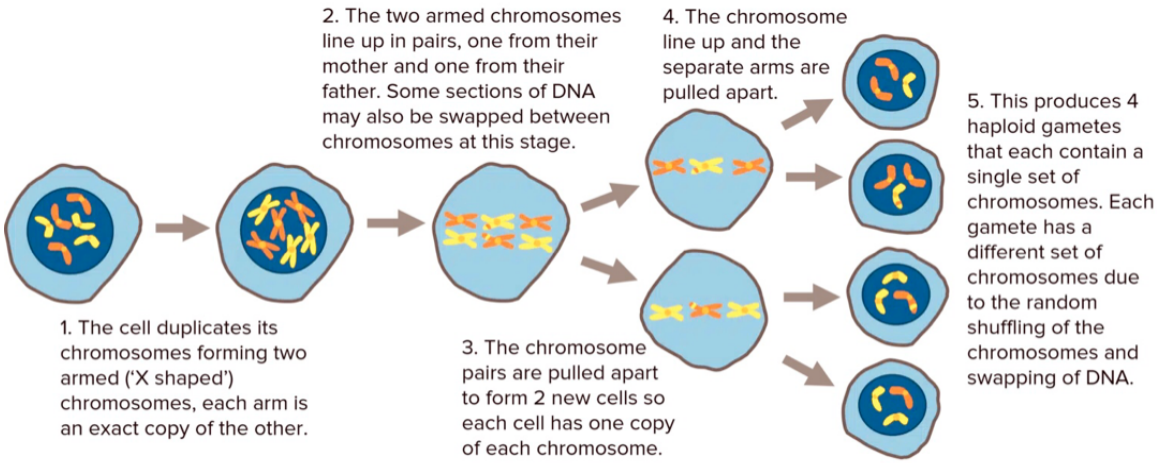
- Meiosis is a type of cell division in sexually reproducing organisms that reduces the number of chromosomes in gametes (the sex cells, or egg and sperm). In humans, body (or somatic) cells are diploid, containing two sets of chromosomes (one from each parent).

Gametes are produced by meiosis

- **Gametes** required for **sexual reproduction** are formed in the **reproductive organs** (testes and ovaries) in a process called **meiosis**.

- **Meiosis** creates **gametes** that contain half the amount of **genetic information** as the parent organism (haploid) so when they fuse together in **fertilisation.**
- **T**hey have a full set of **chromosomes** to create a new **organism**.
- Each **gamete** has a different set of **chromosomes** which creates **genetic variation** in the offspring.
- Phases of reproduction are described below

1. Cells in **reproductive organs** begin to duplicate their **chromosomes**. They form '**X- shaped**', **two armed chromosomes**, each arm is identical to the other arm.
2. The **chromosomes** then **line up** in **pairs** along the centre of the cell. Pairs consist of chromosomes inherited from the **mother** and the **father**. In this stage there may be some swapping of **genetic material** between the **chromosomes**.
3. The **chromosomes** are pulled apart to opposite ends on the cell and the cell **divides** forming two **new cells**.
4. The **chromosomes line up** in the centre of the cells again and each **arm** is pulled to opposite ends.
5. **Four new haploid cells** (**gametes**) are created, each with different sets of **chromosomes** and half the amount of **genetic material** as the original cell.



Fertilisation

- In **fertilisation**, **gametes** from the male and female organisms meet and their **nuclei** fuse together. This forms a **fertilised egg** or **zygote** that contains a full set of **chromosomes** (half from the mother and half from the father).
- The **zygote** will then **divide** multiple times by **mitosis** to form an **embryo** (small bundle of cells).
- Cells then begin to **differentiate** into **specialized cells** that will make up different **body tissues** and perform specific functions in the new organism.