

- DNA replication occurs during interphase
 - Copy of each chromosome
- *Meiosis* is a step-by-step process by which a diploid parent cell produces four haploid daughter cells
 - It is a *reduction division*
- It produces haploid (n) nuclei with 23 chromosomes, each representing half of one pair
- From a parent with 46 chromosomes, 4 cells with 23 chromosomes will be produced
- The DNA is replicated before meiosis and that is why are shown with two sister chromatids (X-shaped)

Crossing over

- *Crossing over* is an exchange of genetic material between nonsister chromatids during prophase I
- This trading of segments happens when sections of the homologous chromatids break at the same point, twist around each other and then each connect to the others initial position
- It allows DNA from a person's maternal chromosomes to mix with DNA from the paternal chromosome
 - Increase variation among offspring
 - Increase chances of survival in case of one combination of alleles is more favourable than others

Random orientation

- The homologous pairs of chromosomes line up along the *cell's equator* in a random order during metaphase I
- Increase variation of offspring
 - $2^{23} = 8\,388\,608$ combinations of lining up
- Very few sperms and eggs from one individual are alike
- Two individuals mating gives rise to even more combinations