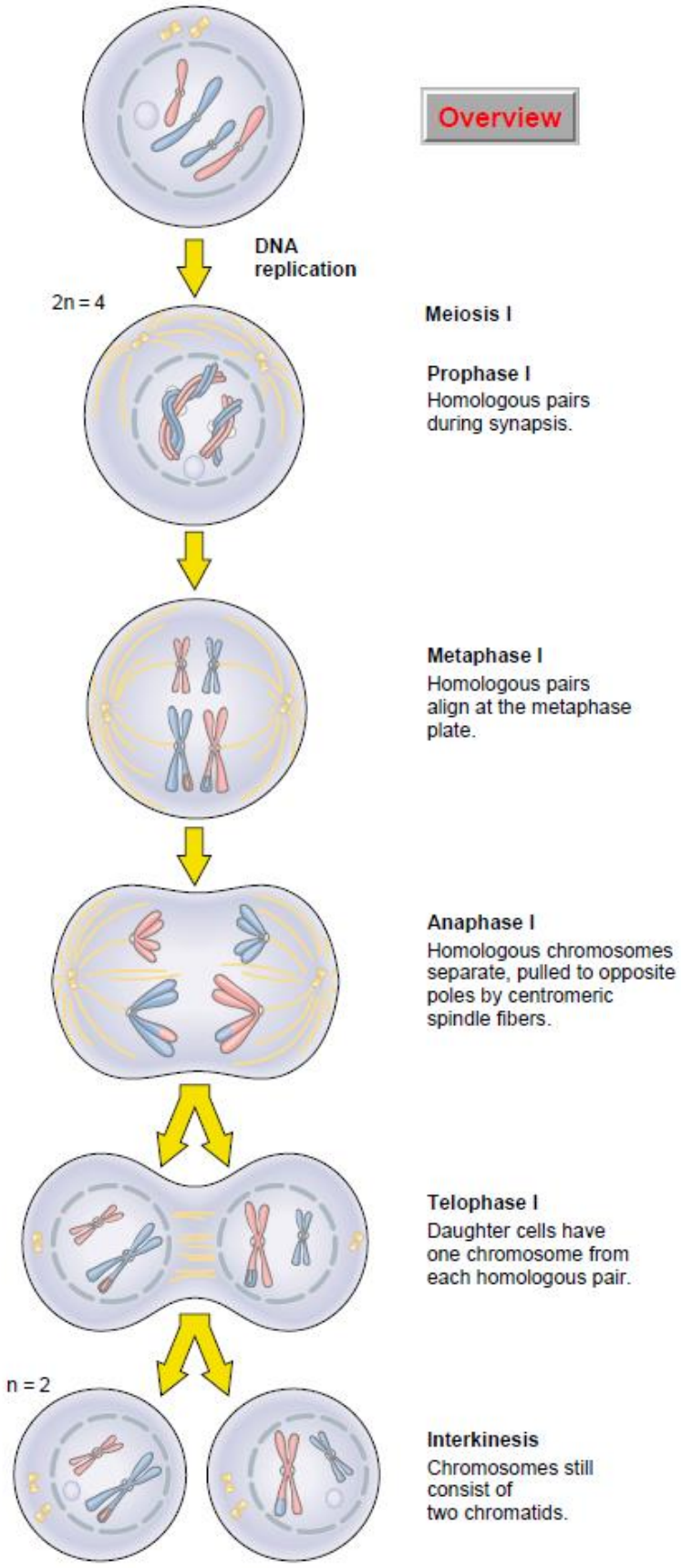
Human Reproduction

Egg and sperm formation :

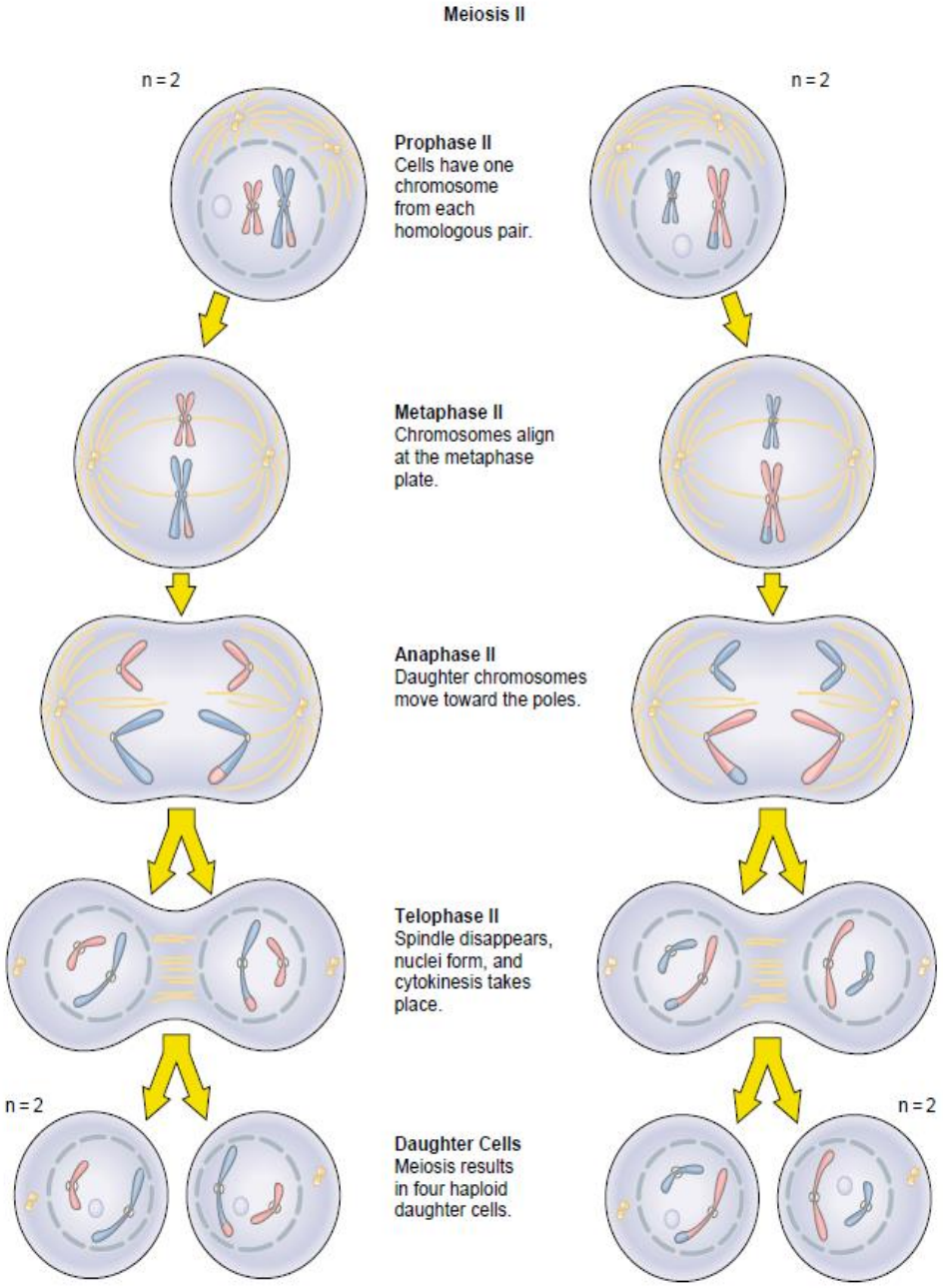
Human life is reproduced sexually , by the combination of two individuals of different sex : a male and female . in order to reproduce zygote both the male and the female must be sexually mature . their bodies must have develop to the point where they produce sex cells (gametes) : in the female , as a rule , one mature egg cell per month : in the male , millions of sperm cells daily .

The human life cycle :

The human life cycle requires both meiosis and mitosis (see the figure below) . In human males , meiosis is a part of spermatogenesis (is the production of sperm in males) which occurs in the testes and produces sperm. in human female , meiosis is a part of oogenesis (is the production of egg in female). Which occurs in the ovaries and produces eggs . a haploid sperm and a haploid egg join at fertilization and the resulting zygote has the full or diploid number of chromosomes . during development of the fetus which is the stage of development before birth , mitosis keeps the chromosome number constant in all the cells of the body , after birth , mitosis is involved in the continued growth of the child and repair of the tissues at any time . as a result of mitosis , each somatic cell in the body has the same number of chromosomes .

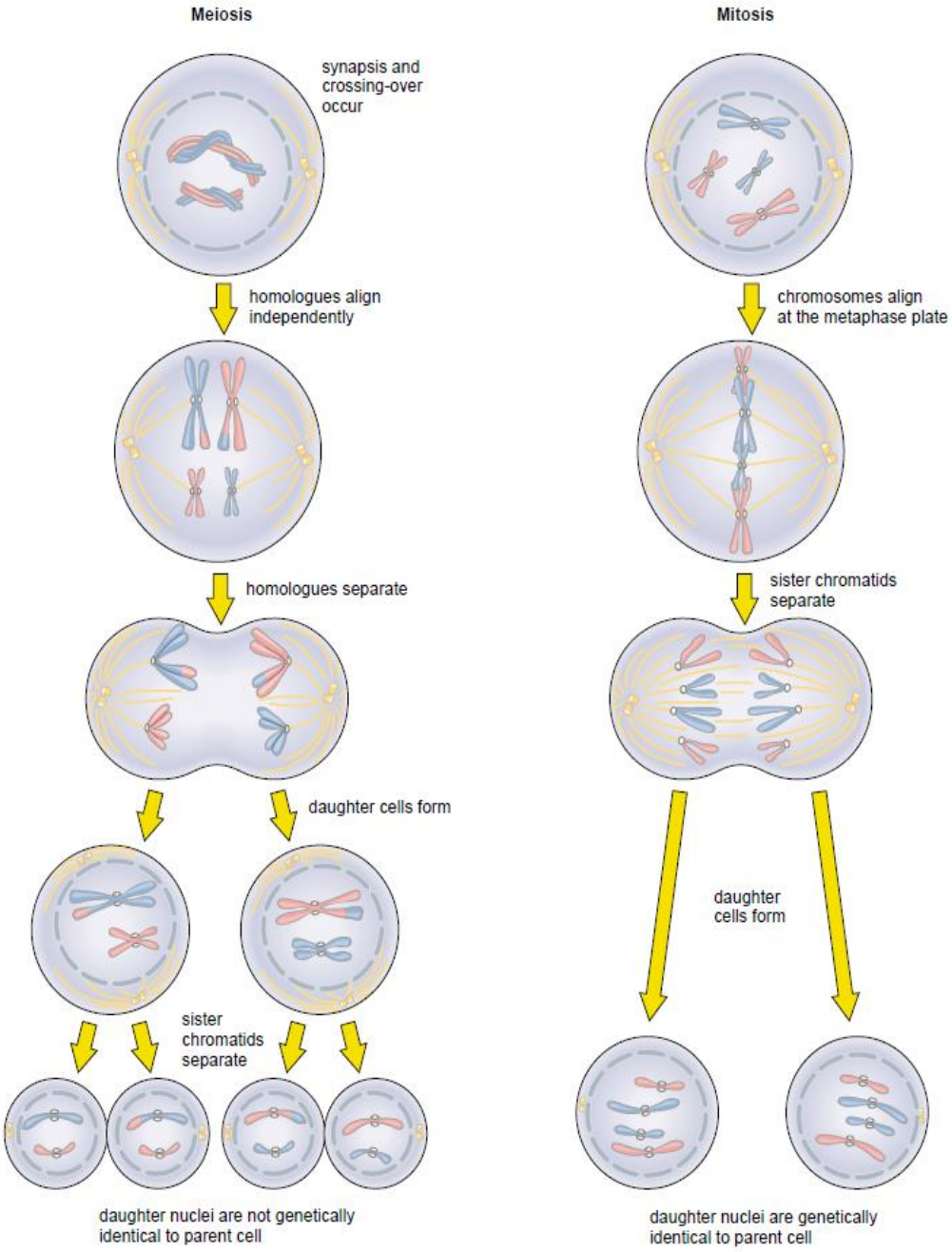


Meiosis I.
The exchange of color between nonsister chromatids represents crossing-over.



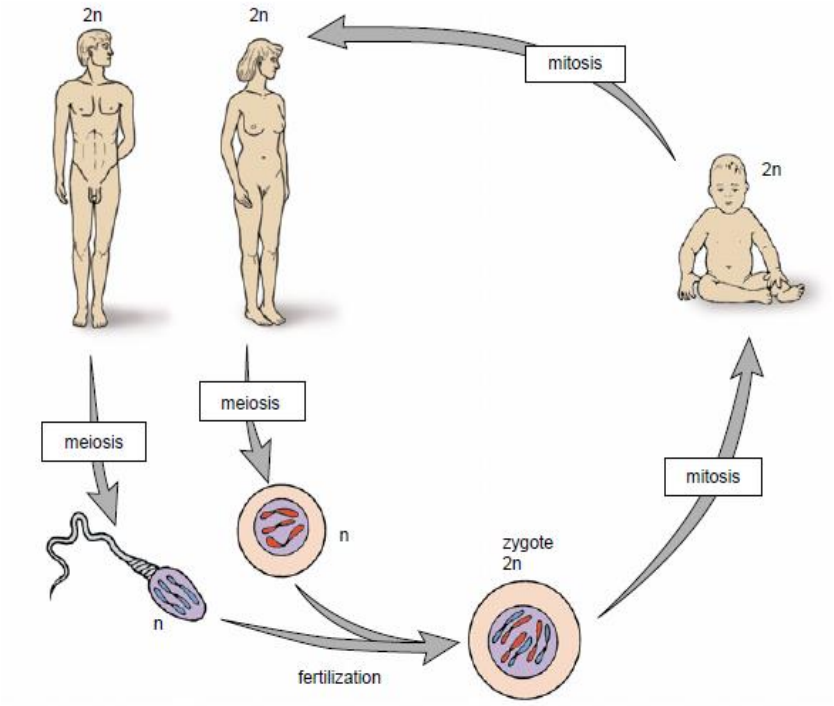
Meiosis II.

During meiosis II sister chromatids separate, becoming daughter chromosomes that are distributed to the daughter nuclei. Following meiosis II, there are four haploid daughter cells. Comparing the number of centromeres in the daughter cells with the number in the parental cell at the start of meiosis I verifies that the daughter cells are haploid.

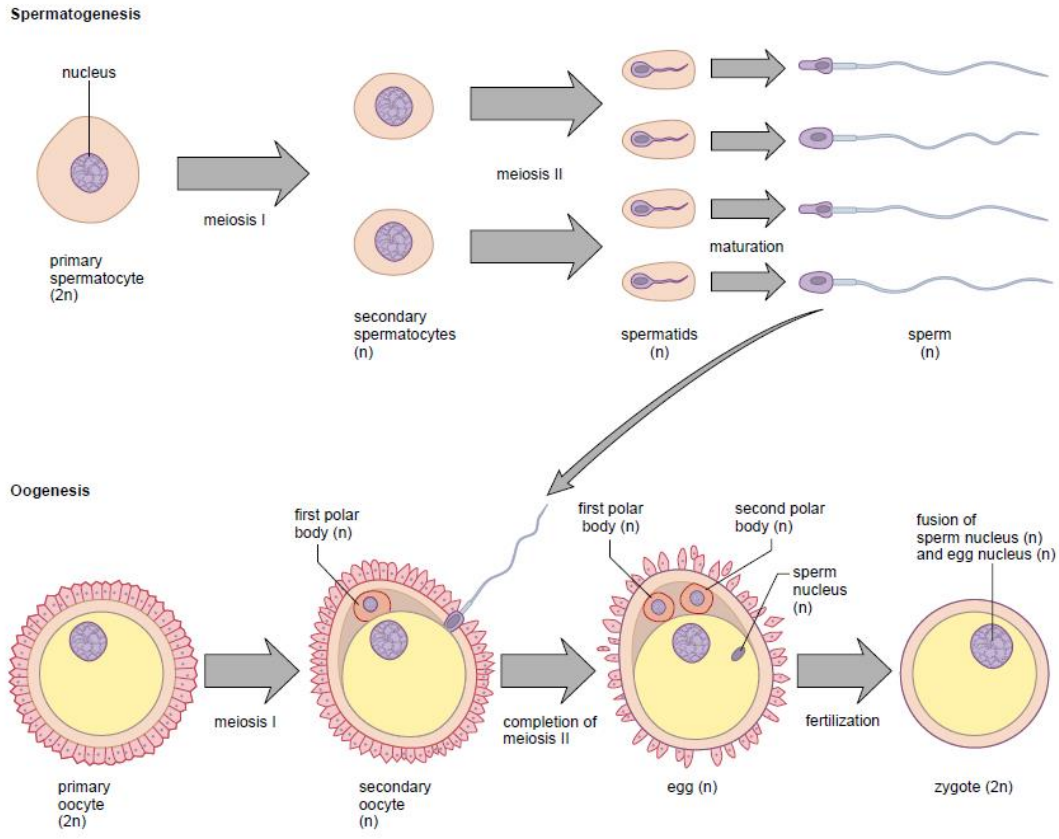


Meiosis compared to mitosis.

Why does meiosis produce haploid daughter cells while mitosis produces diploid daughter cells? Compare metaphase I of meiosis to metaphase of mitosis. Only in metaphase I are the homologous chromosomes paired at the metaphase plate. Members of the homologous chromosomes separate during anaphase I, and therefore the daughter cells are haploid. The blue chromosomes were inherited from one parent and the red chromosomes were inherited from the other parent. The exchange of color between nonsister chromatids represents crossing-over during meiosis I.



Life cycle of humans.
Meiosis in human males is a part of sperm production, and meiosis in human females is a part of egg production. When a haploid sperm fertilizes a haploid egg, the zygote is diploid. The zygote undergoes mitosis as it develops into a newborn child. Mitosis continues after birth until the individual reaches maturity; then the life cycle begins again.



Spermatogenesis and oogenesis.
Spermatogenesis produces four viable sperm, whereas oogenesis produces one egg and two polar bodies. In humans, both sperm and egg have 23 chromosomes each; therefore, following fertilization, the zygote has 46 chromosomes.