Meiosis

Human cells contain 46 chromosomes. Imagine what would happen if a human cell containing 46 chromosomes fertilized with another 46 chromosomes. The resulting cell would contain 92 chromosomes! If cells with 96 chromosomes united, the following offspring would have 184 chromosomes, and so on. For sexual reproduction to occur, there must be a way to reduce the number of chromosomes. This is why sex cells are formed with meiosis.

Meiosis produces sex cells that have half the number of chromosomes (Human sex cells have 23 chromosomes)

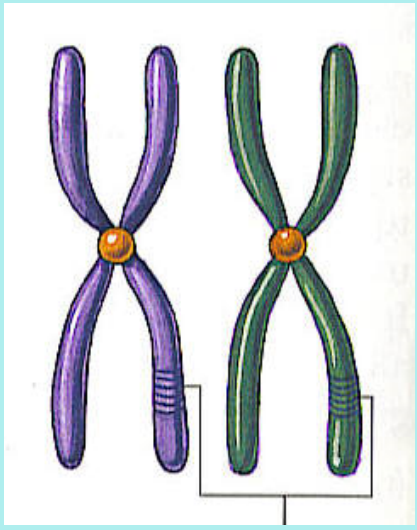
The 46 chromosomes is referred to as the diploid chromosome number. It is written 2n. The 23-chromosome number is referred to as the haploid chromosome number and is given the symbol n.

Organism that reproduce sexually show a greater range in their characteristics than those that reproduce asexually. Because the male and female sex cells come from different individuals in most species, sexual reproduction ensures a recombination of genes. Off springs carry genetic information from each parent. That may explain why you may have thick hair like your father, while your brother has thin hair like your mother.

Both parents give 23 chromosomes but they ay be expressed differently in each off spring

Homologous Chromosomes carry genes that code for the same trait on the same part of the chromosome. One comes from mom and the other from dad. They are similar in shape and size.

Meiosis



Appearance is determined by the way the genes from your homologous chromosomes interact

Organisms that reproduce sexually contain two types of cells

1) Somatic Cells (all cells except sperm and egg)

2) Reproductive Cells → only sperm or egg

1) Cells that divide by mitosis are known as somatic cells.

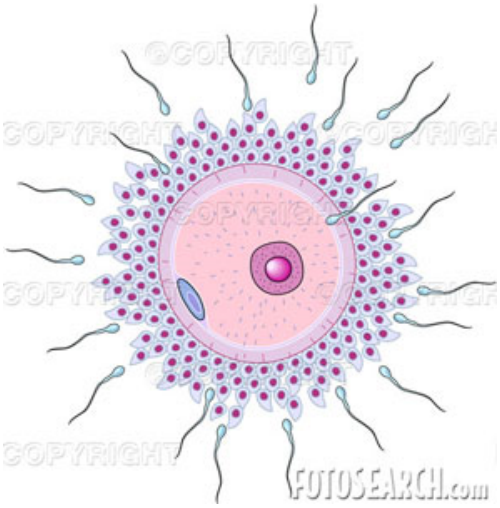
muscle, brain cells

They are diploid, which means that they have the full amount of chromosomes. symbol for diploid is 2n.

Hu mans

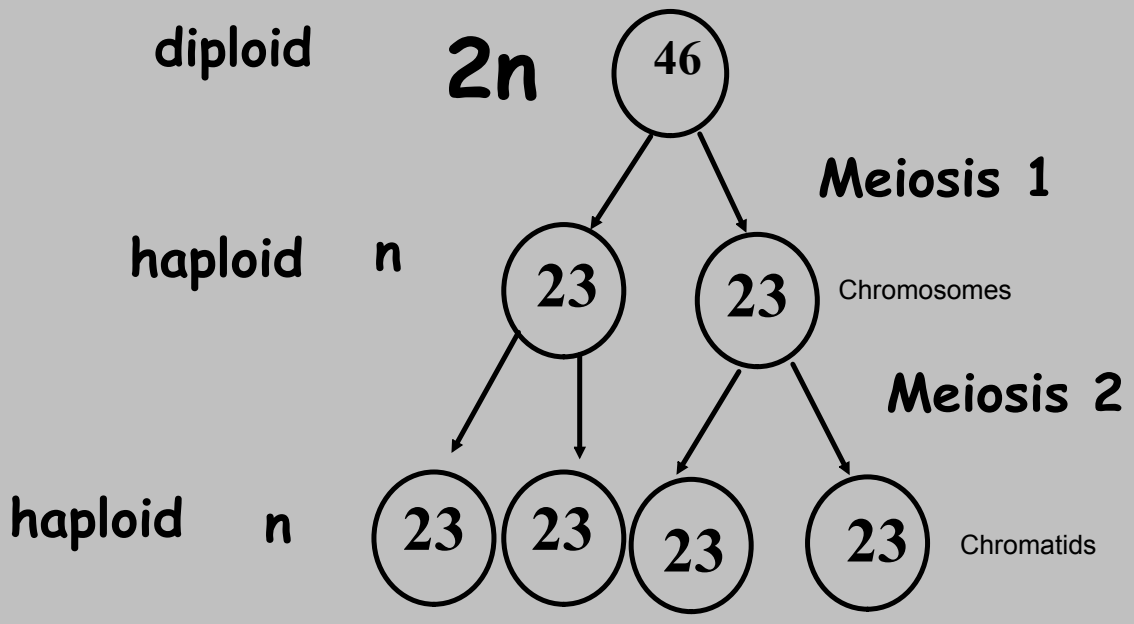
→ 46 chromosomes

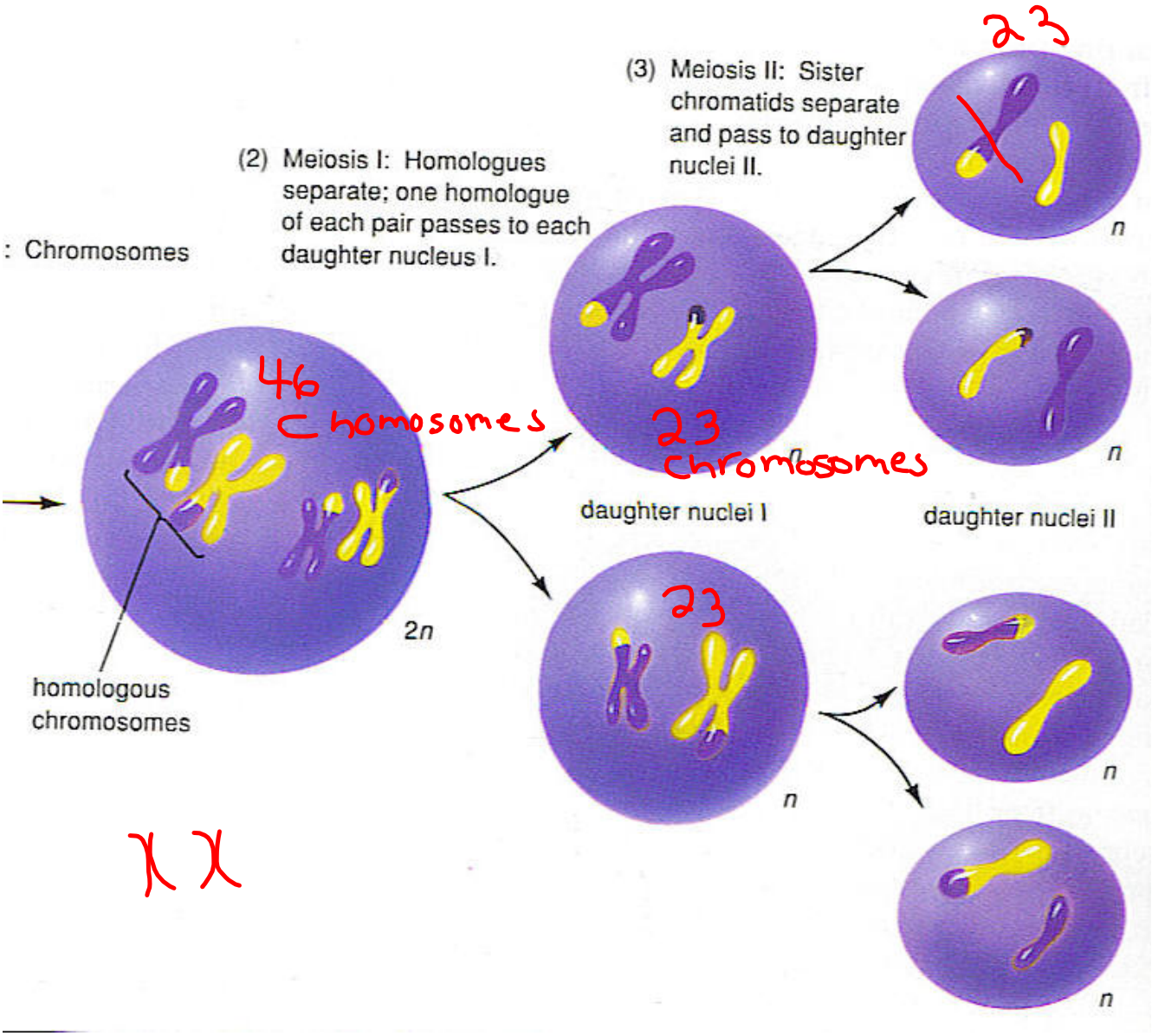
2) Reproductive cells produce sex cells that contain only half the number of chromosomes through a process called meiosis.



They are haploid, which means they only have half the chromosome number.
Also called n

Meiosis has two stages. In the first stage, you go from 46 chromosomes to 23 chromosomes (the homologous chromosomes go to opposite poles). In the second part, the chromosomes divide (just like mitosis). The end result is 4 daughter cells that are all haploid.




23
(3) Meiosis II: Sister chromatids separate and pass to daughter nuclei II.
(2) Meiosis I: Homologues separate; one homologue of each pair passes to each daughter nucleus I.
: Chromosomes
46 chromosomes
23 chromosomes
n
n
n
n
n
2n
daughter nuclei I
daughter nuclei II
homologous chromosomes
XX

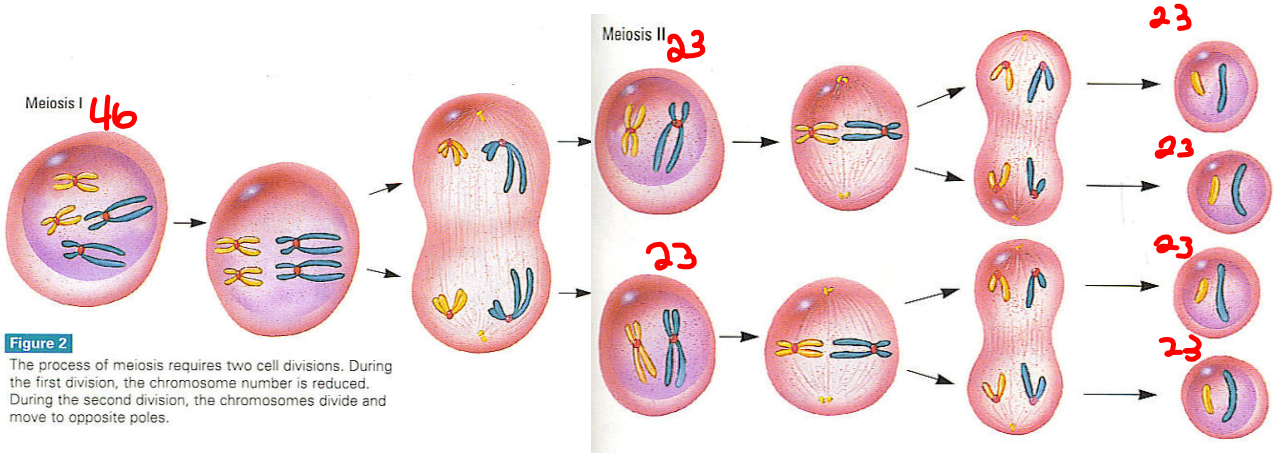


Figure 2
The process of meiosis requires two cell divisions. During the first division, the chromosome number is reduced. During the second division, the chromosomes divide and move to opposite poles.

Attachments

Genes__Genetics__and_DNA.mp4