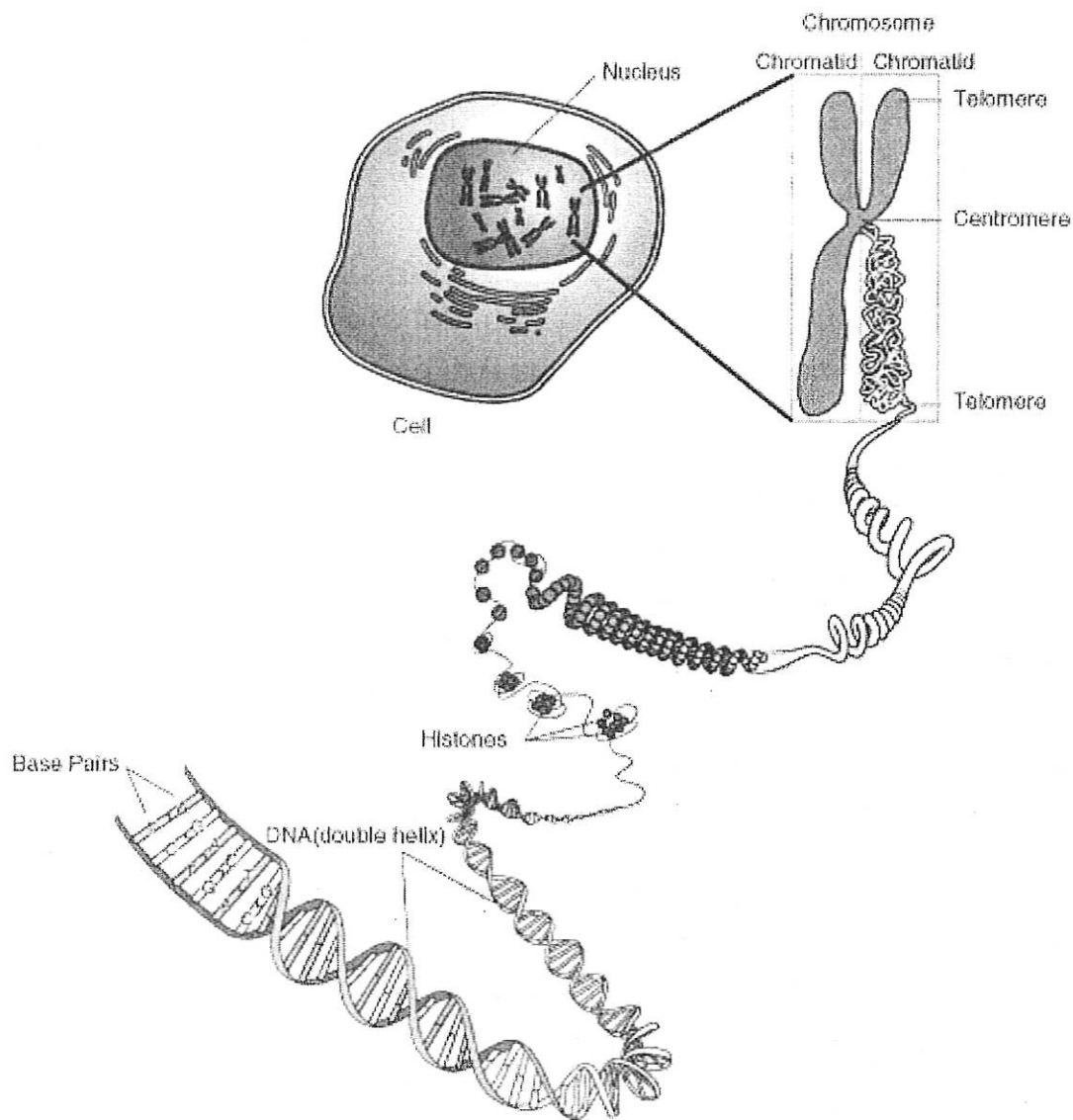


Chromosomes and Genes

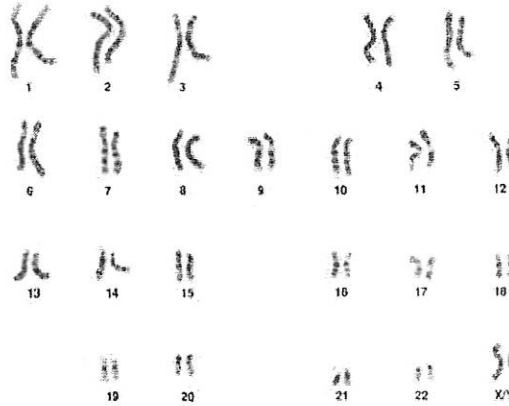
- Chromosomes are found in the nucleus
- Genes are made of DNA sequences in specific locations on the chromosomes
- Genes code for specific traits and exist in pairs.
- Traits may be dominant, recessive or blended.
- Many traits are determined by several pairs of genes.



Human Chromosomes

- Humans have 23 pairs of chromosomes (46 total)
- 22 pairs of **autosomes**
- 1 pair of **sex** chromosomes

Karyotype – A picture of all the chromosomes in a somatic cell arranged by size



Chromosome Facts:

- If all the DNA in a single human cell was unwound and placed end to end, it would stretch 6 feet. The DNA molecules are wound up like thread around a spool in order to fit inside the nucleus.
- Chromosomes vary in number and shape among living things. Most bacteria have one or two circular chromosomes. Humans, and other animals and plants, have chromosomes that are arranged in pairs within the nucleus of the cell.
- The only human cells that do not contain pairs of chromosomes are reproductive cells, which carry just one copy of each chromosome. When two reproductive cells unite, they become a single cell that contains two copies of each chromosome. This cell then divides many times, eventually producing a mature individual with a full set of paired chromosomes in all of its cells.
- In humans, each cell normally contains 23 pairs of chromosomes, for a total of 46. Twenty-two of these pairs, called autosomes, look the same in both males and females. The 23rd pair, the sex chromosomes, differ between males and females. Females have two copies of the X chromosome, while males have one X and one Y chromosome.
- Identifying genes on each chromosome is an active area of genetic research. Because researchers use different approaches to predict the number of genes on each chromosome, the estimated number of genes varies. Chromosome 1 likely contains 2,000 to 2,100 genes that provide instructions for making proteins. These proteins perform a variety of different roles in the body.
- There are an estimated 20,000 to 25,000 total genes in the human genome.