

DNA EXISTS IN CHROMOSOMES, WHICH CONTAIN THOUSANDS OF GENES.

- During interphase, DNA exists as condensed fibres called **chromatin**
- During mitosis, DNA is found in a very condensed form called **chromosomes**.

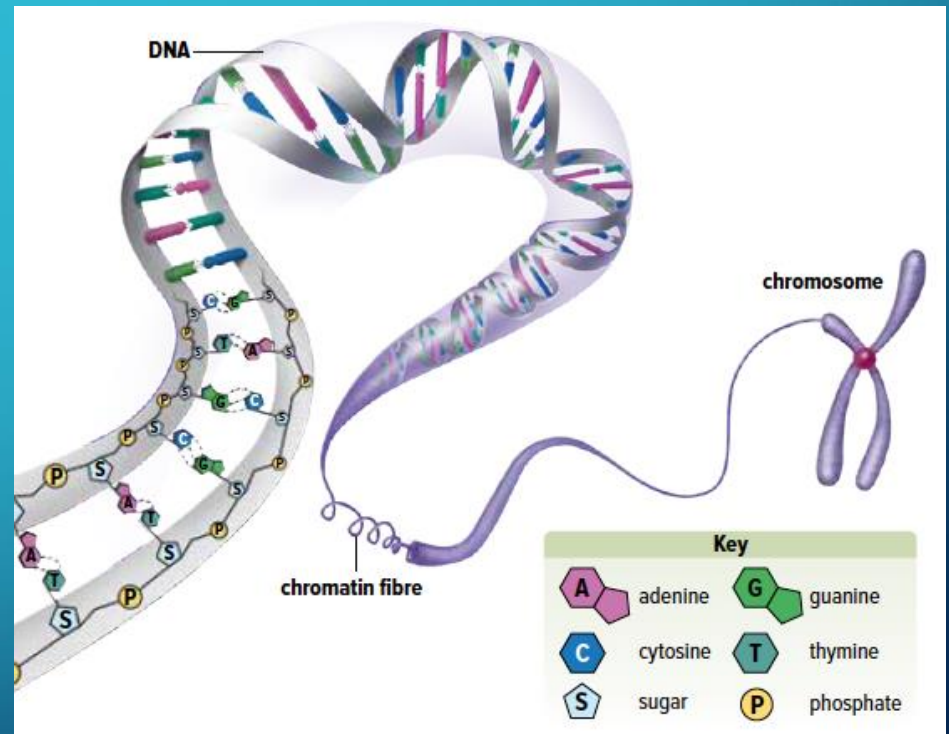


Figure 1.4: DNA is part of chromatin fibre, which condenses to form chromosomes.

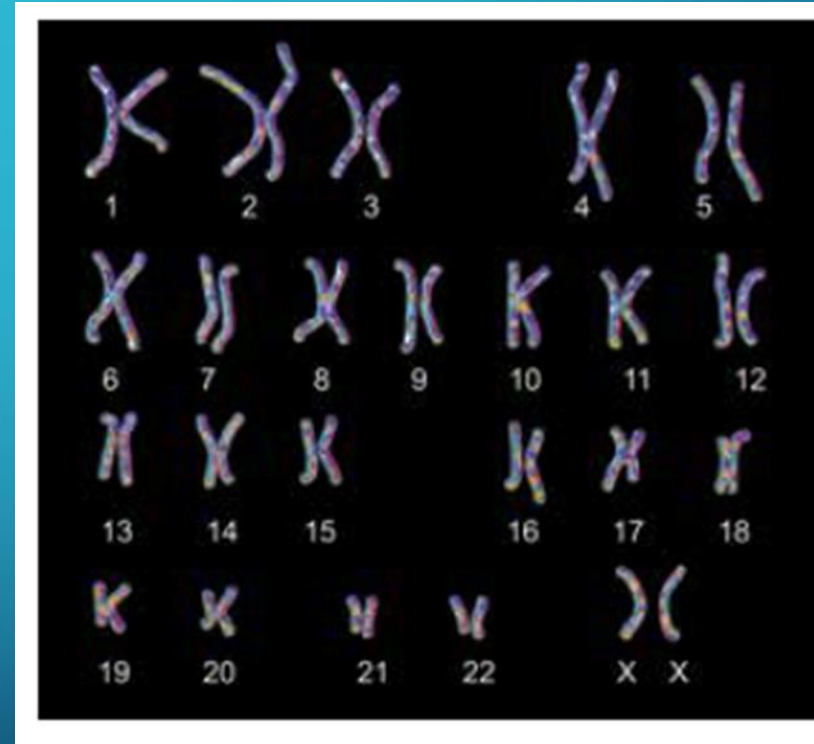
CHROMOSOME NUMBER

- Each species has a particular # of chromosomes in its cells.
 - Gold Fish = 94
 - Fruit Flies = 8
 - Banana = 22



CHROMOSOMES ARE PAIRED

- There are 46 chromosomes in human somatic cells.
- Half the chromosomes come from the biological father and the other half are from the biological mother.
- Chromosomes are organized into 23 pairs:
 - One pair consists of the sex chromosomes (X and Y chromosomes).
 - The other 22 pairs are called *autosomes*.



HOMOLOGOUS CHROMOSOMES

- Chromosomes that are paired are called *homologous chromosomes*
- During fertilization, each parent contributes one chromosome of each pair
- Homologous chromosomes :a chromosome that contains the same sequence of genes as another chromosome
- Homologous chromosomes are not identical to each other.

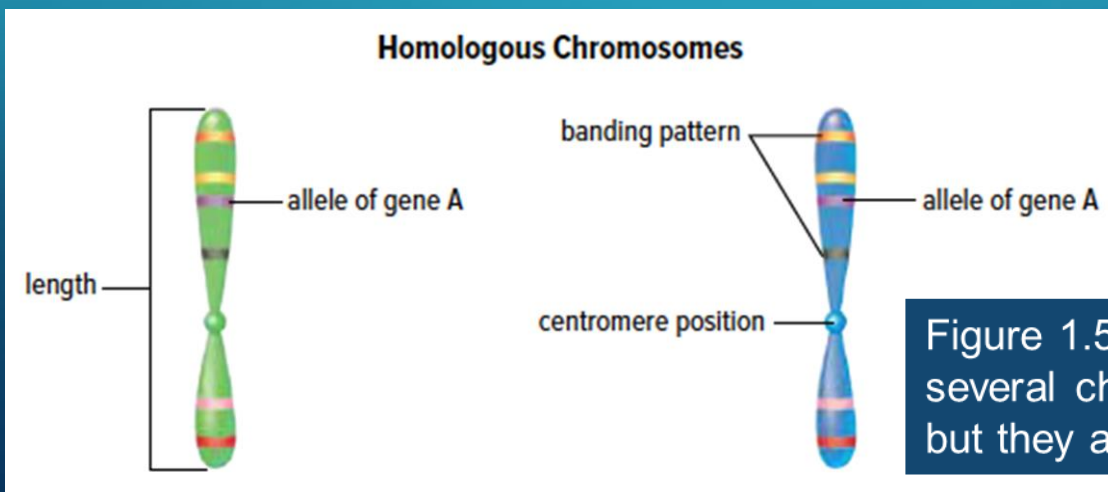
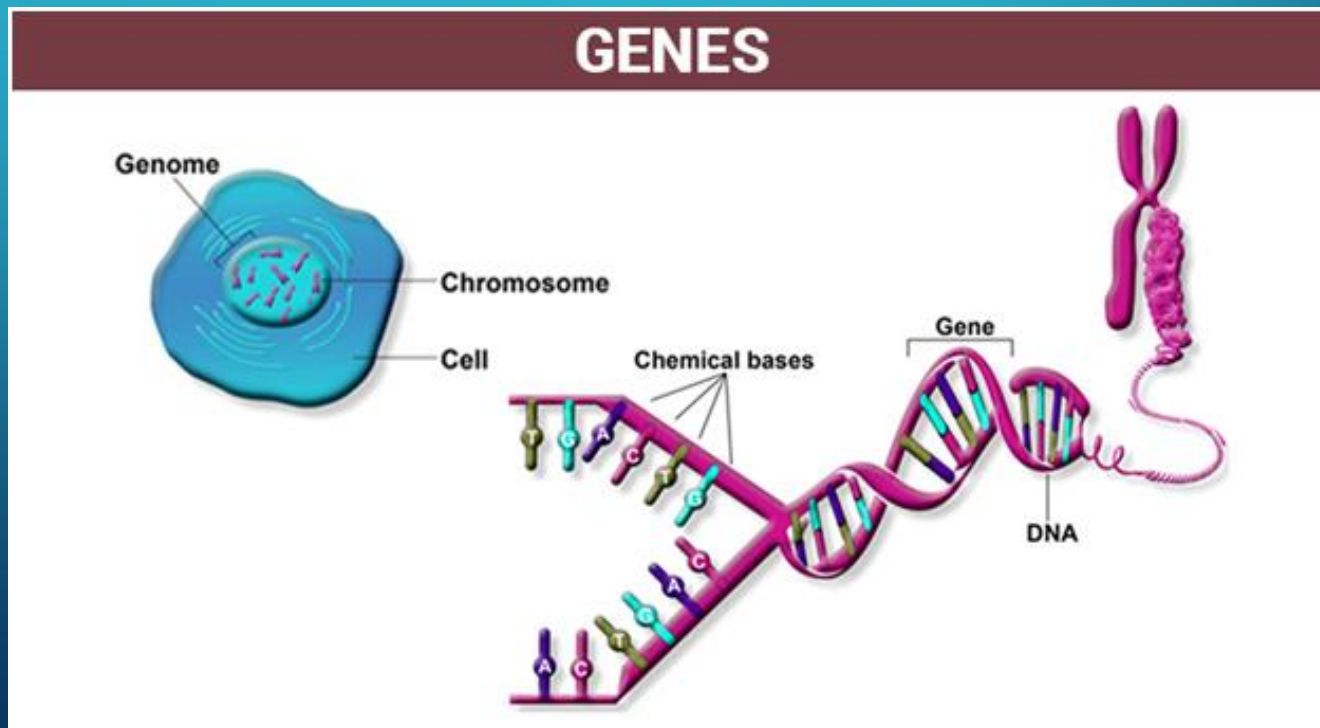


Figure 1.5: Homologous chromosomes have several characteristics in common, but they are not identical.











GENES

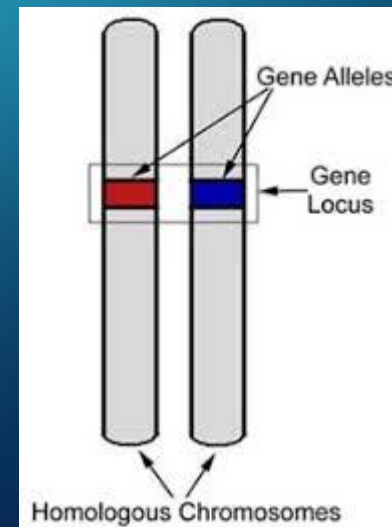
- **Gene:** Short section of DNA that “codes” for a specific protein (instructions for making it).
 - governs the expression of a trait and is passed on to offspring
 - Eye colour, hair colour etc.



VERSIONS OF A GENE

- **Alleles:** different forms of the same gene
 - *Eg. A homologous chromosome will have two different alleles for the same gene*

Gene	Alternative Alleles			
 Eye colour	 Brown	 Blue	 Emerald	 Grey
 Hair colour	 Blonde	 Red	 Brown	 Black



DISCUSSION QUESTIONS

1. Describe the relationships among chromatin, a chromosome, DNA, and a gene.

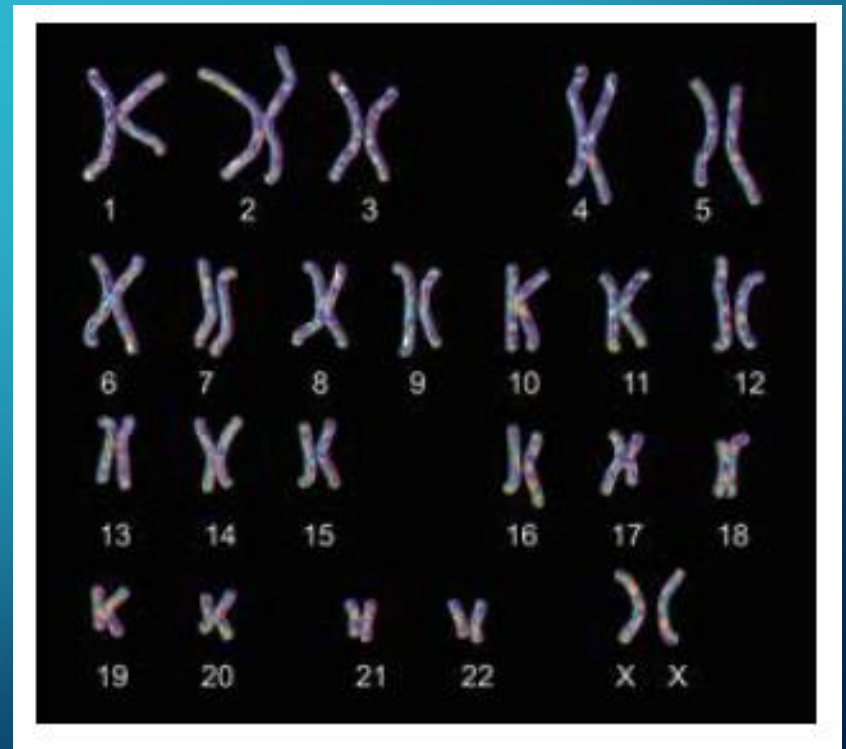
EXAMINING CHROMOSOMES: THE KARYOTYPE

Karyotype: a photograph of pairs of homologous chromosomes in a cell

Biological Female: Two X's

Biological Male: One X, One Y

Figure 1.6: This is a human karyotype. The chromosome pairs are arranged and numbered in order of their length, from longest to shortest. The sex chromosomes are placed last.



KARYOTYPE CUT & PASTE

- Groups of 2
- Need
 - 1 booklet per group
 - 1 “normal karyotype”
 - 1 Abnormal karyotype
 - Set A or B or C etc
- Before handing in, you must research what genetic disorder your person has. With your partner at the bottom of your worksheet write a few sentences describing the genetic disorder.

