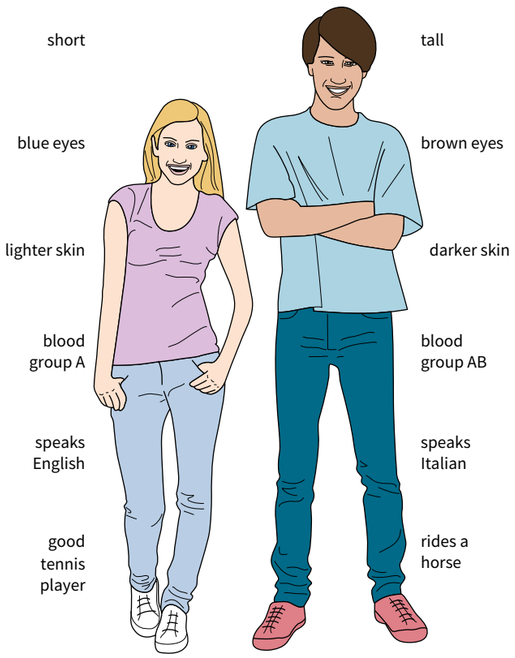
B2 Chapter 4: Inheritance

Knowledge organiser

Variation

Variation is the difference in characteristics of individuals of the same species. Variation can be:

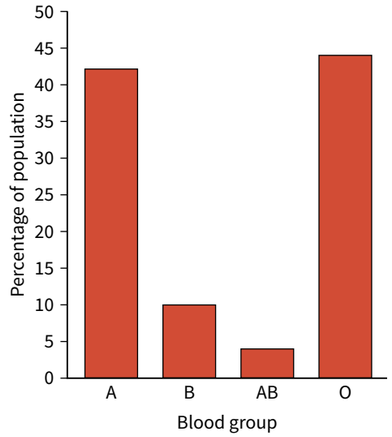
- **Inherited** – passed on from parents to offspring by genes e.g., eye colour.
- **Environmental** – caused by the surroundings and what has happened to you in your life e.g., getting a tattoo.



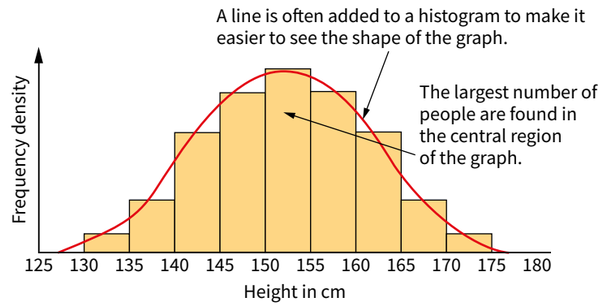
Many characteristics are affected by both inherited and environmental variation. For example, somebody may inherit the characteristic to be tall from a biological parent, but if they eat a poor diet their rate of growth may be reduced.

Displaying data

- **Discontinuous variation** – Fixed number of values e.g., Blood group. Display data in tables, pie charts, and bar charts.



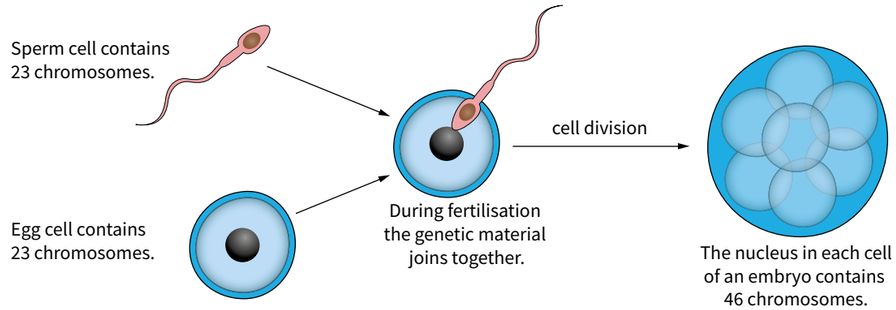
- **Continuous variation** – Any value within a range e.g., height. Display data in tables, scatter graphs, histograms, and bar charts.



How are genes inherited?

DNA (deoxyribonucleic acid) is genetic material stored in the **nucleus** of your cells. The structure of DNA was discovered by Crick, Watson, and Wilkins, who won the Nobel Prize for medicine in 1962. Their discovery was underpinned by the X-ray images from Rosalind Franklin.

The DNA is organised into **chromosomes**; different species have different numbers of chromosomes. Each section of a chromosome is called a gene.



What causes species to change?

Natural selection is when individuals that are best adapted survive and have offspring of their own and pass on the successful genes. This causes a gradual change in a species over millions of years and is called evolution. Fossils give evidence to this theory.

If all the organisms in a species die before reproducing the species will become **extinct**.
This can happen due to:

- changes to the organisms' environment
- destruction of habitat
- outbreak of a new disease
- introduction of new predators and competitors.

Key words

Make sure you learn the definitions for these key terms:

adaptation ***biodiversity*** ***chromosome*** ***continuous variation*** ***discontinuous variation*** DNA ***endangered*** ***environmental variation*** ***extinct*** ***fossil*** ***gene*** ***gene bank*** ***inherited variation*** ***evolution*** ***natural selection*** ***nucleus*** ***species*** ***variation.***