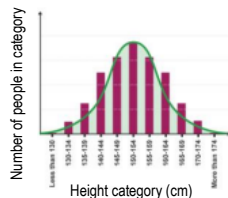


Keyword	Definition
<b>Nucleus</b>	Controls what happens inside the cell. Chromosomes are structures found in the nucleus of most cells
<b>DNA</b>	Deoxyribonucleic Acid. The material inside the nucleus of cells, carrying the genetic information of a living being
<b>Double Helix</b>	The shape of the DNA molecule with two strands twisted together in a spiral
<b>Base Pair</b>	The pair of nitrogenous bases that connects the complementary strands of DNA
<b>Bond</b>	The chemical link that holds molecules together
<b>Gene</b>	The basic unit of genetic material inherited from our parents. A gene is a section of DNA which controls part of a cell's chemistry
<b>Heredity</b>	Genetic information that determines an organism's characteristics, passed on from one generation to another. To do with passing genes to an offspring from its parent or parents
<b>Variation</b>	Difference between individuals
<b>Continuous Variation</b>	Variation that shows a wide range of intermediate values between two extremes. They can be measured e.g. hand span
<b>Discontinuous Variation</b>	Differences between individuals in a characteristic that can only be put into different categories e.g. eye colour
<b>Environmental Variation</b>	Differences between individuals of a species due to factors in their surroundings

**Continuous Variation**

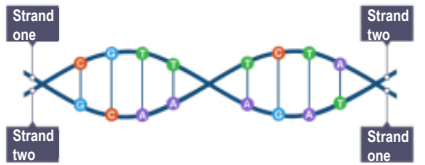
Human height is an example. It ranges from the smallest person on Earth to the tallest. Continuous variation shows characteristics that change gradually over time.



**DNA**

DNA is found in the nuclei of cells and organized into chromosomes. This genetic information is passed from one generation to the next. It is called heredity and why we resemble our parents. The genetic information itself is contained in a complex molecule called DNA.

DNA molecules contain two strands. The strands are twisted around each other to form a double helix. These strands are held together by bonds between base pairs.



A DNA molecule showing its base pairs, G-C and A-T

**Chromosomes and Genes**

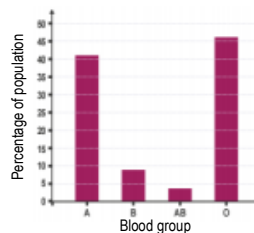
DNA molecules are so long and thin, it is coiled into structures called chromosomes. The chromosomes are found in the nucleus of each cell.

Human body cells each contain 23 pairs of chromosomes, half of which are from each parent. Human gametes (eggs and sperm) each contain 23 chromosomes. When an egg is fertilized by a sperm, it becomes a cell with 23 pairs of chromosomes. This is why children resemble both their parents – half of their chromosomes and DNA come from their mother, and half from their father.

A gene is a section of DNA that is responsible for characteristics such as eye colour. Humans have around 20,000 genes. One copy of all your chromosomes is called your genome.

**Discontinuous Variation**

A characteristic of any species with only a limited number of possible values. Eye colour and blood group are examples.



**Further Reading:**

- <https://www.bbc.co.uk/bitesize/guides/zw9jq6f/revision/1>
- <https://www.bbc.co.uk/bitesize/guides/zn7thyc/revision/1>
- <https://www.bbc.co.uk/bitesize/guides/z9gk87h/revision/1>

**Inherited Variation**

Variation in characteristics that is a result of genetic information from parents.

Examples include:

- Eye colour
- Hair colour
- Lobed or lobeless ears
- Ability to roll your tongue



**Environmental Variation**

Characteristics of animal and plant species can be affected by factors such as climate, diet, accidents, culture and lifestyle. If you eat too much food, then you will become heavier.

Variation caused by the surroundings is called environmental variation. Examples include your language and religion.



**Evolution**

Change in the inherited characteristics of a population over time through a process of natural selection, which may result in the formation of a new species.

The theory of evolution by natural selection states that all species of living things have evolved from simple life forms that first developed more than three billion years ago.

Natural selection of variants that give rise to phenotypes best suited to their environment

- Variation (mutation)
- Adaptation
- Survival & reproduction



**Extinction**

The permanent loss of all the members of species



Reasons for extinction:

- Introduction of a NEW disease
- Introduction of a NEW competitor
- Introduction of a NEW predator / overhunting
- Lack of food / prey
- Environmental change (temp, rainfall, loss of habitat etc)
- Natural disaster