Environmental Variation

Environmental causes of variation

Characteristics of animal and plant species can be affected by factors such as climate, diet, accidents, culture and lifestyle. For example, if you eat too much you will become heavier, and if you eat too little you will become lighter. A plant in the shade of a big tree will will grow taller as it tries to reach more light.

Variation caused by the surroundings is called **environmental variation**. Here are some other examples of features that show environmental variation:

- your language and religion
- flower colour in hydrangeas - these plants produce blue flowers in acidic soil and pink flowers in alkaline soil.

Classification

A **species** is a category within the classification system. Living things of the same type belong to the same species. For example, humans are one species and dogs are another species.

Individuals of the same species can reproduce to make more individuals of the same species. Two individuals belonging to different species cannot normally reproduce together. If they do, their offspring is usually infertile and unable to reproduce.

For example animals called ligers are produced when a male lion and a female tiger reproduce. But a liger cannot have offspring. This means that lions and tigers are different species.

Selective Breeding

Selective breeding to produce new varieties of a species. A variety is a type of a particular species that is different in some clear way from other varieties of that species.

EG, pedigree dogs come in lots of different varieties, called breeds.They may be different colours and sizes, but they are all still the same species.

Selective breeding of cows

Suppose you wanted a variety of cow that produced a lot of milk. This is what you could do:

- choose or select the cows in your herd that produce the most milk
- let only these cows reproduce
- select the offspring that produce the most milk
- let only these offspring reproduce
- keep repeating the process of selection and breeding until you achieve your goal.

Other examples of selective breeding:

- hens that lay big eggs
- cattle that produce lots of meat
- crops that are resistant to certain plant diseases.

The 5 Kingdoms

Kingdom	Examples
Protoctists	• Amoeba • Paramecium
Prokaryotes	• Bacteria • Blue-green algae
Fungi	• Moulds • Mushrooms • Yeast

& animals and plants

Adaptation

DNA

DNA is the complex chemical that carries genetic information. DNA is contained in chromosomes, which are found in the nucleus of most cells.

The gene is the unit of inheritance and different forms of the same gene are called alleles.Chromosomes are X-shaped objects found in the *nucleus* of most cells. They consist of long strands of a substance called deoxyribonucleic acid, or DNA for short.

Inheritance

Variation in a characteristic that is a result of genetic inheritance from the parents is called **inherited variation**.

Children usually look a little like their father, and a little like their mother, but they will not be identical to either of their parents. This is because they get half of their inherited features from each parent.

Each egg cell and each sperm cell contains half of the **genetic information** needed for an individual. When these join at fertilisation a new cell is formed with all the genetic information needed for an individual.

Here are some examples of inherited variation in humans:

- eye colour
- hair colour
- skin colour
- lobed or lobeless ears.

Natural Selection & Evolution

Within a population of animals, plants or any living organisms, there will be **inherited variations**. Within each species the individuals with the variations best suited to the environment will survive better than the others.

More of them will survive to reproduce than the others. When they do, they pass on the genetic information for these variations to their offspring. Species gradually evolve in this way. This process is called **natural selection**.

Over time a population can change so much it may even become a new species, unable to reproduce successfully with individuals of the original species.

A species becomes extinct when there are no more individuals of that species left. An extinct species has gone forever.

Here are some of the things that can cause a species to become extinct:

- a new disease
- a new predator
- a change in the physical environment, such as a change in the long-term temperature or rainfall patterns
- competition from another species that is better adapted, including competition from humans

Natural Selection & Evolution	Adaptation	DNA	Inheritance
Extinction	Selective Breeding	Classification	Variation