

1. Variation

Humans, dogs and goldfish are examples of **species**. Different species have very different **characteristics** from each other.

The individual members of a species also have differences in **characteristics**. For example, humans have different coloured eyes. The differences in **characteristics** between individuals of the same species is called **variation**.

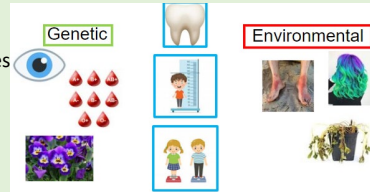


4. Genetic and Environmental Variation

Some variation is passed on from parents to offspring, via **genes**, during reproduction. This is **genetic** variation and examples include eye colour, sex and ability to roll your tongue.

Some variation is the result of differences in the surroundings, or what an individual does such as lifestyle, culture and climate you live in. This is called **environmental** variation and examples include your language and religion.

Some variation is caused by a mixture of both genes and environmental factors and examples include your weight and height.



6. Extinction

Changes in the environment may leave individuals less well adapted to compete successfully for resources such as food, water and mates. Sometimes an entire species may become unable to compete successfully and reproduce. These problems can lead to **extinction**.

Extinction is the loss of an entire species.

Causes of extinction:

1. new disease
2. new predator
3. climate change
4. competition

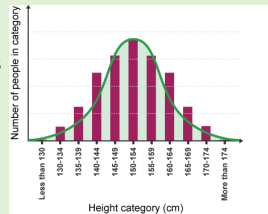
Examples of animals who have gone extinct: the dodo, dinosaurs and the West African Black Rhinoceros.



2. Continuous Variation

Human height is an example of continuous variation. It ranges from that of the shortest person in the world to that of the tallest person. Any height is possible between these values. So it is continuous variation.

Examples of such characteristics are height and weight. This bell-shape of graph is typical of a feature with continuous variation.



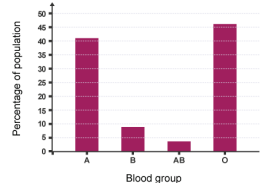
KS3 Science Evolution

3. Discontinuous Variation

A characteristic of any species with only a limited number of possible values shows **discontinuous variation**. Human blood group is an example of discontinuous variation. In the ABO blood group system, only four blood groups are possible (A, B, AB or O). There are no values in between, so this is discontinuous variation.

Here are some examples blood group, sex (male or female) and eye colour.

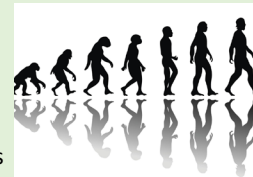
A bar chart can be used to represent discontinuous data.



5. Evolution

If all the individuals of a species were genetically identical they would be vulnerable to the same diseases. If this were the case a single disease could wipe out an entire species! As a result of their genes, some individuals of a species might have better camouflage, or be able to run faster. These individuals are more likely to survive. This is called the **survival of the fittest**.

The members of a species that survive may reproduce. Their offspring are likely to have the desirable characteristics of their parents. This process is known as **evolution**.



8. Conservation Measures

Some species in Britain are endangered, including the skylark, red squirrel and grass snake. They could be helped by conservation measures such as:

- education programmes
- captive breeding programmes
- legal protection and protection of their habitats
- making artificial ecosystems for them to live in.

Plant species can also be endangered. Seed banks are a conservation measure for plants. Seeds are carefully stored so that new plants may be grown in the future.

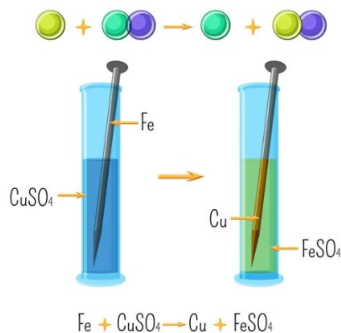


1. Displacement reactions

Displacement reactions are used to help establish the order of reactivity for metals.

In these reactions a more reactive metal replaces a less reactive metal to form a salt.

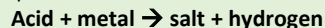
Colour changes are a good indicator of displacement.



4. Acid and Metal Reactions

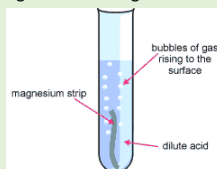
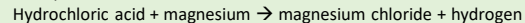
Acid and metal reactions are used to determine a metal's reactivity.

The general equation for this is:



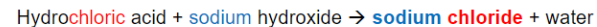
Bubbles of hydrogen gas are observed.

Example



6. Naming Salts

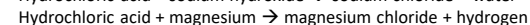
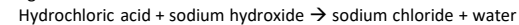
Salts are produced during reactions with metals.



acid alkali salt

Acid	Salt Produced
Hydrochloric acid	Chloride
Sulfuric acid	Sulfate
Nitric acid	Nitrate

Eg.



2. The Reactivity Series

The reactivity series is the order of metals based on their reactivity. We can use this to predict what is made in a reaction. Carbon and hydrogen are included as carbon is sometimes used to extract metals from their ores.

Potassium	most reactive ↑ ↓ least reactive
Sodium	
Calcium	
Magnesium	
Aluminium	
Carbon	
Zinc	
Iron	
Tin	
Lead	
Hydrogen	
Copper	
Silver	
Gold	
Platinum	

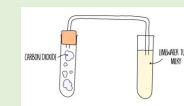


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Metals and Reactivity

7. Tests for Carbon Dioxide and Hydrogen

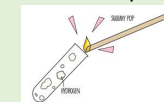
CO₂ – Carbon Dioxide

1. Lit splint is extinguished (goes out) in the presence of CO₂ gas.
2. lime water turns from colourless to cloudy.



H₂ – Hydrogen

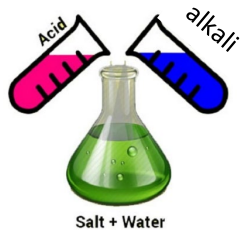
Squeaky pop test - a lit splint, in the presence of hydrogen makes a squeak pop sound.



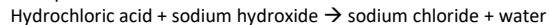
3. Acid and Alkali Reactions

An acid and an alkali can be reacted together in a neutralisation reaction. This produces salt and water.

The general equation for this is:
Acid + alkali → salt + water



Example:



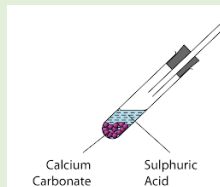
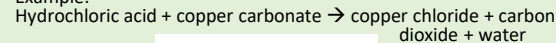
5. Acid and Metal Carbonate Reactions

The general equation for these reactions:



Bubbles of carbon dioxide gas are observed.

Example:



8. Group 1 Metals

In group 1 metals the reactivity increases down the group.

Element	Observations
Lithium, Li	Fizzes steadily, slowly becomes smaller until it disappears
Sodium, Na	Melts to form a ball, fizzes rapidly, quickly becomes smaller until it disappears
Potassium, K	Quickly melts to form a ball, burns violently with sparks and a lilac flame, disappears rapidly, often with a small explosion