

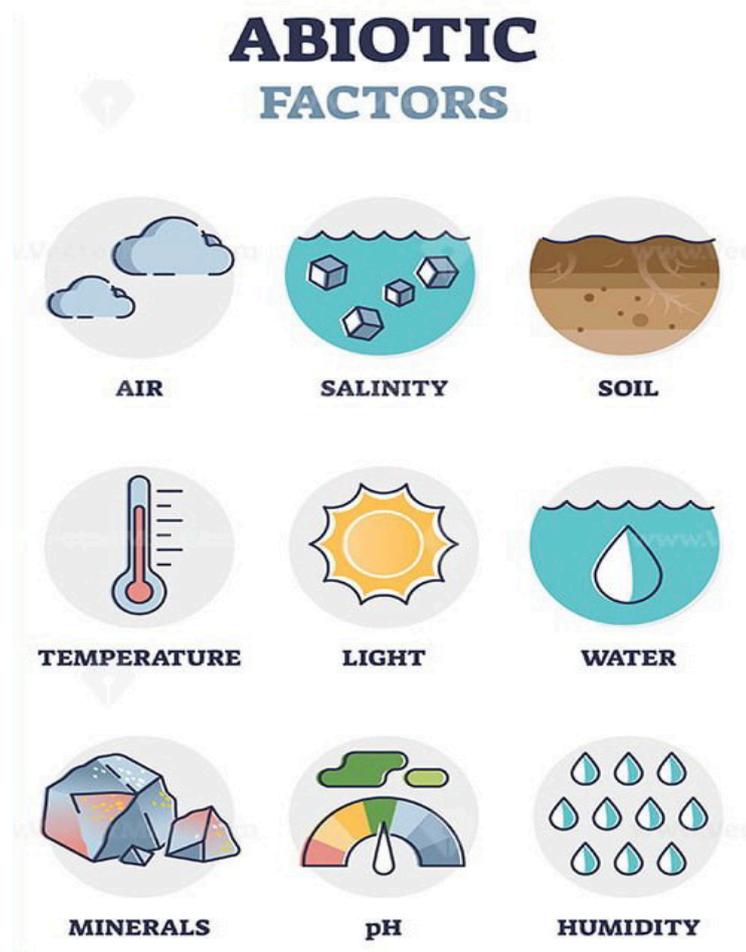
Abiotic and Biotic Factors

Abiotic Factors

- ▶ **Abiotic factors** are **non-living** factors that can interact with the **community** and affect the **ecosystem**.
- ▶ Factors include:
 1. **Light intensity** – Increasing light intensity will increase the **rate of photosynthesis** in plants.
 2. **Temperature** – Animals and plants grow the best at their **optimum temperatures**.
 3. **Moisture/ water** levels – Plants and animals require the correct amount of **water**.
 4. **pH** of the **soil** – Different plants will grow best in different **soil acidities**.
 5. **Soil mineral** levels – Plants require lots of **minerals** to grow healthily.
 6. **Direction** and **intensity** of the **wind** – Wind speed can affect **transpiration** and **photosynthesis** rates in plants. Organisms may also move to find **shelter** from the wind.
 7. Levels of **carbon dioxide** – Plants need lots of **carbon dioxide** for **photosynthesis**.
 8. Levels of **oxygen** – Some **aquatic** animals can only survive if there is lots of **oxygen** dissolved in the water.
- ▶ A change in an **abiotic factor** can affect the whole **community**.

Examples:

1. If the **soil water** and minerals content is too low, **plants** will struggle to **grow and lead to nutrient deficiencies** and animals who feed on the plants will be without **food**. This may cause them to **migrate**, use other **food sources** or in some cases cause **death**. This will have **knock-on effects** on the rest of the **food chain**.
2. A decrease in light intensity temperature or level of CO₂ could decrease which lead to decrease in rate of photosynthesis

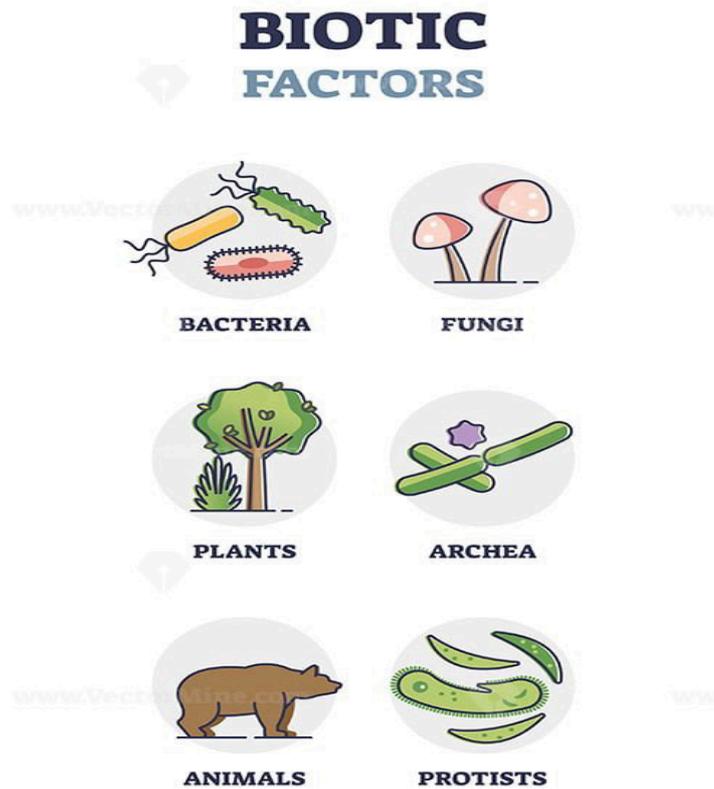


Biotic Factors

- **Biotic factors** are **living** factors that can influence an **ecosystem**.
- Factors include:
 1. **Availability of food** – Organisms require food to **survive** and **reproduce**. Populations thrive when there is lots of food available.
 2. Introduction of **new predators** – In **balanced** communities, there is enough **prey** for the **predators** to feed on, without wiping out a whole prey population. If **new predators** arrive this balance can be shifted and there may not be enough prey to go around.
 3. Introduction of **new pathogens** – Populations will have no **immunity** or **resistance** to new **diseases** which can lead to **increased deaths** until resistance **evolves**.
 4. **Competition** – Different organisms **compete** for the same **resources**. If some organisms are better at acquiring the shared resource than others, they will **out compete** the less **adapted** organism until there is no longer enough of

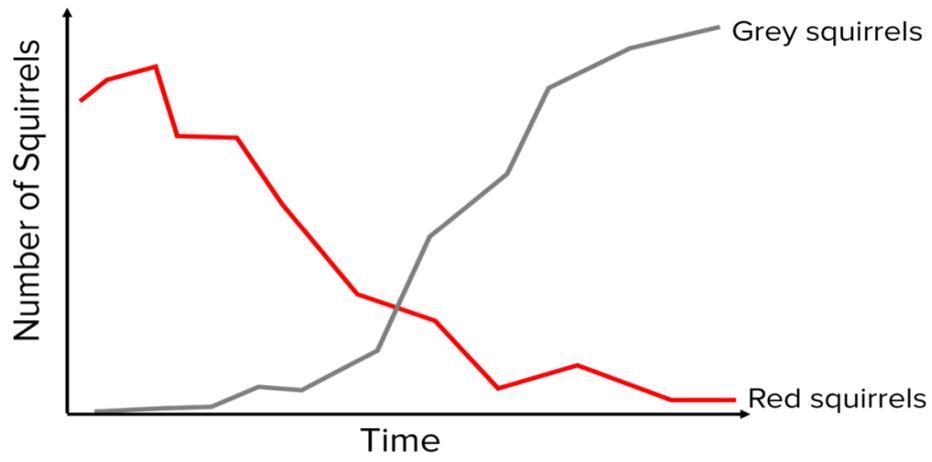
them left to breed. Animals often compete for **food**, **water**, **mates** and **territory**. Plants often compete for **light**, **space**, **water** and **mineral ions**.

- ▶ A change in one **biotic factor** can affect the whole **community**.



Example:

Grey squirrels were introduced into the UK in the late 1800s. They have since **outcompeted** the native **red squirrels** for food and other resources. As the number of **grey squirrels increased**, the number of **red squirrels decreased**, as seen in the graph



Difference between Biotic and Abiotic factors

BIOTIC	VERSUS	ABIOTIC
Biotic refers to the living elements in an ecosystem		Abiotic refers to the non-living, physical elements in an ecosystem
Biotic elements depend on the abiotic elements for the survival		Abiotic elements do not depend on biotic elements within an ecosystem
Measurement is subjective		Measurement is objective
Affect the individual of a species, community, population, biosphere, and the biome		Affect the individual of a species, community, population, and biosphere
Living things directly or indirectly affect the other living things in the ecosystem		Abiotic elements determine the number of organisms, which are capable of existing in the environment
Have the ability to adapt changes in the environment		Unable to adapt to changes in the environment
Components include plants, animals, and microorganisms which serve as producers, consumers, and decomposers in an ecosystem		Components include climate, parent material and soil, topography and natural disturbances
Resources include forests and their products, animals, birds, and marine resources like fish		Resources include land, water, coal, and oil
Factors include organisms which interact with other organisms in an ecosystem like predators, prey, parasites, competitors, and symbionts		Factors include water depth, sunlight, pH, turbidity, salinity, available nutrients, and dissolved oxygen

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