Your notes

GCSE Biology: revision notes

Ecosystems, adaptations and interdependence

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Communities and competition

- An **ecosystem** is the interaction of a **community** of living organisms (biotic parts) with the non-living (abiotic) parts of their environment.
- Plants compete with each other for light, space, water and mineral ions from the soil.
- Animals compete with each other for food, mates and territory.
- Species depend on each other for food, shelter, pollination and seed dispersal. This is **interdependence**: removing one species can affect the whole **community**.
- In a stable **community**, all the species and environmental factors are in balance, so **population** sizes stay fairly constant.

Abiotic and biotic factors

- Abiotic (non-living) factors: light intensity, temperature, moisture levels, soil pH and mineral content, wind intensity and direction, carbon dioxide levels for plants, and oxygen levels for aquatic animals.
- Biotic (living) factors: availability of food, new **predators** arriving, new pathogens, and one species outcompeting another.

Adaptations

- Structural **adaptations** are features of the body, such as thick fur or a large surface area.
- Behavioural **adaptations** are ways of behaving, such as migrating or hibernating.
- Functional **adaptations** are processes inside the body, such as making concentrated urine or antifreeze proteins.

- **Extremophiles** live in extreme environments with high temperature, pressure or salt concentration, such as bacteria living in deep-sea vents.

Feeding relationships

- Food chains start with a **producer**, a photosynthetic organism such as a green plant or alga, which makes glucose and so **biomass**.
- **Producers** are eaten by primary consumers, which are eaten by secondary consumers, then tertiary consumers. Consumers that kill and eat other animals are **predators**; those eaten are prey.
- In a stable **community**, **predator** and prey numbers rise and fall in cycles: when prey increase, **predators** increase; then prey fall, and predators fall after them.

Trophic levels and biomass (separate sciences)

- **Trophic levels** are the feeding levels in a food chain; level 1 is **producers**. Decomposers break down dead material.
- Pyramids of **biomass** show the relative amount of **biomass** at each level. Only about 10% of **biomass** is transferred to the next level.
- **Biomass** is lost because not all food is eaten or absorbed (some is egested as faeces), and much is lost as waste such as carbon dioxide, water and urea, and used in respiration.
- Efficiency of transfer = (**biomass** transferred to next level ÷ **biomass** at previous level) × 100.

Key terms

Ecosystem	A community of organisms interacting with the non-living parts of their environment.
Community	All the populations of different species living in a habitat.
Population	All the organisms of one species living in a habitat.
Interdependence	The way species in a community depend on each other.
Abiotic factor	A non-living factor, such as temperature or light, that affects organisms.
Biotic factor	A living factor, such as predators or disease, that affects organisms.
Adaptation	A feature that helps an organism survive in its environment.
Extremophile	An organism that lives in extreme conditions, such as high temperature or salt.
Producer	An organism, usually a plant or alga, that makes its own food by photosynthesis.
Predator	An animal that kills and eats other animals.
Trophic level	A feeding level in a food chain.

Your notes

Biomass	The mass of living material.

Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

1. What do plants compete for?
2. Which of these is an abiotic factor?
3. Which of these is a biotic factor?
4. What is interdependence?
5. What is at the start of every food chain?
6. Which type of adaptation is hibernation?
7. What is an extremophile?
8. In a predator-prey cycle, what happens after the prey population rises?

Answers

1. Light, space, water and mineral ions
2. Temperature
3. A new pathogen
4. Species in a community depending on each other
5. A producer
6. Behavioural
7. An organism that lives in extreme conditions
8. The predator population rises

What to do next

Practise 12 questions on this topic

Try 7 exam questions, with mark schemes

Read the lesson, one step at a time

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