Edexcel Biology GCSE

Topics 9.1 to 9.8B - Ecosystems

Flashcards

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Outline the levels of organisation in an ecosystem

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Outline the levels of organisation in an ecosystem

- Individual
- Population
- Community
- Ecosystem

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Define population

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Define population

All organisms of the same species living with one another in a habitat

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Define community

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Define community

All of the populations of different species living together in a habitat

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Define ecosystem

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Define ecosystem

The community of organisms and non-living components of an area and their interactions

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Organisms within a community are described as being ‘interdependent’. What does this mean?

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Organisms within a community are described as being ‘interdependent’. What does this mean?

- Organisms are dependent upon each other.
- A change in the population of one species can affect other populations within a community

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Give some examples of interdependence in a community

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Give some examples of interdependence in a community

- Plants depend on pollinators e.g. bees
- Herbivores are dependent on plants
- Animals are dependent on mates

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Describe mutualism

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Describe mutualism

The interaction between two organisms where both benefit as a result of their relationship

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Describe parasitism

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Describe parasitism

The interaction between two organisms where only one organism, the parasite, benefits whilst the host does not

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What are abiotic factors? Give some examples.

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What are abiotic factors? Give some examples.

The non-living aspects of an ecosystem

e.g. temperature, water availability, light intensity, pollutants

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Describe how communities are affected by environmental conditions

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Describe how communities are affected by environmental conditions

- Environmental conditions (e.g. temperature, light intensity, water availability) affect the abundance and distribution of organisms within communities

- e.g light intensity affects the rate of photosynthesis in producers which serve as a source of food and shelter for other organisms

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Describe how communities are affected by pollutants

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Describe how communities are affected by pollutants

- Toxic chemicals (e.g. pesticides) bioaccumulate in food chains to deadly concentrations at higher trophic levels, killing tertiary and quaternary consumers
- Fertilisers that contaminate water sources can cause eutrophication, killing multiple populations within a community
- Air pollution can affect the ability of some plant species to survive

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What are biotic factors? Give some examples.

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What are biotic factors? Give some examples.

The living components of an ecosystem

e.g. competition, predation

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Describe how competition affects communities

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Describe how competition affects communities

- The presence of competitors affects population distribution and size
- If one species is better adapted to survive in a certain environment, it will outcompete other species, causing their populations to decline

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Describe how predation affects communities

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Describe how predation affects communities

- Predation affects prey populations within a community
- e.g. if the number of predators decreases, the number of prey will increase as fewer are killed
- Populations of all other organisms within the food chain will also be affected

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What piece of apparatus is used to measure the abundance and distribution of organisms in an area?

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What piece of apparatus is used to measure the abundance and distribution of organisms in an area?

Quadrat

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What piece of apparatus is used to study the distribution of organisms across a gradient?

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What piece of apparatus is used to study the distribution of organisms across a gradient?

Belt transect

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What does a food chain show?

(biology only)

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What does a food chain show? (biology only)

It describes the feeding relationships between organisms and the resultant stages of biomass transfer.

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Define biomass (biology only)

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Define biomass (biology only)

The total mass of living material

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What are trophic levels? (biology only)

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What are trophic levels? (biology only)

The stages in a food chain

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What do arrows in a food chain represent? (biology only)

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What do arrows in a food chain represent? (biology only)

The direction of biomass transfer

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Describe a simple food chain

(biology only)

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Describe a simple food chain (biology only)

producer → primary consumer → secondary consumer → tertiary consumer

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Why are producers the first trophic level?

(biology only)

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Why are producers the first trophic level? (biology only)

- Producers provide all biomass for the food chain (via photosynthesis)
- The rest of the food chain involves the transfer of this biomass

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What does a pyramid of biomass represent? (biology only)

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What does a pyramid of biomass represent? (biology only)

It represents the dry mass of living material at each trophic level of a food chain.

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Why is a pyramid of biomass almost always pyramid-shaped? (biology only)

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Why is a pyramid of biomass almost always pyramid-shaped? (biology only)

- Producers (at the bottom of the pyramid) have the greatest biomass so have the longest bar
- As you move along the food chain (and up the pyramid) biomass is lost so the bars decrease in length

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Why is biomass lost between each trophic level in a food chain? (biology only)

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Why is biomass lost between each trophic level in a food chain? (biology only)

- Glucose is immediately used for respiration in plants
- Respiration to generate heat energy, energy for movement etc.
- Some parts of organisms are indigestible
- Egestion, excretion

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Why are there rarely more than four or five trophic levels in a food chain? (biology only)

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Why are there rarely more than four or five trophic levels in a food chain? (biology only)

Above this, there is insufficient energy to support another breeding population.

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What is the equation for calculating the efficiency of biomass transfer between trophic levels? (biology only)

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What is the equation for calculating the efficiency of biomass transfer between trophic levels?
(biology only)

$$\text{Efficiency} = \frac{\text{Biomass available after transfer}}{\text{Biomass available before transfer}} \times 100$$

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