

# Edexcel Biology GCSE

Topics 9.1 to 9.8B - Ecosystems

Flashcards



# Outline the levels of organisation in an ecosystem



# Outline the levels of organisation in an ecosystem

- Individual
- Population
- Community
- Ecosystem



# Define population



## Define population

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



# Define community



## Define community

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



# Define ecosystem





## Define ecosystem

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



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



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



Give some examples of interdependence  
in a community



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



# Describe mutualism



## Describe mutualism

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



# Describe parasitism





## Describe parasitism

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



What are abiotic factors?  
Give some examples.



What are abiotic factors? Give some examples.

The non-living aspects of an ecosystem  
e.g. temperature, water availability, light  
intensity, pollutants



Describe how communities are affected  
by environmental conditions



# 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



Describe how communities are affected  
by pollutants



# 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



What are biotic factors?  
Give some examples.





What are biotic factors? Give some examples.

The living components of an ecosystem

e.g. competition, predation



Describe how competition affects communities



# 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



# Describe how predation affects communities



## 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



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



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

Quadrat



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





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

Belt transect



# What does a food chain show? (biology only)



What does a food chain show? (biology only)

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



Define biomass (biology only)



Define biomass (**biology only**)

The total mass of living material



What are trophic levels? (biology only)



What are trophic levels? (biology only)

The stages in a food chain



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





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

The direction of biomass transfer



Describe a simple food chain  
(biology only)



Describe a simple food chain (biology only)

producer → primary consumer →  
secondary consumer → tertiary consumer



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



# 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



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



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.



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





## 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



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



# 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



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



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.



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



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

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

