

# AQA Biology GCSE

## 7.2 - Organisation of an Ecosystem

### Flashcards

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# Define population



## Define population

A species that occupy the same habitat.



# Define habitat



# Define habitat

The place in which an organism lives.



# Define community



Define community

Populations of different species  
interacting.



# Define ecosystem





## Define ecosystem

The interactions between the biotic and abiotic factors in an area.

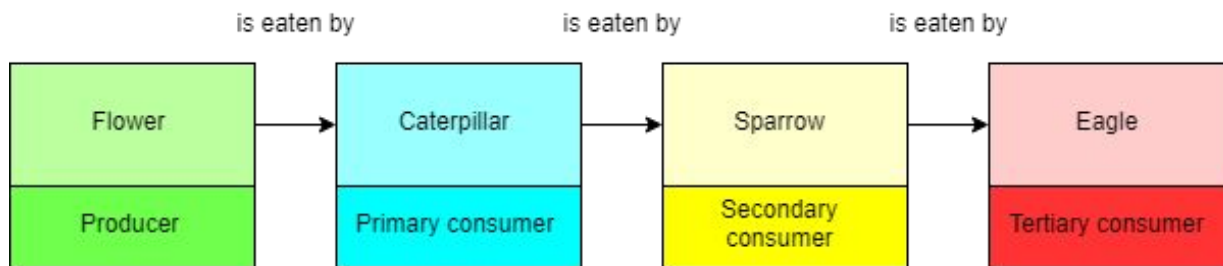


# What do food chains show?



# What do food chains show?

Food chains show the feeding relationships of different organisms and the flow of energy between the organisms.



# Define biomass



# Define biomass

The total mass of living material.



# What are trophic levels?



# What are trophic levels?

## The stages in a food chain.



What do arrows in a food chain represent?





What do arrows in a food chain represent?

The direction of biomass transfer.



# Describe a simple food chain



# Describe a simple food chain

producer → primary consumer →  
secondary consumer → tertiary consumer.



# What is a producer?



# What is a producer?

An organism that makes its own food.



What types of organisms are primary producers?



What types of organisms are primary producers?

Photosynthetic organisms like green plants and algae that trap energy from the sun.



# What is a primary consumer?





# What is a primary consumer?

An organism that feeds on producers.



# What is a secondary consumer?



# What is a secondary consumer?

An organism that feeds on primary consumers.



# What is a tertiary consumer?



# What is a tertiary consumer?

An organism that feeds on secondary consumers.



# What is a predator?



# What is a predator?

A consumer that kills and eats other animals.



# What is prey?





What is prey?

An animal that is killed and eaten by another animal.



Describe the pattern of predators and prey in a stable community



Describe the pattern of predators and prey in a stable community

The numbers of predators and prey rise and fall in cycles.



# Why are producers the first trophic level?



## Why are producers the first trophic level?

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



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



When considering the abundance of organisms, what is meant the term “mean”?



When considering the abundance of organisms, what is meant by the term “mean”?

The average number of organisms.



# How is the arithmetic mean calculated?



How is the arithmetic mean calculated?

Sum of each number of each organism/the total number of each type of organism.



When considering the abundance of different organisms, what is meant by the term “mode”?



When considering the abundance of different organisms, what is meant by the term “mode”?

The most populous organism



When considering the abundance of organisms, what is meant by the term “median”?





When considering the abundance of organisms, what is meant by the term “median”?

The organism that represents the middle value when the numbers of each organism are arranged from lowest to highest.



Describe how materials cycle through the living and non-living components of an ecosystem



# Describe how materials cycle through the living and non-living components of an ecosystem

- Organisms take in elements from their surroundings e.g. soil, air.
- Elements converted to complex molecules which become biomass.
- Elements transferred along food chains.
- Elements returned to environment during excretion and decomposition of dead organisms.



Give 3 molecules which are cycled through ecosystems



Give 3 molecules which are cycled through ecosystems

Oxygen, carbon dioxide and water.



# Describe the carbon cycle



# Describe the carbon cycle

- Plants fix carbon dioxide into organic molecules during photosynthesis.
- The organic carbon-containing molecules are passed onto organisms that eat the plants.
- Carbon dioxide is released back into the atmosphere by respiration from animals and plants.
- Burning fossil fuels also releases carbon dioxide into the atmosphere.



# Why is the carbon cycle important?





# Why is the carbon cycle important?

Carbon-containing molecules such as glucose are important for living organisms to grow and provide energy for vital functions within cells.



# Describe the water cycle



# Describe the water cycle

- Water from lakes and oceans evaporates.
- The evaporated water condenses into clouds and returns to earth as precipitation.
- The water from precipitation is useful for life on land.
- The water then returns to rivers and oceans through surface runoff.



# Why is the water cycle important?



## Why is the water cycle important?

Living organisms require water and the water cycle provides organisms on land with a continuous supply of water.



Why are microorganisms important for the cycling of materials through an ecosystem?



# Why are microorganisms important for the cycling of materials through an ecosystem?

Microorganisms (bacteria and fungi) return carbon to the environment by releasing carbon dioxide through respiration while they decompose dead matter. The decomposition of dead matter in soil returns mineral ions to the environment for other organisms to use e.g. plants use mineral ions for growth.



What is meant by decomposition?  
(biology only)





What is meant by decomposition? (biology only)

The breakdown of dead materials into simpler organic matter



# How do decomposers break down dead matter?

(biology only)



How do decomposers break down dead matter?  
(biology only)

Decomposers release enzymes which catalyse the breakdown of dead material into smaller molecules.



What are the two types of decomposition? (biology only)



What are the two types of decomposition?

(biology only)

Aerobic decomposition (with oxygen)

Anaerobic decomposition (without oxygen)



What factors affect the rate of decomposition? (biology only)



# What factors affect the rate of decomposition?

(biology only)

- Oxygen availability
- Temperature
- Water content



# Why is oxygen required for decomposition? (biology only)





Why is oxygen required for decomposition?  
(biology only)

Most decomposers require oxygen for aerobic respiration.



How does the availability of oxygen  
affect the rate of decomposition?  
(biology only)



How does the availability of oxygen affect the rate of decomposition? (biology only)

- As oxygen levels increase, the rate of decomposition increases.
- As oxygen levels decrease, the rate of decomposition decreases.



Why can decomposition still occur in the  
absence of oxygen?  
(biology only)



Why can decomposition still occur in the absence of oxygen? (biology only)

Some decomposers respire anaerobically.\*

\*However, the rate of decomposition is slower as anaerobic respiration produces less energy.



How does soil water content affect the  
rate of decomposition?  
(biology only)



# How does soil water content affect the rate of decomposition? (biology only)

Decomposers require water to survive:

- In moist conditions the rate of decomposition is high.
- In waterlogged soils there is little oxygen for respiration so the rate of decomposition decreases.



# Why does decomposition require water? (biology only)





Why does decomposition require water?  
(biology only)

Water is required for the secretion of enzymes and absorption of dissolved molecules.



# How does temperature affect the rate of decomposition?

(biology only)



# How does temperature affect the rate of decomposition? (biology only)

Decomposers release enzymes:

- Rate highest at 50°C (optimum temperature for enzymes).
- Lower temperatures, enzymes work too slowly, rate decreases.
- High temperatures, enzymes denature, decomposition stops.



How is the rate of change calculated when considering the decay of biological material? **(biology only)**



How is the rate of change calculated when considering the decay of biological material? (biology only)

$$\text{Rate of change} = \frac{\text{Change in value}}{\text{Change in time}}$$

Where value is a measurable variable associated with the decay of the material



# What is compost? (biology only)



What is compost? (biology only)

The nutrient-rich product of the rapid decay of waste biological material (dead plants and animal waste) in optimum conditions set by gardeners and farmers.



# How is compost used? (biology only)





How is compost used? (biology only)

Used as natural fertiliser to promote growth of crops or garden plants.



# Describe how biogas generators work (biology only)



Describe how biogas generators work (biology only)

Biogas generators provide methane gas for fuel through anaerobic decomposition that occurs in animal waste.



# Describe how environmental conditions affect communities (biology only) (higher only)



## Describe how environmental conditions affect communities (biology only) (higher only)

- Environmental conditions e.g. temperature, soil pH, light intensity affect the abundance and distribution of organisms within communities.
- e.g rising global temperatures have been linked to the extinction of frog species (their thin skin makes them more vulnerable to temperature changes).



How can different temperatures be bad for certain communities?



## How can different temperatures be bad for certain communities?

- If the temperature is too low, growth will be slower as organisms will use more energy to stay warm
- If the temperature is too high, organisms can die and water will become limited as evaporation increases



How can changes in water levels affect  
ecosystems?  
(Higher)





# How can changes in water levels affect ecosystems? (Higher)

- Animals may have to migrate to find water.
- Melting ice caps may destroy the habitats of some animals (either animals living in icy regions or by sea level rise).



# How can atmospheric gases affect ecosystems? (Higher)



# How can atmospheric gases affect ecosystems?

(Higher)

- Some organisms cannot survive when certain gases are present.
- Polluted water can cause illness to animals that drink it.



What detrimental impacts can sulfur dioxide have on the environment?



What detrimental impacts can sulfur dioxide have on the environment?

- Formed when fossil fuels containing impurities are burnt.
- Sulfur dioxide can dissolve in water to form acid rain which can erode buildings and pollute water sources.



What detrimental impacts can carbon monoxide have on the environment?



## What detrimental impacts can carbon monoxide have on the environment?

- Carbon monoxide is formed from the incomplete combustion of fossil fuels.
- Carbon monoxide binds irreversibly to haemoglobin which prevents it from carrying oxygen.
- Too much exposure can cause unconsciousness and death.



Name 5 greenhouse gases





## Name 5 greenhouse gases

- Water vapour
- Carbon dioxide
- Nitrous oxide
- Methane
- CFCs



Give 3 human activities that contribute to greenhouse gases



Give 3 human activities that contribute to greenhouse gases

- Burning fossil fuels
- Deforestation
- Large scale livestock farming



# How do greenhouse gases lead to global warming?



# How do greenhouse gases lead to global warming?

- Greenhouse gases allow heat from the sun to enter the atmosphere.
- The gases act as a 'blanket' and trap the heat in the atmosphere.



State 3 negative consequences of global warming



## State 3 negative consequences of global warming

- Sea level rise caused by melting icebergs.
- Disrupted farming and agriculture.
- Increased spread of diseases in warmer climates.

