

WJEC Wales Biology GCSE

1.6 - Ecosystems, Nutrient Cycles and the Environment

Flashcards

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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 are herbivores?



What are herbivores?

Herbivores are animals that only eat plants



What are carnivores?



What are carnivores?

Organisms that mainly eat animals



What are decomposers?



What are decomposers?

Organisms that break down dead matter

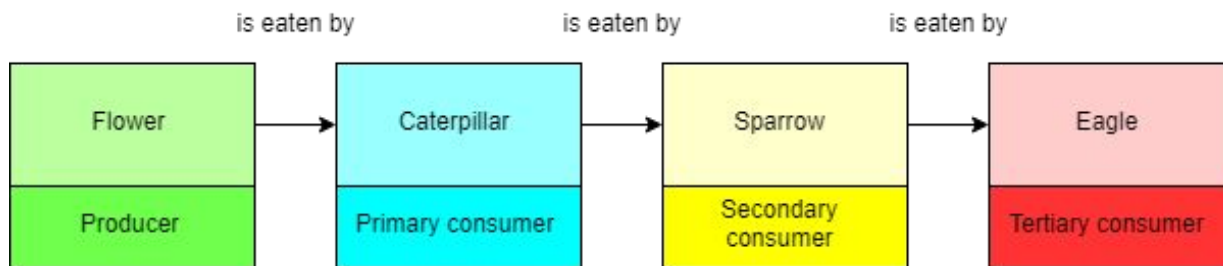


What do food chains show?



What do food chains show?

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



What is the difference between a food web and a food chain?



What is the difference between a food web and a food chain?

Food webs show the interactions of multiple different food chains. Food chains show one path of food dependencies.



Why are biomass transfers not 100% efficient?



Why are biomass transfers not 100% efficient?

Energy is lost through

- Egestion (removal of faeces)
- Excretion (removal of waste products e.g. urine)
- Respiration
- The production of inedible bones and shells



What is biomass?



What is biomass?

The dry mass of all of the living organisms in an area



Why is dry mass used for biomass?



Why is dry mass used for biomass?

Because the wet mass varies as the volume of water in the organism varies



What is a biomass pyramid?



What is a biomass pyramid?

A pyramid that shows the total dry mass of organisms at each trophic level



What is a pyramid of numbers?

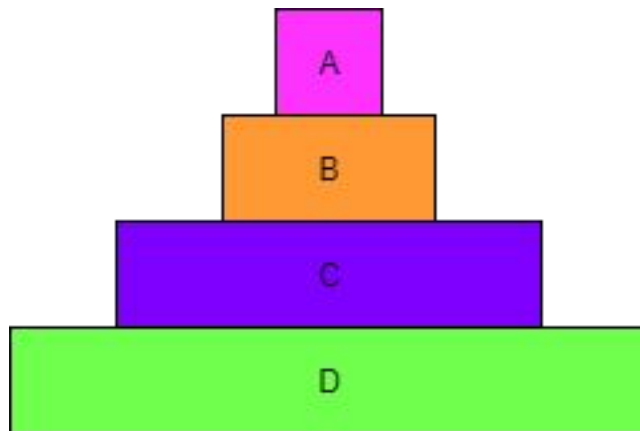


What is a pyramid of numbers?

A pyramid of numbers shows the number of organisms at each trophic level



Identify the producer in this pyramid of biomass

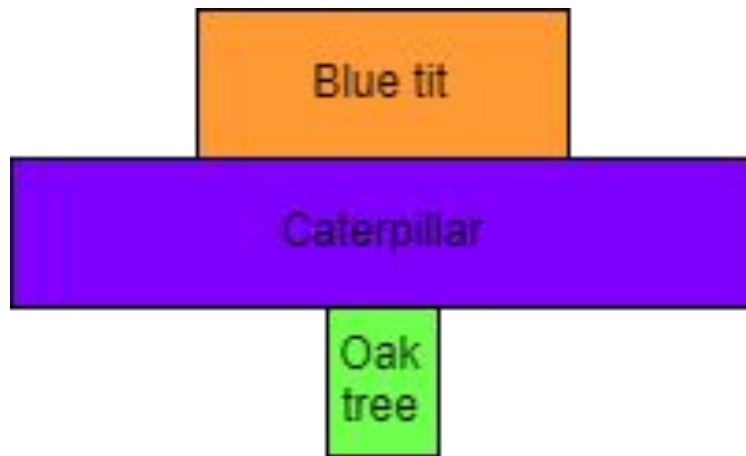


Identify the producer in this pyramid of biomass

D is the producer



Why is this pyramid of numbers not pyramid shaped?



Why is this pyramid of numbers not pyramid shaped?

Pyramids of numbers don't take size and mass of organisms into account



How do you calculate the efficiency of biomass transfer? (Higher)

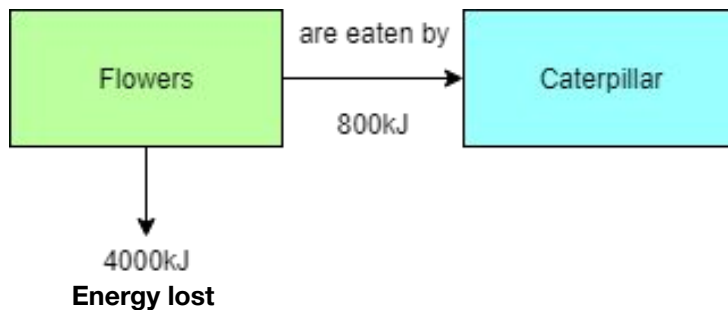


How do you calculate the efficiency of biomass transfer? (Higher)

$$\text{efficiency} = (\text{energy transferred} / \text{total energy available}) \times 100$$



Calculate the efficiency of this biomass transfer from the flowers to the caterpillar
(Higher)



Calculate the efficiency of the biomass transfer from the flowers to the caterpillar (**Higher**)

efficiency = (energy transferred / total energy available) \times 100

Total energy available = 800 kJ + 4000 kJ = 4800 kJ

Energy transferred = 800 kJ

$800/4800 \times 100 = 16.67\%$



How does the efficiency of biomass transfers affect the number of trophic levels in a biomass pyramid?



How does the efficiency of biomass transfers affect the number of trophic levels in a biomass pyramid?

The less efficient the transfers, the fewer trophic levels and the fewer organisms in higher trophic levels



Name 2 different types of decomposer



Name 2 different types of decomposer

Bacteria and fungi



What are nutrient cycles?



What are nutrient cycles?

Processes by which molecules and ions are transferred between dead and living organisms



Give 4 examples of nutrient cycles



Give 4 examples of nutrient cycles

- Carbon cycle
- Nitrogen cycle
- Phosphorus cycle
- Water cycle



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



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. The water cycle provides organisms on land with a continuous supply of water



What are the two types of decomposition?



What are the two types of decomposition?

Aerobic decomposition (with oxygen)

Anaerobic decomposition (without oxygen)



Which type of decomposition is faster?



Which type of decomposition is faster?

Aerobic decomposition is faster than anaerobic decomposition



How would a decrease in water availability affect the rate of decomposition?



How would a decrease in water availability affect the rate of decomposition?

- Decomposing microorganisms need water for chemical processes
- The less water available, the slower the rate of these processes



How does the presence of too much water affect decomposition?



How does the presence of too much water affect decomposition?

Waterlogged soil prevents oxygen from reaching the decomposers and so anaerobic decomposition must occur which is slower



How would a change in temperature
affect the rate of decomposition?



How would a change in temperature affect the rate of decomposition?

- A decrease in temperature slows the rate of the decomposition reactions
- A large increase in temperature will denature enzymes, slowing or even stopping decomposition



Where does mummification happen instead of decomposition?



Where does mummification happen instead of decomposition?

In places where the climate is too harsh for decomposition to take place (e.g. too dry or too hot)



Briefly describe how nitrogen is cycled through an ecosystem (Higher)



Briefly describe how nitrogen is cycled through an ecosystem (Higher)

- Nitrogen is fixed by lightning, the Haber process and bacteria
- Decomposers break dead matter down into ammonia
- Nitrifying bacteria convert ammonia into nitrites and nitrates
- Denitrifying bacteria release nitrogen back to the atmosphere



How is a rising human population negatively impacting the environment?



How is a rising human population negatively impacting the environment?

More space is needed for housing, work and leisure which leads to the destruction of habitats which can threaten organisms that live there



What are intensive farming methods?



What are intensive farming methods?

Ways of farming to maximise the potential yield (e.g. by using fertilisers, pesticides or battery farming)



How can fertilisers and pesticides help agriculture?



How can fertilisers and pesticides help agriculture?

- Fertilisers provide the plant with all the nutrients it needs so that it can grow more quickly
- Pesticides kill pests that could harm the growth of the plant



State 2 methods of pest control



State 2 methods of pest control

Biological control

Pesticides



What is biological control?



What is biological control?

It is a method of controlling plant pests by deliberately introducing organisms that feed on the pests to decrease the number of them



Give 3 disadvantages of pesticides



Give 3 disadvantages of pesticides

- They are not specific and so can kill other insects that are not pests
- They can contaminate water sources
- They have to be applied more than once



What methods are used in battery farming to maximise yield?



What methods are used in battery farming to maximise yield?

- Animals are given antibiotics so that less energy is spent fighting disease
- Animals are kept in small spaces so that movement is restricted
- The temperature of the pens is regulated so that the animals do not use energy keeping themselves warm
- Animals are fed high protein food to maximise growth



What is an indicator species?



What is an indicator species?

Any species which can be used to measure conditions in an environment, often by the presence or absence of that species



What does a decrease in water pH suggest about pollution levels?



What does a decrease in water pH suggest about pollution levels?

A lower pH (more acidic) suggests pollution levels are increasing as lots of gases in pollutants are acidic in solution (CO_2 makes carbonic acid)



Describe how sewage in waterways can affect aquatic life



Describe how sewage in waterways can affect aquatic life

Microorganisms that decompose sewage will use up the oxygen in the water so that there is not enough oxygen left for respiration in other aquatic organisms



What is eutrophication?



What is eutrophication?

An excess of nutrients in a body of water, often due to fertilisers in the water source



Why is eutrophication bad for aquatic life?



Why is eutrophication bad for aquatic life?

It causes an 'algal bloom' which decreases oxygen supplies in the water and degrades the water quality



Why are heavy metals in industrial waste and pesticides bad for the environment?



Why are heavy metals in industrial waste and pesticides bad for the environment?

They can enter food sources and build up to toxic levels which can harm or kill animals that eat them

