EDEXCEL GCSE Ecosystems and material cycles PART 2

Food production (biology only)

Factors affecting food security	*Enough food is needed to feed a changing population*
	Increasing human population
	Increased meat and fish consumption.
	New pests and pathogens affecting farming.
	Environmental changes caused by human activity.
	Cost of agriculture input.
	Use of land for biofuel production.

Maintaining local and global biodiversity	*Conservation of animal species*	Protecting rare or endangered species by protecting habitats and use of breeding programmes.
	Impact of reforestation	Increasing range of habitats so that an area can support a greater range of species.

Positive and negative human interactions within ecosystems	
Fish farming	Can be used to reduce over fishing of wild species and increase biodiversity.
Introduction of non-indigenous species	Can decrease biodiversity by introducing predators where prey do not have time to adapt.
Eutrophication	Fertilisers on farm land lead to too many nutrients in water act as pollutants reducing biodiversity.

Biodiversity

Biodiversity is the variety of all different species of organisms on Earth, or within an ecosystem

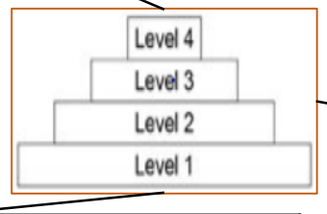
Experimental methods are used to determine the distribution and abundance of a species.

Sampling techniques		
	Quadrats	Organisms are counted within a randomly placed square
	Transects	Organisms are counted along a belt (transect) of the ecosystem.

Processing data	
Median	Middle value in a sample.
Mode	Most occurring value in a sample.
Mean	The sum of all the value in a sample divided by the sample number.

Decomposers break down dead plants and animal matter by secreting enzymes. Small soluble food molecules than diffuse into the microorganism.

Trophic levels and biomass



Transfer of biomass (biology only)	
Biomass is lost between the different trophic levels	
Producers transfer about 1% of the incident energy from light for photosynthesis.	Large amounts of glucose is used in respiration, some material egested as faeces or lost as waste e.g. CO_2, water and urea in urine.
Approximately 10% of the biomass from each trophic level is transferred to the level above.	

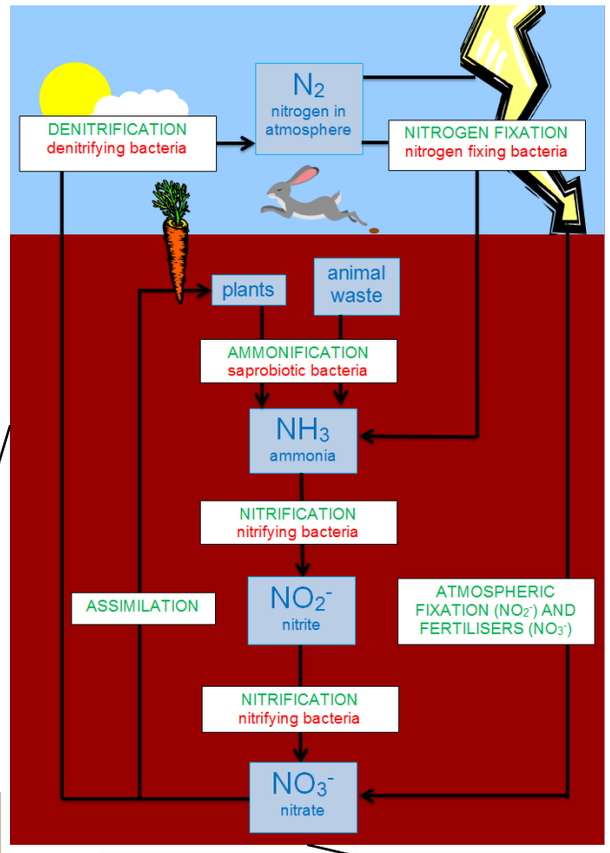
Trophic levels can be represented by numbers and biomass in pyramids.		
Trophic levels are numbered sequentially according to how far the organisms is along the food chain.		
Level 1	Producers	Plants and algae.
Level 2	Herbivores	Primary consumers.
Level 3	Carnivores	Secondary consumers.
Level 4	Carnivores	Tertiary consumers.

Pollution (biology only)

Indictor species	*Assessing levels of pollution*	
		Polluted water – blood worm, sludgeworm.
		Clean water – freshwater shrimps, stonefly.
		Air quality – lichen species, blackspot fungus

Nitrogen cycle

Nitrates are made available for uptake by plants



Nitrate availability can also be increased by the use of fertilisers and crop rotation.

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Food production (biology only)

Enough food is needed to feed a changing population	Increasing human population
	Increased meat and fish consumption.
	New pests and pathogens affecting farming.
	Environmental changes caused by human activity.
	Cost of agriculture input.
	Use of land for biofuel production.

Conservation of animal species	Protecting rare or endangered species by protecting habitats and use of breeding programmes.
Impact of reforestation	Increasing range of habitats so that an area can support a greater range of species.

Positive and negative human interactions within ecosystems	
Fish farming	Can be used to reduce over fishing of wild species and increase biodiversity.
Introduction of non-indigenous species	Can decrease biodiversity by introducing predators where prey do not have time to adapt.
Eutrophication	Fertilisers on farm land lead to too many nutrients in water act as pollutants reducing biodiversity.

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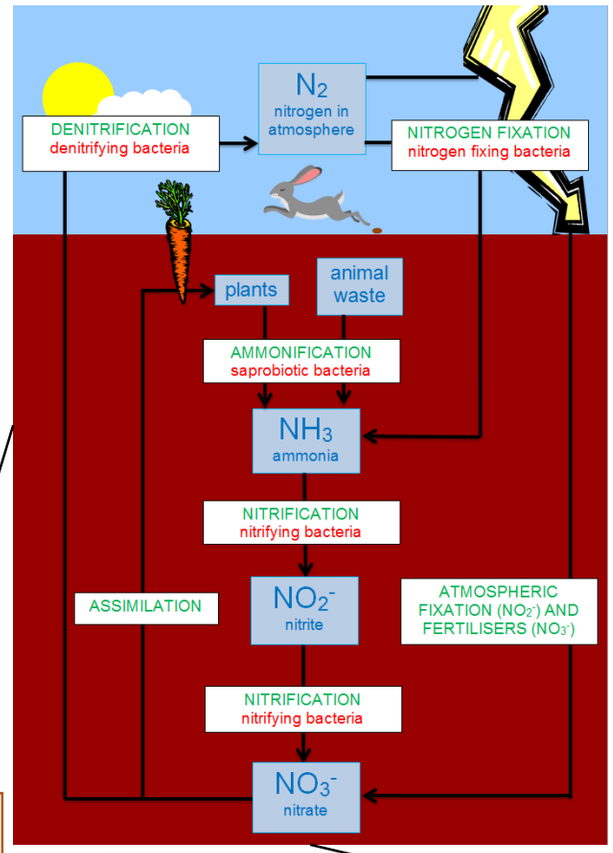

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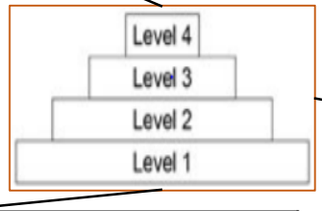

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Food production (biology only)

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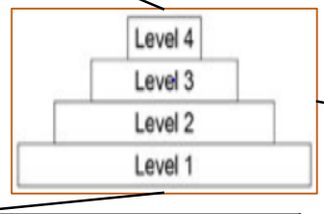

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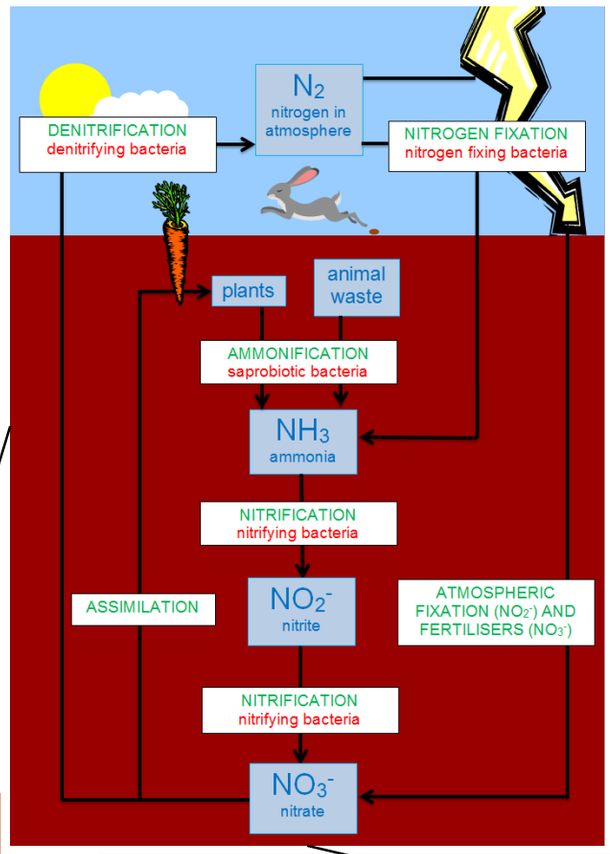

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Pollution (biology only)

Positive and negative human interactions within ecosystems

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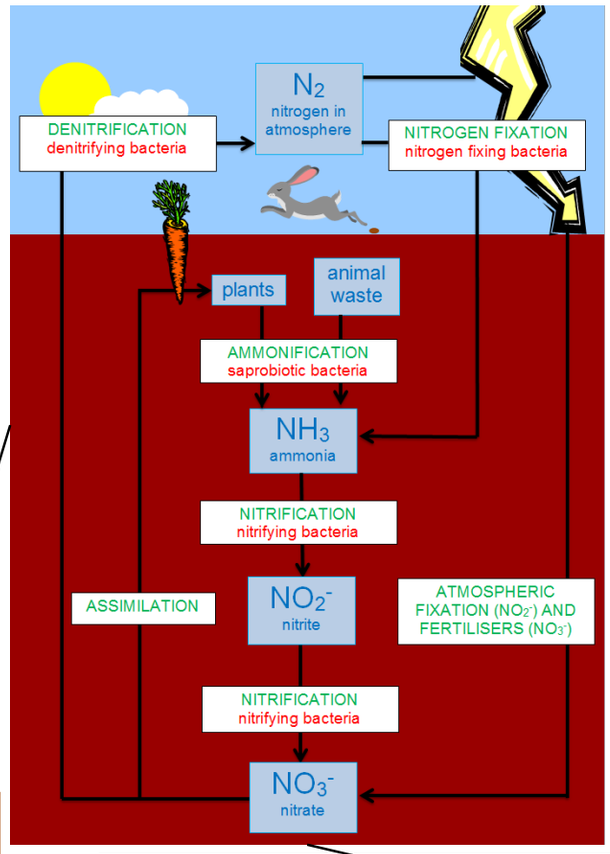

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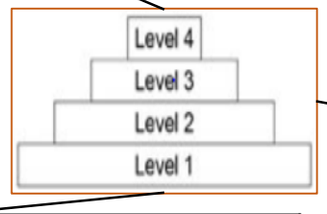

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