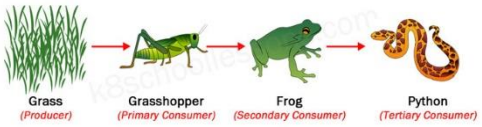
AQA Trilogy-Biology key terms - Ecology

Ecosystems	
Biotic (living)/ **Abiotic** (non-living) features that can affect a community	Examples of **biotic** factors= availability of food/new predators/new pathogens/competition between animals
Examples of **abiotic** factors= light intensity, temperature, moisture, soil pH, wind intensity, CO_2 levels (for plants), O_2 levels (for animals living in water)	**Ecosystem**- The interaction of a community of living organisms (biotic) with the non-living (abiotic) parts of an environment
Habitat- The place where an organism lives	**Community**- populations of different species living in the same habitat
Population - A group of interbreeding organisms of one species in a habitat	Always too many animals –they **compete** for food, territory & mates
Plants **compete** for light, space, water and minerals from the soil	**Interdependence** – how each species **depends on another** (e.g. for food, shelter, pollination etc). If 1 species is taken away, it can affect lots of the others
Stable community- all the species and environmental factors are in balance so that the population stays **fairly constant**	Animals and plants have **adaptations** to help them survive in different places (e.g. colour, surface area to volume ratio, body fat, fur etc) –**say how it helps them.** They can be physical or behavioural.
Plants are often adapted for **dry conditions**. Have long roots near surface (to get as much water), leaves with small surface area, ability to store water (e.g. cactus)	**Extremophiles** are organisms that live in extreme conditions (e.g. v. hot) and may have specific adaptations. E.g. bacteria living in deep sea vents.
Radiation from the **sun** is energy source for all organisms. Plants absorb it in **photosynthesis** and use it to make **biomass** for life on earth.	**Biomass** is the dry mass of living material in an organism.
Food chains show feeding relationships. They start with a producer (plant). **Producers** are eaten by **primary consumers**, which may be eaten by **secondary consumers** and then **tertiary consumers.**  	**Predators-** Eat other animals. **Prey** – Are eaten by predators In stable communities, predators and prey **rise and fall** in cycles (i.e. as prey increases, more food for predators so they increase. Then as there are more predators, the prey decrease. Not enough food for predators so they die out etc)
Quadrats can be used to find distribution of organisms in environments. **Random sampling** should be used in environments that **don't change**. They should be placed **randomly** to avoid BIAS. NOTE THAT QUADRATS WAS A REQUIRED PRACTIAL SO LIKELY TO COME UP	**Transects** can be used to find distribution of organisms in an environment that is changing. Usually measured in a line (not random)
*How to carry out **random sampling**:* 1. Use a tape measure to make a grid 2. Method of obtaining random coordinates (e.g. use a random number generator) 3. Count number of plants in a quadrat; 4. Repeat at least 10-15 times 5. Calculate mean / average number (per quadrat) (If comparing 2 areas, you need to mention you would do this to the other area too)	How to carry out a **transect:** 1. Use tape measure to make transect 2. Place quadrats along …… 3. Count numbers of plants in each quadrat 4. Do at regular intervals along tape 5. Repeat several times
Data can be used to calculate **mean** (add numbers together and divide by how many results you have)**, mode** (most common) **and median** (middle). Results should be done several times and compared with others to make sure they are **valid** and representative.	In random sampling, you aren't counting every organism in an area. Questions may ask you to work out an estimate for the full area. Use equation below: **Full area ÷ quadrat size x mean** = estimate for whole area

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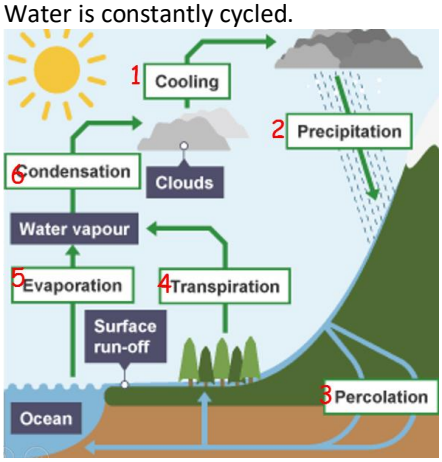
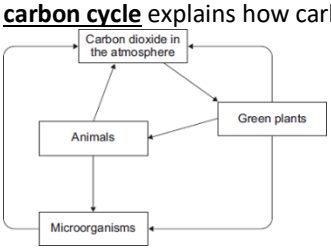
Water is constantly cycled.



Nutrients and other materials are constantly recycled. The **carbon cycle** explains how carbon (C) is cycled.



Photosynthesis removes CO_2 from atmosphere. **Respiration** (by plants & animals) and **combustion** put it back. When things die, they **decay** when they are broken down by micro-organisms (**decomposers**). These also **release CO_2** in respiration

Decay is caused by **decomposers** (a type of microorganism found in soil)- i.e. when things break down when they die. They need **oxygen** for **respiration**. Decay of dead organisms also **releases minerals** that plants can take up by their roots. It also **releases heat and carbon dioxide** (as the decomposers respire)

Biodiversity- variety of all the different species of organisms on earth

Important to maintain biodiversity:
-Organisms make substances useful to humans
-Duty to future generations
-Can affect other organisms in the food chain.

Reasons biodiversity is being reduced- deforestation/ land use/global warming/waste management

Deforestation = **cutting down trees**. Happening because land is needed for cattle or rice fields or to grow crops for biofuels.

Deforestation leads to **less habitats/food sources** for animals. **Less CO_2 being taken out of atmosphere** by plants in photosynthesis and burning/decay of the trees releases more CO_2.

Waste management:
Making more waste and using more resources because of a bigger human population and increases in the standard of living. Pollution can happen from **water** (sewage, fertiliser), in **air** (smoke, acidic gases) or **land** (landfills and toxic chemicals)
Pollution **kills** plants and animals reducing biodiversity.

Land use:
Humans are reducing land for animals by using it to **build, quarry, farm** and **dump waste.**

Peat bogs (wetland made of lots of dead plant material)- destroyed to make cheap **compost** (lots of minerals, help to increase food production). *Reduces habitat* for animals and *burning of peat gives off CO_2.*

Global warming- caused by increasing **CO_2** and **methane** levels (greenhouse gases).
Problems= Changes in climate, rise in sea levels, change in species distribution, changes animal's migration patterns etc.

Evidence for global warming→ based on systematic reviews of thousands of peer reviewed journals.

Ways to maintain biodiversity:

- **Breeding programmes** for endangered species
- **Protection** and regeneration of rare habitats
- Reintroduction of **field margins** and hedgerows in farming areas
- **Reducing deforestation** and CO2 emissions

Recycling (rather than dumping in landfills)

Carbon sequestration -= removing CO_2 from air. E.g. growth of plants (to trap CO_2 in photosynthesis) or making new peat bogs