Knowledge Organiser Key Stage 3

Subject: Science Year: 8 Topic Title: Ecological relationships

Key Facts

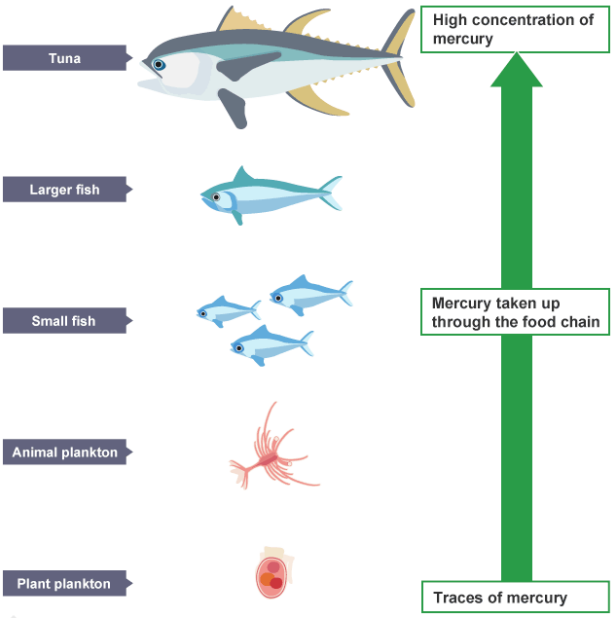
1. **Food chain/web** - A **food chain** shows the different **species** of an organism in an **ecosystem**, and what eats what. A food chain always starts with a **producer.** A food chain ends with a **consumer.** When all the food chains in an ecosystem are joined up together, they form a food web.
2. **Natural selection**- Individuals in a species show a wide range of **variation; s**ome of this variation is **inherited** by genes being passed on; individuals who are best suited to the environment are **more likely to survive** and **reproduce; (survival of the fittest).** The genes that allow these individuals to be successful are passed to their offspring; over many generations these small differences add up to the new evolution of species; given enough time, a population may change so much it may even become a new species, unable to reproduce successfully with individuals of the original species.
3. **Bioaccumulation** - **Toxic** materials are poisonous. Some quickly break down into harmless substances in the environment. Others do not break down. These substances **accumulate** in the food chain. This means that the further up the chain you go, the more toxins there are. This is because accumulating compounds cannot be excreted. **Mercury** and **DDT** are two examples of toxins that accumulate in the food chain.
4. **The carbon cycle**: The **carbon cycle** is the process in which **carbon** travels from the atmosphere into organisms and the Earth and then back into the atmosphere over and over again. Plants take **carbon** dioxide from the air and use it to make food. Animals then eat the food and **carbon** is stored in their bodies or released as CO_2 through respiration. Most **carbon** is stored in rocks and sediments, while the rest is stored in the ocean, atmosphere, and living organisms.

Key words

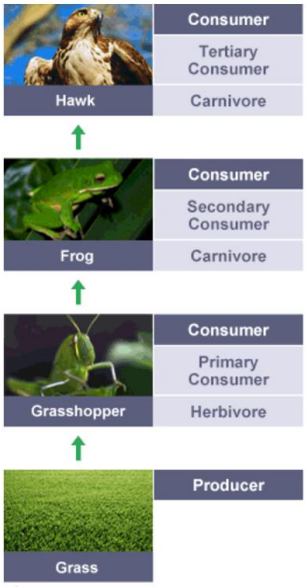
5. **Environment**: all the conditions surrounding a living organism
6. **Habitat**: the place where an organism lives
7. **Population**: all members of a single species living in a habitat
8. **Community**: all populations of different organisms living in a habitat
9. **Ecosystem**: a community and the habitat in which organisms live
10. **Producer**: usually a plant at the start of a food chain, because plants make their own food.
11. **Consumer**: an animal that eats a plant or animal
12. **Photosynthesis**: a process that plants use to make food
13. **Herbivore**: a consumer that only eats plants
14. **Carnivore**: a consumer that only eats animals
15. **Omnivore**: a consumer that eats both plants and animals
16. **Predator**: an animal that hunts and eats other animals
17. **Prey**: an animal that is eaten by a predator
18. **Decomposer:** an organism that decomposes, or breaks down, organic material
19. **Scavenger:** an animal that feeds on carrion or dead plant material
20. **Species**: able to breed to produce fertile offspring that can also breed
21. **Variation**: differences between organisms
22. **Extinction**: when there are no more individuals of a species left
23. **Endangered**: when a species is at risk of extinction due to low population numbers
24. **Biodiversity**: having a wide range of different species in an ecosystem
25. **Interdependence**: All organisms in an ecosystem depend upon each other. If the population of one organism rises or falls, then this can affect the rest of the ecosystem.

Diagrams

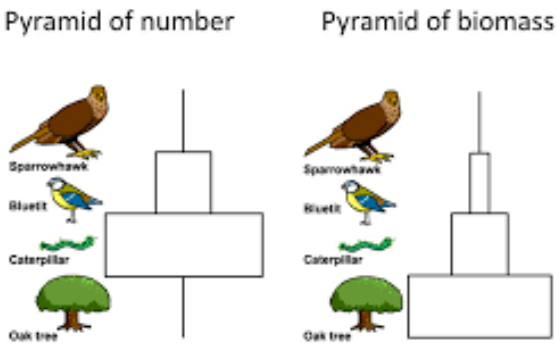
Bioaccumulation:



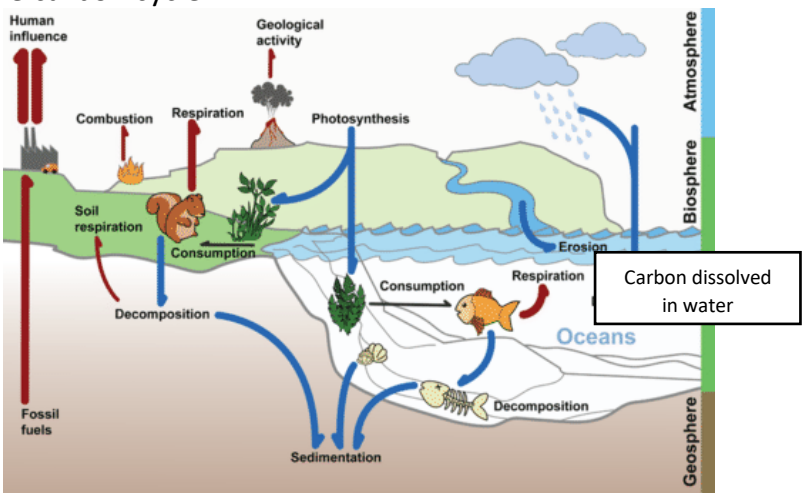
Food chain:



Pyramid of numbers / biomass:



The carbon cycle:



Potential misconceptions to avoid / errors students often make

1. The **arrows** in a food chain show the **direction of energy transfer through a food chain**
2. **Describing impact on food chains / webs :** use comparative language at all times, eg use 'population *decreases'* instead of 'all die out' or 'go extinct'.
3. **Camouflage:** Not only prey needs to be camouflaged to avoid being hunted, Predators also benefit from camouflage.
4. **Genes:** use the term genetic variation and talk about passing on "genes" not "characteristics" – characteristics are either determined by genes or developed by an interaction of genes and the environment.
5. **Loss of species:** try to remember that species are interdependent; a decrease in one species has an impact on the other species withing that ecosystem**.**
6. **Extinction:** the dangers associated with extinction are to do with the effect it will have on us, eg reduced food supply or medicines.