Biology 7: Ecology

Section 1: Key terms

1 Ecosystem	The **interaction** of a **community of living organisms (biotic)** with the **non-living (abiotic)** parts of their environment.
2 Habitat	The **area** in which an organism **lives**.
3 Community	**Two or more different species** in an ecosystem**. A stable community** is one **where all the species and environmental factors are in balance** so that **population sizes remain fairly constant.**
4 Population	The **total number of organisms** of **one species** in an ecosystem**.**
5 Competition	**Plants** often compete for **light, space, water** and **mineral ions. Animals** often compete for **food**, **mates** and **territory**
6 Interdependence	Within a community each **species depends on other species** for **food, shelter, pollination** etc.
7 Adaptations	A **feature** that an organism has that allows it to **survive** in its ecosystem.
8 Biodiversity	The **variety** of all the **different species** of organisms **on Earth**, or **within an ecosystem.**

Section 2: Biotic and Abiotic Factors

9 Biotic	10 Abiotic
Availability of **food**	**Light intensity**
New **predators** arriving	**Temperature**
New **pathogens**	**Moisture** levels
One species **outcompeting** another	**Oxygen** levels for aquatic animals
	Wind intensity and direction
	Carbon dioxide levels for plants
	Soil pH and **mineral** content

Section 4: Adaptations

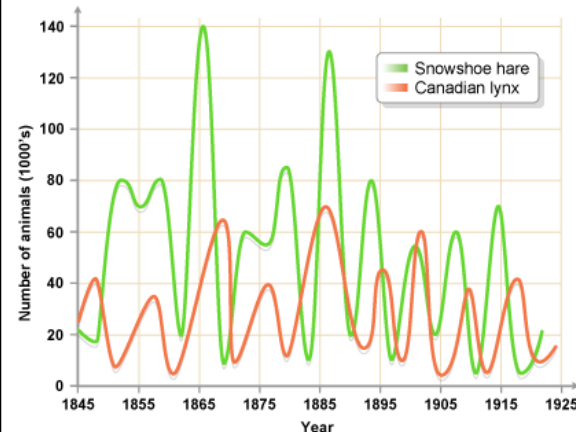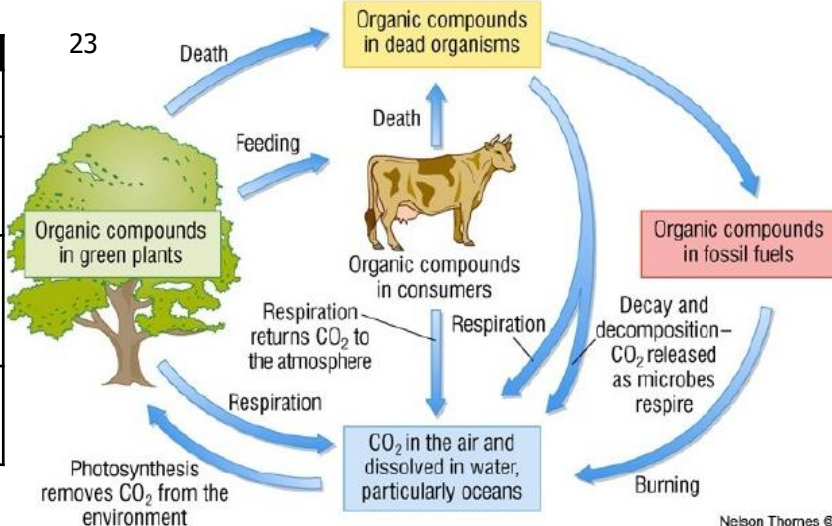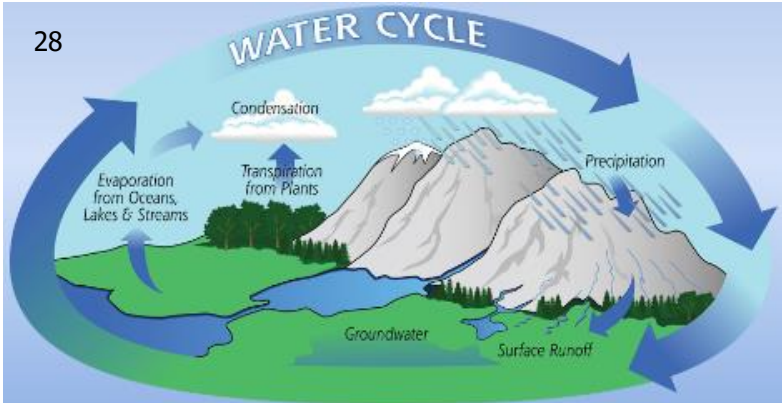|	
20 Structural Adaptations	Part of the **body** that helps the organism survive. e.g. polar bears have a thick layer of fat for insulation.
21 Functional Adaptations	How the **body operates** that helps the organism survive. E.g. camels do not sweat.
22 Behavioural Adaptations	A **behaviour** that helps the organism survive. e.g. desert rats stay in their burrows during the hottest parts of the day.

Section 3: Food Chains and Predator-Prey Relationships

11 **Producer** – **Start** of a food chain. Produces **glucose** through **photosynthesis.**

12 **Primary Consumer** – **Eats** a **producer. Prey** of secondary consumer.

13 **Secondary Consumer** – **Eats** a **primary consumer. Predator** of primary consumer.

14 **Tertiary Consumer** – **Predates** on **secondary consumer.**

Predator-prey cycles
15 The population of the **prey increases**
16 **More food** is available for the **predators**, so their population increases.
17 There are **more predators** so the **population of the prey decreases**.
18 There is **less prey to feed on** so the population of **predators decreases.**
19 The **cycle restarts** from the beginning.

Section 5: Cycles

Section 5a: Carbon cycle steps

24 Photosynthesis	**Plants absorb CO_2** from atmosphere.
25 Respiration	**Animals**, **plants** and **micro-organisms** respire, **releasing CO_2** into the atmosphere.
26 Decay	The carbon in dead organisms is **released to the atmosphere** by **micro-organisms respiring**.
27 Combustion	Carbon locked in **fossil fuels** is **released** as CO_2 when fuels are **burned**.

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Section 5b: Water cycle steps

29 Evaporation	**Liquid water** is **turned** into **water vapour** in the **atmosphere.**
30 Condensation	Water vapour **condenses** to **form clouds**.
31 Precipitation	Water is deposited from clouds as **rain**.

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Section 6: Human effects on biodiversity

Human activity	Why it happens	Effects
32 Polluting water with fertiliser and sewage	Farmers spread **fertiliser** on fields. **Rain** washes fertiliser into **rivers** and ponds. Sewage is released directly into rivers.	Fertilisers and sewage cause an **increase in growth of algae**. When the algae **die**, they are **decomposed by bacteria** that **use oxygen**. Other animals **die due to a lack of oxygen**.
33 Using land	Humans **construct buildings**, create **quarries** and **farm**.	**Habitat** for plants and animals is **reduced**.
34 Destroying peat bogs	Humans **use peat to provide compost** to increase food production.	**Removes habitat, reducing biodiversity. Decay or burning of peat produces CO_2.**
35 Deforestation	To provide **land for cattle and rice fields**. To **grow crops for biofuels**.	**Burning** or **decomposing trees releases CO_2. Fewer trees to remove CO_2 from the atmosphere. Loss** of **biodiversity.**
36 Producing acidic gases	**Combustion** of **fossil fuels** releases **carbon dioxide, sulfur dioxide** and **nitrogen oxides**. These gases **dissolve in water** making it **acidic**.	**Acid rain. Damages plants.** Can cause **rivers** and **lakes** to become acidic, killing animals and plants.
37 Polluting water with toxic chemicals	**Pesticides** and other toxic chemicals (e.g. from **landfill**) are washed into rivers and lakes by **rain**.	**Toxic chemicals accumulate** in animals. The **further up** the **food chain**, the **greater the accumulation**. Top predators die or fail to breed.
38 Increasing temperature of the planet (global warming)	Humans release extra **greenhouse gases** (**CO_2** and **methane**) into the atmosphere and **less CO_2 is absorbed** by plants through photosynthesis. **Greenhouse gases absorb heat** and stop it escaping to space.	**Loss of habitat** as **sea levels rise**; animals and plants can **no longer survive** in certain areas; **reduced biodiversity**; **change in migration patterns** of animals.

Section 7: Maintaining biodiversity

39 **Breeding programmes** for **endangered species.**
40 **Protection** and **regeneration** of **rare habitats.**
41 **Reintroduction of field margins** and **hedgerows** in agricultural areas where farmers grow only one type of crop
42 **Reduction of deforestation**
43 **Reduction of carbon dioxide** emissions by some **governments**
44 **Recycling resources** rather than dumping waste in landfill.
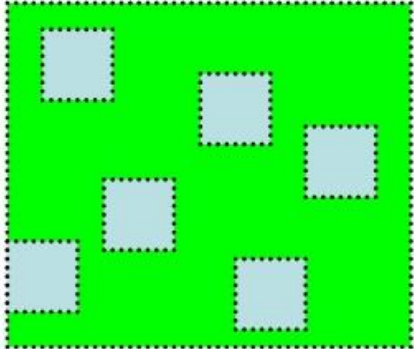
Section 8: Measuring biodiversity

	Random Sampling	Systematic Sampling (transect)
45 Purpose	**Estimate the size of a population** in an area.	See how populations and communities **change over a distance**.
46 Method	1. Choose a suitable number of quadrats to use. 2. Assign **co-ordinates** to the area that you are sampling. **3. Randomly** choose co-ordinates. 4. Place the **quadrats** and count organisms present. 5. Calculate the mean number of organisms.	1. Use a **tape measure** to create a long line (**transect**). 2. Put **quadrats** at set distances. 3. Count organisms present. **4. Repeat** in a different place/ different time of year. 5. Draw graphs to see how communities change over a distance.