

## Section 7: Ecology

### Section 1: Key terms

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

### Section 3: Food Chains and Predator-Prey Relationships

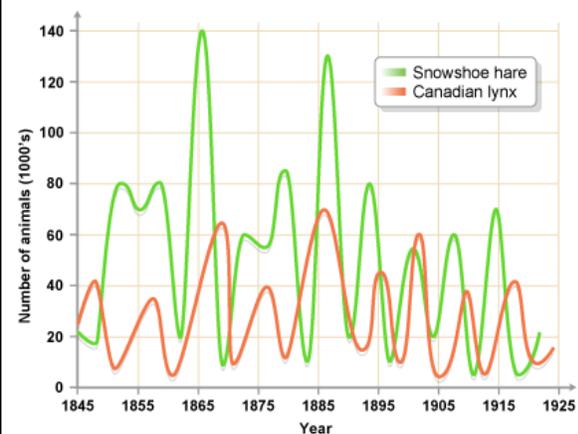


**11 Producer** – Start of a food chain. Produces **glucose** through **photosynthesis**.

**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 2: Biotic and Abiotic Factors

### 9 Biotic

Availability of **food**  
 New **predators** arriving  
 New **pathogens**  
 One species **outcompeting** another

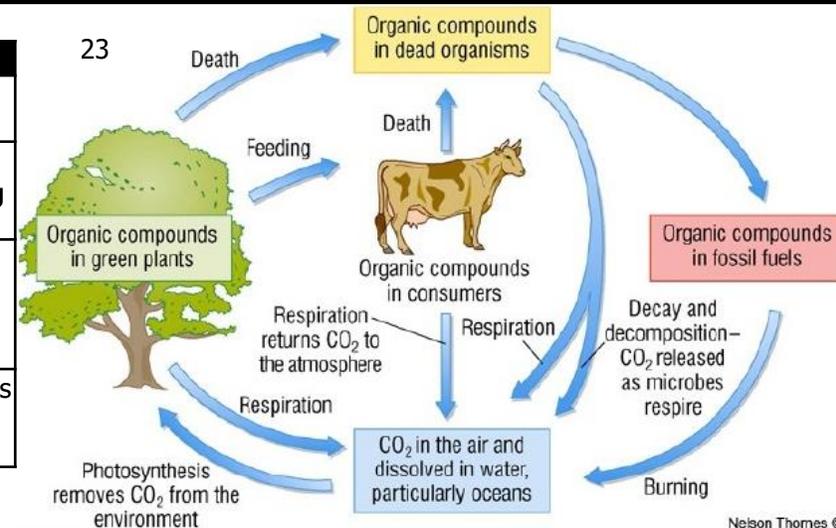
### 10 Abiotic

**Light intensity**  
**Temperature**  
**Moisture** levels  
**Oxygen** levels for aquatic animals  
**Wind** intensity and direction  
**Carbon dioxide** levels for plants  
**Soil pH** and **mineral** content

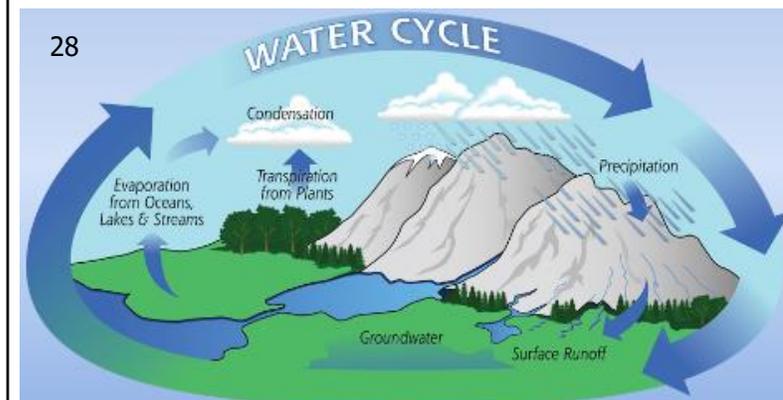
## Section 5: Cycles

### Section 5a: Carbon cycle steps

24 Photosynthesis	<b>Plants absorb CO<sub>2</sub></b> from atmosphere.
25 Respiration	<b>Animals, plants and micro-organisms</b> respire, <b>releasing CO<sub>2</sub></b> into the atmosphere.
26 Decay	The carbon in dead organisms is <b>released to the atmosphere</b> by <b>micro-organisms respiring</b> .
27 Combustion	Carbon locked in <b>fossil fuels</b> is <b>released</b> as CO <sub>2</sub> when fuels are <b>burned</b> .



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## Section 4: Adaptations

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

### Section 5b: Water cycle steps

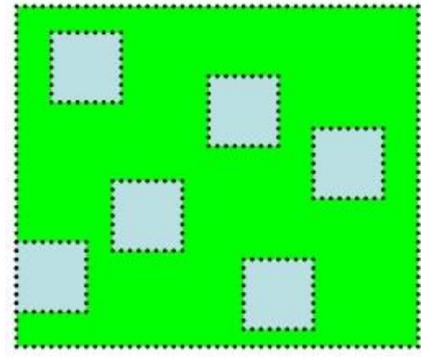
29 Evaporation	<b>Liquid water</b> is turned into <b>water vapour</b> in the <b>atmosphere</b> .
30 Condensation	Water vapour <b>condenses</b> to <b>form clouds</b> .
31 Precipitation	Water is deposited from clouds as <b>rain</b> .

**Section 6: Human effects on biodiversity**

Human activity	Why it happens	Effects
32 Polluting water with fertiliser and sewage	Farmers spread <b>fertiliser</b> on fields. <b>Rain</b> washes fertiliser into <b>rivers</b> and ponds. Sewage is released directly into rivers.	Fertilisers and sewage cause an <b>increase in growth of algae</b> . When the algae <b>die</b> , they are <b>decomposed by bacteria</b> that <b>use oxygen</b> . Other animals <b>die due to a lack of oxygen</b> .
33 Using land	Humans <b>construct buildings</b> , create <b>quarries</b> and <b>farm</b> .	<b>Habitat</b> for plants and animals is <b>reduced</b> .
34 Destroying peat bogs	Humans <b>use peat to provide compost</b> to increase food production.	<b>Removes habitat, reducing biodiversity</b> . <b>Decay or burning of peat produces CO<sub>2</sub></b> .
35 Deforestation	To provide <b>land for cattle and rice fields</b> . To <b>grow crops for biofuels</b> .	<b>Burning or decomposing trees releases CO<sub>2</sub></b> . <b>Fewer trees to remove CO<sub>2</sub> from the atmosphere</b> . <b>Loss of biodiversity</b> .
36 Producing acidic gases	<b>Combustion of fossil fuels</b> releases <b>carbon dioxide, sulfur dioxide</b> and <b>nitrogen oxides</b> . These gases <b>dissolve in water</b> making it <b>acidic</b> .	<b>Acid rain. Damages plants</b> . Can cause <b>rivers and lakes</b> to become acidic, killing animals and plants.
37 Polluting water with toxic chemicals	<b>Pesticides</b> and other toxic chemicals (e.g. from <b>landfill</b> ) are washed into rivers and lakes by <b>rain</b> .	<b>Toxic chemicals accumulate</b> in animals. The <b>further up the food chain</b> , the <b>greater the accumulation</b> . Top predators die or fail to breed.
38 Increasing temperature of the planet (global warming)	Humans release extra <b>greenhouse gases (CO<sub>2</sub> and methane)</b> into the atmosphere and <b>less CO<sub>2</sub> is absorbed</b> by plants through photosynthesis. <b>Greenhouse gases absorb heat</b> and stop it escaping to space.	<b>Loss of habitat as sea levels rise</b> ; animals and plants can <b>no longer survive</b> in certain areas; <b>reduced biodiversity</b> ; <b>change in migration patterns</b> of animals.

**Section 7: Maintaining biodiversity**

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



**Section 8: Measuring biodiversity**

	Random Sampling	Systematic Sampling (transect)
45 Purpose	<b>Estimate the size of a population</b> in an area.	See how populations and communities <b>change over a distance</b> .
46 Method	<ol style="list-style-type: none"> <li>Choose a suitable number of quadrats to use.</li> <li>Assign <b>co-ordinates</b> to the area that you are sampling.</li> <li><b>Randomly</b> choose co-ordinates.</li> <li>Place the <b>quadrats</b> and count organisms present.</li> <li>Calculate the mean number of organisms.</li> </ol>	<ol style="list-style-type: none"> <li>Use a <b>tape measure</b> to create a long line (<b>transect</b>).</li> <li>Put <b>quadrats</b> at set distances.</li> <li>Count organisms present.</li> <li><b>Repeat</b> in a different place/ different time of year.</li> <li>Draw graphs to see how communities change over a distance.</li> </ol>

