SB9 Ecosystems and Material Cycles

SB9a Ecosystems

Step	Learning outcome	Had a look	Nearly there	Nailed it!
	State what is meant by the ecological terms community, population and habitat.	☐	☐	☐
	Give examples of an ecosystem, a community, a population and a habitat.	☐	☐	☐
	Describe the organisation of the components of an ecosystem (including populations, communities, habitats and abiotic factors).	☐	☐	☐
	Describe how the interdependence of organisms in an ecosystem allows their survival.	☐	☐	☐
	Explain how to estimate population size, including the use of quadrats.	☐	☐	☐

SB9b Energy transfer

Step	Learning outcome	Had a look	Nearly there	Nailed it!
	Describe the energy transfers that occur between trophic levels.	☐	☐	☐
	Explain how energy is transferred at each trophic level, including making some energy less useful.	☐	☐	☐
	Explain how energy transfers limit the length of a food chain.	☐	☐	☐
	Explain how energy transfers determine the shape of pyramids of biomass.	☐	☐	☐
	Calculate the efficiency of energy transfer between trophic levels.	☐	☐	☐
	Calculate the percentage of biomass transferred between trophic levels.	☐	☐	☐

SB9c Abiotic factors and communities

Step	Learning outcome	Had a look	Nearly there	Nailed it!
	Give examples of abiotic factors.	☐	☐	☐
	Explain how communities are affected by abiotic factors (temperature, light, water, pollutants).	☐	☐	☐
	Explain how to investigate the effect of abiotic factors on the distribution of organisms using belt transects.	☐	☐	☐

SB9d Biotic factors and communities

Step	Learning outcome	Had a look	Nearly there	Nailed it!
	Give examples of biotic factors.	☐	☐	☐
	Describe how competition can affect communities.	☐	☐	☐
	Describe how predation can affect communities.	☐	☐	☐
	Explain how predator–prey cycles affect communities.	☐	☐	☐
	Explain how the structure of a community can affect biodiversity.	☐	☐	☐

SB9e Assessing pollution

Step	Learning outcome	Had a look	Nearly there	Nailed it!
	H Name some indicator species and what they indicate.	☐	☐	☐
	H Explain why indicator species are evidence for a particular level of air or water pollution.	☐	☐	☐
	H Describe the advantages of using indicator species as evidence for the level of pollution.	☐	☐	☐
	H Describe the disadvantages of using indicator species as evidence for the level of pollution.	☐	☐	☐
	H Evaluate the use of indicator species for assessing the level of pollution.	☐	☐	☐

SB9f Parasitism and mutualism

Step	Learning outcome	Had a look	Nearly there	Nailed it!
	Define the term ‘parasitism’.	☐	☐	☐
	Define the term ‘mutualism’.	☐	☐	☐
	Describe how parasites are dependent on their hosts.	☐	☐	☐
	Describe how hosts are harmed by parasites.	☐	☐	☐
	Identify parasites and mutualists in examples.	☐	☐	☐
	Explain how mutualists benefit from their relationship.	☐	☐	☐

SB9g Biodiversity and humans

Step	Learning outcome	Had a look	Nearly there	Nailed it!
5th	Define the term eutrophication.	☐	☐	☐
5th	Describe examples of the introduction of non-indigenous species.	☐	☐	☐
6th	Describe the advantages of fish farming.	☐	☐	☐
7th	Explain how fish farming can affect ecosystems and biodiversity.	☐	☐	☐
7th	Explain how the introduction of species can affect ecosystems and biodiversity.	☐	☐	☐
7th	Explain how eutrophication can affect ecosystems and biodiversity.	☐	☐	☐

SB9h Preserving biodiversity

Step	Learning outcome	Had a look	Nearly there	Nailed it!
5th	Define the term conservation.	☐	☐	☐
5th	Explain what is meant by reforestation.	☐	☐	☐
5th	Give examples of animal conservation.	☐	☐	☐
7th	Explain how animal conservation can benefit biodiversity.	☐	☐	☐
7th	Explain how reforestation can benefit biodiversity.	☐	☐	☐

SB9i Food security

Step	Learning outcome	Had a look	Nearly there	Nailed it!
5th	Define the term ‘food security’.	☐	☐	☐
6th	Describe the effect of increasing human population on food security.	☐	☐	☐
6th	Describe the effect of new pests and pathogens on food security.	☐	☐	☐
7th	Describe the effect of animal farming and consumption on food security.	☐	☐	☐
7th	Describe the effect of human-induced environmental change on food security.	☐	☐	☐
8th	Describe the effect of sustainability issues [production of biofuels, cost of agriculture] on food security.	☐	☐	☐

SB9j The water cycle

Step	Learning outcome	Had a look	Nearly there	Nailed it!
5th	Give examples of materials that cycle through ecosystems.	☐	☐	☐
4th	Describe the processes by which water cycles through abiotic parts of an ecosystem.	☐	☐	☐
5th	Describe the processes by which water cycles through living organisms.	☐	☐	☐
5th	Describe how drinking water is produced where water is plentiful.	☐	☐	☐
7th	Explain how drinking water can be produced by desalination in areas of drought.	☐	☐	☐
7th	Explain why water is important to living organisms.	☐	☐	☐

SB9k The carbon cycle

Step	Learning outcome	Had a look	Nearly there	Nailed it!
6th	Give examples of decomposers.	☐	☐	☐
6th	Define the term *decomposer*.	☐	☐	☐
7th	Describe the carbon cycle.	☐	☐	☐
7th	Identify the key processes in the carbon cycle.	☐	☐	☐
8th	Explain how carbon is cycled through the biotic and abiotic components of an ecosystem.	☐	☐	☐
8th	Explain the importance of the carbon cycle (in balancing photosynthesis and respiration, and removal of wastes by decomposition).	☐	☐	☐

SB9l The nitrogen cycle

Step	Learning outcome	Had a look	Nearly there	Nailed it!
6th	Describe how plants use nitrates.	☐	☐	☐
7th	Describe the different roles of bacteria in the nitrogen cycle.	☐	☐	☐
7th	Explain how fertilisers increase the nitrate content of the soil.	☐	☐	☐
8th	Explain why bacteria are important for soil fertility.	☐	☐	☐
8th	Explain how crop rotation can increase the nitrogen content of the soil.	☐	☐	☐

SB9m Rates of decomposition

Step	Learning outcome	Had a look	Nearly there	Nailed it!
	Describe ways that food is preserved.	☐	☐	☐
	Explain why food is preserved in different ways [reducing temperature, water content and oxygen availability].	☐	☐	☐
	Describe how compost is made.	☐	☐	☐
	Explain how the rate of decomposition in composting can be increased.	☐	☐	☐
	Calculate the rate of decay in food and compost.	☐	☐	☐