

SB9: **Ecosystems and Material Cycles** (Paper 2)

Lesson	Objectives Tracker Sheet	Date covered	I know this well	I need to do more work on this
SB9a Ecosystems	B9.1 Describe the different levels of organisation from individual organisms, populations, communities, to the whole ecosystem.			
	B9.3 Describe the importance of interdependence in a community.			
	B9.6 Explain how to determine the number of organisms in a given area using raw data from field-work techniques, including quadrats.			
SB9b Energy transfer	B9.7b Explain how some energy is transferred to less useful forms at each trophic level and that this affects the number of organisms at each trophic level, limits the length of a food chain and determines the shape of a pyramid of biomass in an ecosystem			
	B9.8b Calculate the efficiency of energy transfers between trophic levels and percentage calculations of biomass.			
SB9c Abiotic factors and communities	B9.2 Explain how communities can be affected by abiotic factors including temperature, light, water, pollutants			
	B9.6 Explain how to use raw data from field-work techniques, including quadrats and belt transects.			
SB9c Quadrats and transects – Core Practical	B9.5 Core Practical: Investigate the relationship between organisms and their environment using field-work techniques, including quadrats and belt transects.			
SB9d Biotic factors and communities	B9.2 Explain how communities can be affected by biotic factors including: competition, predation.			
SB9e Assessing pollution	B9.16B <b>H</b> Evaluate the use of indicator species as evidence to assess the level of pollution, including:			

	polluted water – bloodworm, sludgeworm clean water – freshwater shrimps, stonefly air quality – different species of lichen, blackspot fungus on roses.			
SB9f Parasitism and mutualism	B9.4 Describe how the survival of some organisms is dependent on other species, including parasitism and mutualism			
SB9g Biodiversity and humans	B9.9 Explain the positive and negative human interactions within ecosystems and their impacts on biodiversity, including: fish farming introduction of non-indigenous species eutrophication			
SB9h Preserving biodiversity	B9.10 Explain the benefits of maintaining local and global biodiversity, including the conservation of animal species and the impact of reforestation.			
SB9i Food security	B9.11b Describe the biological factors affecting levels of food security, including: increasing human population increasing animal farming and the increased meat and fish consumption the impact of new pests and pathogens environmental change caused by human activity sustainability issues, e.g. use of land for biofuel production and the cost of agricultural inputs			
SB9j The water cycle	B9.12 Describe how different materials cycle through the abiotic and biotic components of an ecosystem			
	B9.14 Explain the importance of the water cycle including the processes involved and the production of potable water in areas of drought including desalination			
SB9k The carbon cycle	B9.13 Explain the importance of the carbon cycle including the processes involved and the role of microorganisms as decomposers.			

SB9l The nitrogen cycle	B9.15 Explain how nitrates are made available for plant uptake, including the use of fertilisers, crop rotation and the role of bacteria in the nitrogen cycle			
SB9m Rates of decomposition	B9.17b Explain the effects of temperature, water content and oxygen availability on the rate of decomposition in food preservation			
	B9.18b Explain the effects of temperature, water content and oxygen availability on the rate of decomposition in composting.			
	B9.19b Calculate rate changes in the decay of biological material.			