

KS3 Biology – Ecology & Photosynthesis – Learning Objectives

	Beginning	Developing	Secure	Embedding	Extending	Excelling
Photosynthesis	Recall the similarities and differences between plant and animal cells, and how multicellular organisms are organised.	Recall the word equation for photosynthesis, and state the other factors that are also required. Recall the adaptations of leaves for photosynthesis.	Recall the structure of a leaf, including the names and functions of the layers and organs. Write the balanced symbol equation for photosynthesis. Demonstrate how to prove that starch is stored in a leaf, as a result of photosynthesis. Describe and perform an experiment to show that leaves require access to light and chlorophyll in order to do photosynthesis.			-
The Impact Of Photosynthesis	Recall that photosynthesis is used to make glucose in the leaves, and that the plant receives water and other nutrients from the soil via their roots.	Understand the relationship between respiration and photosynthesis.	Explain that plants make carbohydrates in their leaves during photosynthesis, and this is used by the plant during respiration. Explain that animals rely on photosynthesis in plants, since they need carbohydrates in their diets and cannot make their own food. Explain the role of stomata in controlling the gases entering and leaving the leaf. Explain the role of plants in maintaining the correct levels of carbon dioxide and oxygen in the atmosphere.			-
Food Chains	Recall that a food chain / web shows the direction that food and energy pass within an ecosystem.	Identify the producer, and primary, secondary (etc) consumers in a food chain.	Construct accurate food chains and webs for an ecosystem.	Explain what is meant by the term 'biomass'.	Explain the differences between pyramids of numbers and pyramids of biomass, and interpret them to show the feeding relationships within a food chain.	
Ecological Relationships	Explain the difference between predator and prey. Recall the definition of the term 'competition' (in the context of ecology).	Explain the interdependence of organisms in an ecosystem, including food webs.	Understand that the population of organisms with a feeding relationship to each other are connected. Interpret quantitative data showing predator-prey relationships. Explain the impact on population size after the introduction of a new species to an ecosystem.		Discuss case studies in which an ecosystem has changed resulting from competition between species, or an increase in the number of predators.	-
Human Impact On Ecosystems	Recall the functions of fertilisers and pesticides, and discuss their advantages.	Explain how organisms affect, and are affected by, their environment.	Explain how the overuse of fertilisers may impact the environment. Explain the long-term effects of using pesticides, and how this can have a negative impact on an ecosystem. Discuss how the accumulation of toxic materials (resulting from human activity) may impact on an environment.		Discuss case studies in which an ecosystem has been affected by the overuse or prolonged use of fertilisers and pesticides.	-

* Objectives covering more than one grade are assessed based on the level of scientific detail and language used by the learner.