

Session title	Environmental change in freshwater ecosystems	
Key question	What effects do humans have on freshwater habitats and how can these be measured?	
Session description	Investigate environmental change and human impacts on freshwater habitats. Discover the interdependence of organisms and how they affect and are affected by their environment. Work scientifically to identify which organisms are present and use the correlation between water quality and biodiversity to determine the health of the pond.	
Key Stage suitability	KS3/4	
Duration	1 hour	

Curriculum links	KS3 Science: Relationships in an ecosystem - The interdependence of organisms in an ecosystem, including food webs and insect pollinated crops. - How organisms affect, and are affected by, their environment, including the accumulation of toxic materials.		
Learning outcomes	Most learners will...	More able learners will...	
	- Be able to name three abiotic tests used to measure the quality of a freshwater ecosystem. - Be able to use equipment and follow a methodology to carry out a scientific survey. - Be able to use pond dipping equipment safely and effectively to catch animals with minimal disturbance to the habitat.	- Be able to explain how three abiotic factors affect the biotic component of a pond. - Be able to interpret what the findings of the scientific surveys mean. - Be able to suggest pros and cons for abiotic and biotic tests to determine water quality.	
Key vocabulary	Wetland Freshwater Ecosystem Habitat Biodiversity Population Invertebrate	Methodology Abiotic Biotic Eutrophication Acid Alkali Neutral	Salinity Nitrate PH Indicator species Pollution Sensitivity Tolerance

Session Outline	Time
Introduction	1 mins
Learners are introduced to the session and the key question.	
Activity 1: Introduction to pond surveying	10 mins
As a group, learners consider which human activities can impact negatively on freshwater ecosystems. Learners are introduced to both abiotic and biotic tests to measure water quality, considering the pros and cons of both.	
Activity 2: Biotic test - Intro	5 mins

Learners are given a demonstration on how to use the dipping equipment, covering health and safety points and methodology of the biotic test.	
Activity 3: Pond sampling - Biotic test	18 mins
Learners undertake pond sampling.	
Activity 4: Biotic test – Identification and Results	11 mins
Learners are given a demonstration of using the ID guide and survey sheet. They complete the biotic test and allocate a biotic score.	
Activity 5: Abiotic tests	5 mins
We demonstrate the methodology of four abiotic tests and select groups of learners to carry out these tests.	
Plenary:	10 mins
Learners consider what the results mean. They consider the threats to freshwater ecosystems and how we can help.	