Year 7
Subject: Biology
Topic/Unit: Changing Ecosystems
When:

Huntington School
Learn and succeed

Overview: Why this? Why now?
This unit explores how organisms interact within dynamic ecological systems. Understanding these natural relationships is crucial as global ecosystems face unprecedented anthropogenic pressures. Students investigate the biochemical foundation of life through photosynthesis, examine how genetic and environmental variation drives adaptation, and trace how human activities alter habitats. This key knowledge empowers students to comprehend modern environmental crises and the biological mechanisms of evolutionary change.

Building on...building to:
This curriculum builds on primary school concepts of simple food chains and basic plant structure. It prepares students for GCSE Biology, introducing core themes of bioenergetics, evolutionary genetics, quantitative field ecology, and environmental chemistry.

Sequence summary:
- **Photosynthesis and Starch Testing.** Students define photosynthesis as an endothermic reaction converting carbon dioxide and water into glucose and oxygen, with light transferring the required energy. They safely perform a leaf starch test using boiling water, hot ethanol, and iodine to observe chemical energy storage.
- **Interdependence and Bioaccumulation.** Students construct food webs to model ecological energy pathways. They analyse how species fluctuations disrupt webs and study bioaccumulation, evaluating mercury pollution in Minamata Bay and DDT accumulation in food chains.
- **Variation and Ecosystem Resilience.** Classes distinguish between genetic and environmental variation in species. Analysing the Irish Potato Famine, students discover how a lack of variation in cloned crops prevents disease resistance, leaving populations vulnerable to blight.
- **Adaptations.** Exploring structural and behavioural traits that aid survival. Students examine polar bears, waterbucks, and orchids, and analyse how marram grass leaf tubes minimise water loss.
- **Natural Selection.** Comparing Darwinian and Lamarckian evolutionary theories. Students conduct a bird beak forceps practical to model natural selection, linking it to the historical peppered moth industrial camouflage.
- **Extinction.** Investigating species loss via environmental shifts, disease, and predators, using case studies of the dodo and woolly mammoth.

Key Vocabulary:
Photosynthesis, biomass, endothermic, interdependence, bioaccumulation, biodiversity, variation (genetic and environmental), adaptation, natural selection, extinction.

Assessments:
Formative assessment is integrated through whiteboard retrieval, practical risk-assessment tables, and scientific graph analysis using the Trend-Evidence-Explanation framework. Summative assessment is conducted through a structured end-of-unit examination.

Able and interested:
Learners are stretched via independent research into human evolution and the modern peer-review process, analysing how new evidence can challenge or validate established scientific theories.

Inclusion, Personal Development and Wider Skills:
Lessons develop practical teamwork and safety awareness. Students engage with wider ethical issues by studying global deforestation and the work of young environmental activists.

Homework and Independent Learning:
Students will complete a task set on the SPARX online platform. The task is based on the current topic but also includes consolidation on previous topics. It will automatically adjust the level of challenge as the student complete the activities.