Year 10
Subject: Biology
Topic/Unit: Topic 7 – Ecology.
When: Summer Term.

Huntington School
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Overview: Why this? Why now?
This unit explores how organisms interact within their environments and the essential services ecosystems provide to support human life. Understanding these complex communities is vital for modern students as they evaluate how human activity threatens global **biodiversity**. By studying these concepts now, students gain the scientific literacy needed to engage with global challenges like climate change and food security.

Building on...building to: The unit builds on basic Key Stage 3 concepts of habitats and simple food chains. It develops these into sophisticated models of **trophic levels**, biomass transfer, and chemical cycling. This knowledge provides the foundation for higher-level study in environmental science and prepares students for GCSE examinations.

Sequence summary:
1. **Communities and Adaptations:** Students define ecosystems and explain how structural, behavioural, or functional features allow organisms to survive, including **extremophiles** in harsh conditions.
2. **Organisation and Sampling:** Using **quadrats** and transects (Required Practical 9), students estimate population sizes and interpret predator-prey cycles.
3. **Material Cycling:** Analysis of the carbon and water cycles, followed by an investigation into how temperature affects decay (Required Practical 10).
4. **Biodiversity and Human Impact:** Evaluating the environmental implications of waste, land use, deforestation, and global warming.
5. **Conservation and Food Production:** Investigating programmes to maintain biodiversity and the role of **biotechnology**, such as GM crops and mycoprotein, in feeding a growing population.

Key Vocabulary: Abiotic, Biotic, Biodiversity, Ecosystem, Interdependence, Trophic level, Biomass, Homeostasis, Decomposer, Biotechnology.

Assessments:
- **Required Practical 9:** Measuring the population size of a common species.
- **Required Practical 10:** Investigating the effect of temperature on the rate of decay.
- **Summative Assessment:** A formal end-of-unit test using past exam questions to assess all Topic 7 content.
- **Formative Assessment:** Regular 'Do Now' retrieval tasks and progress checks.

Able and interested:
Advanced learners will evaluate the conflicting pressures on maintaining biodiversity and the ethical objections to modern farming techniques. They may also explore the mathematical complexities of **biomass** transfer efficiency and standard form in population estimates.

Inclusion, Personal Development and Wider Skills:
Practical fieldwork promotes teamwork and provides opportunities to develop mathematical skills such as calculating means, medians, and modes. Discussions on environmental protection and global food security foster personal development and a sense of global responsibility

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. Teachers may also set consolidation and revision activities.