Biology – ATAR Year 11 Semester 1 February - June 2019

Unit 1 Ecosystems and Biodiversity

| **Week** | **Key teaching points** | **Resources** | **Assessment** |
| --- | --- | --- | --- |
| 1-2 | **Biodiversity and Scientific Literacy**   * An introduction to Biology * The 3 types of biodiversity; genetic; species & ecosystem * The significance of Biodiversity in each context * The Earth as an interconnected functioning system * The Scientific Method * Graphs and tables * Response construction (including short answer and extended response). * Research skills | - **NB** pg. 4-12  - **NBO** (Prior Knowledge, AS 1.1, Revision, and Review Quiz)  - **PPT Biodiversity**  - **KA** (Intro to Biology, Levels of Biodiversity, Global Distribution of Biodiversity) | **Task 1:** Ecology Report (due Monday week 4) |
| 3–4 | **Classifying Biodiversity**   * The necessity of classification and the history of it * Taxonomy–naming groups and the significance of the nomenclature (levels of classification) * Major groups–the 3 domain system and the six kingdom approaches * The three characteristics used to classify organisms * Using dichotomous keys to classify organisms and an introduction to cladistics * Technology and classification | **- NB** pg. 14-37  **- NBO** (Prior Knowledge, AS 2.1-2.5, Revision, and Review Quiz)  - **PPT Classifying Biodiversity**  - **KA** (Evolutionary Tress) | Ecology Report due |
| 5–6 | **Biodiverse Ecosystems**   * The key Components of ecosystems, communities, and definitions * Naming ecosystems * Types of ecosystems and Biomes * Classifying ecosystems * Ecological niches and resource partitioning * The competitive exclusion principle * Relationships–predation, competition, symbiosis, collaboration and parasitism * Examples of all of these relationships * Keystone species and examples of these in local, national and global systems. | - **NB** pg. 40-66  **- NBO** (Prior Knowledge, AS 3.1-3.5, Revision, and Review Quiz)  - **PPT Biodiverse Ecosystems**  - **KA** (Intro to Ecosystems, Ecosystems and Ecosystem Services, Niches and Competition) | **Task 2:** Biodiversity and classification test (Monday) |
| 7–9 | **Energy and Matter in Ecosystems**   * How organisms get energy (autotrophs, heterotrophs, detritivores, and decomposers) * Photosynthesis, producers, and productivity * Food chains and food webs * Energy is lost at every trophic level, only 10% passed on * Flow of energy and trophic efficiency * Biological productivity- comparisons and calculations * Quantitative modeling to predict change * Cycling of matter–carbon and nitrogen * Carbon fixation in nature * Biological magnification | **- NB** pg. 70-98  **- NBO** (Prior Knowledge, AS 4.1-4.5, Revision, and Review Quiz)  - **PPT Energy and Matter in Ecosystems**  - **KA** (Ecological Interactions, Intro to Ecology, Intro to Ecosystems, Biogeochemical Cycles) | **Task 3:** Extended response – Population dynamics |
| 10–13 | **Population Dynamics**   * Populations in stable and unstable environments * Population growth calculations * Size, density, composition and distribution * Monitoring populations (direct observation, quadrats, transects, capture-mark-recapture, and telemetry) * Lincoln Peterson calculations (capture-mark-recapture) * Carrying capacity and significance of it * Restoring and controlling populations (success – wolves & cactoblastis moth, and catastrophe – cane toad) | **- NB** pg. 102-123  **- NBO** (Prior Knowledge, AS 5.1-5.5, Revision, and Review Quiz)  - **PPT Population Dynamics**  - **KA** (Intro to Population Ecology, Population Growth and Regulation) | **Task 4:** Practical Population Sampling |
| 14–15 | **Changes in Ecosystems**   * Ecosystems and dramatic change over time * Mass extinctions * Evidence of changes in the past (ice cores) * Ecological succession and climax community (primary and secondary) * Serengeti migration due to water availability * Natural disasters * Change in ecosystems leads to development of new niches-evolution * Human impacts on the environment; local; national and global examples * Fire in the Australian context (Indigenous burn control) * Using data to predict and model the impact of change on these systems * Sustainability. Define sustainability. * Strategies used to maintain biodiversity in Australia and throughout the World * Monitoring and managing ecosystems; National Parks, Strategies; Protected zones etc. * International agreements–World Heritage, biodiversity hotspots, migration routes * Analysis of Global strategies and their relative success | - **NB** pg. 126-146  **- NBO** (Prior Knowledge, AS 6.1-6.5, Revision, and Review Quiz)  - **PPT Changes in Ecosystems and Conservation**  - **KA** (Community Structure and Diversity, Biogeochemical Cycles – Eutrophication and Dead Zones, Threats to Biodiversity, Protecting Biodiversity) | **Task 5:** Energy and matter, population dynamics, and changes in ecosystems test |
| 16 | **Task 6:** Semester 1 Examination |  | **Task 6**: Exam |

**Abbreviations key**

**NB = Nelson Biology NBO = Nelson Biology Online KA = Khan Academy PPT = PowerPoint Presentation AS = Activity Sheet**