Biology – ATAR Year 11 Semester 1 February - June 2019

Unit 1 Ecosystems and Biodiversity

| **Week** | **Key teaching points** | **Resources** | **Assessment** |
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| 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**