

Cecil Andrews College

Year 9 Biological Sciences Program

2021

Resources: EDI PowerPoints, Oxford Science 9 (OS9), Pearson Science 9 (PS9), Pearson Science Activity Book (PAB9)

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| **ACSSU175: Ecosystems consist of communities of interdependent organisms and abiotic components of the environment; matter and energy flow through these systems**  **ACSSU175: Multi-cellular organisms rely on coordinated and interdependent internal systems to respond to changes in their environment** | | |
| **CONTENT/ELABORATIONS** | **KNOWLEDGE/SKILLS/VALUES** | **ACTIVITIES** |
| **Food Chains and Webs**   * Considering how energy flows into and out of an ecosystem via the pathways of food webs | **Term 1, Week 1-2**   * Describe flow of energy through ecosystems using food chains and webs * Identify organisms as producers, consumers and decomposers * Identify food chains within food webs * Describe direct impacts of changes to the food web | EDI PowerPoint: 1 Food Chains and Food Webs  Worksheet: 2 Food Chains and Food Webs |
| **Food Pyramids**   * Considering how energy flows into and out of an ecosystem via the pathways of food webs   **Relationships between Species**   * Examine interactions between organisms, such as parasites, predator/prey, and competitors | **Term 1, Week 1-2**   * Food pyramids can be used to show the transfer of energy from one organism to another * Only 10% of energy is passed on to the next level of the food pyramid * 90% of energy is used by the organism for movement, bodily functions or wasted as heat * Draw food pyramids from food chains * Food pyramids can show energy transfer or number of organisms at each level * Organisms interact with each other in an ecosystem * Relationships occur within a species (collaboration, mating, competition) * Short-term relationships occur between species (predator-prey, competition) * Symbiotic (long-term) relationships occur between organisms of different species (mutualism, commensalism and parasitism) | EDI PowerPoint: 3 Food pyramids  Worksheet: 4 Food pyramids  Class Demonstration: Challenge 2.6 Food for Thought OS9 p186  EDI PowerPoint: 5 Relationships between species  Worksheet: 6 Relationships between species |
| **Balance in Ecosystems**   * Examining factors affecting population sizes, such as habitat destruction, seasonal changes and introduced species   **Disruptions to Ecosystems**   * Investigating how ecosystems change as a result of events such as bushfires, drought and flooding | **Term 1, Week 3**   * Population size of organisms depends on abiotic and biotic factors * Ecosystem balance is a dynamic equilibrium * Changes to the ecosystem may upset the equilibrium until a new equilibrium is established * Disruptions to ecosystems can be due to natural events or human activity * Natural events include limiting resources, seasonal changes, flooding, bushfires and droughts * Human activities include introducing new species, competition for resources, pollution and clearing land | EDI PowerPoint: 7 Balance in ecosystems  Experiment: Challenge 2.3 Delicious Counting OS9 p182  EDI PowerPoint: 9 Natural Disruptions to Ecosystems  EDI PowerPoint: 10 Human Disruptions to Ecosystems |
| **Invasive Species**   * Examine interactions between organisms, such as parasites, predator/prey, and competitors * Examining factors affecting population sizes, such as habitat destruction, seasonal changes and introduced species | **Term 1, Week 4**   * Research an invasive species in Australia and present research as a written report * Identify when the species was introduced in Australia * How or why it was introduced * On a map, show where the species was first introduced and where the species has spread * What factors allowed the species to thrive in the Australian environment * Describe how the species impacted on the native flora and fauna * Describe how the species is being controlled | Assessment task: Invasive Species Assignment  Test Revision |
|  | **Assessment Task: Biological Interactions Test (Wednesday Week 4)**  **Assessment Task: Invasive Species Assignment** |  |
| **Nervous Control**   * Explaining how body systems work together to maintain a functioning body using models, flow diagrams or simulations * Identifying responses using nervous and endocrine systems | **Term 1, Week 5**   * Define stimulus as information received by the body that causes the body to respond * Define receptor as a structure that detects an external stimulus or a change in the body * Sense organs detect external stimuli * Each sense organ is sensitive to a specific stimulus * Describe examples of stimulus-response for each sense organ * Identify parts of the central nervous system as the brain and spinal cord * Identify parts of the peripheral nervous system as nerves in limbs and organs * Identify neuron parts (cell body, axon, dendrites, myelin sheath and synaptic terminal) and describe their function * Identify the three types of neuron (sensory, motor and inter) and describe their function | EDI PowerPoint: 6 Responding to Stimuli  Experiment: Testing your senses OS9 p188    EDI PowerPoint: 7 The nervous system and Neurons |
| **Nervous Control**   * Explaining how body systems work together to maintain a functioning body using models, flow diagrams or simulations * Identifying responses using nervous and endocrine systems | **Term 1, Week 6**   * Central nervous system is the control centre of the body and consists of the brain and spinal cord * The brain processes information gathered from the rest of the body * The spinal cord connects the brain to the other nerves in the body * Peripheral nervous system is a network of nerves in the limbs and organs * The peripheral nervous system is divided into the somatic nervous system and the autonomic nervous system * The stimulus response model describes how messages are sent through the body * Stimulus 🡪 Receptor 🡪 Control centre 🡪 Effector 🡪 Response * Describe examples of stimulus response * A reflex action is an involuntary, almost instantaneous movement * Explain difference between reflex actions and normal stimulus-response * Explain why reflex actions are faster than usual responses | EDI PowerPoint: Central and Peripheral Nervous Systems  EDI PowerPoint: Stimulus-Response Model  Experiment: How fast is the nervous system? OS9 p189  Worksheet: OS9 Things can go wrong with the nervous system |
| **Hormonal Control**   * Explaining how body systems work together to maintain a functioning body using models, flow diagrams or simulations * Identifying responses using nervous and endocrine systems | **Term 1, Week 7**   * The endocrine system uses hormones to control and regulate the body * Hormones are chemical messengers produced by glands, which travel through the blood stream * Target cells have receptors that match specific hormones * Identify some endocrine organs in the body, the hormones they produce and their target organs * Homeostasis is maintaining a constant internal environment in the body * Maintains blood sugar and body temperature through negative feedback * Negative feedback occurs when the body responds to remove a stimulus * Describe negative feedback in terms of heat and blood glucose regulation (general) | EDI PowerPoint: Endocrine System  Worksheet:  EDI PowerPoint: Homeostasis |
| **Hormonal Control**   * Explaining how body systems work together to maintain a functioning body using models, flow diagrams or simulations * Identifying responses using nervous and endocrine systems   **Disease**   * Investigating the response of the body to changes as a result of the presence of micro-organisms | **Term 1, Week 8**   * Blood glucose levels are controlled by the pancreas * When blood glucose is high (stimulus), pancreas secretes insulin * Insulin causes muscle and liver cells to store glucose, removing stimulus * When blood glucose is low (stimulus), pancreas secretes glucagon * Glucagon causes muscle and liver cells to release glucose into the blood, removing the stimulus * Diseases are caused by micro-organisms, including bacteria, viruses and fungi * The micro-organisms that cause disease are also called pathogens | EDI PowerPoint: Blood glucose regulation  Worksheet: OS9 Hormones are used in Sport  Worksheet: PS9 EW2 Diseases of the endocrine system  EDI PowerPoint: Pathogens cause disease  Worksheet: Timeline or microbe passports?  Worksheet: Investigation Planning Sheet |
| **Disease**   * Investigating the response of the body to changes as a result of the presence of micro-organisms | **Term 1, Week 9**   * **Revision and test** | EDI PowerPoint: Immune System |