

Unit 1: Maintaining Dynamic Equilibrium II

Nervous System: Neurons and Structure

1.1.1 - explain how different plant and animal systems maintain homeostasis; identify the role of some compounds, such as water, glucose, and ATP, commonly found in living systems; design an experiment to investigate and collect data on aspects of the nervous system and identify specific variables involved; analyze the nervous system and compile and organize data to interpret its structure and dynamics

Influences on the Nervous System

1.2.1 - evaluate the impact of viral, bacterial, genetic, and environmental diseases on an organism's homeostasis; analyze how and why technologies and drugs developed and improved over time can affect homeostasis; evaluate and describe examples of treatments and technologies for visual and auditory functions

Endocrine System: Maintaining Homeostasis

1.3.1 - explain how different plant and animal systems maintain homeostasis; identify and describe the structure and function of important biochemical compounds, including protein and steroid hormones; explain the critical role of enzymes in cellular metabolism; design and do an experiment, identify variables, and compile and organize data on selected aspects of the endocrine system

Endocrine System: Feedback Mechanisms

1.4.1 - analyze homeostatic phenomena to identify the feedback mechanisms involved; analyze contributions, including Canadian, to science and technology and how these have improved over time

Unit 2: Reproduction and Cell Development

Cell division

2.1.1 - design, perform, compile data, and evaluate experiments on plant materials, using instruments effectively, controlling major variables, and selecting appropriate processes; describe in detail mitosis and meiosis; investigate, analyze, and communicate genetic techniques, giving examples from organized data, that use technologies that have been developed based on cells; evaluate the physiological and ethical consequences of medical treatments such as radiation therapy and chemotherapy

Reproductive Systems: Regulation and Technologies

2.2.1 - analyze and describe the structure and function of female and male mammalian reproductive systems; identify and apply criteria, including potential applications, chemicals, and diseases, to explain the human reproductive cycles; select and integrate information from various sources and explain current reproductive technologies for plants and animals; distinguish between scientific questions and technological problems to evaluate the use of reproductive technologies for humans

Embryonic Differentiation and Development

2.3.1 - explain the human reproductive cycles, including analyzing examples of the effects of technology and science on reproduction

Molecular Level: DNA and Protein Synthesis

3.1.1 - summarize the discoveries, including the role of evidence, that led to the modern concept of the gene; identify and describe the roles of chromosomes in the transmission of hereditary information from one cell to another; explain how the current model of DNA replication, the structure of DNA and RNA, and protein synthesis revolutionized thinking in scientific communities; describe and predict the effects of genetic mutations on a cell's information, including protein synthesis, phenotypes, and heredity

Unit 3: Genetic Continuity and Evolution: Change and Diversity

Mendelian Genetics

3.2.1 - using Mendelian genetics, state a prediction, perform, and interpret patterns and trends in genetic data of monohybrid and dihybrid crosses and explain how the data supports or refutes the situation

Implications: Genetic diseases and technologies

3.3.1 - explain the circumstances that lead to genetic diseases; analyze the risks and benefits to society and the environment and construct arguments concerning the use of genetic engineering, using examples and evidence from various perspectives; analyze, describe, and evaluate genetics-based technology development, design, and solutions; explain and analyze, from a variety of perspectives, the risks and benefits of the influence of the Human Genome Project; investigate, perform, and defend a position or course of action on genetic modification, integrating various sources and science- and technology-based careers

Evidence and Mechanisms of Evolution and Evolutionary Change

4.1.1 - describe and evaluate scientific peer review and evidence that have changed evolutionary concepts and feeds the debates on gradualism and punctuated equilibrium; explain and analyze the roles of evidence, theories, and paradigms as these are tested, and subsequently restricted, revised, or replaced

Implications from a Biological Perspective

4.2.1 - identify questions to investigate, collect information, and construct arguments to support the development and diversity of living organisms, using examples and evidence; outline evidence and arguments pertaining to the origin, development, and diversity of living organisms on Earth and identify new questions that arise from what was learned