

## **Curriculum Outcomes Biology 12**

### **Cell division:**

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

### **Genetic continuity at molecular level:**

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

### **Mendelian genetics:**

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

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

### **Reproductive system: regulation and technologies:**

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:**

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

### **Nervous system: Neurons and Structure**

explain how different plant and animal systems, including the vascular and nervous systems, help 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

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:**

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

analyze homeostatic phenomena to identify the feedback mechanisms involved

design and do an experiment, identify variables, and compile and organize data on selected aspects of the endocrine system

analyze homeostatic phenomena to identify the feedback mechanisms involved

analyze contributions, including Canadian, to science and technology and how these have improved over time