

BIG IDEAS

Homeostasis

The body strives to maintain homeostasis.

DNA and Cells

All living things are made of cells, which contain DNA and cell structures that allow cells to survive and reproduce.

Organization

Organ systems have complex interrelationships to maintain homeostasis.

Learning Standards

Curricular Competencies	Content
<p><i>Students are expected to be able to do the following:</i></p> <p>Questioning and predicting</p> <ul style="list-style-type: none"> • Demonstrate a sustained intellectual curiosity about a scientific topic or problem of personal, local, or global interest • Make observations aimed at identifying their own questions, including increasingly abstract ones, about the natural world • Formulate multiple hypotheses and predict multiple outcomes <p>Planning and conducting</p> <ul style="list-style-type: none"> • Collaboratively and individually plan, select, and use appropriate investigation methods, including fieldwork and lab experiments, to collect reliable data (qualitative and quantitative) • Assess risks and address ethical, cultural, and/or environmental issues associated with their proposed methods • Use appropriate SI units and appropriate equipment, including digital technologies, to systematically and accurately collect and record data • Apply the concepts of accuracy and precision to experimental procedures and data: <ul style="list-style-type: none"> – significant figures – uncertainty – scientific notation 	<p><i>Students are expected to know the following:</i></p> <p>Homeostasis</p> <ul style="list-style-type: none"> • cellular compounds and biological molecules: <ul style="list-style-type: none"> – water – acids, bases, buffers – organic molecules: carbohydrates, lipids, proteins, nucleic acid, ATP • dehydration and synthesis reactions • enzymes and metabolic pathways: <ul style="list-style-type: none"> – models of enzymatic reactions – role of vitamins and coenzymes – effects on enzyme activity – metabolism • feedback loops regulate the body's internal environment: <ul style="list-style-type: none"> – positive feedback – negative feedback • structure of plasma membrane: <ul style="list-style-type: none"> – phospholipid bilayer – hydrophobic and hydrophilic regions – proteins • transport across a cell membrane: <ul style="list-style-type: none"> – selective permeability – factors that affect the rate of diffusion – tonicity • surface-area-to-volume ratio

Learning Standards (continued)

Curricular Competencies	Content
<p>Processing and analyzing data and information</p> <ul style="list-style-type: none"> • Experience and interpret the local environment • Apply First Peoples perspectives and knowledge, other ways of knowing, and local knowledge as sources of information • Seek and analyze patterns, trends, and connections in data, including describing relationships between variables, performing calculations, and identifying inconsistencies • Construct, analyze, and interpret graphs, models, and/or diagrams • Use knowledge of scientific concepts to draw conclusions that are consistent with evidence • Analyze cause-and-effect relationships <p>Evaluating</p> <ul style="list-style-type: none"> • Evaluate their methods and experimental conditions, including identifying sources of error or uncertainty, confounding variables, and possible alternative explanations and conclusions • Describe specific ways to improve their investigation methods and the quality of the data • Evaluate the validity and limitations of a model or analogy in relation to the phenomenon modelled • Demonstrate an awareness of assumptions, question information given, and identify bias in their own work and in primary and secondary sources • Consider the changes in knowledge over time as tools and technologies have developed • Connect scientific explorations to careers in science • Exercise a healthy, informed skepticism and use scientific knowledge and findings to form their own investigations to evaluate claims in primary and secondary sources • Consider social, ethical, and environmental implications of the findings from their own and others' investigations • Critically analyze the validity of information in primary and secondary sources and evaluate the approaches used to solve problems • Assess risks in the context of personal safety and social responsibility 	<p>DNA and Cells</p> <ul style="list-style-type: none"> • cell structures and functions • interrelationship of cell structures • DNA carries the cell's genetic information: <ul style="list-style-type: none"> – process of DNA replication – process of protein synthesis – effects of DNA mutations – genomics – biotechnology, cloning, and recombinant DNA <p>Organization</p> <ul style="list-style-type: none"> • levels of organization • tissues are organized into four groups • organs within each of the systems are interconnected to maintain homeostasis: <ul style="list-style-type: none"> – digestive system – cardiovascular and lymphatic system – respiratory system – urinary system – reproductive system – nervous system • functional interrelationships exist among body systems • nutrition and lifestyle differences affect human health • First Peoples holistic approach to health • medical conditions may affect body systems

Learning Standards (continued)

Curricular Competencies	Content
<p>Applying and innovating</p> <ul style="list-style-type: none"> • Contribute to care for self, others, community, and world through individual or collaborative approaches • Co-operatively design projects with local and/or global connections and applications • Contribute to finding solutions to problems at a local and/or global level through inquiry • Implement multiple strategies to solve problems in real-life, applied, and conceptual situations • Consider the role of scientists in innovation <p>Communicating</p> <ul style="list-style-type: none"> • Formulate physical or mental theoretical models to describe a phenomenon • Communicate scientific ideas, information, and perhaps a suggested course of action, for a specific purpose and audience, constructing evidence-based arguments and using appropriate scientific language, conventions, and representations • Express and reflect on a variety of experiences, perspectives, and worldviews through place 	