

BIG IDEAS

Homeostasis is maintained through physiological processes.

Gene expression, through protein synthesis, is an interaction between genes and the environment.

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 field work 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>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 | <p><i>Students are expected to know the following:</i></p> <ul style="list-style-type: none"> • biological molecules • metabolism and enzymes • feedback loops and regulation of the body's internal environment • transport across a cell membrane • DNA: <ul style="list-style-type: none"> – the cell's genetic information – replication • gene expression • proteins and their relationship to the structure and function of all cells • genomics and biotechnology • micro to macro organization • organ systems: <ul style="list-style-type: none"> – structure and function – structural and functional interdependence – maintenance of homeostasis • lifestyle differences and their effects on human health • holistic approach to health • disease as an imbalance in homeostasis |

Learning Standards (continued)

| Curricular Competencies | Content |
|---|---------|
| <ul style="list-style-type: none"> • 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 their 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 | |

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 • Cooperatively 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 and 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 | |