Alberta Curriculum Outcomes

Grade 6

Grade 6 Science

Organizing Idea:
Living Systems: Understandings of the living world, Earth, and space are deepened through investigating natural systems and their interactions.
Guiding Question: What are ecosystems?
Learning Outcome: Students investigate the characteristics and components of ecosystems and the impact of human activity.

Knowledge:
- Biotic components of an ecosystem include plants, animals, and microorganisms. Abiotic components of an ecosystem include • the Sun • water • soil • air • temperature
- There are many types of ecosystems, such as • desert • arctic • grassland • wetland • forest • tundra • freshwater • marine • alpine
- Wetlands store greenhouse gases and prevent them from being released into the atmosphere.
- Characteristics of ecosystems include • climate patterns • size • vegetation structure • animal populations • geographic location.

Understanding:
- Ecosystems are complex systems of biotic and abiotic components.
- All components of an ecosystem depend on each other either directly or indirectly.
- Each ecosystem has specific components and characteristics.

Skills and Procedures:
- Represent the connections between components of an ecosystem by recording observations using words, tables, graphs, diagrams, photographs, or other representations.
- Locate and responsibly examine an ecosystem in nature.
- Practice safe and appropriate use of materials and digital or non-digital tools, including still-image, video recording, and magnifying devices, while physically examining a local ecosystem.
- Relate the preservation of wetlands to possible actions to address climate change.

- Identify characteristics of a chosen ecosystem and represent them using a model.
- Identify similarities and differences between two ecosystems.

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Knowledge:
- Plants play a variety of roles in an ecosystem, including photosynthesis • cleaning and filtering water • preventing soil erosion providing food and shelter for animals.
- Humans use plants in various ways, including • production of oxygen • food • clothing • paper • building materials • medicine • fuel • shade from the Sun.
- Certain plants, such as sage, sweetgrass, cedar, and tobacco, are considered sacred to First Nations and Métis.

Understanding:
- The characteristics of an ecosystem affect the diversity of the organisms that live in it.
- Plants play an essential role in an ecosystem.
- Plants are used to meet human needs.

Skills and Procedures:
- Analyze diversity of animals and plants in various ecosystems.
- Research the importance of plants in an ecosystem.
- Identify how plants are used to meet human needs.

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Knowledge:
- The process of photosynthesis produces food in the form of sugar (glucose) and oxygen.
- Food produced by photosynthesis can be used by plants and algae to perform vital biological processes.
- Food produced by photosynthesis can be digested by animals when they consume plants.
- Oxygen released by plants during photosynthesis is used in respiration by animals.
- The following are required for photosynthesis to occur: • chlorophyll • light energy • water • carbon dioxide • nutrients.
- The release of oxygen and the presence of starch prove that a plant has been photosynthesizing.
- Sugar produced by plants through photosynthesis is stored as starch.
- Iodine can be used to indicate the presence of starch.

Understanding:
- Photosynthesis is essential to maintain many ecosystems.
- Tests can be performed to determine if a plant has been photosynthesizing.

*Obtain one of the plants grown and conduct tests to determine photosynthesis

Skills and Procedures:
- Explain the process of photosynthesis and its importance in an ecosystem.
- Design a simple experiment to demonstrate the importance of light energy to photosynthesis.
- Design a simple experiment to show a plant is releasing gas.
- Design a simple experiment to show a plant contains starch.

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Organizing Idea:

Scientific Methods: Investigation of the physical world is enhanced through the use of scientific methods that attempt to remove human biases and increase objectivity.

Guiding Question: What is the purpose of scientific explanations?

Learning Outcome: Students investigate and describe the role of explanation in science.

Knowledge:
- Scientific explanations must be testable (falsifiable).
- Testable explanations can be contradicted by evidence.
- Scientific explanations make sense of natural phenomena by identifying relationships between natural phenomena, including cause and effect.

Understanding:
- Scientific explanations are answers to scientific questions.
- Scientific explanations are statements that aim to make sense of natural phenomena.

Skills and Procedures:
- Discuss the role of scientific explanations.
- Research and share examples of scientific explanations that make sense of natural phenomena.
- Use evidence to evaluate explanations of cause and effect related to natural phenomena.

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Knowledge:
- Hypotheses are based on prior scientific knowledge and understandings.
- Data used in scientific explanations includes observations or measurements gathered using scientific methods.

- Evidence used in scientific explanations includes findings from analyzing observations and measurements used to support or contradict a hypothesis.
- Explanations should be constructed using reliable, objective data and evidence.
- Only scientific experiments performed with objectivity and a high level of accuracy produce trustworthy evidence to support explanations.
- Not all scientific experiments are completed with the same level of objectivity and accuracy.

Understanding:
- Hypotheses are proposed scientific explanations that are developed prior to conducting an investigation.
- Scientific explanations are based on data and evidence.

Skills and Procedures:
- Develop a hypothesis before conducting a simple investigation.
- Create scientific explanations using observations and measurements to explain how natural phenomena occur.
- Discuss observations and measurements that were used to create scientific explanations.
- Evaluate the trustworthiness of evidence and explanations from a variety of sources.
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Knowledge:
- Scientists communicate evidence and explanations differently to the public than to the scientific community.
- Scientists communicate data, evidence, and explanations to the public through graphs, tables, flow charts, diagrams • • formulas • models • role plays • films • maps.
- Scientists communicate data, evidence, and explanations to the scientific community through research papers • conferences graphs, tables, flow charts, diagrams • • formulas • models • maps.
- Ways to share explanations of natural events include • written texts • traditional knowledge • visual forms • verbal presentations • stories and legends.

Understanding:
- Representations of data and evidence enhance scientific understanding and explanation.
- Explanations of natural events and phenomena have historically been and continue to be shared in various ways.

Skills and Procedures:
- Communicate ideas, explanations, and processes using various representations, including appropriate technologies.
- Construct graphs and tables using proper labels, legends, scales, and titles.
- Interpret various representations of data and evidence to explain natural phenomena.
- Compare and refine explanations based on an evaluation of the evidence presented.
- Determine the appropriateness of methods of communicating data, evidence, and explanations based on the audience.
- Compare and contrast multiple forms of text that offer explanations of natural events and phenomena.

Grade 6 English Language Arts

Organizing Idea:

Oral Language: Listening and speaking form the foundation for literacy development and improve communication, collaboration, and respectful mutual understanding.

Guiding Question: How can understanding aspects of the history of oration enhance the quality and efficacy of oral communication?

Learning Outcome: Students connect historical aspects of oral communication to how ideas and information can be shared today.

Knowledge:

- Collaborative dialogue can empower individuals or groups to voice ideas • express understandings • consider a variety of perspectives • improve thinking.
- Collaborative dialogue can include generating innovative ideas during conversational exchanges.
- Collaborative dialogue can be used as a process to solve problems.
- Collaborative dialogue can increase individual or group confidence through the development of trust and the building of relationships.
- Respectful language can advance collaborative dialogue.

Understanding:

- Collaborative dialogue can be used to expand ideas and deepen understanding of self, others, and the world.

Skills and Procedures:

- Offer relevant information and logical reasoning to enhance collaborative dialogue.
- Examine alternatives to make decisions, solve problems, or select courses of action.
- Consider varied perspectives or opinions to make dialogue more collaborative.
- Share new, expanded, or adjusted learnings derived from collaborative dialogue.

Grade 6 Mathematics

Organizing Idea: Statistics: The science of collecting, analyzing, visualizing, and interpreting data can inform understanding and decision making.
Guiding Question: How can frequency support communication?
Learning Outcome: Students apply and explain relative frequency with experimental data

Knowledge:
- Relative frequency can be used to compare the same category of data across multiple data sets.
- Relative frequency can be represented in various forms.

Understanding:
- Relative frequency expresses the frequency of a category of data as a fraction of the total number of data values.

Skills and Procedures:
- Interpret frequency of categorized data as relative frequency.
- Express relative frequencies as decimals, fractions, or percentages.