Alberta Curriculum Outcomes

** Statements written in green italics are suggestions for carrying out each outcome*

Grade 4

Grade 4 Science

Organizing Idea
Matter: Understandings of the physical world are deepened through investigating matter and energy
Guiding Question: How can materials be managed safely?
Learning outcome: Students investigate management of waste materials and describe potential personal and environmental impacts.

Knowledge:

- Methods of waste management can include using landfills • combusting • composting • recycling
- Waste materials may be solids, liquids, or gasses.

Understanding:

- Waste materials should be managed responsibly based on potential impact.
- New materials created from natural materials can produce waste that must be carefully managed to protect the environment.

Skills and Procedures:

- Research the environmental impact of different methods of waste management.

Knowledge:

- Ways to lessen the amount of waste materials and the environmental impact of those materials include • reducing •reusing •recycling • repurposing • repairing

Understanding:

- People can make choices that reduce the environmental impact of waste materials.

Skills and Procedures:

- Apply knowledge of recycling, reusing, reducing, repurposing, and repairing materials to develop a personal plan to reduce waste.
- Research local programs for recycling, reusing, reducing, repurposing, and repairing materials. Represent the recycling process using diagrams.

**Discuss the concept of recycling food, i.e. composting. Explain how composting helps agriculture.*

Knowledge:

- Water is a basic need for plants and animals and provides habitat for many organisms.
- For many First Nations, Métis, and Inuit, water is sacred, as it sustains life.

Understanding:

- Most organisms on Earth require water to meet their needs.
- First Nations, Métis, and Inuit hold a sense of responsibility to protect water and sources of water.

Skills and Procedures

- Discuss ways that plants and animals use water to meet their basic needs.
- Research plants and animals that exist in various bodies of water.
- Discuss the importance of water to First Nations, Métis, and Inuit and how it sustains life.

Knowledge:

- Changes made to one system that can impact another system can include • number of organisms • food sources • habitat • water cleanliness • migration patterns • weather patterns

Understanding:

- Changes in one of Earth's systems can affect other systems.
- Small changes to an environment can significantly impact organisms in that environment.

Skills and Procedures:

- Explain how changes made to one system can have impacts on other systems.
- Research and discuss how Indigenous communities work alongside Parks Canada to further understand multisystem impacts.

Knowledge:

- Natural resources include • air • water • soil • minerals • metals • organism

- Conservation is the preservation and protection of Earth's systems from pollution, depletion, or extinction.
- Conservation can be informed by a variety of • methods • understanding First Nations, Métis, and Inuit perspectives • processes

Understanding:

- Earth's systems include natural resources.
- Conservation can impact land, natural resources, and organisms.
- Many First Nations, Métis, and Inuit practise traditional methods of conservation.

Skills and Procedures:

- Investigate natural resources found locally.
- Identify ways in which plants, animals, and land can be protected or maintained through conservation practices.
- Discuss First Nations, Métis, and Inuit conservation practices that include giving and taking only what is needed.

Knowledge:

- Conservation practices can be implemented in natural and cultivated areas.
- Conservation involves creating parks, including • local • provincial • national
- Conservation can be practiced through actions around • use of electricity • use of water • reducing waste • daily life choices

Understanding:

- Conservation aims to minimize disturbance and impact on plants, animals, and land.
- Conservation of Earth's systems requires taking deliberate actions.
- Conservation of Earth's systems requires planning and design.

**Discuss how recycling and composting help to preserve the Earth*

Skills and Procedures:

- Identify examples of conservation practices in natural and cultivated areas.
- Evaluate the benefits of creating provincial and national parks.
- Discuss how to balance human use of parks and conservation of wildlife.
- Describe examples of personal actions that contribute to conservation in daily life.
- Create a plan to implement a conservation practice in a local environment.

Organizing Idea:

Living Systems: Understandings of the living world, Earth, and space are deepened through investigating natural systems and their interactions.

Guiding Question: How are organisms designed for survival?

Learning Outcome: Students analyze organisms and relate their external structures to functions.

Knowledge:

- Micro-organisms include bacteria.
- Ways to classify organisms can include • appearance • habitat • structures
- Structures, including body parts, are features of organisms that serve a purpose or function.

Understanding:

- Organisms are individual animals, plants, or single-celled life forms.
- Organisms can be classified in various ways.

Skills and Procedures:

- Find examples of local plants and animals and describe their appearance and habitat.

Knowledge:

- External structures of organisms can include • roots • stems • leaves • flowers • fruit • claws • teeth • legs • shells • skins

Understanding:

- Organisms have external structures.

Skills and Procedures:

- Represent the external structures of plants and animals.
- Find examples of local plants and identify their external structures.
- Classify plants and animals by external structures and appearance.

Knowledge:

- Ways that external structures support growth and survival include how plants and animals sense their environment and meet their needs.

**Create a lesson on how a plant may sense its environment and protect itself*

Understanding:

- Organisms have external structures that support growth and survival.

Skills and Procedures:

- Describe how external structures are connected to survival.

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: How can evidence advance knowledge in science?
Learning Outcome: Students investigate the nature of evidence and reflect on its role in science.

Knowledge:

- Types of data include qualitative and quantitative.
- Qualitative data is descriptive and usually categorized and expressed using words.
- Quantitative data is measured and expressed using numbers and counts
- Relevant data addresses the question that is being investigated.
- All relevant data must be considered.

Understanding:

- Evidence is produced through the study and interpretation of data.
- Evidence can be used to support or refute predictions based on the question being investigated.
- Some observations and data are not relevant to the question being investigated.

Skills and Procedures:

- Analyze data collected from investigations.
- Differentiate between qualitative and quantitative data.
- Determine what observations and data should be collected to address the question being investigated.

Knowledge:

- Data gathered during a descriptive investigation is used as evidence to describe characteristics of components of the physical world.
- Data gathered during a comparative investigation is used as evidence to make comparisons between components of the physical world.
- Data gathered during an experimental investigation is used as evidence to determine cause and effect.
- Data from observations can be recorded or measured more accurately using tools and technology.

**Have students collect data from the plant growth and document it*

Understanding:

- Ongoing collection of evidence allows the scientific community to attach new learning to what was previously understood.
- Accurate evidence requires the careful use of measuring tools and technology.

Skills and Procedures:

- Research how past scientific understandings have changed based on new evidence.
- Produce reliable and valid evidence by using appropriate measuring tools and technology to collect accurate data.
- Discuss technologies used in investigations to improve observation or measurement.

Knowledge:

- Ways to share scientific evidence include • written texts • verbal presentations • oral traditions • graphs • tables • charts • diagrams • simulations • models

Understanding:

- Evidence can be summarized, represented, and shared in multiple ways to build a body of knowledge.

Skills and Procedures:

- Summarize, represent, and share evidence from an investigation in a variety of ways.
- Represent data in graphs, tables, charts, diagrams, simulations, or models

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Grade 4 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: In what ways can listening and speaking have an intentional and reciprocal relationship?
Learning Outcome: Students examine and demonstrate how listening and speaking interactions build relationships and support understanding.

Knowledge:

- Respectful interactions include behaviours that consider the contributions, feelings, and needs of participants.
- Phrasing and pausing work together to create flow of thought and speech.
- Rhythms and pauses can be used to support meaning or create emphasis.
- Projection is a safe way to be heard.
- Projection is the directing and supporting of the voice toward an intended target.
- Projection is a combination of relaxation, breath, clarity, and intentionality.
- Listening can include restating key points or ideas and making personal connections.
- Listening to texts can expand vocabulary, understandings, and personal views

Understanding:

- Listening and speaking can support interactions that consider the needs of participants.
- Listening involves playing an active role in understanding the speaker.

Skills and Procedures:

- Contribute respectfully to a variety of interactions that involve listening and speaking.
- Identify opinions or points of view shared in conversations or texts that are listened to.
- Select appropriate volume, intonation, phrasing, and pausing to evoke a desired effect when speaking or presenting.
- Project voice appropriately for the audience and situation.
- Identify stress, emphasis, or pauses when listening to others.
- Demonstrate active listening when engaging in collaborative work.
- Use a variety of listening strategies to support understanding.

Knowledge:

- Questioning can help focus research topics and processes.

Understanding:

- Research processes can involve investigating materials or information to uncover facts and support problem solving.

Skills and Procedures:

- Access information from a variety of sources to critically answer questions or expand knowledge.
- Demonstrate how information can be shared using a variety of methods or tools.
- Use research to create written text for an intended audience.
- Choose and cite appropriate sources of information to inform research.

Grade 4 Mathematics

Organizing Idea:

Statistics: The science of collecting, analyzing, visualizing, and interpreting data can inform understanding and decision making.

Guiding Question: In what ways can we shape communication with our choice of representation?

Learning Outcome: Students apply and evaluate representation with scale.

Knowledge:

- A statistical problem-solving process includes • formulating statistical questions • collecting data • representing data • interpreting data
- Many-to-one correspondence is the representation of many objects using one object or interval on a graph.
- Graphs can include • pictographs • bar graphs • dot plots.

Understanding:

- Representation is part of a statistical problem-solving process.
- Representation can express many-to-one correspondence by defining a scale.
- Different representations tell different stories about the same data

Skills and Procedures:

- Engage in a statistical problem solving process.
- Select an appropriate scale to represent data.
- Represent data in a graph using many-to-one correspondence.
- Describe the effect of scale on representation.
- Justify the choice of graph used to represent certain data.
- Compare different graphs of the same data.
- Interpret data represented in various graphs.