

## Grade 2 Curriculum



**M = Matter**

**E = Energy**

**ES = Earth Systems**

**S = Space**

**LS = Living Systems**

**CS = Computer Science**

**SM = Scientific Method**



**Indigenous content**

### Matter (M)

Understandings of the physical world are deepened by investigating matter and energy.

*Guiding Question: How can the suitability of materials be determined for specific purposes?*

### LEARNING OUTCOME

**2M 1.1 Students investigate properties of materials and relate them to a purpose.**

#### 2M 1.1 UNDERSTANDING

Materials can be combined in a variety of ways to make objects.

#### KNOWLEDGE

Materials are used to make objects.

#### SKILLS & PROCEDURES

Identify the materials used to make various objects.

Combine materials to create an object for a specific purpose.

#### 2M 1.2 UNDERSTANDING

Materials have unique properties.

#### KNOWLEDGE

Properties of materials that can be tested include

- if light passes through (transparency)
- if water is absorbed
- if the material can be shaped (malleability)
- if light is reflected (reflection)

Various properties of materials can be measured, including length and weight (mass).

#### SKILLS & PROCEDURES

Test properties of various materials.

Measure various materials using non-standard units.

#### 2M 1.3 UNDERSTANDING

Materials are natural or processed.

All processed materials originate from natural materials.

#### KNOWLEDGE

Natural materials are those that come from plants, animals, the land, or the sky.

Processed materials are made by humans.

#### SKILLS & PROCEDURES

Sort various materials as being natural or processed.

#### 2M 1.4 UNDERSTANDING

Natural and processed materials are used to make a variety of objects that serve a variety of purposes.



#### KNOWLEDGE

An object can be made from different materials; e.g., a canoe can be made from wood or aluminum.

Examples of objects made from natural materials that are

#### SKILLS & PROCEDURES

Identify natural and processed materials that could be used for a specific purpose.

<p>created and used by First Nations, Métis, and Inuit are</p> <ul style="list-style-type: none"> <li>• Dene birchbark baskets</li> <li>• travois</li> <li>• Red River carts</li> <li>• canoes</li> <li>• Inuit scraping tools; e.g., ulu</li> </ul>	<p>Identify an object that can be made from different materials.</p> <p>Identify natural materials used by local First Nations, Métis, or Inuit and relate the materials' uses to specific purposes.</p> 
<p><b>2M 1.5 UNDERSTANDING</b></p> <p>The purpose of an object influences the choice of materials used to produce it.</p> <p>Some materials are more suitable than others for making a product for a specific purpose.</p>	
<p><b>KNOWLEDGE</b></p> <p>Knowledge of the properties of materials and their purposes is important in many occupations and roles, such as</p> <ul style="list-style-type: none"> <li>• carpenter</li> <li>• engineer</li> <li>• designer</li> <li>• Knowledge Keeper or Elder</li> </ul> <p>First Nations, Métis, and Inuit use of materials is informed by</p> <ul style="list-style-type: none"> <li>• traditional knowledge</li> <li>• time of year</li> <li>• availability</li> <li>• taking only what is needed</li> <li>• respect for the land</li> </ul> 	<p><b>SKILLS &amp; PROCEDURES</b></p> <p>Compare the properties of materials to determine what material is best suited for a specific purpose.</p> <p>Explain the relationship between suitability of materials and purpose.</p> <p>Select a material and use it to create an item for a specific purpose.</p> <p>Discuss the choice of material based on availability and purpose.</p>

NEW (or Not explicitly stated in current curriculum)

<p><b>Energy (E)</b></p> <p>Understandings of the physical world are deepened by investigating matter and energy.</p> <p><b>Guiding Question: Where do light and sound come from, and how do they move?</b></p>	
<p><b>LEARNING OUTCOME</b></p> <p><b>2E 1.1 Students investigate the behaviours of light and sound.</b></p>	
<p><b>2E 1.1 UNDERSTANDING</b></p> <p>Behaviours of sound affect its characteristics.</p>	
<p><b>KNOWLEDGE</b></p> <p>Sound behaves in various ways, including</p> <ul style="list-style-type: none"> <li>• travelling in a straight line from its source</li> <li>• transferring from one object to another</li> <li>• bouncing off a surface (reflection/diffusion)</li> <li>• stopping in an object (absorption)</li> </ul> <p>Sound is produced by vibrations of objects.</p> <p>Vibration is a rapid back-and-forth movement.</p> <p>Sources of sound can be natural or human-made, such as</p> <ul style="list-style-type: none"> <li>• musical instruments</li> <li>• speakers and headphones</li> <li>• vocal cords of humans and other animals</li> <li>• objects hitting each other</li> </ul>	<p><b>SKILLS &amp; PROCEDURES</b></p> <p>Relate vibration to the production of sound.</p> <p>Identify sources of sound.</p> <p>Listen to sounds and describe their characteristics.</p> <p>Safely explore the production and behaviour of sound.</p> <p>Build a device to change the behaviour of sound.</p>


<p>Characteristics of sound include</p> <ul style="list-style-type: none"> <li>• volume, which can be described as quiet or loud</li> <li>• pitch, which can be described as high or low</li> <li>• duration, which can be described as short or long</li> <li>• Sound can travel through air, water, and some solids.</li> </ul> <p>Properties of materials that affect the production and behaviour of sound include</p> <ul style="list-style-type: none"> <li>• size</li> <li>• texture</li> <li>• shape</li> <li>• type</li> </ul>	
<b>2E 1.2 UNDERSTANDING</b> Behaviours of light affect its path.	
<p><b>KNOWLEDGE</b></p> <p>Sources of light include</p> <ul style="list-style-type: none"> <li>• the Sun matter</li> <li>• electricity</li> <li>• fire</li> <li>• some plants and animals (bioluminescence)</li> </ul> <p>Light behaves in various ways, including</p> <ul style="list-style-type: none"> <li>• travelling in a straight line from its source</li> <li>• bouncing off a surface (reflection)</li> <li>• bending as it travels from one material to another (refraction)</li> <li>• splitting into colours (dispersion)</li> </ul> <p>Light travels through objects that can be seen through (transparent).</p> <p>The path of light is affected by mirrors, prisms, and water.</p> <p>The path of sunlight can be affected in a variety of ways by natural objects, such as</p> <ul style="list-style-type: none"> <li>• leaves</li> <li>• trees</li> <li>• bodies of water</li> <li>• mountains</li> </ul>	<p><b>SKILLS &amp; PROCEDURES</b></p> <p>Identify sources of light.</p> <p>Conduct an investigation to determine how the path of light can be affected.</p> <p>Examine how natural objects affect the path of sunlight.</p>

<p><b>Earth Systems (ES)</b></p> <p>Understandings of the living world, Earth, and space are deepened by investigating natural systems and their interactions</p> <p><i>Guiding Question: How can Earth's components and relationship to the Sun be understood?</i></p>	
<p><b>LEARNING OUTCOME</b></p> <p><b>2ES 1 Students investigate Earth, its landforms, its bodies of water, and its relationship to the Sun.</b></p>	
<p><b>2ES 1.1 UNDERSTANDING</b></p> <p>Earth consists of many components that support life.</p>	
<p><b>KNOWLEDGE</b></p> <p>Components of Earth include</p> <ul style="list-style-type: none"> <li>• land</li> </ul>	<p><b>SKILLS &amp; PROCEDURES</b></p> <p>Represent various components of Earth.</p>

<ul style="list-style-type: none"> <li>• water</li> <li>• air</li> <li>• plants, animals, and humans</li> </ul> <p>At this time, Earth is the only planet known to support life.</p> <p>Scientists are looking for life on other planets and moons.</p>	<p>Discuss how the various components of Earth interact to support life.</p>
<b>2ES 1.2 UNDERSTANDING</b> Earth's surface consists of various types of landforms.	
<b>KNOWLEDGE</b> A landform is a natural feature of Earth's surface.  Alberta has many different landforms, such as <ul style="list-style-type: none"> <li>• plateaus</li> <li>• mountains</li> <li>• valleys</li> <li>• hills</li> <li>• prairies</li> </ul> Landforms can be described as <ul style="list-style-type: none"> <li>• hilly</li> <li>• rocky</li> <li>• steep or flat</li> <li>• big or small</li> </ul> Some places and landforms in Alberta have been identified as UNESCO World Heritage Sites, such as <ul style="list-style-type: none"> <li>• Dinosaur Provincial Park</li> <li>• Wood Buffalo National Park</li> <li>• Head-Smashed-In Buffalo Jump</li> </ul>	<b>SKILLS &amp; PROCEDURES</b> Identify landforms that are found locally or in Alberta.  Compare various landforms on Earth's surface.  Identify and discuss UNESCO World Heritage Sites found in Alberta.
<b>2ES 1.3 UNDERSTANDING</b> Earth's surface is mostly covered by bodies of water.	
<b>KNOWLEDGE</b> Bodies of water on Earth's surface include <ul style="list-style-type: none"> <li>• oceans</li> <li>• glaciers</li> <li>• lakes</li> <li>• wetlands</li> <li>• rivers</li> </ul> Water flows downhill from smaller bodies of water to larger bodies of water in the following ways: <ul style="list-style-type: none"> <li>• small creeks flowing downhill and merging to form small streams</li> <li>• small streams merging to form larger streams and rivers</li> <li>• streams and small rivers merging to form larger rivers</li> <li>• large rivers merging into major waterways, such as oceans</li> </ul> Water found on Earth can be either fresh or salt water.  Freshwater bodies include <ul style="list-style-type: none"> <li>• glaciers</li> <li>• most lakes</li> <li>• wetlands</li> <li>• rivers</li> </ul>	<b>SKILLS &amp; PROCEDURES</b> Investigate local and provincial bodies of water.  Diagram the flow of water from small creeks to an ocean.  Create a model to represent various types of landforms and bodies of water.  Identify bodies of water on Earth that contain fresh water.  Identify bodies of water on Earth that contain salt water.

Saltwater bodies include oceans and seas.	
<b>2ES 1.4 UNDERSTANDING</b> Earth revolves around the Sun and rotates.	
<b>KNOWLEDGE</b> A year is the length of time it takes Earth to revolve around the Sun.  A day is the length of time it takes Earth to rotate fully (on its axis).  Earth's surface experiences day when it faces the Sun, and night when it does not face the Sun.	<b>SKILLS &amp; PROCEDURES</b> Describe the relationship between time and Earth revolving around the Sun.  Represent ways that Earth's rotation connects to patterns of day and night.

<b>Living Systems (LS)</b> Understandings of the living world, Earth, and space are deepened through investigating natural systems and their interactions.  <i>Guiding Question: How do plants and animals live and grow?</i>	
<b>LEARNING OUTCOME</b> <b>2LS 1 Students investigate the growth and development of plants and animals and consider their relationship to humans.</b>	
<b>2LS 1.1 UNDERSTANDING</b> Plants and animals can be affected by human behaviour.	
<b>KNOWLEDGE</b> Some human behaviours can positively affect plants and animals, such as <ul style="list-style-type: none"> <li>• reducing, reusing, recycling, and repurposing</li> <li>• recovering natural areas</li> <li>• protecting and not disrupting natural spaces</li> <li>• creating natural areas and parks</li> </ul> Some human behaviours can negatively affect plants and animals, such as <ul style="list-style-type: none"> <li>• littering</li> <li>• polluting</li> <li>• depleting resources that plants and animals need to live</li> <li>• introducing plants and animals that are not native to the area</li> </ul>	<b>SKILLS &amp; PROCEDURES</b> Discuss ways to respect plants and animals while interacting in various environments.  Explain positive and negative impacts of human behaviour on plants and animals.
<b>2LS 1.2 UNDERSTANDING</b> Plants and animals share similarities with their offspring.	
<b>KNOWLEDGE</b> Offspring are the children of plants or animals.	<b>SKILLS &amp; PROCEDURES</b> Identify similarities between offspring and their parents.
<b>2LS 1.3 UNDERSTANDING</b> Plants and animals have observable patterns or stages in their development.	
<b>KNOWLEDGE</b>	<b>SKILLS &amp; PROCEDURES</b>

<p>A life cycle shows the different stages of life that a plant or an animal goes through.</p> <p>Life cycles can be represented in many ways, such as</p> <ul style="list-style-type: none"> <li>• illustrations</li> <li>• diagrams</li> <li>• models</li> <li>• stories</li> </ul>	<p>Represent the life cycles of various plants and animals.</p> <p>Discuss and compare life cycles of various plants and animals.</p>
<p><b>2LS 1.4 UNDERSTANDING</b> The ways in which individuals or groups relate to land, plants, and animals can influence cultural practices.</p>	
<p><b>KNOWLEDGE</b> First Nations, Métis, and Inuit relate to land, plants, and animals as equal to or above humans.</p>  <p>Care and consideration for land, plants, and animals can be demonstrated through cultural practices, such as</p> <ul style="list-style-type: none"> <li>• taking only what is needed</li> <li>• making use of the whole plant or animal</li> <li>• sustainable farming</li> <li>• treating land, plants, and animals as relatives</li> </ul>	<p><b>SKILLS &amp; PROCEDURES</b> Discuss how humans might interact with land, plants, and animals if they see land, plants, and animals as equals.</p> <p>Identify ways in which people show care for land, plants, and animals through cultural practices.</p>

<p><b>Computer Science (CS)</b> <b>Problem solving and scientific inquiry are developed through the knowledgeable application of creativity, design, and computational thinking.</b></p> <p><b>Guiding Question: How can creativity support design?</b></p>	
<p><b>LEARNING OUTCOME</b> <b>2CS 1 Students apply creativity when designing instructions to achieve a desired outcome.</b></p>	
<p><b>2CS 1.1 UNDERSTANDING</b> Instructions are designed using creativity and problem solving, which can be enhanced through collaboration.</p>	
<p><b>KNOWLEDGE</b> Creativity is the ability to generate something original, such as</p> <ul style="list-style-type: none"> <li>• ideas</li> <li>• technology</li> <li>• tools</li> <li>• products</li> </ul> <p>Creativity can be used to design instructions for</p> <ul style="list-style-type: none"> <li>• games</li> <li>• sports</li> <li>• investigations</li> <li>• recipes</li> <li>• computer programs</li> </ul> <p>Collaboration can result in improved ideas, which may enhance creativity and problem solving.</p>	<p><b>SKILLS &amp; PROCEDURES</b> Identify ways creativity is used to design instructions.</p>
<p><b>2CS 1.2 UNDERSTANDING</b> Instructions can be created to be precise, reliable, and efficient to achieve the desired outcome.</p>	

<p><b>KNOWLEDGE</b></p> <p>Precise instructions have a variety of components, including</p> <ul style="list-style-type: none"> <li>• verbs</li> <li>• simple language</li> <li>• clear steps</li> <li>• a starting and stopping point</li> </ul> <p>Reliability of instructions means they consistently lead to the same desired outcome.</p> <p>Efficiency of instructions refers to designing in a way that yields desired outcomes with the least amount of energy, time, or steps.</p> <p>The reliability and efficiency of instructions can be affected by how they are communicated, including</p> <ul style="list-style-type: none"> <li>• form; e.g., verbal, visual, written</li> <li>• order</li> <li>• clarity</li> </ul> <p>Many people, individually or in groups, can create instructions, such as</p> <ul style="list-style-type: none"> <li>• teachers</li> <li>• parents</li> <li>• students</li> <li>• computer programmers</li> </ul> <p>Many activities at school and in the workplace require creativity and collaboration to improve ideas.</p> <p>Debugging is the process of identifying and removing errors in a set of instructions to achieve a desired outcome.</p> <p>Debugging can increase the reliability of instructions.</p>	<p><b>SKILLS &amp; PROCEDURES</b></p> <p>Work individually or in groups to create instructions using precise words, pictures, or diagrams.</p> <p>Create three-step to four-step instructions that achieve a desired outcome.</p> <p>Predict the outcome of instructions that have three to four steps.</p> <p>Refine instructions to more efficiently achieve a desired outcome.</p> <p>Test instructions with three to four steps to verify that a desired outcome is achieved.</p> <p>Debug any errors in a set of instructions to achieve a desired outcome.</p>
<p><b>2CS 1.3 UNDERSTANDING</b></p> <p>Instructions may be simplified by repeating steps.</p>	
<p><b>KNOWLEDGE</b></p> <p>Many daily activities include repeated steps, such as</p> <ul style="list-style-type: none"> <li>• brushing teeth</li> <li>• tying one shoe and then using the same process on the other shoe</li> </ul>	<p><b>SKILLS &amp; PROCEDURES</b></p> <p>Describe a situation in which repetition simplifies instructions.</p> <p>Exchange ideas to design clear three- to four-step instructions, including repetition, to achieve a desired outcome.</p>

## Scientific Method (SM)

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 methods and processes can be used in scientific investigation?**

### LEARNING OUTCOME

**2SM 1 Students examine investigation and explain how it is influenced by purpose.**

#### 2SM 1.1 UNDERSTANDING

Investigations involve carrying out procedures for a purpose.

<p><b>KNOWLEDGE</b></p> <p>Investigations are conducted for purposes such as</p> <ul style="list-style-type: none"> <li>• answering questions</li> <li>• building knowledge</li> <li>• satisfying curiosity</li> <li>• problem solving</li> </ul> <p>Procedures scientists use to guide investigations include</p> <ul style="list-style-type: none"> <li>• asking questions</li> <li>• making predictions</li> <li>• planning the investigation</li> <li>• observing and recording data</li> <li>• analyzing data</li> <li>• reaching conclusions</li> <li>• discussing observations and conclusions</li> </ul>	<p><b>SKILLS &amp; PROCEDURES</b></p> <p>Explore various purposes for conducting an investigation.</p> <p>Describe procedures of an investigation.</p> <p>Develop questions for the purpose of an investigation.</p>
<p><b>2SM 1.2 UNDERSTANDING</b></p> <p>Investigations can involve comparing data.</p>	
<p><b>KNOWLEDGE</b></p> <p>Data should relate to the purpose of an investigation.</p> <p>Observations and data should be similar if the investigation is repeated.</p> <p>Repetition of an investigation includes performing the same procedures in the same way.</p> <p>Data collected by people performing the same investigation can be combined.</p>	<p><b>SKILLS &amp; PROCEDURES</b></p> <p>Determine if observations relate to the purpose of the investigation.</p> <p>Collaborate to combine recorded data into a single list or chart.</p> <p>Compare observations and data with others.</p>