

Making Connections



Earth
Systems



Computer
Science



grade 2

Organizing Idea	Computer Science: Problem solving and scientific inquiry are developed through the knowledgeable application of creativity, design, and computational thinking.	
Guiding Question	How can instructions affect outcomes?	
Learning Outcome	Students follow instructions and relate them to outcomes.	
Knowledge	Understanding	Skills & Procedures
<p>Creativity is the ability to generate something original, such as</p> <ul style="list-style-type: none"> • ideas • technology • tools • products <p>Creativity can be used to design instructions for</p> <ul style="list-style-type: none"> • games • sports • investigations • recipes • computer programs <p>Collaboration can result in improved ideas, which may enhance creativity and problem solving.</p>	<p>Instructions are designed using creativity and problem solving, which can be enhanced through collaboration.</p>	<p>Identify ways creativity is used to design instructions.</p>

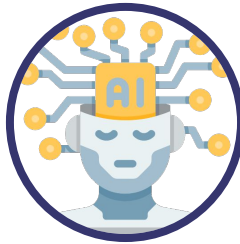
Organizing Idea	Computer Science: Problem solving and scientific inquiry are developed through the knowledgeable application of creativity, design, and computational thinking.	
Guiding Question	How can instructions affect outcomes?	
Learning Outcome	Students follow instructions and relate them to outcomes.	
Knowledge	Understanding	Skills & Procedures
<p>Precise instructions have a variety of components, including</p> <ul style="list-style-type: none"> • verbs • simple language • clear steps • a starting and stopping point <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"> • form; e.g., verbal, visual, written • order • clarity 	<p>Instructions can be created to be precise, reliable, and efficient to achieve the desired outcome.</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>

Organizing Idea	Computer Science: Problem solving and scientific inquiry are developed through the knowledgeable application of creativity, design, and computational thinking.	
Guiding Question	How can instructions affect outcomes?	
Learning Outcome	Students follow instructions and relate them to outcomes.	
Knowledge	Understanding	Skills & Procedures
<p>Many people, individually or in groups, can create instructions, such as</p> <ul style="list-style-type: none"> • teachers • parents • students • computer programmers <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>Instructions can be created to be precise, reliable, and efficient to achieve the desired outcome.</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>

Organizing Idea	Computer Science: Problem solving and scientific inquiry are developed through the knowledgeable application of creativity, design, and computational thinking.	
Guiding Question	How can instructions affect outcomes?	
Learning Outcome	Students follow instructions and relate them to outcomes.	
Knowledge	Understanding	Skills & Procedures
<p>Many daily activities include repeated steps, such as</p> <ul style="list-style-type: none"> • brushing teeth • tying one shoe and then using the same process on the other shoe 	<p>Instructions may be simplified by repeating steps.</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>

Computational Thinking

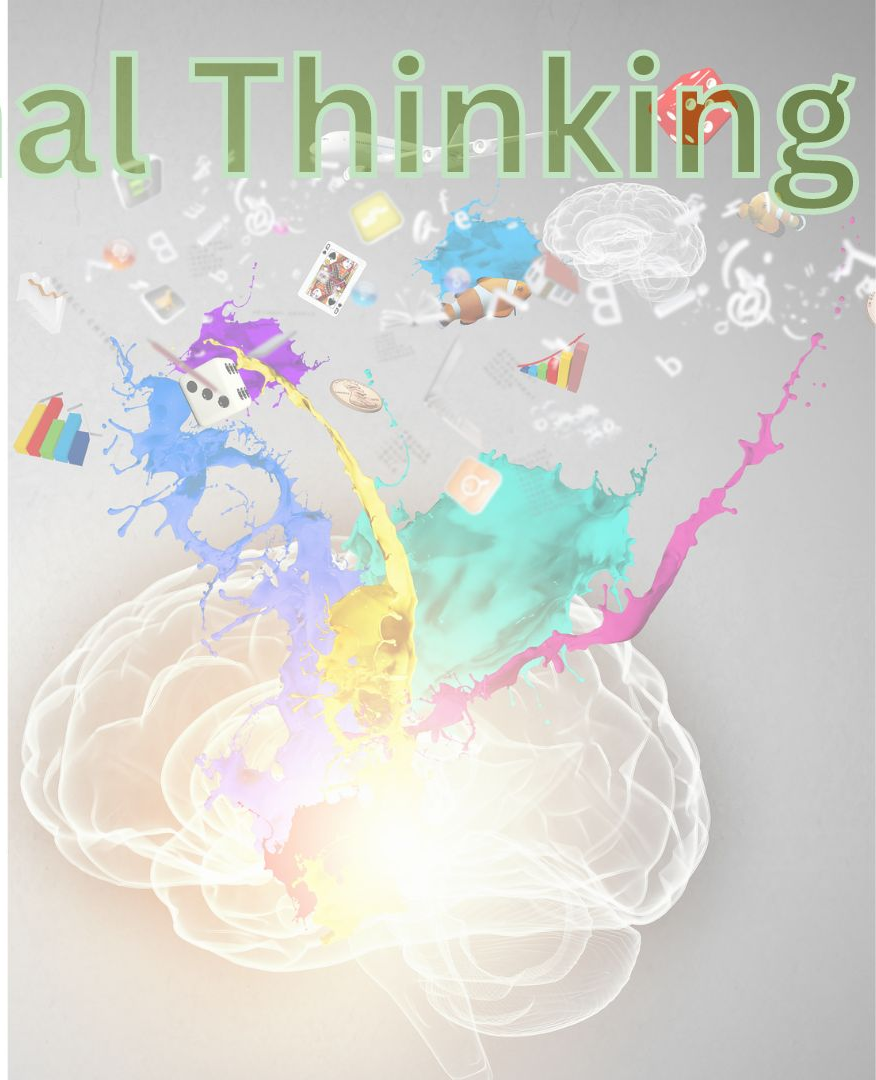
Decomposition



Pattern Recognition

Pattern Abstraction

Algorithm Design



Design Thinking Process



*Learn About
Your Audience*



*Brainstorm and
Come up with
Creative Solutions*

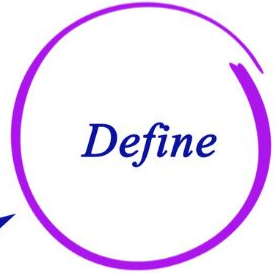


Test Your Ideas

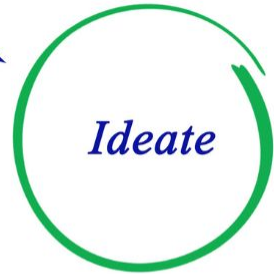


Empathize

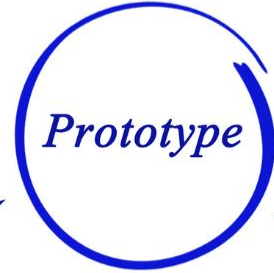
*Construct Point
of View Based
on User Needs*



Define

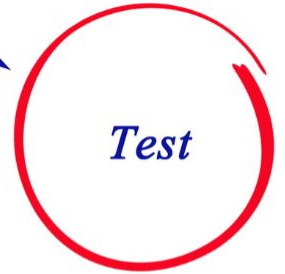
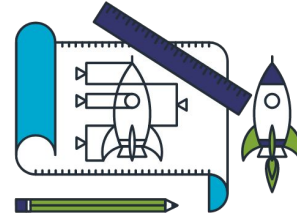


Ideate



Prototype

*Build
Representation
of Your Ideas*



Test

Creativity

Finding different ways to reach the same outcome.

Problem solving to overcome obstacles to achieve a desired outcome.

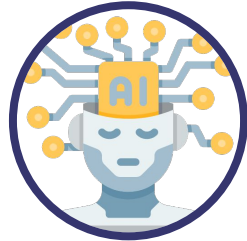


Organizing Idea	Earth Systems: Understandings of the living world, Earth, and space are deepened by investigating natural systems and their interactions.
Guiding Question	How can Earth's components and relationship to the Sun be understood?
Learning Outcome	Students investigate Earth, its landforms, its bodies of water, and its relationship to the Sun.

Skills & Procedures

Represent various components of Earth.

Discuss how the various components of Earth interact to support life.

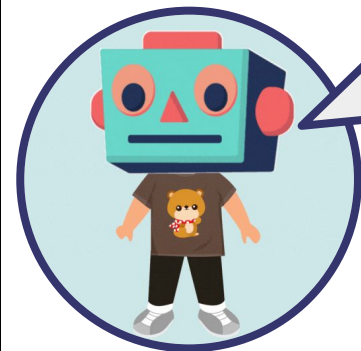


Work individually or in groups to create instructions using precise words, pictures, or diagrams.

SKILLS & PROCEDURES

Create three-step to four-step instructions that achieve a desired outcome.

SKILLS & PROCEDURES



IF it has green leaves or needles THEN it makes oxygen for animals to breathe

UNDERSTANDING
Instructions can be created to be precise, reliable, and efficient to achieve the desired outcome.

UNDERSTANDING
Instructions may be simplified by repeating steps.

Organizing Idea	Earth Systems: Understandings of the living world, Earth, and space are deepened by investigating natural systems and their interactions.
Guiding Question	How can Earth's components and relationship to the Sun be understood?
Learning Outcome	Students investigate Earth, its landforms, its bodies of water, and its relationship to the Sun.


Skills & Procedures

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.


Work individually or in groups to create instructions using precise words, pictures, or diagrams.



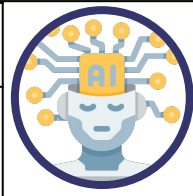
SKILLS & PROCEDURES



Create three-step to four-step instructions that achieve a desired outcome.



SKILLS & PROCEDURES

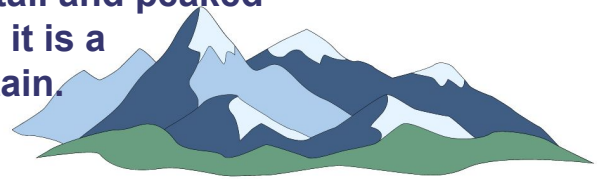
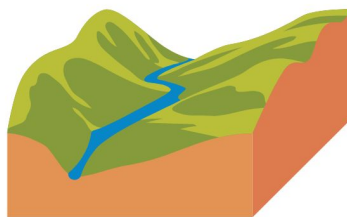
Come up with a set of rules or instructions for how to identify each of the landforms.



If it is tall and flat on top it is a plateau.



If it is tall and peaked on top it is a mountain.



Organizing Idea	Earth Systems: Understandings of the living world, Earth, and space are deepened by investigating natural systems and their interactions.
Guiding Question	How can Earth's components and relationship to the Sun be understood?
Learning Outcome	Students investigate Earth, its landforms, its bodies of water, and its relationship to the Sun.

Skills & Procedures

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.


Test instructions with three to four steps to verify that a desired outcome is achieved.




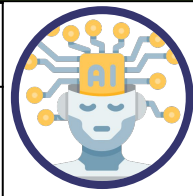
SKILLS & PROCEDURES



Debug any errors in a set of instructions to achieve a desired outcome.



SKILLS & PROCEDURES

**Trade your instructions with a partner and test them out with these images.
Fix any errors in your instructions that your partner finds.**

Organizing Idea	Earth Systems: Understandings of the living world, Earth, and space are deepened by investigating natural systems and their interactions.
Guiding Question	How can Earth's components and relationship to the Sun be understood?
Learning Outcome	Students investigate Earth, its landforms, its bodies of water, and its relationship to the Sun.

Skills & Procedures



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.



Work individually or in groups to create instructions using precise words, pictures, or diagrams.

SKILLS & PROCEDURES

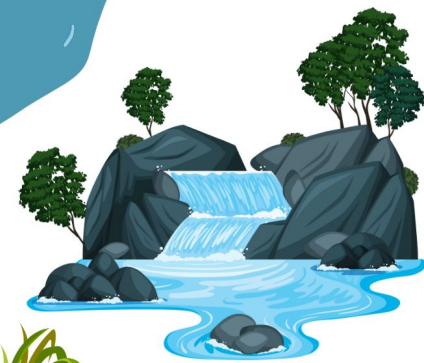
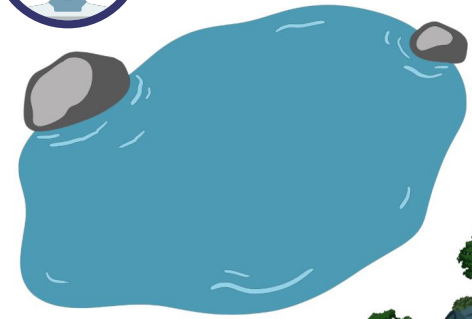



Create three-step to four-step instructions that achieve a desired outcome.

SKILLS & PROCEDURES


How does water get from the mountains and glaciers to the ocean?



Organizing Idea	Earth Systems: Understandings of the living world, Earth, and space are deepened by investigating natural systems and their interactions.
Guiding Question	How can Earth's components and relationship to the Sun be understood?
Learning Outcome	Students investigate Earth, its landforms, its bodies of water, and its relationship to the Sun.

Skills & Procedures

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.


Test instructions with three to four steps to verify that a desired outcome is achieved.




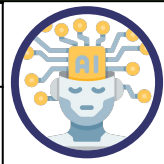
SKILLS & PROCEDURES



Debug any errors in a set of instructions to achieve a desired outcome.



SKILLS & PROCEDURES

How does water get from the mountains and glaciers to the ocean?



Organizing Idea	Earth Systems: Understandings of the living world, Earth, and space are deepened by investigating natural systems and their interactions.
Guiding Question	How can Earth's components and relationship to the Sun be understood?
Learning Outcome	Students investigate Earth, its landforms, its bodies of water, and its relationship to the Sun.

Skills & Procedures

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.



UNDERSTANDING
Instructions are designed using creativity and problem solving, which can be enhanced through collaboration.

UNDERSTANDING
Instructions can be created to be precise, reliable, and efficient to achieve the desired outcome.

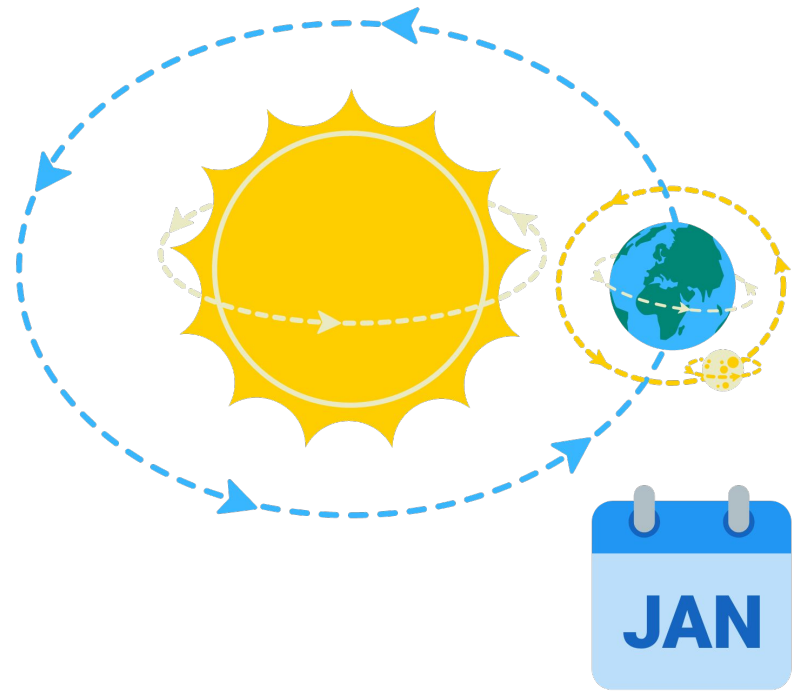
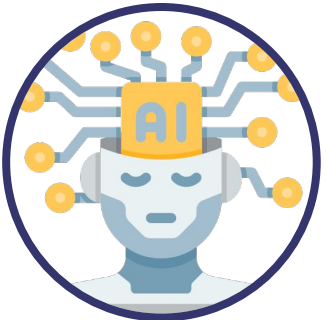
UNDERSTANDING
Instructions may be simplified by repeating steps.

Organizing Idea	Earth Systems: Understandings of the living world, Earth, and space are deepened by investigating natural systems and their interactions.
Guiding Question	How can Earth's components and relationship to the Sun be understood?
Learning Outcome	Students investigate Earth, its landforms, its bodies of water, and its relationship to the Sun.

Skills & Procedures

Describe the relationship between time and Earth revolving around the Sun.

Represent ways that Earth's rotation connects to patterns of day and night.

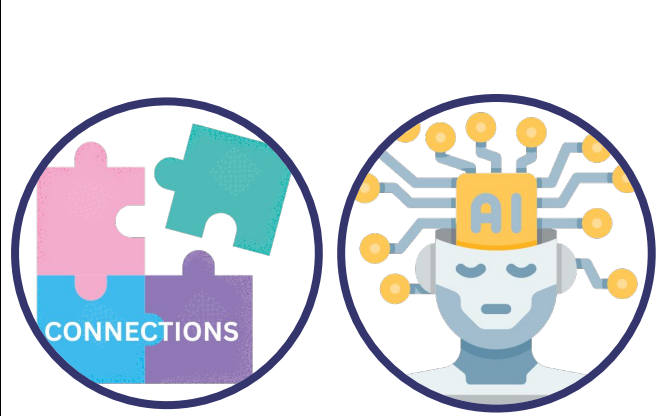


Organizing Idea	Earth Systems: Understandings of the living world, Earth, and space are deepened by investigating natural systems and their interactions.
Guiding Question	How can Earth's components and relationship to the Sun be understood?
Learning Outcome	Students investigate Earth, its landforms, its bodies of water, and its relationship to the Sun.

Skills & Procedures

Describe the relationship between time and Earth revolving around the Sun.

Represent ways that Earth's rotation connects to patterns of day and night.



IF we are facing the SUN THEN it is DAY.
 IF we are facing away from the SUN THEN it is NIGHT.

