Making Connections

Earth Systems

Computer Science

grade 5

Organizing Idea	**Computer Science: Problem solving and scientific inquiry are developed through the knowledgeable application of creativity, design, and computational thinking.**
Guiding Question	**In what ways can design be used to help achieve desired outcomes or purposes?**
Learning Outcome	**Students apply design processes when creating artifacts that can be used by a human or machine to address a need.**

Knowledge	Understanding	Skills & Procedures
A computational artifact is anything created by a human using a computer, such as • computer programs and code images • audio video • presentations • web pages Design can be used to create algorithms and translate them into code. Code is any language that can be understood by and run on a computer. There are many ways to code, including using visual block-based languages. Visual block-based languages are a form of code in which prepared chunks of instructions are in drag-and-drop blocks that fit together like puzzle pieces to design a program. A computer cannot think for itself and must rely on code for all that it does. A loop is a repetition of instructions used in an algorithm.	Design can be used by humans or machines to meet needs.	Engage in the design process to create computational artifacts. Relate a block of code to an outcome or a behaviour. Explain what will happen when single or multiple blocks of code are executed. Translate a given algorithm to code using a visual block-based language. Design an algorithm that includes a loop and translate it into code.

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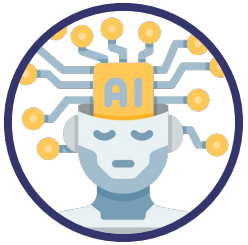
Knowledge	Understanding	Skills & Procedures
Design process can be influenced by various factors, including • safety • functionality • usability • reliability • efficiency • aesthetics Functionality is the quality of being useful to do the job for which something was designed. Usability is the degree of ease with which something can be used to achieve an outcome. Design processes that support the development of multiple iterations include • enhancing • refining Design can be improved through collaboration.	Design can better meet needs through the development of multiple iterations.	Discuss examples of designs that have been enhanced or refined to better meet needs. Evaluate an artifact based on various factors. Design an artifact to meet a need. Propose enhancements and refinements to an artifact in collaboration with others. Develop multiple iterations of an artifact.

Computational Thinking

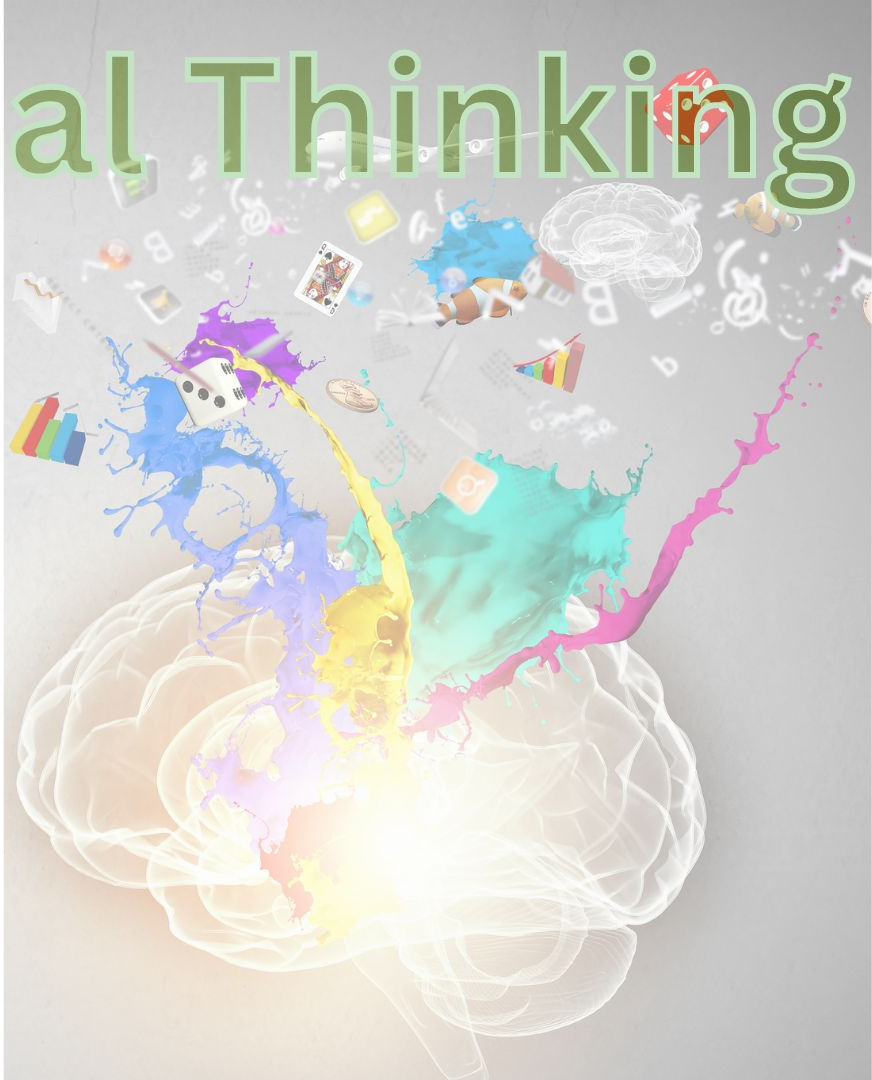


Decomposition

Pattern Recognition

Pattern Abstraction

Algorithm Design



Design Thinking Process

Learn About
Your Audience

Empathize

Define

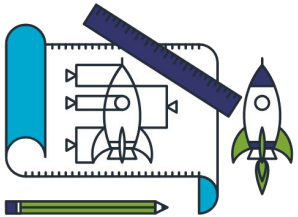
Construct Point
of View Based
on User Needs

Brainstorm and
Come up with
Creative Solutions

Ideate

Prototype

Build
Representation
of Your Ideas



Test Your Ideas

Test

Organizing Idea	**Earth Systems: Understandings of the living world, Earth, and space are deepened by investigating natural systems and their interactions.**
Guiding Question	**How does Earth sustain life?**
Learning Outcome	**Students investigate the systems of Earth and reflect on how their interconnections sustain life.**

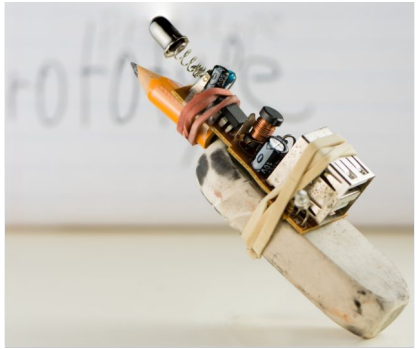
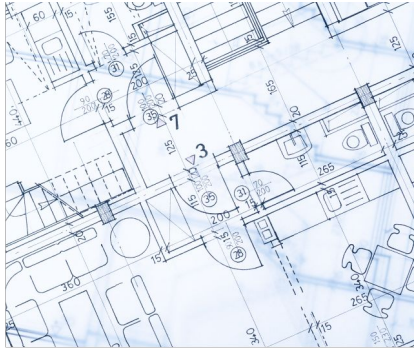
Gr. 4 CS KNOWLEDGE

Design can produce many artifacts, including

- **algorithms**
- **models**
- **prototypes**
- **blueprints**
- **programs**
- **experiments**
- **objects**

Design an artifact to meet a need.

SKILLS & PROCEDURES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Gr. 5 CS KNOWLEDGE

A computational artifact is anything created by a human using a computer, such as

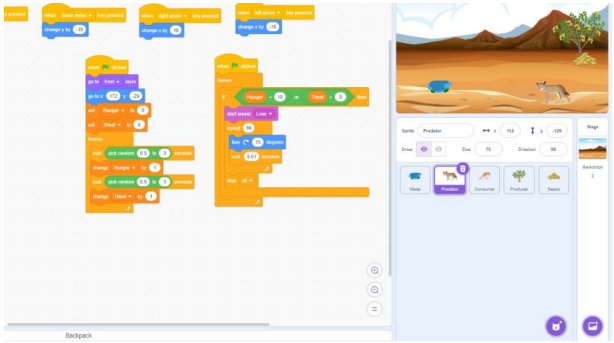
- **computer programs and code images**
- **audio video**
- **presentations**
- **web pages**

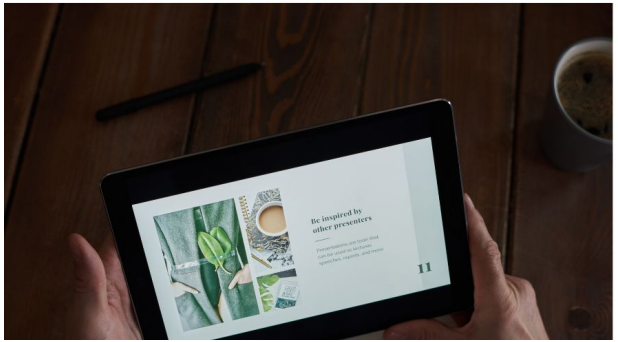
Engage in the design process to create computational artifacts.

SKILLS & PROCEDURES

Design an artifact to meet a need.

SKILLS & PROCEDURES





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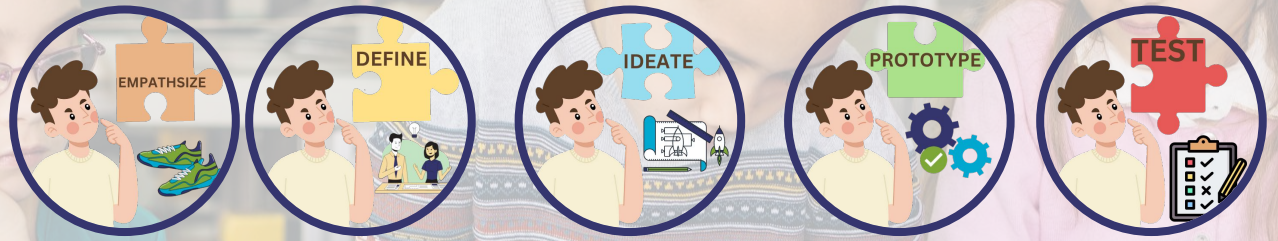


UNDERSTANDING

Design can better meet needs through the development of multiple iterations.

Evaluate an artifact based on various factors.

SKILLS & PROCEDURES

Design an artifact to meet a need.

SKILLS & PROCEDURES

Propose enhancements and refinements to an artifact in collaboration with others.

SKILLS & PROCEDURES

Develop multiple iterations of an artifact.

SKILLS & PROCEDURES

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 climate and its effects be understood?**
Learning Outcome	**Students analyze climate and connect it to weather conditions and agricultural practices.**

Skills & Procedures

Distinguish climate from weather.

Discuss the characteristics of local, national, and global weather conditions to determine climate.

Compare key characteristics of climate zones.

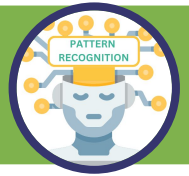
Interpret data about climate.

Relate factors that contribute to Alberta's climate.

Compare Alberta's climate to the climates of other Canadian provinces or territories.

Breaking climate & weather into their parts
Breaking zones down into their parts.

Looking for patterns and connections between climate and weather.



Determining which key weather characteristics determine climate.

Write a set of instructions for how to use weather to determine climate.

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Skills & Procedures

Examine tools used to measure and track weather conditions.

Construct simple tools to measure weather.

Observe and record local weather for a given time interval.

Represent local weather data.

Construct a sample weather map of a local region for a given time.

Explain the importance of weather forecasts.

Investigate methods used to predict the weather.

Discuss First Nations, Métis, and Inuit methods of predicting weather.

Discuss examples of designs that have been enhanced or refined to better meet needs.

SKILLS & PROCEDURES

Evaluate an artifact based on various factors.

SKILLS & PROCEDURES

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Skills & Procedures

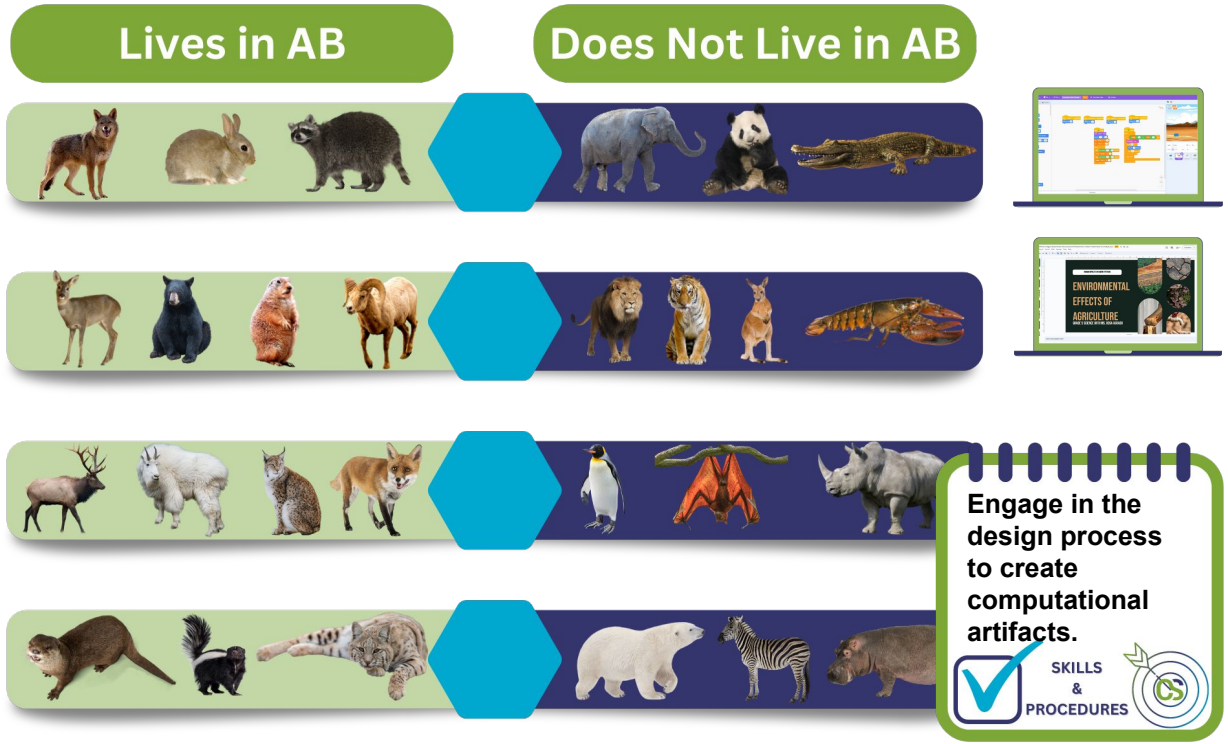
Explain how climate can affect human and other animal activity.

Explain practices related to sustainable harvesting.

Describe how climate may affect plants and animals farmed in Alberta.

Discuss conservation agriculture practices and potential uses.

Describe local climate and weather events that affect agricultural practices.



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SKILLS & PROCEDURES

Engage in the design process to create computational artifacts.

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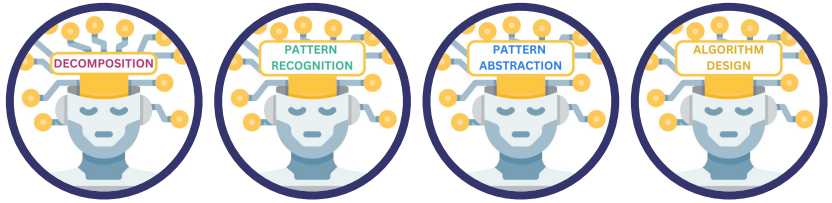

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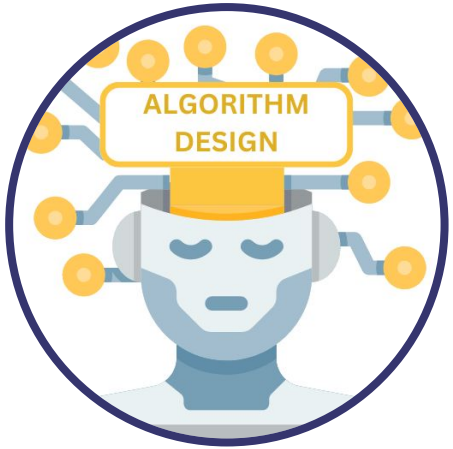
Skills & Procedures

Examine how weather conditions and animal behaviour can be used to recognize weather patterns and cycles.



IF the geese are flying south OR the bears are going into hibernation THEN winter will be soon.

Organizing Idea	Earth Systems: Understandings of the living world, Earth, and space are deepened by investigating natural systems and their interactions. Energy: Understandings of the physical world are deepened by investigating matter and energy.
Guiding Question	How are energy resources understood?
Learning Outcome	Students investigate and analyze various energy resources.

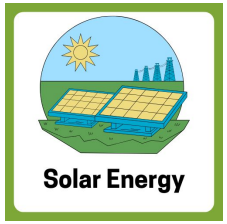
Skills & Procedures

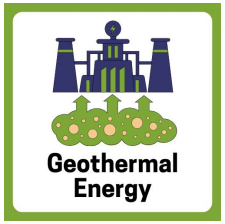
Compare renewable energy resources with non-renewable energy resources.

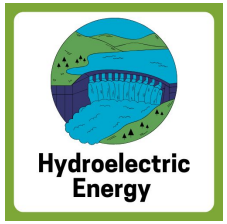
Discuss advantages and disadvantages of using renewable and non- renewable energy resources.

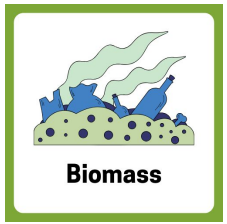
Examine how various provinces and territories throughout Canada fulfill energy needs.

RENEWABLE









NON-RENEWABLE