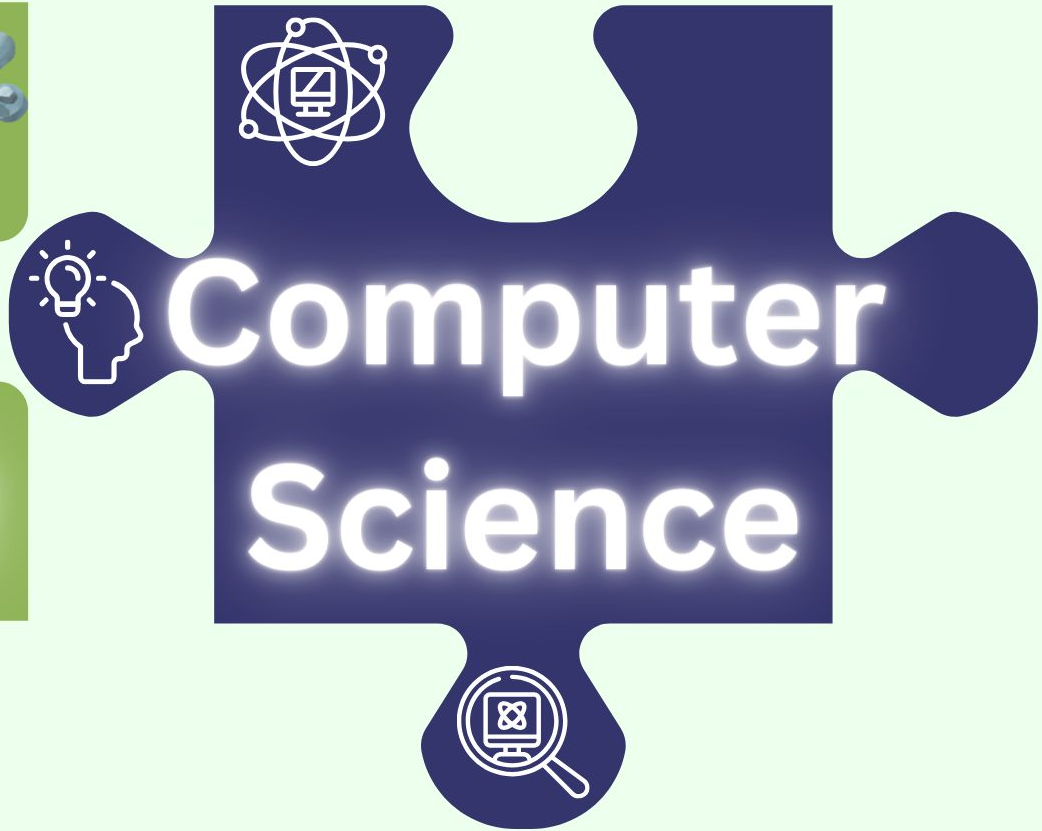
Making Connections



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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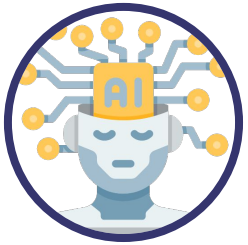
Knowledge	Understanding	Skills & Procedures
Design process can be influenced by various factors, including • safety • functionality • usability • reliability • efficiency • aesthetics Functionality is the quality of being useful to do the job for which something was designed. Usability is the degree 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.	Computational thinking is a problem-solving process that uses creativity.	Create a set of instructions that could be followed by a human or a machine to complete a task. Identify computational thinking used to solve problems or achieve desired outcomes.

Computational Thinking

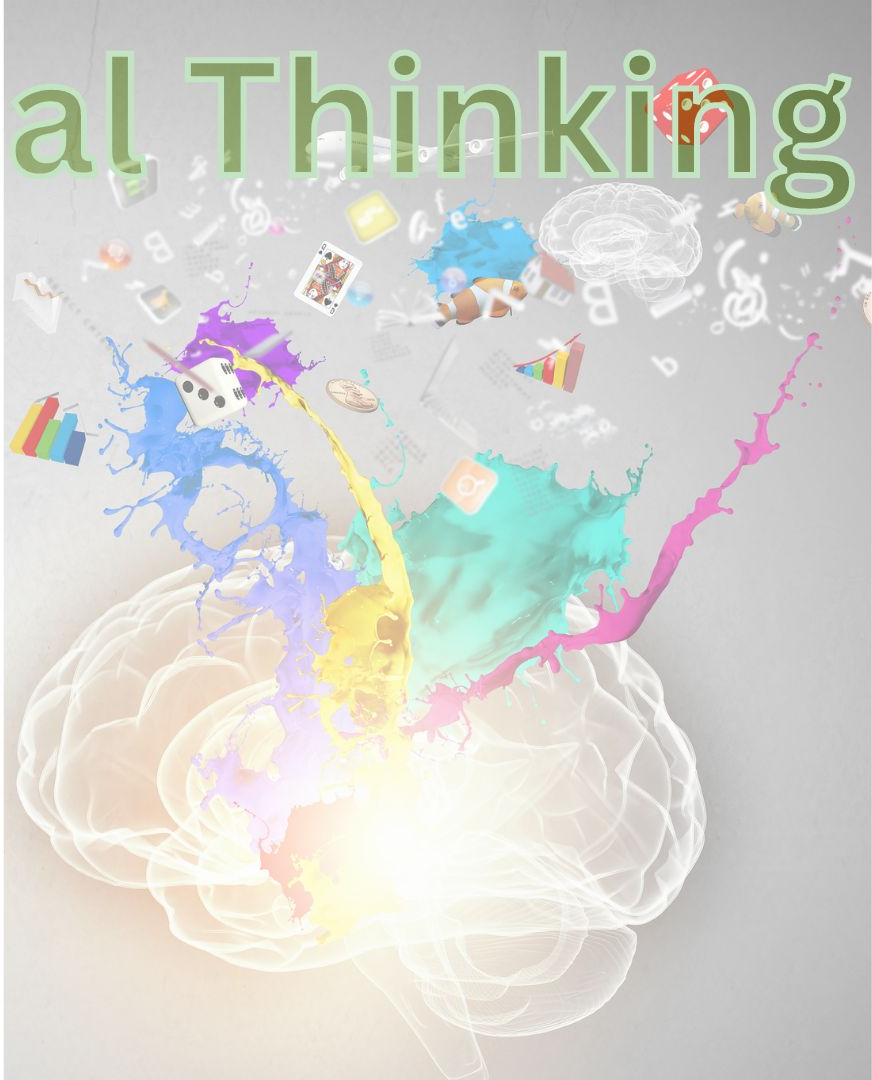
Decomposition



Pattern Recognition

Pattern Abstraction

Algorithm Design



Design Thinking Process

Learn About Your Audience

Empathize

Define

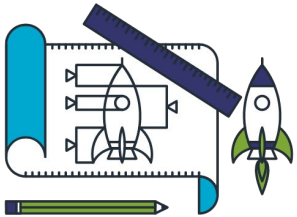
Construct Point of View Based on User Needs

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.**

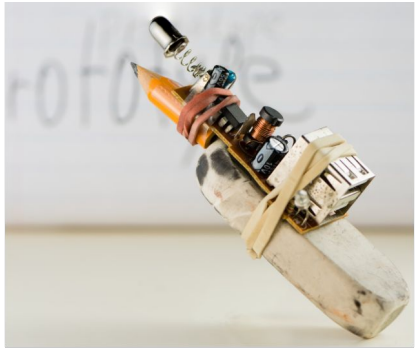
Gr. 4 CS KNOWLEDGE

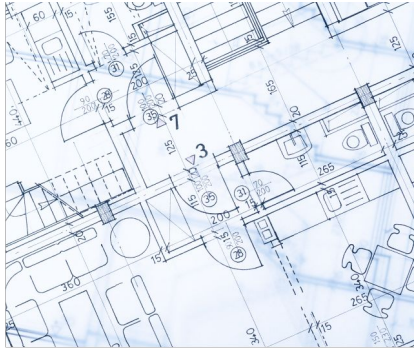
Design can produce many artifacts, including

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

Design an artifact to meet a need.

SKILLS & PROCEDURES





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Gr. 5 CS KNOWLEDGE

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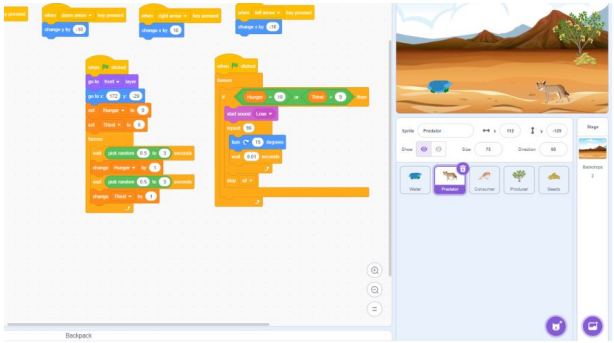
- **computer programs and code images**
- **audio video**
- **presentations**
- **web pages**

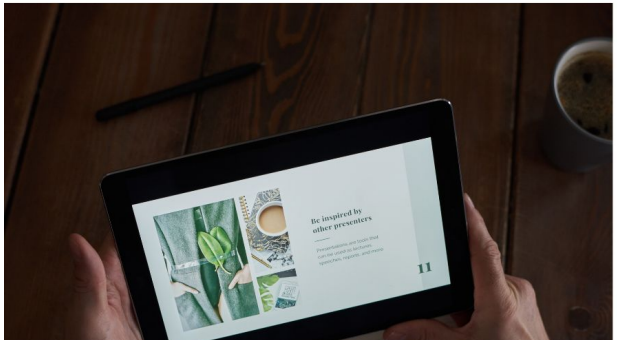
Engage in the design process to create computational artifacts.

SKILLS & PROCEDURES

Design an artifact to meet a need.

SKILLS & PROCEDURES





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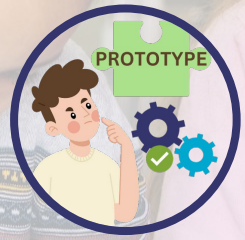

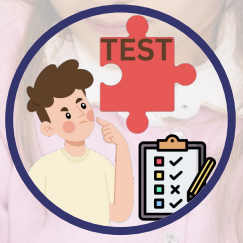

UNDERSTANDING

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	**Space: Understandings of the living world, Earth, and space are deepened by investigating natural systems and their interactions.**
Guiding Question	**How are astronomical phenomena observed and interpreted?**
Learning Outcome	**Students investigate and interpret astronomical phenomena.**

Skills & Procedures

Connect the direction of Earth's tilt in relation to the Sun to the length of day and night in each season.

Describe personal observations related to cyclical changes in the Moon's appearance.

Discuss observable features of lunar and solar eclipses and auroras. Identify astronomical phenomena that occur cyclically.

Explore First Nations, Métis, and Inuit understandings of phases and cycles within astronomical phenomena that inform ways of living and community activities.

Explore Inuit, northern First Nations', or Métis' stories related to the midnight sun, the polar night, or the northern lights.

Represent astronomical phenomena in a variety of ways.

Explore Indigenous representations of astronomical phenomena, past and present.

Identify how observation of astronomical phenomena can determine agricultural and hunting practices.

Breaking observations of the moon down into various stages.

Understanding patterns in astronomical phenomena

Determining which observations are relevant when studying astronomical phenomena

Write a set of instructions for how to safely view various astronomical phenomena

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Create Projects in Scratch

Engage in the design process to create computational artifacts.

SKILLS & PROCESSES

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SKILLS & PROCESSES

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SKILLS & PROCESSES

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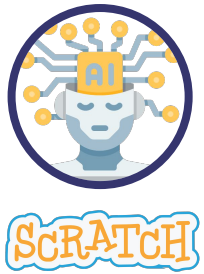

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