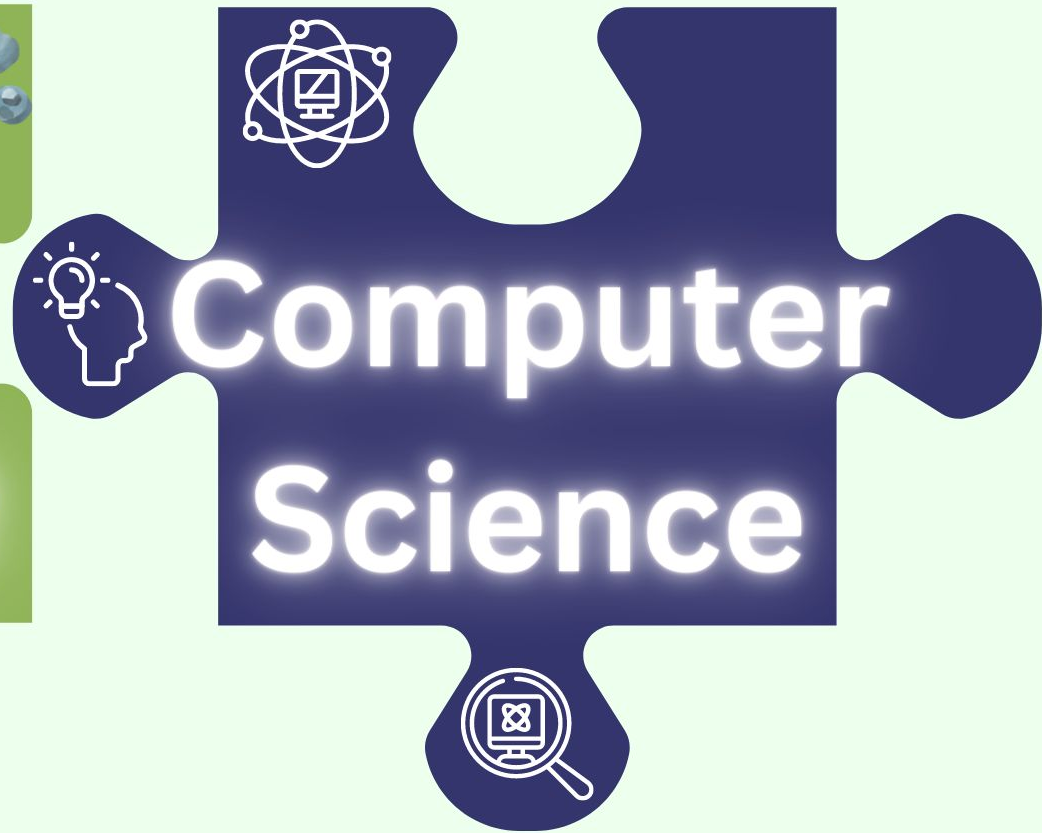


# Making Connections



grade 4

<b>Organizing Idea</b>	<b>Computer Science: Problem solving and scientific inquiry are developed through the knowledgeable application of creativity, design, and computational thinking.</b>
<b>Guiding Question</b>	<b>How can design meet needs?</b>
<b>Learning Outcome</b>	<b>Students examine and apply design processes to meet needs.</b>

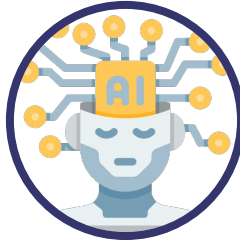
<b>Knowledge</b>	<b>Understanding</b>	<b>Skills &amp; Procedures</b>
<p>Design processes include</p> <ul style="list-style-type: none"> <li>• understanding the problem</li> <li>• forming ideas (ideating)</li> <li>• planning</li> <li>• creating</li> <li>• analyzing</li> <li>• testing</li> <li>• troubleshooting</li> </ul> <p>Feedback helps to ensure all needs are considered during the design process.</p> <p>An algorithm is a sequence of instructions.</p> <p>Artifacts are objects or products made by humans, machines, or computers through the process of design.</p>	<p>Design involves processes that can transform ideas into artifacts that meet needs.</p>	<p>Plan and create an artifact to meet a need.</p> <p>Provide feedback to others during the design process.</p> <p>Test an artifact to confirm that it meets intended needs.</p> <p>Collaborate to design an algorithm to solve a problem.</p> <p>.Examine availability and cost of materials during design.</p>

<b>Organizing Idea</b>	<b>Computer Science: Problem solving and scientific inquiry are developed through the knowledgeable application of creativity, design, and computational thinking.</b>
<b>Guiding Question</b>	<b>How can design meet needs?</b>
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<b>Knowledge</b>	<b>Understanding</b>	<b>Skills &amp; Procedures</b>
<p>Design can produce many artifacts, including</p> <ul style="list-style-type: none"> <li>• algorithms</li> <li>• models</li> <li>• prototypes</li> <li>• blueprints</li> <li>• programs</li> <li>• experiments</li> <li>• objects</li> </ul> <p>Design can deal with complex problems.</p> <p>Availability of materials and costs are considerations in design.</p>	<p>Design involves processes that can transform ideas into artifacts that meet needs.</p>	<p>Plan and create an artifact to meet a need.</p> <p>Provide feedback to others during the design process.</p> <p>Test an artifact to confirm that it meets intended needs.</p> <p>Collaborate to design an algorithm to solve a problem.</p> <p>.Examine availability and cost of materials during design.</p>

# Computational Thinking

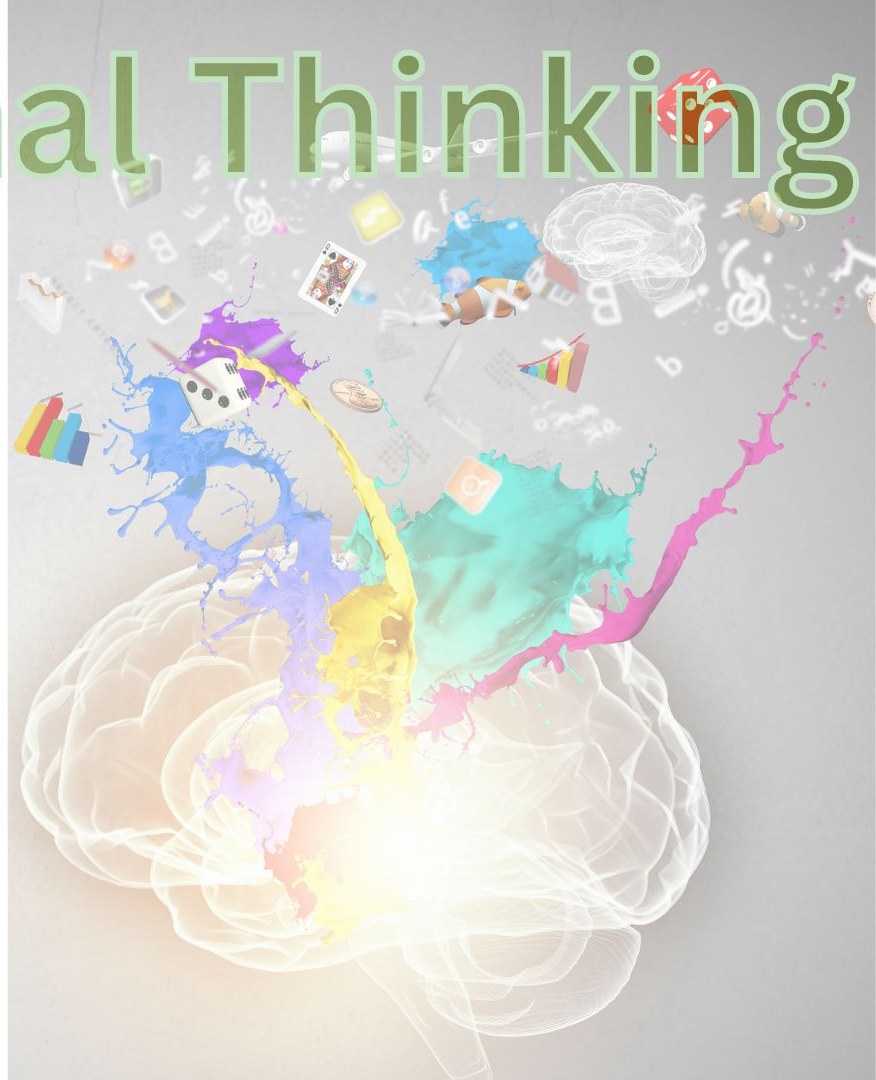
Decomposition



Pattern Recognition

Pattern Abstraction

Algorithm Design





# *Design Thinking Process*



*Learn About  
Your Audience*



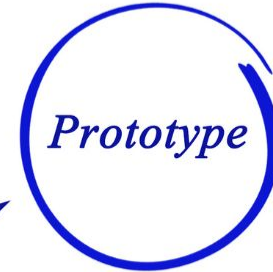
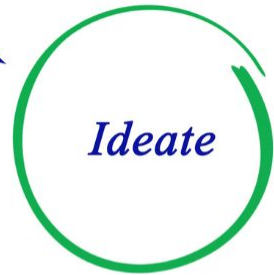
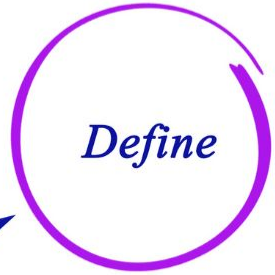
*Brainstorm and  
Come up with  
Creative Solutions*



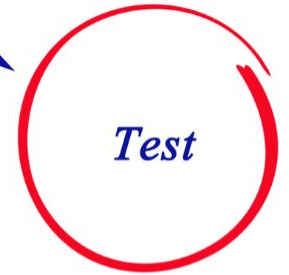
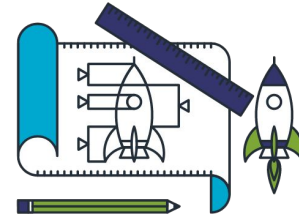
*Test Your Ideas*



*Construct Point  
of View Based  
on User Needs*



*Build  
Representation  
of Your Ideas*



# Creativity

Finding different ways to reach the same outcome.

Problem solving to overcome obstacles to achieve a desired outcome.



<b>Organizing Idea</b>	Space: Understandings of the living world, Earth, and space are deepened by investigating natural systems and their interactions.
<b>Guiding Question</b>	How do objects in space impact daily life?
<b>Learning Outcome</b>	Students investigate and describe objects in space in connection to daily life.

**CS KNOWLEDGE**

Design can produce many artifacts,

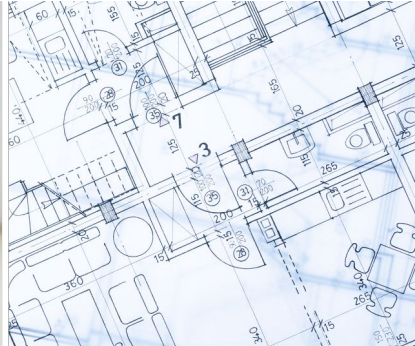
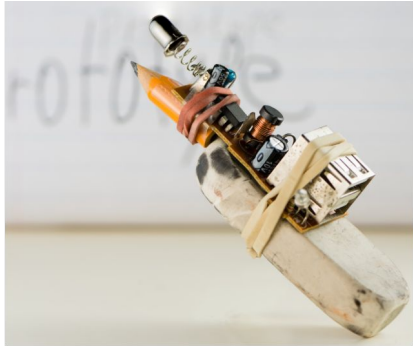
- algorithms
- models
- prototypes
- blueprints
- programs
- experiments
- objects



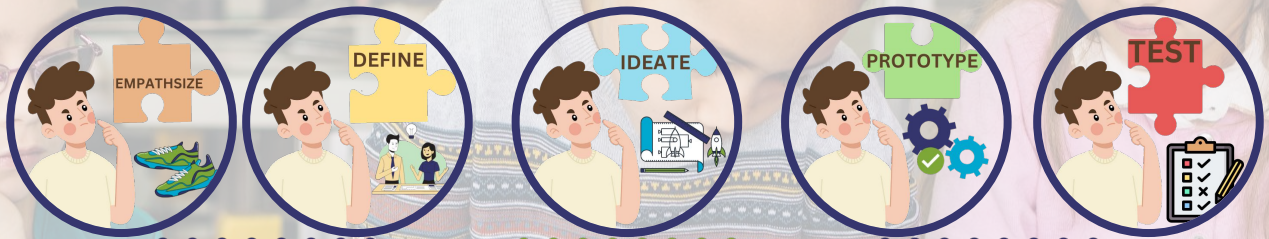
Plan and create an artifact to meet a need.



SKILLS & PROCEDURES

Organizing Idea	Space: Understandings of the living world, Earth, and space are deepened by investigating natural systems and their interactions.
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**Plan and create an artifact to meet a need.**

✓ SKILLS & PROCEDURES 


**Provide feedback to others during the design process.**

✓ SKILLS & PROCEDURES 

**Test an artifact to confirm that it meets intended needs.**

✓ SKILLS & PROCEDURES 

**UNDERSTANDING**  
Design involves processes that can transform ideas into artifacts that meet needs.





Organizing Idea	Space: Understandings of the living world, Earth, and space are deepened by investigating natural systems and their interactions.
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**Skills & Procedures**

**Record observations of objects in space using appropriate safety equipment when necessary.**

Compare observations of objects in space taken during the day and night.

Compare technologies for viewing objects in space.

NAME: \_\_\_\_\_ DATE: \_\_\_\_\_

**DESIGN THINKING BRAINSTORM**

understand your users needs

EMPATHIZE: \_\_\_\_\_ DEFINE: \_\_\_\_\_

IDEATE: \_\_\_\_\_ PROTOTYPE: \_\_\_\_\_

Develop a bunch of awesome ideas! Nothing is too crazy!

return to your users for feedback

The image shows a design thinking brainstorming worksheet. At the top, there are fields for 'NAME' and 'DATE'. Below that is the title 'DESIGN THINKING BRAINSTORM'. The worksheet is divided into four quadrants: 'EMPATHIZE', 'DEFINE', 'IDEATE', and 'PROTOTYPE'. A 'TEST' section is at the bottom. A central illustration shows a person thinking, surrounded by puzzle pieces labeled 'Empathize', 'Define', 'Ideate', and 'Prototype'. A pink speech bubble says 'understand your users needs'. A purple speech bubble says 'Develop a bunch of awesome ideas! Nothing is too crazy!'. An orange speech bubble says 'return to your users for feedback'. To the right is a large blue scroll graphic with a sun and clouds. At the bottom left, there is a small icon of a person with a ladder and a lightbulb.

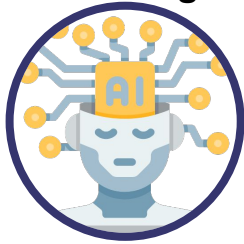
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### Skills & Procedures

Record observations of objects in space using appropriate safety equipment when necessary.

Compare observations of objects in space taken during the day and night.

Compare technologies for viewing objects in space.



## Let's write a set of instructions for viewing space during the day and the night.



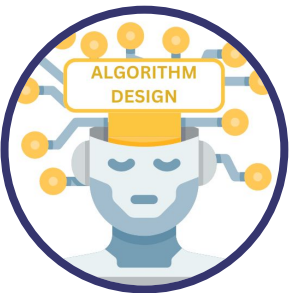
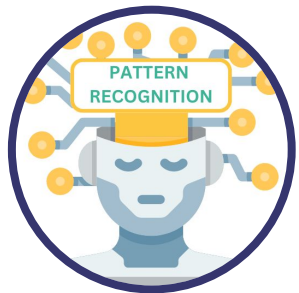
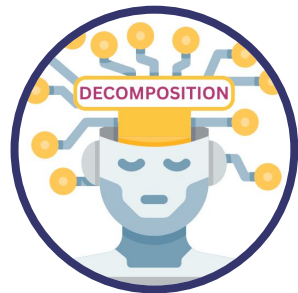
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**Skills & Procedures**

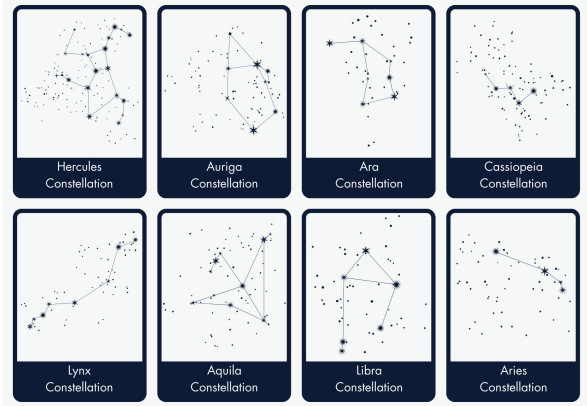
**Examine constellations in relation to location in the sky.**

**Explain ways in which stars can be used for navigation.**

**Explore the local traditional names of the North Star.**



**Search up constellations on Canva for these great templates!**



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**Skills & Procedures**

**Represent observations of objects in space as they connect to seasons, plants, and animals in a local area.**

**Discuss similarities and differences between a lunar calendar and the international standard calendar.**

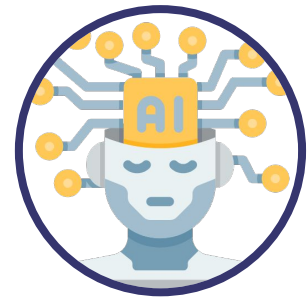
**Bridging Gaps**



Plan and create an artifact to meet a need.

SKILLS & PROCEDURES

**Create a model that shows how our view of space changes throughout the year.**



**Write a set of instructions for how to follow an international standard calendar.**

**Write a set of instructions for how to follow a lunar calendar.**