Making Connections

Energy

Computer Science

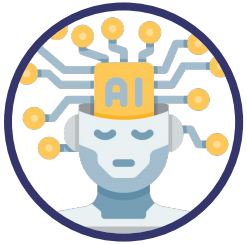
grade 1

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
Instructions are directions that can be followed and given in various forms, including • verbal • audio • visual • written	The form in which instructions are given may not affect the outcome.	Follow instructions with two or three steps given in different forms.
Many types of instructions need to be in a specific order, such as • directions • recipes • computer programs • safety protocols	Instructions are ordered in a way that will produce a desired outcome.	Determine if instructions with two or three steps given in different orders still produce the desired outcome. Sequence two or three instruction steps to achieve a desired outcome. Exchange ideas for creating three-step instructions that achieve a desired outcome.
Following instructions is a way to demonstrate respect and safety during investigations.	Instructions help to keep people safe.	Follow instructions during investigations.

Computational Thinking

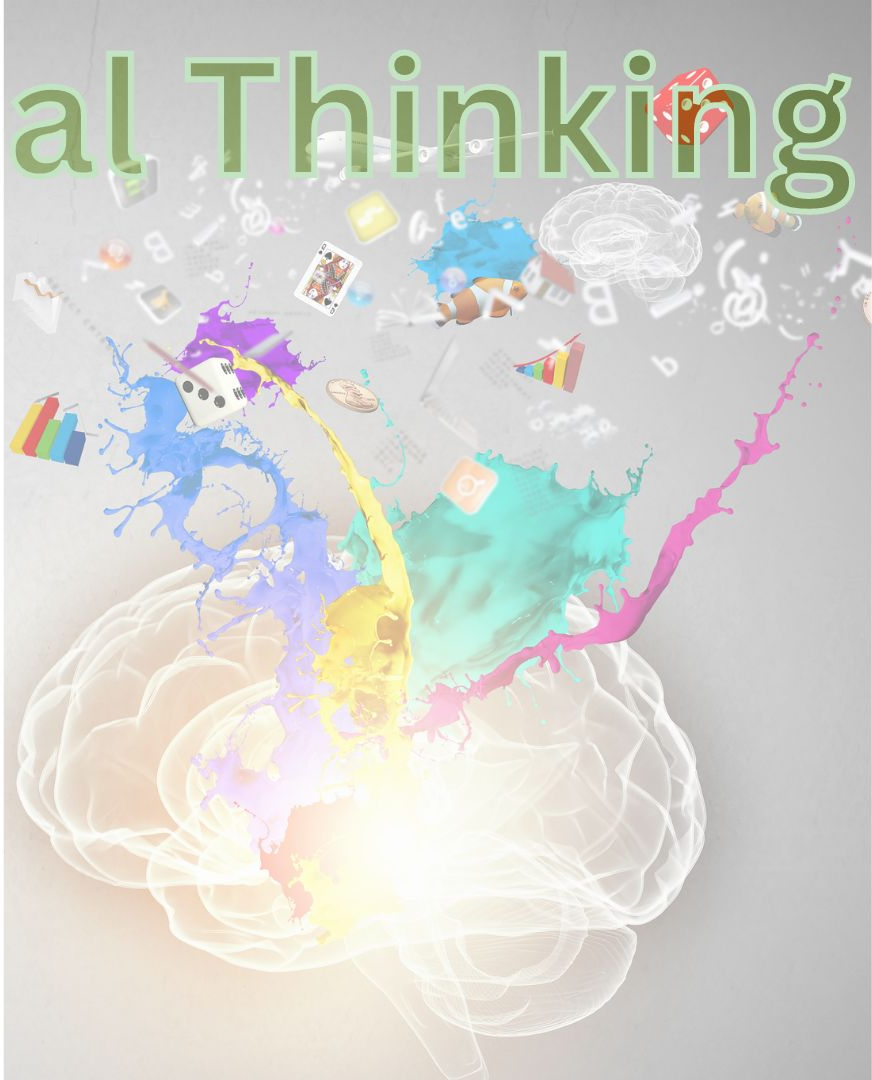
Decomposition



Pattern Recognition

Pattern Abstraction

Algorithm Design



Design Thinking Process

Learn About Your Audience

Empathize

Define

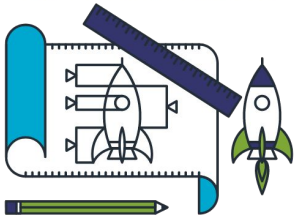
Construct Point of View Based on User Needs

Brainstorm and Come up with Creative Solutions

Ideate

Prototype

Build Representation of Your Ideas



Test Your Ideas

Test

Creativity

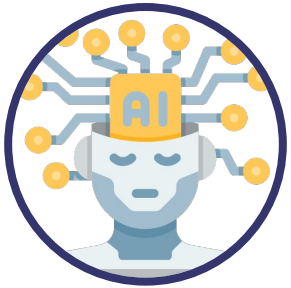
Finding different ways to reach the same outcome.

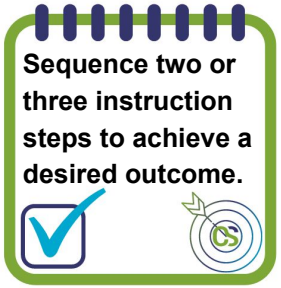
Problem solving to overcome obstacles to achieve a desired outcome.

Organizing Idea	Energy: Understandings of the physical world are deepened by investigating matter and energy.
Guiding Question	How can objects, humans, and other animals move?
Learning Outcome	Children explore movement of objects, humans, and other animals.

Skills & Procedures

Observe and describe the direction, pathway, and speed of objects or animals.



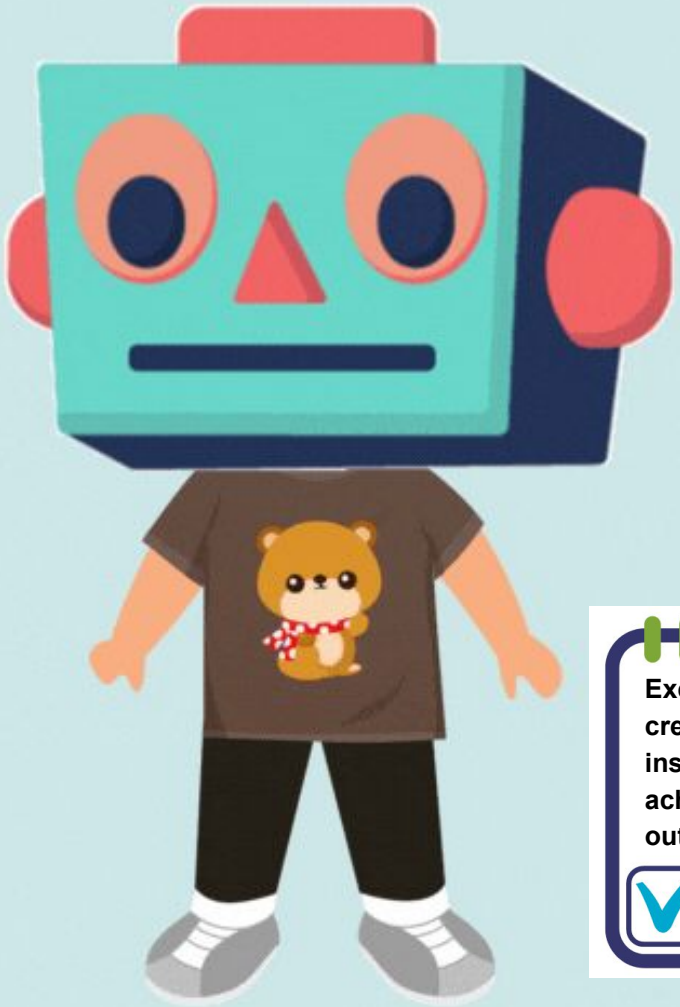


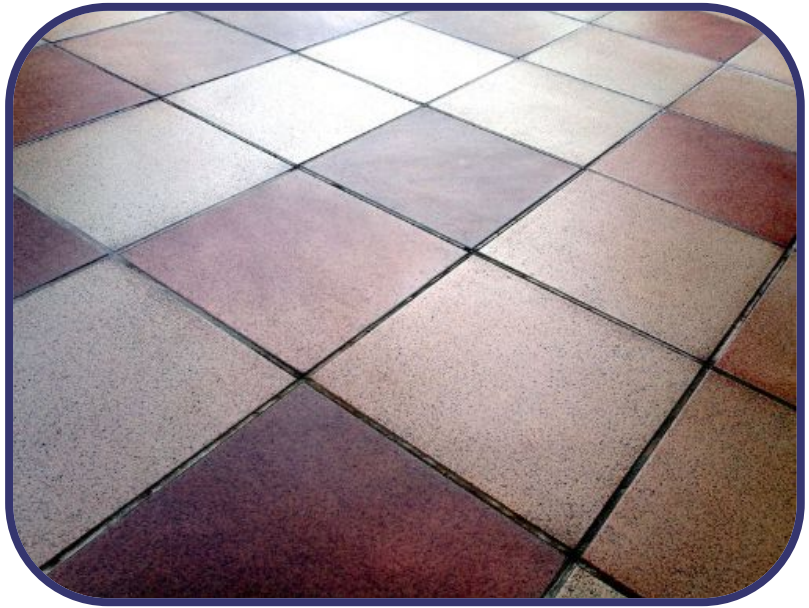
CODE a Drawing

How do you draw a square?

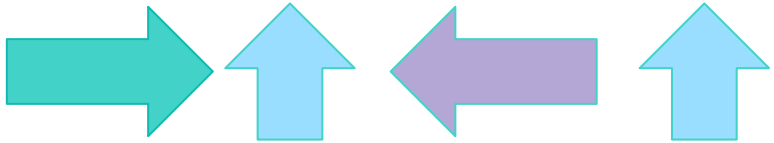
1. Put your pencil on the paper.
2. Draw a line UP
3. Draw a line SIDEWAYS
4. Draw a line DOWN
5. Draw a line SIDEWAYS TOWARD the first line.

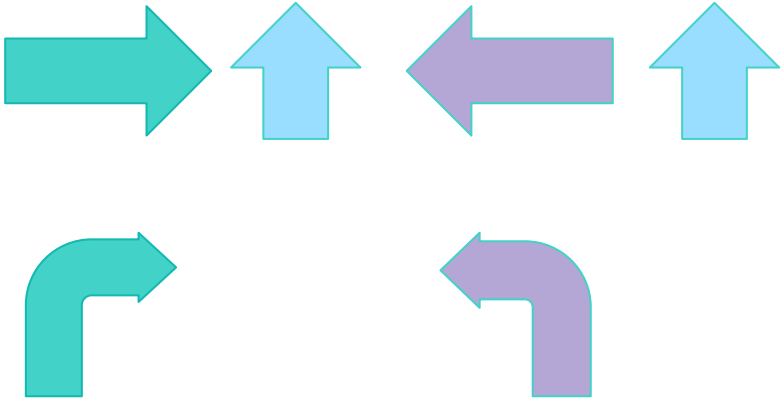
CODE a Human

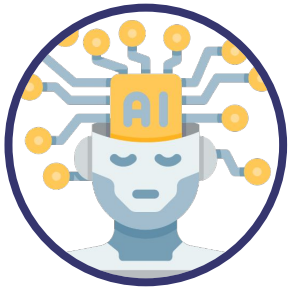




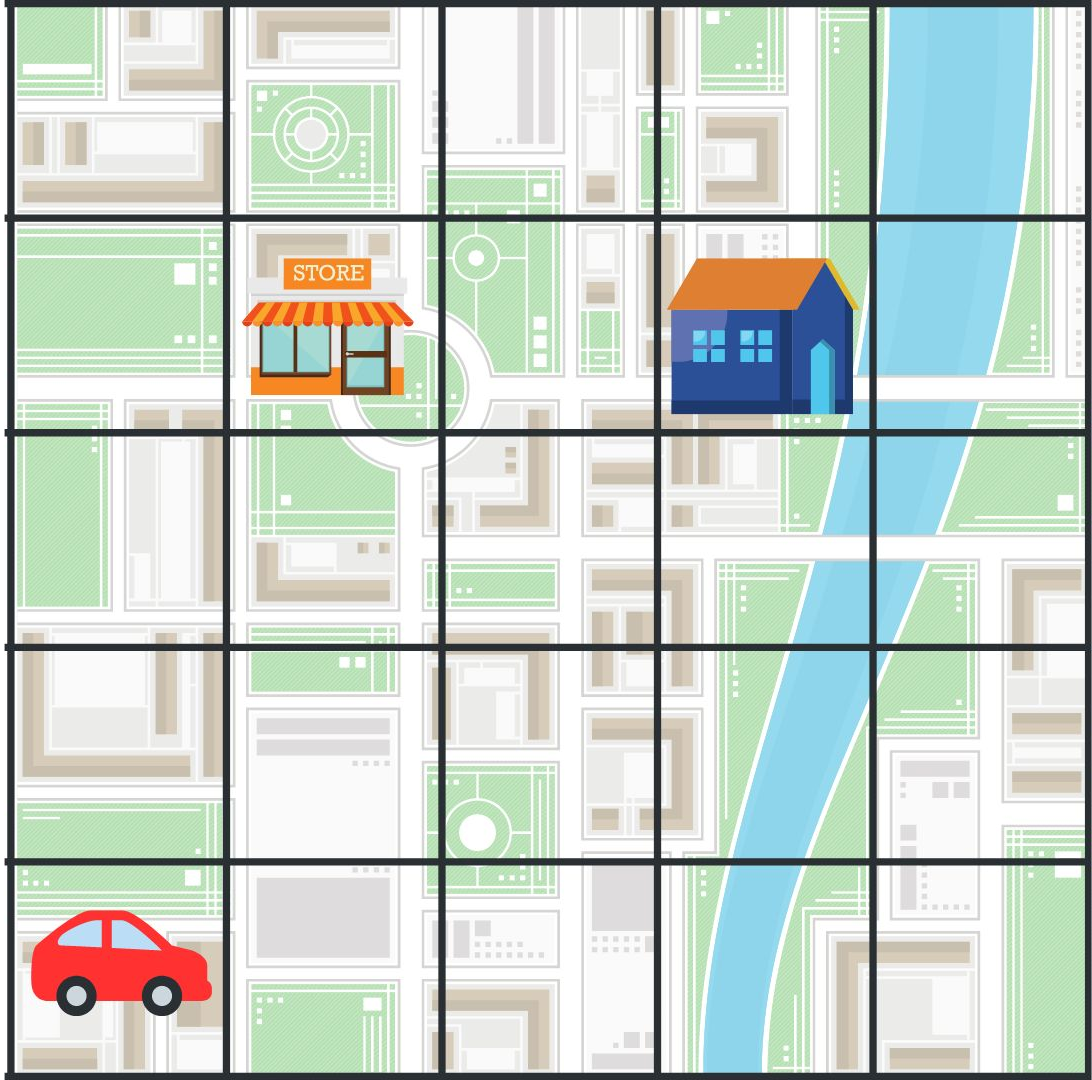
Exchange ideas for creating three-step instructions that achieve a desired outcome.







Sequence two or three instruction steps to achieve a desired outcome.



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Skills & Procedures

Conduct an investigation to determine how objects move.

Describe and record ways objects or animals move along different pathways.

Demonstrate how the movement of objects can be influenced.