Exploring Grade One Computer Science

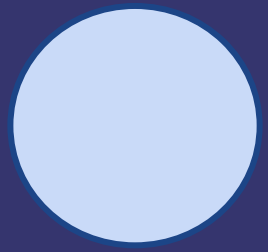
IF you teach THEN they will learn

Alberta Regional Consortia

Electrical and Computer Engineering

The most promising and profitable jobs of now and the future.

Over the next 10 years...



There will be

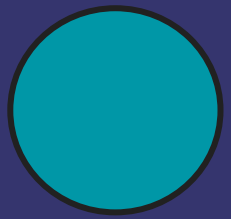
1.4 million

Programming jobs to fill

With only

400 000

Graduates in computer science



Leaving

1 million

empty jobs!

There are technology jobs in every field:

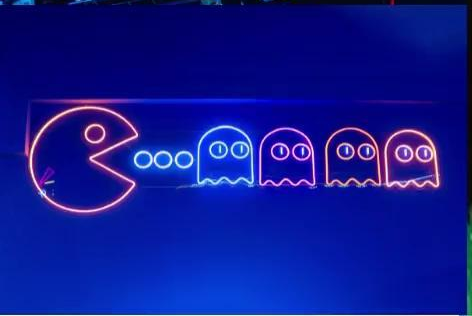
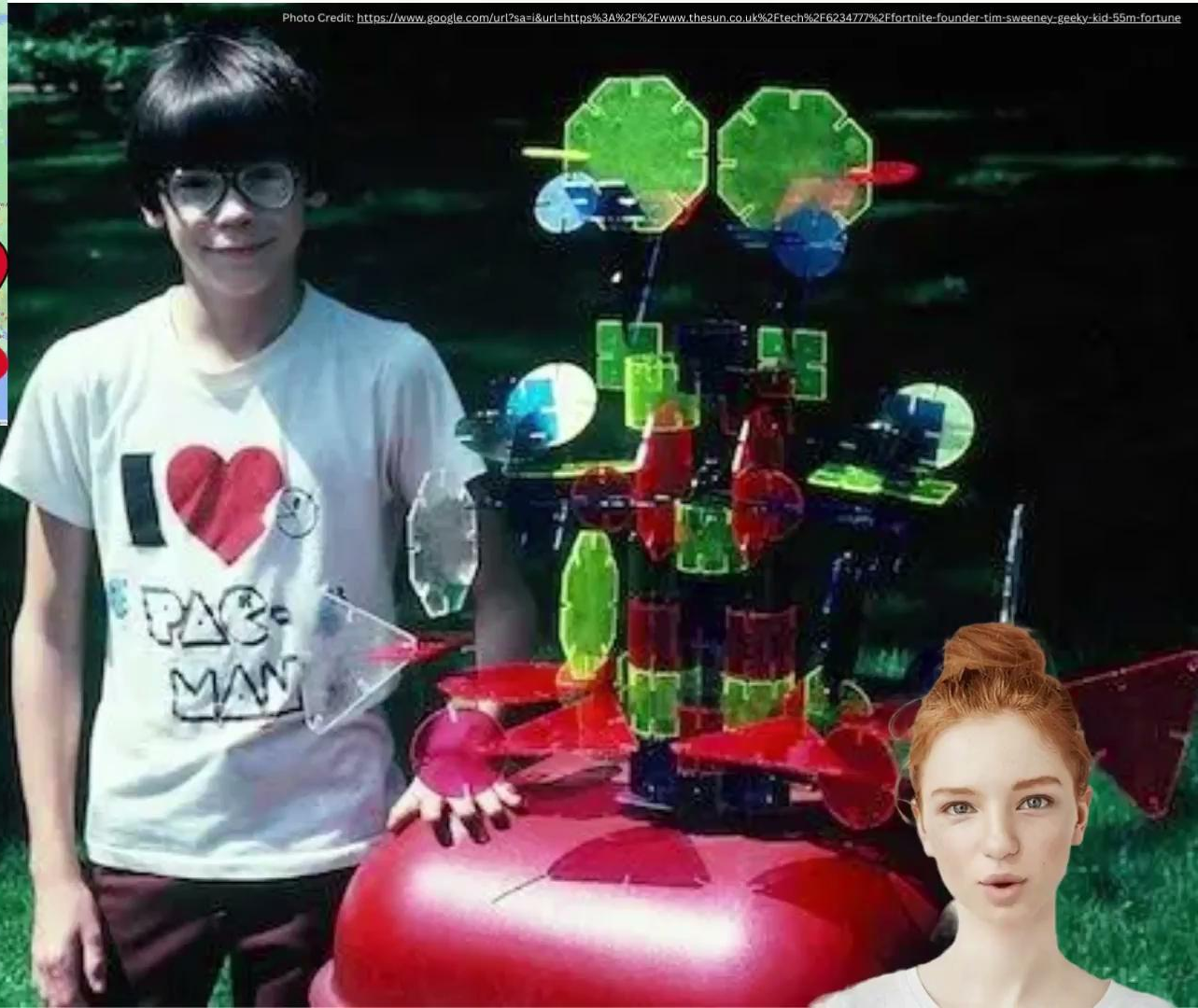


Photo Credit: https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.thesun.co.uk%2Ftech%2F6234777%2Ffortnite-founder-tim-sweeney-geeky-kid-55m-fortune



Alberta new LearnAlberta

English Login

Home

Alberta's K–6 Curriculum

Explore Resources

Curriculum Implementation Information Hub

Student Learning Hub

Printable Curriculum

Support

e-Tutoring Hub

Contact Us

Science Change Subject

Expand All

Prev Grade 4 Next

ORGANIZING IDEA

Matter: Understandings of the physical world are deepened thro

ORGANIZING IDEA

Energy: Understandings of the physical world are deepened thro their

ORGANIZING IDEA

Earth Systems: Understandings of the living world, Earth, and spa th

ORGANIZING IDEA

Living Systems: Understandings of the living world, Earth, and sp

ORGANIZING IDEA

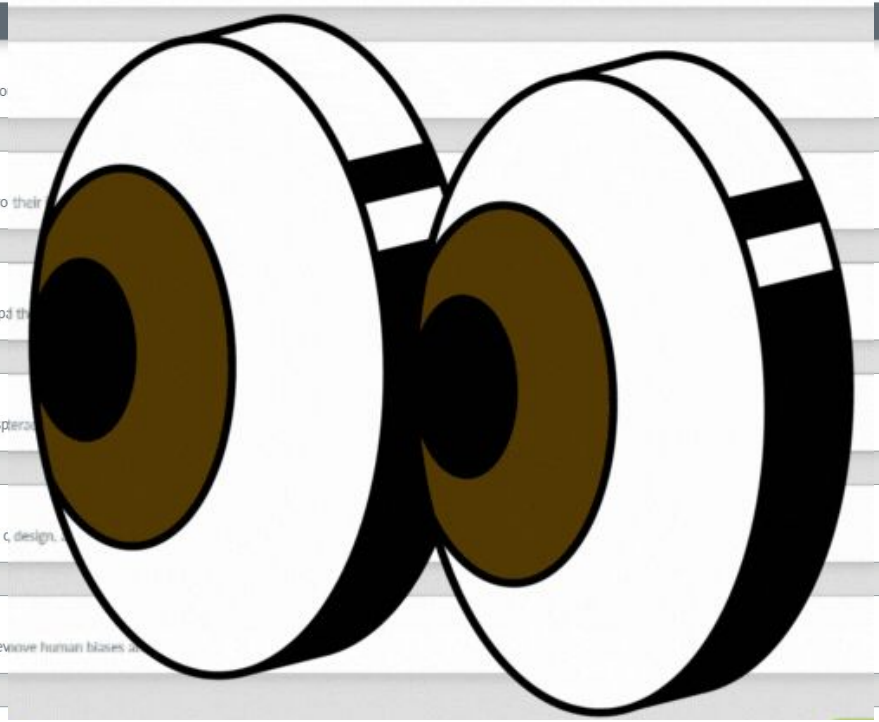
Space: Understandings of the living world, Earth, and space are design.

ORGANIZING IDEA

Computer Science: Problem solving and scientific inquiry are dev ove human biases

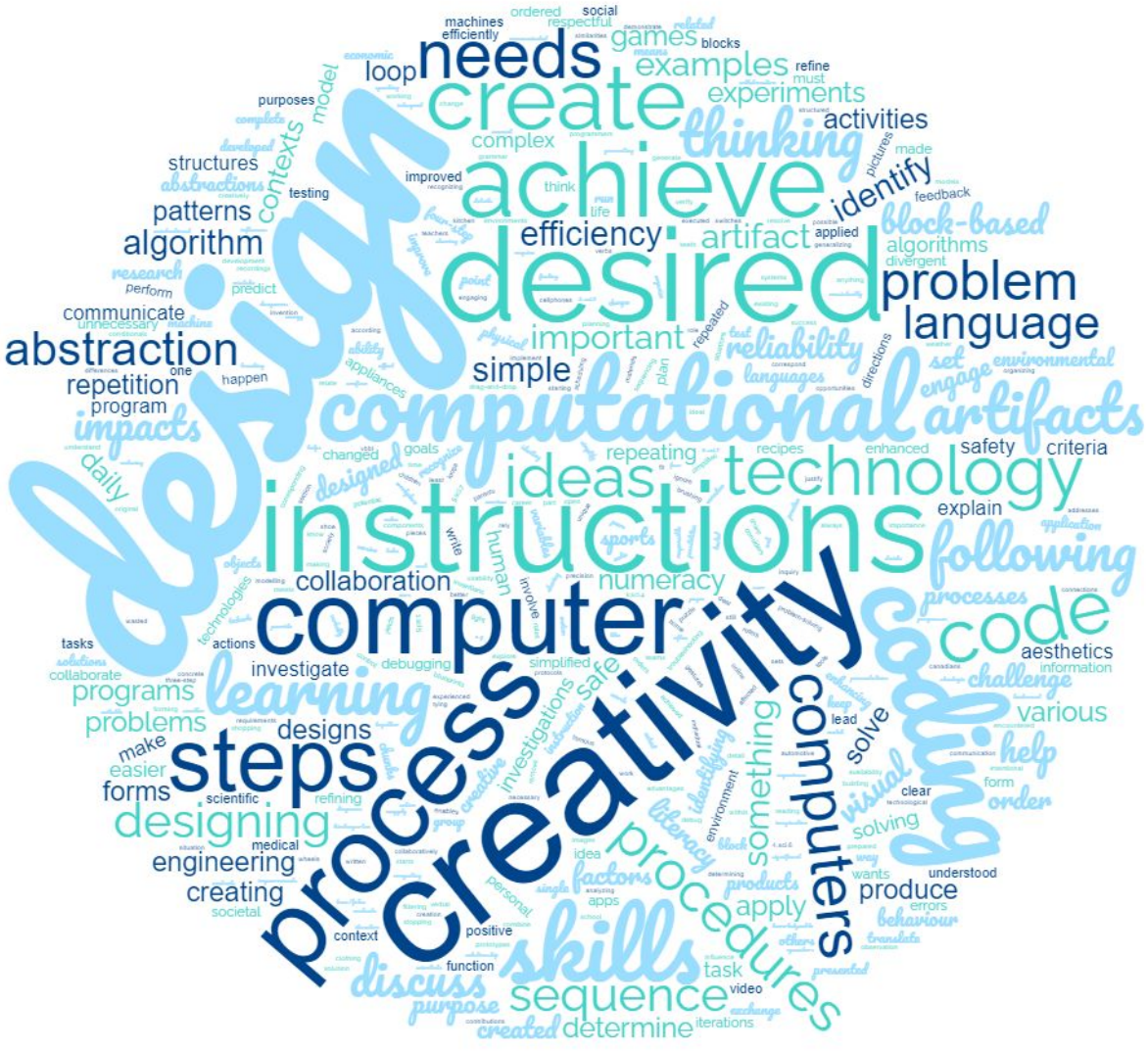
ORGANIZING IDEA

Scientific Methods: Investigation of the physical world is enhanced through the use of scientific methods that attempt to remove human biases and increase objectivity.



Contact Us

Problem solving and **scientific inquiry** are developed through the knowledgeable application of **creativity**, **design**, and **computational thinking**.



Learning Outcomes

K Children interpret instructions in the learning environment.

1 Students investigate instructions and their influence on actions and outcomes.

2 Students apply creativity when designing instructions to achieve a desired outcome.

3 Students investigate creativity and its relationship to computational thinking.

4 Students investigate and apply design in the context of computer science and technology.

5 Students create and justify a design that could be used by a human or machine to address a challenge.

6 Students create and refine computational artifacts through the use of design and abstraction.

K *Children interpret instructions in the learning environment.*

1 *Students investigate instructions and their influence on actions and outcomes.*

2 *Students apply creativity when designing instructions to achieve a desired outcome.*

K *Children interpret instructions in the learning environment.*

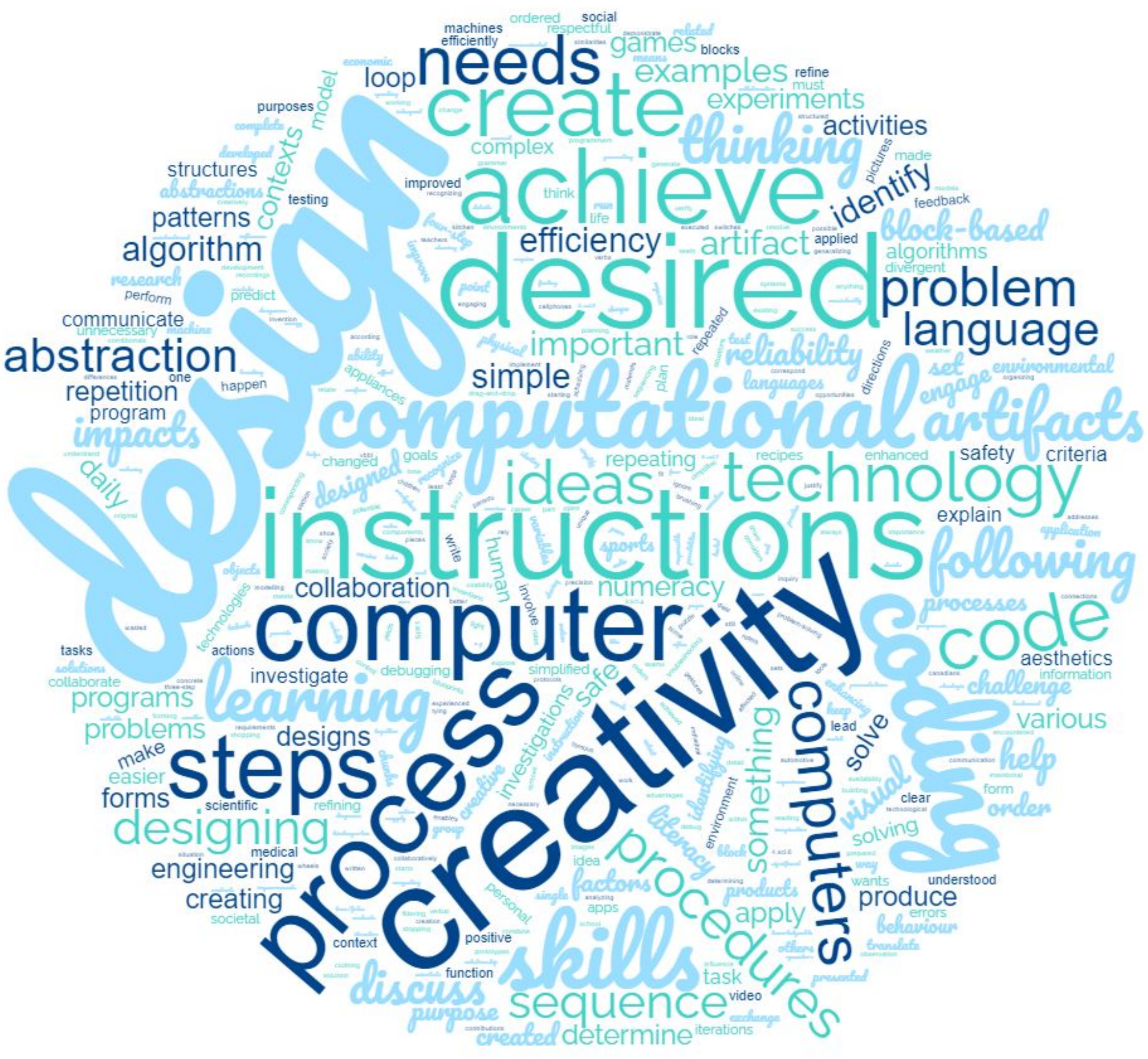
1 *Students investigate instructions and their influence on actions and outcomes.*

2 ***Students apply creativity when designing instructions to achieve a desired outcome.***

K *Children interpret instructions in the learning environment.*

1 ***Students investigate instructions and their influence on actions and outcomes.***

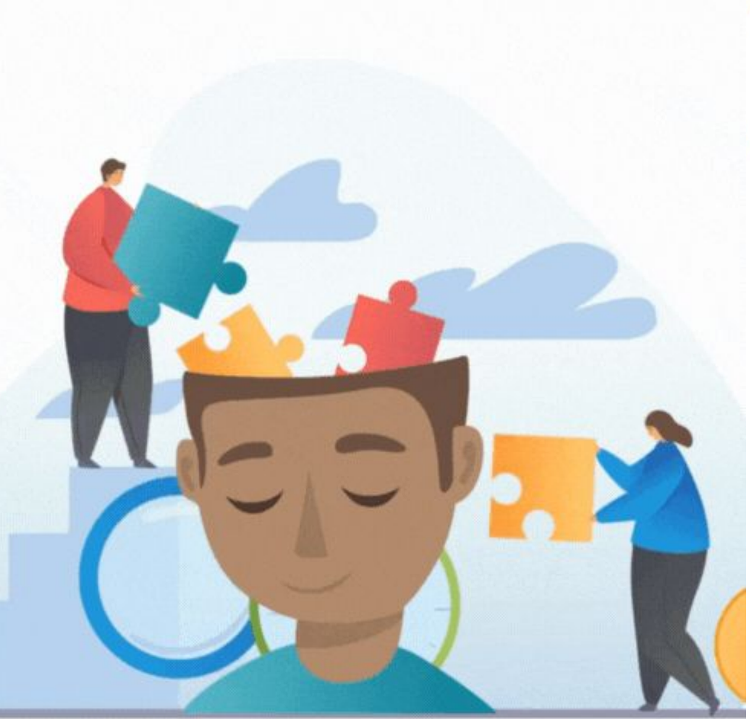
2 *Students apply creativity when designing instructions to achieve a desired outcome.*

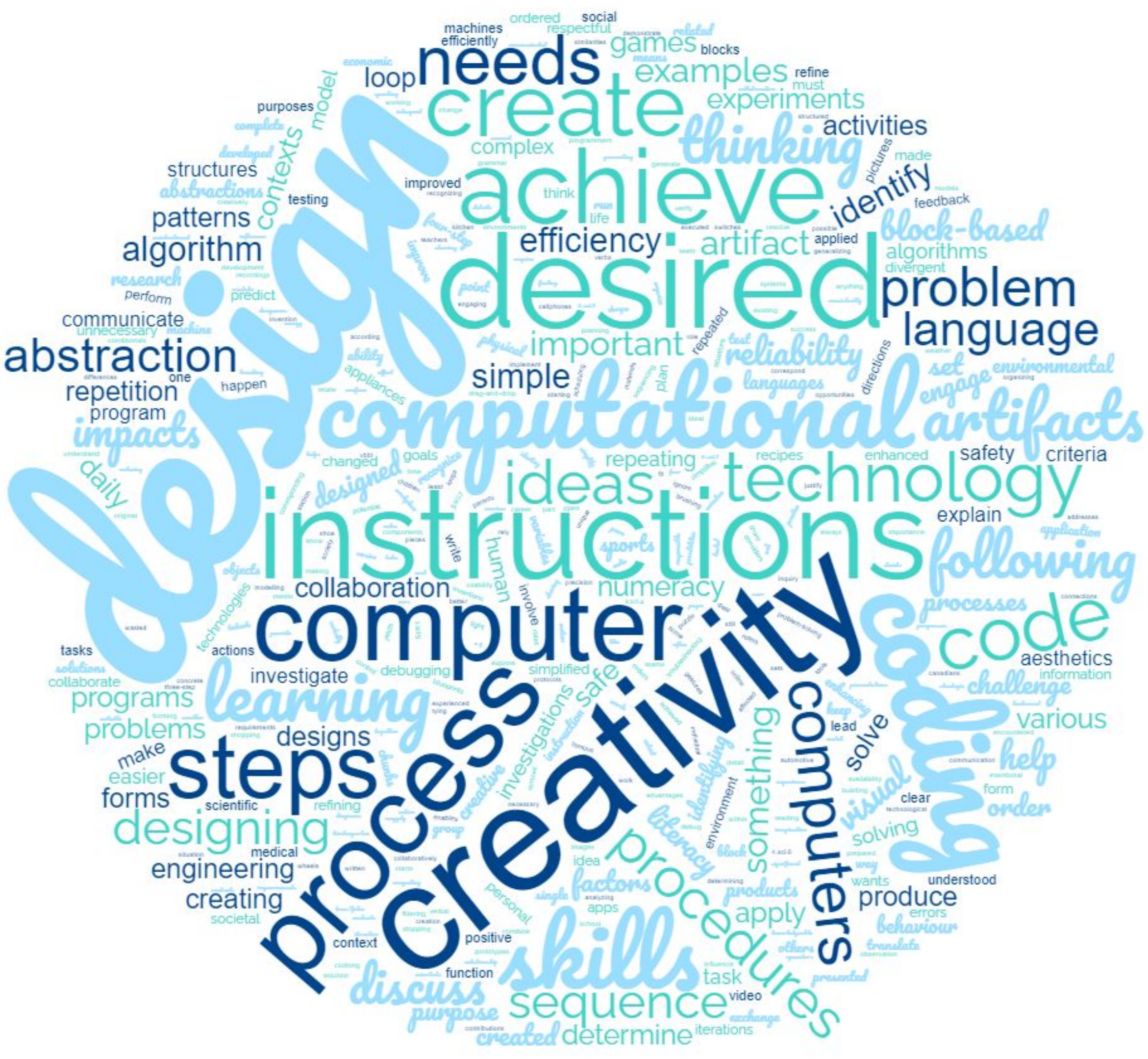

design
desired
instructions
computational
creativity
computer
process
achieve
create
needs
steps
coding
technology
ideas
code
thinking
abstraction
skills
learning
problem
language
computers
procedures
artifacts
following
designing
algorithm
efficiency
artifact
identify
block-based
important
reliability
simple
sequence
discuss
examples
experiments
games
loop
activities
complex
structures
patterns
contexts
communicate
repetition
program
impacts
daily
programs
problems
designs
engineering
creating
forms
easier
make
collaboration
numeracy
investigate
debugging
collaborate
tasks
actions
something
solve
solving
apply
produce
aesthetics
various
information
challenge
help
order
visual
literacy
factors
products
behaviour
determine
purpose
created
iterations
video
function
task
positive
context
societal
scientific
medical
refining
safety
criteria
explain
recipes
enhanced
repeating
goals
changed
recognize
designed
sports
human
write
involve
simplified
investigations
safe
identifying
environment
clear
understood
wants
errors
processes
application
environmental
engage
set
languages
algorithms
divergent
applied
feedback
pictures
made
refine
must
blocks
social
respectful
ordered
machines
efficiently
purposes
model
improved
testing
think
life
predict
perform
research
unnecessary
appliances
happen
one
technologies
solutions
personal
apps
idea
lead
form
translate
exchange
presented
others
single
repeated
plan
test
directions
improve
point
physical
ability
objects
variables

Creativity

Finding different ways to reach the same outcome.

Problem solving to overcome obstacles to achieve a desired outcome.




design
creativity
computational
instructions
computer
desired
achieve
create
process
steps
coding
needs
technology
ideas
code
procedures
computers
skills
learning
thinking
artifacts
following
abstraction
algorithm
problem
language
designing
sequence
efficiency
artifact
identify
simple
important
reliability
block-based
examples
experiments
activities
games
loop
patterns
structures
contexts
repetition
program
impacts
communicate
collaboration
numeracy
repeating
programs
problems
designs
investigate
engineering
creating
forms
easier
make
determine
discuss
purpose
apply
produce
various
aesthetics
explain
safety
criteria
debugging
simplified
safe
investigations
something
solve
literacy
factors
daily
complex
algorithms
engage
languages
environmental
processes
challenge
help
visual
order
solving
behaviour
translate
created
iterations
societal
collaborate
actions
tasks
scientific
medical
context
positive
function
video
task
apps
personal
idea
refining
clear
form
understood
wants
errors
information
enhanced
recipes
goals
changed
designed
human
write
involve
technologies
predict
perform
research
unnecessary
machine
happen
one
testing
purposes
model
improved
think
life
applied
divergent
feedback
pictures
made
refine
must
blocks
social
ordered
respectful
machines
efficiently
economic
complete
developed
abstractions
physical
ability
appliances
variables
sports
objects
solutions
lead
application
products
exchange
presented
group
single
identifying
creative
instruction
block
environment
repeated
directions
plan
test
set
point
improve
run
related
means

Design Thinking Process

Learn About
Your Audience

Empathize

Define

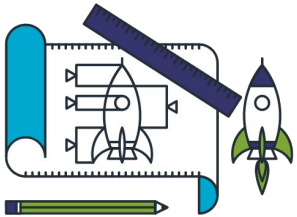
Construct Point
of View Based
on User Needs

Brainstorm and
Come up with
Creative Solutions

Ideate

Prototype

Build
Representation
of Your Ideas



Test Your Ideas

Test

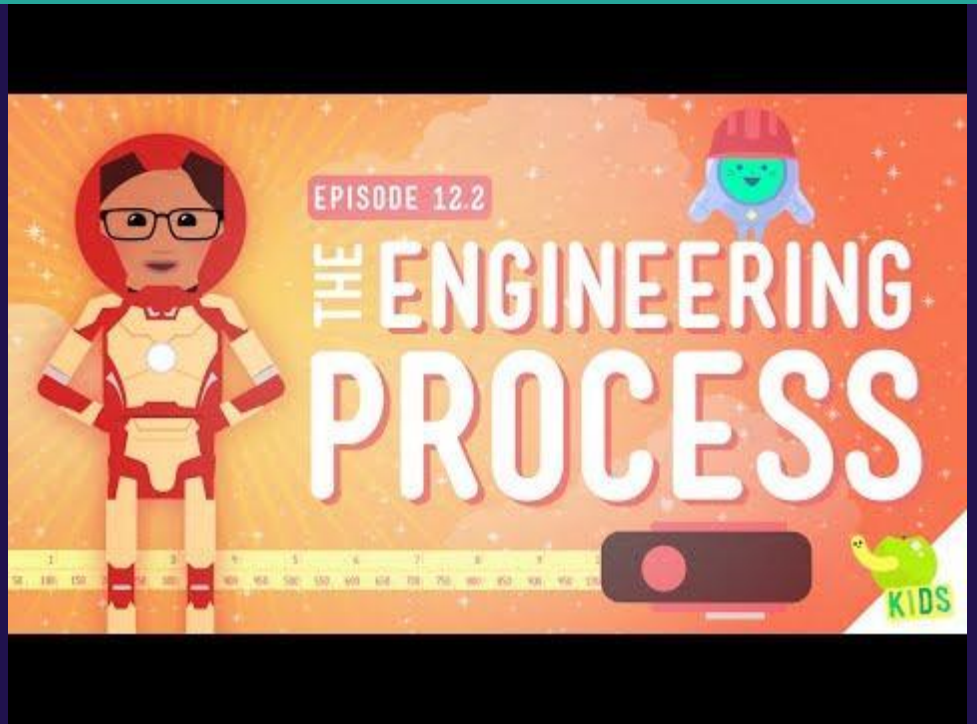
Empathize → Define → Ideate → Prototype → Test

Learn about the audience for whom you will be designing.

Walk a mile in their shoes.

Empathize → **Define** → Ideate → Prototype → Test

Use what you know about your audience to determine exactly what the problem you are going to solve is.



Empathize → Define → **Ideate** → Prototype → Test

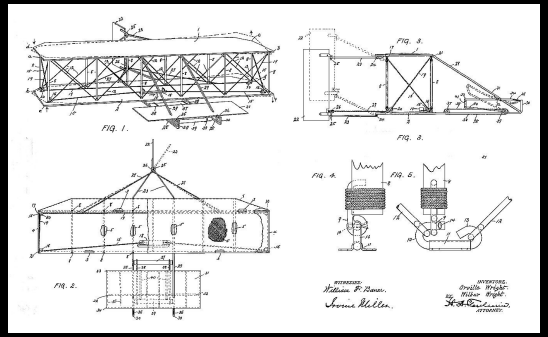
There are NO bad ideas!

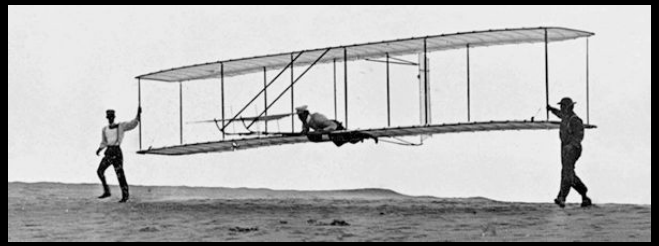
Think about your audience's needs!

Quantity over Quality!

Ideas! Ideas! Ideas!

Empathize → Define → Ideate → **Prototype** → Test





Empathize → Define → Ideate → Prototype → **Test**

If at first you don't succeed,
TRY
TRY
Again...and again...
and again.

Did you know? The Wright Brothers had 2 failures before they were successful with flight.

Empathize

As you watch the video, start to think about what this person needs. Also be prepared to talk about how the video made you feel.

Think about…

- How you would feel in Mandy's position?
- What kind of person does Mandy seem like?
- What qualities does the video show you about Mandy?

Define

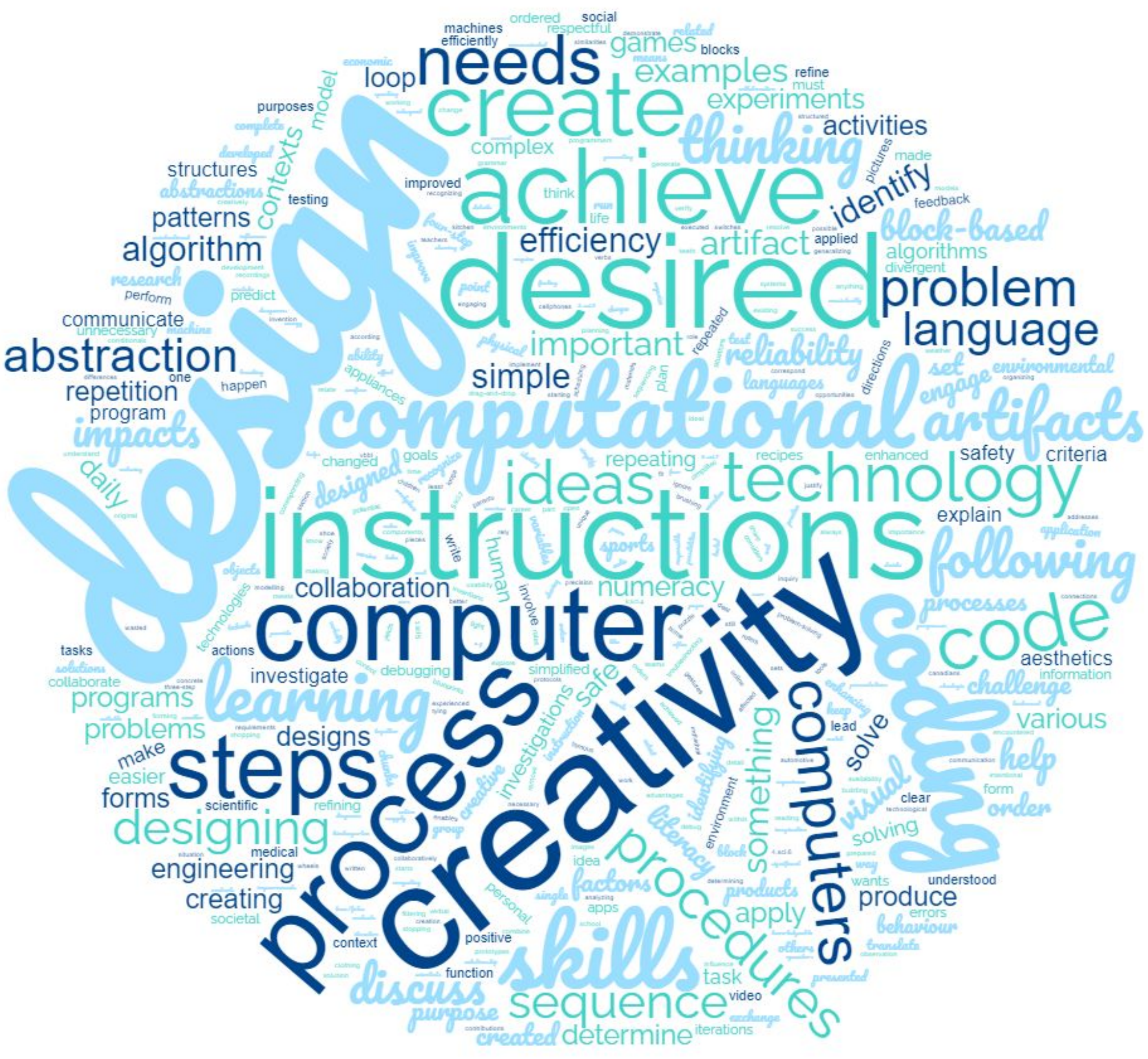
What is Mandy's problem?

Tip: It's not that she is deaf.

This is an impairment that cannot be fixed and Mandy has figure out how to sing even though she cannot hear.

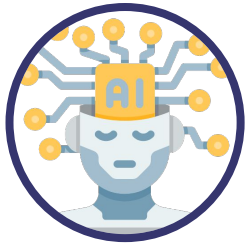
How does Mandy currently deal with her problem?

She sings in her stocking feet so she can feel the vibrations.


design
computational
instructions
creativity
desired
achieve
create
needs
computer
process
steps
coding
skills
technology
ideas
procedures
computers
code
learning
following
artifacts
abstraction
algorithm
problem
language
thinking
identify
efficiency
artifact
block-based
important
reliability
simple
repetition
impacts
daily
designing
sequence
discuss
programs
problems
designs
engineering
creating
apply
produce
various
collaboration
numeracy
investigate
patterns
structures
contexts
communicate
examples
experiments
activities
games
loop
complex
algorithms
technologies
aesthetics
criteria
safety
explain
repeating
recipes
enhanced
something
investigations
literacy
factors
purpose
determine
created
video
function
context
positive
personal
apps
sports
human
write
involve
debugging
simplified
safe
forms
easier
make
collaborate
tasks
actions
scientific
medical
refining
societal
understood
errors
behaviour
translate
products
solving
visual
clear
form
order
help
challenge
information
processes
application
lead
solve
task
iterations
exchange
presented
others
wants
idea
identifying
program
happen
one
unnecessary
perform
predict
research
improved
testing
abstractions
developed
complete
purposes
model
machines
efficiently
ordered
social
respectful
blocks
refine
must
made
pictures
feedback
applied
divergent
languages
set
engage
environmental
directions
repeated
plan
appliances
changed
goals
designed
environment
variables
objects

Computational Thinking

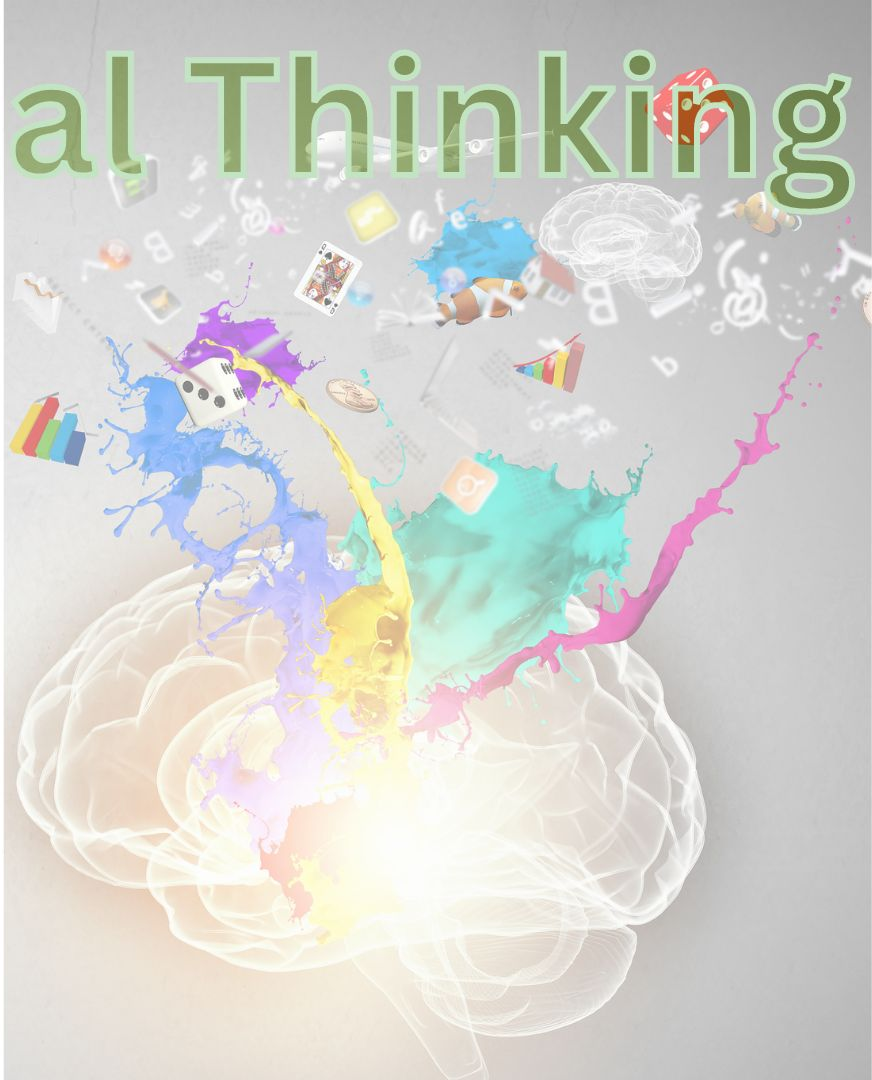
Decomposition



Pattern Recognition

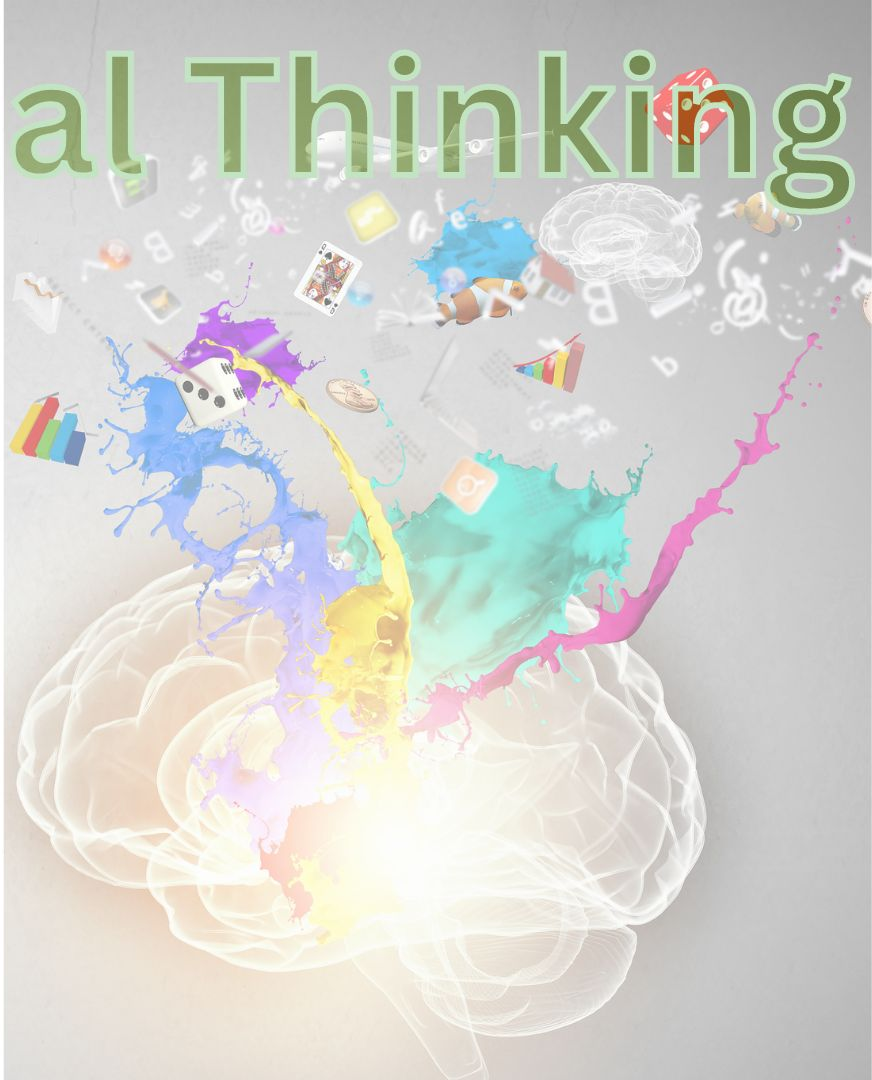
Pattern Abstraction

Algorithm Design



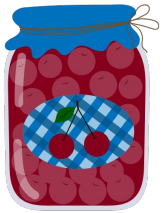
Computational Thinking

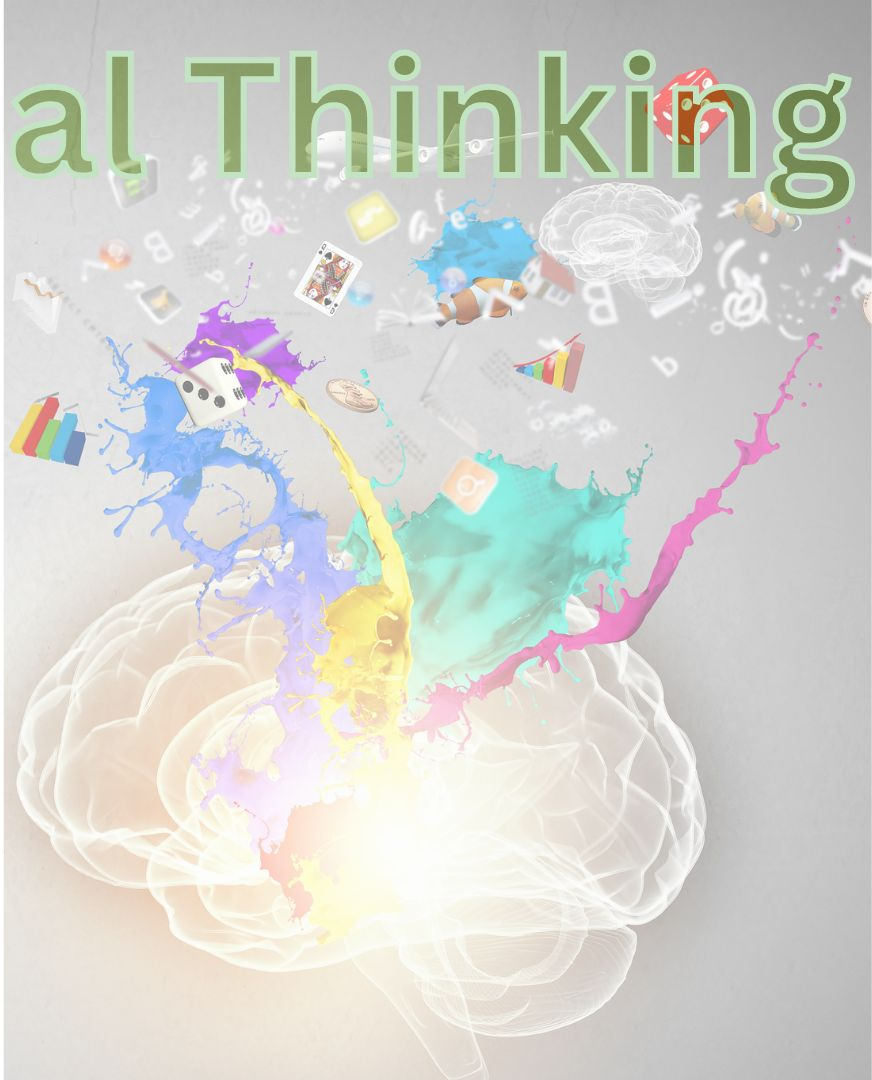
Decomposition



Computational Thinking

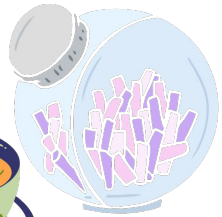
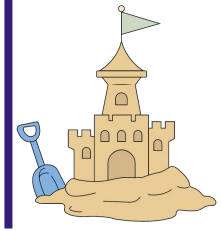
Pattern Recognition

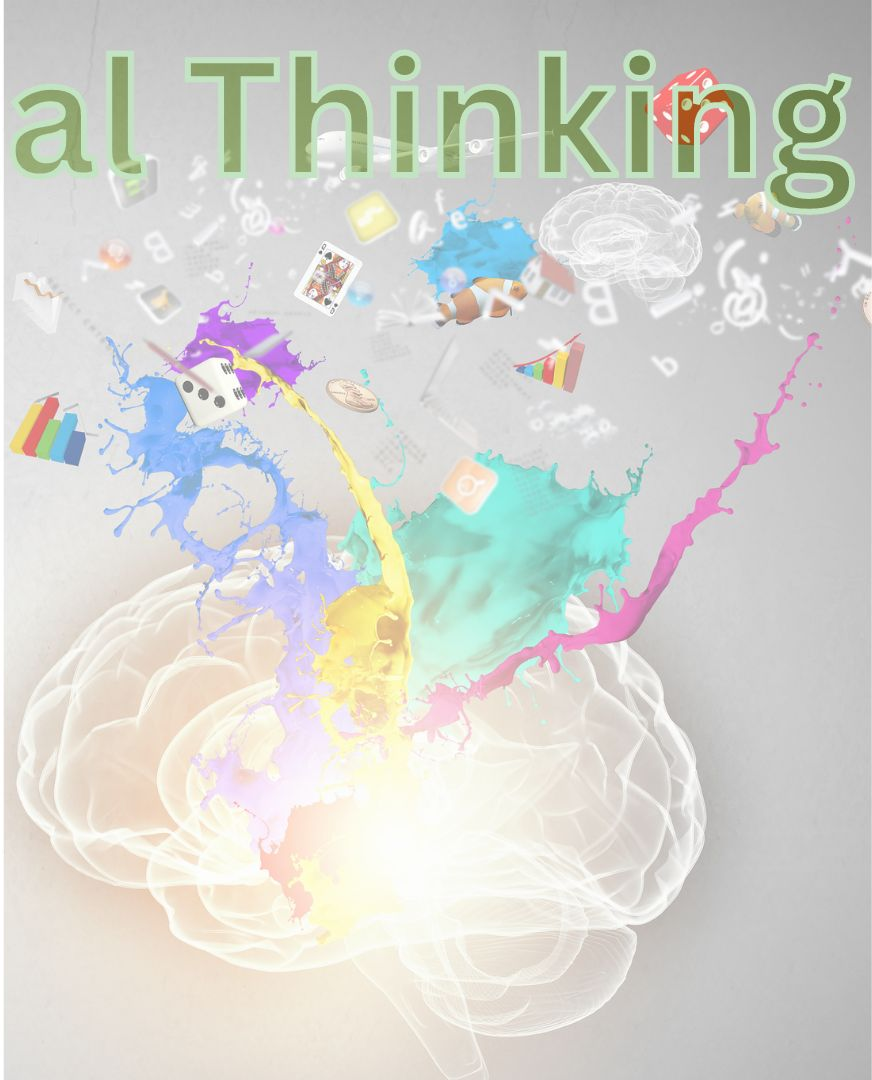
Pour	Scoop
 	 



Computational Thinking

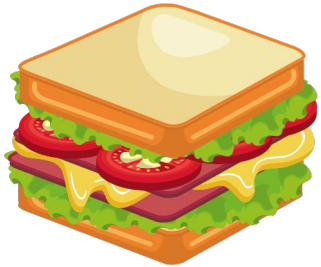
Pattern Abstraction

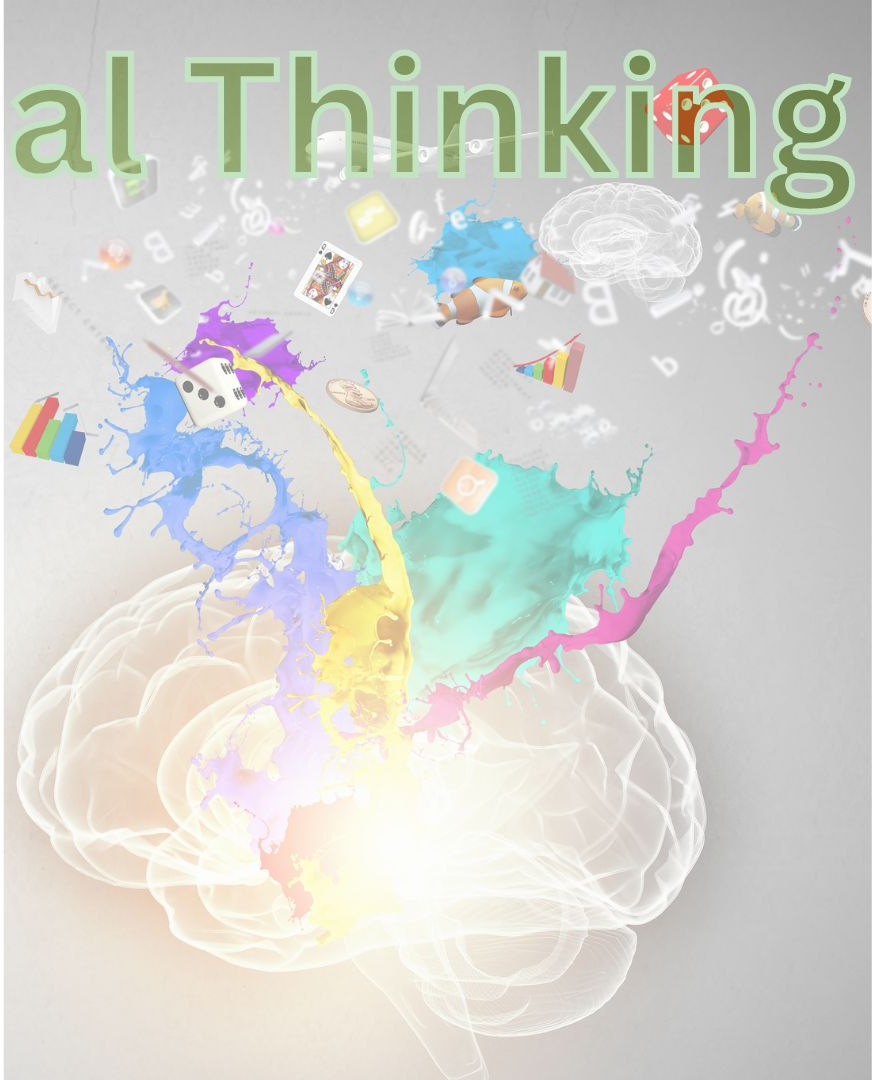
Pour	Scoop
    	   



Computational Thinking

Pattern Abstraction

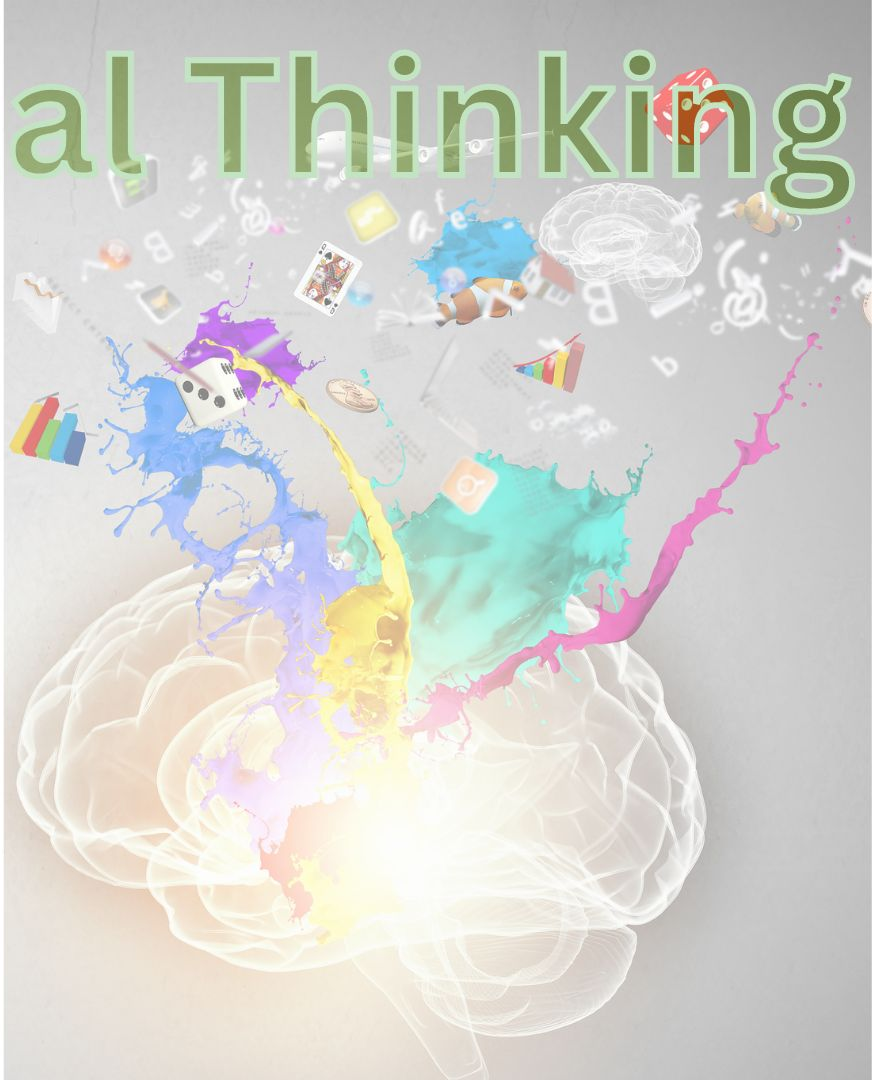




Computational Thinking

Algorithm Design

1. Gather ingredients.
    a. If it is closed then open it.
2. Build sundae.
    a. Scoop ice cream and put in bowl.
    b. Pour
        i. Chocolate sauce
        ii. Whipped cream
    c. Scoop a cherry out and place it on top of the whipped cream.
3. Put ingredients away.
    a. If it is open then close it.



Ears

To listen to the ideas of others

Eyes

To make observations

Mouth

To collaborate & share your conclusions with others

Hands

To do experiments & record observations

Curious Mind

To make predictions & hypothesis. To think deeply about the world.

Strong Heart

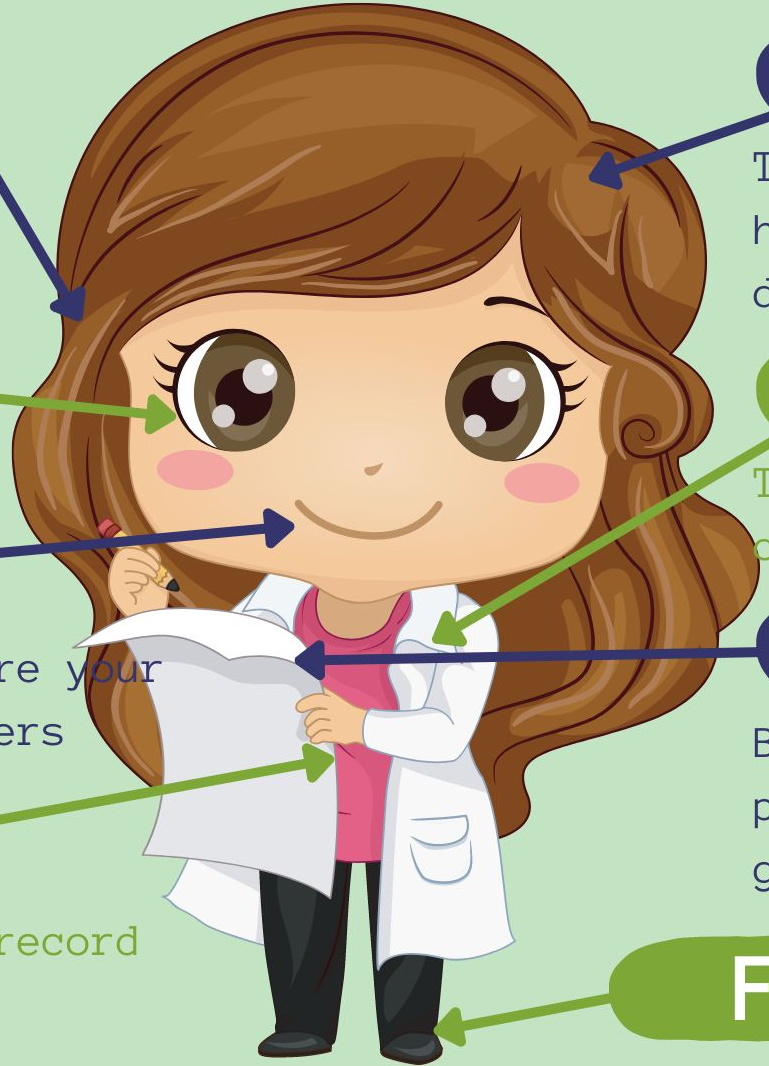
To be brave and take chances!

Tools

Beakers, Chromebooks, pencils, magnifying glasses & more

Feet

To move safely



Ears

To listen to the ideas of others

Eyes

To make observations

Mouth

To collaborate & share your conclusions with others

Hands

To do experiments & record observations

Curious Mind

To make predictions & hypothesis. To think deeply about the world.

Strong Heart

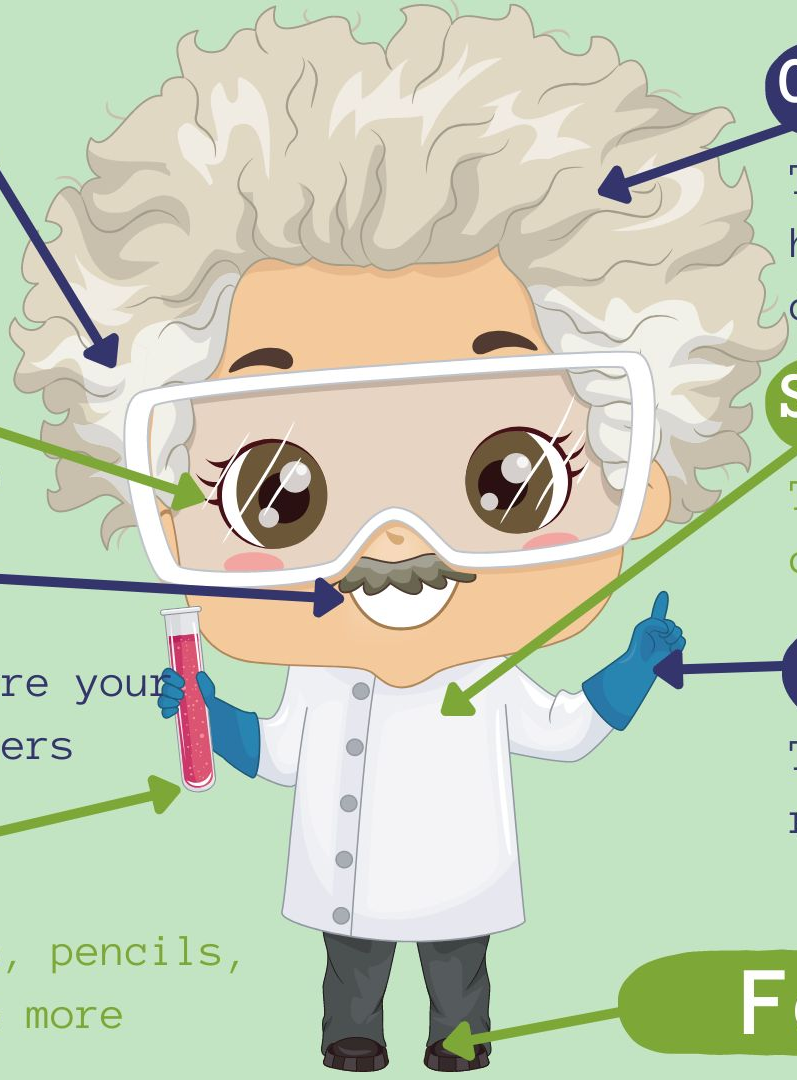
To be brave and take chances!

Tools

Beakers, Chromebooks, pencils, magnifying glasses & more

Feet

To move safely



Ears

To listen to the ideas of others

Eyes

To make observations

Mouth

To collaborate & share your conclusions with others

Tools

Beakers, Chromebooks, pencils, magnifying glasses & more

Curious Mind

To make predictions & hypothesis. To think deeply about the world.

Strong Heart

To be brave and take chances!

Hands

To do experiments & record observations

Feet

To move safely

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.

Attack of the Kidbots

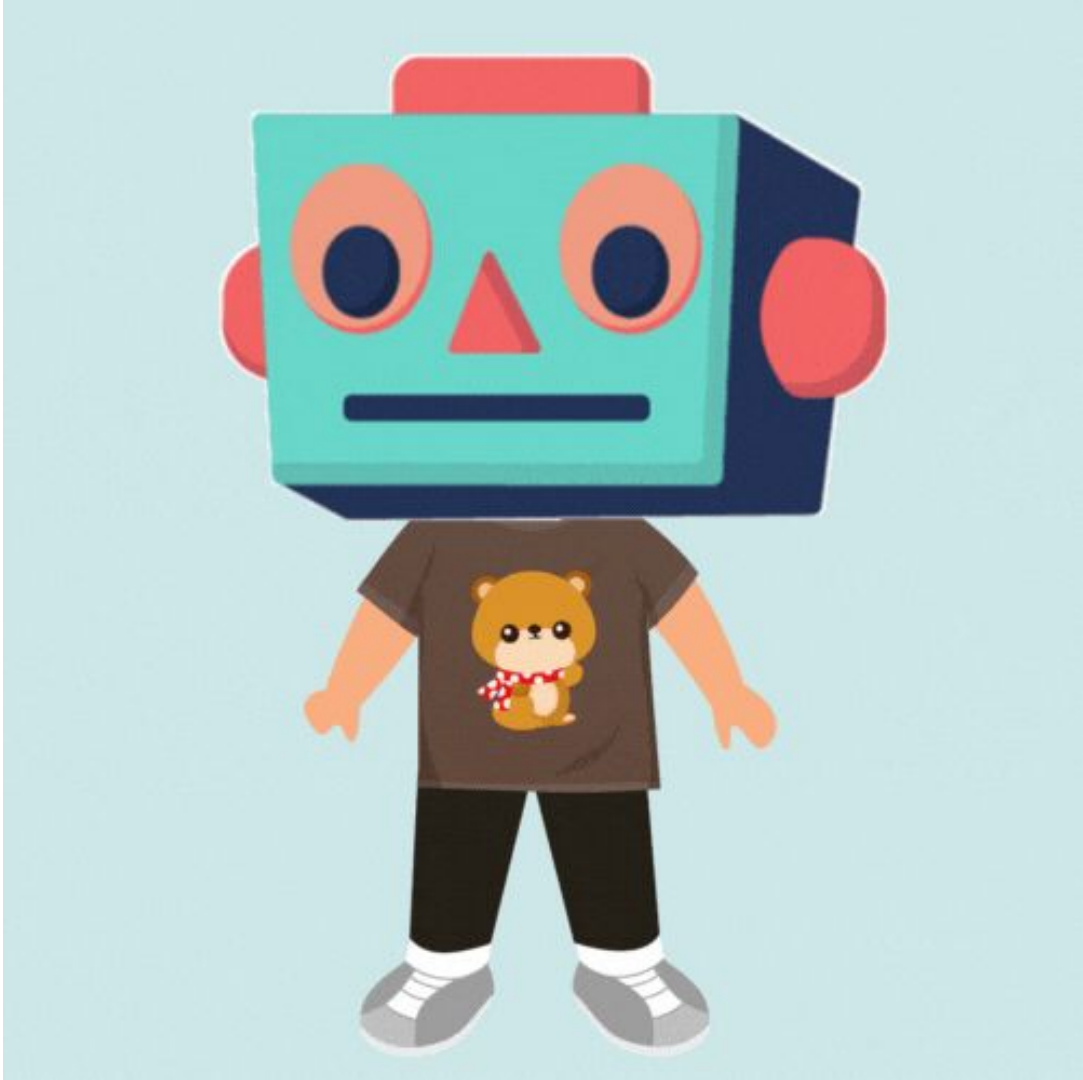
Classroom routines

Learning instructions

Other subject areas

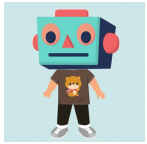
Outside of school

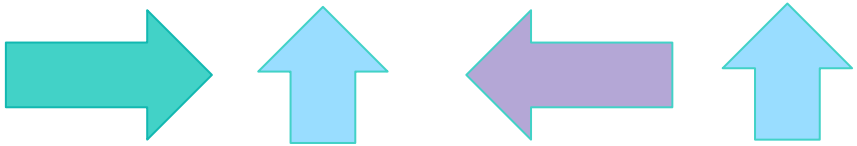
- Community
- Family
- The world
- In nature

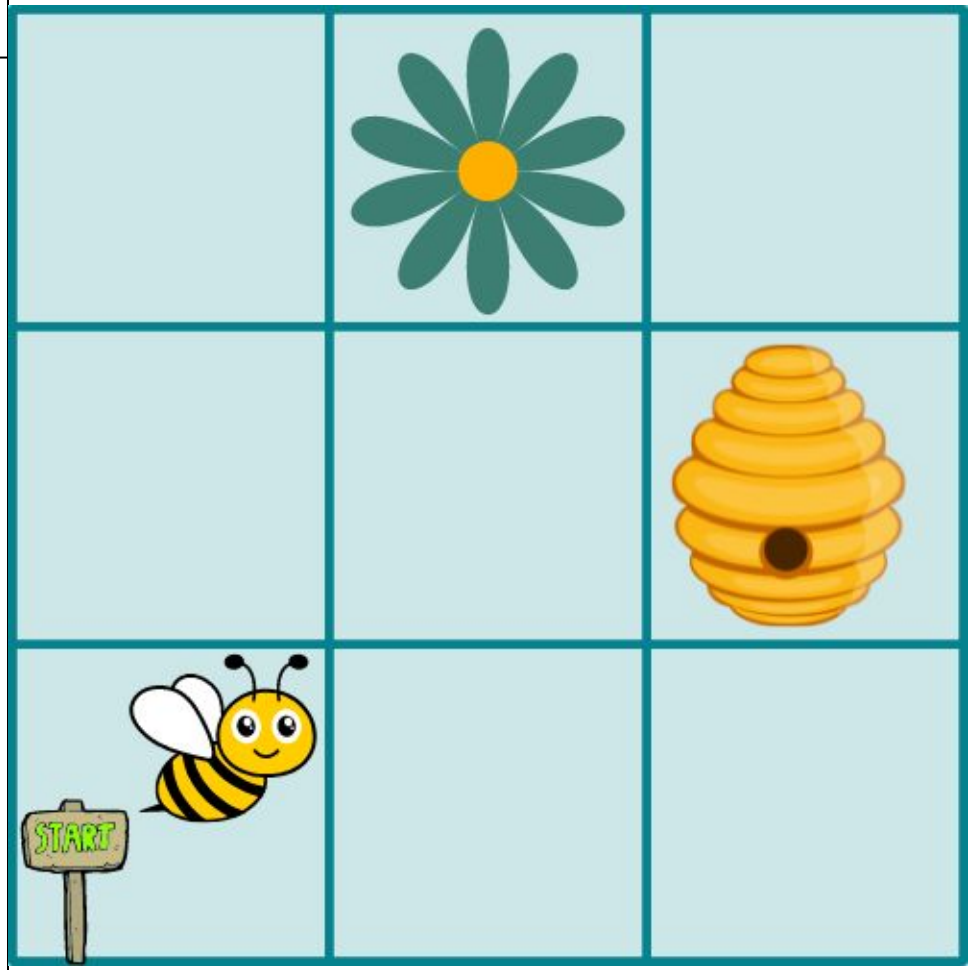


Skills & Procedures

Follow instructions with two or three steps given in different forms.

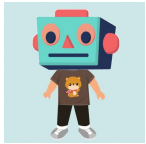


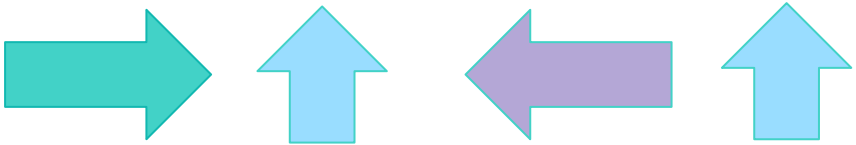


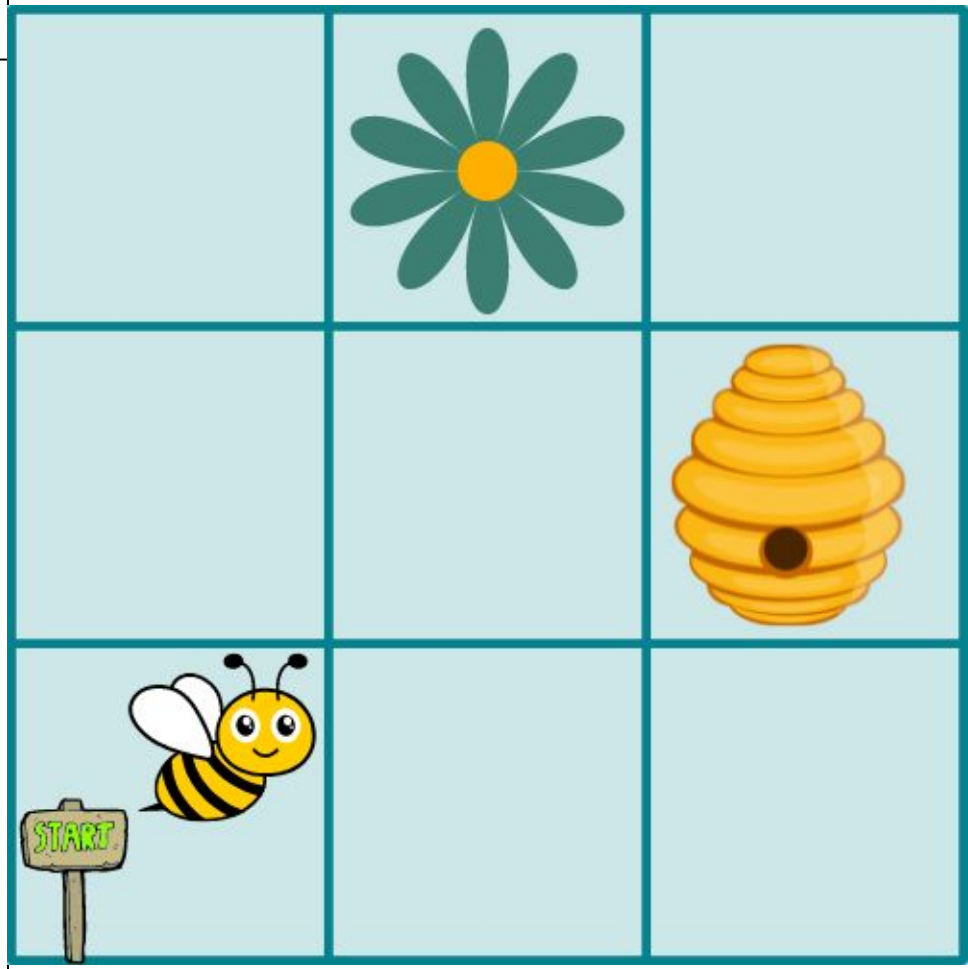


Skills & Procedures

Determine if instructions with two or three steps given in different orders still produce the desired outcome.

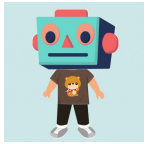


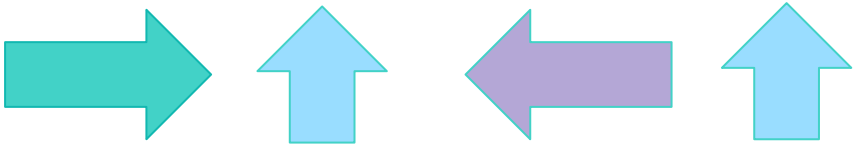


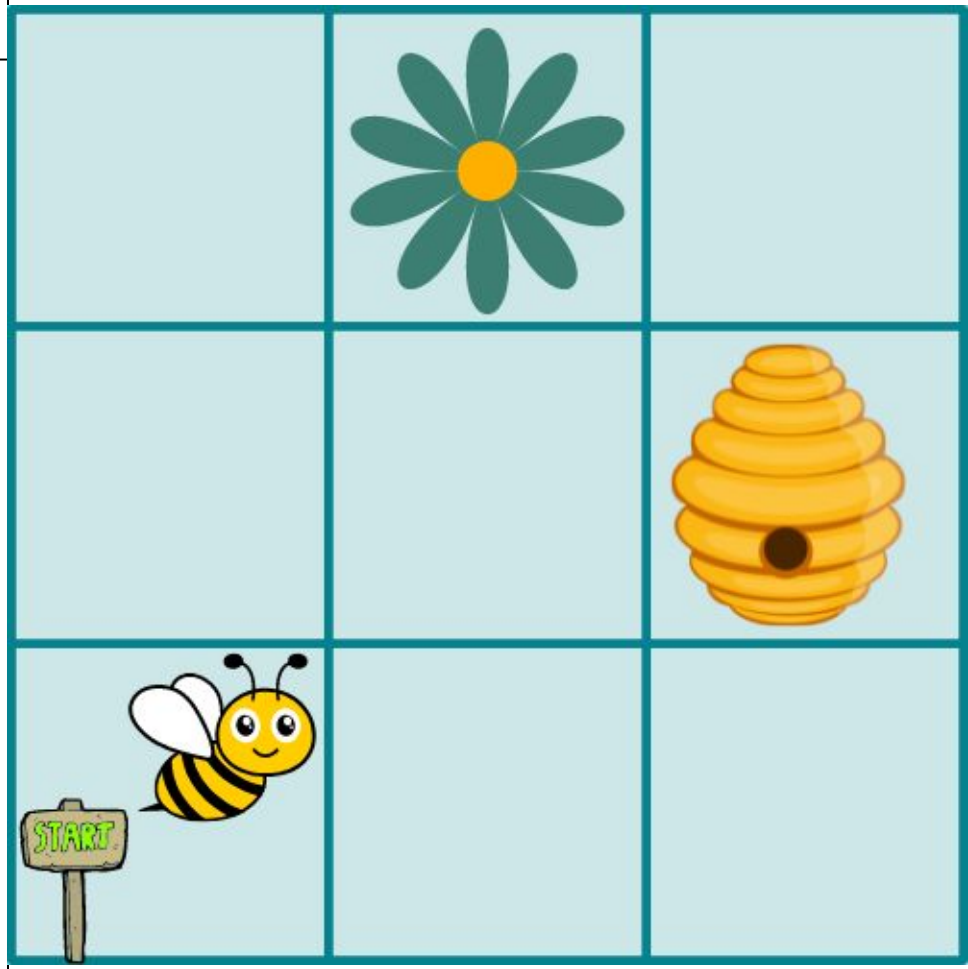


Skills & Procedures

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

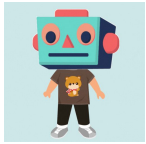


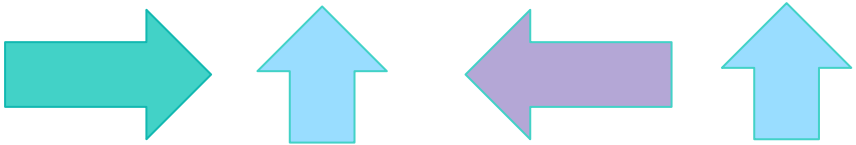


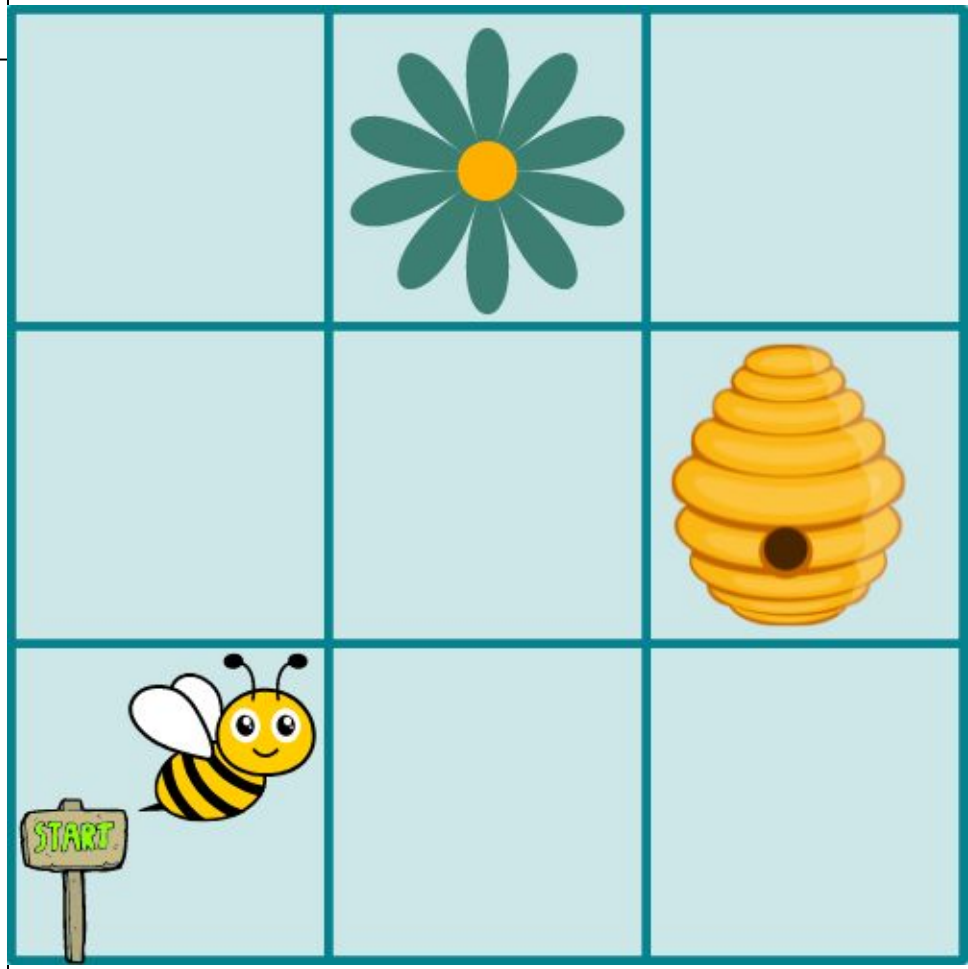


Skills & Procedures

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

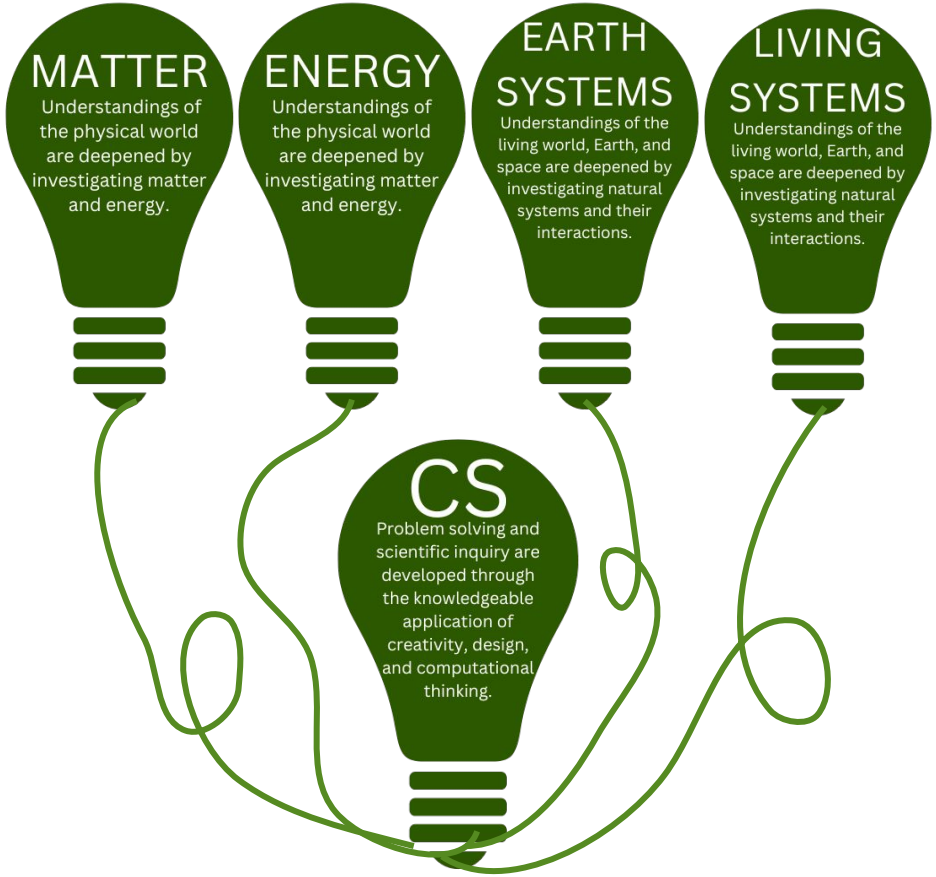


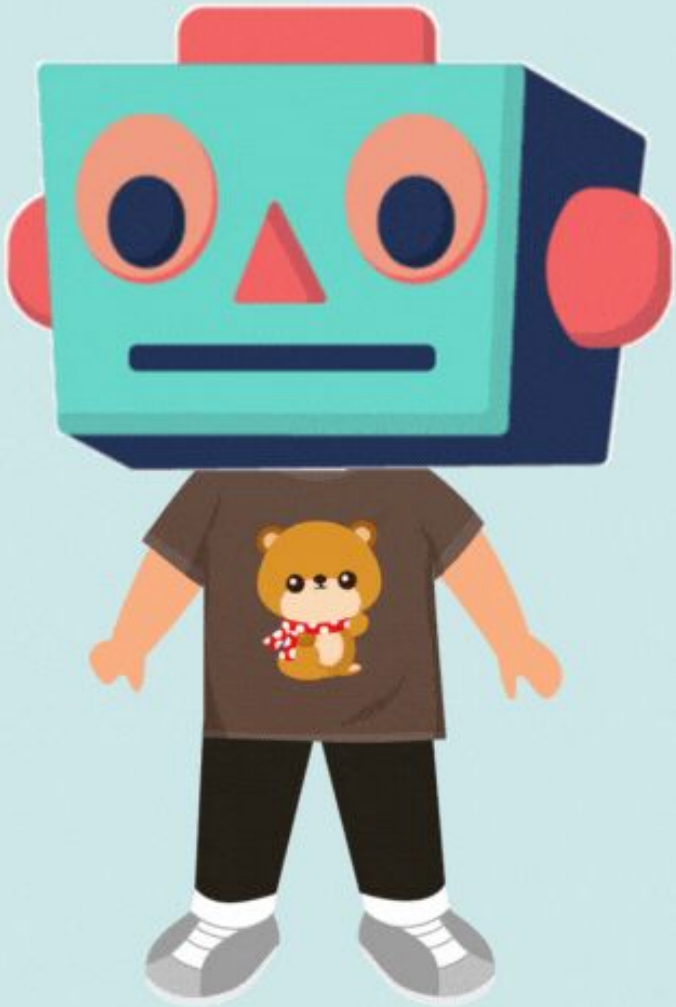




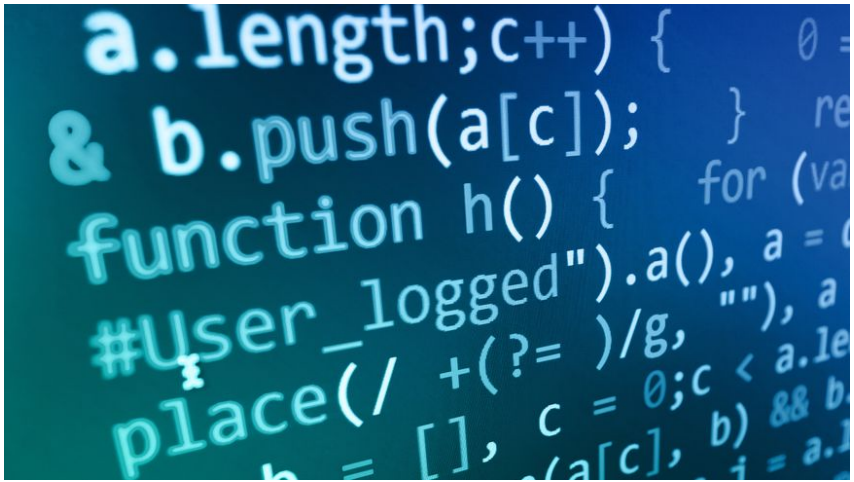
Skills & Procedures

Follow instructions during investigations.





Coding consists of many languages that computers understand.



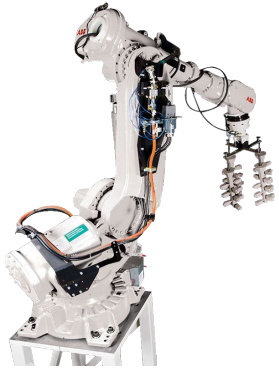

Search
Home
Discover
Apps
Pose
Trending | Your truth if you dare
Favorite Apps
Play Next
Youtube

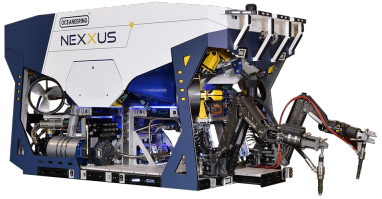

1:21
18°C

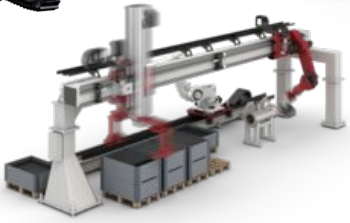

COOLING
75
78


Yale
1 2 3
4 5 6
CARD
7 8 9
* 0 #

ROBOTS!!!



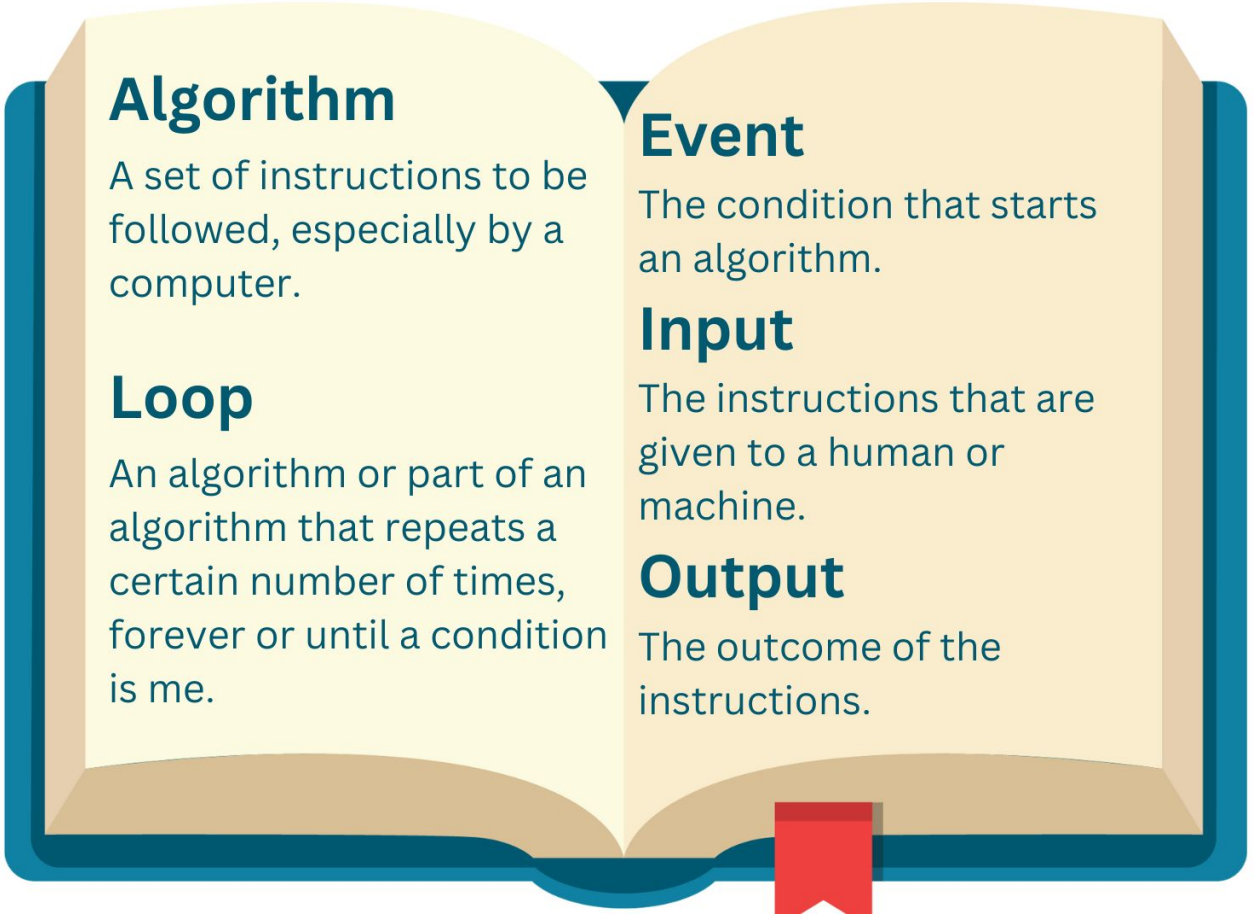




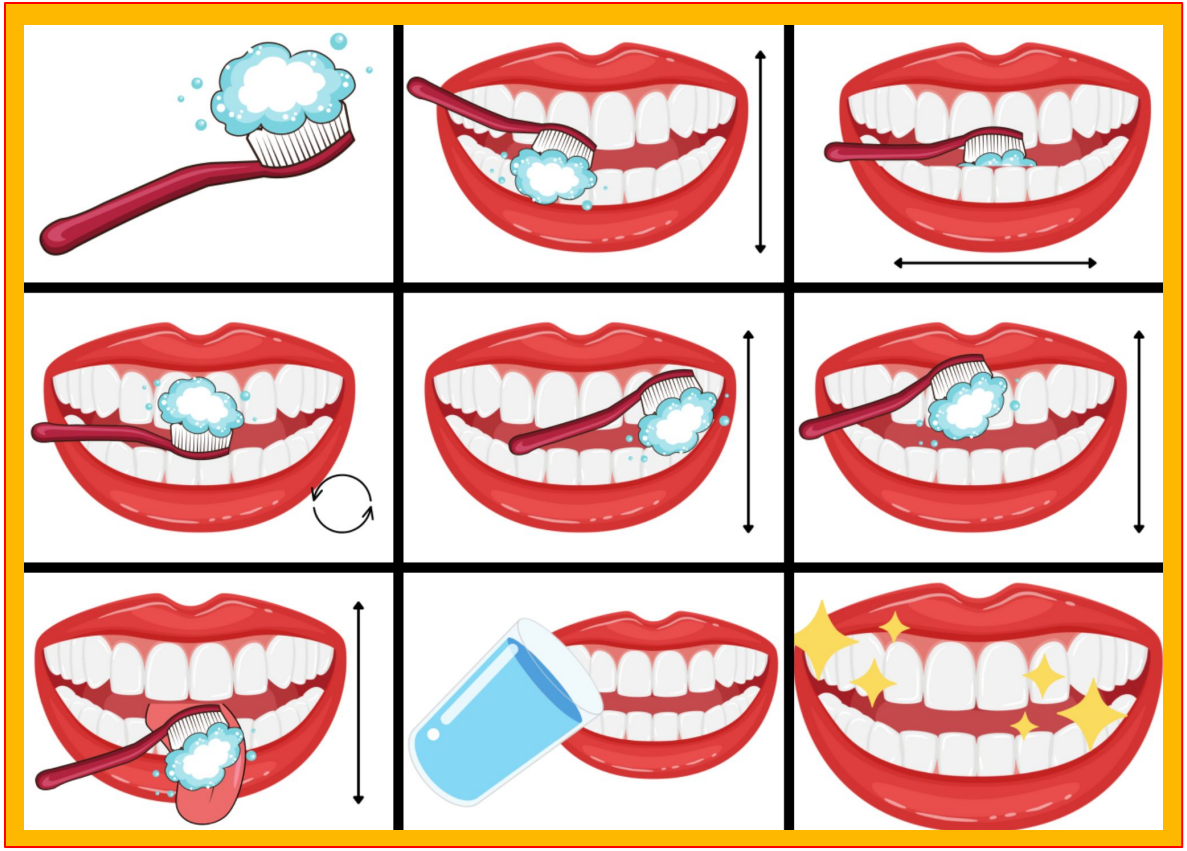
Coding

What we think it is…

Computer Science Vocabulary



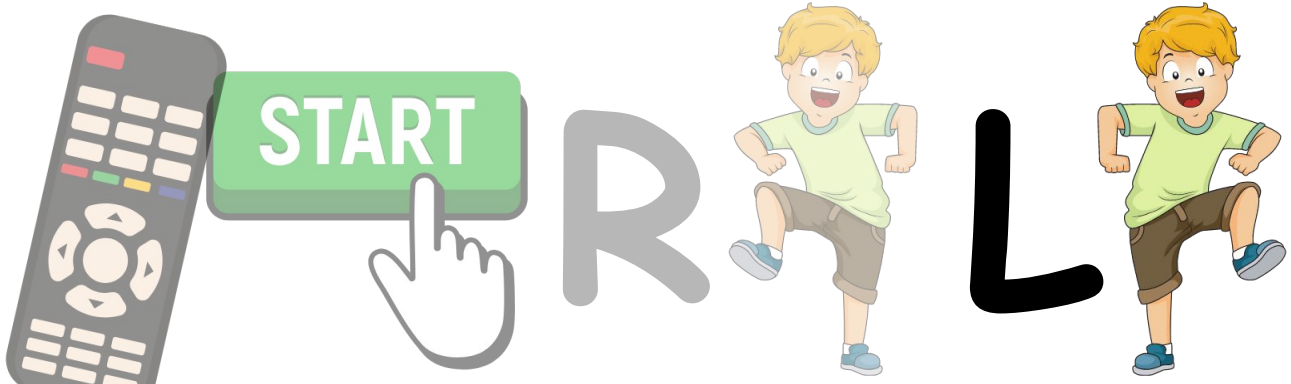
What Coding Really is



Algorithm

Algorithm

Algorithm



Algorithm

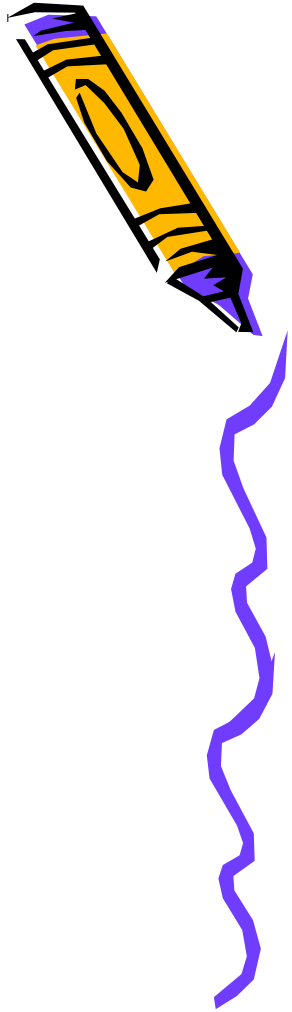
Algorithm

R

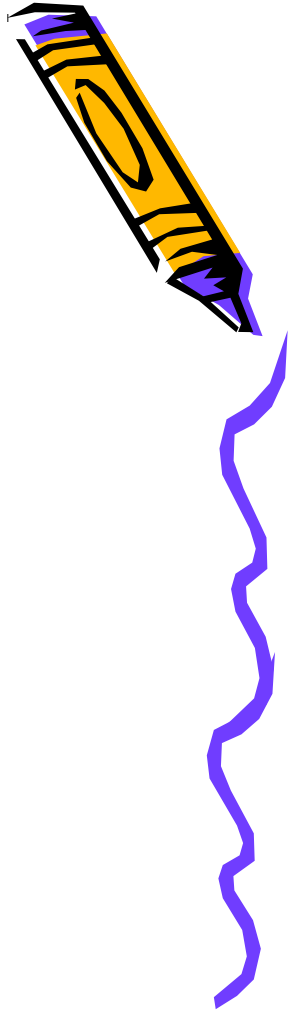
L

H

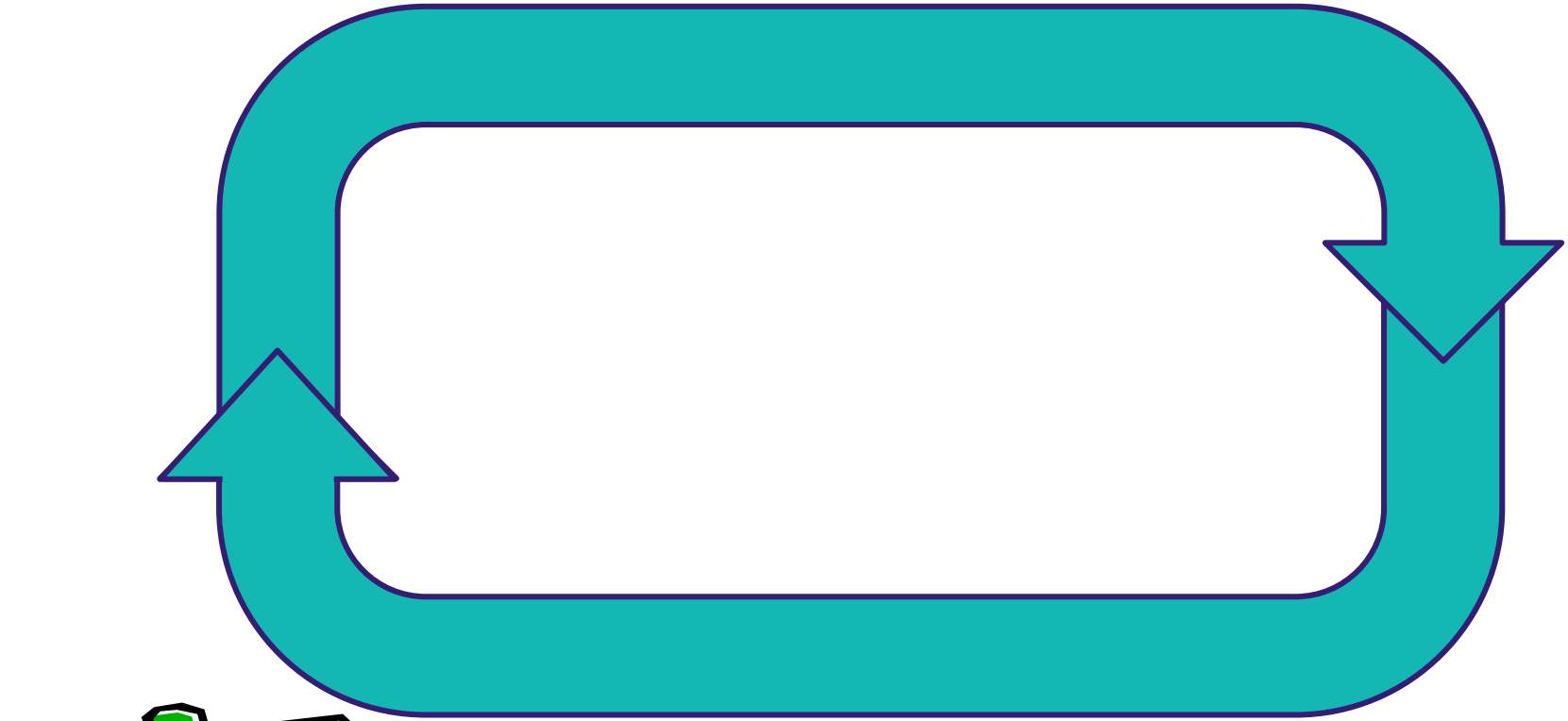
R H



L H



L H R



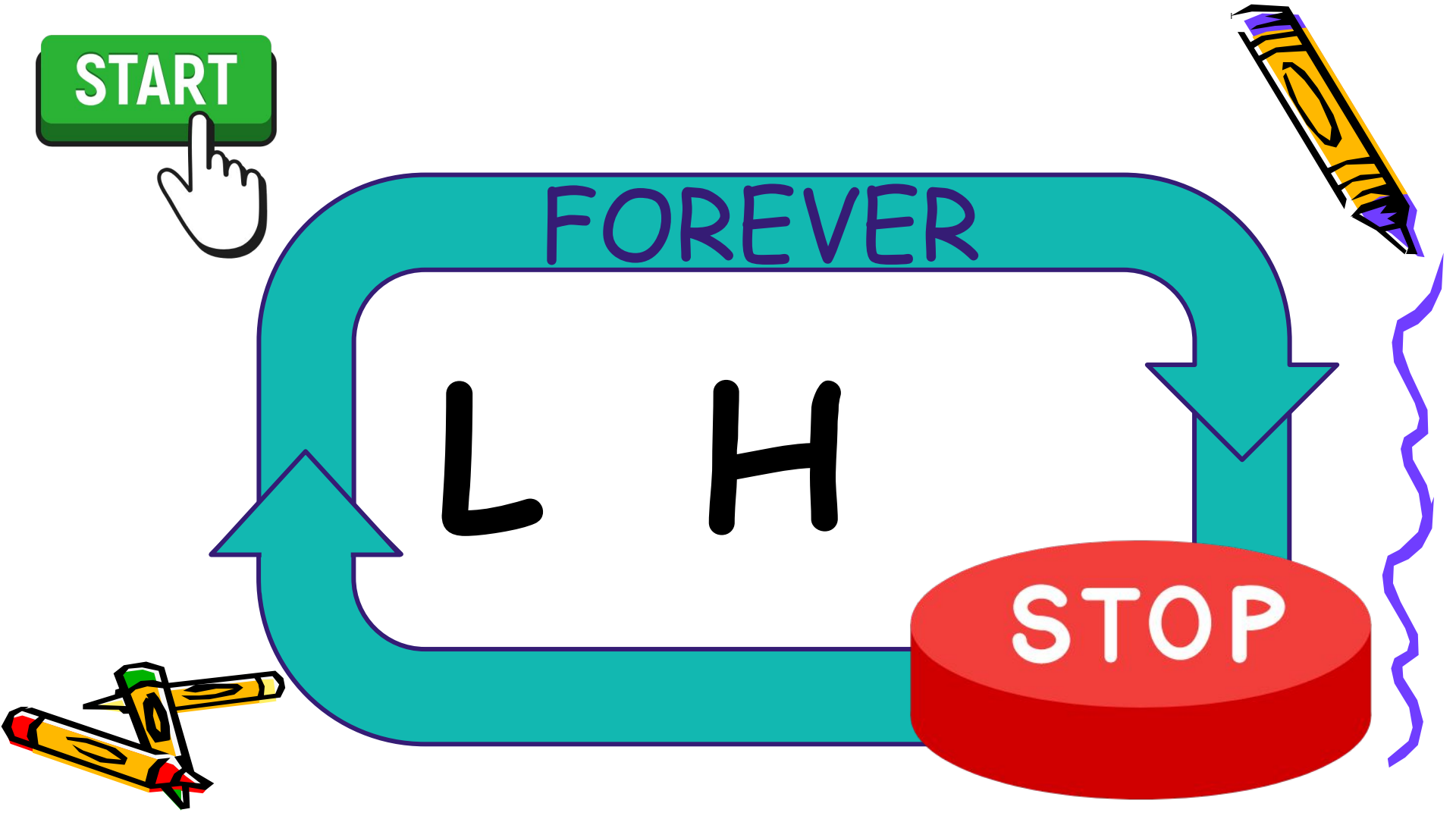
START

3

L H

FOREVER

L H


START
FOREVER
L H
STOP

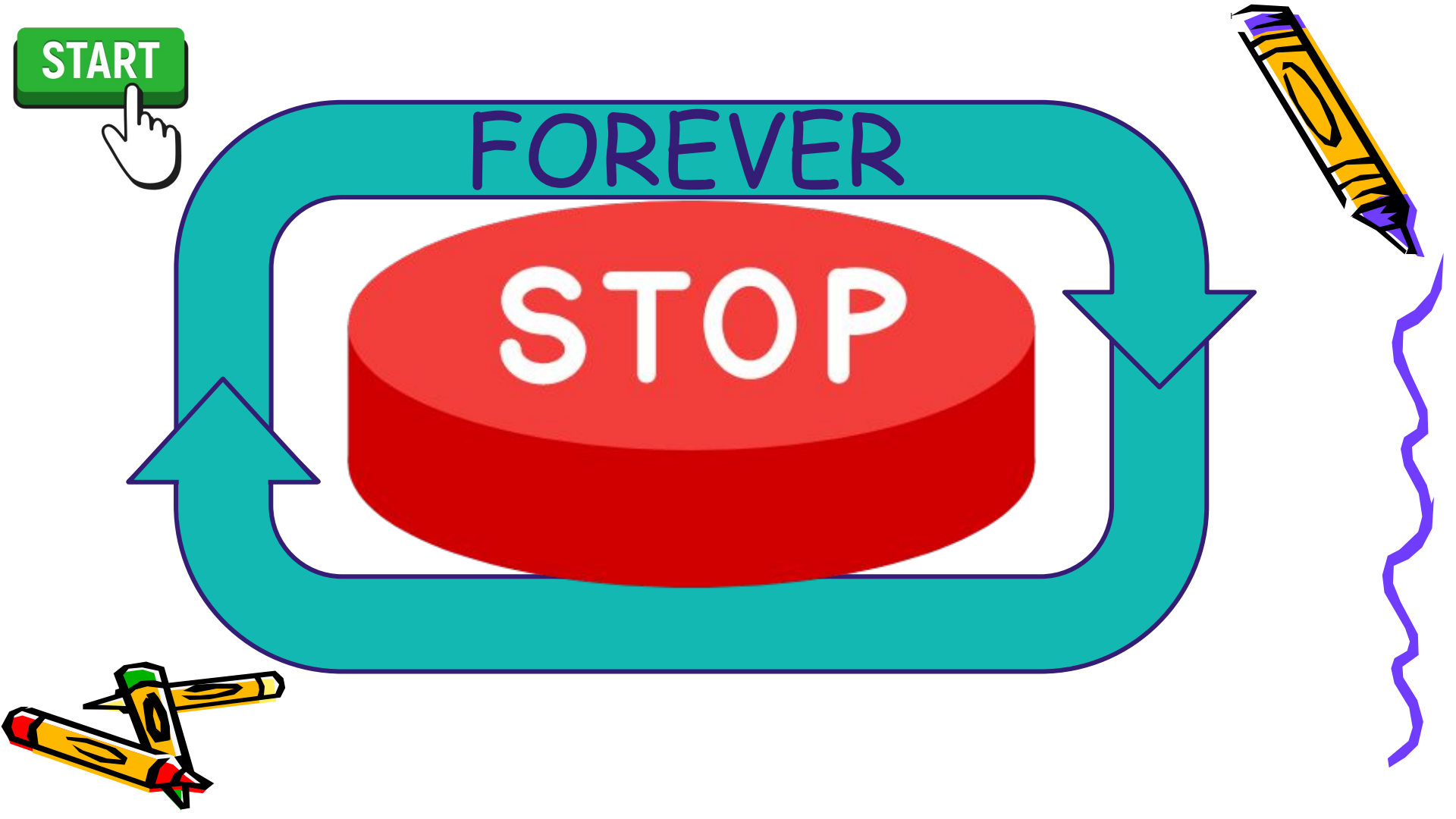
START

FOREVER

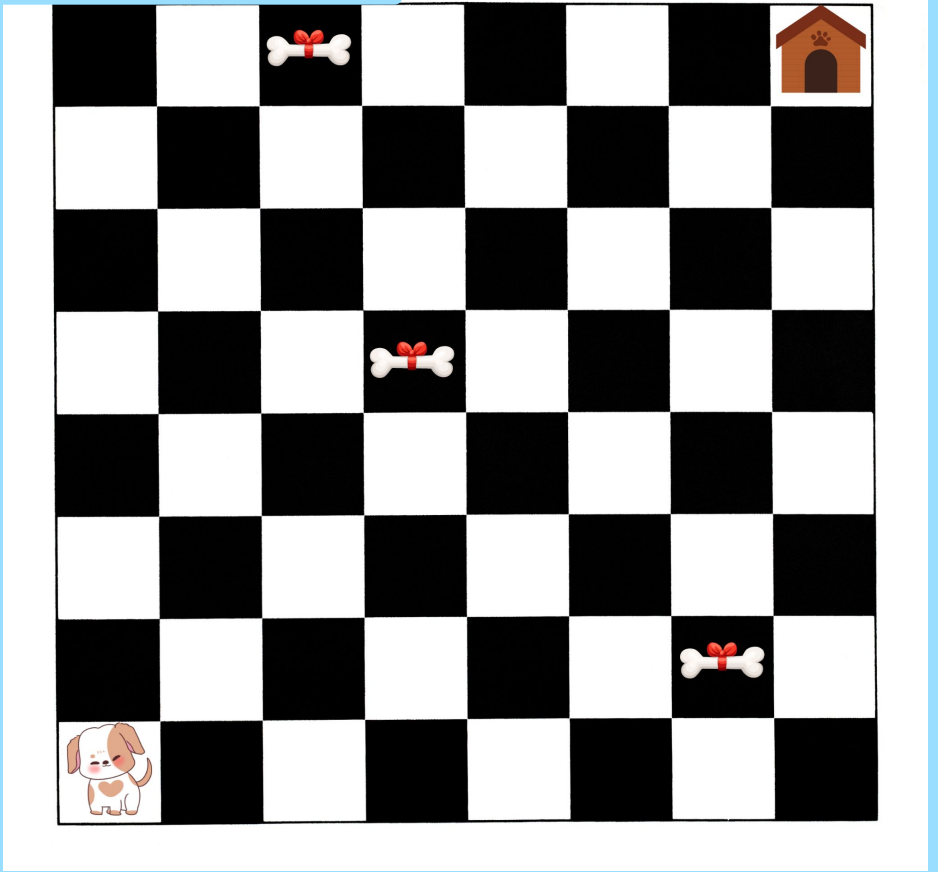
R L H

START

FOREVER


START
FOREVER
STOP

No tech? No problem.



No tech? No problem.

- Sudoku
- Code a Drawing
- Code math counting or equations
- Eye spy and other guessing games
- Code a friend/family member/teacher
- Hand signals & actions

Chromebook Coding & Computational Thinking

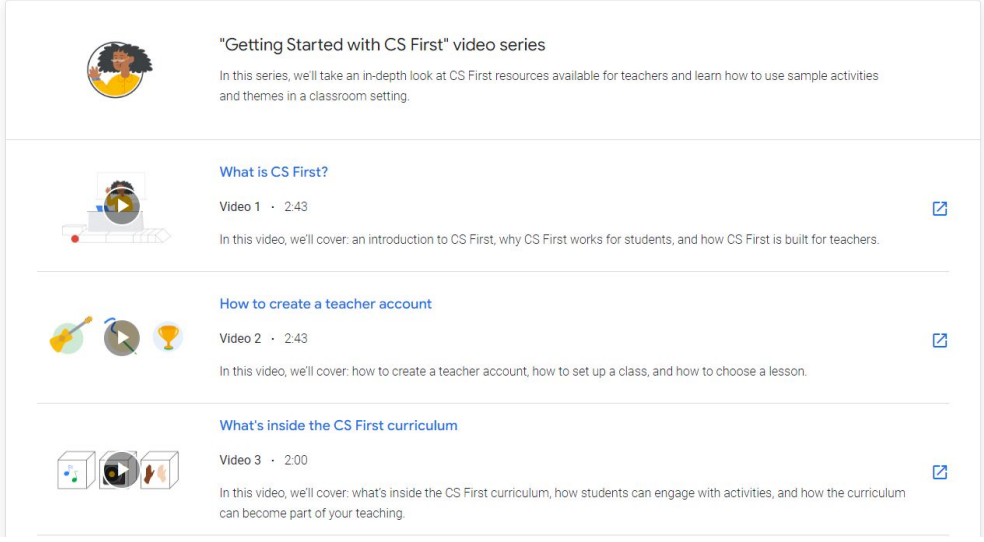
Blockly Games beta

Google CS First

Tynker

CODE.ORG

SCRATCH



Toys!!!

Your ATA Library

The Alberta Teachers' Association

Kits in Your ATA Library

- Makerkits A-D
- Makerkits E-G
- Makerkits H-L
- Makerkits M-O
- Makerkits P-S
- Makerkits T-Z



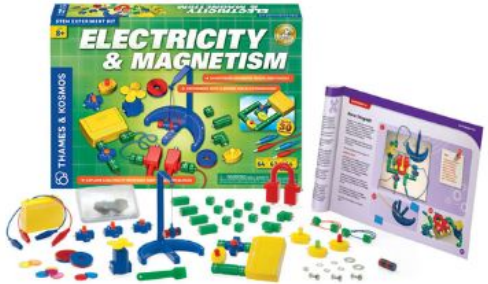










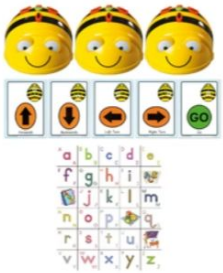
BeeBots

ROBOTIX EDUCATION

$134.95

Bee Bot - Programmable Floor Robot - See & Say Version !

Bee- Bot & Blue Bot Robotics



$495.95

Bee-Bot (3 Robot Pack)- Robot Bundle with Mat & Command Cards

Bee- Bot & Blue Bot Robotics

Code&Go Robot Mouse

Learning Resources Code & Go Robot Mouse Activity Set - 83 pieces, Ages 4+ Coding Robot For Kids, STEM Toys For Boys And...

★★★★½ 2,006

$77.98

✓prime

Learning Resources Code & Go Robot Mouse Classroom Set, STEM Coding Classroom Set

★★★★½ 11

$286.56

Prime

Botley

Learning Resources Botley the Coding Robot Activity Set, Homeschool, Coding Robot for Kids, STEM Toy, Programming for Kids, Ages 5+

Visit the Learning Resources Store

4.5 ratings 152 ratings

$123.5

prime