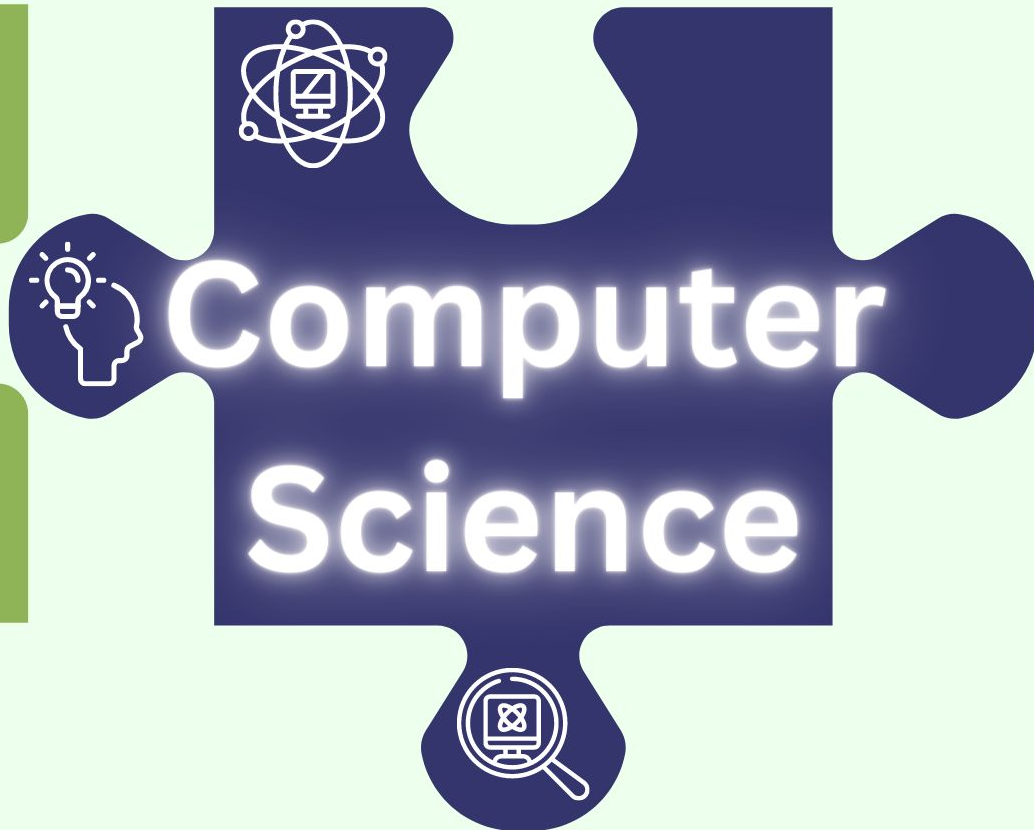


Making Connections



Living
Systems

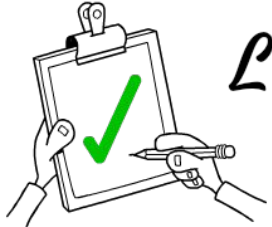


Computer
Science

grade 4

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.

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 design meet needs?		
Learning Outcome	Students examine and apply design processes to meet needs.		
Knowledge	Understanding	Skills & Procedures	
Design processes include • understanding the problem • forming ideas (ideating) • planning • creating • analyzing • testing • troubleshooting Feedback helps to ensure all needs are considered during the design process. An algorithm is a sequence of instructions. Artifacts are objects or products made by humans, machines, or computers through the process of design.	Design involves processes that can transform ideas into artifacts that meet needs.	Plan and create an artifact to meet a need. Provide feedback to others during the design process. Test an artifact to confirm that it meets intended needs. Collaborate to design an algorithm to solve a problem. Examine availability and cost of materials during design.	

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 design meet needs?		
Learning Outcome	Students examine and apply design processes to meet needs.		
Knowledge	Understanding	Skills & Procedures	
Design can produce many artifacts, including • algorithms • models • prototypes • blueprints • programs • experiments • objects Design can deal with complex problems. Availability of materials and costs are considerations in design.	Design involves processes that can transform ideas into artifacts that meet needs.	Plan and create an artifact to meet a need. Provide feedback to others during the design process. Test an artifact to confirm that it meets intended needs. Collaborate to design an algorithm to solve a problem. Examine availability and cost of materials during design.	

Creativity

Finding different ways to reach the same outcome.

Problem solving to overcome obstacles to achieve a desired outcome.





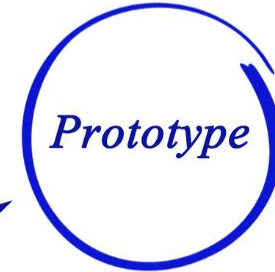
Design Thinking Process



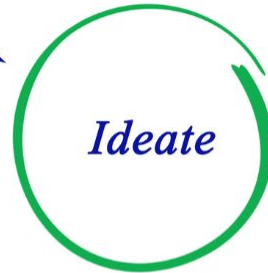
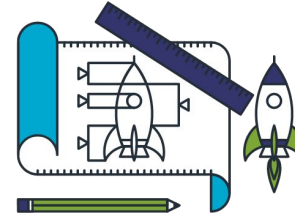
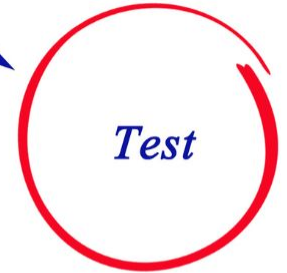
*Brainstorm and
Come up with
Creative Solutions*



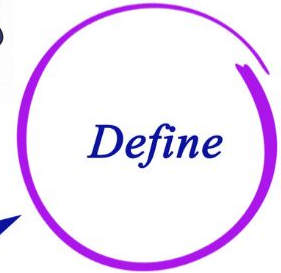
Test Your Ideas



*Build
Representation
of Your Ideas*



Ideate



*Construct Point
of View Based
on User Needs*



*Learn About
Your Audience*



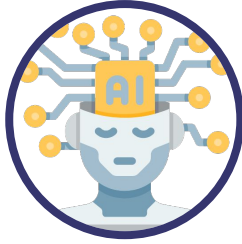
Empathize



*Learn About
Your Audience*

Computational Thinking

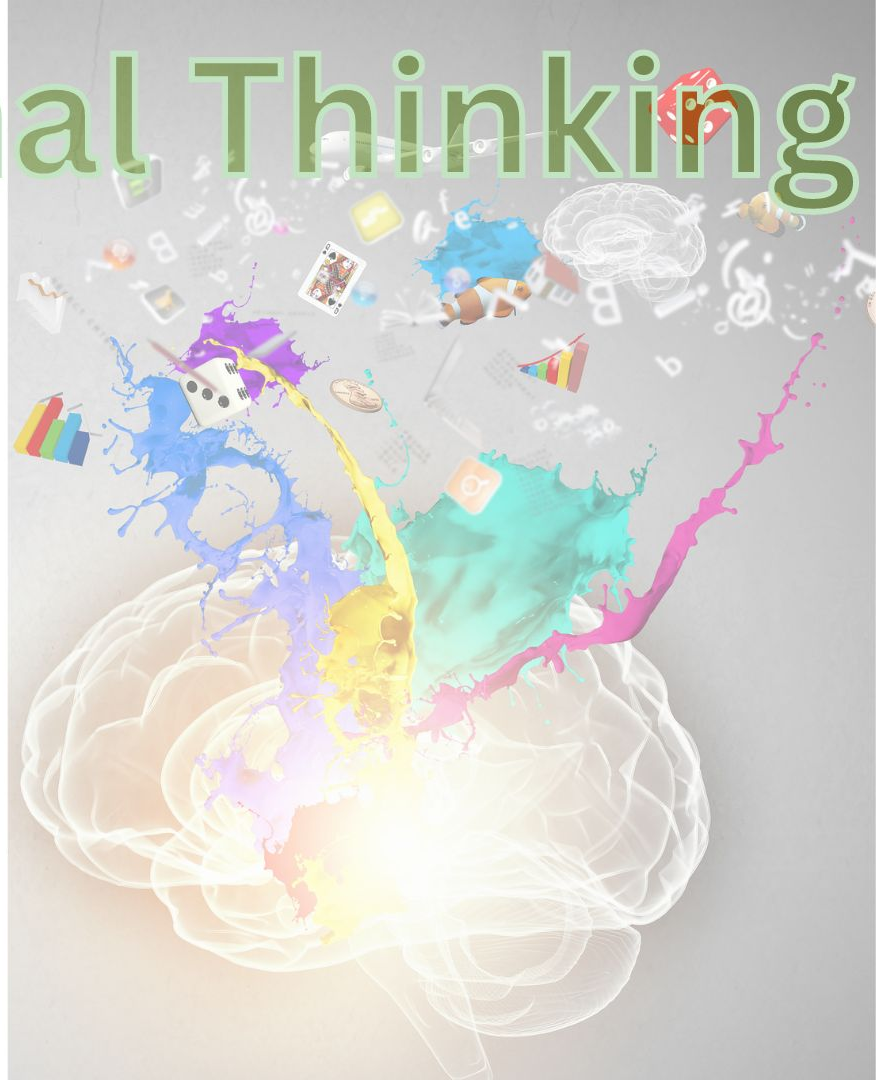
Decomposition



Pattern Recognition

Pattern Abstraction

Algorithm Design



Organizing Idea	Living Systems: Understandings of the living world, Earth, and space are deepened by investigating natural systems and their interactions.
Guiding Question	In what ways do the structures of organisms support survival?
Learning Outcome	Students analyze organisms and relate external structures to functions.

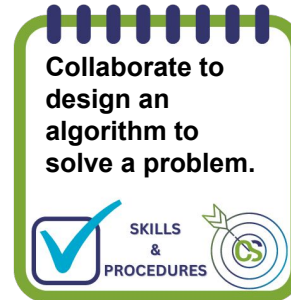
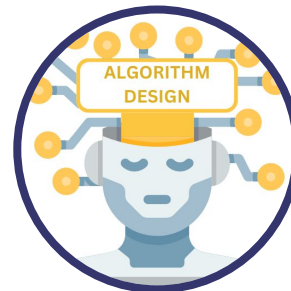
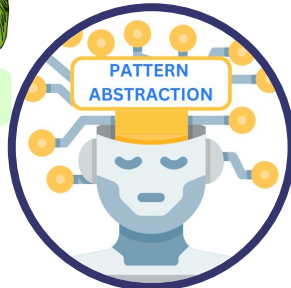
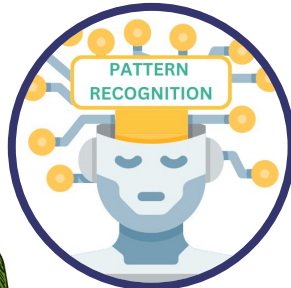
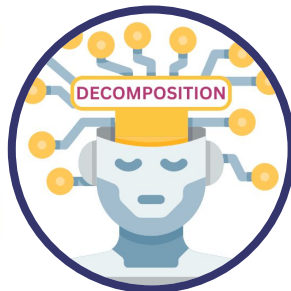
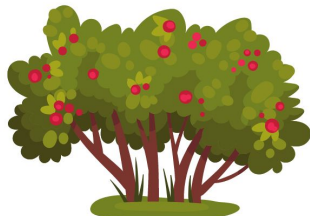
Skills & Procedures	Grows Seeds	Doesn't Grow Seeds
Find and classify examples of local plants and animals based on appearance, habitat, and structures. Demonstrate respect when interacting with plants and animals in local environments.		

Name: _____

TYPE OF PLANTS

Write the names of the plants on the boxes below.

tree	vine	flowers
herb	shrubs	



Can you come up with a set of instructions that would help another person or a machine classify a new plant?

IF it has a TRUNK
and BRANCHES
THEN it is a TREE.

Organizing Idea	Living Systems: Understandings of the living world, Earth, and space are deepened by investigating natural systems and their interactions.
Guiding Question	In what ways do the structures of organisms support survival?
Learning Outcome	Students analyze organisms and relate external structures to functions.

Skills & Procedures

Find and classify examples of local plants and animals based on appearance, habitat, and structures.

Demonstrate respect when interacting with plants and animals in local environments.



Organizing Idea	Living Systems: Understandings of the living world, Earth, and space are deepened by investigating natural systems and their interactions.
Guiding Question	In what ways do the structures of organisms support survival?
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Skills & Procedures

Relate the external structures of plants to their functions.

Relate the external structures of animals to their functions, excluding reproduction.

Plan and create an artifact to meet a need.



SKILLS
&
PROCEDURES



Collaborate to design an algorithm to solve a problem.



SKILLS
&
PROCEDURES

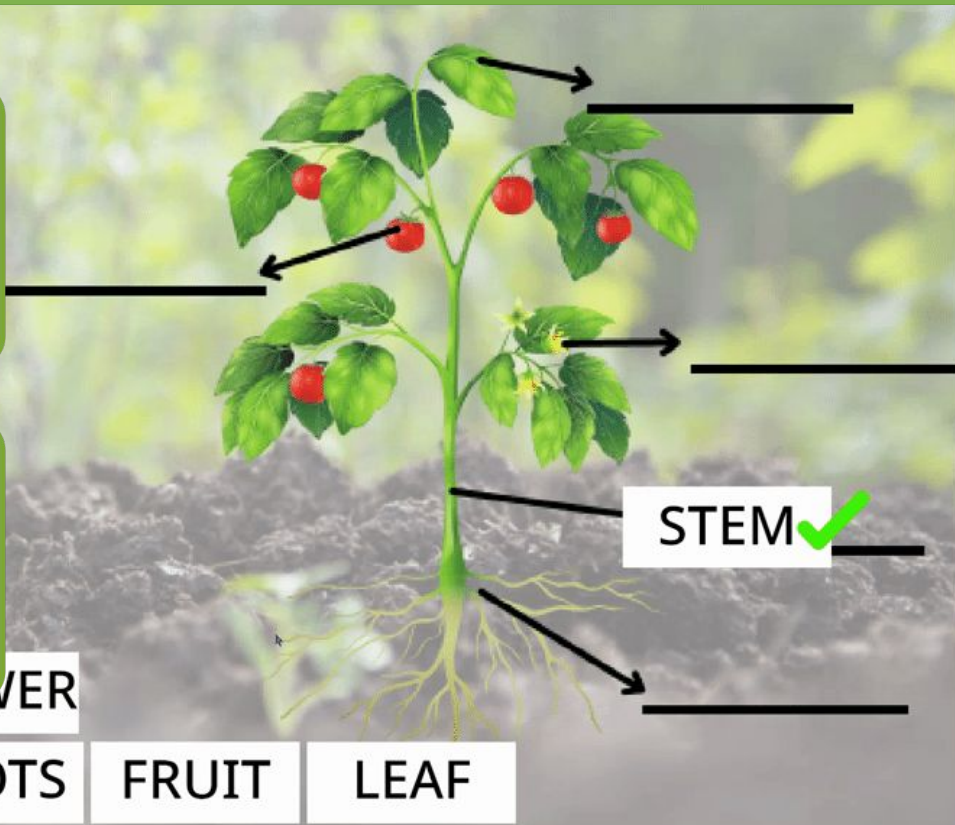


ROOTS

FRUIT

LEAF

STEM



Organizing Idea	Living Systems: Understandings of the living world, Earth, and space are deepened by investigating natural systems and their interactions.
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Skills & Procedures
Relate the external structures of plants to their functions. Relate the external structures of animals to their functions, excluding reproduction.

Project Template

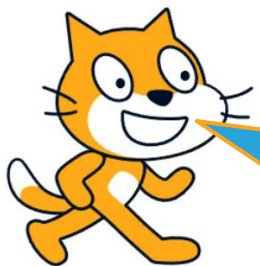
<http://bit.ly/MrsDPlant>



Project Cards

<http://bit.ly/MrsDPlantCards>





Cat

CHOICE!
Delete the cat
sprite and
choose a
different garbage
dropping sprite
from the gallery.

Add this code to the cat sprite.

The cat will walk across the stage and
change costumes creating a walking
animation as it goes.

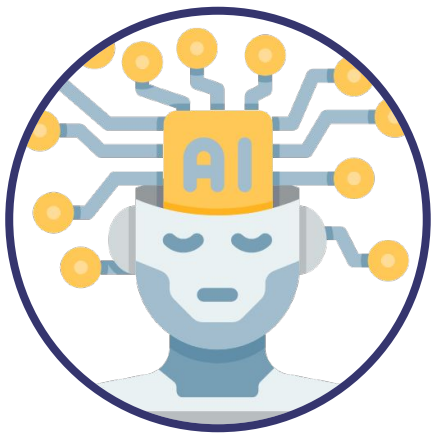
When the cat reaches the far right side of the stage
it will restart at the far left making it continually
move across the screen over and over.



Organizing Idea	Living Systems: Understandings of the living world, Earth, and space are deepened by investigating natural systems and their interactions.
Guiding Question	In what ways do the structures of organisms support survival?
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Skills & Procedures

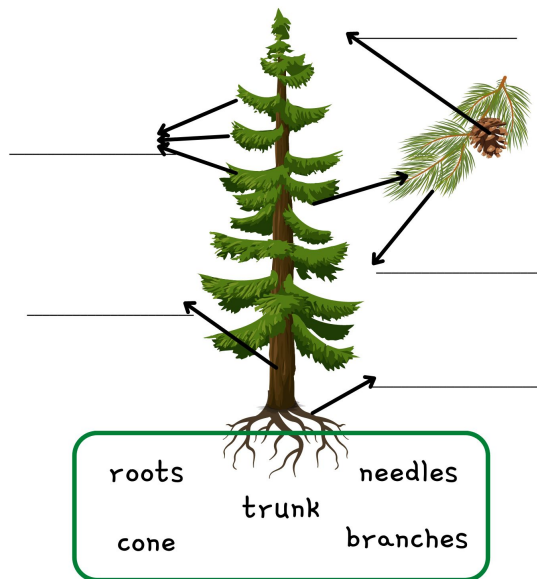
Compare external structures of various plants and animals in relation to function.



Label Me!

Name: _____

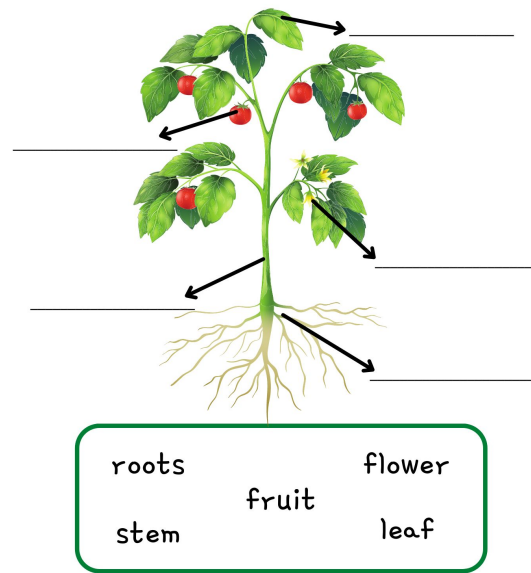
Direction: Label the parts of the plant.



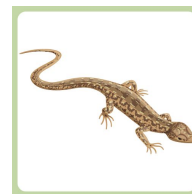
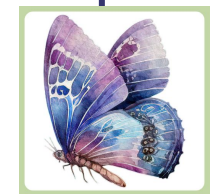
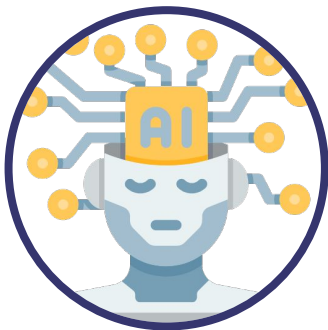
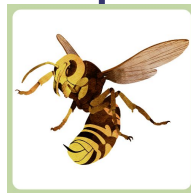
Label Me!

Name: _____

Direction: Label the parts of the plant.



SWIM



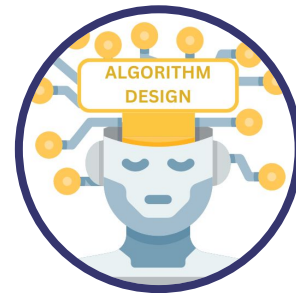
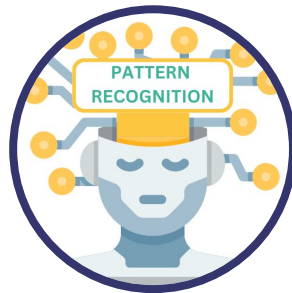
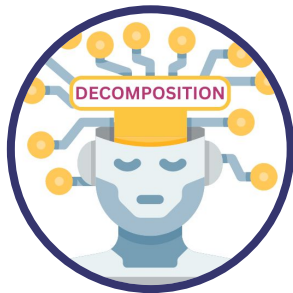
WALK

FLY

CRAWL

Organizing Idea	Living Systems: Understandings of the living world, Earth, and space are deepened by investigating natural systems and their interactions.
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Learning Outcome	Students analyze organisms and relate external structures to functions.

Skills & Procedures
Discuss how plants respond to sensory stimuli. Relate sensory organs of animals to their survival. Conduct an investigation to determine if an organism senses and responds to changes in an environment.



**IF a plant SENSES sunlight
THEN it will TURN toward it.**

**IF an animal SENSES danger
THEN is will look for
SHELTER.**

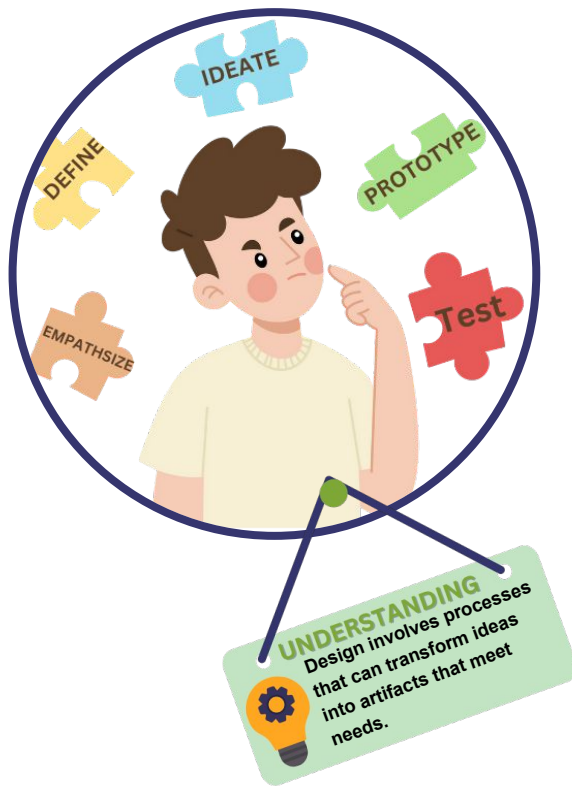
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Provide feedback to others during the design process.



SKILLS
&
PROCEDURES



Collaborate to design an algorithm to solve a problem.



SKILLS
&
PROCEDURES



Examine availability and cost of materials during design.



SKILLS
&
PROCEDURES

