

Making Connections



Living
Systems



Computer
Science



Alberta Regional Consortia

grade 3

Organizing Idea	Computer Science: Problem solving and scientific inquiry are developed through the knowledgeable application of creativity, design, and computational thinking.		
Guiding Question	How does creativity contribute to computational thinking?		
Learning Outcome	Students investigate creativity and its relationship to computational thinking.		
Knowledge		Understanding	Skills & Procedures
Computational thinking includes • breaking a task into smaller chunks • finding patterns and similarities in tasks • identifying the important details when reading or solving a problem • designing instructions • working backward if a mistake is made Computational thinking can be used by humans to communicate with computers more efficiently; e.g., apps, virtual reality, and robotics.		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.

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The same outcome, such as arriving at school, can be achieved in different ways. Divergent thinking is the process of generating multiple unique ideas or solutions. Creativity is an important part of computer science, technology, and engineering; e.g., computer programming, robotics. Creativity involves combining, changing, or reapplying existing ideas to produce something new. Canadians are responsible for many creative inventions, such as the Canadarm.	Creativity involves divergent thinking and can be used to develop different ways to achieve the same outcome. Creativity involves imagination, observation, and making connections.	Collaborate to write two different sets of instructions that achieve the same outcome. Relate creativity to engineering, computing, and the development of new technologies. Create something new by combining, changing, or reapplying existing ideas. Examine a Canadian invention. Identify examples of creativity in computer science, technology, or engineering.	

Creativity

Finding different ways to reach the same outcome.

Problem solving to overcome obstacles to achieve a desired outcome.





Design Thinking Process



*Learn About
Your Audience*



*Brainstorm and
Come up with
Creative Solutions*



Test Your Ideas

Define

*Construct Point
of View Based
on User Needs*

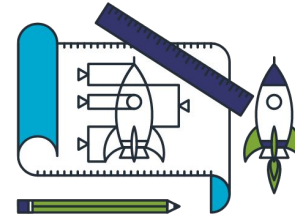
Ideate

Prototype

*Build
Representation
of Your Ideas*

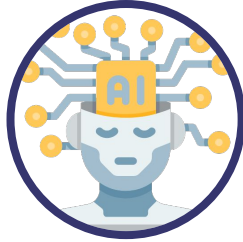
Test

Empathize



Computational Thinking

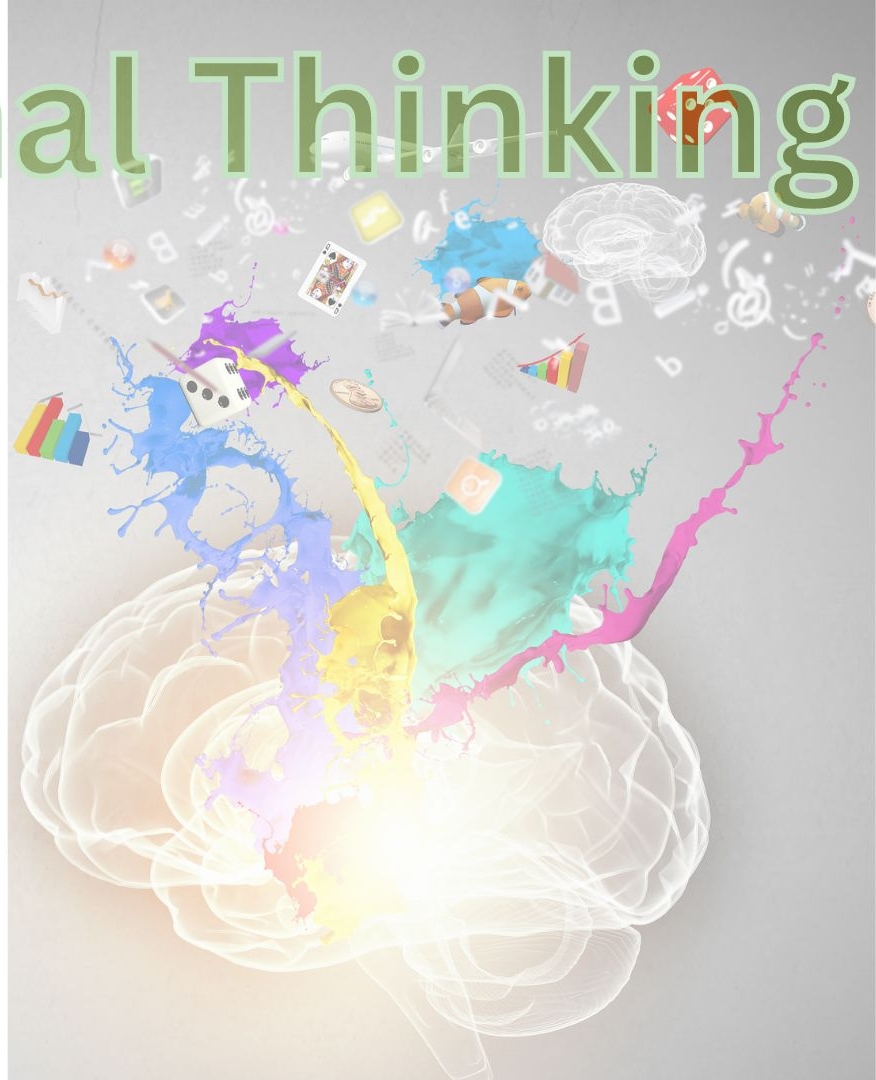
Decomposition



Pattern Recognition

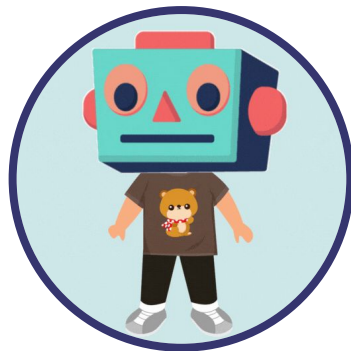
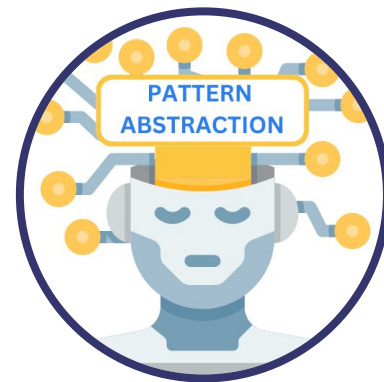
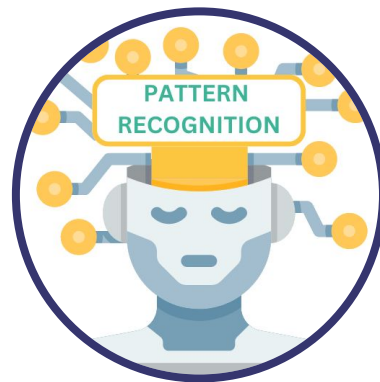
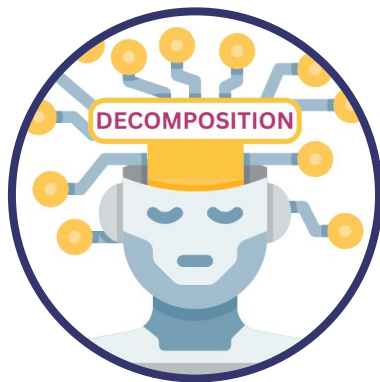
Pattern Abstraction

Algorithm Design

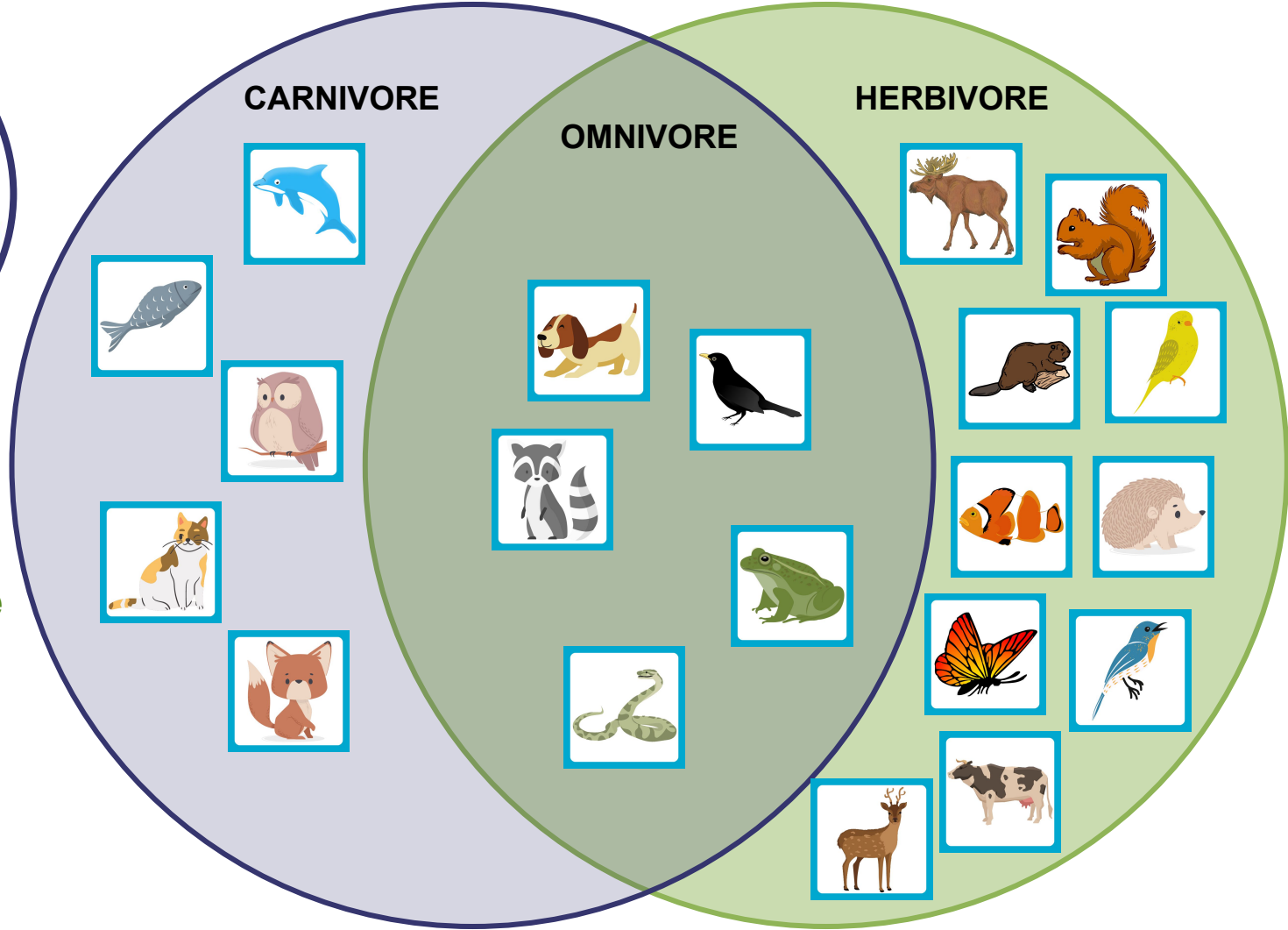
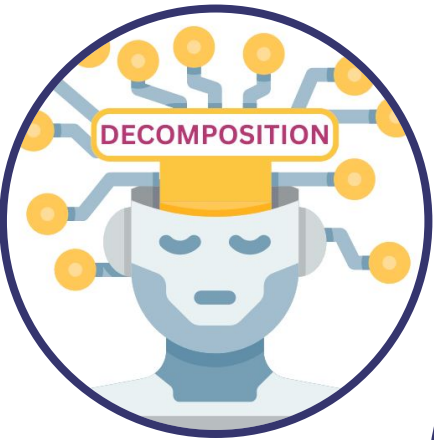


Organizing Idea	Living Systems: Understandings of the living world, Earth, and space are deepened by investigating natural systems and their interactions.
Guiding Question	How do plants and animals interact?
Learning Outcome	Students analyze and describe how plants and animals interact with each other and within environments.

Skills & Procedures
Classify animals in a food chain as carnivores, herbivores, or omnivores.

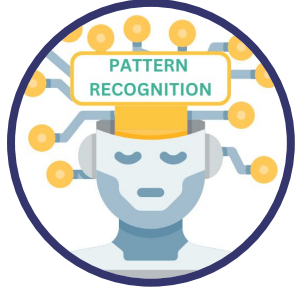


BRIDGING: In grades K-2 a lot of the CS has to do with following and creating simple instructions. You can make connections to these throughout your daily routines and activities by asking students to repeat given instructions, giving instructions in different ways and having students come up with instructions on their own and collaboratively.



What is the same
for all animals?

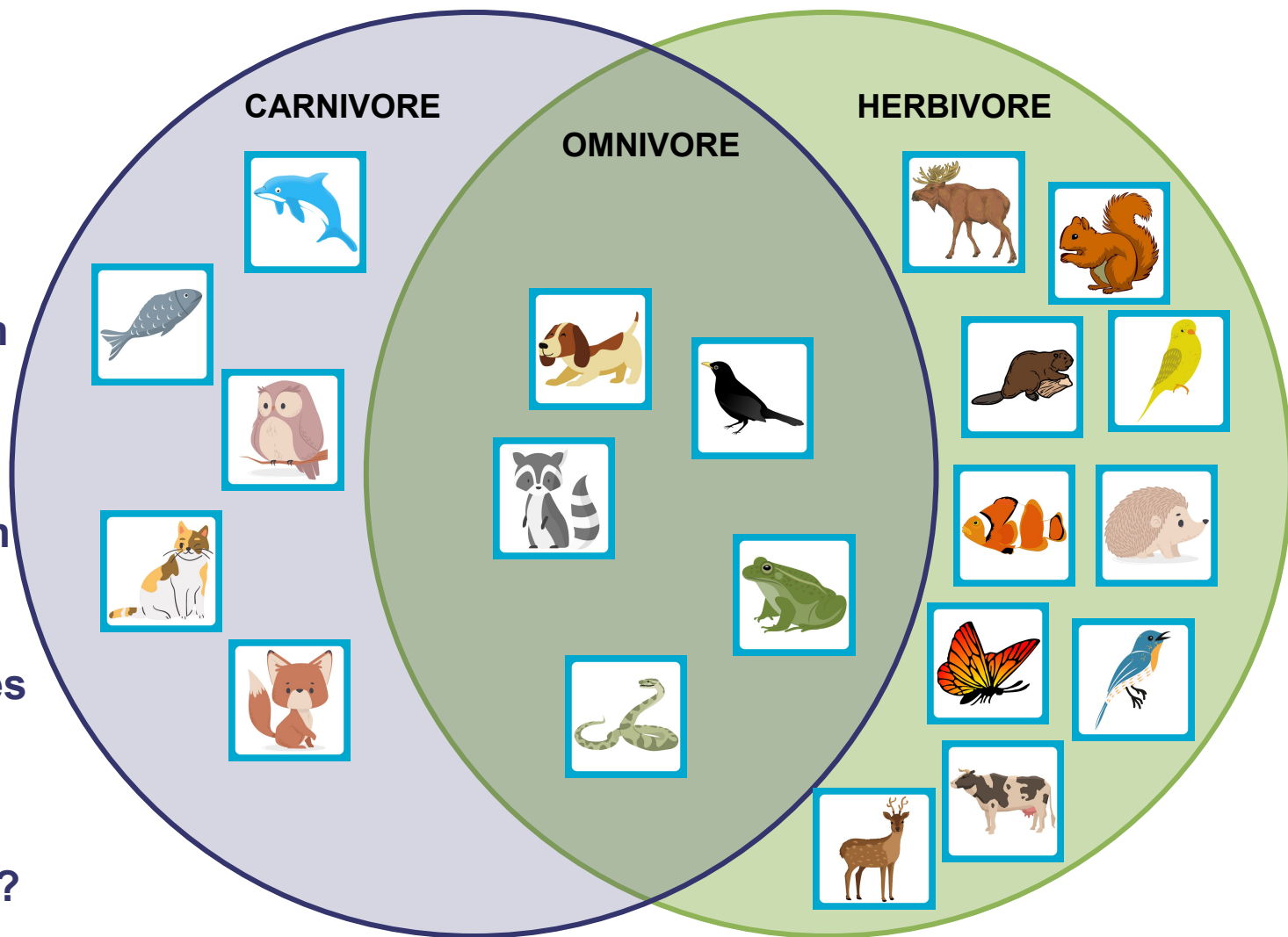
What is different
based on what
they eat?



What traits do all carnivores have in common?

What traits do all herbivores have in common?

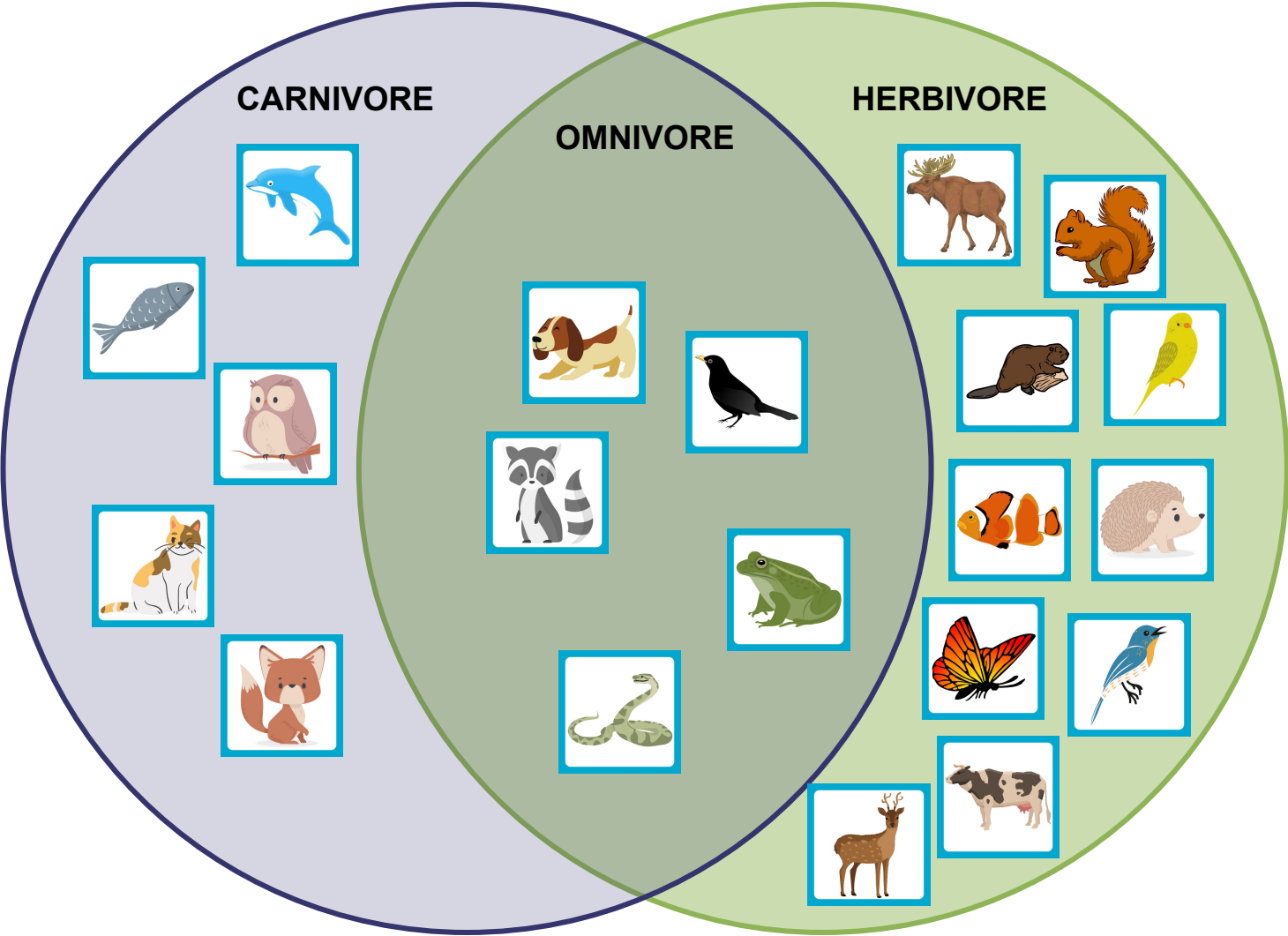
How are omnivores different from carnivores and herbivores? How are they the same?

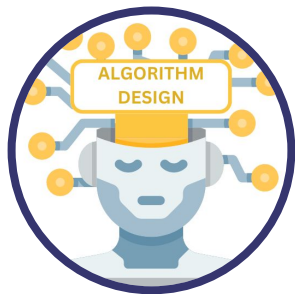




How many more
carnivores,
omnivores and
herbivores can
you think of?

Are humans
carnivores,
herbivores or
omnivores?



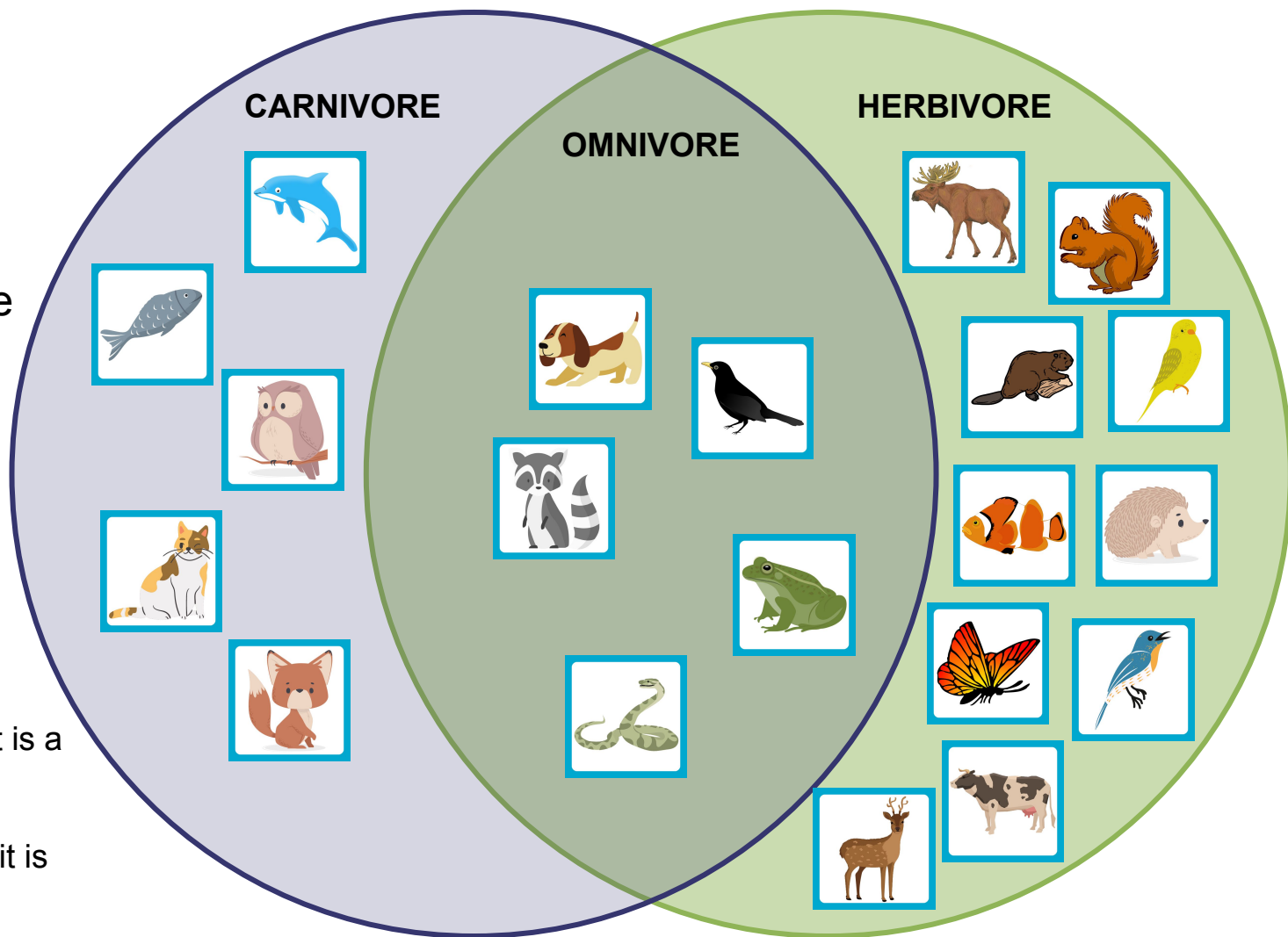


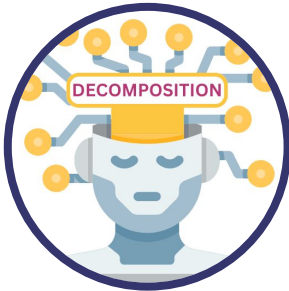
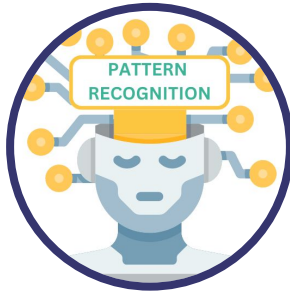
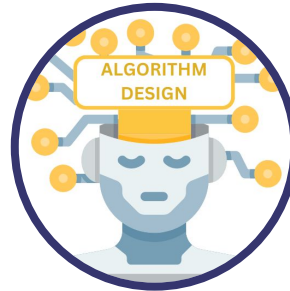
Can you write a rule for how to tell if an animal is a:

- Carnivore
- Omnivore
- Herbivore

If it only eats meat then it is a carnivore.

If it has sharp teeth then it is a carnivore or omnivore.

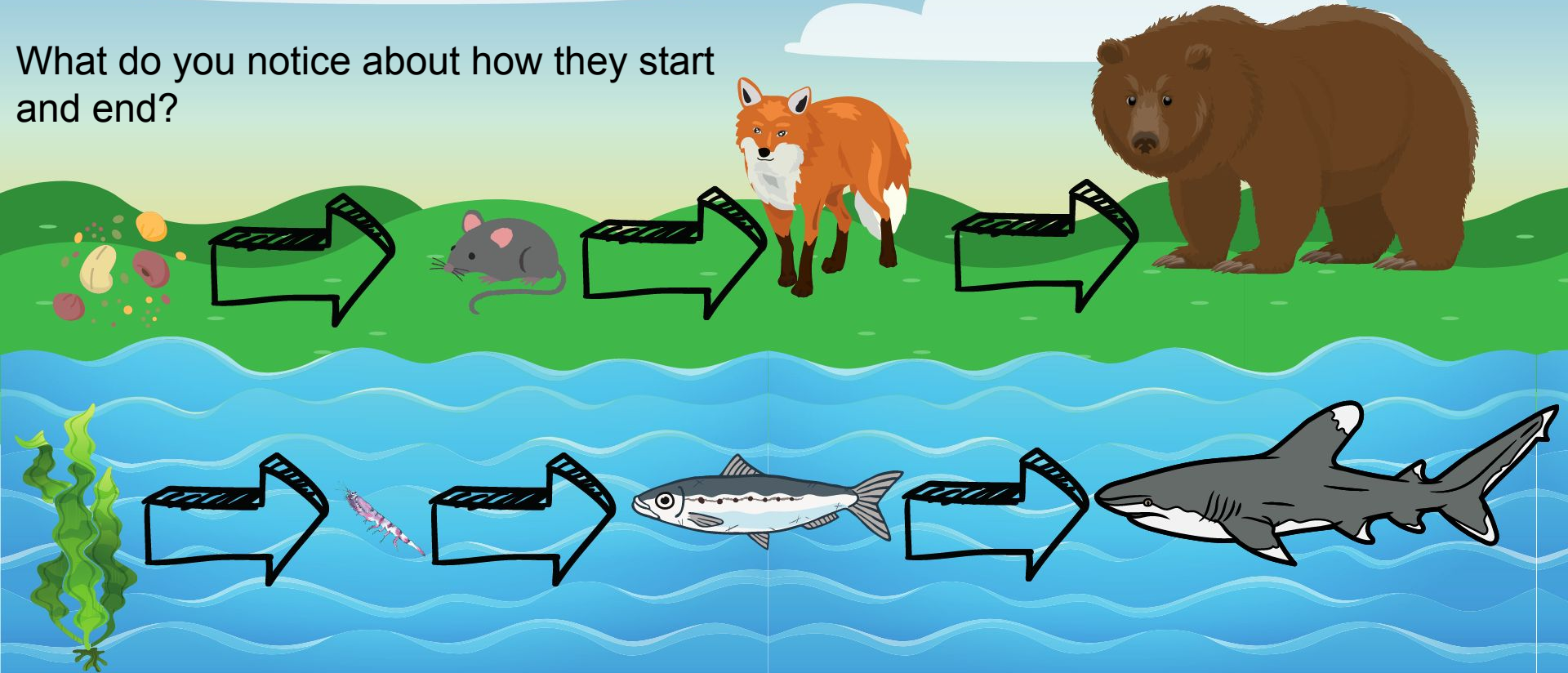


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Skills & Procedures	   		
Represent various food chains in local and other Canadian environments.			

DECOMPOSE:

What do you know about the things in these food chains?

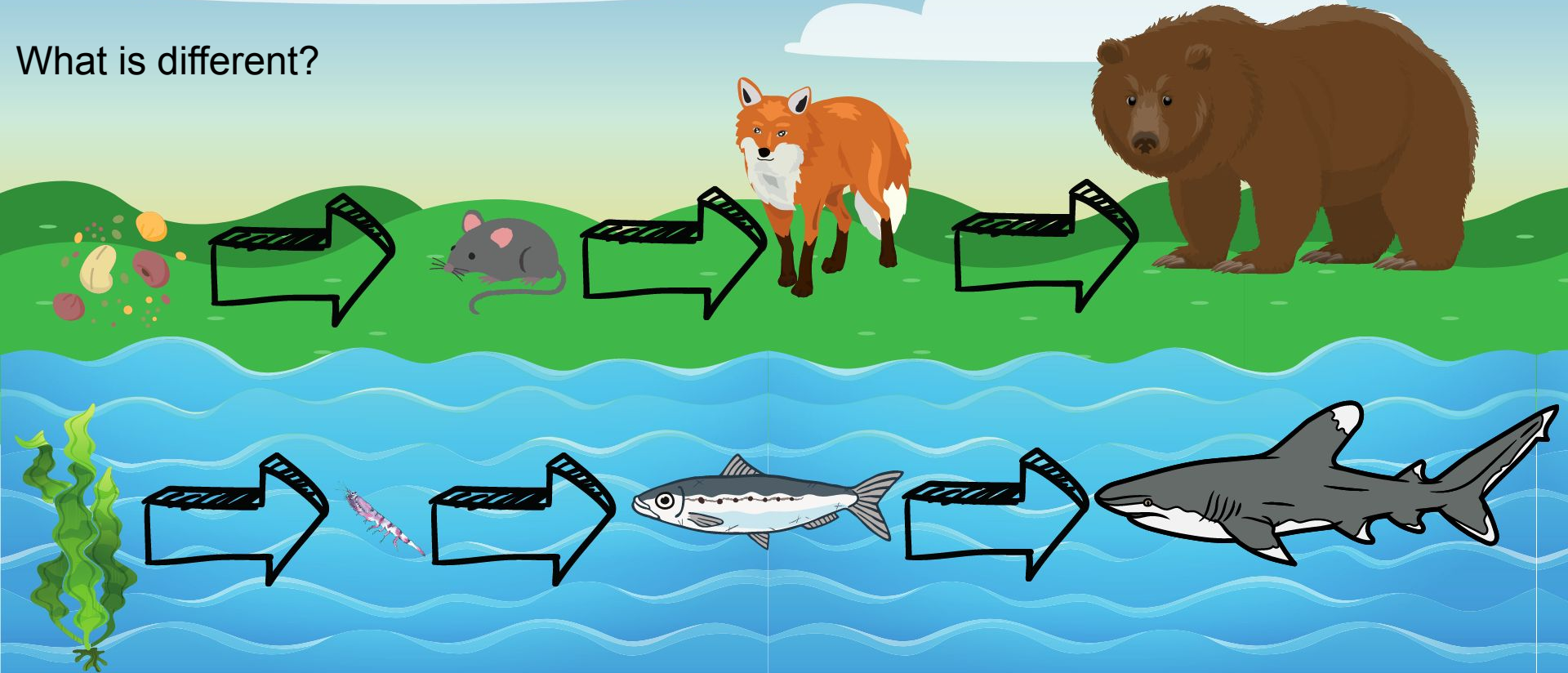
What do you notice about how they start and end?



PATTERN RECOGNITION:

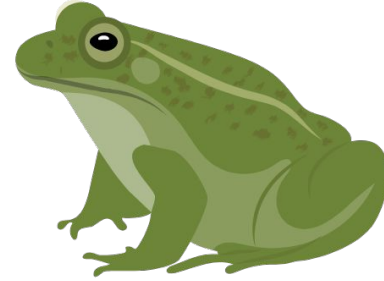
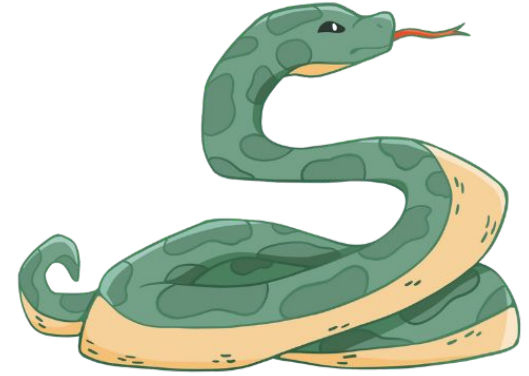
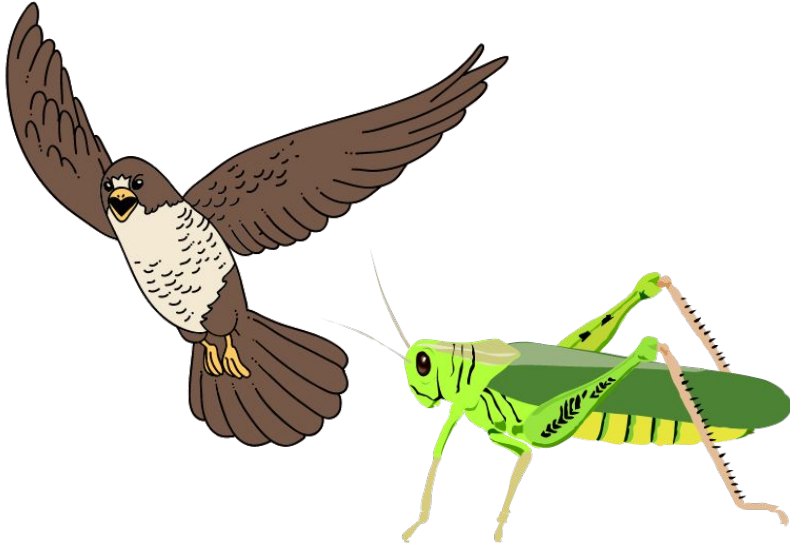
What can you find that is the same and different between these 2 food chains?

What is different?



ABSTRACTION:

Knowing what you know about food chains, can you put this one in order?



ALGORITHM DESIGN:

Can you write a set of instructions that would help a machine put these in order?

Can you write a set of instructions for putting any food chain in order?

