

Science Grade 1 Session 2: Living Systems

May 1, 2023



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Acknowledgment of Land and People



In the spirit of reconciliation, we want to acknowledge that this gathering is taking place on traditional lands across the province of Alberta, home to many diverse First Nations, Métis and Inuit peoples. We acknowledge that this land is a traditional meeting ground giving voice to its original peoples and the story of creation of this country in a way that history has forgotten.



AGENDA

01	Backgrounder • Phases of Learning
02	Conceptual Overview • Concept Progressions in Living Systems • Key Concepts (Surface Level Activities)
03	Skills and Procedures • Key Skills and Procedures (Surface Level Activities) • Intentional Use (Deep)
04	Understandings • Relating Concepts & Deepening Understanding (Deep Level)
05	Integrating Scientific Methods • Skills and Concepts
06	Integrating Computer Science • Skills and Concepts
07	Assessment • Formative & Summative
08	Resources



Backgrounder



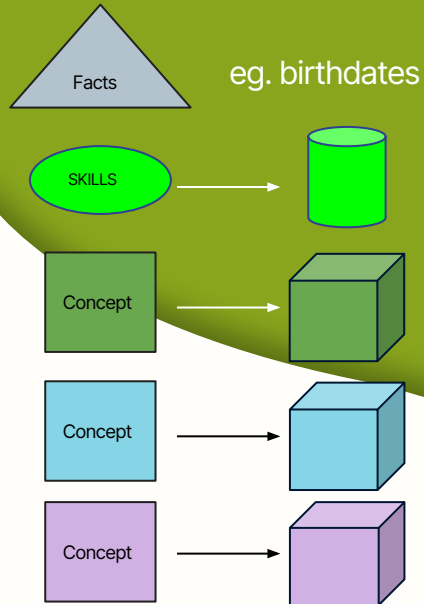
Photo by [Geoffrey Baumbach](#) on [Unsplash](#)

Phases of Learning

Hattie, Fisher & Frey: *Visible Learning for Literacy* (2016)

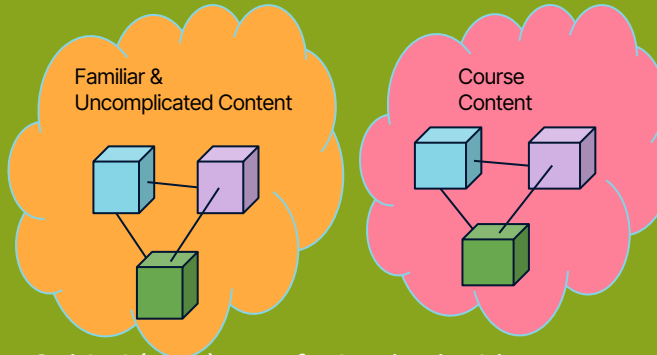
Surface

Students are first exposed to individual skills, concepts and their related knowledge.



Deep

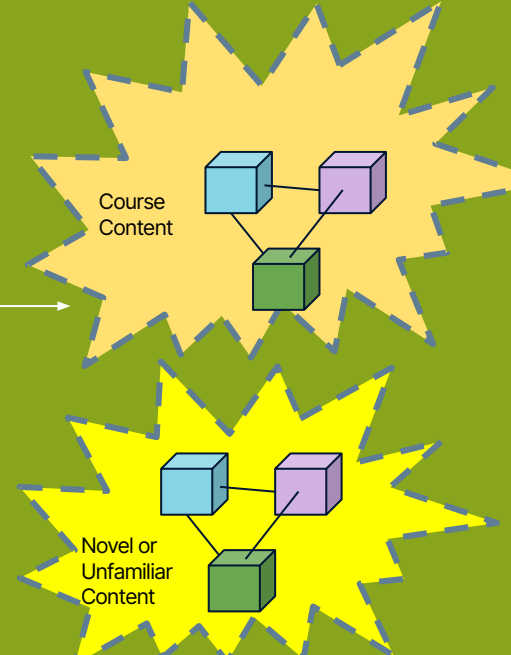
Making connections between concepts to create deeper understanding and applying skills/procedures to new situations



Guided (near) transfer begins in this stage as students begin to make connections with the concepts in *different contexts* to create and deepen their understanding.

Transfer

Applying understandings and skills to a variety of novel and unrelated contexts.



Conceptual Overview

Photo by [Maros Misove](#) on [Unsplash](#)



Concepts

What is a concept?

A concept is ...

- an organizing idea of 1 -2 words;
- with distinct attributes;
- that are shared across multiple examples.



Photo by [Fernando Andrade](#) on [Unsplash](#)



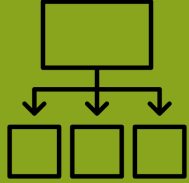
Photo by [charlesdeluvio](#) on [Unsplash](#)



Orange: Photo by [Dessy Dimcheva](#) on [Unsplash](#)



Photo by [Sami Ahmed](#) on [Unsplash](#)



Created by Made by Made
from the Noun Project

Concepts the way we organize our world - they are like categories which we make to group things that have similar qualities.



Created by S Fahrudin
from the Noun Project

Concepts are like file folders. We name the file and store information in that file that have certain attributes (eg. “Science Activities,” “Assessments.” “Bills,” etc.)



Created by B. Agustín Amenábar Larrai
from the Noun Project

When we play “I Spy,” we are essentially identifying **concepts** (eg. “something that is red,” “something that is heavy,” etc.)



What concepts do you “see”
in this image?



Concepts

Guiding Question	How do plants and animals survive?	
Learning Outcome	1LS1.1 Students investigate and examine needs of plants and animals.	
Knowledge	Understanding	Skills & Procedures
Plants are living things that can grow and make their own food. Plants usually cannot move from place to place. Animals are living things that can grow and that need to find food. Animals are usually able to move from place to place. Plants and animals exist in all shapes and sizes.	Plants and animals share similarities and have differences. Shape is the external outline or form of an object. Examples of shape include circles, triangles, and rectangles	Share examples of plants and animals native to Alberta and Canada. Observe and describe similarities and differences between plants and animals.

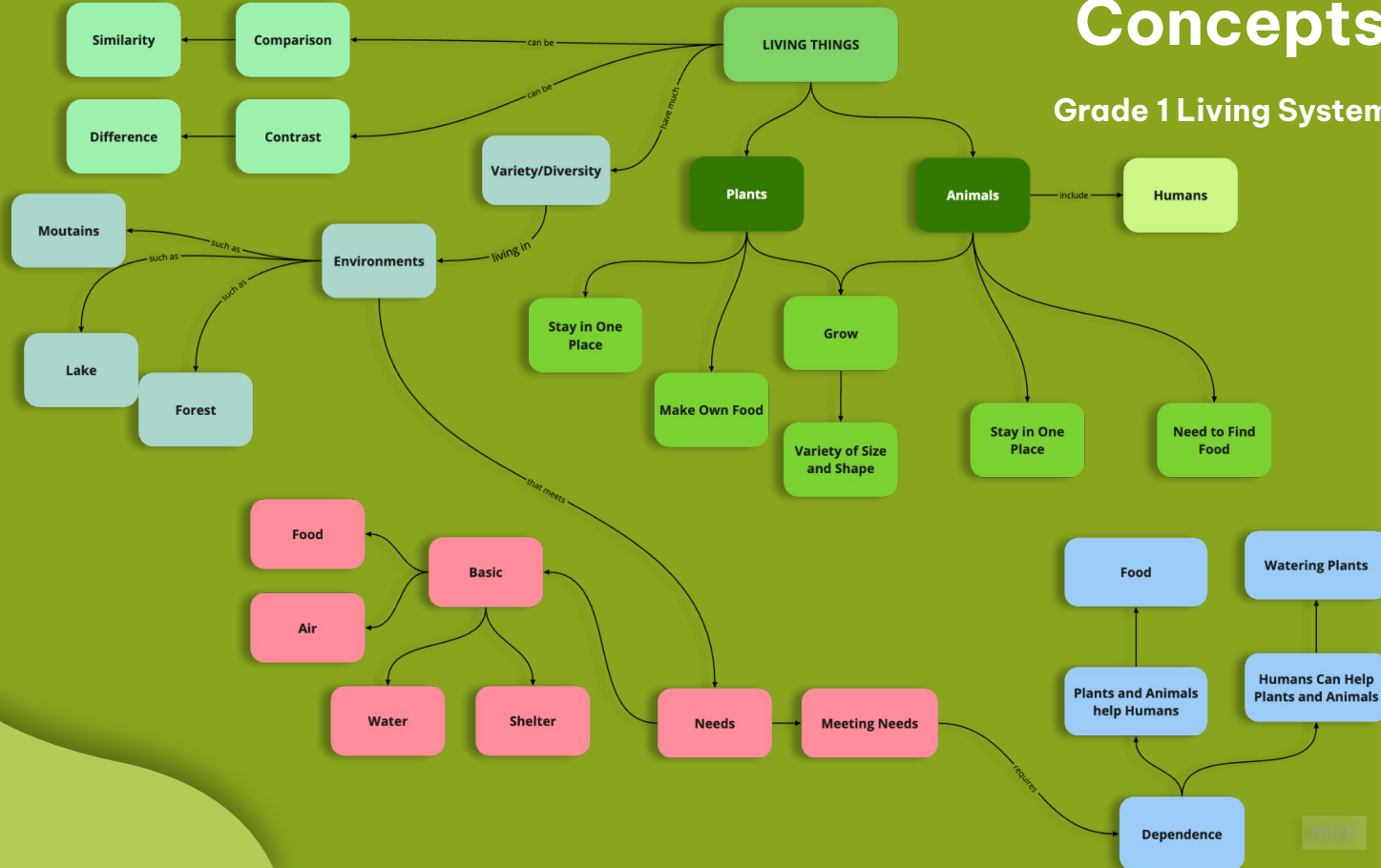
Concepts

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Note that this concept map is only one of the many possible ways to organize these concepts.

Concepts

Grade 1 Living Systems



Living Systems Concept Progressions

Concept Progressions

Science Curriculum (March 2023)

Kindergarten to Grade 6

LIVING SYSTEMS

Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
	Guiding Question: How do plants and animals survive?	Guiding Question: How do plants and animals grow?	Guiding Question: How do plants and animals interact?	Guiding Question: In what ways do the structures of organisms support their survival?	Guiding Question: How are organisms supported by biological processes and systems?	Guiding Question: In what ways are ecosystems complex?
	Learning Outcome: Students investigate and examine needs of plants and animals.	Learning Outcome: Students investigate the growth and development of plants and animals and consider their relationship to humans.	Learning Outcome: Students analyze and describe how plants and animals interact with each other and with the environment.	Learning Outcome: Students analyze organisms and relate their external structures to functions.	Learning Outcome: Students investigate the internal systems of organisms and explain how they support biological processes.	Learning Outcome: Students investigate the characteristics and components of ecosystems.

LIVING SYSTEMS

Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
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	KEY CONCEPTS			KEY CONCEPTS		
Animals	Animal	Animal	Carnivore Herbivore Omnivore	External Structure	Biological Systems	Components: Abiotic & Biotic
Dependence	Behaviour: Human	Behaviour: Human	Classification	Function	Organism: Complex	Diversity
Environment	Development	Development	Environmental Protection	Microorganism	Biological Processes	Ecosystem Types
Living Things	Development: Stage	Development: Stage	FNMI Knowledge of Plants and Animals	Organism	Biological Systems: Animals: Internal	Ecosystem & Diversity
Needs	Effect: Positive, Negative	Effect: Positive, Negative	Food Chain	Sensory Structure	Digestive Respiratory Circulatory Musculoskeletal	Ecosystem: Characteristics
Plants	FNMI Relationship to Land	FNMI Relationship to Land	Interaction	Structure	Biological Systems: Animals: Transport Systems	Ecosystem: Components
Similarity	Life Cycle	Life Cycle	Stimuli		Xylem	Ecosystem: Greenhouse Gas Storage
Difference	Offspring	Offspring	Stimuli Response		Phloem	Ecosystem: Role: Plants
Humans	Pattern	Pattern	Survival			FNMI: Sacred Plants
Diversity	Plant	Plant	FNMI: Respectful interaction with natural materials.			Interdependence - Relationships
	Relationship	Relationship	FNMI: Plant and animal behaviours and patterns			Interdependence: Plants and Animals
	Relationship to Land	Relationship to Land				Organisms
	Stages of Development	Stages of Development				Photosynthesis
						Photosynthesis: Chlorophyll

Anchoring Concepts

Dependence

Animal

Plant

Living Things

Difference

Needs

Environment

Difference

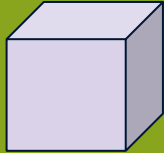
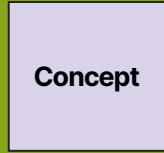
Similarity

Diversity



Surface Level

Instructional Approaches & Activities



Creating/Identifying examples and non-examples in new contexts

Definition





Surface Strategy #1

Card Sort

In a card sort, students are given a series of labelled cards with information on them (words, images, etc.)

Students are asked to organise and sort them into groups or categories that they think are appropriate.



EXAMPLES

CONCEPTS

Living Things

Plants & Animals

Description

Lens:
Observation/Discussion

OBS	
OBSERVATIONS	INFERENCES



Discuss / Observe

Review Card Sort - Living/NonLiving

Same Cards for Animal /
Plant
Header Cards for Card Sort

Plants and **Animals** have
similarities and **differences**.
How can you describe or model
this?



Sort It!



Dona Herweck Rice

Sort it by look.



Sort it by smell.

Sort it by taste.



Let's Sort!

(from Kindergarten - background knowledge)

Kindergarten
Sort

You could
resort from the
lens of
living/nonliving



Plants /Animals

Further sort -
Plants and Animals

How did you sort!

Colour
Food
Instruments
people
things outside
smelly things



Create a word chart for how students grouped their items. Many will be used in properties and with the senses activities. Continue to build on the word chart as you move into *senses*.

Science: Detail

How else could your cards be sorted?

Can you find any of the items in your pictures in the room - or something almost like it?

Find at least 10 items

Sort your items again.

How did you sort them this time? What are some words that describe it?

Add words to the word wall for sorting.

Sort the words towards the use of the senses.



Seamless Transition
between objects
sorting and senses

The **Senses** can help us sort - Senses are studied in Matter (Kindergarten)



Surface Strategy #2

Case Study

Case studies provide students with real-world situations that students can relate to and understand.

Depending on the questions or activity following the case study, this approach can be used at

- surface level
- deep level
- transfer level



Concept

NEEDS



Image: Four basic human needs by Becris from Noun Projects



Case Study approach

Also provides pre-assessment opportunities to determine the level of student understanding.



Author: Sheila Rivera
Lerner Publications

Consider reading the short story first and then have students proceed to sort what they believe Living vs Nonliving to be.



Surface Strategy #3

Frayer Model

The Frayer Model is a graphic organizer used to help students develop a understanding of new concepts.

The model includes four main components:

- Definition
- Characteristics
- Examples
- Non-examples



Concept

NEEDS



[Frayer Model Template](#)

Image: Four basic human needs by Becris from Noun Projects

What do living things need to stay alive?

Surface level -
facts about
living things

1) View the following vides

Story

What's Alive / Living vs Non-Living

<https://www.youtube.com/watch?v=OkmR6tURgQA>

Living or Non-Living Read Aloud

<https://www.youtube.com/watch?v=TjwkFSFa0AI>

2) Complete a Frayer Model ([example](#))



Surface Strategy #4

Concept Attainment

A concept attainment strategy is similar to a card sort in that students are looking for patterns or similarities in the information that is presented

The difference is that the teacher pre-arranges the examples into groups of examples of the concept, and non-examples.

Examples and non-examples are presented one at a time as the attributes of the concept becomes apparent.



Concept

DIVERSITY

DEPENDENCE

SIMILARITY &
DIFFERENCE

Description

Conclusion

Observation

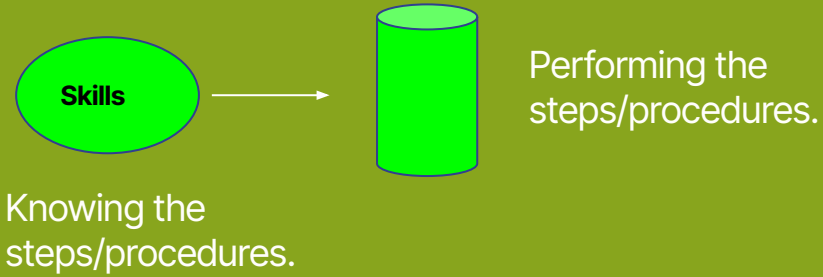
Skills & Procedures



Photo by [Lukasz Szmigiel](#) on [Unsplash](#)

Surface Level

Instructional Approaches & Activities



Skills and Procedures

1LS1.1: **Share** examples of plants and animals native to Alberta and Canada. (discuss)

1LS1.1: **Observe** and **describe similarities** and **differences** between plants and animals.(compare and contrast)

1LS1.2: **Represent** plants and animals in various environments.

1LS1.2: **Determine** how a local environment meets the basic needs of plants and animals. (conclude)

1LS1.2: **Discuss** the movement of local animals from place to place to meet their needs..

1LS1.3: **Describe** personal experiences related to how humans take care of plants and animals.

1LS1.3: **Discuss** how humans depend on plants and animals to meet their basic needs.

1LS1.3: **Identify** products made by various cultures, including local First Nations, Métis, or Inuit, that use plant and animal parts. (recall)

Living Systems

Compare & Contrast

Represent

Determine
(Conclude)

Describe

Discuss

**Consider other contexts these skills
can be introduced and practiced.**

- **Art?**
- **English Language Arts and Literature?**
- **Math**
- **Physical Education and Wellness?**
- **Social Studies**
- **Resolving Conflicts?**

Living Systems

Compare & Contrast

Represent

Determine
(Conclude)

Describe

Discuss

Scientific Methods

Investigate

Ask Questions

Observe

Predict

Record Data

Make Conclusions

Computer Science

Follow Instructions

**Sequence Instructions
to achieve an Outcome**



Skill-Related Concepts

Compare & Contrast

Similarity & Difference

Represent

Representation

Determine
(Conclude)

Conclusion

Describe

Description

Discuss

Discussion



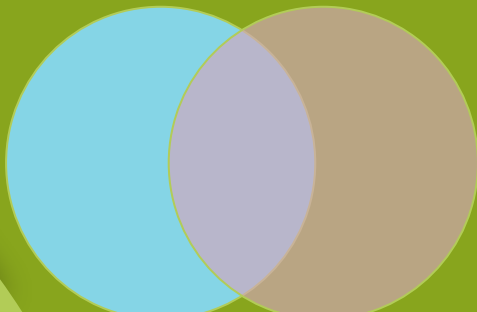
Surface Strategy #4

Venn Diagram

Compare & Contrast:

A Venn diagram consists of overlapping circles, each circle representing a different set or different item

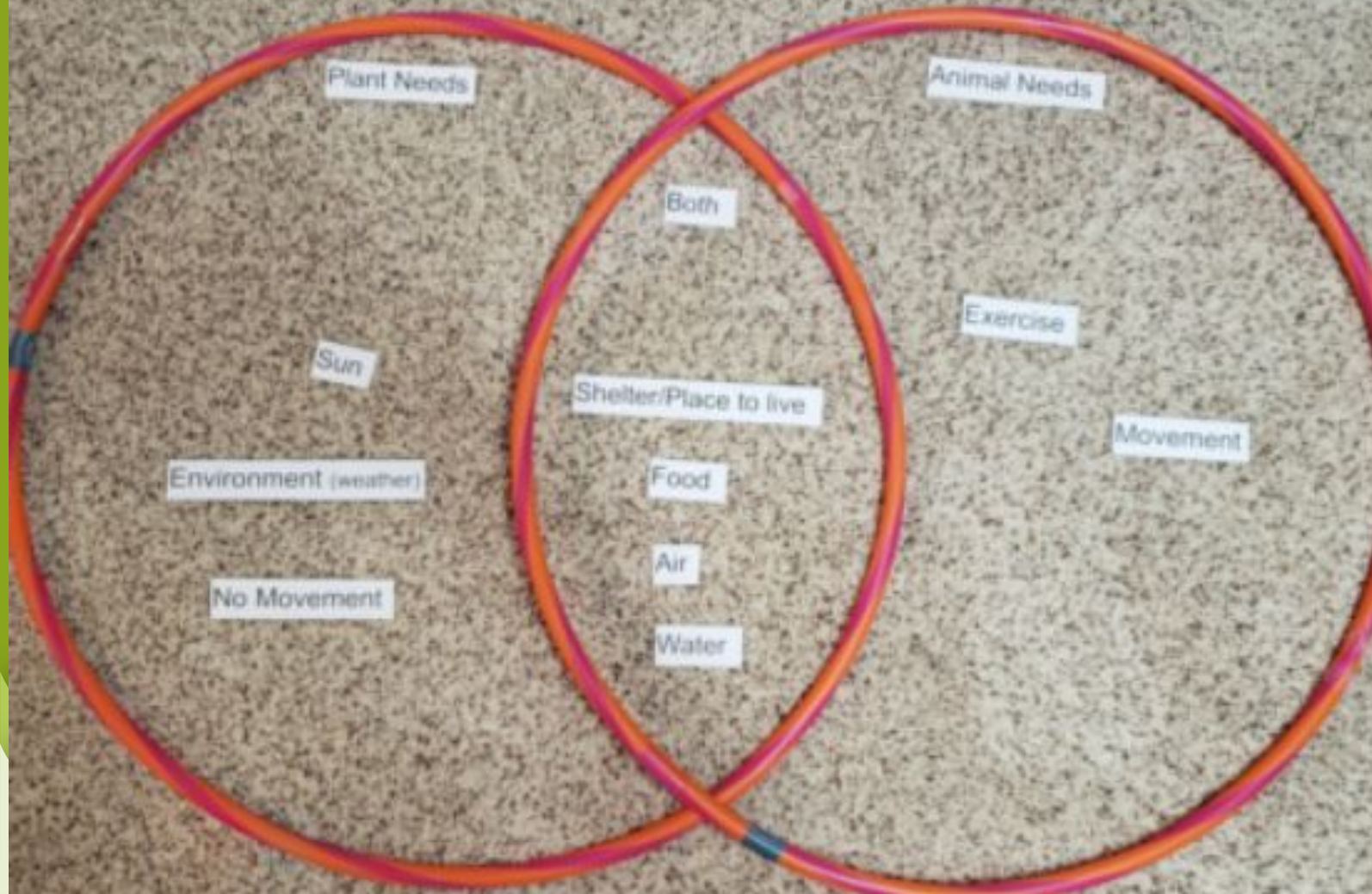
The shared area (overlapping section) are the elements that belong to both sets or items.



**Skill
&
Procedure**

**Compare
&
Contrast**

Plants and animals require environments that allow them to meet their needs.



Compare and Contrast

Similarities/
Differences

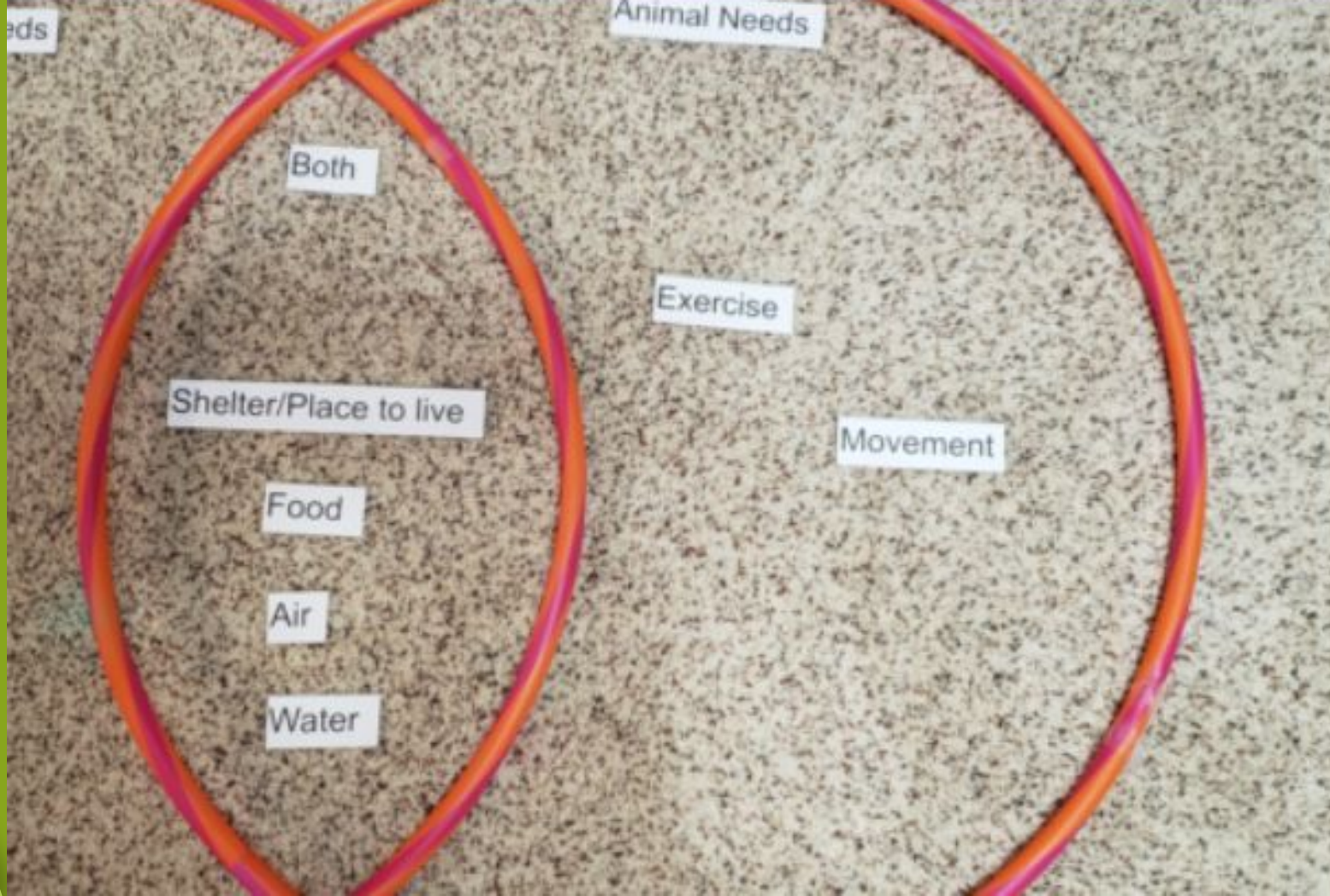
What is a
'need'?

What are **basic**
needs for ALL
living things?

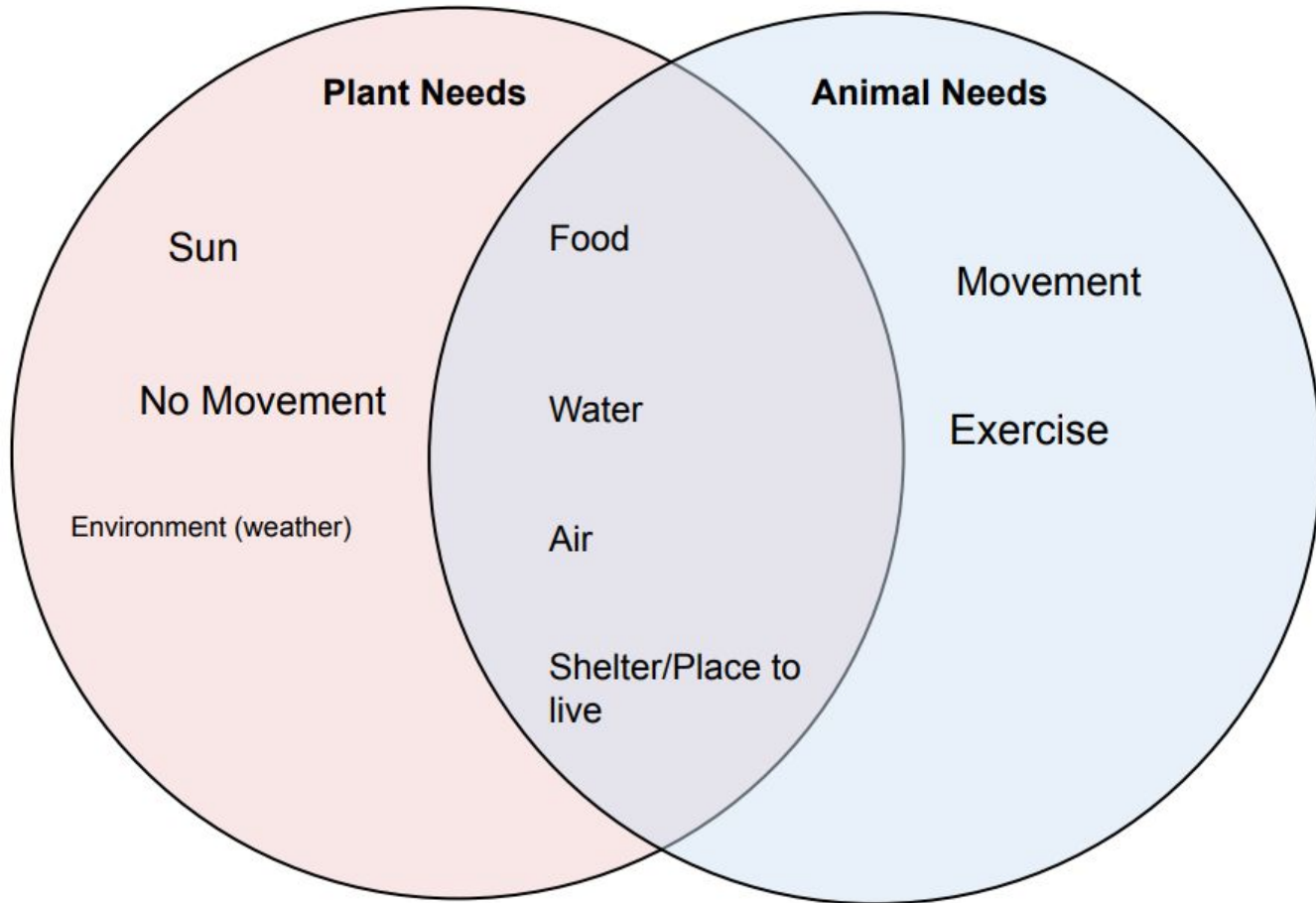
Header Cards

How do animals get food?

Movement is likely to come up in the discussion. Have students take the plant and animal cards and sort them on how each moves.



2 Circle Venn Diagram



Surface:

What are the **basic needs** of a pet?

What are the **basic needs** of farm animals (livestock)?

What are the **basic needs** of a plant in your house/outside in a flower bed/garden/classroom?

Deep:

Walk around your school yard and identify the **basic needs** of two different living things. How are their needs **related**?



Surface Strategy #5

Direct Teaching of Skills Strategy

In the direct teaching of skills strategy, the skill or procedure is explicitly taught using. The strategy involves the following:

- breaking a skill or procedure into its steps
- explaining the steps to the students
- demonstrating the steps to the students
- providing guided practice



**Skill
&
Procedure**

Describing



Anne Montgomery



One is **rough**.

8

Descriptive and
Comparative
Language

Suggested activity
- tied to sample
senses



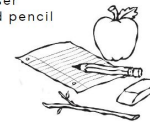
One is smooth.

Let's Do Science!

How can you describe things like
a scientist? Try this!

What to Get

- ☐ 3 things you can hold and look at, such as an apple, a twig, or an eraser
- ☐ paper and pencil



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What to Do

- 1 Make a chart like this one. Write the names of the three things you chose.

Item	Sight	Touch
Apple		
Twig		
Eraser		

- 2 Hold each thing, one at a time. Write how it looks under . Write how it feels under .



- 3 Describe how the things are the same. Describe how they are different.



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Discussing

Discuss means to explore and examine a topic or issue by

- ***talking*** about a topic or issue with others, exchanging ideas and opinions in a collaborative and respectful manner
- providing a detailed and thorough analysis or examination of a particular topic or issue.



[Discussion Checklist](#)

(Some) Discussion Formats

Gallery Walk (Chat Stations)	Snowball Discussion	Conver-Stations	Concentric Circles
Pinwheel Discussion	Think-Pair-Share	<u>Circle of Viewpoints</u>	Fishbowl
4 Corners	Spectrum Sort	Silent Discussions (eg. Mentimeter, Padlet)	<u>See-Think-Wonder</u>



Deep Strategy #1

Representing

Representing means to effectively communicate one's understanding of a particular subject, concept, topic to understanding to others, whether through writing, speaking, or some other form of expression.

(Some) Representation Ideas

Concept Map	<u>Infographic</u>	<u>Mind Map</u>	Skit
Comic Strip	Podcast	Poem	Dance
Diagram/Drawing	Charts & Tables	Song	Clay Sculptures
Infomercial	Mobile	News Report	Puppet Show
Role Play	Board Game	Kahoot!	Diorama

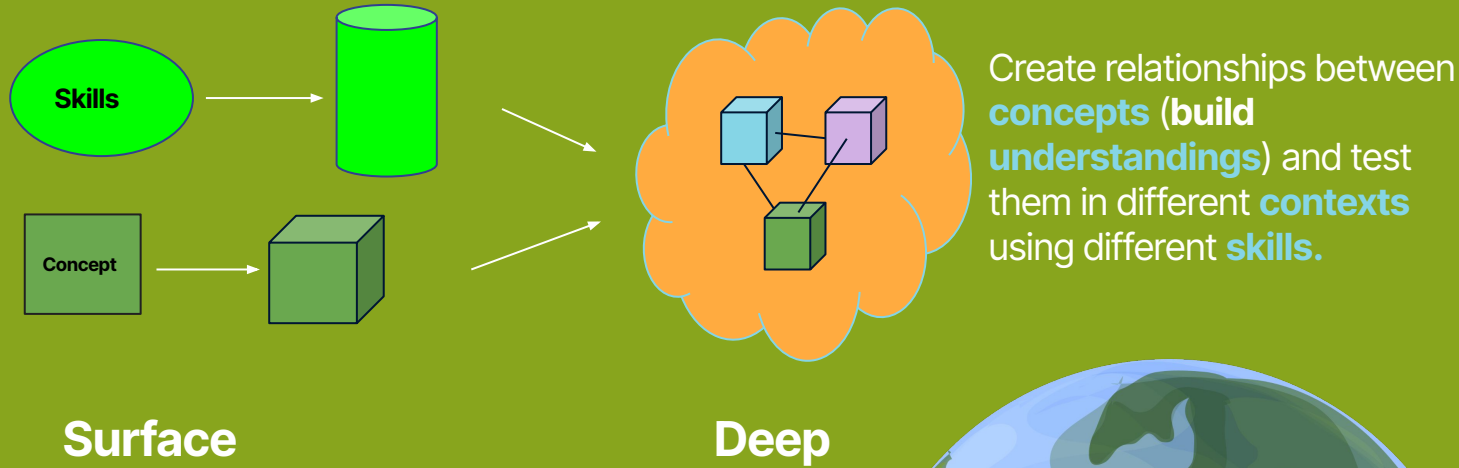
At the surface level, provide students with exemplars, a checklist, and guided practice with a representation format.

Understandings



Photo by [Jonah Brown](#) on [Unsplash](#)

Deep Level Instructional Approaches & Activities



Understandings

1LS1.1: **Plants** and **animals** share **similarities** and have **differences**.

1LS1.2: **Plants** and **animals** require **environments** that allow them to meet their needs.

1LS1.3: **Humans**, other **animals**, and **plants** depend (**dependence**) on each other to meet their **needs**.



1LS1.1: Understanding

Plants and **animals** share **similarities** and have **differences**.



Why did you
group them
this way?

Which animals
can you name
in each group
by name.



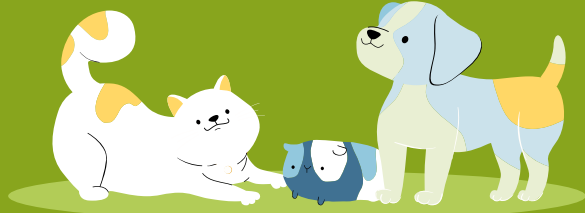


2



Movement to meet basic needs

Do all animals move the same way?



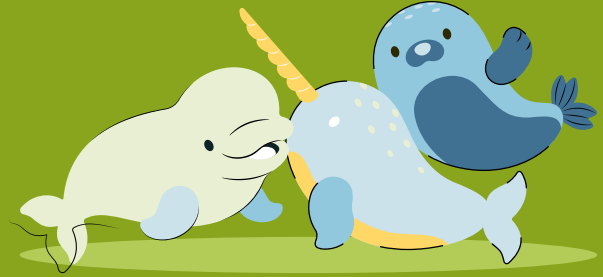
4 legs

What were some examples?



2 legs/2 wings

What were some examples?



No legs-but still move!

What were some examples?

No legs-no movement.

What were some examples?

Did you think of any others?





Deep

Look through books or think about other animals you know that fit into each group. How will explain to someone why you put them into each group?



1LS1.2: Understanding

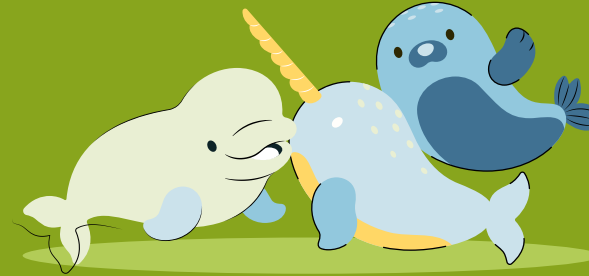
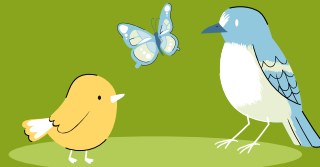
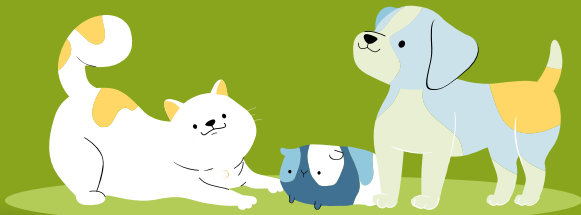
1LS1.2: **Plants** and **animals** require **environments** that allow them to meet their needs.



Different environments allow plants and animals to meet their basic needs.

How do animals move?

Do all animals move for the same purpose?



Use your animal and plant cards to answer our questions.

1LS1.3: Understanding

Humans, other **animals**, and **plants** depend (**dependence**) on each other to meet their **needs**.



Animal, Plants and Humans – we each have a function!

How do plants, animals and humans help each other?

Caring For Animals in
Our Care - Grade 1
Living Systems
A lesson Plan



How do plants fill the
needs for humans?



Importance and uses of
animals and plants to
Indigenous culture.



Our Plants
Buffalo and Seals

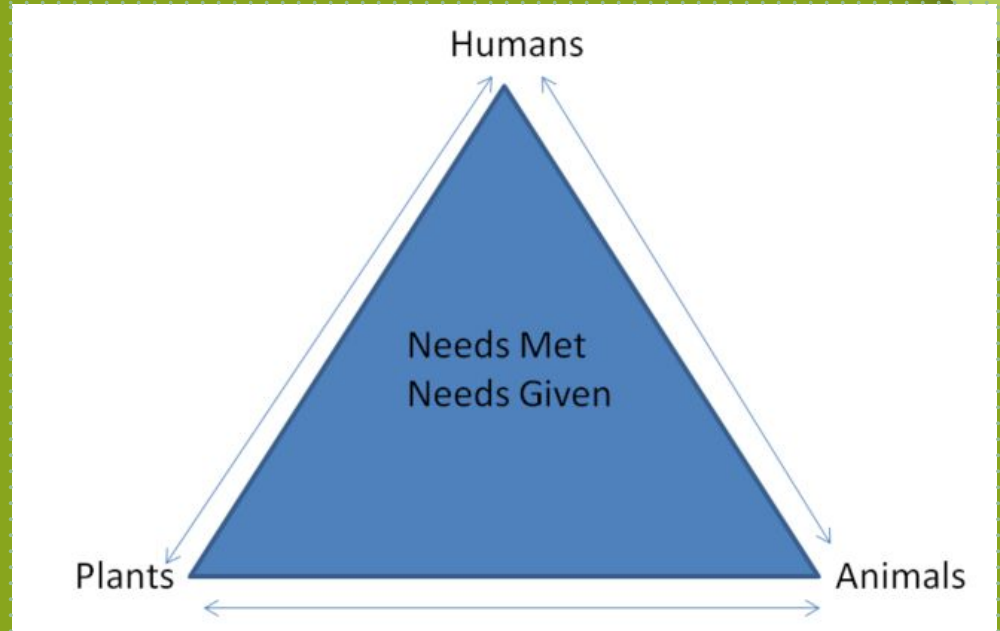
CAN WE
LIVE
WITHOUT
PLANTS ?



Can we live without
plants - teacher
information video.

How do humans, other animals and plants depend on each other to meet their needs?

Consider a zoo.... Take a virtual field trip to a zoo.



How are these animals helping humans?



What is 'interdependency'?



Find an animal and plant that are interdependent and explain why.

Integrating Scientific Methods

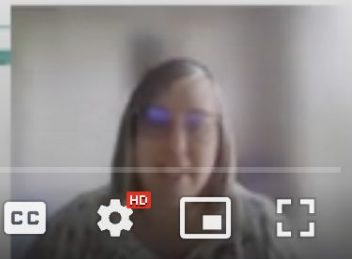


Photo by [Zoe Schaeffer](#) on [Unsplash](#)

Scientific Methods

Grade 1

Nicole Lamoureux, M. Ed. ERLC



0:02 / 29:07

Classification: Protected A



HD



Integrating Computer Science



Assessment



Photo by [imagenation.jpeg](#) on [Unsplash](#)

Skills and Procedures

1LS1.1: **Share** examples of plants and animals native to Alberta and Canada.

1LS1.1: **Observe** and **describe similarities** and **differences** between plants and animals. (compare and contrast)

1LS1.2: **Represent** plants and animals in various environments.

1LS1.2: **Determine** how a local environment meets the basic needs of plants and animals. (conclude)

1LS1.2: **Discuss** the movement of local animals from place to place to meet their needs.

1LS1.3: **Describe** (discuss) personal experiences related to how humans take care of plants and animals.

1LS1.3: **Discuss** how humans depend on plants and animals to meet their basic needs.

1LS1.3: **Identify** products made by various cultures, including local First Nations, Métis, or Inuit, that use plant and animal parts. (recall)

Formative Assessment: Surface

1LS1.1: **Share** examples of plants and animals native to Alberta and Canada.

1LS1.1: Classify images as a **plant** or **animal**. Justify the classification.

1LS1.1: Provide statements about two or more items. Students classify them as **similarities** or **differences**. Students generate their own statements that are examples of similarities and differences.

1LS1.2: Students identify different **environments** in the school yard. (eg. treed area, north facing side, south facing side) and identify the different types of plants or animals they may find.

1LS1.3 Students provide examples of **dependence** in the classroom, playground, zoo, etc.

1LS1.3: **Identify** products made by various cultures, including local First Nations, Métis, or Inuit, that use plant and animal parts. (recall)

Formative Assessment: Deep

1LS1.1: **Observe** and **describe similarities** and **differences** between plants and animals.(compare and contrast)

1LS1.2: **Represent** plants and animals in various environments.

1LS1.2: **Determine** how a local environment meets the basic needs of plants and animals. (conclude) This can be an “investigation” (eg. Ask A Question > Predict > Gather Data > Conclude.

1LS1.2: **Discuss** the movement of local animals from place to place to meet their needs.

1LS1.3: **Describe** (discuss) personal experiences related to how humans take care of plants and animals.

1LS1.3: **Discuss** how humans depend on plants and animals to meet their basic needs.



Deep Strategy #3

Investigating

Steps followed during an investigation include

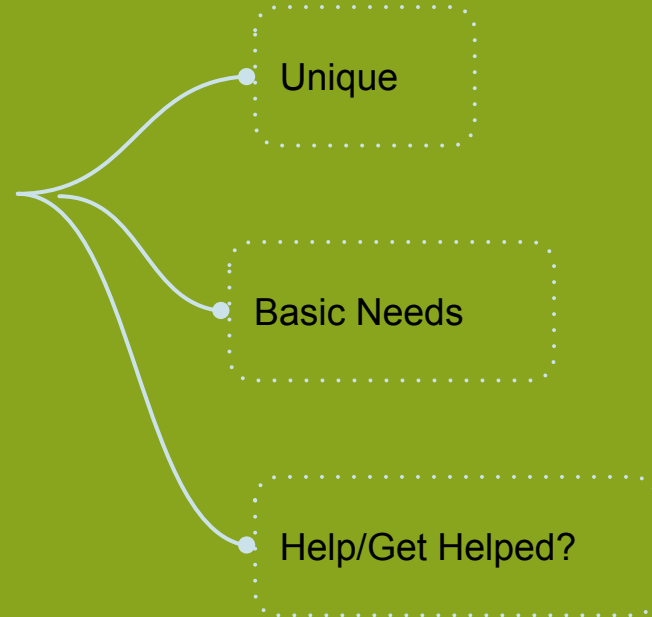
- asking questions
- making predictions
- gathering data
- forming conclusions

Possible Transfer Activity

Design your own animal or plant. It must be *unique*!

- What is your animal called? What makes it unique?
- What are its basic needs? What animal or plant do you know with similar basic needs?
- How does your plant or animal help and get helped by humans?

How will you share your informations?





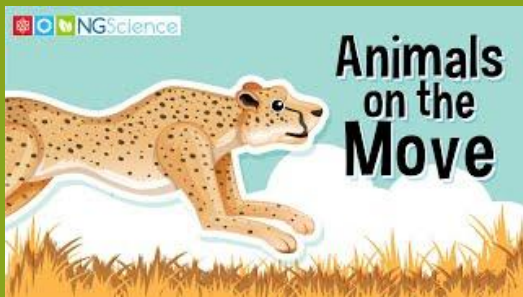
**Living and Non-living Things for Kids |
Learn why some things are alive and
others are not (Great review of the entire
living/nonliving comparison)**

Quizizz

This site offers a number of short formative/summative quizzes specific to living and nonliving things. The menu at the right also provides extensions to broaden the discussions. Sign up is free.



Additional resources to Supplement your lessons



Animals on the Move - NG Science

Living vs Nonliving

PBS Learning Media Lesson

Plan

*The needs and characteristics of
Living Things*

Lesson Plans and additional
resources

Source: mrcollinson.ca



Living and Non-Living Things | Science for KIDS!

Lesson using the Inquiry
Approach - 5E's



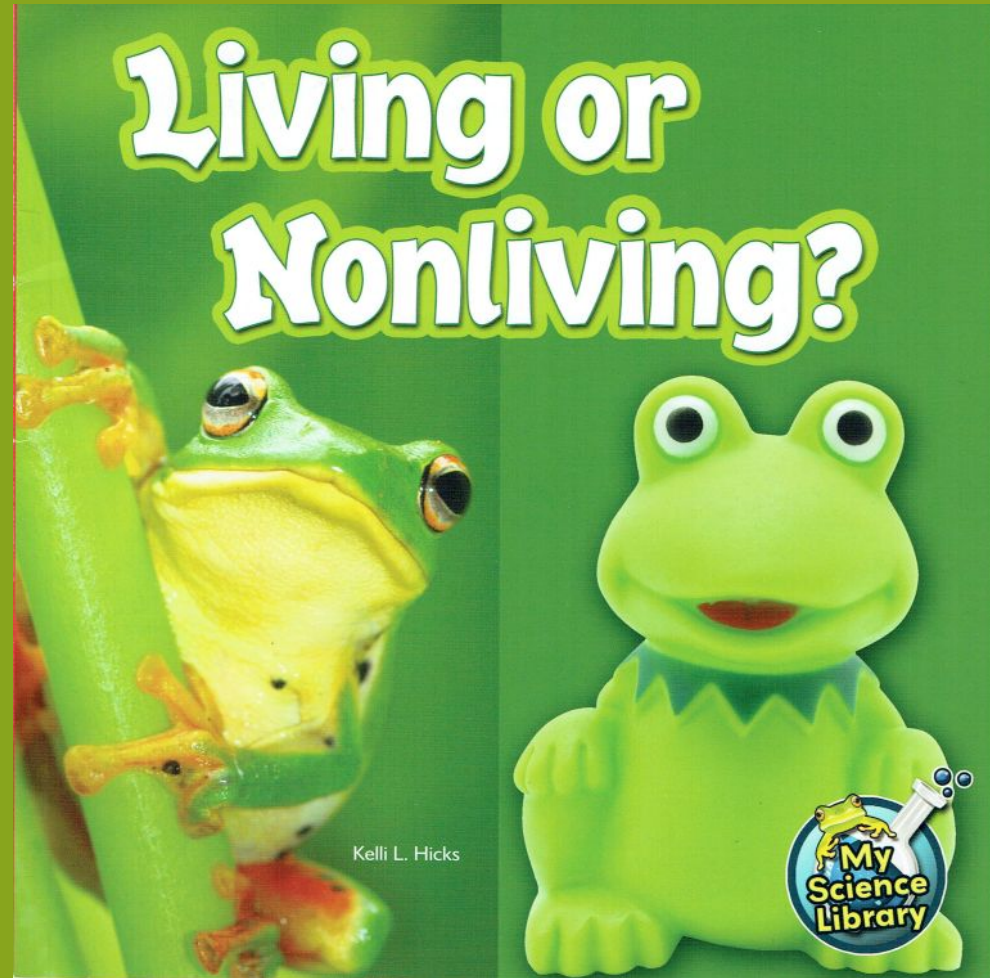
Living or Nonliving?

Level 1

Author: Kelli L. Hicks

Publisher: Rourke Educational media

ISBN: 9781617419454

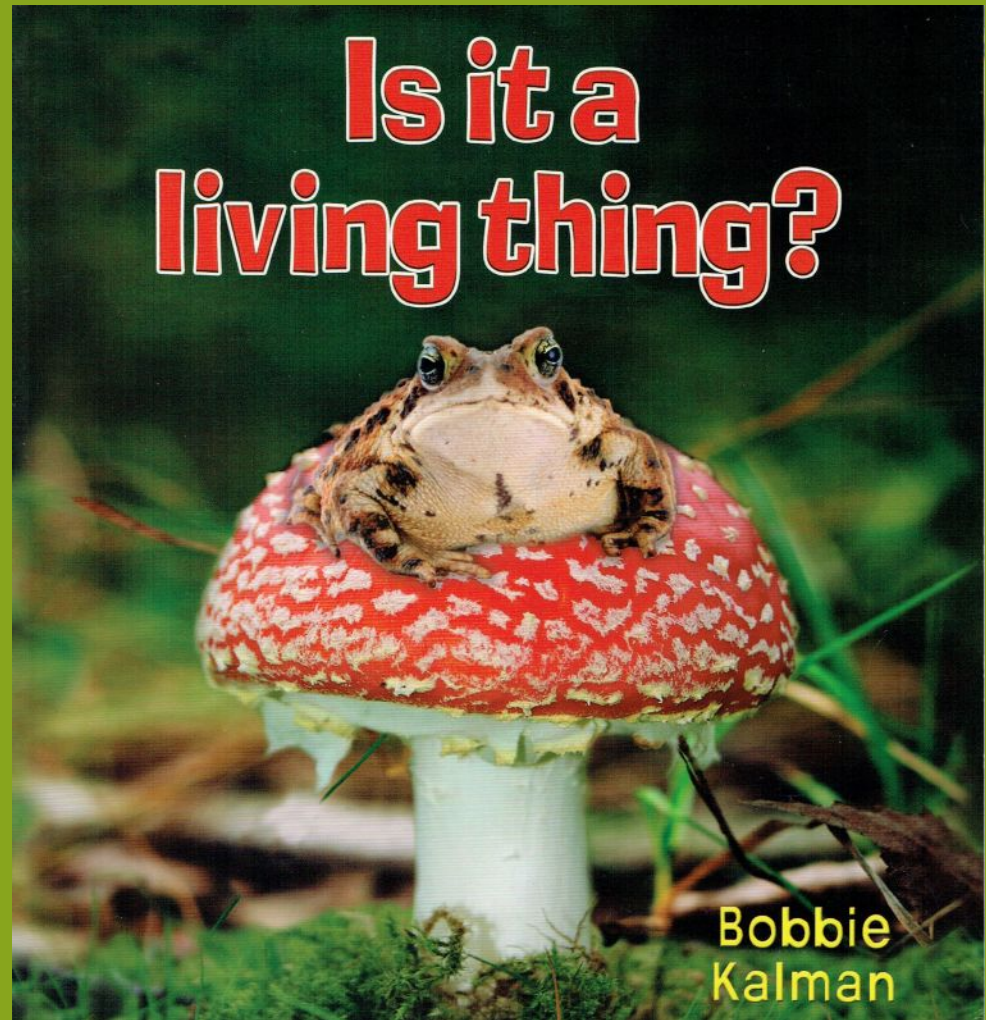


Is it a living thing?

Author: Bobbie Kalman

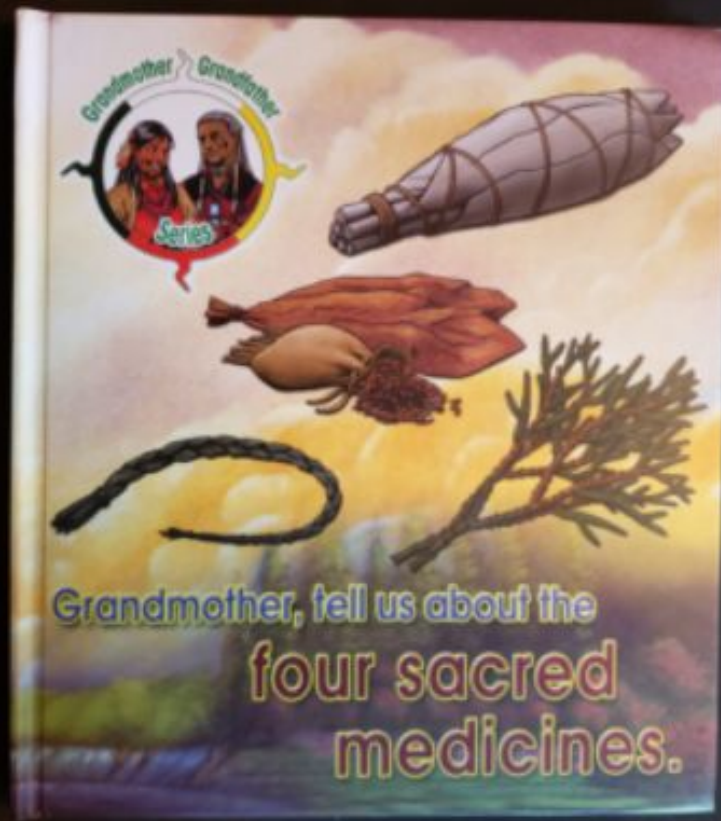
Publisher: Crabtree Publishing
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A Compare and Contrast Book (with a teacher guide)





Grandfather and Grandmother Series - NativeReflections.com

Thanks!



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