

Science Grade 5 Session 2: Living Systems

May 9, 2023



Facilitators:
Chris Zarski (CARC)
Ted Zarowny (ERLC)

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 Instructional Strategies and Activities)
03	Skills and Procedures • Key Skills and Procedures (Surface Level Activities)
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

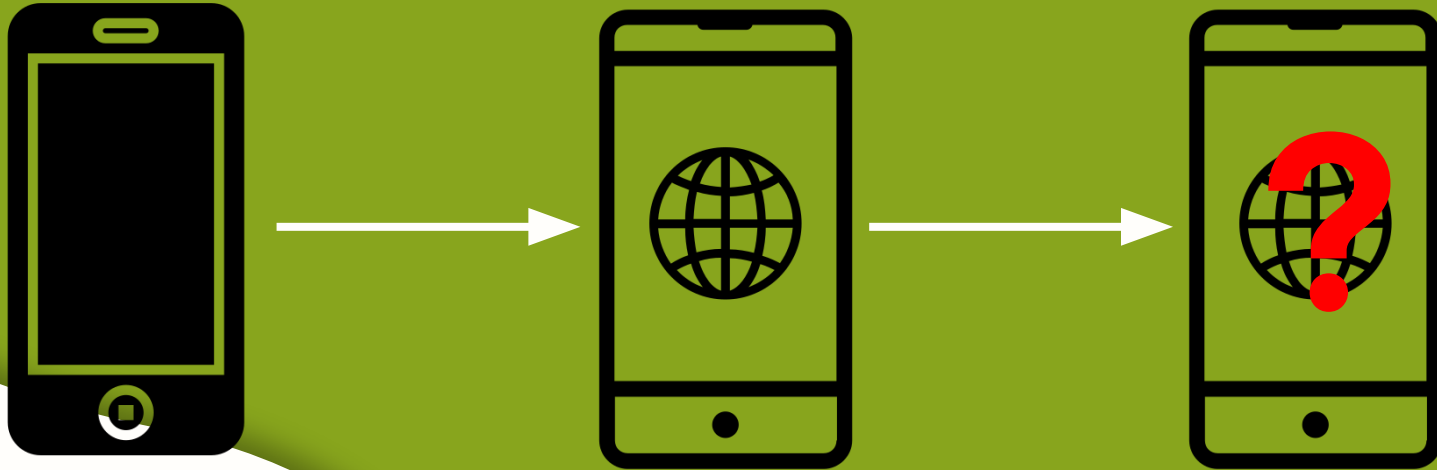


Backgrounder



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

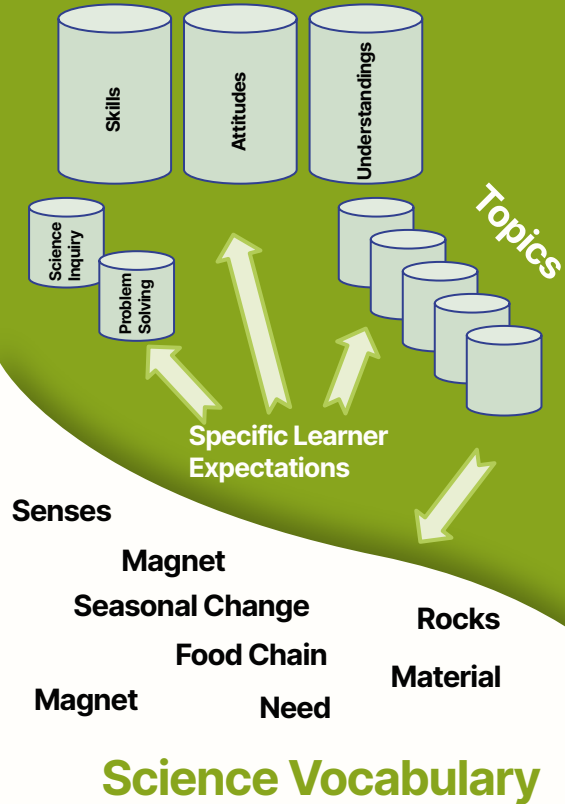
Potential of A Smartphone



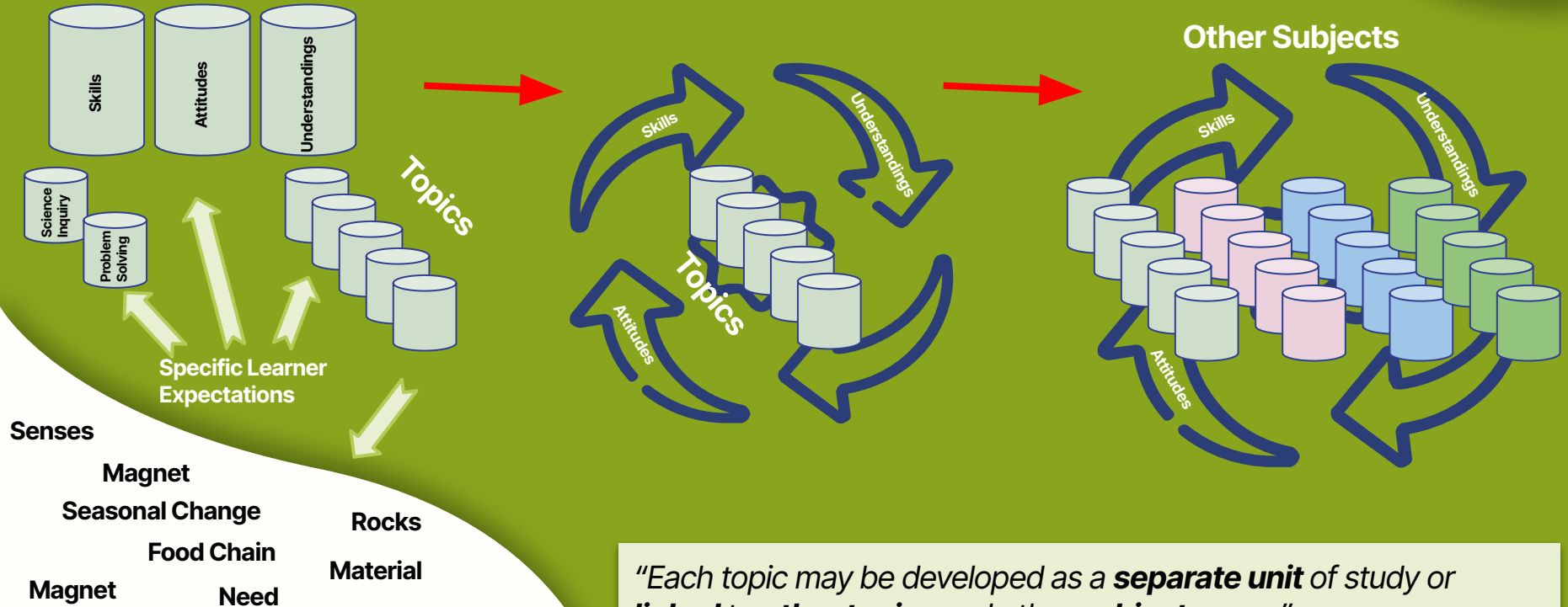
Cell Phone by Laymik from <https://thenounproject.com/browse/icons/term/cell-phone/> title="Cell Phone Icons">Noun Project

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Potential of A Curriculum (1996)



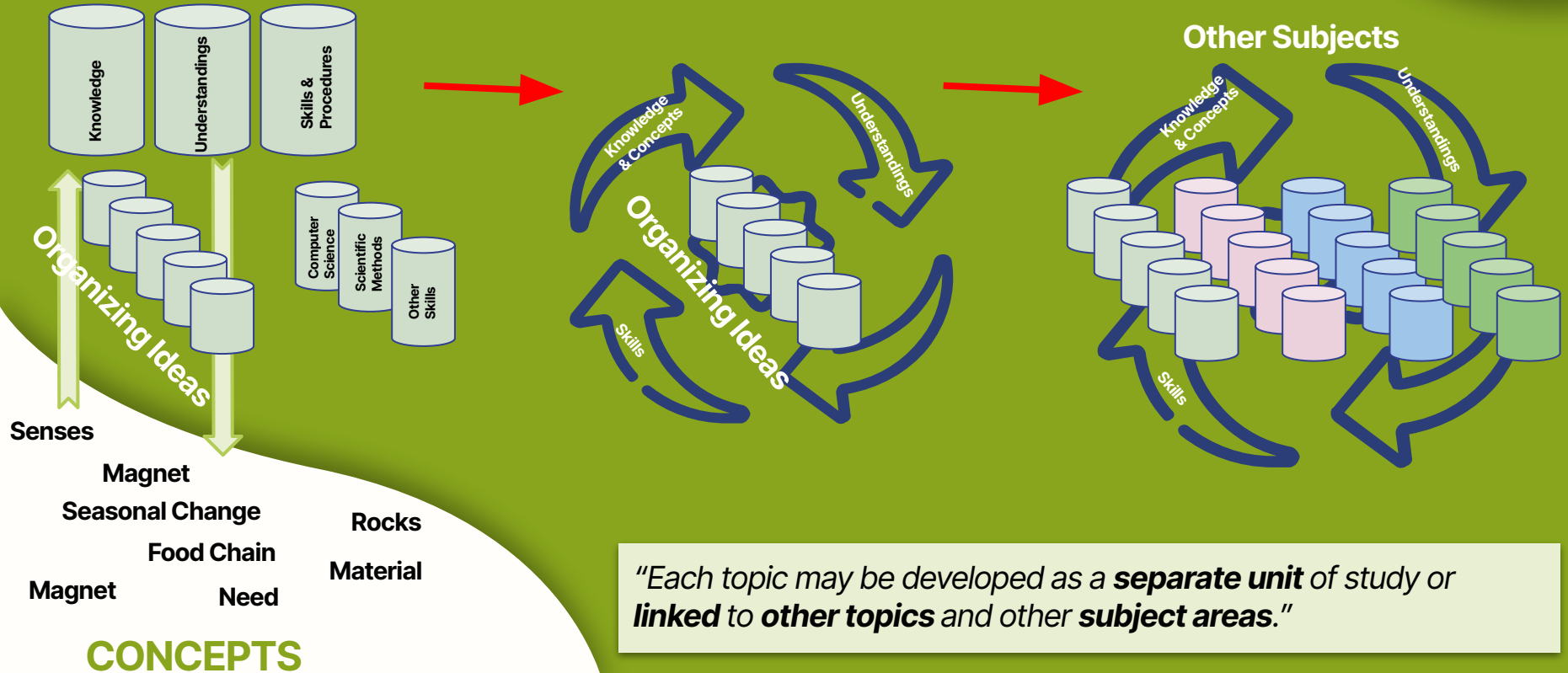
Potential of A Curriculum (1996)



*"Each topic may be developed as a **separate unit** of study or **linked** to **other topics** and other **subject areas**."*

VOCABULARY / TERMS

Potential of A Curriculum (2023)

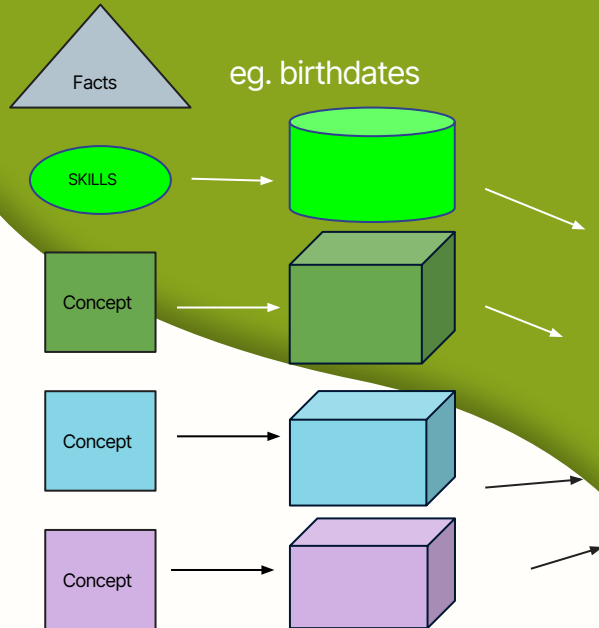


Phases of Learning

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

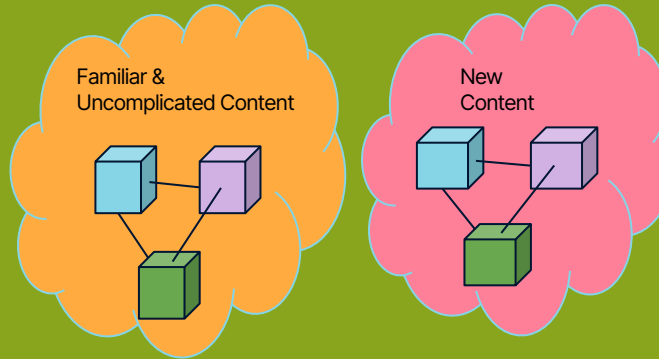
Surface

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



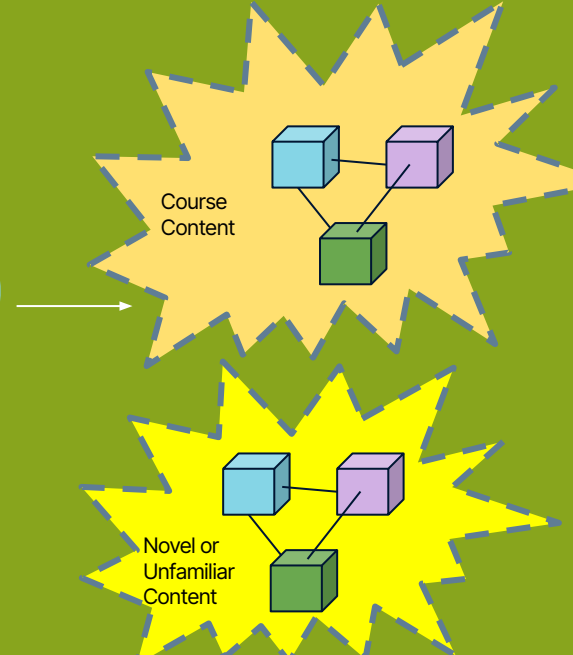
Deep

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



Transfer

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



Conceptual Overview

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Concepts

What is a concept?

A concept is ...

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



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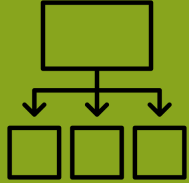
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Created by Made by Made
from the Noun Project

Concepts are 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

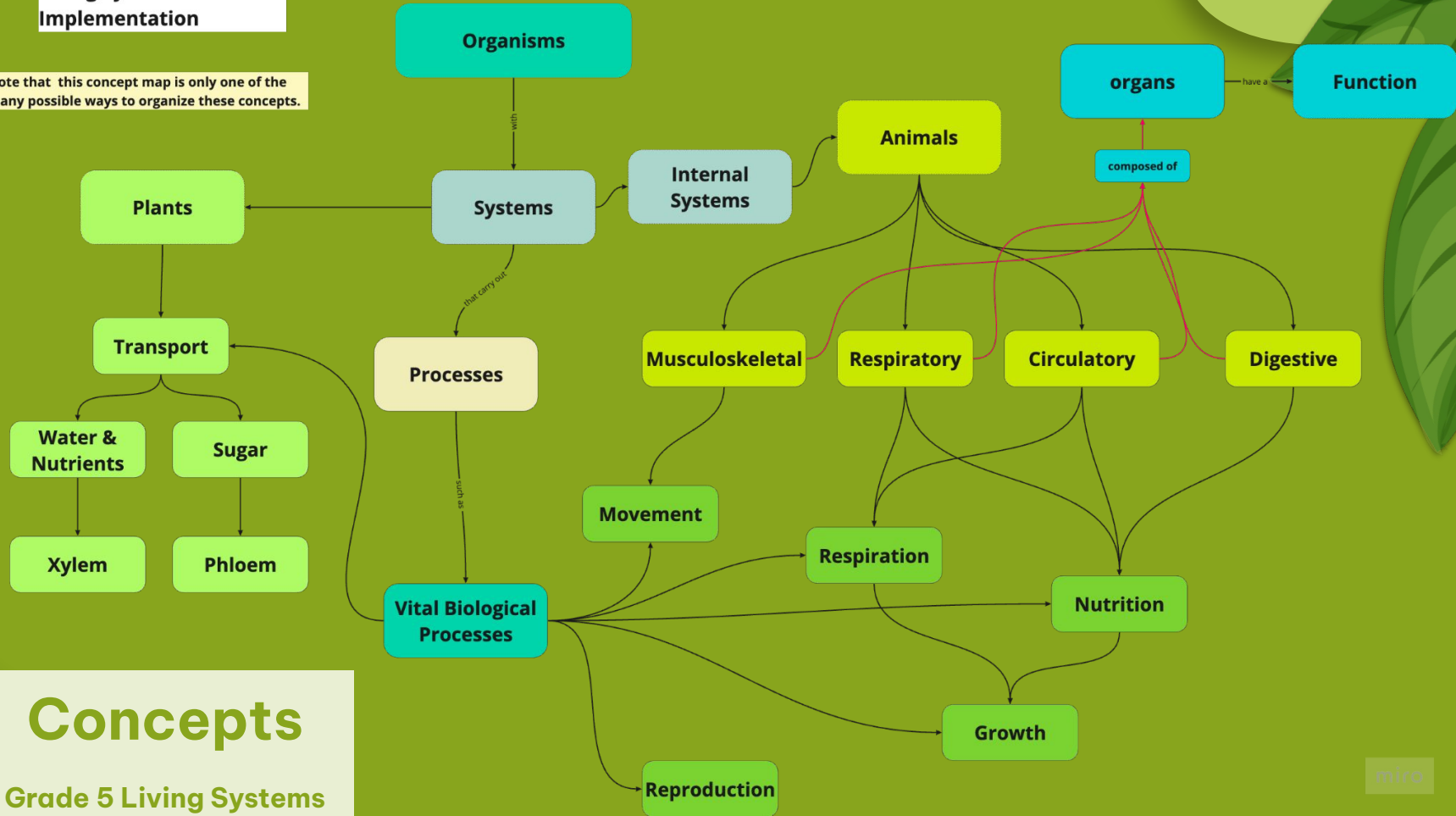
Guiding Question	How are organisms supported by vital biological processes and systems?	
Learning Outcome	5LS1 Students investigate the internal systems of organisms and explain how they support vital biological processes.	
Knowledge	Understanding	Skills & Procedures
Vital biological processes in complex organisms are carried out by biological systems that rely on each other. Vital biological processes of complex organisms include • movement • nutrition • respiration • growth • reproduction	Humans are complex organisms with biological systems that carry out vital biological processes.	Relate vital biological processes to a human or other animal's internal biological systems.

Concepts

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Living Systems Grade 5 Implementation

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



Concepts

Grade 5 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

Organism

Internal System

Function

System

Organ

Process

Key Concepts

Grade 5 Living
Systems

Previous Grades

Senses

**External
Structure**

Living Things

Interaction

Plant

**Non-Living
Things**

Animal

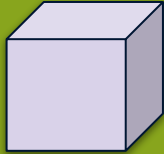
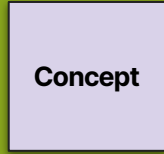
Environment

Survival

**Growth
(Life Cycle)**

Surface Level

Instructional Approaches & Activities



Creating/Identifying examples and non-examples in new contexts

Definition





Surface Strategy

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 organize and sort them into groups or categories that they think are appropriate.



Examples

Concepts

Living and
Non-Living Things

Plants

Animals

Function



Review of Key Concepts from Grade 1 & 3

Lens:
Observation/Discussion

808	
OBSERVATIONS	INFERENCES





What is the **relationship** between the 'things' you placed in the "**Living**" column?

What is the **relationship** between the pictures of things you placed in the "**non-living**" column?



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?





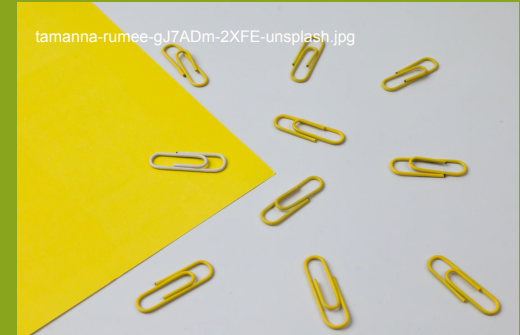
Applications of Card Sort to Grade 4

Using your cards, sort (classify) the organisms according to:

- a) Appearance - have students describe what appearance is common to each group they created. Make a list of words (classifications) that students use on the board to help students understand "appearance" related characteristics.

Repeat the same for

- b) Habitat
- c) Structures. You may wish to use the "features" poster from Grade 1 to assist students in identifying structures.



Card Sort (Concept:Function)



Surface Strategy

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



Examples **Concepts**

Carnivore
Omnivore
Herbivore



What is a feature?!

Case Study approach
Could be the first time
any of the concepts are
introduced or it
extends the card sort.

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

Look at the following pictures through the lens of *Connection*.

How are the roads way connections important to humans using them?

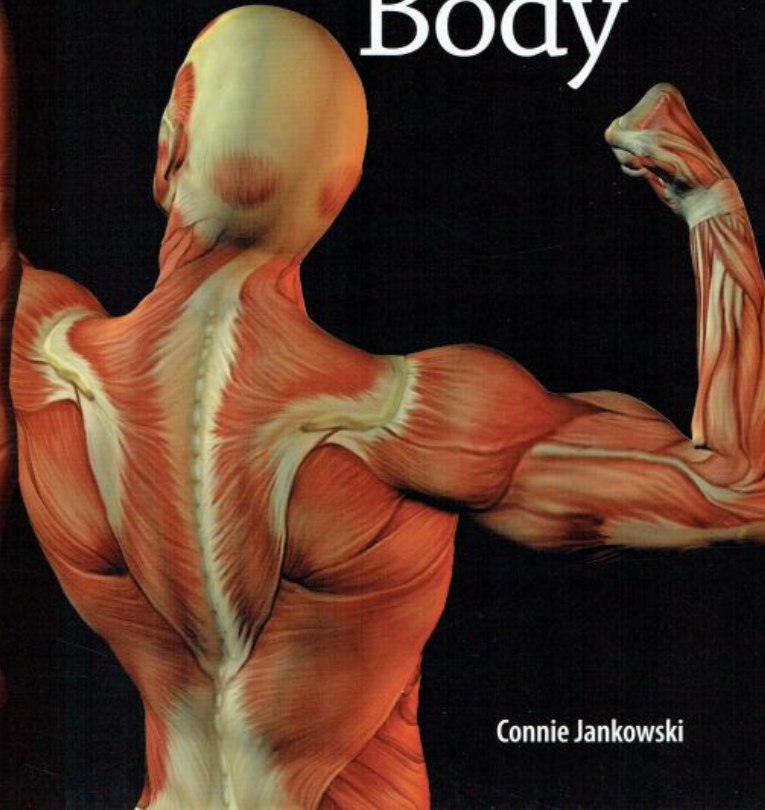
How do the connections increase the flow of traffic?

You could also talk about complexity of the system - how someone had to design the system so that the roads connections allow for 'smooth' travel - accident free etc.



Read a
Book
(Pearson)

Investigating the Human Body



Connie Jankowski

Investigating the Human Body

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The Cardiovascular System

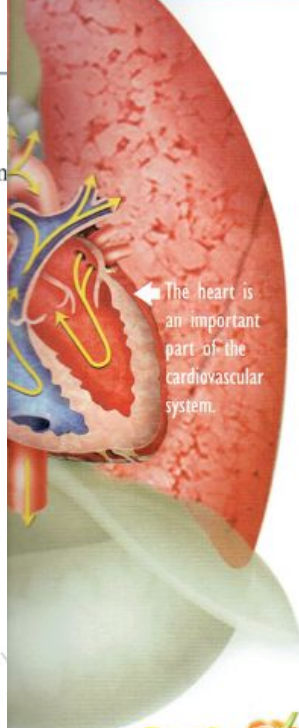
The cardiovascular system has many jobs. It keeps blood moving. It keeps the heart beating. It affects body temperatures. This system never rests. The body cannot live without a working heart. The heart supplies blood and oxygen to other organs.

Heart problems can occur when the **arteries** become blocked or narrow. A condition known as coronary artery disease occurs. It can cause chest pain, leading to heart attacks. Smoking, lack of exercise, and poor diets can cause arteries to clog.

↑ Your heart is like a pump.

Did You Know?

Physicians who specialize in treating the heart and related structures are called cardiologists.



↑ A healthy diet helps to create a healthy heart.

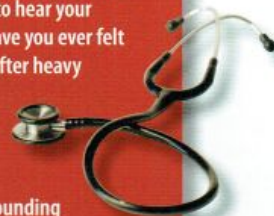
The Respiratory System

The respiratory system provides the body's oxygen. It draws air into the lungs. Then, oxygen from the air is moved into the blood that is pumped through the lungs by the heart. Carbon dioxide waste from the blood is moved into the air that is then pushed out of the lungs.

The respiratory system is made of several parts. It includes the nose, which draws in air. It also includes the pharynx (throat), larynx (voice box), trachea (windpipe), and the bronchial tubes. The bronchial tubes carry air between the lungs and the outside atmosphere.

A Beating Heart

Have you ever listened to your heartbeat? You can listen through an instrument called a **stethoscope**. Your doctor or a nurse might let you use a stethoscope to hear your own heartbeat. Have you ever felt your heart beat? After heavy exercise, such as fast running or pumping a bicycle up a hill, you might feel a pounding sensation in your chest.



Relate the road system to:

**Circulatory
System**

**Digestive
System**

**Respiratory
System**

**Musculoskeletal
System**

Knowledge from the Curriculum

Digestive System

The digestive system breaks down food and absorbs nutrients, and includes the mouth, stomach, intestines, liver, and pancreas.

Respiratory System

The respiratory system exchanges oxygen and carbon dioxide, and includes the trachea, lungs, and diaphragm.

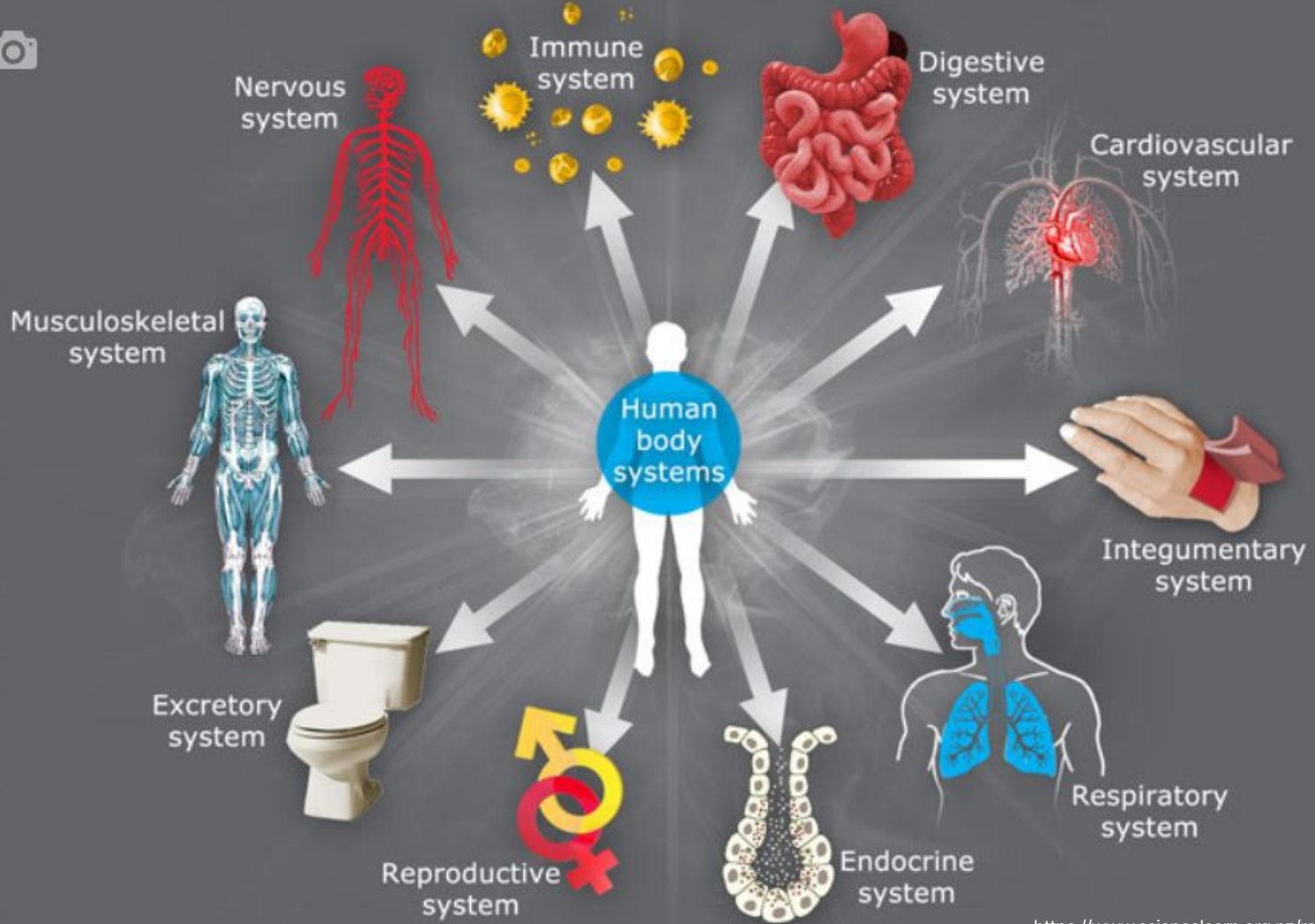
Circulatory System

The circulatory system moves blood around the body and includes the heart and blood vessels.

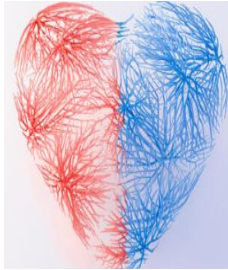
Musculoskeletal System

The musculoskeletal system supports and moves the body, and includes muscles and bones.

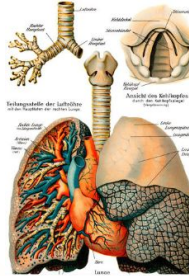




Vital Biological Processes



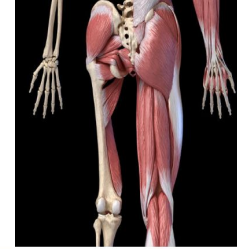
The circulatory system includes the heart and blood vessels.
(respiration, growth)



The respiratory system includes the trachea, lungs, and diaphragm.
(respiration)



The digestive system includes the mouth, stomach, intestines, liver, and pancreas.
(growth, nutrients)



The musculoskeletal system includes muscles and bones.
(movement, stability)

What is a vital biological process?



Surface Strategy

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



Examples Concepts

Four sample
starting points
for Frayer
Models

Organism

System (next slide)

Interaction

CONCEPT: System

A system is a group of things or parts that have a function and interact or work together to carry out a larger function to solve a problem.

1. View the Video: <https://www.youtube.com/watch?v=GOMIBdM6N7Q>
2. Complete the table.
3. What is a good name for this system?
4. What is the function of this system?
5. Students complete this [Frayer Model](#).

Part	Function	Describe the Interaction
Coffee Mug		
Fuse		
Hair Dryer		
Roll of Tape		



Surface Strategy

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. *Using a **Frayer Model** after a concept attainment activity helps reinforce the concepts.*



Examples Concepts

[Relationship](#)

[Cause & Effect & Impact
& Concept Map](#)

[Dependence](#)

[Investigation](#)

[Conclusion](#)

[Analysis](#)

[Criteria](#)

[Prediction](#)

[Observation](#)

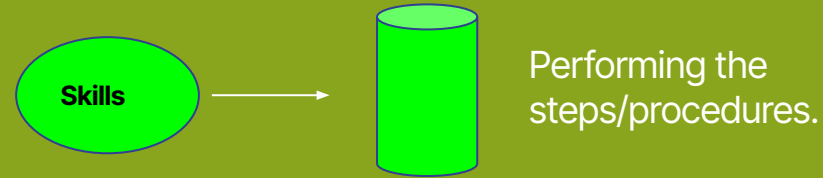
Skills & Procedures



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Surface Level

Instructional Approaches & Activities



Knowing the
steps/procedures.



Skills and Procedures

Skills and procedures “are what students do to demonstrate knowledge and understanding.”

5LS1.1: **Relate** vital biological processes to a human or other animal’s internal biological systems.

5LS1.1: **Examine** the function of the human digestive, respiratory, circulatory, and musculoskeletal systems.

5LS1.1: **Identify** the digestive, respiratory, circulatory, and musculoskeletal systems of the human body and the major body parts of each system.

5LS1.1: **Investigate the relationships** between body systems that are involved in moving oxygen and nutrients throughout the human body.

5LS1.2: **Examine** the transport systems of plants and describe their functions.

Living Systems

Investigate

Discuss

Examine

Relate

Compare & Contrast

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?**

Computer Science at a Glance

Grade 2	Grade 3	Grade 4	Grade 5
<u>Instructions</u> can be created to be precise, reliable, and efficient to achieve the desired outcome. Concepts • precision • reliable • efficient • debugging • outcome • repeated steps	<u>Computational Thinking</u> • 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 <u>Creative Thinking</u>	<u>Design processes</u> include • understanding the problem • forming ideas (ideating) • planning • creating • analyzing • testing • troubleshooting Design uses algorithms (sequence of instructions) to produce artifacts.	Design can be used by humans or machines to meet needs. • Design can be used to create algorithms and translate them into code • Visual block-based languages & loops. • Design functionality. • Design usability.

Scientific Methods at a Glance

Grade 2	Grade 3	Grade 4	Grade 5
Steps followed during an investigation include • asking questions • making predictions • <u>planning the investigation</u> • observing and recording data • analyzing data reaching conclusions • discussing observations and conclusions	Grade 3 Scientific Methods focuses on • Data • Data Accuracy & Trustworthiness • Data Sources • Data Analysis	Relevant <u>data</u> addresses the question that is being investigated. • Descriptive Data • Quantitative Data\ • Qualitative Data <u>Evidence</u> is produced through the study and interpretation of data. Conclusions drawn during investigation must be based on reliable and valid evidence. • Reliability • Validity	Investigations can be conducted to better understand phenomena. <u>Evidence</u> is more reliable and valid when investigations are conducted in a way that limits bias. Evidence from a controlled experiment can be used to make conclusions about cause-and-effect relationships between variables.



Surface Strategy

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
- ensuring students understand any concepts in the steps
- explaining the steps to the students
- demonstrating the steps to the students
- providing guided practice



Examples
**Skills &
Procedures**

[Investigating](#)

[Compare & Contrast](#)



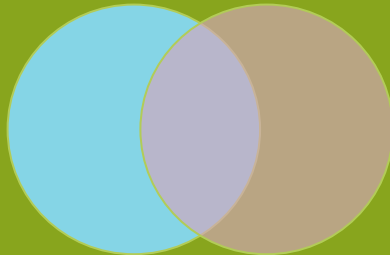
Surface Strategy

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 (similarities) The area not overlapping are difference.

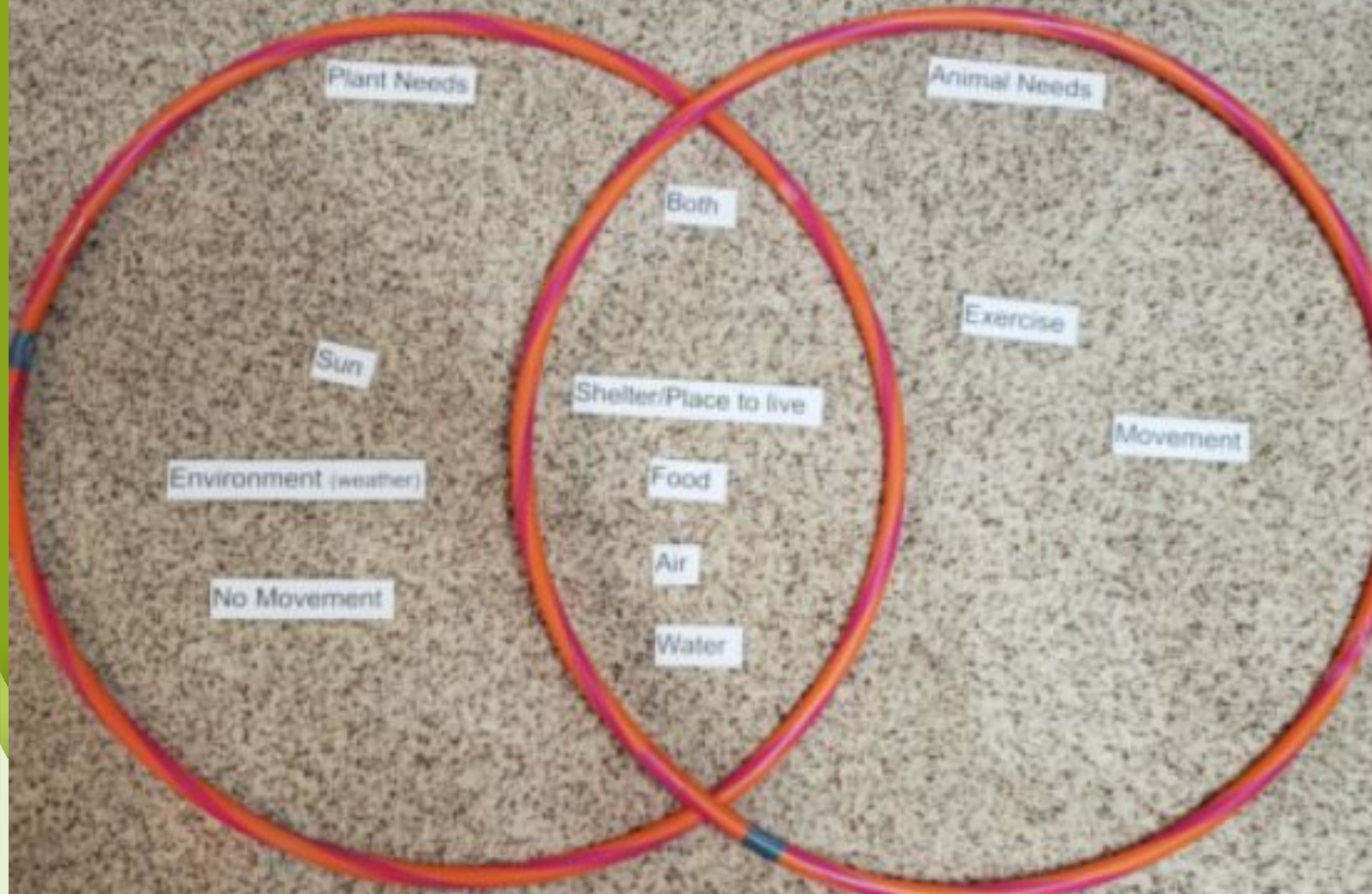


Examples

**Skills &
Procedures**

**Compare
&
Contrast**

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



Compare and
Contrast

Similarities/
Differences

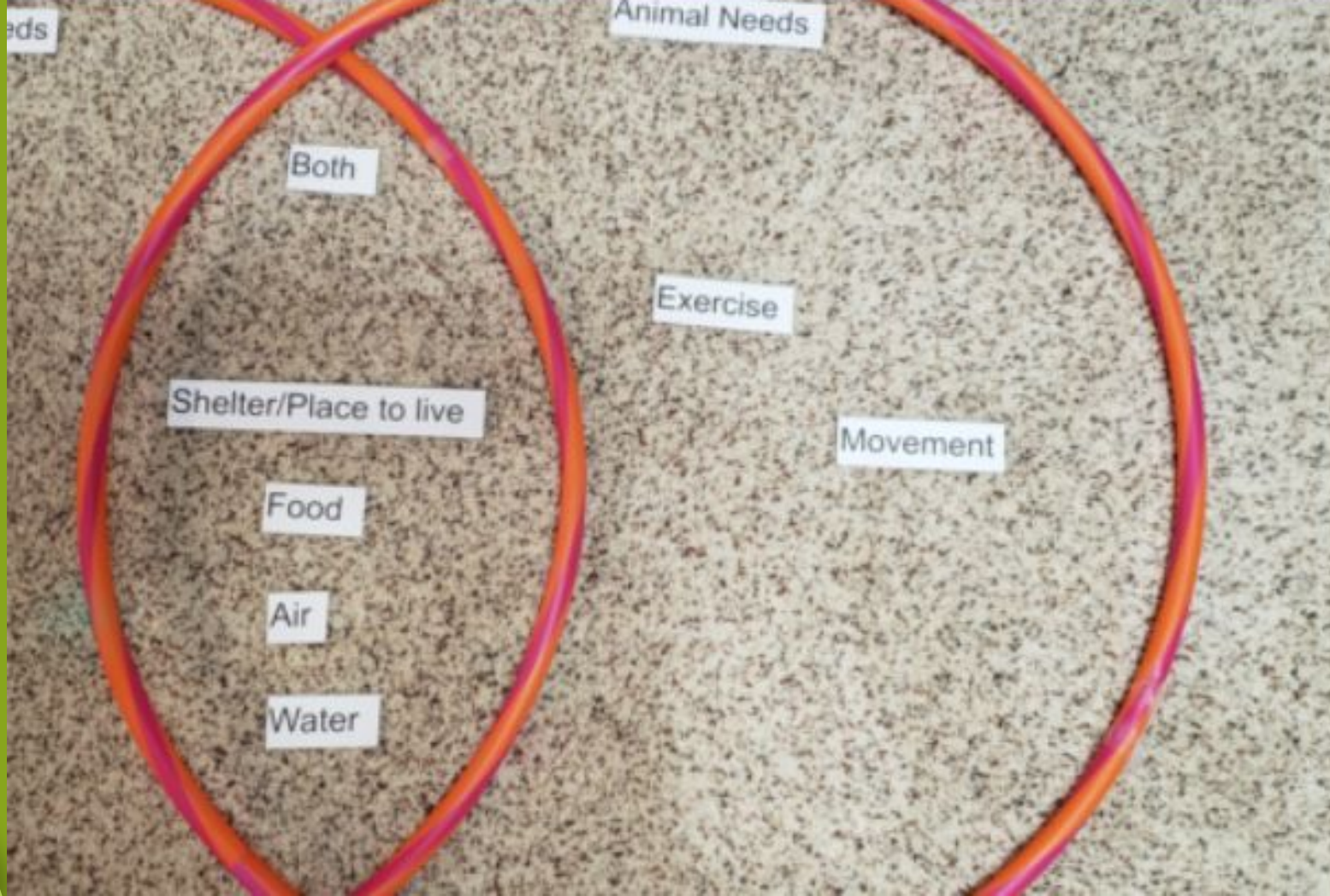
What is a
'need'?

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

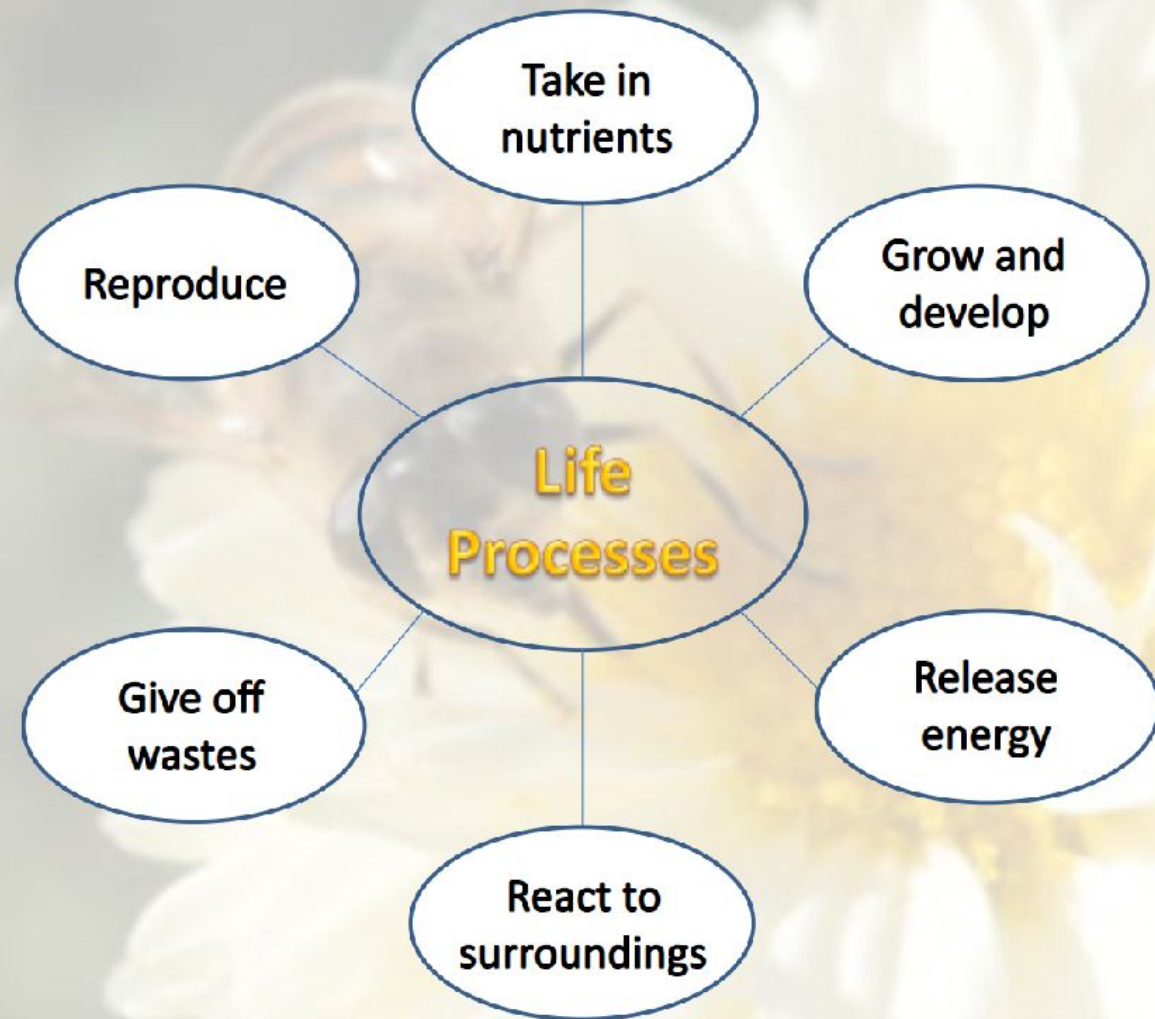
Header Cards

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.



How do
*Basic
Needs*
relate to
*Life
Processes*
listed here?

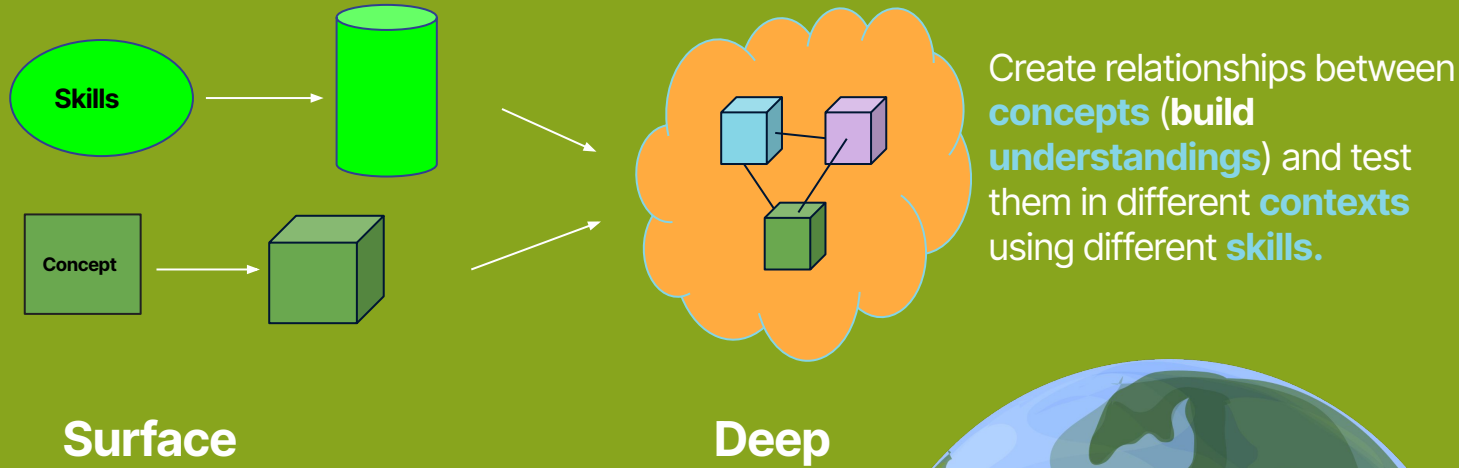


Understandings



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Deep Level Instructional Approaches & Activities



Understandings

5LS1.1: **Humans** are **complex organisms** with **biological systems** that carry out vital **biological processes**.

5LS1.2: **Plants** are **complex organisms** with **transport systems** that carry out **specific functions** for **survival**.

Understanding is “how facts and knowledge fit together in a logical and meaningful order.”



Deep Strategy

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.



**Skills &
Procedures**

Discussing

(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

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.



**Skills &
Procedures**

Representing

(Some) Representation Ideas

Concept Map	<u>Infographic</u>	<u>Mind Map</u>	Skit
Comic Strip	Podcast	Poem/Song	Dance
Diagram	Charts & Tables	Gif Animation	Model
Infomercial	Mash-Up	News Report	Puppet Show
Role Play	Board Game	Kahoot!	Diorama

5LS1.1: Understanding

Humans are complex **organisms** with **biological systems** that carry out vital **biological processes**.





Deep Strategy

Making Concept Maps

Concept maps are graphic organizers that connect concepts together with lines.

The concept map demonstrate a logical and meaningful relationship between those concepts.



Examples **Understanding**

5LS1.1:
Humans are complex organisms with biological systems that carry out vital biological processes.

Skills & Procedures (5LS1.1): Investigate the relationships between body systems that are involved in moving oxygen and nutrients throughout the human body.

Digestive System

Nutrients

Respiratory System

Oxygen

Circulatory System

Veins

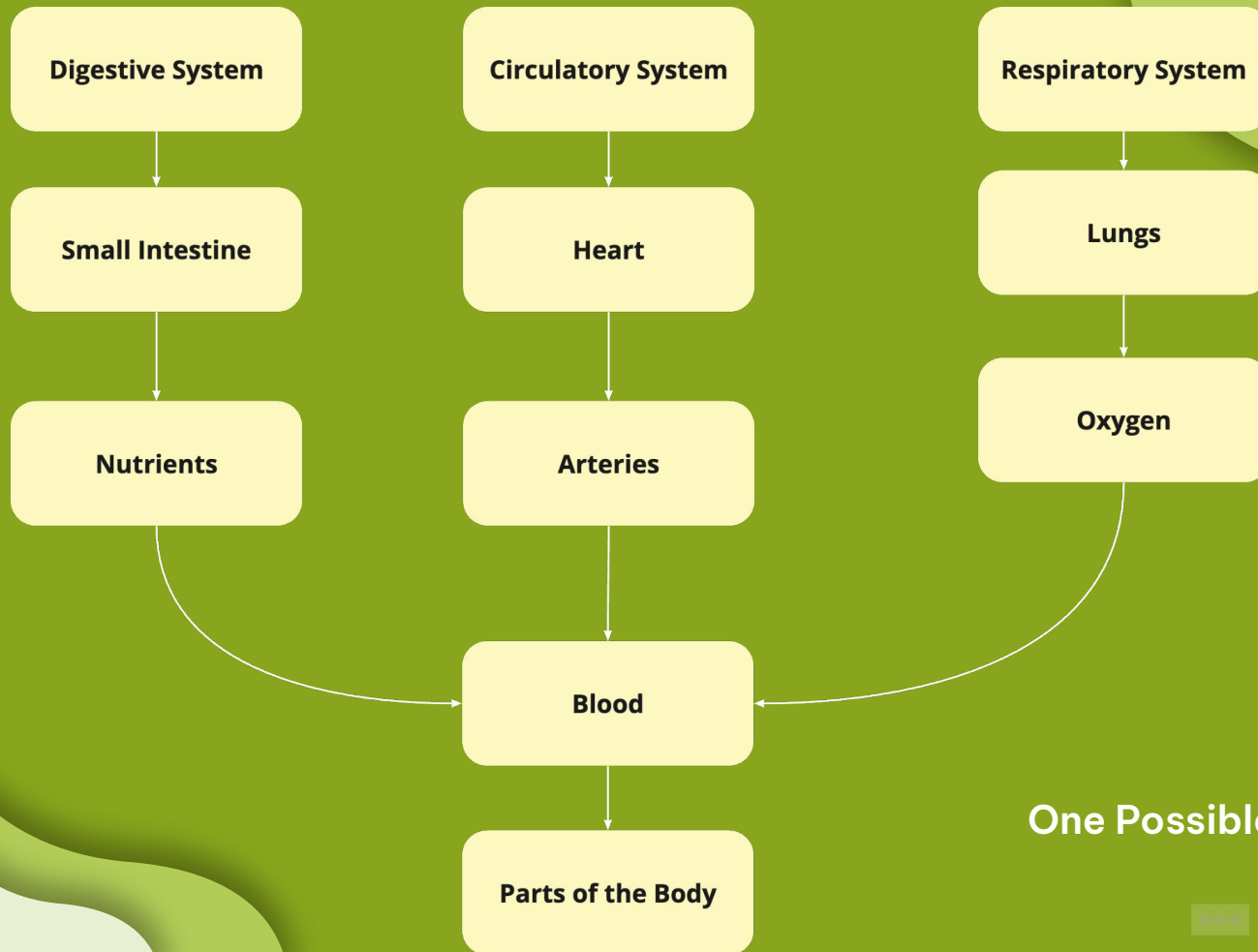
Small Intestine

Lungs

Heart

Blood

Body Parts

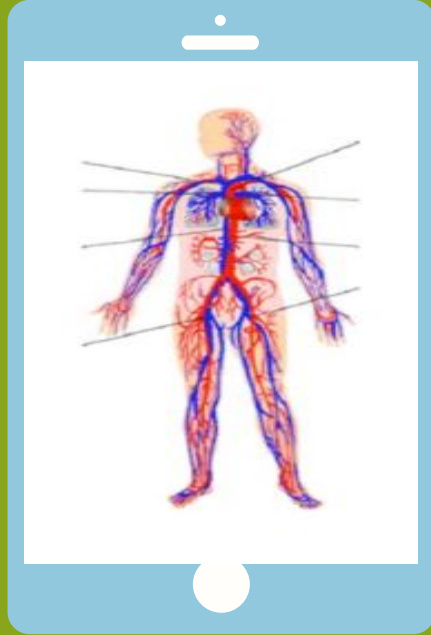


One Possible Arrangement



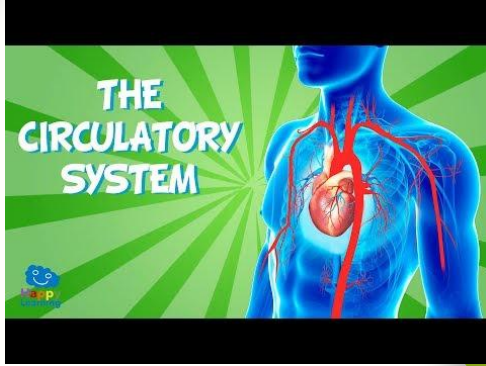
Circulatory System

Transports materials to and from cells.
Includes the heart, veins, arteries and
blood cells.



Circulatory System Resources

The Circulatory System for Kids



The Human Heart



The Human Heart for Kids



Heart rate with various exercises
Blood Pressure changes
The importance of water for your heart
(and digestive system)

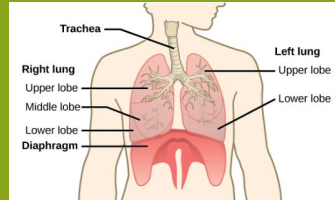
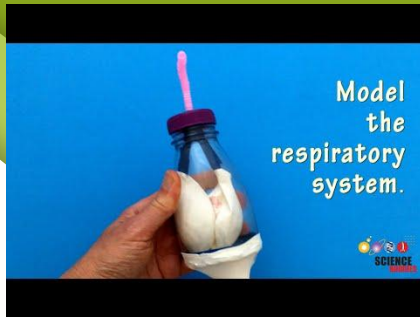
About the respiratory system

Trachea

The main function of the trachea is to funnel the inhaled air to the lungs and the exhaled air back out of the body.



Build a model set of lungs



Lungs



Diaphragm

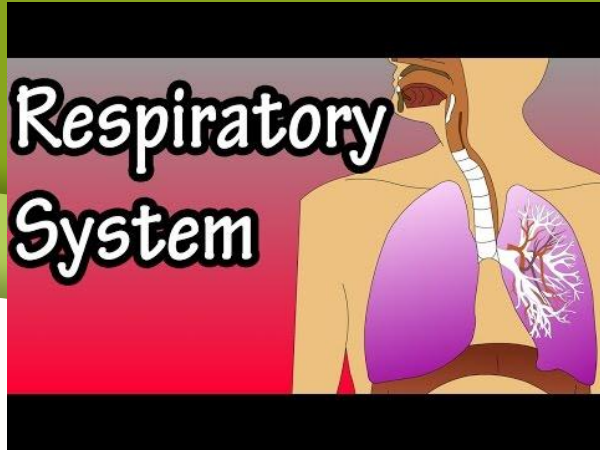
The muscular diaphragm, which facilitates breathing, is below the lungs and marks the end of the thoracic cavity.



Respiratory Resources

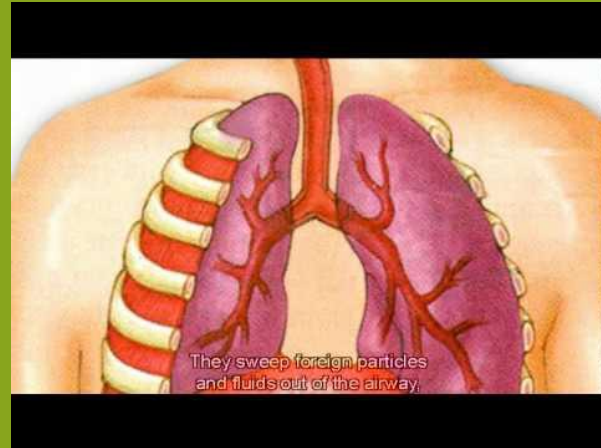
Concepts in Biology
11.3 Circulatory and Respiratory Systems
Open textbooks, BC

Respiratory System - How it Works



Lungs and the Respiratory
System (Kids Health)

Respiratory System



The Digestive system

Mouth

Is the start of the digestive tract.



Esophagus

Long tube carrying food from your mouth to your stomach.



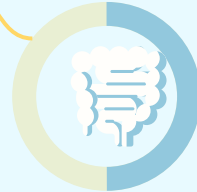
Liver and Pancreas

Pancreas releases enzymes and the liver releases bile to help break down food while moving through the small intestine.



Intestines

Small (absorbs nutrients) and large Intestine (absorbs water & left is waste).



Stomach

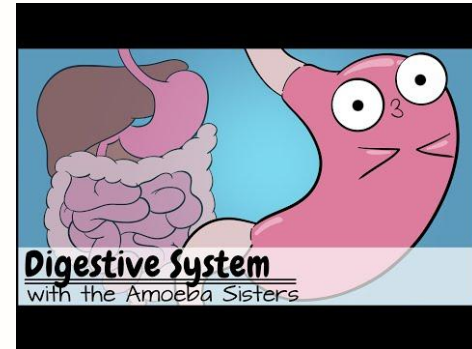
Holding place for food while it mixes with enzymes.



Digestive System Resources

Digestive System - Cleveland Clinic

This site covers the functions of the Digestive systems and each organ contained within.

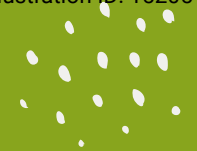


The Musculoskeletal System



Stock Illustration ID: 1520541518

Support and Movement



Resources for Musculoskeletal System

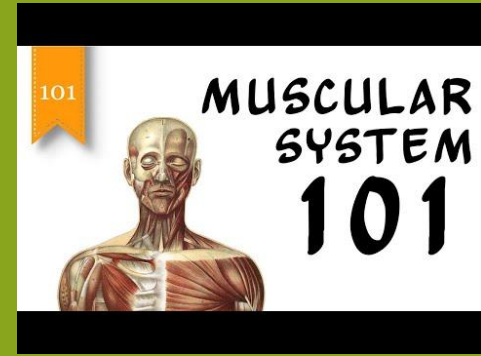
Facts about our skeletal system

How the Body Works for Kids and Teachers

Learn about bones video (animated)

Learn about muscles video (animated)

The Musculoskeletal System - great overview of how the two systems fit together



Muscular System 101

5LS1.2: Understanding

Plants are **complex organisms** with **transport systems** that carry out **specific functions** for **survival**.



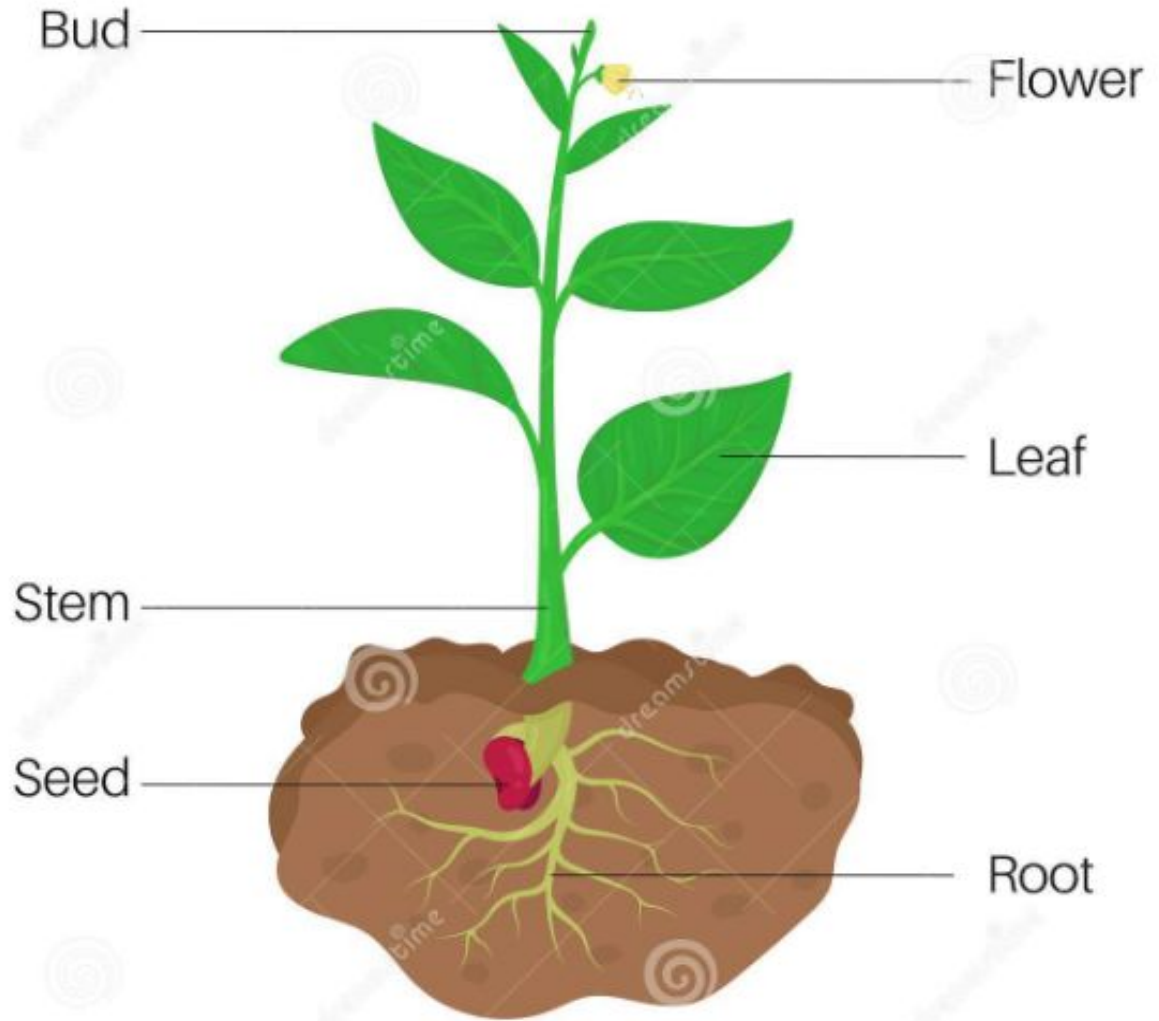
Identifying External Features and Functions can also help to **Classify** plants and animals



What makes up a plant?
(stop after general plant description)



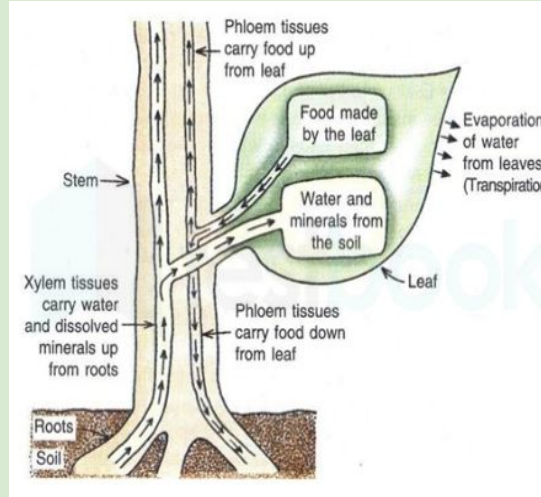
Parts of a plant and Its Function



A Plants Transport System

Water Transport in Plants – Xylem

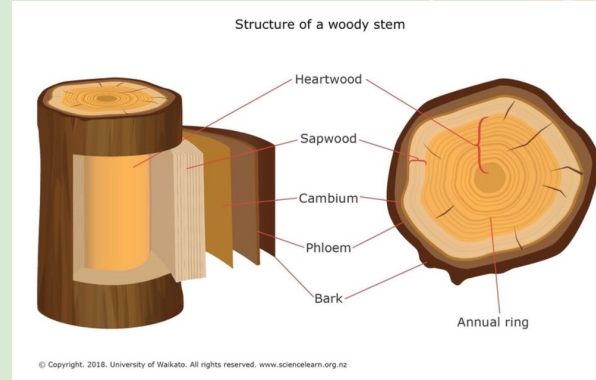
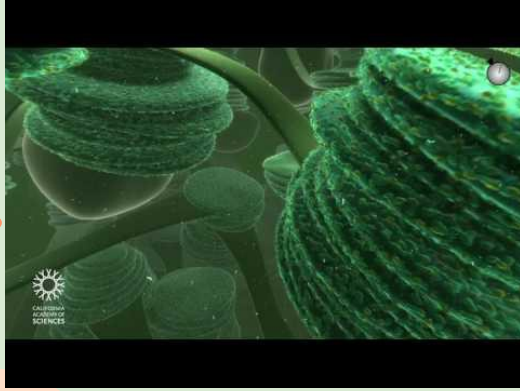
Lesson plan and activity to show water transport in plants.



Food Transport in Plants – Phloem

Source: Testbook Prep
<https://testbook.com/question-answer/the-xylem-in-plants-is-responsible-m--609bb7d43a436efa66b7779e>

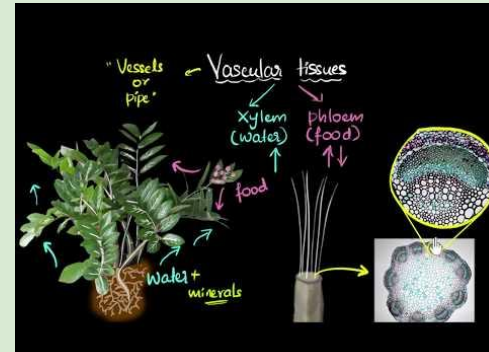
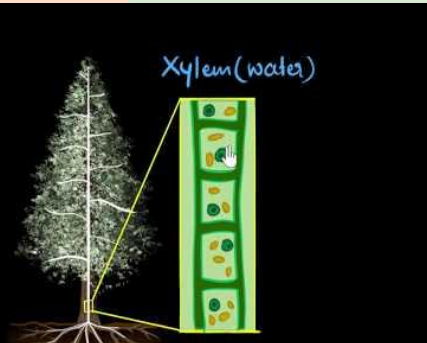
Travel Deep Inside a Leaf - Annotated Version | California Academy of Sciences



New Zealand site -
great resources,
free sign up

em & transpiration | Life processes | Biology |
n Academy

Intro to vascular tissues (xylem & phloem) | Life processes | Biology | K
Academy (includes evolution and growth)



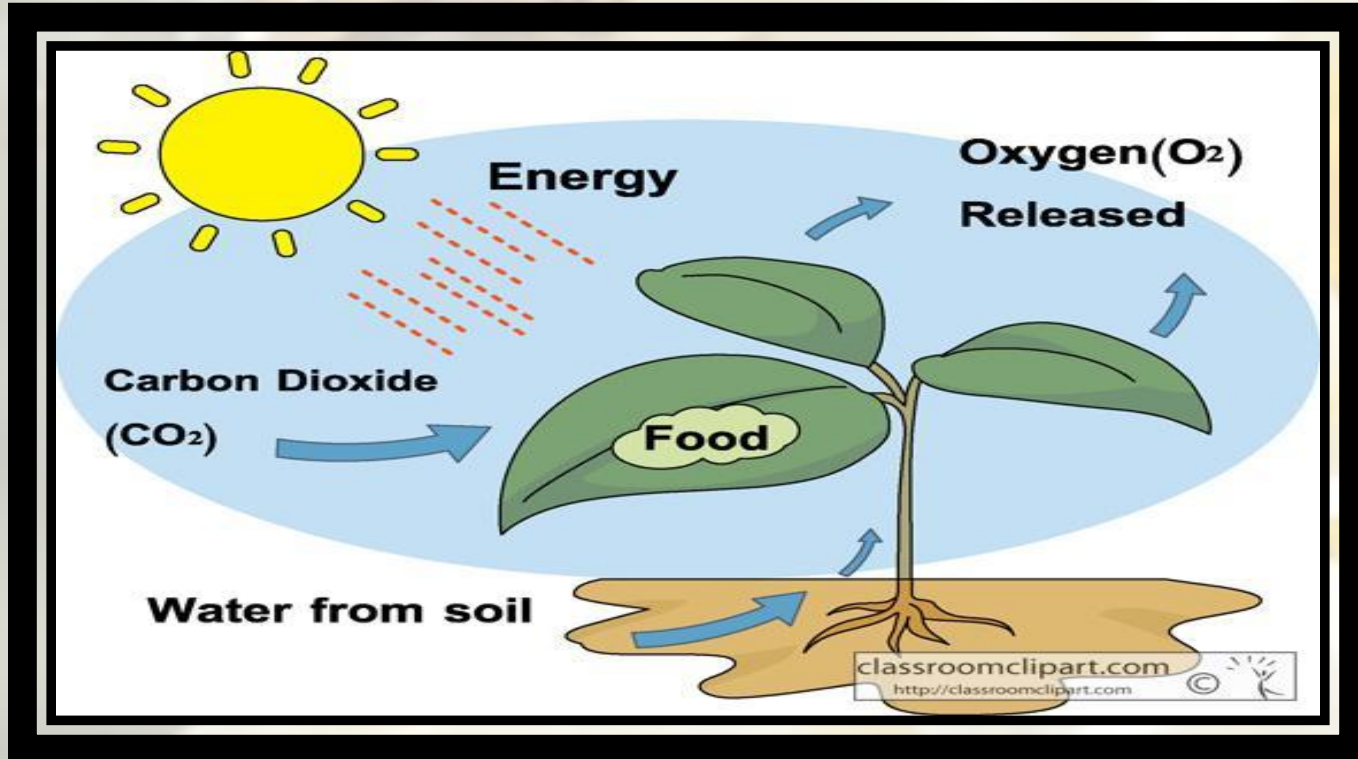
Leaf:

the part of a plant that uses sunlight and air to help the plant make food



photosynthesis:

the process plants use to make food



Root:

the part of a plant that takes in water (moisture) and nutrients from the ground

How could we ***Investigate*** this?



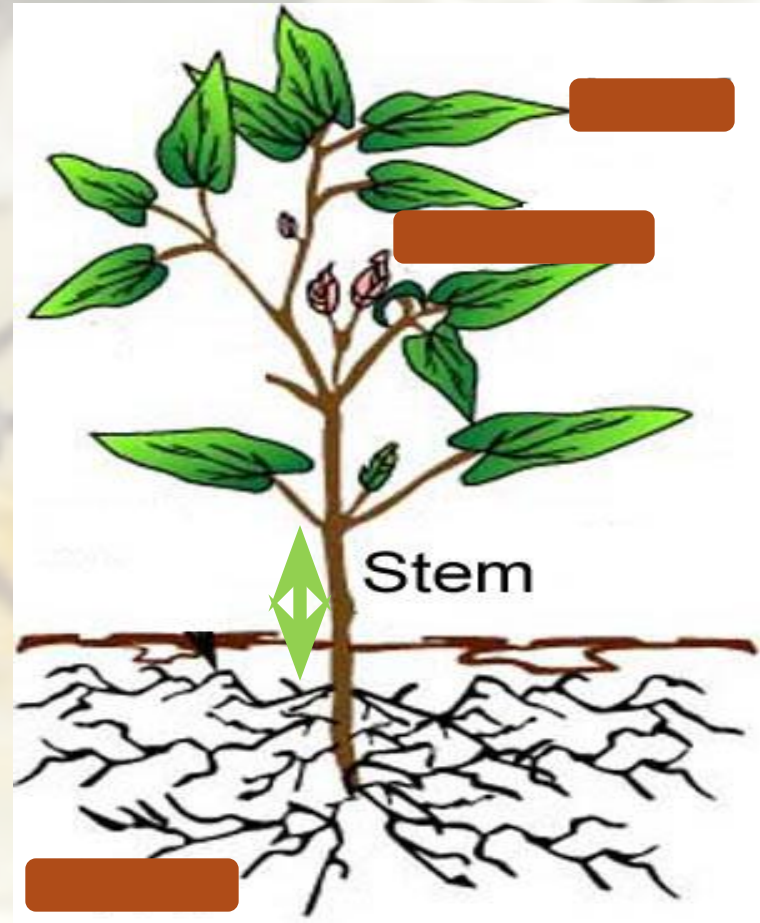


Seed:

An undeveloped plant sealed in a protective coating

Stem:

the part of the plant that carries food, water, and nutrients to and from the roots and leaves





Deep Strategy

Investigation

Investigations are useful strategies for developing understandings or deepening understanding.



Examples Understanding

4LS1.2:
Organisms sense
and respond to
their
environments to
support growth
and survival.

Example: Investigation to develop/deepen understanding

Skills & Procedures: 5LS1.1: Investigate the relationships between body systems that are involved in moving oxygen and nutrients throughout the human body.

Investigating Problem: How does exercise affect breathing and heart rates?

Sample Investigation

Procedures: https://tools.mheducation.ca/web_resources/sch/SL10_sample_unit1_topic1_4.pdf (Investigation 1C)

Likely Conclusion: Heart rate and breathing rates will increase with exposure to exercise and return to resting rates based on individual body response.

Link to Understanding: In what way did our investigation show that “body systems are involved in moving oxygen and nutrients throughout the human body?” 5LS1.1)

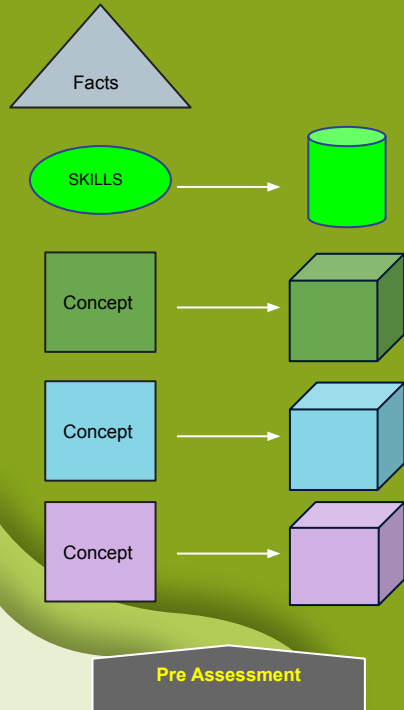
Assessment



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

Phases of Assessment

Surface



Deep



Transfer



Using Skills and Procedures as Assessments

Surface: Fact

Surface: Concept or Skill

Deep: Making Connections or Testing (Applying) Connections

5LS1.1: **Relate** vital biological processes to a human or other animal's internal biological systems.

5LS1.1: **Examine** the function of the human digestive, respiratory, circulatory, and musculoskeletal systems.

5LS1.1: **Identify** the digestive, respiratory, circulatory, and musculoskeletal systems of the human body and the major body parts of each system.

5LS1.1: **Investigate the relationships** between body systems that are involved in moving oxygen and nutrients throughout the human body.

5LS1.2: **Examine** the transport systems of plants and describe their functions.

Skills and procedures “are what students do to demonstrate knowledge and understanding.”

Possible Transfer

How would your digestive system be affected if your circulatory system failed?

Compare and contrast a frogs Biological Systems and Processes to a humans.

Possible sources:

Frog Dissection [Illustrations](#) (read Investigation 1D page 70)



PBS [Dissection 101](#) (Part 1) ([Part 2](#))

How does the body's "Fight or Flight" response demonstrate systems working together?

Compare how the three systems work together.

Summative/Transfer - compare another animal system to humans(organism other than a human)

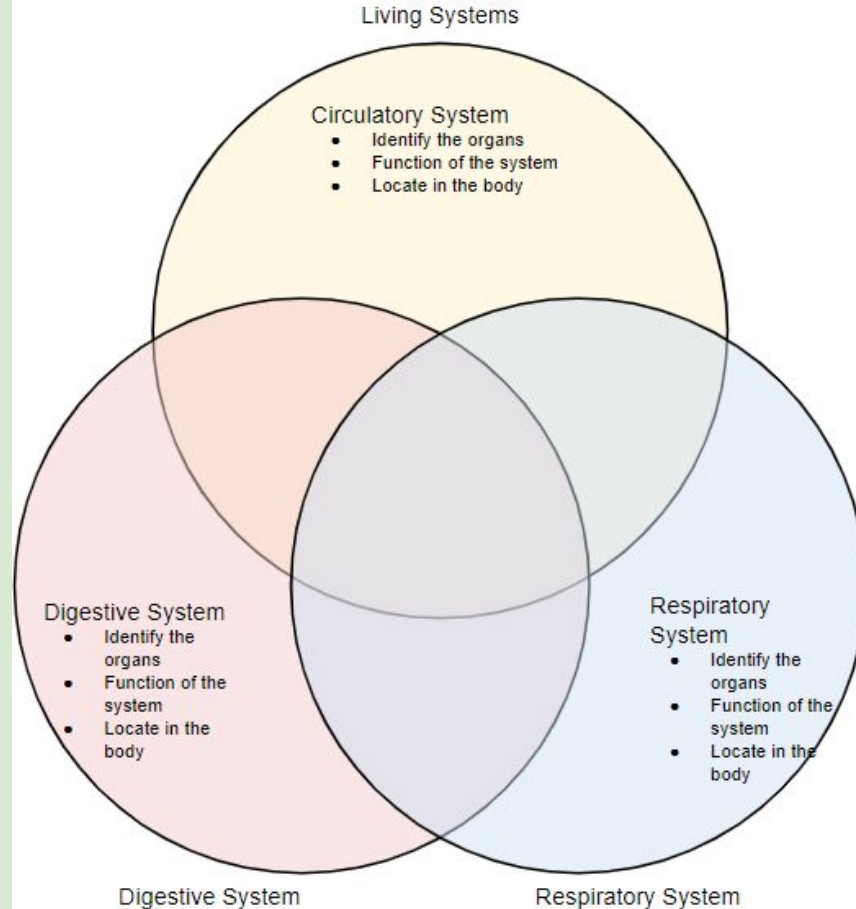
OR

Unique plant

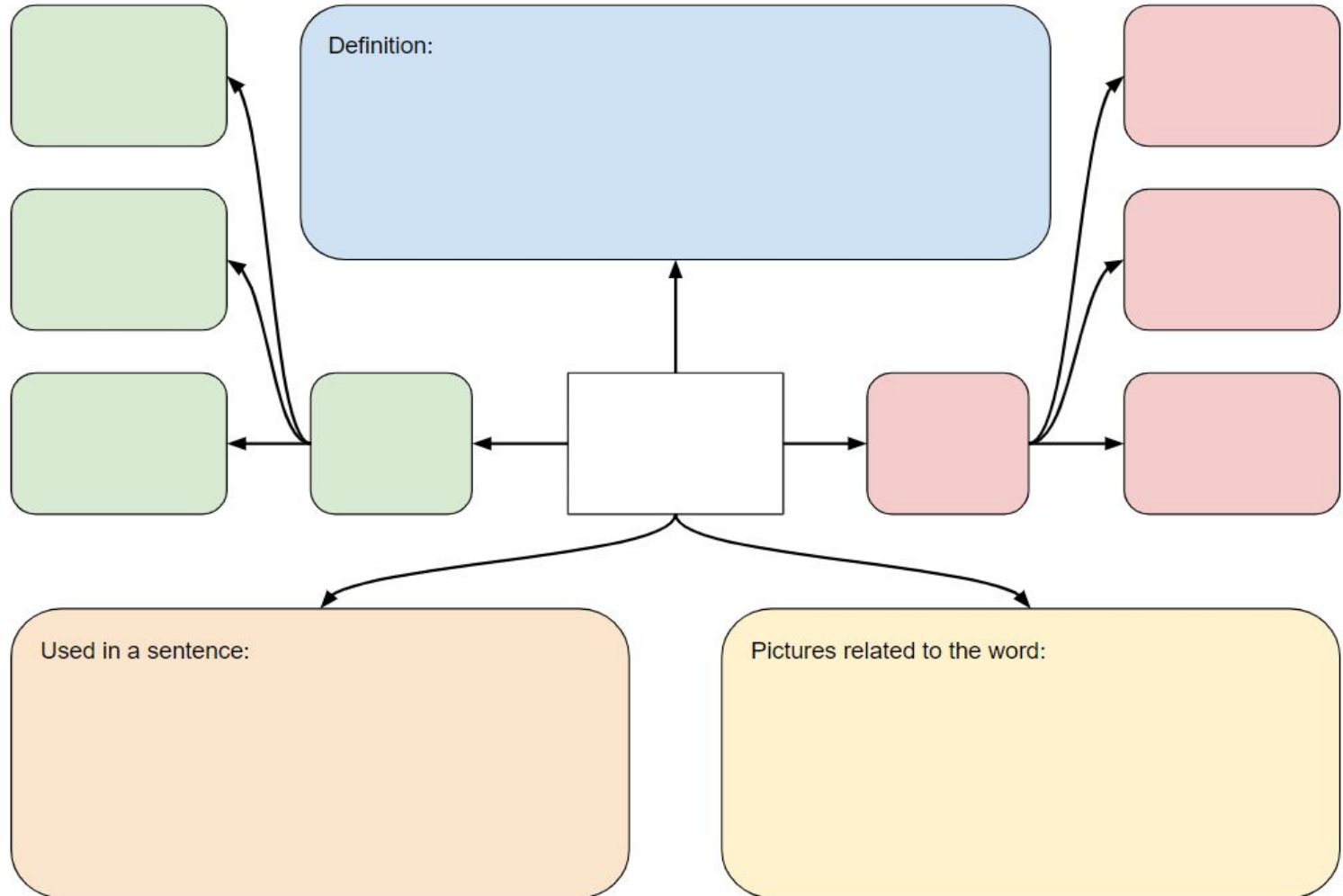
Discuss systems that work together to transport oxygen and nutrients to body parts.

[Science4Inquiry.com](https://www.science4inquiry.com)

How do systems work together?



Summing Up My Thinking



Sample: The Achievement Chart for Science and Technology, Grades 1–6

Knowledge and Understanding – Subject-specific content acquired in each grade (knowledge), and the comprehension of its meaning and significance (understanding)

Categories	Level 1	Level 2	Level 3	Level 4
	The student:			
Knowledge of content (e.g., facts, terminology, definitions)	demonstrates limited knowledge of content	demonstrates some knowledge of content.	demonstrates considerable knowledge of content	demonstrates thorough knowledge of content
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Thinking and Investigation – The use of critical and creative thinking skills and inquiry and problem-solving skills and/or processes

Categories	Level 1	Level 2	Level 3	Level 4
	The student:			

Integrating Scientific Methods



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

Integrating Computer Science





Topic 1.4

How do systems work together in the human body?

Key Concepts

- The respiratory system carries oxygen to and removes carbon dioxide from the blood.
- The circulatory system transports dissolved gases and nutrients through the body.
- The digestive system breaks down food, absorbs nutrients, and eliminates solid waste.
- Organ systems working together carry out important tasks in the body.

Key Skills

- Inquiry
- Literacy

Key Terms

gas exchange
alveoli
capillaries

In 2009, Canadian astronaut Robert Thirsk began a six-month stay on the International Space Station (ISS) orbiting around Earth. The astronauts on the ISS place their lives in the hands of the space station's advanced life support system. For the astronauts to survive in space, the temperature and pressure within the ISS must be maintained. An adequate supply of oxygen must be provided, and waste gases, such as carbon dioxide, must be removed. Solid waste must also be removed, but urine is recycled to provide the crew with clean water. All of these functions are achieved with the help of advanced technology systems.

All the systems on the ISS must work together to support life on board. The same is true inside your body. Like the life support system on the ISS, your organ systems must work together to keep you alive. For instance, your body needs systems that enable it to take in oxygen and remove carbon dioxide.



The 6 Major Body Systems

Generation Genius - a subscription site but much is available for free.

The Interconnected Systems of the Human Body. National geographic Society

This contains more systems than teh students need to study but it has great information and illustrations.

Sciences: Introduction to Body Systems

Genazzano FCJ College Library Services

Provides access to all systems along with diagrams as well as videos of individual systems.



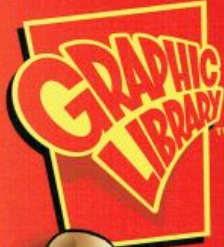
A JOURNEY THROUGH THE

DIGESTIVE SYSTEM

WITH **MaxArton**
SUPER SCIENTIST



by Emily Sohn
illustrated by Cynthia Martin and Barbara Schulz



Meet **MaxArton**, super scientist.

Using powers he acquired in a freak accident, Max teaches science in ways never before seen in a classroom. Whether shrinking to explore an atom or riding on a sound wave, Max does what it takes to make science super cool.

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- ✦ A Crash Course in FORCES and MOTION
- ✦ The Earth-Shaking Facts About EARTHQUAKES
- ✦ Exploring ECOSYSTEMS
- ✦ The Explosive World of VOLCANOES
- ✦ The Illuminating World of LIGHT
- ✦ Investigating the SCIENTIFIC METHOD
- ✦ A Journey Into ADAPTATION
- ✦ A Journey through the DIGESTIVE SYSTEM
- ✦ Lessons in SCIENCE SAFETY
- ✦ The Powerful World of ENERGY
- ✦ The Shocking World of ELECTRICITY
- ✦ The Solid Truth about STATES OF MATTER
- ✦ Understanding GLOBAL WARMING
- ✦ Understanding PHOTOSYNTHESIS
- ✦ Understanding VIRUSES
- ✦ The World of FOOD CHAINS

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Sparkle Box

Assemble a skeleton





**Additional
resources from
previous grades**



How do plants and animals sense and respond to stimuli in order to survive?

Review Senses in Kindergarten Matter to bridge.



Habitats of Our Alberta Plants and Animals

Alberta Prairies



Common species among the four Natural Subregions include: **Carnivores: Coyote, American badger, red fox, swift fox. Ungulates: Elk, pronghorns, mule deer and white-tailed deer.** Historically, bison roamed the Canadian prairies prior until they were hunted nearly to extinction in the 1870s and 1880s.

Mountains



Wildlife. Mammals: **Elk and bighorn sheep, mountain goats, grizzly bear, black bear, wolf, coyotes, pikas, marmots, Columbian ground squirrel.** Woodland caribou are only found in the northern parts of this natural region.

Forest



In Alberta, widespread mammal species in the boreal forest include the black bear, moose, deer, red squirrel, snowshoe hare, southern red-backed vole, shrew, chipmunk, deer mouse, and ermine. Less common species include the fisher, wolverine, river otter, Canada lynx, and gray wolf (NRC 2006).

Lakes and Rivers

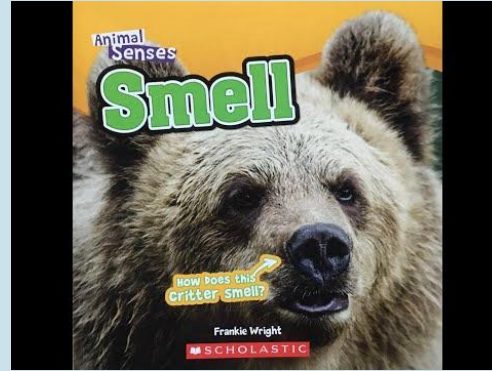


Let's play BINGO

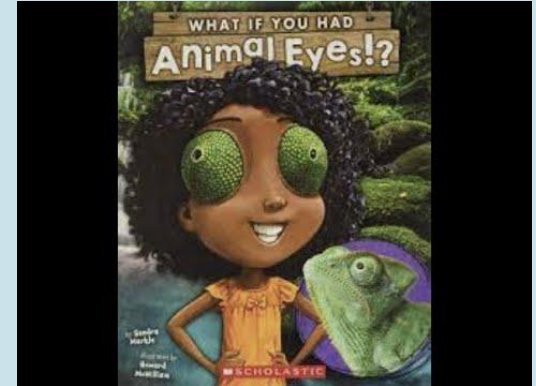
Anatomy of a Boreal Forest
Boreal Forest - Hinterlands

Animal Senses: Smell

Animal Senses
Visual Perception, Hearing,
Taste, Smell



What If You Had Animal Eyes!?
Audio Book



Case Study

Why Do Animals Have
Whiskers?



Plant Senses: Sight

Like us, plants see light.
Just as we have
photoreceptors in our
eyes, plants have their
own throughout their
stems and leaves

Plant Senses: Touch:

Branches sway in the wind,
insects crawl across
leaves, vines search out
supports to cling to: plants
live in a very tactile world

Plant Senses: Taste:

A plant's taste is as
interconnected with smell as it
is in humans – but they use it
to sense danger and drought
and even to recognise
relatives



Animal Adaptations: Scent Behavior and Communication – Scent Behaviour

Amazing Animals Senses

Do plants have senses?

New research on plant intelligence may forever change how you think about plants

How plants see the world.





What do you wonder about this picture?

Why Should I Protect Nature? by Jen Green

Resources



[Link](#)

Pgs.
53-90



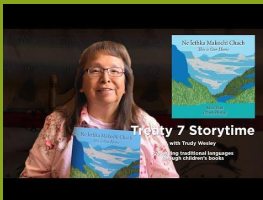
Carrie-Anne Reads
Lessons from Mother Earth
by Local Author Elaine McLeod

Cultural values and beliefs influence how we relate to the land, plants and animals.

Carrie-Anne Reads
Lessons from Mother Earth
by Local Author Elaine McLeod



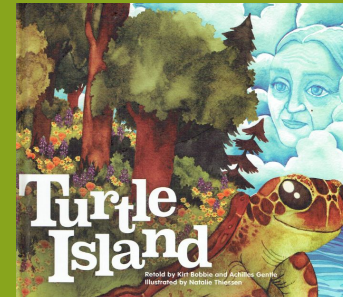
Treaty 7 Storytime | Trudy Wesley: “Ne Îethka Makochî Chach” | Calgary Public Library



Learning from the Land



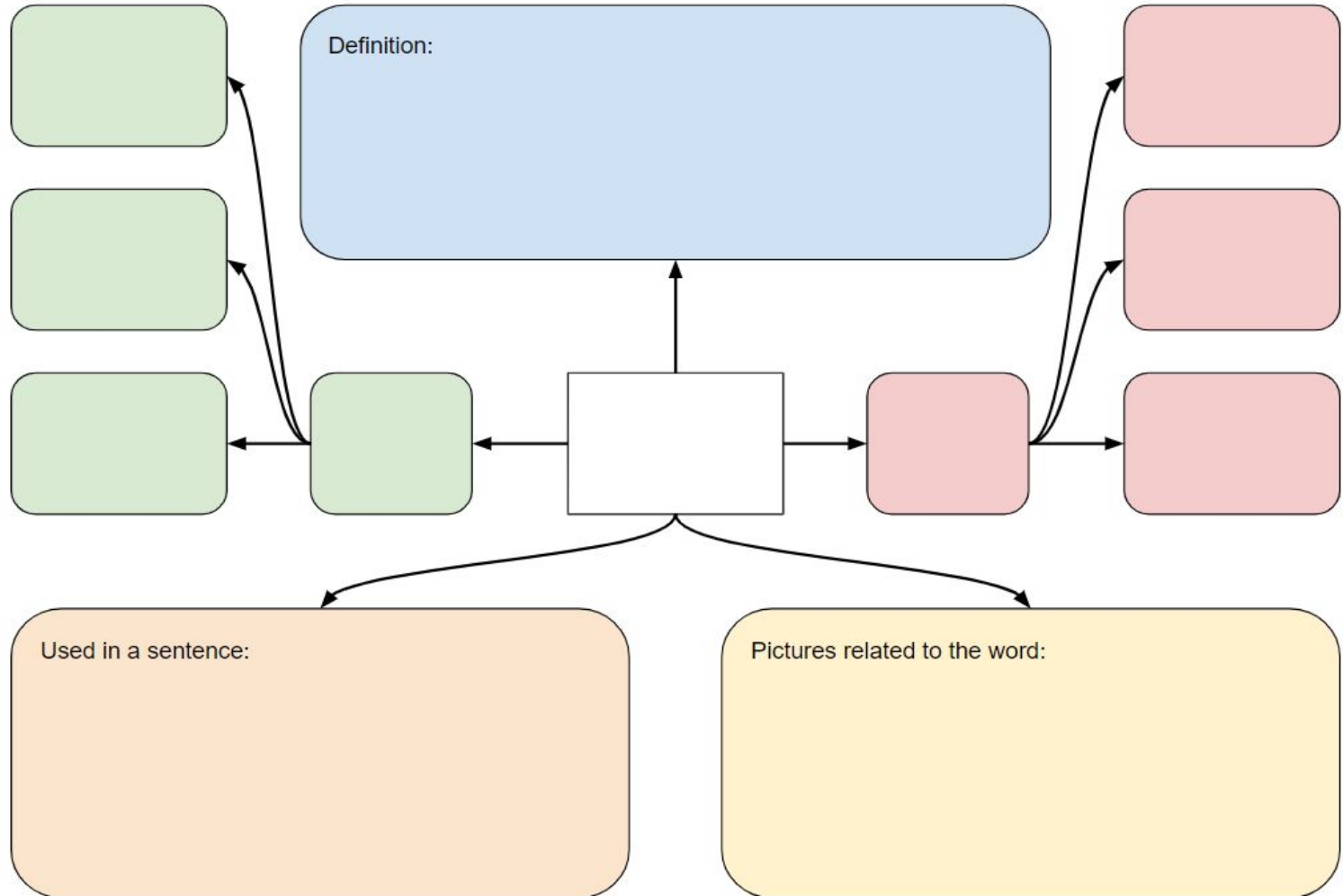
Turtle Island



Aski and Turtle Island - Book For Kids Read Aloud



Summing Up My Thinking





Sacred Relationship Short



Connecting to the Spirit of Mother Earth



Creation Story 🌍 (The MOTHER Earth
Creation Story - Indigenous Teaching)

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Categories	Level 1	Level 2	Level 3	Level 4
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	The student:			

Sources

"How do systems work together in the human body?". Tools for McGrawHill Education resource sample. McGraw Hill Publishing

https://tools.mheducation.ca/web_resources/sch/SL10_sample_unit1_topic1_4.pdf

Thanks!

Do you have any questions?

Chris Zarski (czarski@carc.ab.ca)

Ted Zarowny (ted.zarowny@erlc.ca)

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