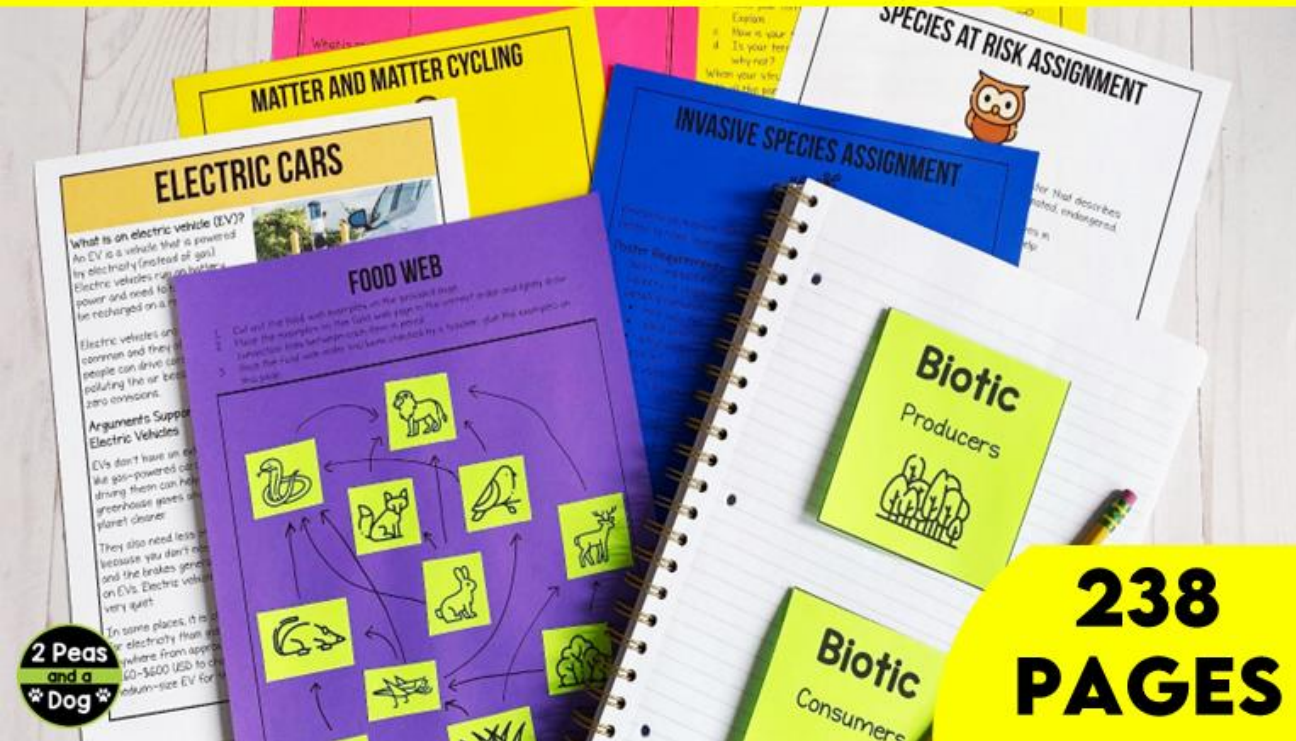


INTERACTIONS IN THE ENVIRONMENT

PDF & DIGITAL FORMATS




2 Peas and a Dog
Middle School Teaching Resources

RESOURCE INCLUDES

- ✓ Ontario Curriculum Aligned
- ✓ Detailed Lesson Plans
- ✓ Readings, Videos, Graphic Organizers, Group Work, Projects, Rubrics
- ✓ Hands-On Science Labs
- ✓ MP3 Audio Files
- ✓ Answer Keys
- ✓ Quizzes & Unit Test
- ✓ Print & Digital Formats

INCLUDED LESSONS



- Introduction - Science Safety & Unit Vocabulary
- Elements of Ecosystems
- Ecosystems - Examples and Interactions
- Energy Transfer and Food Chains
- Biotic Elements Quiz
- Matter Cycling
- Ecological Succession
- Case Study - Ecosystem Limits
- Species at Risk & Invasive Species
- Human Interactions in the Environment
- Agriculture and Ecosystems
- Indigenous Perspectives
- Case Study - Electric Vehicles
- Environmental Protection
- Ecosystem Summative (3 Options)
- Ecosystems Unit Test
- Bonus Files - Bill Nye Ecosystems Videos

UNIT ORGANIZATION

GRADE 7 ECOSYSTEMS ONTARIO CURRICULUM ALIGNMENT

Lesson	2007 Curriculum	2022 Curriculum
1. Safety Rules & Vocabulary	2.1, 2.4	A1.4, A1.5
2. Elements of Ecosystems	3.1, 3.2, 3.3	B2.1, B2.2, B2.3
3. Ecosystems Examples	3.1, 3.2, 3.3	B2.1, B2.2, B2.3
4. Energy Transfer and Food Chains	3.4	B2.4
5. Quiz	3.1 - 3.4	B2.1 - B2.4
6. Matter Cycling	3.5	B2.5
7. Ecological Succession	3.6	B2.6
8. Ecosystem Limits	3.7	B2.7
9. Species at Risk & Invasive Species	2.3	A1.1
10A. Human Interactions in the Environment	3.8	B1.2
10B. Agriculture and Ecosystems	New	B2.8
11. Indigenous Perspectives	3.9	B1.3
12. Environmental Investigation	1.1	B1.1

**CURRICULUM
ALIGNMENT**

LESSON OVERVIEW



Lesson	Activity Type	Name	Suggested
Intro & #1	Class Discussion	Unit Vocabulary	1 - 2 Classes
	QR Code Scavenger Hunt		
#2	Whole Class Readings & Videos Cut and Match	Elements of Ecosystems	1 - 2 Classes
#3	Whole Class Readings & Videos Cut and Match	Ecosystems - Examples and Interactions	1 - 2 Classes
#4	Whole Class Readings & Videos Cut and Match	Energy Transfer and Food Chains	1 - 2 Classes
#5	Quiz	Biotic Elements Quiz	0.5 Class
#6	Whole Class Readings & Videos Cut and Match	Matter Cycling	1 - 2 Classes
#7	Whole Class Readings & Videos T-Chart	Ecological Succession	1 - 2 Classes
#8	Videos & Case Study	Ecosystem Limits	1 Class

UNIT PLAN

LESSON #1



Unit Vocabulary

Lesson Overview:

Students will work on reviewing the vocabulary for this unit.

Materials Needed: Photocopy a class set or use the provided Google Slides version of the:

- Vocabulary sheets (QR Code or Non-QR Code option)
- Vocabulary graphic organizer
- Definitions (for IEP and ESL students)
- [Definitions Google Slides](#)

Teacher Instructions:

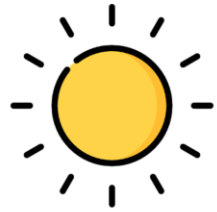
1. Hang the vocabulary words up around the classroom using the QR code or non-QR code format.
2. Divide the class up into groups of 4.
3. Have students walk around the classroom or hallway and find the vocabulary sheets. Students need to scan the QR code to uncover the mystery word. Once they have uncovered the mystery word, have them write it on the vocabulary graphic organizer sheet.
4. This activity can be done digitally by making a copy of the Google Slides version for each group.
5. Once the definition is found, students write the definition on the sheet.

**LESSON
PLANS**

WHAT'S INSIDE?



ABIOTIC VS. BIOTIC ELEMENTS



Abiotic Elements

Abiotic elements (also called abiotic factors) are non-living parts of an ecosystem. These non-living parts are essential to living elements. These include water, air, soil, rocks, nutrients, sunlight, temperature, weather, and others. The term contains two root parts, "A" which means without, and "Bio" meaning life. Living things need abiotic elements to live, grow, and reproduce.

Examples of abiotic elements include temperature, humidity, soil composition, radiation, and pollution. These abiotic elements will affect how living organisms live, eat, reproduce, and develop.

ARTICLES

Biotic Elements

Biotic elements (also called biotic factors) are living elements of an ecosystem. Examples of biotic elements are plants, bacteria, trees, insects, fishes, and animals. Biotic organisms need water, oxygen, food, energy, and a place to live.

Living things adapt to their environment. Animals that live in cold climates have longer fur than animals that live in warmer climates. A longer coat protects these animals from the cold.

SCIENCE VOCABULARY WORD #1

Using a phone or a tablet scan the QR code below the hidden word.



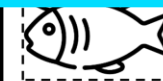
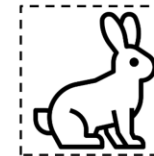
ENGAGING ACTIVITIES

ABIOTIC VS. BIOTIC SORT AND MATCH

Cut out the titles and images below. Match the correct title with all the images that relate. Once checked by your teacher, glue the pieces on to the back of the Abiotic vs Biotic Elements reading.

Biotic Elements

Abiotic Elements



WHAT'S INSIDE?



ECOSYSTEM EXAMPLES ANSWERS



Pond water has living elements, such as fishes and plants, and non-living parts, such as air, sunlight, and water. Fish need air and carbon dioxide from the water.



The rain forest has many plants and animals. The trees provide food for animals and their waste helps provide nutrients to the soil. (The trees also produce fruit.)

BIOTIC AND ABIOTIC

ANSWER KEYS

Biotic

The interactions between the living parts of an ecosystem are called biotic interactions. One of the interactions is the predator-prey relationship. Food and energy is created by the plants and animals. When the animals or insects die, decomposers break them down and returned to the soil. The soil then provides nutrients to the plants.

Interactions Between Biotic and Non-Biotic Components

Biotic elements interact with living parts of an ecosystem. Abiotic elements, such as water, sun, and oxygen, provide nutrients from the soil and sunlight to produce food created by plants.

© http://

CARNIVORE, HERBIVORE OR OMNIVORE?

ANSWER KEY

CARNIVORE	HERBIVORE	OMNIVORE
LION	DEER	BEAR
POLAR BEAR	RABBIT	RACCOON
SNAKE	ELEPHANT	HUMAN
		DOG
		BIRD

© http://www.2peasandadog.com

OWL PELLET LAB



After you have dissected the owl pellet and completed the lab observation chart, it is time to work on the lab report.

Lab Report Requirements

CASE STUDY: URBAN COYOTES

Watch the video: "The Rise of the Urban Coyote". As you watch the video, write down any new information you learn about coyotes.



Write down any new information you learn about coyotes.

LABS & CASE STUDIES

What questions do you still have about this animal?

© http://www.2peasandadog.com

and Notes
 Why did they encounter?
 any surprises?
 recommend this lab to future students?

Level 2	Level 3	Level 4
Student had some of the materials required for the dissection lab.	Student had the required materials for the dissection lab. Student participated in the lab, and took on an active role.	Student had the required materials for the dissection lab. Student took on a leadership position during the lab.
Lab report is missing key elements. Some elements are complete.	Lab report is complete. Some elements could use more detail.	Lab report is well-written and organized. Attention to detail is demonstrated.

http://www.2peasandadog.com

TEACHER FEEDBACK

“This is a fantastic resource! It was an incredible time saver as I was new to teaching intermediate and was a bit overwhelmed with where to start. This resource was very well laid out, clearly followed the curriculum, and included detailed and clear lesson outlines, relevant activities and experiments, and quizzes to check for understanding. It was also very helpful to have the digital and print options for hybrid teaching.” – Val C.

INTRODUCTION & LESSON 1

SCIENCE SAFETY RULES

- 1. LISTEN**
 - ✓ To ALL the teacher's instructions
 - ✓ Know the location of safety equipment
- 2. ATTIRE**
 - ✓ Wear safety goggles
 - ✓ Tie-up any loose items
 - ✓ Wear closed toe, cover-toe shoes
- 3. READ CAREFULLY**
 - ✓ Any labels of chemicals
 - ✓ The procedure
- 4. TOOLS**
 - ✓ Handle a tool properly
 - ✓ Inform the teacher if there is a spill
 - ✓ Do not taste test anything
- 5. CLEAN-UP**
 - ✓ Thoroughly wash all up
 - ✓ Wash hands with soap

SAFETY RULES QUIZ

Complete the following true/false questions on safety:

1. When you clean-up, wash your hands with water.	T	F
2. Before you begin, you must listen to ALL the teacher's instructions.	T	F
3. Remember to tie-up any loose items (e.g. hair, clothing, jewellery, etc.).	T	F
4. Feel free to taste test items in the Science room	T	F
5. Knowing where the safety eyewash station is located	T	F
6. wear open toe shoes, and use gloves/goggles as needed.	T	F
9. Read labels on chemicals used carefully (e.g., WHMIS symbols)	T	F
10. Do not tell the teacher if there is a spill or if an item is broken/faulty.	T	F


© <http://www.2peasandadog.com>


SCIENCE SAFETY

Biotic	Living elements found in an ecosystem. Example: humans, plants, animals, bacteria, etc.
Abiotic	Non-living elements found in an ecosystem. Example: water, air, sun, soil, wind, etc.

SCIENCE VOCABULARY WORD #1

Using a phone or a tablet scan the QR code below to find the hidden word.





© <http://www.2peasandadog.com>

UNIT VOCABULARY

...s within the same species ecosystem.

...ations co-exist with one stem.

...c and abiotic elements that er to survive.

...that has similar climate, soil, together.

...sphere's conditions (e.g., etc.)

...ic area

...air co-

...the Earth.

...th that consists of three e, and core.

...earth that includes all oceans,

...to live in an ecosystem.

...nutrients and oxygen to an e sun's energy.

...sume biotic elements.

...only plants.

...other consumers.

...both plants and other

LESSON 2 & 3



WHAT IS AN ECOSYSTEM?



Fold flap and glue onto paper

Abiotic

Non-Living



Fold flap and glue onto paper

Biotic

Producers



example under each tab.

and glue onto paper

Biotic

Consumers



Biotic

Decomposers



What is an ecosystem?

An ecosystem is a small or large area where different things interact. It's a community of animals, plants, and their surroundings. A water pond with fishes, frogs, and plants can be as complex as an entire rain forest. Animals, sunlight, and land features are all part of an ecosystem.

What are the parts of an ecosystem?

The ecosystem has different parts (the abiotic components) and different types of organisms (the biotic components), including producers, consumers, and decomposers.

What is an ecosystem?

What are the two essential parts of an ecosystem?

ECOSYSTEM EXAMPLES



EXAMPLES AND INTERACTIONS



Sketch and briefly explain the ecosystem examples below.

Pond Water

Rain Forest



Rain Forest

A rain forest is an example of an ecosystem. The trees produce oxygen and provide food for animals. The animals eat the food and their waste goes back into the soil, which the trees use to grow fruit.)

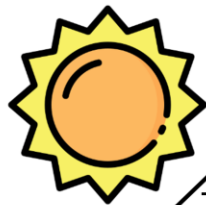
es, the and will animals rest essential for

ECOSYSTEMS – EXAMPLES AND INTERACTIONS

LESSON 4 & 5












ENERGY TRANSFER IN AN ECOSYSTEM



Trophic Level
Apex 5

CARNIVORE, HERBIVORE OR OMNIVORE?

1. Colour all carnivores with a red pencil crayon.
2. Colour all herbivores with a green pencil crayon.
3. Colour all omnivores with a purple pencil crayon.

DOG	ELEPHANT	HUMAN	POLAR BEAR
			
			DEER
			
BEAR	SNAKE	RABBIT	BIRD
			

© <http://www.2peasandadog.com>

The Energy Pyramid shows the flow of energy in an ecosystem. An energy pyramid is a representation of the levels above the ground. The steps of energy in one of the food chains is about 10% of the energy to the loss of energy. only a maximum of 4 trophic levels break down all the waste material. A food chain breaks when one of the links is missing. When this happens, other things disappear. Alternatively, if there is an overabundance of the links, it can lead to an overabundance of the food chain. Many items in the food chain are affected but if seals do not have enough energy, they are affected.

© ht

ENERGY TRANSFER AND FOOD CHAINS

BIOTIC CLASSIFICATION QUIZ /10

Name: _____

Place the following animals in the correct space on the chart.

- BACTERIA
- DOG
- CROW
- ELEPHANT
- APPLE TREE

- GRASS
- LION
- HUMAN
- RACCOON
- GIRAFFE

CARNIVORE

HERBIVORE

OMNIVORE

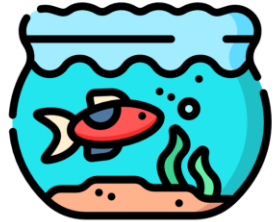
BIOTIC ELEMENTS QUIZ

LESSON 8 & 9



ECOSYSTEM LIMITS

All ecosystems have a maximum number of a species that can exist, also called **carrying capacity**. This is due to **limiting factors**, such as available sunlight, climate, temperature, mates. If these essential elements decline and die off.



Watch the video "Carrying Capacity" and explain what happens when there are too many fish in a bowl.

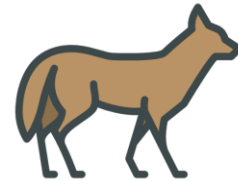


Watch the video "Limiting Factors in an Ecosystem." Then explain what the limiting factors are in the fish bowl?

CASE STUDY ECOSYSTEM LIMITS

CASE STUDY: URBAN COYOTES

Watch the video: "The Rise of the Urban Coyote". As you watch the video, write down any new information you learn about coyotes.



What questions do you still have about this animal?

INVASIVE SPECIES

Invasive species are living things that are introduced (either accidentally or on purpose) to a new area. These new to the area species invade local ecosystems by taking over.

In North America by settlers as they brought new organisms with them in their gardens from other countries. When the weeds got to North America, they became a strangling vine, garlic mustard, zebra mussels and sea



SPECIES AT RISK ASSIGNMENT

Research a species that is at risk and create poster that describes:

1. The designation of the species (extinct, extirpated, endangered, threatened, or special concern)
2. The ecosystem that it used to or currently lives in.
3. Why it is at risk, and explain how people can help.

Requirements:

- Picture (hand-drawn or printed)
- Source list of books used
- Poster is on a separate sheet of paper

SPECIES AT RISK & INVASIVE SPECIES

Criteria	Not coloured, difficult to read.	Partly coloured, some areas difficult to read.	Attractive, mostly coloured, easy to read most parts.	Very attractive and colourful, easy to read.
Research Information				
Picture				
Overall Appearance				
Sources	No sources provided.	Some sources provided.	Most sources provided.	All sources provided.

RISK

(extinct, threatened, endangered, or special concern) will live. Some species are at risk of extinction or extirpation. Some are endangered. Some have characteristics, which make them...

LESSON 10A & 10B



HUMAN INTERACTIONS IN THE ENVIRONMENT

ECOLOGICAL FOOTPRINT ACTIVITY



1. Go to the website: <https://www.footprintcalculator.org/>

Answer

How many
colour in
ent habits.

HUMAN INTERACTIONS IN THE ENVIRONMENT



LESSON #10B



FARMING COMPARISON ACTIVITY



systems

practices to agriculture can

Monocul

AGRICULTURE IN ECOSYSTEMS

Organic

Traditional

Google Slides of:
sheet

(or watch them together as a

systems

to conventional?
[ng - Ecology and Environment -](#)

ts complete the Venn

ple answers and have a class

LESSON 15 & BONUS FILES

UNIT TEST

/20

Name: _____ Class: _____

What is an ecosystem? (2 marks)

UNIT TEST

Name: _____ Class: _____

Why are coyotes thriving in urban settings? Explain what you learned about urban coyotes. (5 marks)

What are the differences between

Select 2 of the following parts of an ecosystem: primary consumers, tertiary consumers, secondary consumers, producers, and decomposers.

ECOSYSTEMS UNIT TEST

BILL NYE: BIODIVERSITY

List at least three ecosystems that are mentioned in the video.

BILL NYE: FORESTS

Statement	True or False
½ of the land on Earth is covered with forests.	
Basement of the forest is called the subfloor.	
The rooftop of the forest is called the canopy.	
The Red Wood tree in the forest is 10,000 years old.	
The forest is made up of four levels (subfloor, floor, understory, and canopy).	
Decomposers live in the canopy of a forest.	
Red Wood trees are the oldest trees in the world.	
Forests supply plastics to make things with.	
Deciduous trees do not lose their leaves in the winter.	
Forests get their energy from the sun.	

ECOSYSTEMS VIDEOS

when describing

this video.

what you are currently doing (or

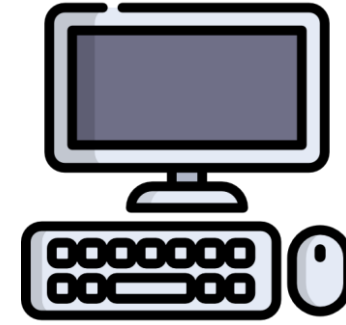
g.com

LESSON FORMATS



PDF

✓ Individual & Whole Unit



DIGITAL

✓ Google Slides

RESOURCE CAN BE USED IN-PERSON OR ONLINE