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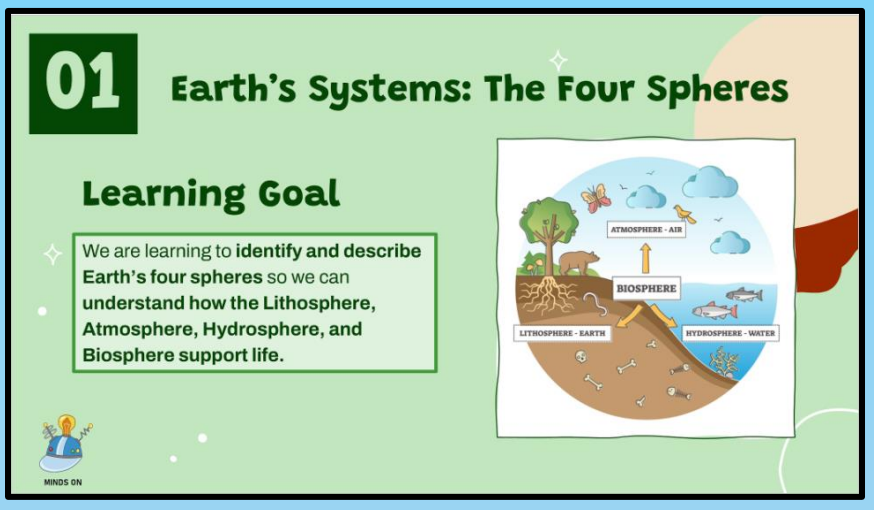
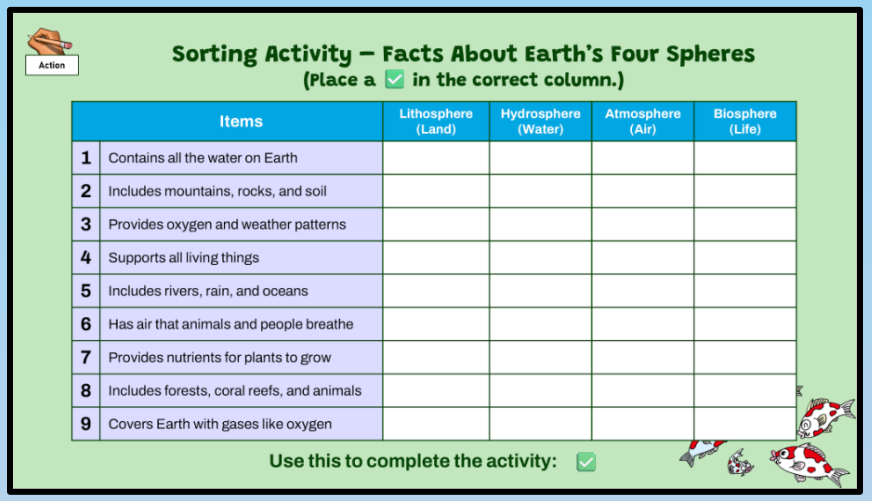
Google Slides Lessons Preview

Alberta Science Curriculum
Earth Systems – Grade 4

3-Part Lesson Format

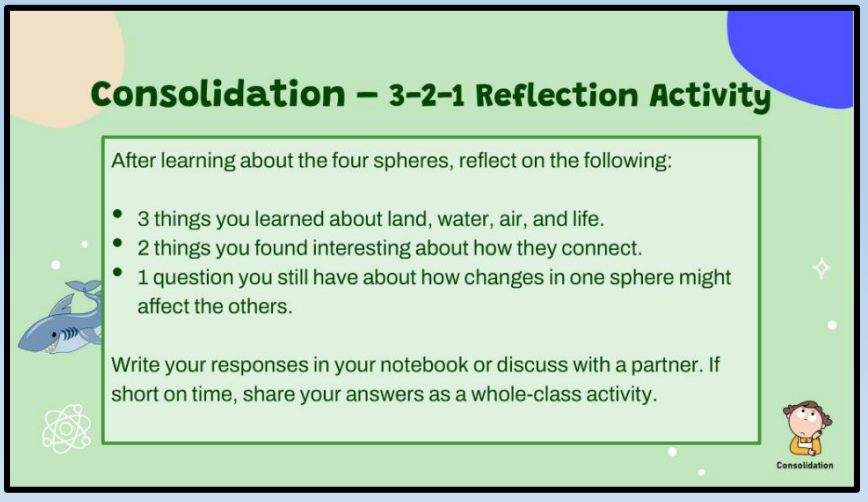
Part 1 – Minds On!
- Learning Goals
- Discussion Questions
- Quotes
- And More!



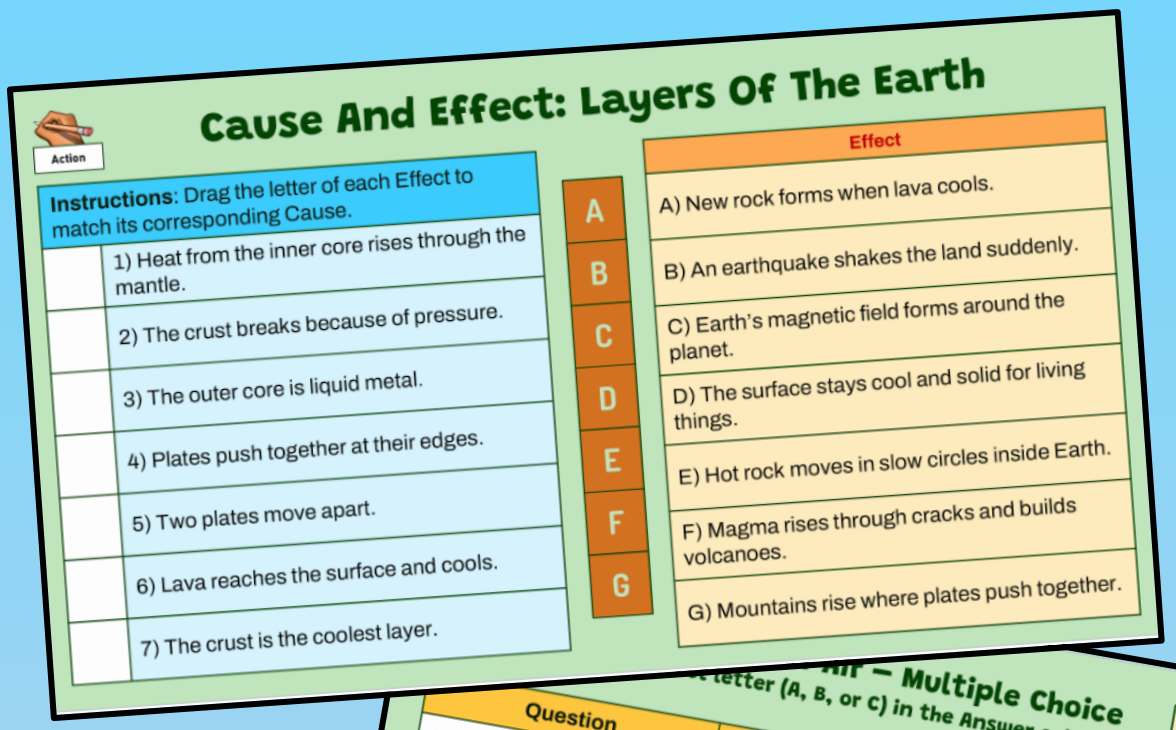


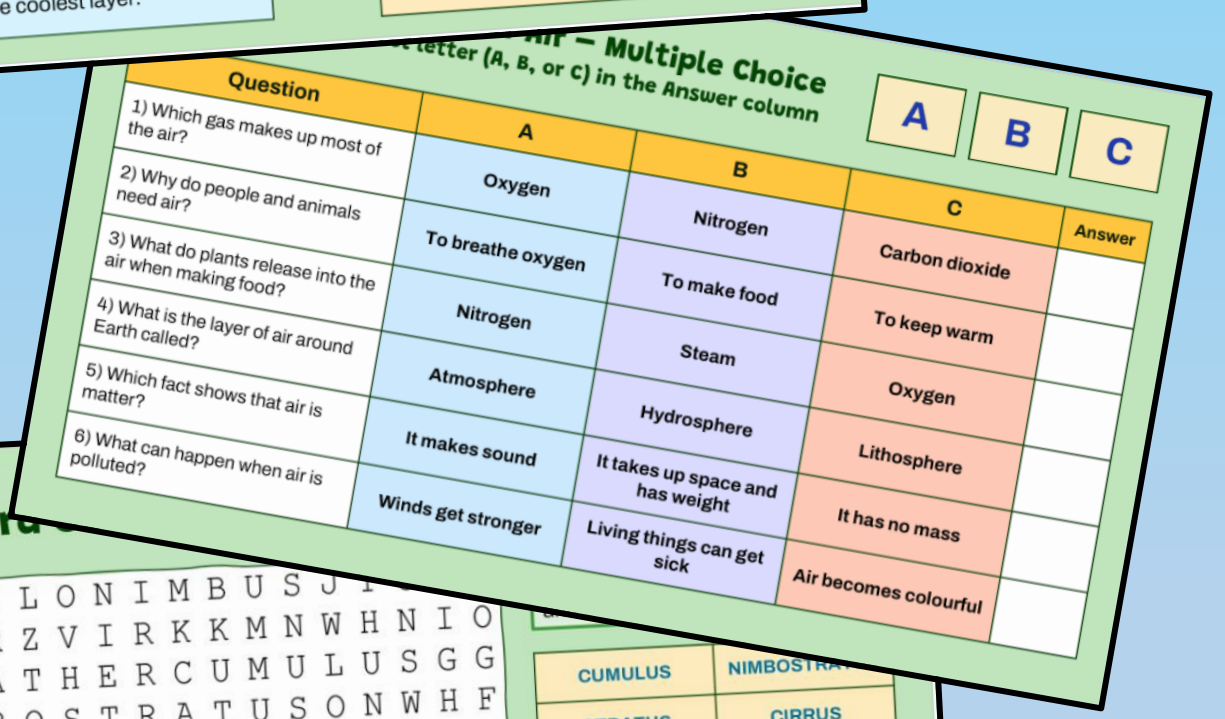
Part 2 – Action!
- Writing
- Matching
- Drag and Drop
- Drawing
- And More!

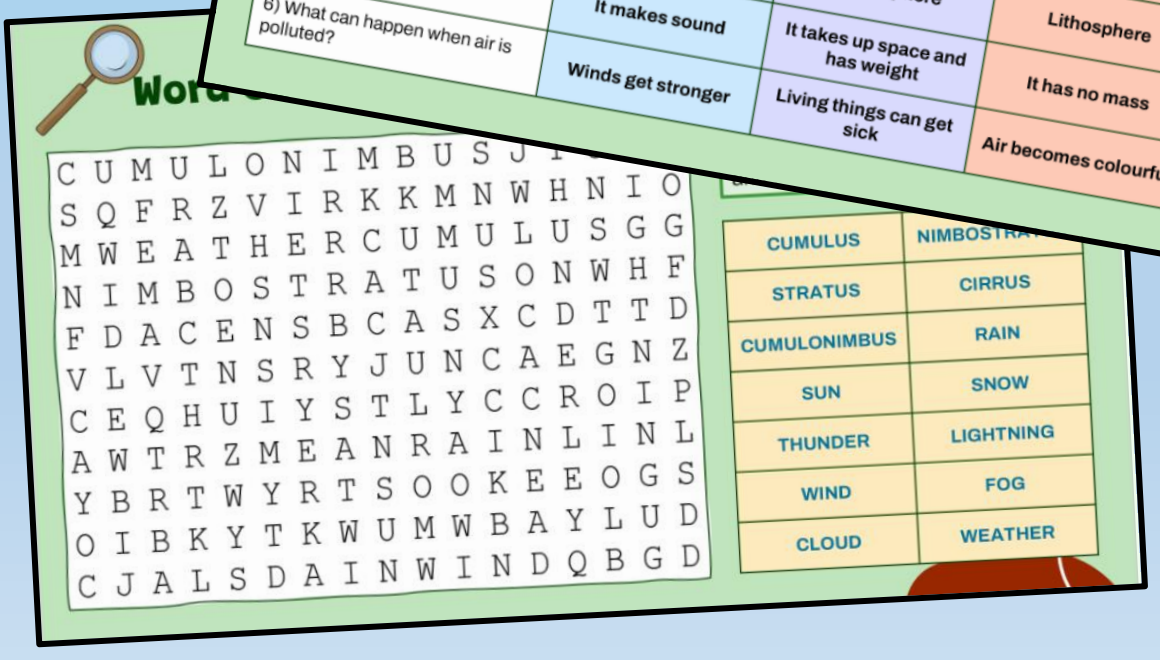
Part 3 – Consolidation!
- Exit Cards
- Quizzes
- Reflection
- And More!



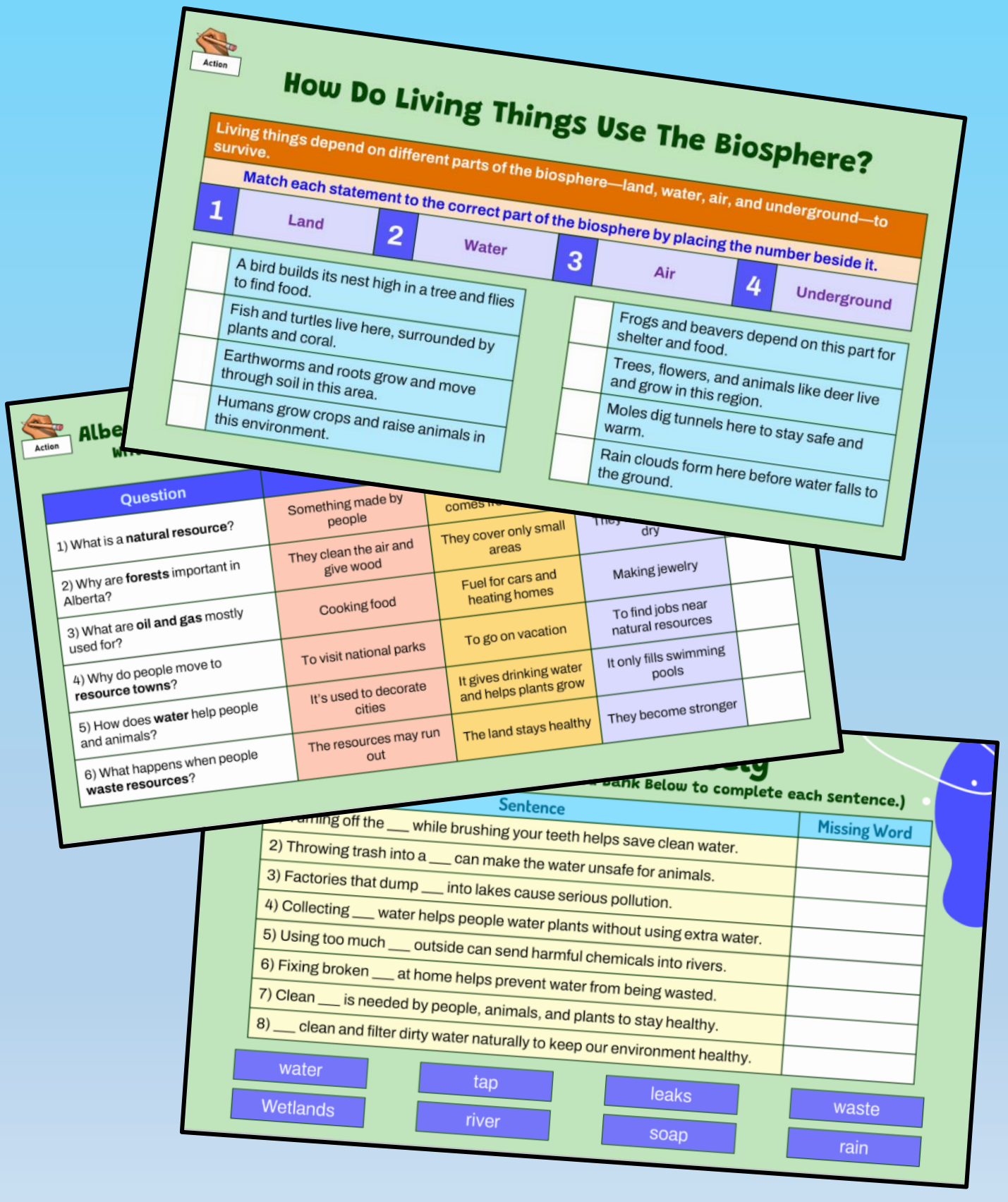
Alberta Science Curriculum
Earth Systems – Grade 4







Alberta Science Curriculum
Earth Systems – Grade 4



Action

How Do Living Things Use The Biosphere?

Living things depend on different parts of the biosphere—land, water, air, and underground—to survive.

Match each statement to the correct part of the biosphere by placing the number beside it.

1 Land | 2 Water | 3 Air | 4 Underground

	A bird builds its nest high in a tree and flies to find food.
	Fish and turtles live here, surrounded by plants and coral.
	Earthworms and roots grow and move through soil in this area.
	Humans grow crops and raise animals in this environment.
	Frogs and beavers depend on this part for shelter and food.
	Trees, flowers, and animals like deer live and grow in this region.
	Moles dig tunnels here to stay safe and warm.
	Rain clouds form here before water falls to the ground.

Action

Alber

Question				
1) What is a **natural resource**?	Something made by people	comes fr		
2) Why are **forests** important in Alberta?	They clean the air and give wood	They cover only small areas	dry	
3) What are **oil and gas** mostly used for?	Cooking food	Fuel for cars and heating homes	Making jewelry	
4) Why do people move to **resource towns**?	To visit national parks	To go on vacation	To find jobs near natural resources	
5) How does **water** help people and animals?	It's used to decorate cities	It gives drinking water and helps plants grow	It only fills swimming pools	
6) What happens when people **waste resources**?	The resources may run out	The land stays healthy	They become stronger	

ety

Bank Below to complete each sentence.)

Sentence	Missing Word
ming off the ___ while brushing your teeth helps save clean water.	
2) Throwing trash into a ___ can make the water unsafe for animals.	
3) Factories that dump ___ into lakes cause serious pollution.	
4) Collecting ___ water helps people water plants without using extra water.	
5) Using too much ___ outside can send harmful chemicals into rivers.	
6) Fixing broken ___ at home helps prevent water from being wasted.	
7) Clean ___ is needed by people, animals, and plants to stay healthy.	
8) ___ clean and filter dirty water naturally to keep our environment healthy.	

water | tap | leaks | waste

Wetlands | river | soap | rain

Workbook Preview

Grade 4 – Science Unit

Organizing Idea: Earth Systems: Understandings of the living world, Earth, and space are deepened by investigating natural systems and their interactions.

Guiding Question: How does Earth sustain life?

	Learning Outcome – Students investigate the systems of Earth and reflect on how their interconnections sustain life	**Pages**
ES.1	Earth scientists call Earth's systems the spheres, including the lithosphere, atmosphere, hydrosphere, biosphere The lithosphere is the outer layers of Earth's surface, is made of rocks, contains soils and minerals that support life The atmosphere is a gas layer that surrounds Earth, warms Earth's surface, reduces extremes of temperature, contains oxygen, which is used for breathing	7-31, 40-46, 65, 76
ES.2	Organisms require warmth and energy from the Sun to live. Sunlight is more direct at the equator than at the poles. The long-term temperature at the equator is warmer than it is at the poles. In Alberta, sunlight is more direct, and the length of daylight is longer, in summer than in winter	77-90
ES.3	Water is a basic need for plants and animals. Water provides habitat for many organisms. First Nations, Métis, and Inuit laws of nature honour water as being sacred because water sustains life. Laws of nature guide First Nations, Métis, and Inuit in their responsibility to protect water and sources of water. First Nations, Métis, and Inuit laws of nature include: how nature provides gifts of life, living in harmony with the land	66-73

	Learning Outcome – Students investigate the systems of Earth and reflect on how their interconnections sustain life	**Pages**
ES.4	Changes in one system that can impact another system include changes in: number of organisms, food sources, habitat, water distribution and cleanliness, weather patterns Governments, conservation groups, and First Nations, Métis, and Inuit communities collaborate with Parks Canada to conserve, restore, and protect Canada's natural and cultural heritages through initiatives such as: culture camps, science camps, land management and preservation of important sites, cultural centres	104-109
ES.5	Natural resources are materials from nature that are used to meet human needs, and include: air, water, soil, minerals, metals, forests, organisms	91-103
ES.6	Conservation is the preservation and protection of Earth's systems from pollution, depletion, or extinction. Conservation practices can be implemented in natural and human-made areas. Conservation can involve creating local, provincial, and national parks. First Nations, Métis, and Inuit have a long history with the land that has informed conservation practices and beliefs.	110-118, 130-136
ES.7	Conservation can be practised through personal actions, including: use of electricity; e.g., turning off lights when leaving a room, use of water; e.g., taking shorter showers, reducing waste; e.g., using reusable packaging Conservation can be practised through community or global actions, such as: use of energy-efficient alternatives; e.g., solar panels, supplying water to support crops (irrigation), community recycling or composting programs	126-129, 137-149
Computer Science		
CS.1	Students examine and apply design processes to meet needs.	32-39, 47-51, 119-125

NAME: _____

EARTH SYSTEMS

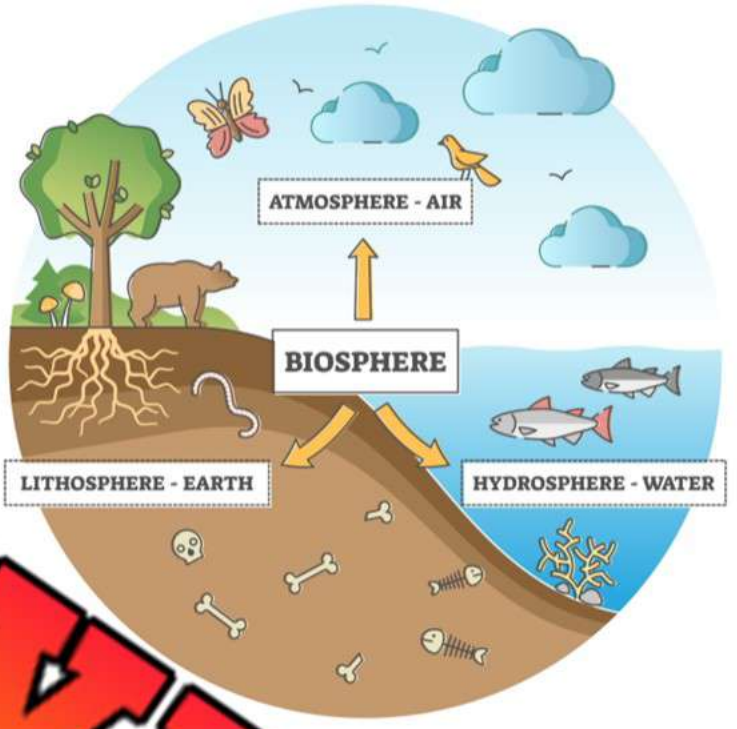
Name: _____ 7

Curriculum Connection
ES.1

Earth's Systems: The Four Spheres

Introduction

Our Earth is made up of different parts or systems, also known as spheres. These four spheres include the Lithosphere, Atmosphere, Hydrosphere, and Biosph



The L

The Lithosphere i lid, rocky part, including t and up mantle. It's the ground e mountains we climb.

The Atmosphere

The Atmosphere is a layer of gases surrounding rth. It us with the air we breathe and protects us from space's harsh condit . It' faces and the warmth of the sun.

The Hydrosphere

The Hydrosphere includes all the water on Earth, in lakes, rivers, glaciers erground, or in the ocean. It's the water we drink and the rain that waters plants. It's very important as water is necessary for all known forms of life.

The Biosphere

Lastly, the Biosphere is where all life exists. The biosphere includes all living organisms on Earth, including humans, animals, and plants.. It overlaps with parts of the other spheres, including forests (lithosphere), coral reefs (hydrosphere), and birds (atmosphere).

Name: _____ 8

Curriculum Connection
ES.1

True or False

Circle whether the statement is true or false

1) The Lithosphere is made up of gases.	True	False
2) We breathe in air in the Atmosphere	True	False
3) The Hydrosphere includes all the water on Earth	True	False
4) The Atmosphere is the solid part of the Earth	True	False
5) Birds a[illegible] of the Lithosphere.	True	False

Des[illegible]escribe each of the spheres below

Lithosphere	
Atmosphere	
Hydrosphere	
Biosphere	

Questioning

Write 3 questions you have about Earth's systems/spheres

1)	
2)	
3)	

Curriculum Connection
ES.1

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____

Circle the answer for each question.

Mark

1) Where do trees and animals live?	Lithosphere	Biosphere
2) Which sphere includes rivers and oceans?	Hydrosphere	Atmosphere
3) Which sphere contains air and weather?	Atmosphere	Hydrosphere
4) Mountains and rocks belong to which?	Biosphere	Lithosphere
5) Glaciers and groundwater are in which?	Hydrosphere	Lithosphere

Name: _____

Circle the answer for each question.

Mark

1) Where do trees and animals live? Lithosphere Biosphere
2) Which sphere includes rivers and oceans? Hydrosphere Atmosphere
3) Which sphere contains air and weather? Atmosphere Hydrosphere
4) Mountains and rocks belong to which? Biosphere Lithosphere
5) Glaciers and groundwater are in which? Hydrosphere Lithosphere

Name: _____

Circle the answer for each question.

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3) Which sphere contains air and weather? Atmosphere Hydrosphere
4) Mountains and rocks belong to which? Biosphere Lithosphere
5) Glaciers and groundwater are in which? Hydrosphere Lithosphere

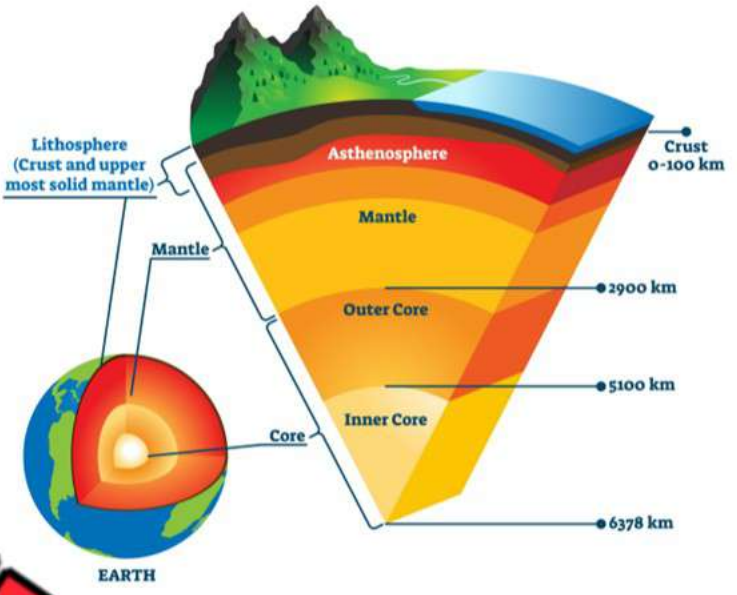
Name: _____ 10

Curriculum Connection
ES.1

The Lithosphere: Earth's Outer Layer

What is the Lithosphere?

The lithosphere is the top layer of the Earth's surface. When you walk on the ground, climb a hill, or touch a rock, you are in cont[illegible]with the lithosphere.



Layers [illegible]

The cr[illegible]d uppe[illegible]make up the two layers of t[illegible]e.

- The Crust: This is [illegible]very [illegible] of the lithosphere that [illegible]nd int[illegible]daily. It includes the continents and the ocean floor.
- The Upper Mantle: Beneath the crust, the uppe[illegible]t of [illegible]mantle. Even though it's rocky, it's very, very hot, and parts of it can [illegible]e sil[illegible]

What's in the Lithosphere?

The lithosphere is mostly made of rocks. These rocks can be as big a[illegible]s small as a grain of sand. There are three types of rocks in the lithosphere[illegible]s, metamorphic, and sedimentary.

How Does the Lithosphere Help Life?

The lithosphere helps life in many ways:

- Soils: The lithosphere has soil, which is made of tiny rock pieces and stuff from dead plants and animals. The soil gives plants a place to grow and holds water.
- Minerals: The lithosphere has minerals too. Minerals are found in rocks. They are things like iron, calcium, and potassium. Plants and animals need minerals.

Name: _____ 11

Curriculum Connection
ES.1

True or False

Circle whether the statement is true or false

1) The crust is part of the lithosphere	True	False
2) The lithosphere is made up of only one layer	True	False
3) The upper mantle is cooler and more solid than the crust	True	False
4) The lithosphere can contain rocks as big as mountains	True	False
5) Mineral[illegible]re not found in the lithosphere	True	False

Questio[illegible]

[illegible] the questions below using evidence from the text

1) What is the [illegible]

2) Why do we need the lithosphere? Ho[illegible]es it su[illegible]tive?

Visualizing

Draw what you were picturing while you were reading. Ex[illegible] the picture

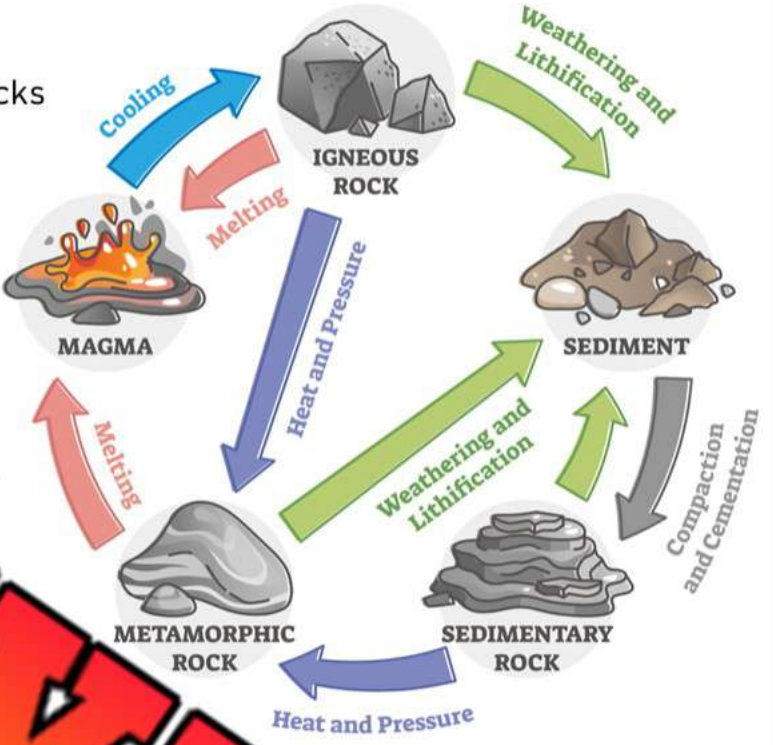
Name: _____ 14

Curriculum Connection
ES.1

The Rock Cycle

The Rock Cycle

The **Rock Cycle** is the process by which rocks change forms from one type to another. There are three main kinds of rocks: igneous ro[illegible]metamorphic rock, and sedimenta[illegible]Each type of rock can chang[illegible]through the follow[illegible]hysical [illegible]compacting, cementing, we[illegible]oling, [illegible], heating, and pressu[illegible]



Magma and Sediment

Magma and sediment are substa[illegible]s th[illegible] become rocks and enter the rock cycle[illegible]**a** is lig[illegible]k [illegible]at is underground.

Sediments are particles from rock erosion[illegible]eathe[illegible]se sediments eventually will become sedimentary rock in the fu[illegible]

Igneous Rock

Igneous rock is hardened magma that can happen below or above th[illegible] become one of the other types of rocks through the following proces[illegible]es: [illegible]into magma, eroding into sediment, or be compacted and pressurized to becom[illegible]metamorphic.

Metamorphic Rock

Metamorphic rock is igneous or sedimentary rock that has been heated and squeezed under heat and pressure. It can erode into sediment or melt into magma.

Sedimentary Rock

Sedimentary rock is compacted sediment. Sediment can be in the form of tiny rock materials or remains of living things. When these tiny materials are compacted together, they form a weak rock known as sedimentary rock.

Name: _____ 15

Curriculum Connection
ES.1

True or False

Circle whether the statement is true or false

1. Metamorphic rock is hardened magma	True	False
2. Rocks can change forms under physical processes like heating	True	False
3. Sediments are big chunks of rock	True	False
4. A sedimentary rock is very strong and tough to break	True	False
5. Igneous [illegible]an be compacted to become metamorphic	True	False

Quest[illegible]

An[illegible] questions below using evidence from the text

1) What is the [illegible]

2) How can rocks change from one form into an[illegible]

Summarize

What is the main idea and supporting details from the reading passage

Name: _____ 19

Curriculum Connection
ES.1

Formation of Different Rocks

Explain How are each type of rock formed? Use the diagram to help

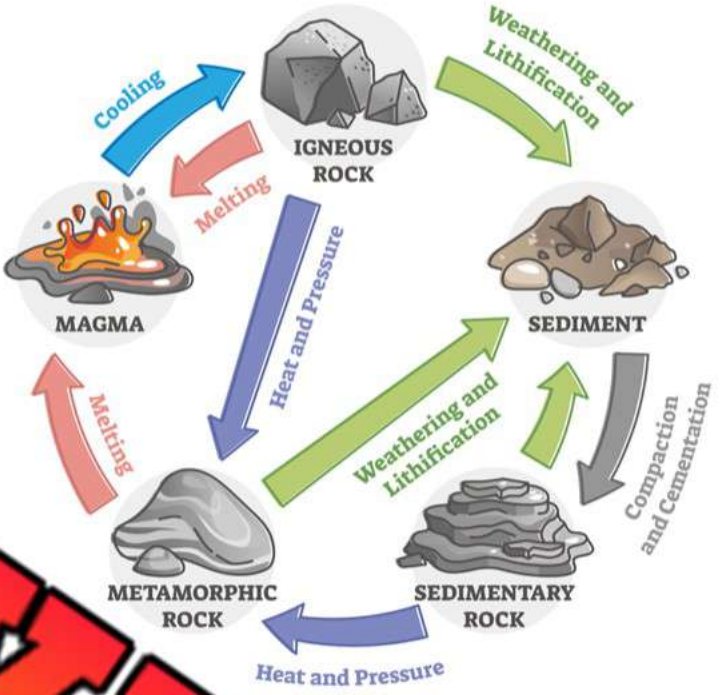
1) How are sedimentary rocks formed?

2) How ar… orphic rocks formed?

3) How are igne… form…

4) How do igneous rocks turn into meta… ic rock…

5) How do metamorphic rocks turn into sedimentary rocks…



True or False Circle whether the statement is true or false

1) When magma is cooled, it turns into metamorphic rock	True	False
2) Igneous and metamorphic rocks can be weathered into sediments	True	False
3) Sediments are compacted and cemented into sedimentary rock	True	False
4) Igneous rock cannot become metamorphic rock	True	False
5) Through heat and pressure, magma becomes metamorphic rock	True	False
6) Metamorphic rock can melt into magma	True	False

Curriculum Connection
ES.1

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____ Mark

Circle the answer for each question.

What is underground liquid rock called?	Lava	Magma
Which rock forms when magma hardens?	Igneous	Metamorphic
Which process wears rocks into pieces?	Weathering	Cooling
Which process turns sediment into rock?	Cementing	Melting
Which rock forms from heat and pressure?	Sedimentary	Metamorphic

Name: _____ Mark

Circle the answer for each question.

What is underground liquid rock called?	Lava	Magma
Which rock forms when magma hardens?	Igneous	Metamorphic
Which process wears rocks into pieces?	Weathering	Cooling
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Name: _____ Mark

Circle the answer for each question.

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Name: _____ Mark

Circle the answer for each question.

What is underground liquid rock called?	Lava	Magma
Which rock forms when magma hardens?	Igneous	Metamorphic
Which process wears rocks into pieces?	Weathering	Cooling
Which process turns sediment into rock?	Cementing	Melting
Which rock forms from heat and pressure?	Sedimentary	Metamorphic

Name: _____ 21

Curriculum Connection
ES.1

Fact or Fiction: Rock Cycle Edition

Objective

What are we learning about?

To help students learn about the rock cycle by listening to true and false statements about igneous, sedimentary, and metamorphic rocks, as well as the processes that change them over time.

Materials

What you need for the activity?

- Fact or Fic[illegible]ts
- A 'Fact' sign and [illegible]ish the two sides of the room
- Designated areas in the classroom [illegible]e 'Fact' and 'Fiction' signs, allowing sp[illegible]or students to move to either side

Instructions

How will you complete the activity?

1. Your teacher will read statements. Pay close attention as each [illegible]ared.
2. Consider carefully whether you think the statement is true or false.
3. If you decide the statement is true, walk to the 'Fact' side of the room.
4. If your guess is that it's not true, move to the 'Fiction' side of the room.
5. Stay on your chosen side and listen attentively for the correct answer to be revealed.
6. When the right answer is announced, return to your seat, ready for the next round.
7. Have fun getting up and moving!

Name: _____ 22

Curriculum Connection
ES.1

Fact or Fiction | Read the statements to the class.

#	Statement	
1	The rock cycle shows how rocks can change from one type to another.	Fact
2	Igneous rocks are formed when sand and shells press together.	Fiction
3	Metamorphic rocks are made when heat and pressure change existing rocks.	Fact
4	Sedim ocks form from layers of materials like sand, mud, and tiny fossils.	Fact
5	R forever and never change.	Fiction
6	Lav at cool Earth's surface makes igneous rock.	Fact
7	Sedimentar e form nderground when magma hardens.	Fiction
8	Only igneous rocks mag	Fact
9	Metamorphic rocks can tu mag	Fact
10	Sedimentary rocks can contain foss plants ls.	Fact
11	Weathering and erosion break rocks into sm eces t m sedimentary rocks.	Fact
12	Igneous rocks can become sedimentary rocks through ing a compaction.	Fact
13	Rocks in the cycle can only move in one direction.	Fiction
14	The rock cycle is part of Earth's natural systems.	Fact
15	All rocks begin as sedimentary rocks.	Fiction
16	Magma is melted rock found beneath Earth's surface.	Fact
17	Metamorphic rocks can become sedimentary if they are broken into pieces.	Fact
18	Metamorphic rocks are formed only from melted lava.	Fact
19	Rocks can change from one type to another many times.	Fact
20	Sedimentary rocks form when lava hardens quickly.	Fiction

Name: _____ 23

Curriculum Connection
ES.1

Quiz Check-In This quiz will assess students' understanding of the concepts covered in the Fact or Fiction activity. Cut along the lines and give each section to a student.

Name: _____

Mark

Is the statement true (T) or false (F)?

1. Sedimentary rocks are formed from layers of sand, mud, or shells.	T	F
2. Igneous rocks always form deep underground.	T	F
3. Heat and pressure can change rocks into metamorphic rocks.	T	F
4. The rock cycle only goes in one direction.	T	F
5. Magma is melted rock found under Earth's surface.	T	F
6. Weathering and erosion can break rocks into sediments.	T	F

Name: _____

Mark

Is the statement true (T) or false (F)?

1. Sedimentary rocks are formed from layers of sand, mud, or shells.	T	F
2. Igneous rocks always form deep underground.	T	F
3. Heat and pressure can change rocks into metamorphic rocks.	T	F
4. The rock cycle only goes in one direction.	T	F
5. Magma is melted rock found under Earth's surface.	T	F
6. Weathering and erosion can break rocks into sediments.	T	F

Name: _____

Mark

Is the statement true (T) or false (F)?

1. Sedimentary rocks are formed from layers of sand, mud, or shells.	T	F
2. Igneous rocks always form deep underground.	T	F
3. Heat and pressure can change rocks into metamorphic rocks.	T	F
4. The rock cycle only goes in one direction.	T	F
5. Magma is melted rock found under Earth's surface.	T	F
6. Weathering and erosion can break rocks into sediments.	T	F

Name: _____ 28

Curriculum Connection
ES.1

Underground Drones

History of Drones

A **drone** is an aircraft with no on-board crew or passengers. Drones are also called "Unmanned aerial vehicles" (UAVs). Drones are controlled by a remote control.

The first drone was made in Britain during the First World War. It was named "Britain's Aerial Target." It was tested and showed promise, but it wasn't used in the war.

Fast[illegible]d over 100 years, and drones are now in many different ways, from monitor[illegible]ge to carrying out search and r[illegible]operati[illegible]natural disasters.

Underground [illegible]s

Mining companies [illegible]w us[illegible]nd drones to help their mining proje[illegible]rones [illegible]into mines to search caves, collect [illegible]and [illegible]underground tunnels.

Underground drones are useful in the f[illegible]ing way

- ✓ They have technology that can record the g[illegible]ls un
- ✓ They can identify geological features like caves, [illegible]nd [illegible]und lakes
- ✓ They can send quality videos of what miners can expe[illegible]the[illegible]ound
- ✓ They can map out any dangerous areas before sending miners d[illegible]

The technology has only been around since 2017, but it will be very usefu[illegible]g able to send drones underground to learn more about a mine will keep humans safer.

In the past, human surveyors were sent deep into these mines to do the research themselves. Drones will save them from potential collapses, unsafe gas conditions, and from getting trapped underground.

Drone Operators

A new job industry is becoming more popular as drones are being used more and more. To get into the drone industry, you'll need A Transport Canada Advanced RPAS Pilots License and a Class 5 Driver's License.

Name: _____ 29

Curriculum Connection
ES.1

True or False

Is the statement true or false

1) An underground drone can map out an underground mine	True	False
2) Underground drones will save people's lives	True	False
3) You can drive a drone as a professional without a license	True	False
4) Drones can be sent into dangerous areas to protect humans	True	False
5) Underg drones have been around a very long time	True	False

Ques wer the questions below

1) Is the mining gro What can drones be used for?

2) How is science and technology helping ners? W t th rground drone technology, how are humans affected?

Visualizing

Draw what you were picturing while you were reading. Explain the picture

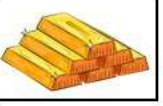
Name: _____ 32

Curriculum Connection
CS.1

IF/THEN Statements - Underground Drones

Directions Follow the if/then statements to move the drone to the gold

1)	If sedimentary rock is the softest	then	Move down 3 spots
2)	If heat and pressure change rocks	then	Move right 5 spots
3)	If m amorphic rock is the weakest	then	Move left 4 spots
4)	If i rocks are cooled lava	then	Move down 2 spots
5)	bination of minerals	then	Move right 3 spots
6)	e eat	then	Move down 1 spot
7)	If steel vithou	then	Move left 3 spots
8)	If rocks can t	then	Move left 7 spots
9)	If rocks and minera o	then	Move right 2 spots
10)	If sediments are small particl ck	then	Move down 1 spot



Name: _____ 33

Curriculum Connection
CS.1

Writing Code - Underground Drones

Nova is a robot drone that helps gathers information about underground mines. Nova is controlled by a remote control.

Mining Use the map to write code on the back of the page

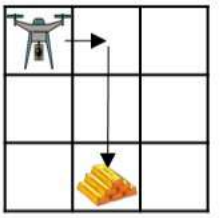
Name: _____ 34

Curriculum Connection
CS.1

Up
Left Right
Down

Commands – Use the example below to learn the code

Move 1 right
Move 2 down



Mining Tell Nova where to dig so that they get to all the materials

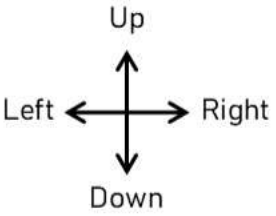
1) Find the copper and emerald

2) Find the platinum and diamond

3) Find the silver, graphite, and granite

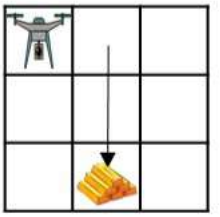
Name: _____ 35

Curriculum Connection
CS.1



Commands – Use the example below to learn the code

Move 1 right
Move 2 down



Mining

Collect the minerals/rocks below using as few lines of code as possible. You can pick up the rocks/minerals in any order

4) Find th iron ore, copper, diamond, gold, and emerald.

5) Find copper, bronze, obsidian, granite, sil ic, go n ore. Don't touch the lava!

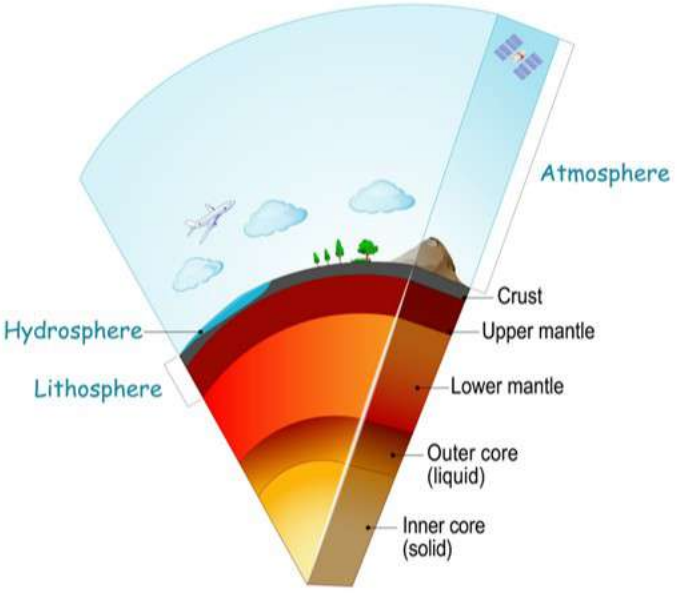
Name: _____ 40

Curriculum Connection
ES.1

The Atmosphere: Earth's Invisible Shield

What is the Atmosphere?

Think of Earth wearing a giant, invisible coat. That's what we call the atmosphere! It's a layer of gases that goes all around our planet. Without this protective coat, Earth would be much different, and not very [illegible]



Keeping Earth [illegible]

One of the cool jobs [illegible] is to keep Earth warm. During the day, [illegible] sends its heat to the Earth. But when the Sun sets at night, the heat tries to escape into space. Here's where the atmosphere comes in, acting like a cozy blanket, trapping some of the warmth near Earth's surface. This makes our planet comfortable for us.

Smoothing Out Temperature Extremes

The atmosphere also helps to level out temperature extremes. It keeps Earth from getting too hot during the daytime and too cold during the nighttime. Without the atmosphere, daytime could feel like an oven, and nighttime could feel like a freezer!

The Atmosphere: Earth's Protective Shield

Besides warming our planet and giving us air to breathe, the atmosphere acts like a superhero shield for Earth! It protects us from small space rocks called meteoroids. Most meteoroids burn up in the atmosphere before they can reach Earth's surface. This is why we see shooting stars! Without the atmosphere, these space rocks could hit Earth and cause damage.

Name: _____ 41

Curriculum Connection
ES.1

True or False

Circle whether the statement is true or false

1) The atmosphere is not needed for life on Earth	True	False
2) All meteoroids that come towards Earth make it to the surface.	True	False
3) The atmosphere traps in heat when the Sun sets	True	False
4) The atmosphere doesn't let too much of the Sun's heat in	True	False
5) Without atmosphere, it would be a warm paradise on Earth	True	False

Quest

he questions below using evidence from the text

1) What is the

2) Explain the three ways the atmosphere helps and

urvive.

1	
2	
3	

Curriculum Connection
ES.1

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____ Mark

Is the statement true or false?

1) The atmosphere is a layer of gases.	True / False
2) It acts like Earth's protective coat.	True / False
3) It is made of liquid water clouds only.	True / False
4) Shooting stars are comets hitting Earth.	True / False
5) The atmosphere makes Earth colder overall.	True / False

Name: _____ Mark

Is the statement true or false?

1) The atmosphere is a layer of gases.	True / False
2) It acts like Earth's protective coat.	True / False
3) It is made of liquid water clouds only.	True / False
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5) The atmosphere makes Earth colder overall.	True / False

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5) The atmosphere makes Earth colder overall.	True / False

Name: _____ Mark

Is the statement true or false?

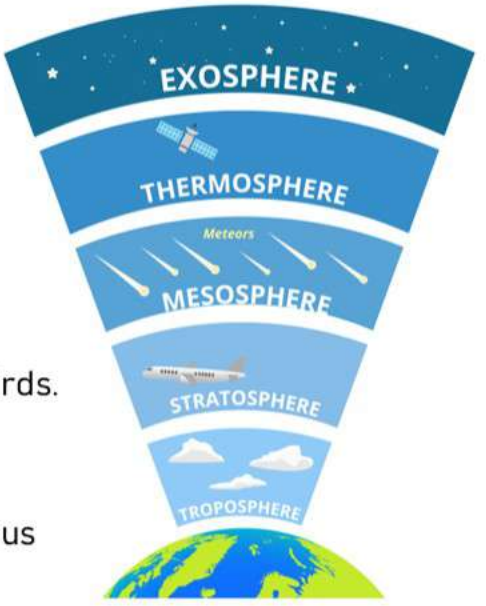
1) The atmosphere is a layer of gases.	True / False
2) It acts like Earth's protective coat.	True / False
3) It is made of liquid water clouds only.	True / False
4) Shooting stars are comets hitting Earth.	True / False
5) The atmosphere makes Earth colder overall.	True / False

Name: _____ 43

Curriculum Connection
ES.1

The Layers of the Atmosphere

The Layers of Earth's Atmosphere



1. Troposphere

- This layer is where all of the weather occurs, so whenever you experience wind, rain, or sunshine, it's thanks to the troposphere!
- Almost all of the air we breathe, including oxygen and nitrogen, is found here, along with clouds and flying birds.

2. Stratosphere

- The ozone layer resides in the stratosphere, shielding us from the Sun's harmful rays.
- It's the preferred flight path for airplanes because it's stable and has few weather disturbances.

3. Mesosphere

- The coldest layer of all, the mesosphere, protects us from most meteors by causing most of them to burn up.
- Whenever you spot a shooting star, you're witnessing a meteor burning in the mesosphere!

4. Thermosphere

- The thermosphere may be super hot, but the air is too thin for us to feel the heat.
- This layer is home to the mesmerizing Northern and Southern Lights (Auroras) and the International Space Station orbits Earth here.

5. Exosphere

- The exosphere is the final layer of Earth's atmosphere, where our atmosphere fades into the vastness of space.
- Although mostly empty, the exosphere is where many satellites orbit the Earth.

Name: _____ 44

Curriculum Connection
ES.1

True or False

Circle whether the statement is true or false

1) Birds fly in the exosphere.	True	False
2) The ozone layer is in the troposphere.	True	False
3) Airplanes fly in the mesosphere.	True	False
4) Shooting stars burn up in the mesosphere.	True	False
5) Satelli[illegible]it in the exosphere.	True	False

Ques[illegible]ibe each of the layers of the atmosphere

Troposphere	
Stratosphere	
Mesosphere	
Thermosphere	
Exosphere	

Name: _____ 45

Curriculum Connection
ES.1

Draw	Draw a diagram of the layers of the atmosphere

Curriculum Connection
ES.1

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____ Mark

Circle the correct answer.

1) Which layer has weather?	Troposphere
	Stratosphere
2) Where do planes usually fly?	Mesosphere
	Stratosphere
3) Which layer has ozone?	Troposphere
	Stratosphere
4) Coldest layer is which?	Mesosphere
	Thermosphere
5) ISS orbits in which layer?	Thermosphere
	Exosphere

Name: _____ Mark

Circle the correct answer.

1) Which layer has weather?	Troposphere
	Stratosphere
2) Where do planes usually fly?	Mesosphere
	Stratosphere
3) Which layer has ozone?	Troposphere
	Stratosphere
4) Coldest layer is which?	Mesosphere
	Thermosphere
5) ISS orbits in which layer?	Thermosphere
	Exosphere

Name: _____ Mark

Circle the correct answer.

1) Which layer has weather?	Troposphere
	Stratosphere
2) Where do planes usually fly?	Mesosphere
	Stratosphere
3) Which layer has ozone?	Troposphere
	Stratosphere
4) Coldest layer is which?	Mesosphere
	Thermosphere
5) ISS orbits in which layer?	Thermosphere
	Exosphere

Name: _____ Mark

Circle the correct answer.

1) Which layer has weather?	Troposphere
	Stratosphere
2) Where do planes usually fly?	Mesosphere
	Stratosphere
3) Which layer has ozone?	Troposphere
	Stratosphere
4) Coldest layer is which?	Mesosphere
	Thermosphere
5) ISS orbits in which layer?	Thermosphere
	Exosphere

Name: _____ 47

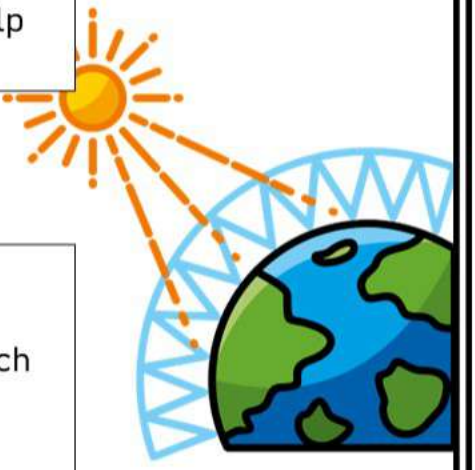
Curriculum Connection
CS.1

Coding Activity – Layers of Atmosphere

Objective

What are we learning about?

To learn more about the atmosphere in a fun and engaging way. This is a physical activity that uses the principles of coding to help students understand the different layers of the atmosphere.



Materials

What do we need?

- ✓ [illegible]ames of the different layers of the [illegible]sphere
- ✓ Flashcards [illegible]t characteristics and facts about each layer
- ✓ Open space [illegible]emen

Method

How do [illegible]ple[illegible]riment?

1) Setup: Lay out the flashcards with [illegible]mes of [illegible]ye[illegible]s in order from the ground up in a line across the room or field.

2) Creating Human Code: Divide the students i[illegible]our[illegible]roup will represent a "program" and each student in the gr[illegible]epres[illegible]yer of the atmosphere.

3) Atmosphere Fact Cards: Give each group a set of fact cards ab[illegible]e facts can include things like "this layer is where weather occurs" or "[illegible]yer is where satellites orbit". The facts should correspond to the layers of [illegible]tmosphere.

4) Programming: The task for each group is to assign the correct facts to each member, representing the correct layer of the atmosphere. They need to "program" their group by discussing and matching the facts to the layers.

5) Execution: Once the groups have assigned the facts, each group will present their "program". When someone says, “run” or “start”, they will line up in the order of the layers, and each student will say out loud the name of the layer they represent and the facts they were assigned.

6) Debugging: If a fact is wrong or misplaced, the other students can help "debug" the program by suggesting corrections.

Name: _____ 48

Curriculum Connection
CS.1

TROPOSPHERE

STRATOSPHERE

MESOSPHERE

THERMOSPHERE

EXOSPHERE

Name: _____ 49

Curriculum Connection
CS.1

Set 1

This is the layer where we live and where weather happens, like rain and snow.

This layer is where the northern and southern lights (aurora borealis and aurora australis) occur.

This lay[illegible]lds the ozone layer, which protects us from the sun's [illegible]ys.

This [illegible]ne o[illegible] layer of the atmosphere, where space begins an[illegible]es o[illegible]Earth.

This is the layer [illegible]eors burn up when they enter Earth's atmosphere.

Set 2

This layer is above the troposphere a[illegible]ds u[illegible]50 kilometers.

It's the layer closest to Earth's surface and exte[illegible]5 kilometers.

This layer is above the mesosphere and extends up to about 600 kilometers.

This layer has the lowest density of molecules as there are less air molecules, making the air is thinner

This is the least explored layer of the atmosphere because it's too high for aircraft and too low for satellites.

Name: _____ 50

Curriculum Connection
CS.1

Set 3

It's the coldest layer of the atmosphere, with temperatures dropping as low as -90°C.

The ozone layer, which absorbs and scatters the sun's harmful ultraviolet rays, is in this layer.

It's the [illegible] where many satellites orbit Earth.

It's where w[illegible]ke[illegible]in, snow, and thunderstorms occur.

The air in this l[illegible]e[illegible]r[illegible]as you go higher due to the absorption of the S[illegible]dia[illegible]

Set 4

Is known as the middle sphere.

The air in this layer gets colder as you go higher.

It's the layer where the Northern and Southern Lights (Aurora Borealis and Aurora Australis) occur.

The air in this layer gets warmer as you go higher because of the ozone layer.

The air is extremely thin in this layer.

Name: _____ 51

Curriculum Connection
CS.1

Set 5

Most of Earth's air mass (around 75-80%) is in this sphere.

The International Space Station orbits in this sphere.

It's ve[illegible]nd has very little water vapor.

It gra[illegible]ually [illegible]o space and has very few particles, mostly hydrogen [illegible]um.

Most meteors b[illegible] th[illegible]ere as they fall towards Earth, causing shooting st[illegible]

Set [illegible]

This layer is above the stratosphere an[illegible]ds u[illegible]about 85 kilometers.

This sphere is the outermost layer of the atmosp[illegible]nding from the thermosphere up to 10,000 kilometers.

Birds and airplanes fly in the lower part of this sphere

Despite its high temperatures, this layer would feel cold to us because of the thin atmosphere.

Most commercial airlines cruise in the lower part of this layer where the air is stable.

Name: _____ 52

Curriculum Connection
ES.1

All About Air

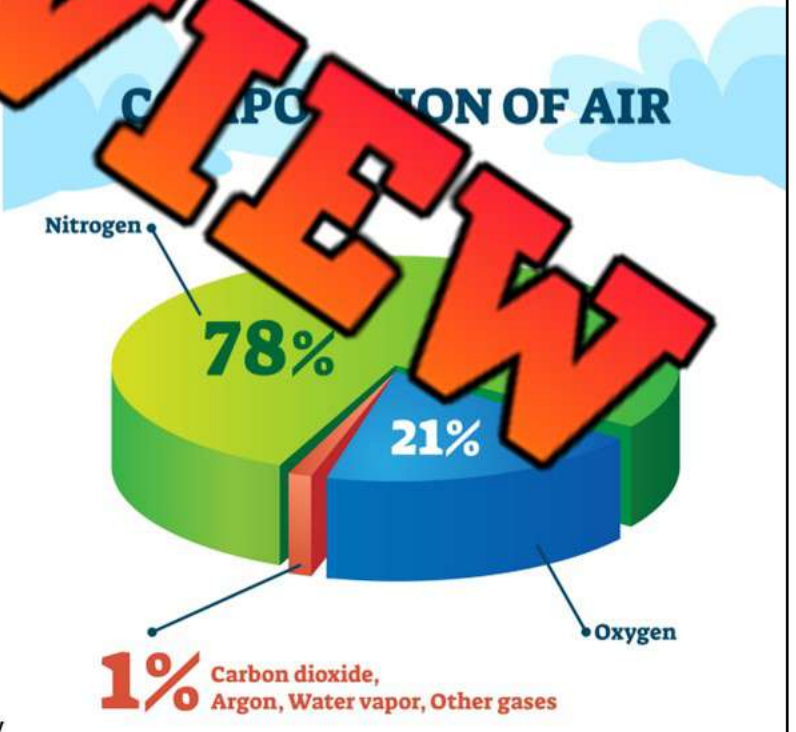
All About Air

Everything around you is matter. The air you breathe is matter. The juice you drink is matter. The chair and desk in the classroom are both matter. They are all different kinds of matter. Matter can be liquid, solid or gas.

Air is matter in the form of a gas. We cannot see air, but it is all around us. Air covers the earth in a layer that is several kilometers deep. This layer is called the **atmosphere**. If you go to outer space, you leave the atmosphere and won't have air.

Air is made of several different kinds of gases. Air is made of:

- Nitrogen → 78 percent
- Oxygen → 21 percent
- Carbon Dioxide
- Water Vapour
- Argon
- Rare gases

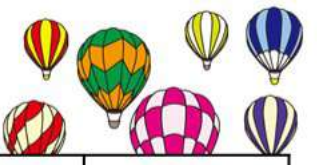


Properties of Air

- We cannot feel air unless it is moving, like on a windy day
- We cannot see clean air
- Air has no colour, unless it is dirty
- We cannot smell air unless it is polluted. Clean air has no smell
- Air is a gas and a fluid. We know this because planes can fly through the air!

Name: _____ 53

Curriculum Connection
ES.1



True or False

Is the statement true or false

1) Air is matter	True	False
2) Our air is made mostly of oxygen	True	False
3) Our bodies are matter	True	False
4) Air is a liquid	True	False
5) We can [illegible] or smell clean air	True	False

Search and Find

Find the answers to the questions below

1. What are the three states of matter? _____, _____, _____
2. Name the two main gases in air? _____, _____
3. Can we see clean air? _____
4. What kind of air can we see? _____
5. What layer on earth has air in it? _____

Making Connections

Have you ever seen dirty air? Exp[illegible]

_____

_____

_____

_____

_____

_____

Curriculum Connection
ES.1

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____ Mark

Is the statement true or false?

1) Air is matter in gas form.	True / False
2) Clean air has no colour.	True / False
3) Oxygen is 50 percent of air.	True / False
4) We can always see air.	True / False
5) We only feel air when it moves.	True / False

Name: _____ Mark

Is the statement true or false?

1) Air is matter in gas form.	True / False
2) Clean air has no colour.	True / False
3) Oxygen is 50 percent of air.	True / False
4) We can always see air.	True / False
5) We only feel air when it moves.	True / False

Name: _____ Mark

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2) Clean air has no colour.	True / False
3) Oxygen is 50 percent of air.	True / False
4) We can always see air.	True / False
5) We only feel air when it moves.	True / False

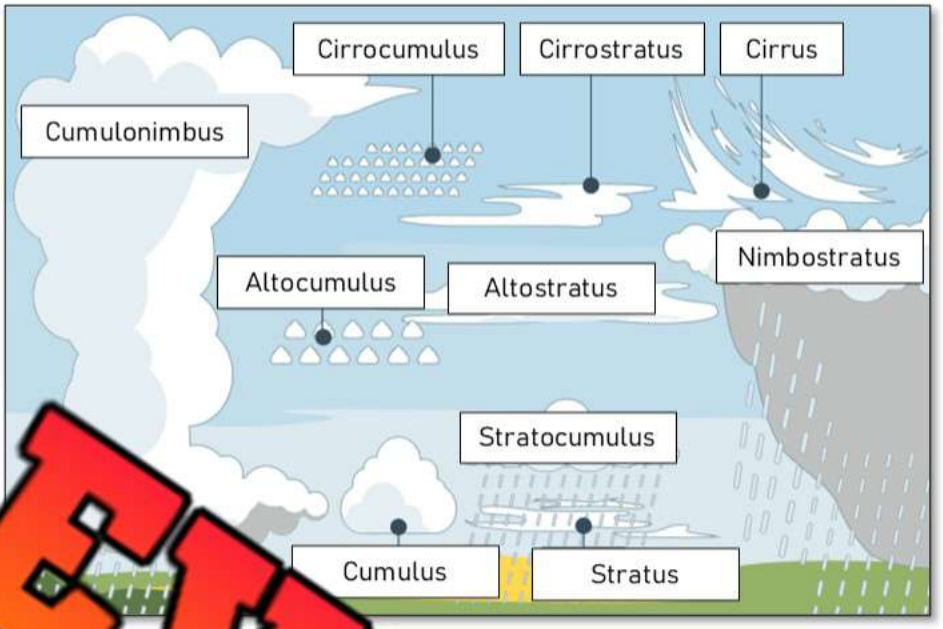
Name: _____ 57

Curriculum Connection
ES.1

Types of Clouds

Understanding Clouds: Types and What They Mean

Clouds are a fascinating part of our sky. They come in different shapes, sizes, and can tell us a lot about the weather. Here are some common t[illegible] of clouds:



Cumulus
Cumu[illegible]e
and [illegible]ooking l
pieces o[illegible]otton f
the sky. They u[illegible]
the weather is ge[illegible]
clear. However, whe[illegible]y
grow bigger and taller, th[illegible]
can turn into cumulonimbus
clouds, which bring thunderstor[illegible]

Stratus Clouds
Stratus clouds are like big gray blankets coverin[illegible]ky. Th[illegible]ually found low in the sky and can cover the whole sky. These clouds [illegible]ring [illegible]y [illegible]my weather. If you've ever been in fog, you've been in a stratus cl[illegible] th[illegible]hing [illegible]round!

Cirrus Clouds
Cirrus clouds are thin and wispy, found high up in the sky. They[illegible]e ma[illegible]ch because it's very cold up high. Cirrus clouds usually mean good we[illegible] start to cover the whole sky, it might mean a change in the weather is coming.

Cumulonimbus Clouds
Cumulonimbus clouds are towering, dark clouds that bring thunderstorms, heavy rain, snow, or even tornadoes. They can reach high up into the atmosphere and sometimes have an anvil shape at the top.

Nimbostratus Clouds
Nimbostratus clouds are thick, dark clouds that cover the sky and bring steady rain or snow. Unlike cumulonimbus clouds, they don't bring thunder or lightning.

By looking at clouds, we can tell a lot about what the weather is going to do. So, next time you're outside, take a look up at the sky and see if you can spot these different types of clouds!

Name: _____ 58

Curriculum Connection
ES.1

True or False

Circle whether the statement is true or false

1) Cumulus clouds often indicate good, clear weather.	True	False
2) Stratus clouds are high in the sky and made of ice crystals.	True	False
3) Fog is a type of stratus cloud that's touching the ground.	True	False
4) Nimbostratus clouds are known for bringing thunder and lightning.	True	False
5) Cirrus clouds are fluffy and white, resembling cotton.	True	False

Match

Write the letter from the description beside the correct type of cloud

Answers	Type of Cloud	Description
	Cumulonimbus	A) Dark clouds that bring thunderstorms, heavy rain, and sometimes tornadoes.
	Stratus	B) Big gray blanket covering the sky, often bringing drizzly, cool weather.
	Cirrus	C) Thin, wispy clouds, found high up in the sky and usually indicate fair weather.
	Cumulonimbus	D) Fluffy, white clouds that look like puffs of cotton floating in the sky.
	Nimbostratus	E) Thick, dark clouds that cover the sky and bring steady rain or snow.

Draw

Draw the types of clouds below

Cumulus	**Stratus**	**Cirrus**	**Cumulonimbus**	**Nimbostratus**

Curriculum Connection
ES.1

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____ Mark ____

Check only the true statements.

Statement	✓
Cumulus clouds look like cotton in sky.	
Stratus clouds often bring light drizzle.	
Cirrus clouds form low near the ground.	
Fog is a stratus cloud touching ground.	
Cirrus clouds are made of ice crystals.	
Cumulus clouds always mean dangerous weather.	
Cumulonimbus clouds may have an anvil top.	
Stratus clouds are thin wispy high clouds.	

Name: _____ Mark ____

Check only the true statements.

Statement	✓
Cumulus clouds look like cotton in sky.	
Stratus clouds often bring light drizzle.	
Cirrus clouds form low near the ground.	
Fog is a stratus cloud touching ground.	
Cirrus clouds are made of ice crystals.	
Cumulus clouds always mean dangerous weather.	
Cumulonimbus clouds may have an anvil top.	
Stratus clouds are thin wispy high clouds.	

Name: _____ Mark ____

Check only the true statements.

Statement	✓
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Cirrus clouds are made of ice crystals.	
Cumulus clouds always mean dangerous weather.	
Cumulonimbus clouds may have an anvil top.	
Stratus clouds are thin wispy high clouds.	

Name: _____ Mark ____

Check only the true statements.

Statement	✓
Cumulus clouds look like cotton in sky.	
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Cirrus clouds form low near the ground.	
Fog is a stratus cloud touching ground.	
Cirrus clouds are made of ice crystals.	
Cumulus clouds always mean dangerous weather.	
Cumulonimbus clouds may have an anvil top.	
Stratus clouds are thin wispy high clouds.	

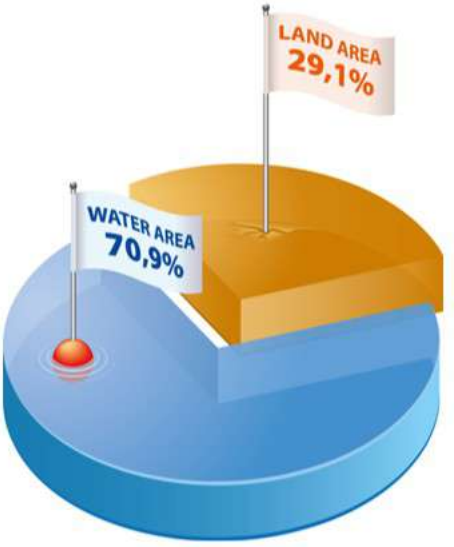
Name: _____ 60

Curriculum Connection
ES.1

What is the Hydrosphere?

What is the Hydrosphere?

Have you ever looked at a globe? Notice how much of it is blue? That's water, and all of it together is called the hydrosphere. The hydrosphere includes all the places on Earth [illegible] water is found, whether it's a drop of dew on [illegible]st, deep ocean.



Places You F[illegible]a

You can find the hy[illegible]sphe[illegible]laces! Here are a few:

- Oceans: This is the bigg[illegible] of [illegible]here. Oceans cover more than 70% of Earth's surface.
- Rivers and Lakes: Flowing rivers a[illegible] peace[illegible]kes [illegible]art of the hydrosphere too.
- Glaciers and Ice Caps: Even frozen water coun[illegible] blocks o[illegible] the Arctic, Antarctica, and high mountains are part of the hydr[illegible]ere.
- Groundwater: Water underground that you can't see is also hydrosphere. This water can be found in soil and rocks.
- Water Vapor: This is water in gas form. It's in the air all around us!

Water: The Essence of Life

Water is super important for life on Earth. Animals, plants, and humans all need water to live. Animals drink water and live in it. Plants need water to grow. Humans use water for drinking, cooking, cleaning, and lots of other things. Even our bodies are mostly water!

Name: _____ 61

Curriculum Connection
ES.1

True or False

Circle whether the statement is true or false

1) The hydrosphere includes all the water on Earth.	True	False
2) Oceans cover less than half of Earth's surface.	True	False
3) Glaciers and ice caps are part of the hydrosphere.	True	False
4) There is no water underground.	True	False
5) Water vapor in the air is part of the hydrosphere.	True	False

Questions

Write 3 questions you have about the reading

1)	
2)	
3)	

Questions

Use information from the text to support your answer.

1) What is the hydrosphere? Where is most of the water found?

_____

_____

_____

2) Why is the hydrosphere important to plant and animal life?

_____

_____

_____

Curriculum Connection
ES.1

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____ Mark

What is the Hydrosphere and why is it so important for life?

Name: _____ Mark

What is the Hydrosphere and why is it so important for life?

Name: _____ Mark

What is the Hydrosphere and why is it so important for life?

Name: _____ Mark

What is the Hydrosphere and why is it so important for life?

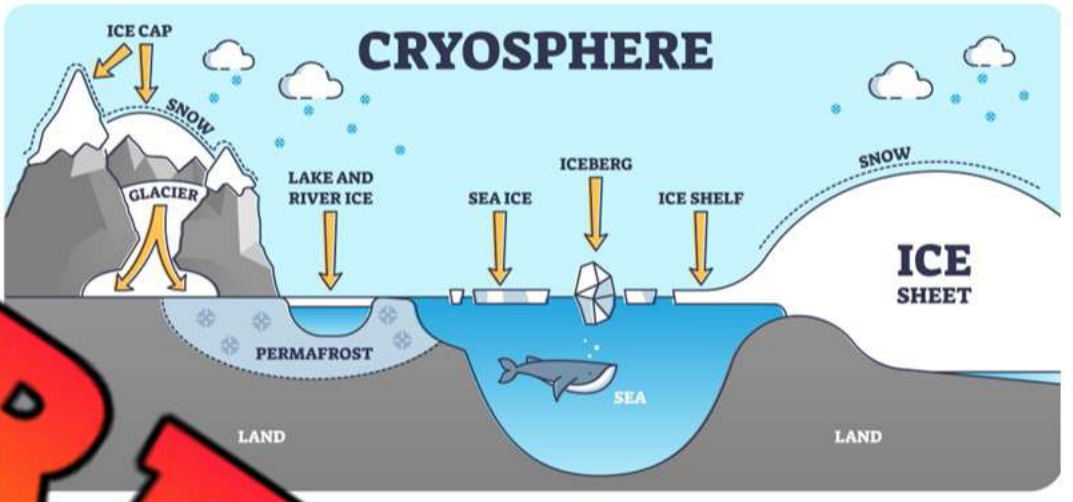
Name: _____ 63

Curriculum Connection
ES.1

Cryosphere - Glaciers

What is the Cryosphere?

The **cryosphere** is the part of the earth's surface that has s… water – i…



What a… laciers

A **glacier** is a … moving, large piec… se th… …n over a long period of time. Most glaciers are made of freshwater … …eed.

- Ice Sheet – Ice sheets are th… larg… …r. Ice sheets are the size of continents as they must be bigger … 50,00… …are …metres. The only ice sheets on Earth are in Antarctica and Gr… …d.
- Ice Cap – Ice caps are smaller than ice sheets, a… …e less… …50,000 square kilometres. Most ice caps are found near the … …n ar… …f the earth. Canada has the Devon Ice Cap on Devon Island in Nu…
- Icebergs – Icebergs are floating pieces of ice that are more than 15 metres long. They are found in oceans or lakes. Icebergs are made when they break off a larger glacier. Icebergs are made of freshwater, as they begin their live on land.
- Sea Ice – Sea ice is frozen ocean water; therefore, it is made of saltwater. Sea ice floats on the ocean's surface.
- Ice Shelf – Ice shelves are permanent floating sheets of ice that are connected to a landmass. When ice breaks off an ice shelf, it can become an iceberg.

Name: _____ 64

Curriculum Connection
ES.1

Questions

Use information from the text to support your answer

1) What is a glacier?

2) What is [illegible] sheet? Where are they found?

Order

Put the glaciers [illegible] smallest (1) to largest (6)

Iceberg	Ice Cap	Ice Sheet	Ice [illegible]	[illegible] Ice	Lake/River Ice

Multiple Choice

Circle the best answer

1) The largest glacier is an	Ice cap	Ice sheet
2) An ice sheet must be larger than	100,000 km^2	50,000 km^2
3) A glacier that is smaller and is made of freshwater	Sea Ice	Iceberg
4) Sea Ice is made of	Freshwater	Saltwater
5) Most glaciers are made of...	Freshwater	Saltwater
6) Glaciers are...	Moving	Still

Curriculum Connection
ES.1

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____ Mark

Circle the correct answer.

1) Which term means Earth's frozen water areas?	Cryosphere
	Sea Ice
2) Largest glacier type, continental sized.	Ice Sheet
	Ice Cap
3) Floating ice connected to landmass.	Ice Shelf
	Iceberg
4) Floating ice that broke from glacier?	Sea Ice
	Iceberg
5) Only in Antarctica and Greenland?	Ice Caps
	Ice Sheets

Name: _____ Mark

Circle the correct answer.

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	Iceberg
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	Iceberg
5) Only in Antarctica and Greenland?	Ice Caps
	Ice Sheets

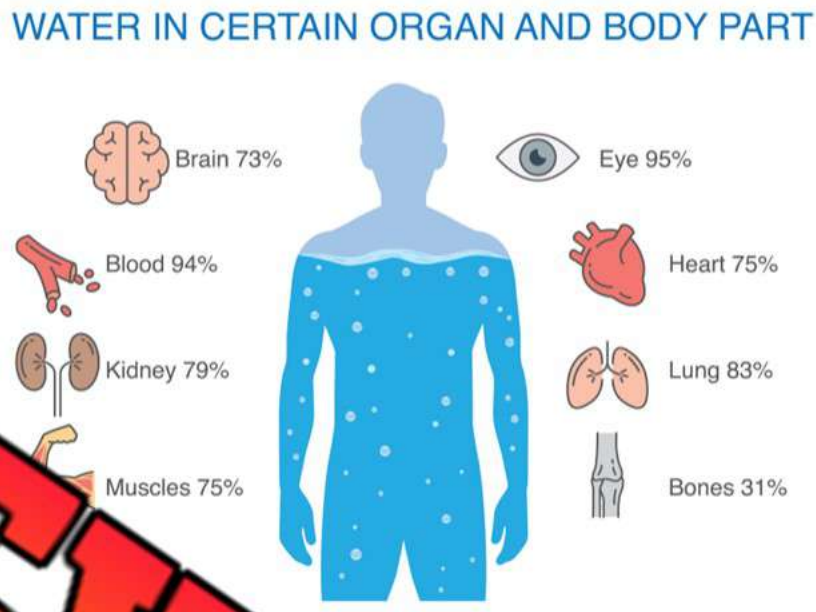
Name: _____ 66

Curriculum Connection
ES.3

All Living Things Need Water

Water

All living things need water to live. Our bodies are made of 75% water. It is very important to drink enough water every day. Most people should drink at least [illegible] of water a day. Our bodies lose water when we go to the bathroom, when we sweat and when we breathe.



Water makes our bodies work and stay healthy. Our blood is made of 94% water. Even our brain does not work well when we don't drink enough water. When we don't drink enough water, we say we are dehydrated.

Plants Need Water

Plants use water to make food for themselves. They take in water from their roots. The water moves up through the plant's stem and into the leaves. The chloroplasts in the leaves use the water to make sugar for the plant to eat.

Without water, a plant will die. This is because they can't make their own food without water. Even a cactus needs a bit of water! A cactus will need to take in water once every month.

Most plants that grow in Canada need to have 2 cm of water each week. Plants will grow best when it rains a lot.

Name: _____ 67

Curriculum Connection
ES.3

Questions

Answer the questions below about the machine you chose

1) Why do we need water?

2) Why do [illegible]eed water?

Visualizing

Draw what you [illegible]stur[illegible]ou were reading. Explain the picture

Word Search

Find the word bank words in the puzzle

A	B	F	U	D	B	O	D	I	E	S	G	L	H	W	B	C
E	I	F	D	Z	D	X	Q	H	L	T	Z	L	T	A	O	A
L	X	E	Y	U	B	L	Q	F	E	A	R	T	H	T	T	C
S	E	K	R	N	E	O	H	E	A	L	T	H	T	E	T	T
N	F	F	R	E	S	H	F	D	C	Q	U	K	O	R	L	U
P	S	W	D	R	I	N	K	P	L	A	N	T	S	T	E	S

Word Bank

❑ Water	❑ Fresh
❑ Drink	❑ Bodies
❑ Health	❑ Need
❑ Earth	❑ Bottle

Name: _____ 68

Curriculum Connection
ES.3

Bodies of Water - Plants and Animals

Bodies of Water - Plants and Animals
Water is home to a diverse range of plants and animals. From the smallest pond to the vast ocean, each body of water has unique life forms. Let's dive in and explore some of them!

Ponds and Lakes
Ponds and lakes are freshwater bodies of water. They're home to a diverse array of plants and animals.

- Plants: Water lilies, cattails, and duckweed are common. They provide shelter and food for animals.
- Animals: Frogs, turtles, ducks, and many kinds of fish live here. Insects like dragonflies and water striders skim across the water's surface.

Rivers and Streams
Rivers and streams are moving bodies of water. They are full of life too!

- Plants: Waterweeds and reeds grow here. These plants are strong and can handle the fast water flow.
- Animals: Fish like trout and salmon live here. Rivers, otters, and even bears can be found nearby.

Oceans
Oceans are the largest bodies of water. They're saltwater, not freshwater.

- Plants: Seaweed and kelp are common. They create underwater "forests" that many creatures call home.
- Animals: There's a huge range! Tiny shrimp, colorful fish, dolphins, whales, and sharks all live in the ocean.

Coral Reefs
Coral reefs are "underwater cities" in the ocean.

- Plants: Algae live in the coral and give it bright colors.
- Animals: Coral reefs are some of the most diverse habitats. They house clownfish, sea turtles, eels, and starfish.

Name: _____ 69

Curriculum Connection
ES.3

True or False

Circle whether the statement is true or false

1) Ponds and lakes are saltwater bodies.	True	False
2) Ducks live in ponds and lakes.	True	False
3) Trout and salmon live in rivers and streams.	True	False
4) Oceans are freshwater bodies.	True	False
5) Coral r[illegible]e found in lakes.	True	False

Describe

Describe e[illegible] aquatic habitats and the plants and animals that live there

Ponds and Lakes	
Rivers and Streams	
Oceans	
Coral Reefs	

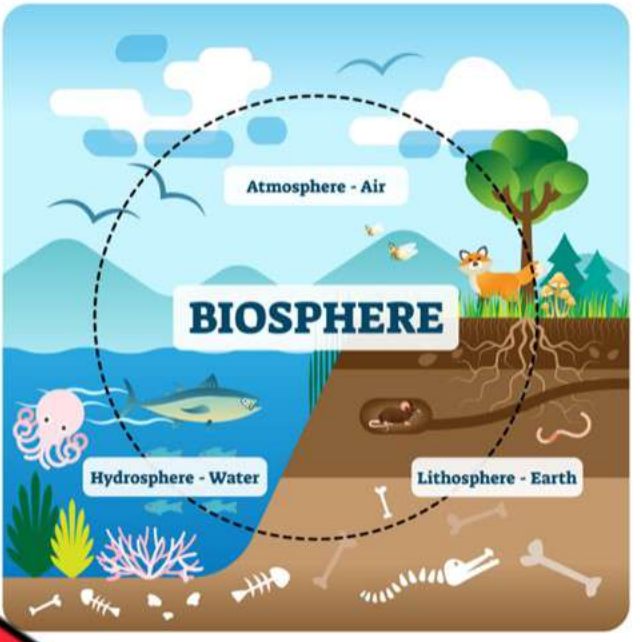
Name: _____ 74

Curriculum Connection
ES.1

What is the Biosphere?

What is the Biosphere?

The biosphere is like a giant, global house where every living thing on Earth resides! From the tiniest microbe to the tallest giraffe, from deep [illegible] creatures to birds in the sky, everythi[illegible] life is part of the biosphere.



Where is the Bios[illegible]

The biosphere [illegible] the pla[illegible]ers many regions on Ea[illegible]her[illegible]d. Here's where you can find [illegible]here:

- Land: On land, life can be found in a[illegible]r pla[illegible]his includes lush forests, hot deserts, high mountains, and even y[illegible] own ba[illegible]d!
- Water: Life loves water! From the deepest o[illegible]ren[illegible]llest ponds, you'll find members of the biosphere. This include[illegible]urtles, ar[illegible] tiny plankton.
- Air: Yes, even in the sky! Birds, insects, and bats are all airborne [illegible] biosphere.
- Underground: Even below the surface, there is life. This includes earthworms in soil, moles in burrows, and bacteria in rocks deep within Earth!

Why is the Biosphere Important?

The biosphere is essential because it includes all life on Earth, and life supports life! Every creature plays a part. Bees help flowers by pollinating them. Plants give us oxygen to breathe. Even small creatures like worms help make the soil good for plants.

Name: _____ 75

Curriculum Connection
ES.1

Draw Draw living things in water, on land (underground too), and in the air

Questions Use information from the text [illegible]

1) What is the biosphere?

_____

_____

_____

2) How does life support life? How do living things help other living things?

_____

_____

_____

_____

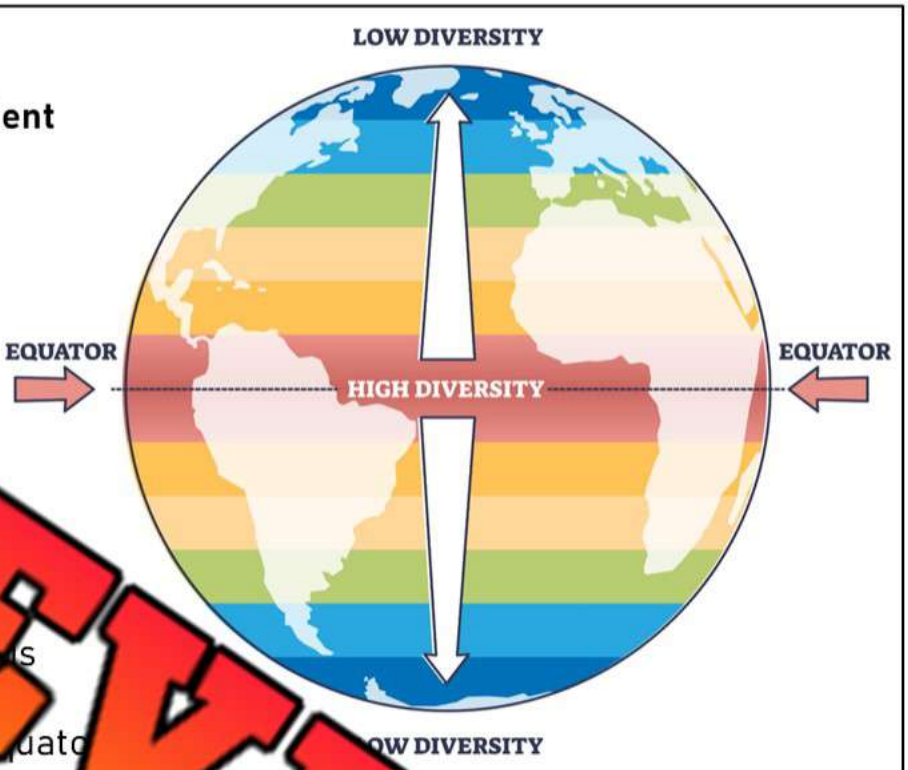
Name: _____ 82

Curriculum Connection
ES.2

Longitudinal Biodiversity Gradient

Biodiversity on Earth

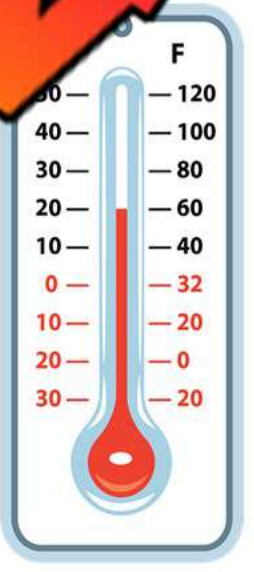
The **latitudinal biodiversity gradient** shows which areas around the world hav most Biodiver



A u can he gradient, the m versit be found along the equa ls because the climate along the uato most mild. This means the temperatures, wind, ainf all almost the same all year.

The temperature is warm and the days are long e Th is why the places near the equator are great for plants and animals t

As you get further from the equator, the climate changes from mild to extreme. The climate on the poles is very difficult to survive in as the temperatures go from -29°C to 23°C. Organisms that live in these climates must be adapted so they can survive in very cold temperatures and warmer temperatures as well.



Name: _____ 83

Curriculum Connection
ES.2

Questions

Answer the questions below using evidence from the text

1) Why is it easier to live near the equator?

2) Why is [illegible] to live near the north or south pole?

Questioning

What questions [illegible] you [illegible] ling the information?

1)	
2)	

True or False

Circle whether the statement is true or false

1) The temperature changes a lot if you live near the equator	True	False
2) Florida is near the equator, so it is warm all year	True	False
3) Animals living away from the equator need to adapt to changing weather	True	False
4) More plants and animals live near the poles	True	False
5) More plants and animals live near the equator	True	False

Name: _____ 86

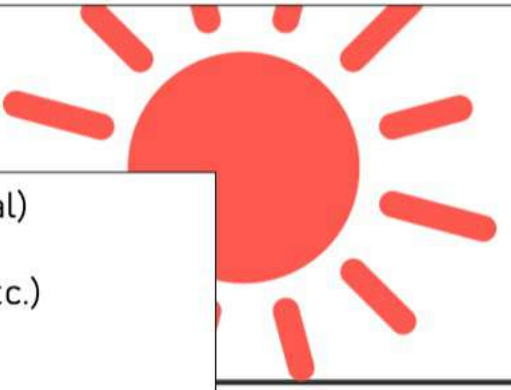
Curriculum Connection
ES.2

Experiment: Effects of Solar Energy

Objective

What are we learning more about?

In this experiment, students will explore how solar energy, or sunlight, affects different materials like water, soil, grass, asphalt, concrete, wood, and metal.



Materials

What do we need?

- ✓ S[illegible]s (one for each material)
- ✓ W[illegible]
- ✓ Something [illegible] paper clips, etc.)
- ✓ Soil
- ✓ Grass
- ✓ Area where there [illegible]nt
- ✓ A small piece of wo[illegible]
- ✓ A sunny outdoor space
- ✓ An infrared thermometer or regu[illegible]ome

Method

How do we complete the exper[illegible]?

1) Setting up the materials: choose the materials yo[illegible]t. Th[illegible] each material in separate containers.

2) Initial Temperature Measurement: Put the materials in a shady are[illegible]e no direct solar energy will affect them. Wait 30 minutes and then use[illegible]nfrared thermometer to measure the temperature of each material. If using a regular thermometer, place it on the material for a minute before reading the temperature. For the asphalt/cement, you will need to measure it when it is in the shade.

3) Start the Experiment: Let the materials sit in the sun for 15 minutes. Make sure all materials receive equal sunlight.

4) Take Measurements: After 15 minutes, use the thermometer to measure the temperature of each material again. Then continue measuring every 15 minutes for 1 hour.

Name: _____ 87

Curriculum Connection
ES.2

Observations Fill in the table below. Write the materials you are using and then record the initial measurement and measurements after 15-minute increments

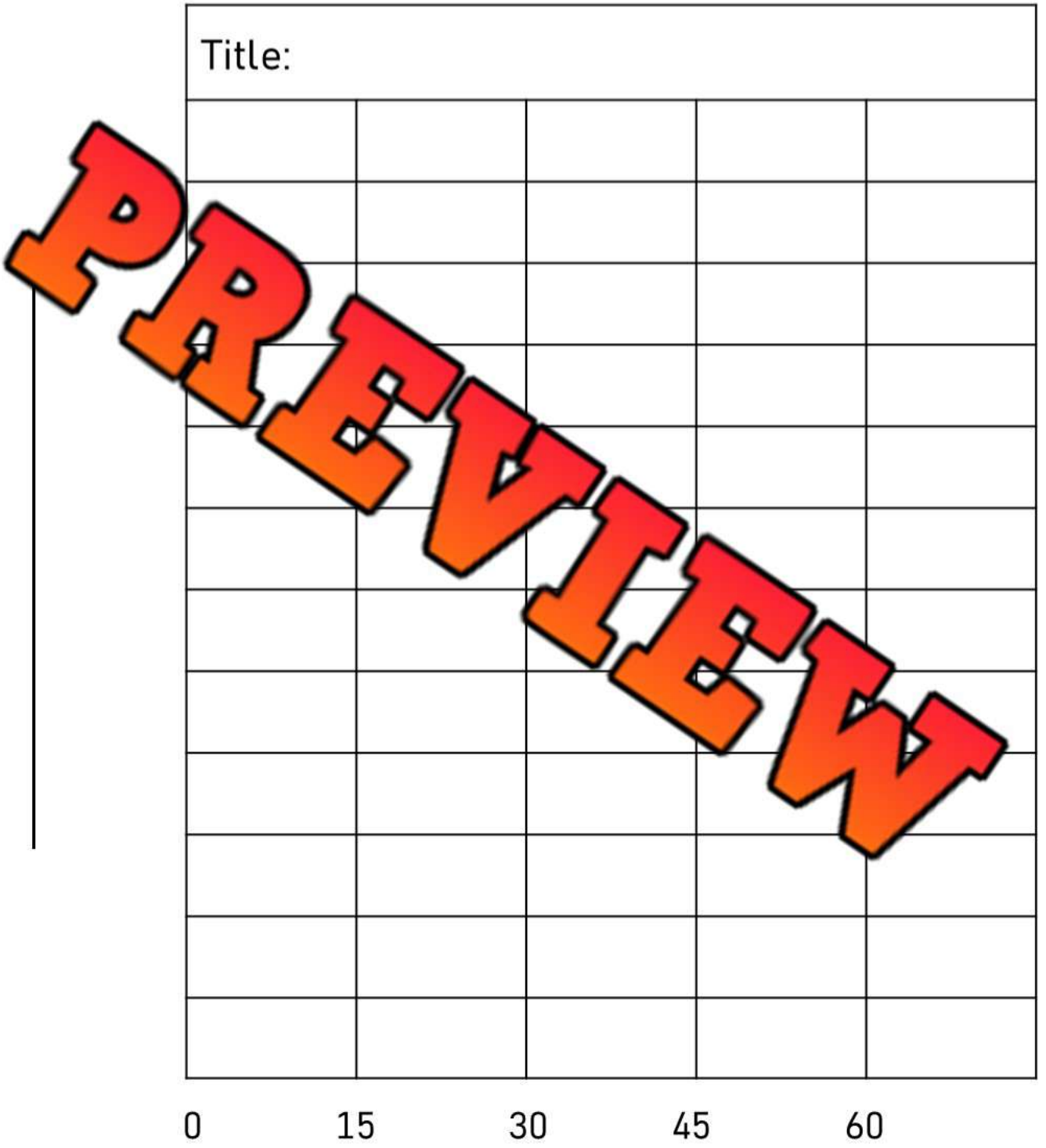
Materials	Initial Measurement	After 15 Minutes	After 30 Minutes	After 45 Minutes	After 60 Minutes

Name: _____ 88

Curriculum Connection
ES.2

Experiment: Effects of Solar Energy

Graph Choose one material to graph. Choose the material that had the biggest change.



Name: _____ 92

Curriculum Connection
ES.5

Natural Resources in Canada

Natural Resources

We call materials and substances that we find in our environment **natural resources**. Think about that. This means that anything you find in your yard is a natural resource.

Some natural resources are worth more than others. The dirt you find in your yard isn't worth much as soil can be found almost anywhere. Gold on the other hand, is a valuable natural resource because it is hard to find! Examples of other natural resources include wat trees, air, oil, coal, natural gas, iron, and copper.

Valuable N sources

A natura is able based on how easy it is to find and how important the resou to our d ead the list below to learn more about 5 natural resources that are y valu

1. Water – Even e ear ly water, only 2.5% of that water is drinkable or useable for cook
2. Air – We NEED clean air ma important natural resource. Clean air is needed, and some places h eav from power plant exhaust as well as exhaust from vehicles.
3. Coal – it is estimated that we will run out of coal e ne years. Coal provides us with electricity that we use to power our ele s.
4. Oil – Some experts believe we will run out of oil in t years used as fuel for our vehicles. It takes millions of years for new oil t
5. Natural Gas – We use natural gas to power many of the machines h as our furnace, air conditioners, stoves, and BBQs.

How Regions Benefit from Natural Resources

When one region has access to valuable natural resources, they benefit because they can sell this resource to other provinces or territories. They can also sell to other countries around the world.

For example, Alberta and the Interior Plains produce the most oil in the world! This means they can sell the valuable oil to other places in order to make money for their province. It also means that many people move to Alberta to get jobs on the oil sands. These jobs usually pay a lot because of all the money the companies are making by selling the oil. These companies pay heavy taxes to the government of Alberta, meaning Alberta benefits as well for having these natural resources on its land.

Name: _____ 93

Curriculum Connection
ES.5

True or False

Circle whether the statement is true or false

1. Air is considered a natural resource because it exists in our environment	True	False
2. Some natural resources are more valuable than others	True	False
3. Soil is a valuable natural resource because it is hard to find	True	False
4. Oil is a natural resource that has benefitted Alberta	True	False
5. Water is [illegible] valuable resource because water is found easily	True	False

Ques[illegible] An[illegible] the questions below using evidence from the text

1. What are na[illegible]es? [illegible]e 3 examples. Try to think of 1 that is not from the reading.

_____

_____

_____

2. How do natural resources help provinces and re[illegible]? Wh[illegible]hey valuable?

_____

_____

_____

_____

Summarize

What is the main idea and the supporting details of the reading?

_____

_____

_____

_____

_____

Curriculum Connection
ES.5

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____

Circle the correct answer.

Mark

1) Which is a natural resource?	Microchips
	Air
2) What do companies pay to the government?	Salaries
	Taxes
3) Which resource powers many home appliances?	Natural Gas
	Soil
4) Which resource fuels most vehicles?	Coal
	Oil
5) Which resource often generates electricity?	Wood
	Coal

Name: _____

Circle the correct answer.

Mark

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	Coal

Name: _____

Circle the correct answer.

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	Soil
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	Oil
5) Which resource often generates electricity?	Wood
	Coal

Name: _____ 97

Curriculum Connection
ES.5

Natural Resources in Alberta

Natural Resources in Alberta

Alberta is a province in Canada that has an abundance of natural resources. Natural resources are things that come from the earth that we can use in many ways. Let's learn about some important natural resources in Alberta.

- Forests - Alberta has many forests that cover a large part of the province. Forests are important because they supply wood for building things like furniture, paper. They also help clean the air we breathe and offer homes to animals.

- Fish - Alberta has a lot of fish in its rivers and lakes. Fish are important because they provide food for people and animals. Some of the most common fish in Alberta are trout, northern pike, and walleye.

- Oil and Gas - Alberta is well-known for its oil and gas deposits. Oil and gas are important because they are used for heating homes, running cars, and making many things like plastic. Alberta is one of the largest producers of oil and gas in the world.

- Water - Alberta has a lot of water in its rivers and lakes. Water is important because it provides drinking water for people and animals. It also helps plants grow and offers habitats for fish and other animals.

Forests, fish, oil and gas, and water are some of the most important natural resources in Alberta. It's essential to take care of these resources so that they can continue to serve us in the future.

Name: _____ 98

Curriculum Connection
ES.5

True or False

Circle whether the statement is true or false

1) Forests are one of Alberta's most important natural resources	True	False
2) Wood isn't very important in our day-to-day lives	True	False
3) Oil is used to make plastics	True	False
4) Alberta has lots of water in its oceans	True	False
5) We can [illegible] many resources as we want because we have lots	True	False

Word [illegible]

[illegible] the words in the word search

Natural	R[illegible]es
Geography	Forests
Fish	Mining
Energy	Economy
Conserve	Extract
Future	Salmon
Trout	Cod

T R A C T Q F B Q O B Z L T B
M O N T K U K A Q N A P Z
N R W O B T U M D I F G
I V I E C U B Q X O N
T E N Y E O R I I R I
U X G B W B S E C E N
O N S O M R A L S I
R E S O U R I K H T M
T G E O G R A P Y G
W X M V D I Y D V C V E

Reflect

Which natural resources are most important in your community?

Name: _____ 99

Curriculum Connection
ES.5

Pictionary: Natural Resources

Objective

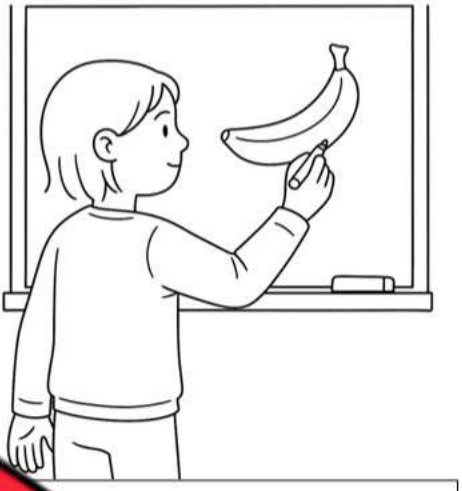
What are we learning about?

Students will learn about natural resources by drawing and guessing them in a fun game. They will explore how natural resources are part of Earth's systems and why they are important for people, animals, and the environment.

Materials

What will you need for the activity?

- Markers
- Natural resources (examples, rivers, rocks, fish, mountains, clouds)



Instructions

How will you complete the activity?

1. Split the class into two teams, maybe by rows or groups of desks.
2. Have one student from Team A come up and pick a card. They should keep the card a secret from everyone else.
3. The student then draws what's on the card on a whiteboard or large paper.
4. Start a timer for 2 minutes. During this time, Team A tries to guess what is being drawn.
5. If Team A guesses the drawing correctly before the timer goes off, they earn a point.
6. Next, it's Team B's turn. A student from Team B picks a card and draws, while their team guesses.
7. Alternate turns between the two teams, letting different students draw each time.
8. Continue the game until all the cards have been used. Keep track of points for each team.
9. At the end, count the points. The team with the most points is the winner of Natural Resources Pictionary!

Name: _____ 100

Curriculum Connection
ES.5

Pictionary Topics | Cut out the topics below.

Tree	River
Fish	Mountain
Sun	Wind
Cloud	Soil
[illegible]	Rock
Flower	Grass
Sand	Lake
Shell	Leaf
Bird	Rain
Star	Moon
Volcano	Iceberg
Waterfall	Cave
Bee	Mushroom
Fruit	Snowflake
Coal	Oil

Name: _____ 102

Curriculum Connection
ES.5

Resource Town in Alberta

What is a Resource Town?

A **resource town** is a community that grows because of the resources available in the area. Quite often, one natural resource is found in an area. When this happens, people move to that area so they can work for companies that extract the resource.

As more and more people move to the area, shops, businesses, and residential areas (hou gin to develop as well. This is an example of how a natural resource can lead to c eloping around it. We call these communities resource towns.

Resour wn in ort McMurray

In 1964, the fir proje rt McMurray began. The Great Canadian Oil Sands (now Suncor Energy) was given permission to build a factory that separates bitumen from oil sands. Many people throughout North America moved to the oil sands to find jobs. The town grew from 2,614 people to 10,000 people by the mid-1970s.

Ten years later, a second project led by Syncrude Canada sta ew to nearly 37,000 with more jobs available. By the late 1990s, Fort McMurray ulation grew to 47,705 people. In 2020, Fort McMurray had a population of 137,000. With so many people living in Fort McMurray, other services were needed to keep the people safe and happy. City workers were needed to offer water, sewage removal, roads, snow removal, and many other services. Many businesses like banks, grocery stores, and restaurants were needed as well. This meant that the small town that was build around the oil sands became a large urban city with everything people needed.

Name: _____ 103

Curriculum Connection
ES.5

Questions

Use information from the text to support your answer

1) Why do communities often develop near natural resources?

2) Why is F Murray considered a resource town?

Making Connections

Ar y re your town that draw people to it?

True or False

Circle whether the statement is true or false

1) The first oil sands project in Fort McMurray was in 1672	True	False
2) Many people moved to Fort McMurray to work at the oil sands	True	False
3) The population grew from just 2,000 to 137,000 in only 56 years	True	False
4) Oil in Alberta is very valuable	True	False
5) Communities grow when surrounded by valuable natural resources	True	False

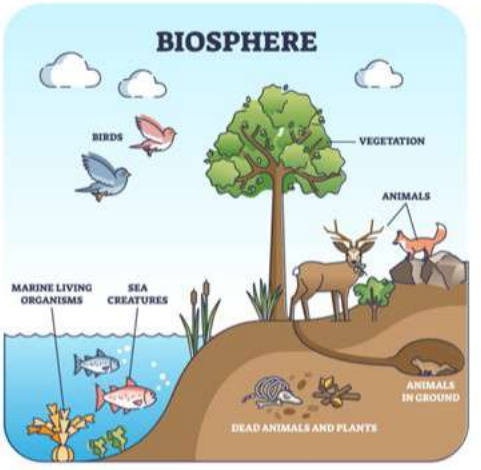
Name: _____ 104

Curriculum Connection
ES.4

Interconnections Between Earth's Spheres

Interconnections of Earth's Spheres

Earth is made up of different family members, or "spheres": the Lithosphere, Atmosphere, Hydrosphere, and Biosphere. Each of these spheres a[illegible]ely interconnected as they help each o[illegible]ys.



	[illegible]e	Atmosphere	Hydrosphere	Biosphere
Lithosphere	-	W[illegible]lcanoes up, [illegible]ake [illegible]g ash [illegible]at int[illegible]	When it rains, the rainwater comes down and makes the [illegible]nd wet	The soil in the land helps plants grow big and strong
Atmosphere	Ash from erupting volcanoes goes up into the air	-	[illegible]d in the air g[illegible] wat[illegible] re[illegible] [illegible]ng up o[illegible]s, lakes, [illegible]d rivers	Plants breathe in the air and [illegible] it to make [illegible]r [illegible]n food
Hydrosphere	Rainwater can wash soil from the land into rivers and lakes	When the sun shines, it heats up the water, causing it to turn into water vapor and go up into the air	-	[illegible]ing [illegible]ngs, including plants and animals, need water to grow and stay healthy
Biosphere	When plants and animals die, they can turn into soil, making the land richer	Plants take in a gas called carbon dioxide from the air and give off oxygen which we need to breathe	Animals like fish live in water and birds drink it	-

Name: _____ 105

Curriculum Connection
ES.4

Questions

Answer the questions below using evidence from the text

1) Are Earth's systems connected? Explain.

2) Why is it important to keep all of our spheres healthy?

Biosphere

How is the biosphere connected with the other spheres?

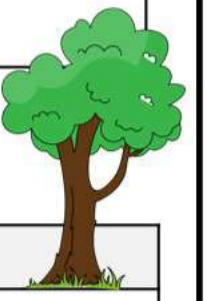
Lithosphere and Biosphere	
Hydrosphere and Biosphere	
Atmosphere and Biosphere	

Name: _____ 106

Curriculum Connection
ES.4

Change in One Sphere Affect Others

Change in Biosphere: A forest full of trees is removed to make space for a new city	
Lithosphere	The land where the trees once grew becomes bare. The tree roots are not there to hold the soil together anymore. This can lead to soil erosion, where the soil gets washed away more easily when it rains
Hydrosph	The soil that gets washed away can end up in our rivers, lakes, or oceans, making the water muddy and not so clean. Also, trees usually lp drink up water from the ground. Without the trees, there might much water left, which can lead to flooding
Atmosphere	mazing because they breathe in a gas called carbon and breathe out oxygen, which we need to live. the t could be more carbon dioxide left in the air. n make the Earth warmer, a process known a warmi



Questions Answer the questions using ce from the text

1) What is the change that is affecting other es?

_____

_____

2) How is the change affecting the other spheres below? Paraphrase information from the text. Add any other effects you can think of.

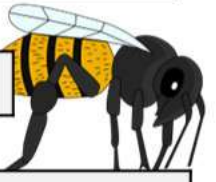
Lithosphere	
Hydrosphere	
Atmosphere	

Name: _____ 107

Curriculum Connection
ES.4

Change in One Sphere Affect Others

Change in Biosphere: The number of bees is decreasing rapidly	
Lithosphere	With fewer bees to pollinate flowers, there may be fewer plants. This could change the way our landscapes and gardens look
Hydrosp	Fewer plants due to less pollination could lead to more water runoff hen it rains, as plants help to absorb water. This would cause g.
Atmosphere	pla due to less pollination by bees, there could be less prodau ause plants create oxygen when they grow



Questions Answer the s b evidence from the text

1) What is the change that is affecting her sph ?
_____
_____

2) How is the change affecting the other spheres below? Parap information from the text. Add any other effects you can think

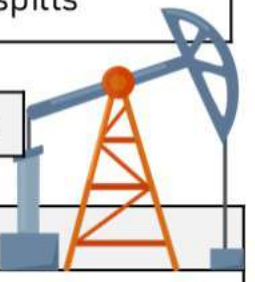
Lithosphere	
Hydrosphere	
Atmosphere	

Name: _____ 108

Curriculum Connection
ES.4

Change in One Sphere Affect Others

Change in Lithosphere: A big piece of land is changed when we drill deep holes to get oil from underground	
Hydrosphere	Sometimes accidents happen during drilling and oil can spill out. This can make rivers, lakes, and oceans dirty and harm the fish and other animals living in the water
Atm	when we use the oil in our cars and factories, it releases a gas called ca dioxide into the air. This gas can make the Earth warmer, a p known as global warming
Biosphere	s that l the land where we drilled lose their homes. A imal water can get sick from the oil spills



Questions Answer the ques s be vidence from the text

1) What is the change that is affecting other sp s?

_____

_____

2) How is the change affecting the other spheres below? Parap information from the text. Add any other effects you can think of.

Hydrosphere	
Atmosphere	
Biosphere	

Name: _____ 110

Curriculum Connection
ES.6

Ways to Conserve Earth's Systems

What is Conservation?

Conservation means taking care of our planet and its many different parts, like the air, the water, the land, and all the animals and plants.

Lithosphere: The Land We Live On

- Recycl… …en we recycle, we use old things to make new ones, reducing trash and keep… …d …ean.
- Co… …ting: W… …ost our food waste. This returns nutrients to the soil, helping plants gro… …k… …g ou… …healthy.

Hydrosphere: Our Wo… …f W…

- Saving Water: By turnin… …fauc… …brush our teeth, or taking shorter shows…s, we… …clo… …ter.
- Cleaning Up: Picking up trash and not littering … our … lakes, and oceans clean, which is better for fish and other wat… …mals.

Biosphere: Home to All Life

- Protecting Animals: Keeping animals safe helps keep our world … protect animals by not destroying their homes or hunting them t… …m.
- Growing Gardens: Planting flowers, vegetables, and other plants provides food and shelter for insects, birds, and other creatures.

Atmosphere: The Air Above Us

- Using Public Transit, Biking, or Walking: Cars can make the air dirty. By driving less and using other ways to get around, we help keep the air clean.
- Using Less Energy: When we use less electricity, like turning off lights when we leave a room, we create less pollution that can dirty the air.

Name: _____ 111

Curriculum Connection
ES.6

Plan Fill in the table below to plan how you can conserve to help Earth's systems

List 5 things you can do to conserve so that Earth's systems can be healthy.	
1	
2	
3	
4	
5	

2) How will you doing these things help the Earth's system?

3) Why is it important for all humans to conserve? Why do we need to work together?

Name: _____ 113

Curriculum Connection
ES.6

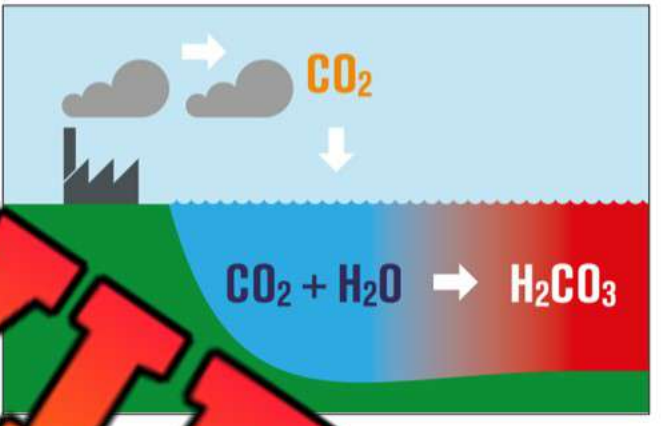
How Humans Affect Water

How Humans Affect Water

Humans need clean water to live. The problem is that many things humans do make our water dirty. Below are 5 ways humans are making water pollution.

1) Farming

To grow p… farmers use pesticides, fertilizers, and manure to make the soil better. … groundwater becomes polluted with too many chemicals that seep … into th… water.



2) Burning Ga… … Wate…

When we burn gas in … … and … airplanes, we make carbon … Ca… dioxide is air pollution. But, carbon di… also gets into our water. When it does, … combines with saltwater in the oceans and m… carb… ac… animals living in the oceans don't like carbonic acid, they like clea… …ter.

3) Medicine

In Canada, doctors give medicines like antibiotics and narcotics to he… …r patients. Some of these medicines don't get thrown out the right way. Instead, they end up in garbage dumps. When rain falls on the medicine, it leaches into the groundwater that we drink.

4) Cities

When cities grow, they take over land that was used to clean water. For example, wetlands filter dirty water and make it clean. When we destroy wetlands, we make water pollution worse.

Name: _____ 114

Curriculum Connection
ES.6

Questions | Answer the questions below

1) How do humans pollute our water?

2) What is acid[illegible] do[illegible]t happen?

True or False | Circle whether the statement is [illegible]lse

1) Farms can make water pollution	[illegible]rue	False
2) Burning gas makes acid water in oceans	True	False
3) Most water animals like living in acid water	True	False
4) Wetlands are bad because they pollute water	True	False
5) Medicines can pollute our water	True	False
6) Wetlands filter water to make it clean	True	False
7) Leaching is when water washes through soil	True	False

Name: _____ 119

Curriculum Connection
CS.1

STEM – Water Testing Technologies

Changing Technologies

For farmers, the most important thing is the quality of their soil and water. In the past, farmers had to send their soil and water samples to science laboratories to test the quality. The process was time-consuming and cost a lot of money.

Today, farmers can use something called an AgroPad t[illegible] their water and soil quality. To run the test, you t[illegible] groPad (a card about the size of a bank card), and put a drop of water or soil o[illegible] s than 10 seconds, the card will change colours.

[illegible] oPad app on your smartphone to scan the card. The app will then gi[illegible] u the r[illegible] need to understand the quality of your water and/or soil. The app will test th[illegible], m[illegible] sium, aluminium, and nitrogen levels found in the soil and water. If fa[illegible] test th[illegible] nd water, they can add the nutrients it needs to be healthy. Healthy [illegible] and [illegible] tter crops and more food for everyone!

The AgroPad is [illegible] It h[illegible] family farms around the world. IBM understands that 80% of fo[illegible] wide[illegible] om family farms. These family farms need to be supported by the hi[illegible] scie[illegible] nology.

Multiple Choice

Circle t[illegible] orrect [illegible] er

1) The AgroPad is made by	[illegible]	Microsoft
2) The AgroPad can test the quality of water and	S[illegible]	Air
3) You can find out if your water or soil has too much	Cl[illegible]	[illegible]um
4) You can add _____ if your soil is low in something	[illegible]	[illegible]trients
5) Family farms grow what percentage of food worldwide?	50%	80%

Question

How is technology helping farmers around the world?

_____

_____

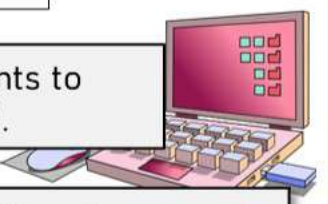
_____

_____

Name: _____ 120

Curriculum Connection
CS.1

STEM – Water Testing Invention



Create your own invention that tests the quality of water and adds nutrients to make the water quality better. Use the legend below to know what to add.

Test Results	What to Add When High Levels	What to Add When Low Levels
Levels of pH	Sodium bisulfate	Sodium Bicarbonate
Levels o lorine	Hydrogen peroxide	Chlorine
Levels o ium	Sodium	Magnesium
Lev u	Malic acid	Aluminum
Level nitro	Chlorine	Nitrogen

IF/THEN Wr r your invention

If the pH is high and mag s lo

THEN

If chlorine is high and nitrogen is low

THEN

If nitrogen is high and aluminum is low

THEN

If the levels of pH, magnesium and nitrogen are high

THEN

If the pH, nitrogen, magnesium, and aluminum are low

THEN

If the pH and chlorine are high, but the aluminum and magnesium are low

THEN

Name: _____ 121

Curriculum Connection
CS.1

STEM – Water Testing Invention

Draw your invention. Make sure the invention has:

- ✓ A place to put the water
- ✓ A screen to tell you the results
- ✓ A start button
- ✓ Any other buttons it will need to work

Name: _____ 122

Curriculum Connection
CS.1

Questions | Answer the questions about your machine below

1) How does your water testing machine work?

2) What bu...es your machine have?

3) For at least 2 buttons, ...be that ... machine what to do when the button is pressed. For example, if on ...pre... light

4) How will your machine help people? Explain its impact on the world.

Name: _____ 123

Curriculum Connection
CS.1

STEM | Math connection – answer the questions below

1) How much does it cost for you to make your machine? Think of the parts you will need and estimate a price.

2) How m its will you make at first?

3) How much its you in total?

4) How much will you sell for

5) How much net profit will you earn if you s the u ill make? For net profit, you'll find the gross and subtract the c bu

6) If you wanted to make $100,000 in profit, how many units would you need to sell?

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Curriculum Connection
CS.1

Writing Code – Calgary's Water Service

Automation is so much more efficient than manually performing work. Furthermore, automation makes less mistakes, as there are no user-errors. That is why the City of Calgary has hired you to automate their billing service.

They would like you to write a code that charges people based on how much water they use. Below is what they want to charge residents for how much water they use.

Tier	Amount of Water	Cost
	Up to 6 cubic metres	$1.00/m^3
	7 to 25 cubic metres	$1.50/m^3
3	180 cubic metres	$2.00/m^3
	tha cubic metres	$3.00/m^3

Coding	Write ents that will send a bill to residents in Calgary ba ir wa

Name: _____ 125

Curriculum Connection
CS.1

Writing Code – Calgary's Water Service

STEM Fill in the code below by calculating the cost of the water for the resident

1) Fill in the blank below to determine how much the resident owes.

```
email = input ("please enter your email so we can send you your bill")
if resident uses [40 m3] of water
    then set [balance owed] to [          ]
    send [balance owed] to [email]
```

2) Describe how the above works.

3) Fill in the blank below to determine how much the resident owes.

```
email = input ("please enter your email so we can send you your bill")
if resident uses [112 m3] of water
    then set [balance owed] to [          ]
    send [balance owed] to [email]
```

4) Fill in the blank below to determine how much the resident owes.

```
email = input ("please enter your email so we can send you your bill")
if resident uses [351 m3] of water
    then set [balance owed] to [          ]
    send [balance owed] to [email]
```

Name: _____ 127

Curriculum Connection
ES.7

Personal Water Consumption - Survey

Water in the World

There is a lot of water in the world, but not a lot of freshwater. Only about 1% of all water can be used for drinking.

Also, to turn dirty water from our homes into drinking water, it takes a lot of w[illegible]. For these reasons, we need to save water when we can.

Sur[illegible]er the questions below

	Answer
1) Do you take ba[illegible] sho[illegible]?	
2) While brushing your te[illegible]u l[illegible]r run?	
3) Do you let the water run while yo[illegible] your	
4) Do you take long, medium, or short show[illegible]	
5) Does your toilet have a full and half flush?	
6) Do you have a pool that you need to fill with water?	
7) Is your shower a high flow or low flow? Is it strong?	
8) Do you wash dishes with running water?	
9) Do you run a dishwater without it being completely full?	
10) Do you use your washing machine without a full load?	
11) If you have a pool, do you use a solar cover to stop water from evaporating?	
12) Do you water your gardens or lawn a lot?	

Curriculum Connection
ES.7

Water Wasting

Answer the questions below

1) Do you waste a lot of water? Explain how you waste water below.

2) Use some of the ideas from the previous page to come up with ways you could conserve water in your

How the Indigenous Use Water

Honouring Water – First Nations, Métis, and Inuit

Water is honoured by indigenous groups. Water is the most important gift on Mother Earth. It provides an interconnection between living things as all living things need water. Water flows between us, within us, and it replenishes us. Water is the bloo[illegible] of Mother Earth.

The [illegible]ous understand that water is the giver of all life. Without clean water [illegible]e Indigenous do not waste water or pollute water.

How the Indig[illegible]ate[illegible]

For most Indige[illegible]oups [illegible]eeded for all aspects of life. They [illegible]ater t[illegible]food. They use rivers and lakes t[illegible]om[illegible]p[illegible] another. Many use canoes to move o[illegible]ater.

The Inuit use water in the form of ice to tr[illegible]alon[illegible]y use sea ice to move around as the sea ice is connected to the lan[illegible] ice [illegible] to move from community to community. It also connects them w[illegible]ean w[illegible]hey find food like seals, walruses, and fish.

Water Pollution

The Indigenous understand that pollution is not good. When Mother Earth is sick, they feel sick too. They do not pollute the same way other groups do. Before Europeans came to present-day Canada, there was no gas burning vehicles. There were no factories. Instead, the Indigenous enjoyed a healthy environment with clean air and water.

First Nations Versus Fossil Fuels is an organization of First Nation members that oppose the water and air polluting burning of fossil fuels.

Name: _____ 131

Curriculum Connection
ES.6

Questions

Answer the questions below

1) How do the Indigenous use water?

2) Why is [illegible]portant to Indigenous groups?

Multiple Choice

Circ[illegible]e be[illegible]

1) The Indigenous pollute more or less than other[illegible]ups?	More	Less
2) To the Indigenous, water is...	[illegible]d	Useless
3) When the environment is unhealthy, the indigenous [illegible]	He[illegible]d	Unhealthy
4) The Inuit move around on...	S[illegible]	[illegible]ains
5) Many Indigenous groups use _____ to move on water	Ships	Canoes

Visualizing

Draw what you were picturing while you were reading. Explain the picture

Parks Canada and Heritage Sites in Alberta

What is Parks Canada?

Parks Canada is a special agency that takes care of Canada's national parks, national historic sites, and marine conservation areas. Their job is to protect these special places for all of us to enjoy and learn from. They also make sure that these places are safe for the plants, animals, and people who visit or live there.

Protecting Heritage

Heritage sites are places that have special meaning because of the important things that happened there. Parks Canada helps to protect these sites in many ways. They repair old buildings, take care of artifacts, and even recreate events from the past for visitors to experience.

Heritage Sites in Alberta

Alberta has some very special heritage sites that are taken care of by Parks Canada. Let's learn about a few of them:

- Banff National Park: This is Canada's first National Park. It has stunning mountains, clear blue lakes, and lots of wildlife. Parks Canada helps to keep the park clean and safe for all the animals that live there and the people who visit.
- Rocky Mountain House National Historic Site: This is a special place where you can learn about the fur trade, which was a very important part of Alberta's history. Parks Canada takes care of the old buildings and artifacts and even puts on special events where visitors can experience what life was like during the fur trade.
- Head-Smashed-In Buffalo Jump World Heritage Site: This site was used by the Blackfoot for thousands of years to hunt buffalo. Today, Parks Canada helps to preserve the site and teaches visitors about its history.

Name: _____ 133

Curriculum Connection
ES.6

Questions

Use information from the text to support your answer

1) What is Parks Canada? What do they do?

2) Why is P nada important? What would happen if we didn't have Parks Canada?

Making Connections

H hea f these heritage sites?

True or False

Circle whether the statement is true or false

1) Parks Canada takes care of Canada's zoos.	True	False
2) Heritage sites are places with special meaning.	True	False
3) Banff National Park is Canada's first National Park.	True	False
4) Parks Canada teaches visitors about Alberta's history.	True	False
5) Parks Canada helps to keep the parks clean and safe.	True	False

Name: _____ 135

Curriculum Connection
ES.6

Parks Canada Work With Indigenous Groups

Parks Canada Working With Indigenous Groups

Parks Canada works with Indigenous groups, like First Nations, Métis, and Inuit people, to take care of our special places in nature. They do this in many different ways.

Learning [illegible] Other

One [illegible] together is by learning from each other. In Alberta's Banff National [illegible] Parks Canada works with local First Nations, the Stoney Nakoda and Blackfoot. The [illegible] Parks Canada about the animals and plants in the park, and how [illegible] Parks Canada shares their knowledge about how to keep the park safe [illegible]

Sharing Stories and Traditions

Parks Canada also works with Indigenous groups to protect their stories and traditions. In Batoche National Historic Site in Saskatchewan, the local Métis people teach visitors about their history. They show how to weave sashes and dance a special dance called the Red River Jig. This way, their traditions are kept alive and shared with others.

Taking Care of the Land Together

Sometimes, Parks Canada gives back land to Indigenous groups. In the Mealy Mountains of Labrador, a new national park reserve is being created. The local Innu people will help take care of this park together with Parks Canada. This means they both make decisions about how to protect the park and its animals and plants.

Name: _____ 136

Curriculum Connection
ES.6

Questions

Use information from the text to support your answer

1) How does Parks Canada work with the Métis in Saskatchewan?

2) How do[illegible]s Canada work with the Inuit community?

3) Why do you think it is [illegible]l or Pa[illegible]da to work with Indigenous groups? Consider who has lived on t[illegible] lo[illegible]

True or False

Circle whether the statement is true or false

1) Parks Canada works alone to take care of natural places	True	False
2) At Batoche National Historic Site, Métis people share their traditions	True	False
3) Parks Canada never gives back land to Indigenous groups	True	False
4) Métis people show visitors sash weaving and the Red River Jig	True	False
5) Innu people help manage the new Mealy Mountains park	True	False

Name: _____ 139

Curriculum Connection
ES.7

Role Play – Humans Destroying Habitats

Objective — What are we learning about?

To help students understand and demonstrate how human activities can damage habitats.

Materials — What do we need?

- ✓ [illegible]
- ✓ [illegible]mes a[illegible]
- ✓ A space f[illegible] a[illegible]rformance
- ✓ Camera o[illegible]hone f[illegible]ding (optional)

Method — How do [illegible]plet[illegible]periment?

1) Cut out the human activities on [illegible]xt pag[illegible]old each one up. Place them in a hat.
2) Divide the class into small groups of 3-4 [illegible]ent[illegible]
3) Each group will pick a piece of paper from the [illegible]hum[illegible]ivity written on the paper will be the theme for their skit.
4) Give the groups time to research their chosen human acti[illegible]uld understand how the activity damages habitats and what effect [illegible]on animals, plants, and the environment.
5) Each group will then brainstorm and write a short skit that shows how this human activity damages a habitat. Make sure the skit includes a solution or a call to action to solve this problem.
6) Groups will need to rehearse their skit, deciding who will play each role and how they will perform their skit.
7) Finally, each group will perform their skit for the class. After each skit, have a class discussion about the human activity and what we can do to lessen our impact on habitats.

Name: _____ 140

Curriculum Connection
ES.7

Deforestation: Cutting down trees removes the habitat of many animals and plants, leading to loss of biodiversity.

Urbanization: Building cities and expanding human settlements often destroys natural habitats.

Pol[illegible]aste into rivers, oceans, or on land can poison habita[illegible]and m[illegible]n unlivable.

Overfishing: Removi[illegible]o many [illegible]om the sea disrupts the balance of aquatic ecosystems.

Mining: Taking resources from the ear[illegible]n lea[illegible]itat destruction and pollution.

Agriculture: Large-scale farming often involves clear[illegible]a[illegible]using pesticides which can destroy habitats.

Climate Change: Human activities leading to global warming can cause habitats to change faster than wildlife can adapt.

Poaching and Hunting: Illegal or excessive hunting can deplete wildlife populations and disrupt habitats.

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Curriculum Connection
ES.7

Planning | Plan your skit below

1) What is the human activity for your skit?

2) How will you act out this skit?

a) What characters will you have? Who will play who?

b) What will happen in your skit?

c) What will the solution to the human activity be?

Name: _____ 146

Curriculum Connection
ES.7

Memory Game – Earth Systems Review Game

Objective

What are we learning about?

Students will review key Earth Systems terms by playing a memory match game. Each card shows either a term or its short definition. Students match the correct pairs and explain how the terms connect to Earth's systems, rocks, and clouds.

Materials

What you need for the activity?

- Set of Memory Cards for each group (provided)
- A small table or clear area on the floor

Instructions

How will you complete the activity?

1) Divide the class into groups of 3 or 4. Give each group a set of Memory Game cards. (provided)
2) Have each group lay all the cards face down in a grid on the table.
3) The students take turns flipping over two cards at a time, trying to find matching term and its definition.
4) If a student finds a match, they remove those cards from the grid and keep them.
5) If the cards do not match, they are turned back over, and the next student takes a turn.
6) The game continues until all the cards have been matched.
7) After the game, review the terms and definitions with the class.
8) Discuss why these terms are important to understand and how they relate to the topic.

Name: _____ 147

Curriculum Connection
ES.7

Cards | Memory Game Cards

Lithosphere	The solid outer layer of Earth made of rocks, mountains, and land surfaces.
Bi[illegible]e	All living things on Earth, including plants, animals, and people.
Hydrosphere	All [illegible]water on Earth, like o[illegible]ans, [illegible]rs, lakes, and [illegible]ater.
Atmosphere	The layers of gas[illegible]ound Earth that give us air to breathe.
Rock Cycle	The process where rocks change type through melting, cooling, and breaking.

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Curriculum Connection
ES.7

Cards | Memory Game Cards

Igneous Rock	Rock formed when hot melted lava or magma cools and hardens.
Metamorphic Rock	Rock changed by heat and pressure into a new kind of rock.
Sedimentary Rock	Rock formed when small pieces of sand and shells pressed together.
Troposphere	The lowest layer of the atmosphere where weather and clouds form.
Exosphere	The outermost layer of Earth's atmosphere, where space begins.

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Curriculum Connection
ES.7

Cards | Memory Game Cards

Biodiversity	The variety of different living things in a place or on Earth.
Natural Resources	Things from nature like water, trees, and minerals people use.
Resource Town	A town that exists mainly because of nearby natural resources.
Cumulus Clouds	Fluffy white clouds that look like cotton and bring nice weather.
Nimbostratus Clouds	Thick, dark clouds that usually bring long periods of rain.

Name: _____ Date: _____

Unit Test – Earth Systems

Multiple Choice /10

1) Which sphere includes all the water on Earth? a) Hydrosphere b) Lithosphere c) Atmosph d) Biosphe	2) Which sphere includes all living things? a) Hydrosphere b) Lithosphere c) Atmosphere d) Biosphere
3) Whi ins belong to? a) Hydr ere b) Lithosphere c) Atmosphere d) Biosphere	4) Which sphere does air belong to? a) Hydrosphere b) Lithosphere c) Atmosphere d) Biosphere
5) Which body of water holds m Earth's water? a) Glaciers b) Rivers c) Oceans d) Groundwater	layer of atmosphere is furthest th's surface? a) Tr her phere c) Th m d) Mesosp
7) Which **doesn't** belong to the lithosphere? a) Earth's crust b) Soil c) Upper Mantle d) Inner Core	8) Where is it wa mes ear? a) At the equator b) At the north pole c) At the south pole d) In Canada
9) Which natural resource is most important in Alberta? a) Saltwater b) Oil and gas c) Fruit plants d) Gold and silver	10) Oceans have which type of water? a) Freshwater b) Glacial water c) Saltwater d) Brackish water

Definitions (1 marks each) **/3**

Term	Definition (what does it mean)
Biosphere	
Atmosph	
Conservation	

Short Answer Questions (2 ma ch)

1. What three types of rocks are part of thosph

2. Where on Earth is there the most biodiversity? Why is there more here?

3. Name 4 natural resources Alberta has a lot of.

Long Answer Questions **/10**

1) If the bee population gets smaller, how does it affect the lithosphere, hydrosphere, and atmosphere?

2) How can we protect our Earth's systems? What things are you going to do to participate in conservation? How will you be helping the Earth's systems specifically.