Workbook Preview

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Grade 7 Geography Unit

A. PHYSICAL PATTERNS IN A CHANGING WORLD

	Curriculum Expectations	Pages
A1.1	Describe various ways in which people have responded to challenges and opportunities presented by the physical environment, and analyse short- and long-term effects of some of these responses	8-10, 18-21, 27-28, 32-38, 42-50, 59-63, 89-90, 97-102
A1.2	Compare and contrast the perspectives of some different groups on the challenges and opportunities presented by the natural environment	57-58, 91-93
A1.3	Assess the physical environment in various locations around the world to determine which environment or environments have the greatest impact on people	13-17, 22-26, 39-41, 76-78, 82-83
A1.4	A er pr th	-67, -102
A2.1	F na er p	-53, , 79-81
A2.2	Gather and organize data and information from a variety of sources, and using various technologies, on the impact of natural events and/or human activities that change the physical environment, ensuring that their sources reflect more than one perspective	8-10, 15-19, 22-24, 27-28, 51-53, 68-75, 79-81, 91-93
A2.3	Analyse and construct maps as part of their investigations into the impact of natural events and/or human activities that change the physical environment, with a focus on investigating the spatial boundaries of the impact	94-96
A2.4	Interpret and analyse data and information relevant to their investigations, using various tools and spatial technologies	25-26, 51-53, 79-81, 94-96
A2.5	Evaluate evidence and draw conclusions about the impact of natural events and/or human activities that change the physical environment	20-21, 32-53, 57-83, 89-90
A2.6	Communicate the results of their inquiries, using appropriate vocabulary (e.g., climate, land use, landforms, vegetation, drought, flood, climate change, agriculture, ecotourism, land reclamation) and formats appropriate for specific audiences	54-56, 68-75, 84-88, 91-93

Preview of 80 pages from this product that contains 148 pages total.

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	Curriculum Expectations	Pages
A3.1	Identify the location and describe the physical characteristics of various landforms (e.g., mountains, plateaus, plains, valleys)	8-10, 13-17, 22-31, 54-56, 94-96
A3.2	Describe some key natural processes and human activities (e.g., tectonic forces, weathering and erosion, deposition, glaciation, mining, land-reclamation projects) that create and change landforms	8-38, 42-47, 54-56, 84-90
A3.3	Demonstrate the ability to extract information from and analyse topographical maps (e.g., construct a cross-section of a landform based on the information from a topographical map)	51-53, 94-96
A3.4	Describe patterns and physical characteristics of some major water bodies and systems around the world (e.g., river systems, drainage basins, lakes, oceans)	11-12, 18-19, 48-50, 76-78
A3.5	Describe some key natural processes and human activities (e.g., changes in rainfall, melting of glaciers, erosion, rising sea levels, climate change, constructing dams, irrigation, bottling water from aquifers) that create and change water bodies and systems	20-21, 32-50, 82-83
A3.6	Describe patterns and characteristics of major climate regions around the world (e.g., characteristics and location of tropical, dry, temperate, continental, and polar climate regions)	59-60
A3.7	Describe some key natural processes and other factors, including human activities (e.g., ocean currents, wind systems, latitude, elevation, bodies of water, landforms, deforestation, human activities that result in greenhouse gas emissions) that create and change climate patterns	76-88
A3.8	Analyse and construct climate graphs to gather information on and illustrate climate patterns for a specific location (e.g., to analyse the trend in precipitation and temperature in Singapore, Khartoum, or Warsaw over the course of a year)	76-78, 82-83
A3.9	Describe patterns and characteristics of major natural vegetation regions around the world (e.g., the location and characteristics of grasslands, boreal forests, tropical rain forests, tundra)	35-36, 39-41, 48-50, 66-67
A3.10	Describe some key natural processes and human activities (e.g., natural and human-influenced climate change, erosion of top soil, deforestation, the use of chemical fertilizers and practice of monoculture, grazing of domestic animals, activities that introduce invasive species into an environment) that create and change natural vegetation patterns	35-38, 57-60, 89-90
A3.11	Describe how different aspects of the physical environment interact with each other in two or more regions of the world (e.g., the interrelationship between vegetation, landforms, and climate in desert regions; between landforms and vegetation in a volcanic region)	57-67

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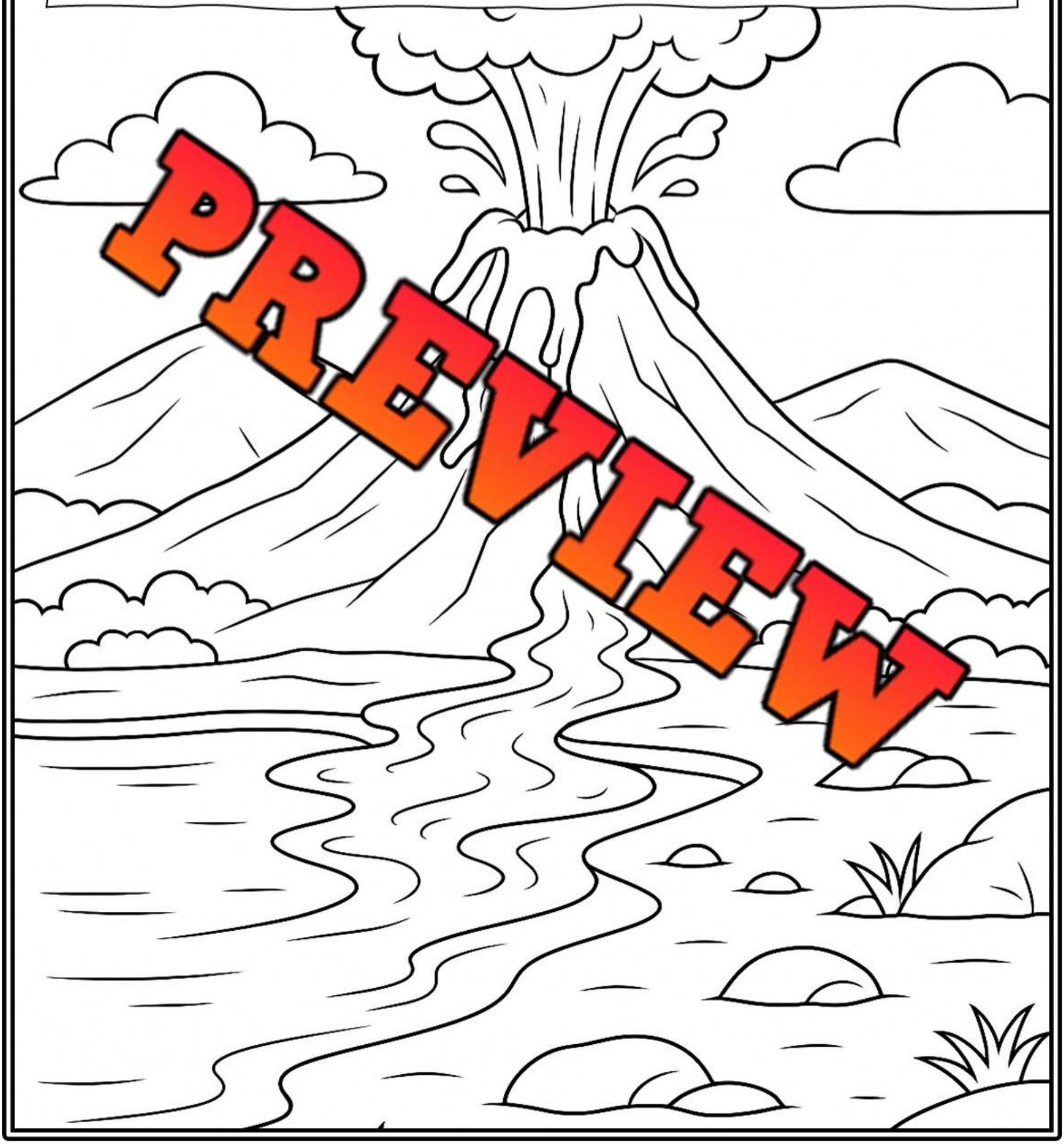
PHYSICAL PATTERNS IN A CHANGING WORLD



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Curriculum Connection
A1.1, A2.2, A3.1, A3.2

Landform Processes

Understanding Landforms

A **landform** is a natural shape or feature found on the Earth's surface. These include valleys, mountains, hills, oceans, and plains. Landforms don't stay the same forever. They are always changing, but these changes often happen very slowly. Scientists say the Earth is about 4.54 billion years old. Over this long time, landforms have shifted and moved because of powerful forces.

Some changes are small and happen slowly. For example, **Niagara Falls** is wearing away rock and moving backward, or **receding**, at a rate of about 30 cm per year today. Before 19[illegible] receding much faster—1.5 metres every year. In the la[illegible] Niagara Falls has moved about 11.4 km, creat[illegible] **Niagara Gorge**.

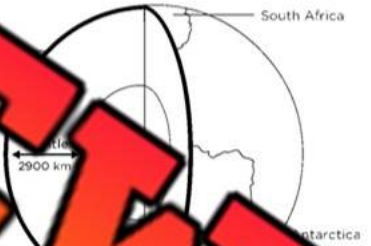


Processes that C[illegible]rm

Landforms cha[illegible]e of n[illegible]rces. These are:

- **Weathering** – th[illegible]aking [illegible]
- **Erosion** – movemen[illegible] rock [illegible]d, water, or ice
- **Volcanoes** – when mol[illegible]alle[illegible]erupts and hardens into land
- **Earthquakes** – sudden sha[illegible]at c[illegible]wer land
- **Land Movement** – shifts in the earth[illegible], oft[illegible]sed by the movement of plates
- **Human Activities** – like mining, buil[illegible]ads or [illegible]

The biggest force that changes landforms is f[illegible]g water, like rivers, rain, and ocean waves.



Tectonic Plates and the Earth's Layers

The Earth can be compared to an egg with three layers:

- **Core** (like the yolk): the very hot centre, with an inner and outer part
- **Mantle** (like the egg white): made of molten rock that slowly move[illegible]
- **Crust** (like the shell): the thin outer layer we live on

The **crust** is broken into large pieces called **tectonic plates**. These plates move because the hot mantle below them is slowly moving. Some plates are under land and can be 30–150 km thick. Others are under the oceans and are thinner—just 5–15 km thick.

Movement of Tectonic Plates

The plates move in different ways:

- Some move **apart** and let magma rise up (like in the middle of the Atlantic Ocean)
- Some **collide**, and one plate slides under the other. This is happening near British Columbia, where the **Juan de Fuca Plate** is going under the **North American Plate**
- Some plates **slide past each other**, causing earthquakes

These movements shape the land by forming mountains, trenches, and volcanoes. They are one of the most important reasons landforms change.

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Curriculum Connection
A1.1, A2.2, A3.1, A3.2

True or False

Is the statement is true or false?

1) Mountains, hills and skyscrapers are examples of landforms.	True	False
2) Landforms are characteristics of the earth surface.	True	False
3) Landforms stay the same forever.	True	False
4) Human actions like farming have no effect on how landforms change.	True	False
5) Tectonic plates are part of the earths mantle.	True	False
6) The Earth's crust is the thickest part of the Earth's layers.	True	False

Questi

n from the text to support your answer.

1) List and exp esse t shape landforms

2) Illustrate and explain the Earth's layers

Making Connections

What does this reading remind you of in your life?

PREVIEW

Curriculum Connection
A1.1, A2.2, A3.1, A3.2

Exit Cards

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

Name: _____ Mark

Match each part of the Earth with its correct description.

	Core	**A)** Thick layer of slowly moving melted rock inside Earth.
	Mantle	**B)** Thin outer layer where people, plants, and animals live.
	Crust	**C)** Deepest, hottest layer made of rock and metal.

Name: _____ Mark

Match each part of the Earth with its correct description.

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	Crust	**C)** Deepest, hottest layer made of rock and metal.

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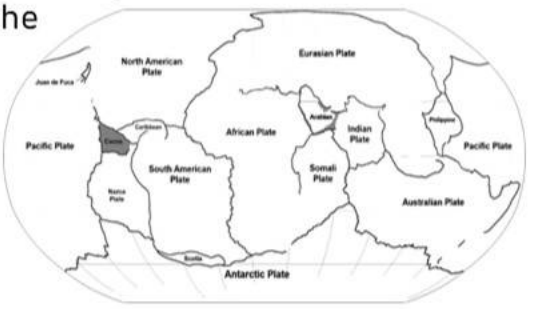
Curriculum Connection
A3.2, A3.4

Tectonic Plates

What Are Tectonic Plates?

The outer layer of the Earth is called the **crust**, and it is not one solid piece. It is broken into giant slabs called **tectonic plates**. There are 7 main plates (like the North American Plate and Pacific Plate) and several smaller ones. These plates cover both land and ocean floors and fit together like a jigsaw puzzle. Tectonic plates float on a layer of **molten rock** called the mantle. Because the mantle moves slowly, it pushes the plates around. On average, a tectonic plate moves about 15 centime[illegible]r 6 inches) per year. That might seem small, but [illegible]ions of years, this movement has caused w[illegible] to drift and change shape[illegible]ed **[illegible]ntal drift**.

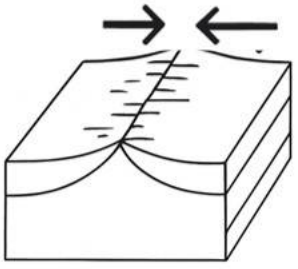


Where Plates M[illegible]und[illegible]

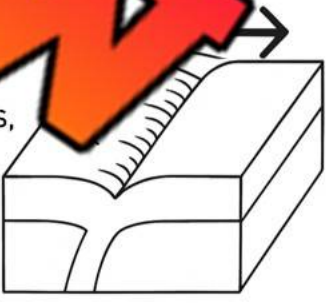
The edges whe[illegible]t[illegible] plates [illegible]re called **plate boundaries**. These boundaries are where many import[illegible]olog[illegible]V[illegible]ppen—like **earthquakes**, **volcanoes**, and the formation of mountain[illegible]n[illegible]na (m[illegible]ock) from deep inside the Earth can rise up through cracks at the plate[illegible]s ar[illegible]lcanoes.

There are three main types of tectonic p[illegible]dari[illegible]

1) Convergent Boundaries (Plates Push[illegible]gether) [illegible]w plates push into each other, one of them may get pushed underneath. This is cal[illegible]**ubdu**[illegible] These areas often have earthquakes, mounta[illegible]ding, [illegible]es. For example:

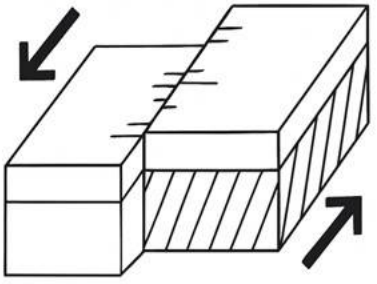


- The **Himalayas** were[illegible]ed [illegible] Plate collided with the Eurasian Plate.
- The **Mariana Trench**, the dee[illegible]an [illegible]n th[illegible]world, was formed by the Pacific Plate[illegible]ng pushed under the Philippine Plate.



2) Divergent Boundaries (Plates Moving Apart) At divergent boundaries, plates move away from each other. Magma rises to fill the gap and cools to form new crust. This often happens under oceans. An example is:

The **Mid-Atlantic Ridge**, a long mountain range on the ocean floor, formed where the Eurasian and North American plates are moving apart.



3) Transform Boundaries (Plates Sliding Past) Here, plates move sideways past each other. This sideways motion builds up pressure that is released as earthquakes. A well-known example is:

The **San Andreas Fault** in California, which causes many earthquakes in that area.

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Curriculum Connection
A3.2, A3.4

True or False Circle whether the statement is true (T) or false (F).

1) A convergent boundary is when 2 tectonic plates are pushed apart.	T	F
2) Tectonic plates move about 6 inches per year.	T	F
3) Tectonic plate boundaries are where volcanoes and earthquakes happen.	T	F
4) The San Andreas Fault is located at a divergent boundary.	T	F
5) The Mariana Trench is formed by subduction.	T	F
6) Most vol[illegible]es and earthquakes happen far from plate boundaries.	T	F

Question [illegible]nd explain the three main types of tectonic plate boundaries:

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Questioning Write at least two questions you have after reading the text.

1)	
2)	

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Curriculum Connection
A1.3, A3.1, A3.2

Mountain Landform

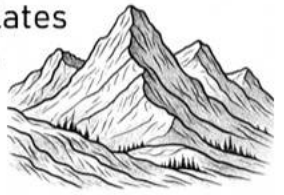
What Are Mountains?

A **mountain** is a type of **landform** made of earth and rock that rises much higher than the land around it. Mountains must rise at least 300 metres above the land to be called a mountain. If the land is shorter than that, we call it a hill. A mountain has two main parts: the **sloped side**, which is the steep part that people often climb, and the **summit**, which is the very top of the mountain. Most mountains are not found alone. Instead, they form in long lines with many peaks. This is called a **mountain range**.

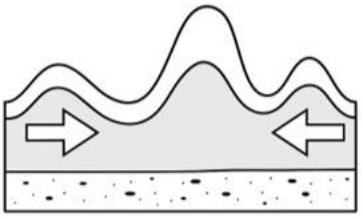
The t ountain in the world is **Mount Everest**, which is 8,850 metres high. It is part of th an Mountain Range in Asia. This range continues to grow taller because of tec Mount Everest rises about 40 centimetres every 100 years.

How Mountains A

Mountains form ff t ways ding on how the earth's tectonic plates move. These plates eces s crust that move slowly. There are 3 main types of mo ey are made:

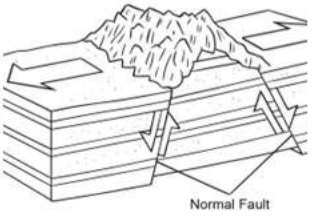


A) Fold Mountains



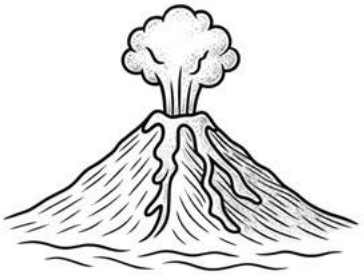
- Form when s push together (a convergent boundary).
- Rock layers squeez d fo upward.
- Often made of sedi rock
- Found at the edges tine
- Tallest type of mountain
- Examples: Himalayas (Asia), unt anada/USA)

B) Fault-Block Mountains



- Form when tectonic plates pull apart.
- Cracks or faults cause some blocks of rock t and others to rise.
- The mountains are made from the blocks that were pushed up.
- Example: Sierra Nevada (California and Nevada)

C) Volcanic Mountains



- Made when **magma** rises through the Earth's crust.
- Two kinds: dome mountains and volcanoes.
  - ❖ Dome mountains: Magma pushes up but doesn't break through. It cools and hardens into rock.
  - ❖ Volcanoes: Magma escapes and becomes **lava**. Lava builds up and forms cone-shaped mountains.
- Example: Mount St. Helens (Washington, USA)

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Name: _____ 14

Curriculum Connection
A1.3, A3.1, A3.2

Questions

Use information from the text to support your answer.

1) What are the characteristics of a mountain?

2) Explain the differences between fold mountains and fault-block mountains.

PREVIEW

Visualization

What [illegible] you were reading? Describe your picture.

Yes or No

Circle whether the statement is true or not.

1) Do mountains need to be 300 metres tall to be called mountains?	Yes	No
2) Are the three types of mountains called fold, tectonic, and volcanic?	Yes	No
3) Is the summit the flat part at the bottom of a mountain?	Yes	No
4) Are fold mountains usually made of soft sedimentary rock?	Yes	No
5) Is Mount Everest getting shorter by 40 cm every 100 years?	Yes	No
6) Do mountain ranges have only one tall mountain peak?	Yes	No

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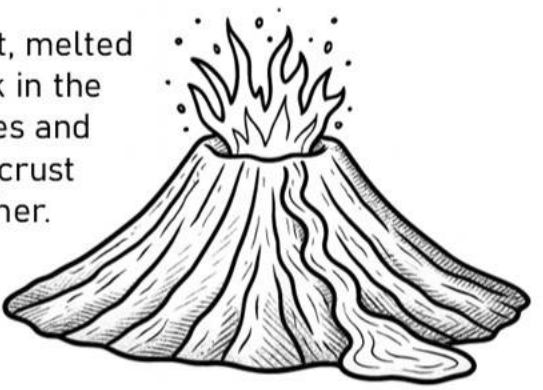
Curriculum Connection
A1.3, A2.2, A3.1, A3.2

Volcanoes

How Volcanoes Form

Volcanoes are special landforms made when **magma** (hot, melted rock) from deep inside the Earth rises up through a crack in the Earth's outer layer, called the **crust**. When magma escapes and reaches the surface, it is called **lava**. These cracks in the crust often happen where **tectonic plates** push against each other. One plate, usually an ocean plate, is pushed underneath another pl[illegible] it sinks, it melts into magma. The pressure b[illegible] until the magma bursts out through the crac[illegible] ption. Most volcanoes are found along[illegible] t[illegible] plates.





The Ring of Fire

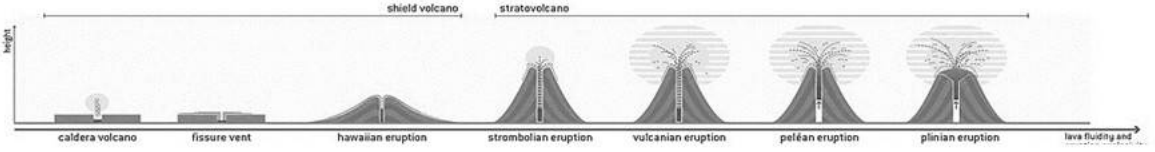
The Pacific Ring of Fire is the most active volcanic area in the world. It is a horseshoe-shaped zone with more than 250 active [illegible]anoes. It stretches along the coasts of the [illegible]Ocean, including places like Japan, [illegible] and the Philippines. About 500 [illegible]oes [illegible]nd are active today, but many [illegible]re—ab[illegible] of all volcanoes—are under the ocea[illegible]d no[illegible] seen.

PREVIEW

Three Types of Volcanoes

There are three main types of volcanoes, and each one [illegible] a differ[illegible]y.

1) **Shield Volcanoes** – These are formed from thin, fas[illegible] lava[illegible] lava flows far from the vent and creates wide volcanoes with gentle s[illegible]s. Th[illegible] tall, but they can cover a huge area.
2) **Stratovolcanoes** – Also called composite volcanoes, these are [illegible] ar[illegible] shaped. They can be nearly 2,500 metres high. They are built over thousands [illegible]ars by many eruptions, which create layers of lava, ash, and cinder that harden into rock.
3) **Cinder Cone Volcanoes** – These are the smallest type, usually under 400 metres. Made from one short eruption of ash and rocks around a single vent.



Massive Volcanoes in Hawaii

Hawaii is home to the two biggest volcanoes on Earth. **Mauna Loa** is the largest volcano by volume and is a **shield volcano**. **Mauna Kea** is the tallest when measured from its base on the ocean floor—it is taller than Mount Everest when measured this way. Both formed on the ocean floor from lava building up over time.

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Curriculum Connection
A1.3, A2.2, A3.1, A3.2

True or False

Circle whether the statement is true or false.

1) Most volcanoes form at tectonic plate edges.	True	False
2) The Pacific Ring of Fire has over 250 volcanoes.	True	False
3) Volcanoes only occur on land.	True	False
4) Magma rises through cracks in Earth's crust during an eruption.	True	False
5) Mauna Kea is the world's tallest volcano.	True	False
6) The Ring [illegible] is located in the Atlantic Ocean.	True	False

Questi[illegible]

[illegible]n from the text to support your answer.

1) What is the [illegible] wee[illegible]gma and lava?

2) What are the three types of volcanoes, [illegible]d how i[illegible]n on[illegible]ferent from the others?

PREVIEW

Summarize

Summarize the reading by writing the important information.

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Curriculum Connection
A1.3, A2.2, A3.1, A3.2

Exit Cards

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

Name: _____ Mark

Draw a line from each word to its correct meaning.

Magma ☐	☐ Flat volcano formed from runny lava with gentle slopes
Lava ☐	☐ Hot melted rock beneath the Earth's surface
Shield Volcano ☐	☐ A cone-shaped volcano built from many eruptions
Stratovolcano ☐	☐ Melted rock that flows on the surface after eruption

Name: _____ Mark

Draw a line from each word to its correct meaning.

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Curriculum Connection
A1.1, A2.2, A3.2, A3.4

Blog Post: The Ring of Fire

Top 5 Things You Didn't Know About the Ring of Fire's Volcanoes

Date: August 7, 2025 *Author: Jasmine K.* *4-minute read*

Have you ever heard of the Ring of Fire? No, it's not just a song—it's a real place on Earth, full of fire and danger! The Ring of Fire is a giant circle of volcanoes and earthquake zones around the Pacific Ocean. It has over 250 active volcanoes and is home to 75% of the world's vol es. Here are 5 wild facts you probably didn't know:

1) **Japan r 100 active volcanoes!**
Japa e dge of four tectonic plates. That's why it has so many earthquakes a . Fuji is the most famous one, and it's still active, even though it h rupted e 7.

2) **The Philippin ive lcano is very dangerous.**
Mount Ma t hilipp pts often. It's known for its perfect cone shape, but it's also deadly s erup times in the last 400 years.

3) **The west coast of th**
From California to Br lumbia, like Mount St. Helens and Mount Rainier sit quietly now, bu an n 1980, Mount St. Helens had a huge eruption that destroyed fores and

4) **Tectonic plates make volcanoes er**
The Earth's crust is cracked into big pieces call ctor tes. Where they push together (called convergent boundaries), m ises les as lava. This is how most Ring of Fire volcanoes are formed

5) **Many volcanoes are underwater!**
Most of the Ring of Fire's volcanoes are actually und cific e. Th se underwater volcanoes can still erupt and even cause tsu is!

PREVIEW

Comments:



Ethan P. – August 7, 2025

This is cool! I didn't know most volcanoes are under the ocean. That explains all the tsunamis near the Philippines and Japan. In 2004, an underwater earthquake caused a tsunami that killed over 200,000 people.

Like Reply 1d ago



Leila M. – August 8, 2025

Great blog, but I think the volcanoes on land are more dangerous to people than the ones underwater. Land volcanoes like Mount Pinatubo caused ash to fall hundreds of kilometres away when it erupted in 1991!

Like Reply 10m ago

Name: _____ 19

Curriculum Connection
A1.1, A2.2, A3.2, A3.4

Questions Answer the questions below using evidence from the text.

1) What is the Ring of Fire and where is it located?

2) Explain how tectonic plates cause volcanoes to erupt.

3) How would you ing n o von? Why?

PREVIEW

Two Truths and a Lie Check only the two tru in ea

	The Ring of Fire has over 250 active volcanoes around the Pacific.
	The Ring of Fire wraps all the way around the Atlantic Ocean.
	Volcanoes in the Ring of Fire form mostly at convergent boundaries.

	Vo n't er der the ocean becaus w ter.
	The Ring of Fire es in Canada and the Unite s.
	Lava comes from deep underground, where magma pushes through cracks.

My Opinion Do you think underwater volcanoes or land volcanoes are more dangerous?

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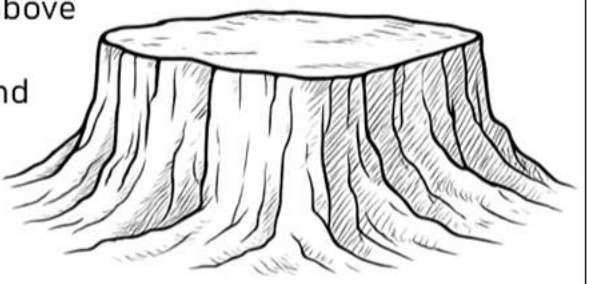
Curriculum Connection
A1.3, A2.2, A3.1, A3.2

Plateaus

What Are Plateaus?

Plateaus are one of the four major landforms on Earth, along with mountains, plains, and hills. A plateau is a flat area of land that rises sharply above the surrounding land. It looks like a large, flat surface sitting high up, almost like a table. Plateaus can be found all over the world, and they cover more than one-third of all land on Earth. There are also landforms under water, incl[illegible]**ceans**, **rivers**, and **lakes**. But plateaus can form [illegible]nd and under the sea.



Types [illegible]by [illegible]n

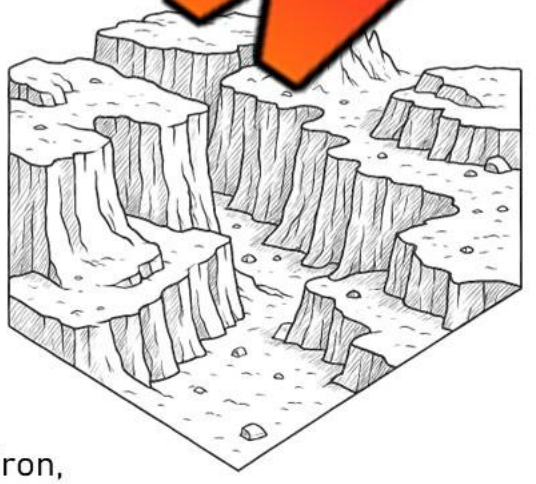
There a[illegible]o main [illegible]lateaus based on where they are found:

- **Continenta[illegible]** [illegible]plateaus that are found on land. They exist on every continent. **[illegible]n Plate[illegible]**[illegible]a is the largest and highest plateau in the world. It is 2.5 million sq[illegible]kilom[illegible]nd sits at a very high elevation.
- **Ocean Plateaus**: [illegible]found under the sea. The largest underwater plateau is [illegible]ralia[illegible]th Pacific Ocean. It is 1.5 million square kilometres, which is larger [illegible]the [illegible]of British Columbia!

How Plateaus Are Formed

Plateaus are also grouped by how they were made. Earth[illegible]t moves and changes, which forms different types of plateaus:

1) **Dissected Plateaus** – These are made when te[illegible]c p[illegible]push land upward. Example: the **Deccan Plateau** in India.
2) **Volcanic Plateaus** – These form from **lava** that flows [illegible]olc[illegible]ring many eruptions. Each time the lava cools and hardens, it create[illegible]new[illegible]ime, these layers build up into a raised, flat area. Example: the **North Island Volcanic Plateau** in New Zealand.



Types Based on Environment

Plateaus can also be grouped by what is around them:

- **Intermontane** – Located between mountain ranges
- **Piedmont** – Located beside a mountain on one side and a plain or body of water on the other
- **Continental** – Surrounded by land or water with steep sides

Natural Resources on Plateaus

Many **minerals** can be found on plateaus, like gold, coal, iron, copper, and diamonds. These minerals are easier to mine from plateaus than from mountains because plateaus have flat land that is easier to reach.

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Name: _____ 23

Curriculum Connection
A1.3, A2.2, A3.1, A3.2

True or False

Circle whether the statement is true or false.

1) Mountains, valleys, hills and plateaus are major landforms.	True	False
2) Plateaus are rich in minerals.	True	False
3) Plateaus are only found on continents.	True	False
4) Plateaus have at least one side that has a steep drop to land or water.	True	False
5) The Tibetan Plateau is the world's largest.	True	False
6) Plateaus [illegible] found on land and under the sea.	True	False

Questi[illegible]

[illegible]n from the text to support your answer.

1) What is a pl[illegible]e o[illegible]nd continental plateaus different?

2) What are two ways that plateaus are classifie[illegible]give e[illegible]each?

PREVIEW

Matching

Match the plateau with the correct description from the list below.

Deccan Plateau ◯	◯ A plateau found underwater
Tibetan Plateau ◯	◯ The highest and largest plateau in the world, found in Asia
Volcanic Plateau ◯	◯ A dissected plateau in India formed by tectonic movement
Ocean Plateau ◯	◯ A plateau formed by lava from many volcanic eruptions

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Curriculum Connection
A1.3, A2.2, A3.1, A3.2

Exit Cards

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

Name: _____
Circle Yes or No for each question.

Mark

1) Can plateaus be found both above and below sea level?	Yes / No
2) Are minerals easier to mine on plateaus than on mountains?	Yes / No
3) Is the Tibetan Plateau the lowest plateau on Earth?	Yes / No
4) Can ocean plateaus be larger than Canadian provinces?	Yes / No
5) Do tectonic plates help form dissected plateaus?	Yes / No

Name: _____
Circle Yes or No for each question.

Mark

1) Can plateaus be found both above and below sea level?	Yes / No
2) Are minerals easier to mine on plateaus than on mountains?	Yes / No
3) Is the Tibetan Plateau the lowest plateau on Earth?	Yes / No
4) Can ocean plateaus be larger than Canadian provinces?	Yes / No
5) Do tectonic plates help form dissected plateaus?	Yes / No

Name: _____
Circle Yes or No for each question.

Mark

1) Can plateaus be found both above and below sea level?	Yes / No
2) Are minerals easier to mine on plateaus than on mountains?	Yes / No
3) Is the Tibetan Plateau the lowest plateau on Earth?	Yes / No
4) Can ocean plateaus be larger than Canadian provinces?	Yes / No
5) Do tectonic plates help form dissected plateaus?	Yes / No

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Curriculum Connection
A3.1, A3.2

Fact Or Fiction: Extreme Landforms

Objective

What are we learning about?

To help students learn about extreme landforms by hearing surprising true or false statements about mountains, volcanoes, plateaus, valleys, and hills. After each guess, students w[illegible]iscuss the real natural processes that shaped each landform.

Materi[illegible]

[illegible]ou need for the activity?

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



PREVIEW

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!

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Curriculum Connection
A3.1, A3.2

Fact or Fiction Read the statements to the class.

#	Statement	
1	Mount Everest grows about 40 centimetres taller every 100 years.	Fact
2	All mountains are formed by volcanic eruptions.	Fiction
3	The Andes Mountains stretch across seven countries in South America.	Fact
4	Plate[illegible] always found between two rivers.	Fiction
5	Th[illegible] is the largest and highest plateau in the world.	Fact
6	Do[illegible] mount[illegible] hen magma pushes up but doesn't break through.	Fact
7	River valley[illegible] when r[illegible]y wear away rock and soil.	Fact
8	All valleys have the [illegible] shape.	Fiction
9	Hills are lower than mount[illegible] but [illegible] land around them.	Fact
10	All hills are made by people piling [illegible] dirt and [illegible].	Fiction
11	Volcanic mountains form when lava builds [illegible] har[illegible] o[illegible].	Fact
12	Shield volcanoes are the smallest type of volcano.	Fiction
13	The Pacific Ring of Fire has over 250 active volcanoes.	[illegible]act
14	All volcanoes are found on land, never underwater.	Fiction
15	Fault-block mountains form when crust cracks and blocks of rock rise.	Fact
16	Plateaus never form under the ocean's surface.	Fiction
17	Cinder cone volcanoes are usually less than 400 metres tall.	Fact
18	Fold mountains form when plates pull apart from each other.	Fiction
19	The Rocky Mountains are an example of fold mountains.	Fact
20	Hills can form when glaciers drop piles of rock and soil.	Fact

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Name: _____ 31

Curriculum Connection
A3.1, A3.2

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) The Andes Mountains stretch across seven countries in Africa.	T	F
2) The Rocky Mountains are an example of fold mountains.	T	F
3) Fault-block mountains form when crust cracks and blocks of rock rise.	T	F
4) Fold mountains form when magma pushes up but doesn't break through.	T	F
5) River valleys form when rivers slowly wear away rock and soil.	T	F
6) Plateaus never form under the ocean's surface.	T	F

Name: _____

Mark

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

1) The Andes Mountains stretch across seven countries in Africa.	T	F
2) The Rocky Mountains are an example of fold mountains.	T	F
3) Fault-block mountains form when crust cracks and blocks of rock rise.	T	F
4) Fold mountains form when magma pushes up but doesn't break through.	T	F
5) River valleys form when rivers slowly wear away rock and soil.	T	F
6) Plateaus never form under the ocean's surface.	T	F

Name: _____

Mark

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

1) The Andes Mountains stretch across seven countries in Africa.	T	F
2) The Rocky Mountains are an example of fold mountains.	T	F
3) Fault-block mountains form when crust cracks and blocks of rock rise.	T	F
4) Fold mountains form when magma pushes up but doesn't break through.	T	F
5) River valleys form when rivers slowly wear away rock and soil.	T	F
6) Plateaus never form under the ocean's surface.	T	F

PREVIEW

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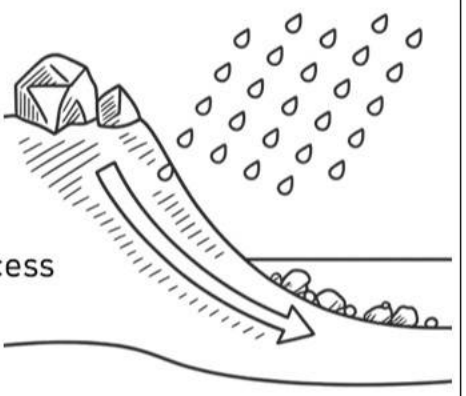
Name: _____ 32

Curriculum Connection
A1.1, A2.5, A3.2, A3.5

Erosion

Understanding Erosion

Erosion is the wearing away of the land by natural forces such as wind, water, ice, and gravity. It also involves moving these particles or larger pieces of the Earth to a new location. Over millions of years, erosion has shaped many of the Earth's most impressive **landforms**, including mountains, valleys, hills, plateaus, and coastlines. While erosion can take thousands of years to noticeably reshape a landscape, it is a continuous process that never stops. Some landforms, like the Grand Canyon in the United States, were carved almost entirely by erosion from the Colorado River.



There are several types of erosion:

- **Water erosion** – caused by rivers, waves, and flooding.
- **Wind erosion** – common in dry areas with little vegetation.
- **Ice erosion** – caused by glaciers scraping and carrying away rock.
- **Mass movement** – landslides and rockfalls caused by gravity.

Water Erosion – The Most Powerful Force

Water is the leading cause of erosion worldwide. It can wear away solid rock, carry large amounts of soil, and change the shape of coastlines and riverbanks. The speed and amount of erosion depend on the strength of the water, the slope of the land, and the type of rock or soil.

Major forms of water erosion include:

1) **Rainfall (Splash Erosion)** – Raindrops hitting the ground can weaken soil particles. Water gathers into small streams that carry these particles downhill.
2) **Rivers** – River water breaks up rock and soil at its bed and banks, moving **sediment** downstream. Many property owners along rivers lose land each year as the banks are worn away.
3) **Waves** – Constant wave action can polish stones smooth and grind pebbles into sand through abrasion. This can expand river mouths, reshape beaches, and deepen bays.
4) **Flooding** – Floodwaters move quickly and can cause severe erosion in hours, destroying roads, farmland, and protective **levees**.

The Role of Climate in Erosion

Climate plays a big role in the rate of erosion. Areas with frequent heavy rain, storms, or strong winds experience erosion more quickly. In Canada, coastal regions like Nova Scotia see strong wave erosion, while the Prairie provinces can experience intense wind erosion during dry seasons. In the North, melting glaciers contribute to erosion by releasing massive amounts of water and carrying rocks over long distances.

PREVIEW

Name: _____ 33

Curriculum Connection
A1.1, A2.5, A3.2, A3.5

True or False

Circle whether the statement is true or false.

1) Erosion has helped create the awesome landforms around the world.	True	False
2) The Grand Canyon was shaped mostly by wind erosion over time.	True	False
3) Climate has no effect on erosion.	True	False
4) Sediment moved by rivers is usually left behind at the source.	True	False
5) Erosion causes particles of earth to be moved from one place to another.	True	False
6) Wind er[illegible]s most common in wet areas with many trees.	True	False

Questi[illegible]nation from the text to support your answer.

1) What is erosi[illegible]are [illegible]four main types?

2) Which type of erosion do you think is the stro[illegible]Why?

PREVIEW

Fill in the Blanks

Fill in the blanks with the missing word.

1) Ice erosion is caused by _____ scraping and carrying away rock.

2) A protective wall built along rivers to prevent flooding is a _____.

3) The grinding action of waves that wears away rocks is called _____.

4) The small pieces of rock or soil moved by rivers are called _____.

5) Erosion caused by raindrops hitting the ground is called _____ erosion.

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Curriculum Connection
A1.1, A2.5, A3.2, A3.5

Exit Cards

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

Name: _____ | Mark

List the 4 main types of erosion explained in the text.

1	
2	
3	
4	

Name: _____ | Mark

List the 4 main types of erosion explained in the text.

1	
2	
3	
4	

Name: _____ | Mark

List the 4 main types of erosion explained in the text.

1	
2	
3	
4	

Name: _____ | Mark

List the 4 main types of erosion explained in the text.

1	
2	
3	
4	

Name: _____ | Mark

List the 4 main types of erosion explained in the text.

1	
2	
3	
4	

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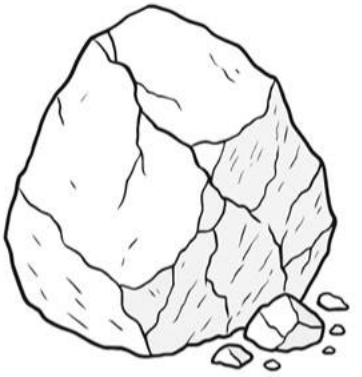
Name: _____ 37

Curriculum Connection
A1.1, A2.5, A3.2, A3.10

Weathering

Weathering – Breaking Down Rocks

Weathering is the process where rocks are broken into smaller pieces while staying in the same location. It changes the size and shape of the rock and can also change its chemical makeup. This process is different from erosion, where the broken material is carried away by wind, water, ice, or gravity. Weathering plays a key role in shaping Canada's landscapes, from the Rocky Mountains to the shores of the Great Lakes.



Physical Weathering – The Seven Main Types

Physical weathering happens when rocks are broken apart without changing their composition. It is caused by temperature changes, water, wind, plants, animals, and gravity. There are seven main types:

1) **Freeze-thaw** – Water enters cracks in rocks. When temperatures drop below 0°C, the water freezes and expands by 9%. This expansion pushes the cracks wider. Over many winters, this freezing and thawing can break large rocks apart.
2) **Crystal formation** – Salty water seeps into cracks in rocks. When the water evaporates, salt crystals form. As the crystals grow, they push against the rock, forcing it to split.
3) **Unloading and exfoliation** – Rocks that formed deep underground are under pressure from layers above. If glaciers melt or erosion removes these layers, the pressure decreases. The rock expands and cracks, sometimes peeling in layers like an onion.
4) **Thermal expansion and contraction** – Rocks heat up and expand during hot summer days or in wildfires. At night or in cold seasons, they cool and contract. Repeated cycles cause cracks to form.
5) **Abrasion** – Wind carrying sand or small particles blasts surfaces. Over many years, this wears the rock smooth or breaks it into smaller pieces.
6) **Gravitational impact** – Rocks fall from cliffs or steep slopes because of gravity. When they hit other rocks, both can break apart.
7) **Biological activity** – Plant roots grow into cracks in rocks, pushing them apart. Burrowing animals loosen rock material as they dig.



Chemical Weathering – Changing Rock Composition

Chemical weathering happens when water and air cause chemical changes in rocks. Minerals in the rock can dissolve, or new substances can form. For example, rocks with iron can rust when exposed to oxygen and water. Acids form naturally when water mixes with carbon dioxide or other gases in the air, and these acids slowly dissolve certain rocks, such as limestone. Warm, humid climates speed up chemical weathering, while cold, dry regions experience more physical weathering.

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Curriculum Connection
A1.1, A2.5, A3.2, A3.10

Questions

Use information from the text to support your answer.

1) What is the difference between erosion and weathering?

2) Describ ids can naturally form and break down rocks.

PREVIEW

Fill in the blanks

Fill in the bl ks w e of physical weathering.

	Rocks crack from repeated h g in s nd cooling in winter.
	Rocks fall from cliffs and br her
	Pressure is removed, and rock cra ls in
	Plant roots or burrowing animals break r cks a
	Wind carrying sand slowly wears away rock sur ces
	Water freezes in cracks and expands by 9%, breaking r ck.
	Saltwater dries, leaving crystals that grow and split rock.

Questioning

Write at least two questions you have after reading the text.

1)	
2)	

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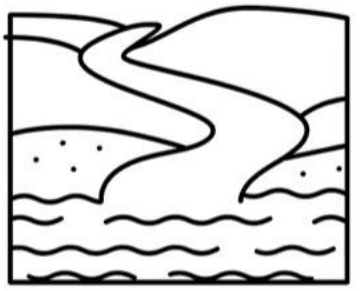
Name: _____ 39

Curriculum Connection
A1.3, A2.5, A3.4, A3.5, A3.9

Deltas

How Rivers Form Deltas



Rivers are moving streams of water that travel from higher land to lower areas, eventually emptying into lakes or oceans. As they flow, they pick up and carry small pieces of rock, **sand**, and soil called **sediment**. This movement of material is part of the process known as **erosion**, which has three stages:

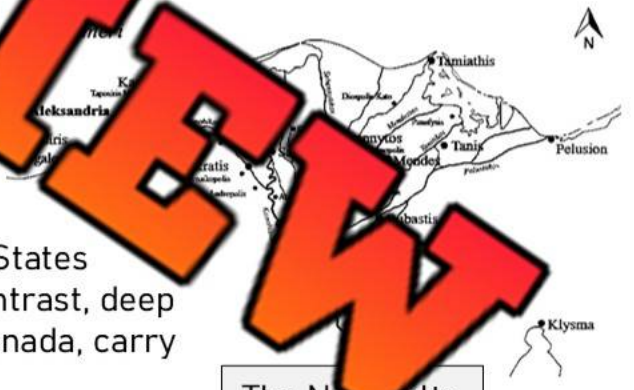
1) **Detachment** – Material breaks away from its original place. For[illegible]ple, soil can wash off riverbanks during heavy rain or [illegible] into the river by wind.
2) **Tr[illegible]** – The river current carries the sediment downstream.
3) **[illegible]** – [illegible]iment is dropped in a new location when the water slows down.

When the [illegible] its [illegible]uth, where it meets a lake or ocean, the water slows because it is pu[illegible]nst sti[illegible] With less force, the river can no longer carry sediment, so the se[illegible]t sett[illegible] this builds up into a landform called a **delta**.

Features and Formation of [illegible]

A **delta** is made of nutrient-ric[illegible]ien[illegible] [illegible]n deposited over thousands of years. The deposition can create small islands [illegible]r's [illegible] splitting the main river into smaller channels called distributaries. T[illegible]ocess also causes the mouth of the river to widen.

Deltas often change shape because they ar[illegible] **prone to flooding**, which moves and redistributes sediment. Not all rivers form deltas. Rivers with slower flow, like the Mississippi River in the United States or the Nile River in Egypt, create large deltas. In contrast, deep and fast rivers, such as the St. Lawrence River in Canada, carry less sediment and do not form deltas.



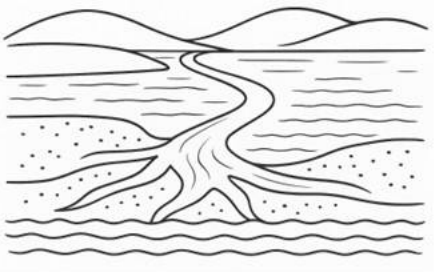
The Nil[illegible]elta

Importance of Deltas

Because delta soil is full of nutrients, it is highly fertile, supporting wetlands and a variety of wildlife. These wetlands provide shelter and food for birds, fish, amphibians, and many other animals. Deltas are also important for people, offering farmland and fishing areas.

Key Facts about Deltas:

- Form at the mouth of rivers where they meet still water.
- Built over thousands of years through deposition.
- Often split into smaller distributary channels.
- Prone to flooding and constant shape change.
- Found in slow-moving, sediment-rich rivers.



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Curriculum Connection
A1.3, A2.5, A3.4, A3.5, A3.9

Multiple Choice
Circle the correct answer.

1) The final stage of erosion is...	Detachment	Deposition
2) A landform at a river's mouth is called a...	Plateau	Delta
3) Sediment in a delta is rich in...	Nutrients	Salt
4) A river splits into smaller channels called...	Distributaries	Tributaries
5) The Nile River delta is found in...	Egypt	Canada

Questions
formation from the text to support your answer.

1) Wha delta? rmed?

2) Explain why nutrient-rich soil in a delt import

PREVIEW

True or False
Circle whether the statement is true or false.

1) A delta is a lake or ocean that leads to a river.	True	False
2) A delta happens when sediments travel by a river to a lake or ocean.	True	False
3) Sediments are huge pieces of rock.	True	False
4) A delta is a landform that is a wetland outside of a lake or ocean.	True	False
5) Rivers are streams, that flow into lakes and oceans.	True	False
6) Deltas are built quickly, usually forming in less than one hundred years.	True	False

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Curriculum Connection
A1.3, A2.5, A3.4, A3.5, A3.9

Exit Cards

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

Name: _____

Mark

Fill in the blanks using the word bank.

1) A delta forms at the _____ of a river.
2) The process of dropping sediment in a new place is called _____.
3) Small rivers that branch off from a main river are called _____.
4) Deltas are important for farming because they have _____ soil.

Name: _____

Mark

Fill in the blanks using the word bank.

1) A delta forms at the _____ of a river.
2) The process of dropping sediment in a new place is called _____.
3) Small rivers that branch off from a main river are called _____.
4) Deltas are important for farming because they have _____ soil.

Name: _____

Mark

Fill in the blanks using the word bank.

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2) The process of dropping sediment in a new place is called _____.
3) Small rivers that branch off from a main river are called _____.
4) Deltas are important for farming because they have _____ soil.

Name: _____

Mark

Fill in the blanks using the word bank.

1) A delta forms at the _____ of a river.
2) The process of dropping sediment in a new place is called _____.
3) Small rivers that branch off from a main river are called _____.
4) Deltas are important for farming because they have _____ soil.

PREVIEW

Name: _____ 54

Curriculum Connection
A2.6, A3.1, A3.2

Pictionary: Name that Landform

Objective

What are we learning about?

Students will learn about different landforms, including mountains, valleys, plateaus, plains, deltas, glaciers, and more. They will draw and guess these landforms while learning about their physical features and the natural processes that shape them.

Materials

What will you need for the activity?

- Markers or pencils
- Landform cards (examples: mountains, valleys, plateaus, plains, deltas, volcanoes)



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 up the points. The team with the most points is the winner of Name that Landform Pictionary!

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Name: _____ 55

Curriculum Connection
A2.6, A3.1, A3.2

Pictionary Cards Cut out the cards below.

Mountain	Valley
Plateau	Plain
Delta	Glacier
[illegible]	Hill
[illegible]	River
Desert	Cliff
Lake	[illegible]land
Swamp	[illegible]
Waterfall	[illegible]
Beach	Forest
Coast	Marsh
Stream	Cave
Wetland	Tundra

PREVIEW

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Curriculum Connection
A1.2, A2.5, A3.10, A3.11

Human-Caused Changes To Habitats

Human Impact on Habitats

As the human population continues to grow, more land is cleared for homes, businesses, farming, and roads. This process destroys or changes **habitats**—the natural environments that plants and animals need to survive. When a habitat is damaged, species lose their sources of food, water, and shelter. In addition to destroying habitats, humans often introduce **invasive species**—plants or animals from other parts of the world—into these areas. Invasive species compete with native species for food and space, sometimes spreading disease or preying on native animals. Both habitat destruction and invasive species can lead to **extinction** and the loss of **biodiversity**.



Research shows humans have caused 322 animal species to go extinct in the past 500 years. Extinction means no individuals remain anywhere on Earth. Examples include sabre-toothed cats, woolly mammoths, dodo birds, and Tasmanian tigers. In Canada, the Vancouver Island wolverine, last seen in 1992, is believed

PREVIEW

Endangered Species in Canada

An **endangered species** is a plant or animal that is seriously at risk of extinction. The Canadian government has officially listed 55 endangered species. Examples include sea otters, beluga whales, and wolverines. The main causes are habitat destruction, overhunting, pollution, and climate change. Many endangered animals have small populations, which makes them more vulnerable to disease, predators, and extreme changes.



Examples of endangered animals in Canada:

- **Sea otter** – harmed by oil spills and hunting for fur
- **Beluga whale** – threatened by pollution and noise in Arctic wat
- **Wolverine** – affected by shrinking wilderness areas and hunting

Human Actions Threatening Wetlands

Wetlands—such as marshes, swamps, bogs, and fens—are highly productive ecosystems. They filter water, store carbon, prevent floods, and provide homes for hundreds of species. However, human activity is changing wetlands in damaging ways.

1) **Pollution:** Chemicals from homes, farms, and factories—such as pesticides, fertilizers, and waste—enter wetlands through surface or groundwater. These pollutants make water unsafe for plants and animals, causing death or reduced growth.
2) **Water Flow Changes:** Humans sometimes reroute water for farming, drinking water supply, or flood control. This disrupts fish populations, which rely on constant water flow for migration and for laying eggs.
3) **Habitat Loss:** Wetlands are often drained or filled to create land for building or agriculture, removing vital habitat for birds, amphibians, and fish.

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Curriculum Connection
A1.2, A2.5, A3.10, A3.11

True or False Circle whether the statement is true or false.

1) Humans caused animals to become extinct in the distant past but now species are not at risk because we know better.	T	F
2) Water pollution does not affect plants.	T	F
3) Over hunting is a problem that threatens certain species.	T	F
4) People need to make a living so we should not be concerned about endangering species.	T	F
5) Farmers [illegible]ten certain wildlife species because of their farming practices.	T	F
6) The Va[illegible]d wolverine was last officially seen in 1992.	T	F

Question Use inf[illegible]om the text to support your answer.

1) Animals are e[illegible]d and [illegible]extinct because of us. Do you think we need to stop developing land [illegible]es? Explain?

2) How are wetlands being affected by human actions?

Questioning Write at least two questions you have after reading the text.

1) _____

2) _____

PREVIEW

Name: _____ 59

Curriculum Connection
A1.1, A2.5, A3.6, A3.10, A3.11

Invasive Species

The Threat of Invasive Species

Habitat loss is the greatest danger to native plants and animals, but **invasive species** are the second biggest threat. These are plants, animals, or organisms that arrive in an area where they do not naturally live. They often come through human activity, sometimes by accident. For example, **zebra mussels** invaded the St. Lawrence River and the Great Lakes in the late 1980s. Native to the Black Sea region in Europe and Asia, they were brought to Canada in the ballast water of ocean-going ships.

Zebra Mus st Spread and Major Impact

Zebra m extremely quickly, with one female laying up to 1 million eggs in a sing ater for **plankton**, which is food for many native fish, reducing food sup s for th s. They also attach to water intake pipes at treatment plants, causing costly

In the St. Law Riv ls have made the water much clearer. This has turned the area into a pop for fre r diving because visibility has improved. However, clearer ows plants to grow faster and taller, changing fish habitats. Ze nuss to native animals like clams and crayfish and can cut swimme ecaus eir sharp shells. Their waste can make drinking w smell ar easant.



Key Facts about Zebra Mussels:

- First discovered in Lake St. Clair in 1988.
- Can survive for days out of water in damp conditi
- Each mussel can filter up to 1 litre of water per day.
- Have no natural predators in Canadian waters

Purple Loosestrife – A Wetland Invader

Purple loosestrife, native to Europe and Asia, arrived in North America in ship ballast soil and as an ornamental garden plant. It spreads in wetlands, forming dense clusters that block other plants from growing. It is not eaten by local wildlife, and its tall, thick growth prevents animals from using it for shelter. When it spreads into farm fields, it lowers the value of livestock feed crops because animals will not eat it.

Controlling Purple Loosestrife with Beetles

Scientists found a beetle in Europe and Asia that feeds only on purple loosestrife. After confirming that it would not harm other plants or the environment, these beetles were released in North America. The beetles eat the plant's leaves, often killing it before it flowers and produces seeds. This method is more environmentally friendly than chemical herbicides or pulling the plants, which can disturb wetlands.

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Curriculum Connection
A1.1, A2.5, A3.6, A3.10, A3.11

Sorting

Decide if each fact describes Zebra Mussels or Purple Loosestrife.

1) First discovered in Lake St. Clair in 1988.	
2) Spreads in wetlands and blocks other plants from growing.	
3) Lowers the value of livestock feed crops.	
4) Can filter up to 1 litre of water per day.	
5) Controlled by beetles that eat only its leaves.	
6) Sharp sh[illegible]an cut swimmers' feet.	

Questio[illegible] from the text to support your answer.

1) Why is habita[illegible]em

2) What are the main benefits of using beetles i[illegible]f her[illegible]and pulling?

PREVIEW

True or False

Circle whether the statement is true or false.

1) Invasive species are always animals.	True	False
2) Zebra mussels increase water clarity in the St. Lawrence River.	True	False
3) Invasive species are very difficult to control.	True	False
4) Invasive species compete with plants and animals for food and space.	True	False
5) Zebra mussels first entered Canada through soil in ship cargo.	True	False
6) One zebra mussel can filter more water than a goldfish.	True	False

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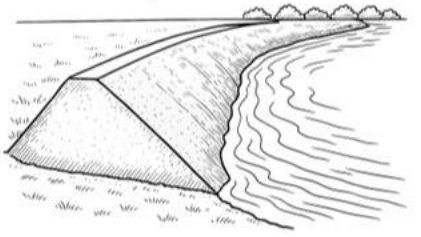
Curriculum Connection
A1.1, A2.5, A3.5, A3.11

Human Impact On Water Landforms

Human Activities that Affect Water Landforms

Humans need water to survive. People use water for drinking, washing, waste disposal, watering crops, generating power, fishing, transportation and recreation. People like to live near water, so they have a convenient source of water for their needs. Because landforms are constantly changing sometimes people live too close to water and they have to build something to make the water flow where they want it to go. For this reason, people build dykes, dams and levees.



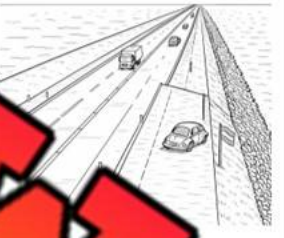
What is a L

A **levee** is [illegible]nt or a wall constructed to keep land that is [illegible]ooding when there are heavy rains, melting [illegible]w or st[illegible] that could cause water levels to rise temporarily. Levees are also used to con[illegible]of [illegible]s. They are usually constructed parallel to the shores of a body of wa[illegible]s a rive[illegible]e. A levee built along the edge of a river keeps the river from overflow[illegible] ban[illegible]g areas where people live.

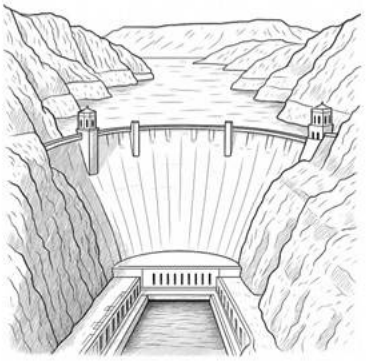
Levees prevent ero[illegible]on widen[illegible]iver. The levee causes the river to stay within it banks and makes the [illegible]eep[illegible]r flowing. Levees prevent rivers from carrying sediment, so deltas do [illegible]form[illegible]tlands.

What is a Dyke?

A **dyke** is a wall or ridge of raised earth that is co[illegible]ted to[illegible]w lying land from being flooded. The difference be[illegible]a dyk[illegible] levee is that a levee protects land that is normally [illegible]f[illegible]ing A dyke keeps land dry that would be wet if not for the d[illegible]s and levees have water on one side. When dykes are built it redu[illegible]tlan



What is a Dam?



A **dam** is a structure or barrier across a stream[illegible]er that is built to create a reservoir of water used to cre[illegible]access to a regular supply of water, for flood control or to generate hydro electric power. Dams can be small. A farmer may make a dam across a small stream just by dumping a few loads of earth into the stream, to create a pool which can be used by farm animals for drinking water. Dams can also be enormous concrete structures such as the Hoover Dam which is built across the Colorado River in United States.

The Hoover Dam was built to control flooding, provide irrigation water and provide hydroelectric power. The Hoover Dam is a 221 meters tall concrete structure that created Lake Meade as its water reservoir. A dam has water on both sides. When huge dams are built large areas of land are flooded causing people and animals to have to relocate.

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Curriculum Connection
A1.1, A2.5, A3.5, A3.11

Matching

Match each structure to its correct description.

Levee ◯	◯ A structure or barrier built across a stream or river to store water, control floods, or make hydroelectric power.
Dyke ◯	◯ A wall or ridge of raised earth that keeps low land dry that would be wet without it, usually with water on one side.
Dam ◯	◯ An embankment or wall built parallel to a river or lake to protect normally dry land from flooding and to control river flow.

Questions

information from the text to support your answer.

1) Wh of ative impacts of humans changing landforms when they build levees, s and d

2) How has the ability to build levees, da and dyk nefi umans?

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Mini-Story

Write a mini-story about a city saved by a levee.

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Curriculum Connection
A1.1, A2.5, A3.5, A3.11

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 (T) or false (F)?

1) A levee keeps water out of areas that are usually dry.	T / F
2) Dykes are made of concrete and built across rivers.	T / F
3) Dykes keep land dry that would otherwise be underwater.	T / F
4) The Hoover Dam is built in British Columbia, Canada.	T / F
5) Levees make river water deeper and move it faster.	T / F

Name: _____ Mark

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

1) A levee keeps water out of areas that are usually dry.	T / F
2) Dykes are made of concrete and built across rivers.	T / F
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4) The Hoover Dam is built in British Columbia, Canada.	T / F
5) Levees make river water deeper and move it faster.	T / F

PREVIEW

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Name: _____ 64

Curriculum Connection
A1.4, A2.5, A3.5, A3.11

Social Media Post – Hydroelectric Dams

JoshPonderer

Should we stop building large hydroelectric dams that flood huge areas of land and destroy animal habitats? These dams provide clean energy, but they also wipe out forests, wetlands, and entire ecosystems.

11:30 AM – 21/03/2025 – 1,529 SHARES 5,921 LIKES

2 LIKES — **Hydr**: Large dams give us renewable hydroelectric power. Canada gets over 60% tricity from water. These dams also reduce air pollution by replacing co g power plants across many provinces.

5 LIKES — **ice_Kid**: y bring energy, but they flood massive forests and wetlands. This estroy mes and wipes out habitats for moose, wolves, frogs, birds, and even hat row back.

0 LIKES — **ThinkItThroug**: me d usands of square kilometres of land. If we plan better and build e d nergy but save more forests, animals, and freshwater ecosyste eing

9 LIKES — **EcoVoice_Kid**: Wetlands a tura d protectors. When large dams drown these areas, we lose clean sh ha d breeding grounds for ducks, turtles, insects, and amphibians. It just ab ow

6 LIKES — **HydroFan55**: Dams also store water for fa nd d ry seasons or emergencies, these reservoirs help commu su re than make power—they provide safety during droughts and oding e.

12 LIKES — **ThinkItThrough7**: We could invest more in solar and w ns. ess space and don't destroy rivers or flood forests. Clean ene gy s e destroying entire ecosystems to keep lights on.

25 LIKES — **EcoVoice_Kid**: Once forests and wetlands are flooded, they don't ret pecies can go extinct. Some dams even force people to move from their homes, including Indigenous communities living near the rivers and forests.

7 LIKES — **HydroFan55**: Wind and solar aren't always reliable. Hydroelectric dams work year-round, even in winter. They're one of the only renewable energy sources that can provide stable power during all seasons and weather conditions.

85 LIKES — **EcoVoice_Kid**: There are more than 90,000 large dams worldwide. That's millions of hectares of land underwater. Most of that land was once animal habitat, forest, or farmland. We should not ignore that damage.

32 LIKES — **ThinkItThrough7**: Instead of building more giant dams, we should study each case. If a dam floods too much or destroys wildlife, it's not worth it. Energy plans must include nature in the decision.

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Curriculum Connection
A1.4, A2.5, A3.5, A3.11

Questions Answer the questions below using evidence from the text.

1) Explain why some people believe dams are necessary for energy.

2) Explain how building a dam could change an ecosystem forever.

3) Expla hy Ind mmunities may be affected by dams.

True or False Is the statement true o

1) Canada gets most of its electricity from fossil fu	True	False
2) Hydro dams are the only clean power that wo sum	True	False
3) Flooded forests can grow back after the dam is built	ue	False
4) Large dams help protect some cities during drought seas		alse
5) Over 90,000 big dams exist around the world today.		False
6) Hydro power is the only clean energy that works in Canada.		False

Opinion Write a comment that you would add to this conversation.

Username: _____ Date: _____

PREVIEW

Name: _____

Curriculum Connection
A1.4, A2.5, A3.5, A3.9, A3.11

Newspaper Article: Hurricane Katrina

Hurricane Katrina Brings Historic Flooding to New Orleans

Published: August 29, 2005

Hurricane Katrina struck the Gulf Coast this morning with devastating force, becoming one of the m[illegible]st powerful storms in U.S. history. Wi[illegible]ched 280 kilometres per hour (175 [illegible]n it was at Category 5 strength[illegible]ade landfall, the storm [illegible]ssi[illegible]ng, killing at least 1,8[illegible] people [illegible]g an estimated $108[illegible]nag[illegible]

New Orleans, [illegible]d in [illegible] the Mississippi River De[illegible] hit especially hard. About 80% [illegible] is now under water, with flood lev[illegible]each up to 6 metres (20 feet) in some neighbourhoods. The city's levees, built protect against rising river water, failed when the storm surge pushed in from the Gulf.

Experts have warned for years that human changes to the delta made New Orleans more vulnerable. Dr. Elaine Roberts, a coastal scientist, explained,

> *"Wetlands and barrier islands are a natural defence. Every mile of wetland can absorb 7 to 20 centimetres of floodwater. But decades of levee building have blocked sediment from reaching the delta, causing wetlands to disappear at a rate of 60 square kilometres a year."*

New Orleans was already built on low ground, but pumping water and oil from the earth caused the land to sink even further—a process called subsidence. Most of the city now sits about 1.8 metres (6 feet) below sea level.



[illegible]ocal r[illegible]ames Harris [illegible]ed e[illegible]ing water:

> *"[illegible]men[illegible] street was w[illegible]the[illegible] water was a[illegible] climbed onto the[illegible] and waited all night for rescue."*

Before the city expanded, marshes acted like a sponge to protect against flooding. Scientists estimate that if the wetlands near the Mississippi's mouth had been left to grow naturally, they could have reduced the storm surge from over 20 metres (25 to 66 feet) to 7.6 meters. Katrina's surge reached deadly levels, overwhelming both natural and man-made defences.

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Curriculum Connection
A1.4, A2.5, A3.5, A3.9, A3.11

True or False

Circle whether the statement is true or false.

1) Wetlands and marshes cause flooding during storms.	True	False
2) Hurricane Katrina was a category 5 hurricane.	True	False
3) Levees and dams prevent wetlands from forming because they hold the sediment that would normally deposit in the river delta.	True	False
4) Subsidence is when the earth sinks because oil or water is removed from the earth.	True	False
5) Levees v[illegible]vent damage from happening during hurricanes.	True	False

Questi[illegible]

[illegible]n from the text to support your answer.

1) What chang[illegible] ma[illegible]landforms that caused the damage from Hurricane Katrina to be wo[illegible]t wou[illegible]en if humans hadn't made these changes?

2) What are the benefits of wetlands?

PREVIEW

Reaction

How do you feel about what happened in New Orleans during Hurricane Katrina?

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Curriculum Connection
A2.1, A2.2, A2.5, A2.6

Human Footprint Case Study

Objective

What are we learning about?

Students will explore a real-world example of how human activity has changed the environment. They will investigate what humans are doing, the environmental problems caused, pos[illegible]le solutions, and interesting facts. This will help them understand the two-way relati[illegible]etween humans and the environment and encourage them to think about c[illegible]

PREVIEW

Materials

[illegible]u n[illegible]for the activity?

- Example case stud[illegible]
- Research page with guid[illegible]ion
- Planning page (provided)
- List of optional topic ideas (provided)
- Report writing page (provided)



Instructions

How will you complete the activity?

1) Read the example case study to understand how human activity [illegible] environment.
2) Choose one topic from the provided list or think of your own.
3) Use the research page with guiding questions to collect key facts and examples.
4) Record notes about what humans are doing and the effects on the environment.
5) Find information on possible solutions or actions that could reduce harm.
6) Add at least one interesting fact about your topic to make it unique.
7) Use the planning page to organize your information before writing.
8) Write your final report on the provided report page and include drawings, maps, or images if possible.

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Curriculum Connection
A2.1, A2.2, A2.5, A2.6

Criteria Use the criteria below to complete the activity.

Criteria	Description
Topic Choice	The student selected a relevant human footprint case study topic from the list or created their own.
Research Quality	The student used the guiding questions to collect accurate and detailed information about their topic.
Environmental Impa	The student clearly explained how humans are affecting the environment and how the environment is affecting humans.
Solution	The student included at least one possible solution and one esting fact about the topic.
Pres on & Visuals	ent wrote their report clearly, included a drawing, map, or wed understanding of the topic.

Case Study Topics case study topics below for your research.

Alberta Oil Sands (Mining)	Larg rta that extracts oil from sand and clay, cha ging a lot of water.
Amazon Rainforest Deforestation	Cutting down areas arming, cattle ranching, and logging, reducing bio sity.
2010 Deepwater Horizon Oil Spill	Massive oil spill in the Me d sea life and coastlines.
Great Pacific Garbage Patch	A huge area of floating plastic an in an harming marine animals.
Aral Sea Drying (Water Diversion)	Once a large lake, now mostly dry because verted for farming.
Melting Glaciers in the Himalayas	Glaciers shrinking due to climate change, affecting rivers and water supply for millions.
Purple Loosestrife in Canadian Wetlands	Tall plant from Europe that spreads fast, crowding out native wetland plants.
Palm Oil Plantations in Indonesia	Clearing tropical forests to grow palm oil, affecting wildlife like orangutans.
Three Gorges Dam, China	World's largest dam providing power but flooding villages and changing river habitats.
Coral Reef Damage from Climate Change	Warming oceans and pollution causing coral to die, affecting fish and tourism.

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Curriculum Connection
A2.1, A2.2, A2.5, A2.6

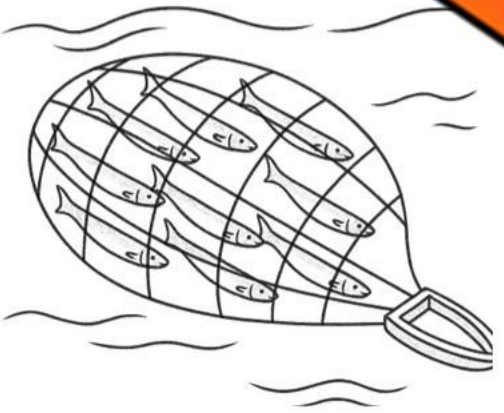
Example Case Study | Nathan's Case Study on Overfishing in the Atlantic Ocean

Overfishing in the Atlantic Ocean



Ever since I went fishing with my grandfather on a summer trip to Newfoundland, I've been fascinated by the ocean. I still remember pulling up my first codfish and feeling so proud. But last year, my grandfather told me that we can't fish for cod the way he used to when he was my age. He explained that too many fish have been taken from the ocean, and their numbers are much lower. That made me want to learn more about overfishing and why it's such a big problem.

Overfishing happens when we catching more fish than the ocean can replace naturally. In the Atlantic Ocean, this has happened with several species, like cod, tuna, and swordfish. Big fishing boats with advanced equipment can catch thousands of fish at once using giant nets or long lines with hundreds of hooks. While this seems efficient, it doesn't give the fish enough time to reproduce and grow their numbers. Some fishing methods also harm other animals, like dolphins, turtles, and birds, which get caught by accident.



This is serious because when a fish population becomes too small, it can collapse. In the 1990s, the Canadian government had to ban cod fishing in Newfoundland because the population had dropped so much. This affected communities that depended on the ocean for jobs and income. Overfishing also changes the marine ecosystem, because removing too many predators or prey can throw the food chain off balance.

There are ways to help. Governments can set strict limits on how many fish can be caught each year and protect certain areas as "no fishing zones" so fish can recover. People can also choose seafood from sustainable sources, where fishing is done in a way that doesn't harm the long-term health of the species.



One interesting fact I found is that some scientists are using satellite tracking to watch fishing boats and make sure they follow the rules. That makes me feel hopeful that technology can help solve the problem.

Learning about overfishing has made me see the ocean differently. The next time I go fishing with my grandfather, I'll be thinking not just about catching fish, but about making sure there will be fish for future generations too.

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Name: _____ 71

Curriculum Connection
A2.1, A2.2, A2.5, A2.6

Research Answer the questions below about your chosen topic.

1) Which topic did you choose?	

2) Describe the human activity. What are the humans doing and why?

3) De[illegible] caused in the environment.

4) How is the environment affecting hu[illegible] this s[illegible]?

5) What can be done to stop or reduce the problem?

6) Other interesting facts about this topic.

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Curriculum Connection
A2.1, A2.2, A2.5, A2.6

Draft Write a rough copy of your Case Study



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Curriculum Connection
A2.1, A2.2, A2.5, A2.6



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Curriculum Connection
A2.1, A2.2, A2.5, A2.6

Peer Compliment Card | Write a kind note or compliment

Instruction
Write a kind note to a classmate about their Human Footprint Case Study presentation. Mention something they shared, like what human activity they researched, how it affects the environment, possible solutions they suggested, or an interesting fact they included.

To: _____

From: _____



PREVIEW

Example Compliment

To: Nathan
From: Sarah

I really enjoyed your case study on overfishing in the Atlantic Ocean. I didn't know that cod fishing was banned in Newfoundland in the 1990s because of low fish numbers. I liked how you explained both how humans affect the ocean and how the loss of fish affects people. Your solution ideas were clear and realistic.

Awesome job!

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Curriculum Connection
A2.1, A2.2, A2.5, A2.6

Rubric How did you do on the activity?

Criteria	1 Point	2 Points	3 Points	4 Points
Topic Choice	Topic missing or unclear	Topic chosen but not from list or unclear relevance	Topic chosen from list and somewhat relevant	Topic clearly chosen and relevant to human footprint
Research Quality	Little or no information collected	Basic information with few details	Clear information with some examples	Detailed, accurate research with strong examples
Environmental Impact	[illegible]	Only one side of impact explained (human on [illegible]ronment OR [illegible]ment on [illegible])	Both sides explained simply	Both sides explained clearly with examples or research
Solutions & Facts	No solution or fact included	Eithe[illegible]tutio[illegible] fact	One solution and one fact [illegible]luded	Multiple solutions and interesting facts included
Presentation & Visuals	Report incomplete or hard to follow, no visual	Report complete[illegible] but unclear[illegible] minimal visual	[illegible]lear [illegible] with [illegible]	Clear, well-organized report with strong and [illegible]iled visual

PREVIEW

Teacher Comments

Mark

Student Comments – What Could You Do Better?

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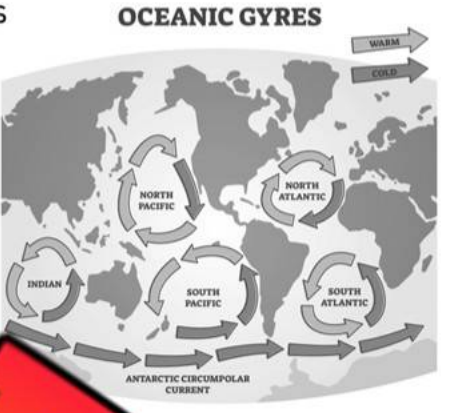
Curriculum Connection
A1.3, A2.5, A3.4, A3.7, A3.8

Ocean Currents

The Five Oceans and Their Currents
The Earth has five oceans. From largest to smallest, they are the Pacific, Atlantic, Indian, Southern (Antarctic), and Arctic Oceans. Together, they cover about 71% of the planet's surface, making oceans the largest physical feature on Earth. Within each ocean, there are permanent streams of water called **ocean currents**. These currents move in a set direction from one part of the ocean to another and can be thousands of kilometres long and up to 200 kilometres wide.

Warm and Cold Currents
Ocean currents are either **warm** or **cold**. Warm currents form near the **equator**, where the water is warmer. Cold currents start near the **North or South Pole**, where water is much colder. These temperature differences create patterns that affect both climate and marine life in coastal areas.



Causes of Ocean Currents
Currents are moved by several factors, including:

- **Wind** pushing water across the surface
- **Earth's rotation** (the Coriolis effect)
- **Tides** caused by the Moon's gravity
- **Water temperature** changes
- **Salt content** in the water

Warm water is lighter and rises, while cold water is heavier and sinks. Salt also affects density—when saltwater evaporates or freezes, the remaining water becomes saltier and sinks, pushing less salty water up. This creates powerful convection currents.

Impact on Weather and Rainfall
Warm ocean currents heat the air above and cause rain clouds. Since most of the world's rain comes from ocean water, these currents play a major role in controlling weather. They can bring warm, wet weather to some areas and cool, dry conditions to others.



Example: The Gulf Stream
One of the most famous currents is the **Gulf Stream** in the Atlantic Ocean. It starts in the Gulf of Mexico, flows along the U.S. coast to Newfoundland, then crosses the Atlantic to Europe. Driven by convection, it pulls **cold Arctic water** southward while sending **warm tropical water** northward, helping to balance heat and rainfall worldwide.

Direction of Currents
In the **Northern Hemisphere**, currents move in a **clockwise** direction. In the **Southern Hemisphere**, they move **counterclockwise**, due to the Earth's rotation.

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Name: _____ 77

Curriculum Connection
A1.3, A2.5, A3.4, A3.7, A3.8

True or False

Circle whether the statement is true (T) or false (F).

1) Most of the world's rain originates from water evaporating over oceans.	T	F
2) Cold currents always begin near the equator where water is cooler.	T	F
3) The Gulf Stream helps move warm tropical water north toward Europe.	T	F
4) In the Southern Hemisphere, ocean currents rotate in a clockwise direction.	T	F
5) The amount of salt in ocean water affects ocean currents.	T	F

Questions

rmation from the text to support your answer.

1) Na d explai ings that can change how ocean currents move.

2) Describe how salt content can create water urrents.

PREVIEW

Did You Know?

The Gulf Stream moves enough water daily to fill over 100 million Olympic pools. It carries heat from the tropics to northern Europe, keeping winters warmer. How might Europe's climate change if it slowed or stopped?

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Curriculum Connection
A2.1, A2.2, A2.4, A2.5, A3.7

Experiment: Ocean Current

Objective

What are we learning about?

Students will explore how temperature differences in water create ocean currents. They will observe how warm and cold water interact, helping them understand how ocean currents m[illegible] heat and affect global weather.

Materials

What will you need for the activity?

- 1 clear dish [illegible] container
- Cold water ([illegible] reh[illegible] ubes in final setup)
- Hot water (recent[illegible]
- Blue food colouring and [illegible] col[illegible]
- 2 separate cups or small cont[illegible]
- Spoon for stirring and towel to prev[illegible] spills



Instructions

How will you complete the activ[illegible]

1) Pour cold water into one container and add 2–3 drops of [illegible] fo[illegible] until evenly mixed.
2) Pour hot water into the second container and add 2–3 drops of red fo[illegible] olouring. Stir until mixed.
3) Carefully pour the blue cold water into the clear dish until it is about one-third full.
4) Make sure there are no ice chunks in the dish, as these can change the results.
5) Slowly pour the red hot water into one corner of the dish.
6) Watch how the red and blue water move and swirl around each other.
7) Continue adding a small amount of hot water to see how the pattern changes.
8) Discuss how this model shows what happens in real oceans when warm and cold water meet.

PREVIEW

Name: _____ 80

Curriculum Connection
A2.1, A2.2, A2.4, A2.5, A3.7

Step-by-Step Guide Follow the steps below to do the Ocean Current

Step		What to Do	Details & Tips
1	**Prepare Your Area**	Choose a flat workspace and put a towel under your dish.	Make sure the area is well-lit so you can see the colours.
2	**Prepare Cold Water**	Fill a cup with cold water and ice for 5 min. Remove ice. Add 2–3 drops of blue food colouring and stir.	Colour should be bright but not too dark. No ice chunks in final water.
3		Heat water until boiling. Pour to a cup. Add 2–3 drops of food colouring and stir.	Ask an adult for help with hot water. Be careful—it can burn skin.
4	**Fill the Dis**	Slow the cold blue wate ar dish until	Pour gently so the surface stays still.
5	**Add Hot Water**	Pic Slowly ur a of hot red w r the surfa	Let it slide in without splashing. Watch the colours move.
6	**Observe Movement**	Look for swirling patterns warm and cold water mix.	r will rise, cold ater w —this is like al o urrents.
7	**Add More if Needed**	If movement slows, pour a little more hot red water.	This can he rling p
8	**Clean Up**	Pour water down the sink. Wash and dry all items.	Wipe up any spill o avoid stains from food colouring.
-	**Safety Tips**	Always handle hot water carefully. Ask for help if needed.	Keep food colouring away from clothes—it can stain.

PREVIEW

Experiment Video You can watch this experiment on YouTube:

Title: Ocean Currents Activity

Link: https://www.youtube.com/watch?v=aB-gBvX-524



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Curriculum Connection
A2.1, A2.2, A2.4, A2.5, A3.7

Understanding Check | Experiment: Ocean Current

Name: _____

How well do you understand the topics discussed below? Rate your understanding from 1 to 5 stars, with 1 being "I don't understand" and 5 being "I understand very well."

1) Why ocean currents are important for the Earth's climate	☆☆☆☆☆
2) How warm water and cold water move differently	☆☆☆☆☆
3) How t rature and density affect water movement	☆☆☆☆☆
4) How ts can affect rainfall and storms	☆☆☆☆☆
5) dels real ocean currents	☆☆☆☆☆

Name: _____

How well do you unde pics d d below? Rate your understanding from 1 to 5 stars, with 1 being "I d stan ing "I understand very well."

1) Why ocean currents are imp tant f th ate	☆☆☆☆☆
2) How warm water and cold water mo differen	☆☆☆☆☆
3) How temperature and density affect water ment	☆☆☆☆☆
4) How ocean currents can affect rainfall and storms	☆☆☆☆☆
5) How this experiment models real ocean currents	☆

Name: _____

How well do you understand the topics discussed below? Rate your understanding from 1 to 5 stars, with 1 being "I don't understand" and 5 being "I understand very well."

1) Why ocean currents are important for the Earth's climate	☆☆☆☆☆
2) How warm water and cold water move differently	☆☆☆☆☆
3) How temperature and density affect water movement	☆☆☆☆☆
4) How ocean currents can affect rainfall and storms	☆☆☆☆☆
5) How this experiment models real ocean currents	☆☆☆☆☆

PREVIEW

Name: _____ 82

Curriculum Connection
A1.3, A2.5, A3.5, A3.7, A3.8

El Niño And La Niña

How the Cycle Works

Warmer or colder than average ocean temperatures in certain regions can cause major shifts in weather patterns around the world. This is called the **El Niño Southern Oscillation (ENSO)** Cycle. It is caused by the **Trade Winds**, which normally blow near the equator from the west coast of South America toward Asia. The ENSO Cycle is a repeating back-and-forth change in which warm and cool water in the Pacific Ocean trade places as the winds change strength and direction. **El Niño** is the warm phase, and **La Niña** is the cold phase.

Normal Co

During a ... strong Trade Winds push warm surface water west toward Asia and A... huge pool of warm water in the western Pacific. Along South America ... from the deep rises to the surface in a process called **upwelling**, whic... feed marine life. Rain tends to form over warm water, so countri... ific receive heavy rainfall, while the west coast of South America rema... uch

PREVIEW

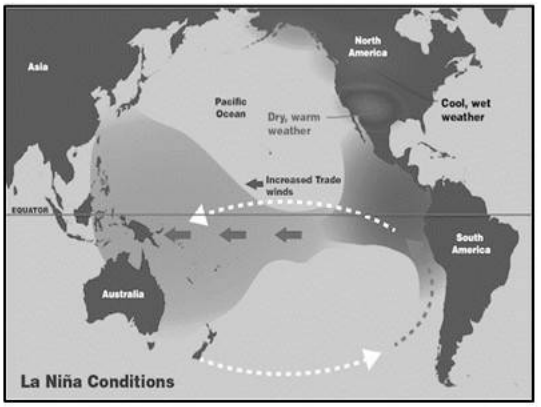


El Niño – The Warm Phase

When the Trade Winds weaken, ... su... drifts east toward South America. This is ... The warmer water pulls the **Jet Stream** ... farther south than usual. As a result:

- Heavy rain and flooding occur in the southe... United States.
- Warmer, drier winters happen in the Pacific Northwest and western Canada.
- Australia experiences drought because cooler water is on their side of the Pacific, reducing rainfall.

La Niña – The Cold Phase



When the Trade Winds blow stronger than normal, more cool water builds up along the coast of South America. This is **La Niña**. The colder Pacific water pushes the Jet Stream northward, bringing drought to the southern United States and heavy rain with flooding to the Pacific Northwest. In Australia, La Niña often causes wetter summers, sometimes leading to flooding. It can also make Atlantic hurricane seasons stronger, as warmer water remains in the Atlantic to fuel storms.

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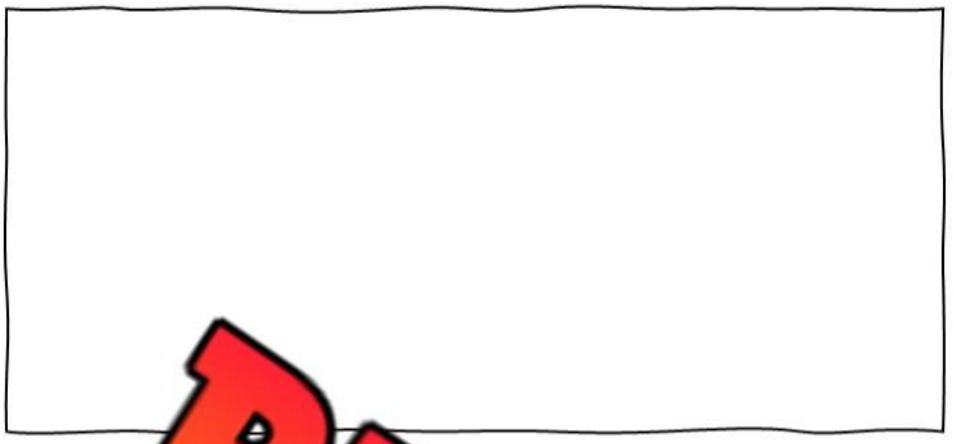
Curriculum Connection
A1.3, A2.5, A3.5, A3.7, A3.8

Visualization

What were you picturing while you were reading? Describe your picture.



Questi

from the text to support your answer.

1) What is the [illegible] cause El Niño and La Niña?

2) Does El Niño affect different continents in dif[illegible]ways[illegible]? If not, why not?

PREVIEW

True or False

Circle whether the statement is true (T) or false (F).

1. El Niño happens when warm water drifts east toward South America.	T	F
2. Strong Trade Winds push warm water toward Asia and Australia normally.	T	F
3. La Niña pushes the Jet Stream farther south than normal.	T	F
4. Upwelling brings cold water and nutrients to South America's coast.	T	F
5. El Niño brings wetter summers to Australia most of the time.	T	F

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Curriculum Connection
A2.6, A3.2, A3.7

Memory Game – Natural Processes

Objective

What are we learning about?

Students will learn about natural processes that shape the Earth, such as erosion, deposition, glaciation, weathering, and ocean currents, by playing a memory match game. Each card will show a term or image, and students will match it with the correct definition. This will he[lp] understand how each process changes the physical environment.

PREVIEW

Mater[ials]

What [do] you need for the activity?

- Set of Mem[ory] [Game] cards [per] group (provided)
- A small table or clear are[a] [on the] flo[or]



Instructions

How will you complete [the] [act]ivity?

1. Divide the class into groups of 3 or 4. Give ea[ch] [gro]up [one] [Mem]ory Game cards. (provided)
2. Have each group lay all the cards face down in a grid on [the] [tab]le.
3. The students take turns flipping over two cards at a time, trying [to] [fin]d 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.

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Curriculum Connection
A2.6, A3.2, A3.7

Cards | Memory Game Cards

Erosion	Movement of rock, soil, or sand by wind, water, ice, or gravity forces.
D	When wind, water, or ice drops and builds up materials in new locations.
Glaciation	For n and slow movement of iers arve valleys and es urface.
Weathering	Breaking dow into smaller pieces by wind, water, temperature, or chemicals.
Subduction	One tectonic plate sinks under another, forming trenches, volcanoes, and mountain ranges.

PREVIEW

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Name: _____ 86

Curriculum Connection
A2.6, A3.2, A3.7

Cards | Memory Game Cards

Volcanic Activity	Eruption of magma through Earth's crust forming mountains, islands, and changing landscapes.
Ea[illegible]s	Sudden ground shaking caused by tectonic plate movement releasing energy deep within Earth.
Flooding	O[illegible]w of water onto land [illegible]ed b[illegible]vy rain, melting [illegible]ms.
Landslides	Rapid downhi[illegible]d [illegible]t of rock, soil, or debris due to gravity and weather.
Tsunamis	Huge ocean waves triggered by underwater earthquakes, landslides, or volcanic eruptions displacing water.

PREVIEW

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Curriculum Connection
A2.6, A3.2, A3.7

Cards | Memory Game Cards

Tectonic Uplift	Raises sections of Earth's crust, forming mountains and changing land elevation.
Avalanches	Sudden rush of snow, ice, and debris down a mountain slope due to gravity.
Hurricanes	Powerful rotating storms with strong winds and heavy rain that form over warm oceans.
El Niño	Warm phase of Pacific Ocean cycle that changes weather, causing floods or droughts.
La Niña	Cool phase of Pacific Ocean cycle that shifts weather, increasing rain or dryness.

PREVIEW

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Curriculum Connection
A2.6, A3.2, A3.7

Quiz Check-In	This quiz will assess students' understanding of the concepts covered in the memory game activity.

Name: _____ Mark

Pick two terms from the memory game. Write one sentence about each one.

PREVIEW

Name: _____ Mark

Pick two terms from the me[illegible]ne. [illegible]ntence about each one.

Name: _____ Mark

Pick two terms from the memory game. Write one sentence about each one.

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Name: _____ 89

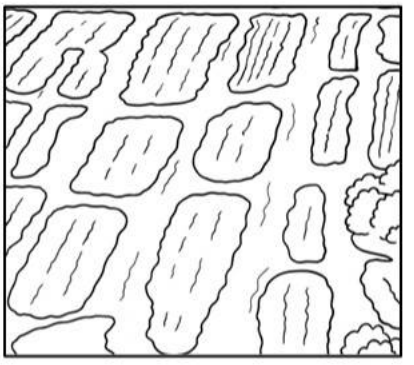
Curriculum Connection
A1.1, A2.5, A3.2, A3.10

Land Reclamation

Land Reclamation

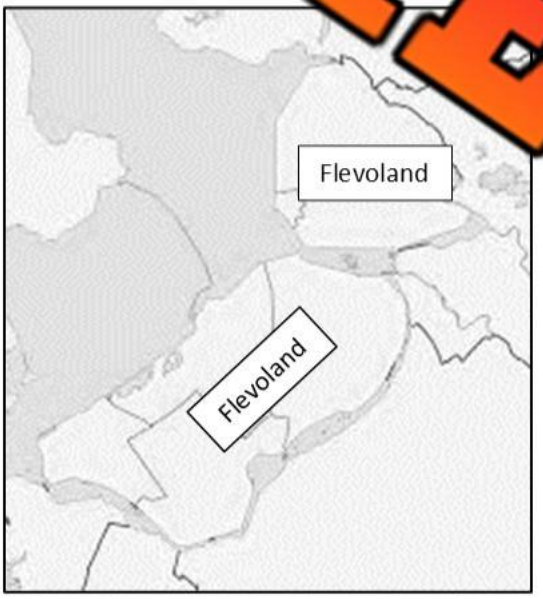
Land reclamation refers to either:

- creating new land from **marshes**, **riverbeds** or **oceans**
- returning land that has been disturbed by mining or use as a landfill and returning it to an improved condition.



Polders in the Netherlands

The larges[illegible]ple of the first type of land reclamation is the **polder**[illegible]etherlands. A polder is a piece of land that has [illegible]from a body of water. The Nethe[illegible]ow[illegible]ountry in Europe. Polders are created by building **dykes** that hold ba[illegible]e large[illegible]ater and then draining the inland section of land with a series of drainage ca[illegible]e o[illegible] Netherlands have been using windmills to pump water from one [illegible]land t[illegible]r for hundreds of years.



[illegible]the 1920s, a land reclamation project began [illegible]in Ne[illegible]ds. Another province called **Flevoland** was [illegible]reat[illegible]rea that used to be a lake called the **[illegible]jsse**[illegible]laimed 1620 square kilometers of lan[illegible]er 40[illegible]eople live in this province.

Notre Dame Is[illegible]n Mo[illegible]

Notre Dame[illegible] is a[illegible]land in the St Lawrence River[illegible]was built using 15 million tons of [illegible]was [illegible]to create the Montreal Metro underg[illegible]ail[illegible]'67 was built on the island. Since then, th[illegible]s removed, and the island has be[illegible]park with gardens and a lake for swimming[illegible]mmer and skating in winter. The island is 62 acres.

Reclaiming land used for Natural Gas Wells.

Natural Gas wells are usually used for 20 to 30 years before they are no longer productive. After that companies have the responsibility to restore the land to its condition before the well was opened. The land needs to be reshaped with drainage systems added. The layers of soil that were removed for the well need to be replaced and topped with topsoil and then trees and grass need to be replanted.

The site needs to be monitored to check soil and water quality and to make sure the replanted vegetation is growing. The process is the same when landfills are closed. They need to be returned to their former or improved condition and monitored to make sure they are not a source of groundwater or air pollution from methane gas.

PREVIEW

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Name: _____ 90

Curriculum Connection
A1.1, A2.5, A3.2, A3.10

True or False

Circle whether the statement is true or false.

1) Land reclamation is taking land back from previous owners.	True	False
2) Notre Dame Island was formed from soil removed for the Montreal Metro.	True	False
3) Flevoland was reclaimed from an area that used to be ocean.	True	False
4) Polders in the Netherlands are created by flooding low-lying farmland.	True	False
5) Restoring used wells includes replacing topsoil and planting vegetation.	True	False
6) Land re[illegible]ion can return damaged areas to their former condition.	True	False

Questic[illegible]

[illegible]ion from the text to support your answer.

1) What are the[illegible]d r[illegible]mation project after an oil well is no longer in use?

2) What are the benefits of land reclamation?

PREVIEW

Summarize

Summarize the reading by writing the important information.

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Curriculum Connection
A1.2, A1.4, A2.2, A2.6

Interview With An Indigenous Knowledge Keeper

Jamie: Hi! I'm learning about how people protect the environment. Can you tell me how Indigenous communities take care of the land?

Knowledge Keeper: Of course, Jamie. Indigenous communities have cared for the land for thousands of years. They follow traditional knowledge passed down through Elders, stories, and ceremony. This helps them understand how to live in balance with nature.

Jamie: What is traditional knowledge?

Knowledge Keeper: Traditional knowledge is the wisdom that comes from observing the land, water, animals, and weather over many generations. It's not written in books. It comes from experience, stories, and deep respect for the Earth.

Jamie: How do Indigenous people respond to changes in the land?

Knowledge Keeper: We pay close attention to signs in nature. For example, if berries grow late, they know the seasons are changing. If water levels drop, they may change where or when they fish to protect spawning areas.



Jamie: That's amazing. Are there examples of how they protect the land?

Knowledge Keeper: Yes. In British Columbia, the Haida Nation protects forests using traditional harvesting rules. In northern Ontario, many Cree communities check ice conditions and monitor moose populations before hunting. These actions help keep ecosystems healthy.

Jamie: Do Indigenous people work with scientists too?

Knowledge Keeper: Absolutely. Today, many Indigenous communities work with researchers to track climate change. Elders share knowledge about rising temperatures, melting permafrost, and species that are disappearing. This teamwork helps everyone make better decisions for the future.

Jamie: Why is it important to learn from the land?

Knowledge Keeper: Because the land teaches us how to live. It gives us food, water, medicine, and shelter. When we respect it, it continues to provide. That's why many Indigenous Peoples say, "The land is our teacher."

Jamie: I really liked learning this. I want to help take care of the land too.

Knowledge Keeper: That's wonderful, Jamie. Learning is the first step. Keep listening, observing, and respecting nature—just like our ancestors always have.

PREVIEW

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Name: _____ 92

Curriculum Connection
A1.2, A1.4, A2.2, A2.6

True or False

Is the statement true or false?

1) Indigenous knowledge is mainly learned from printed books and maps.	True	False
2) The Haida Nation protects forests with traditional harvesting rules.	True	False
3) Cree communities hunt moose without checking population levels.	True	False
4) Learning from land means taking only what is needed.	True	False
5) Listening to nature is part of being an informed citizen.	True	False
6) Indigen mmunities have protected the land for thousands of years.	True	False

Questi s e questions below.

1) How do Indi lun respond to environmental changes?

2) What does the phrase “the land is our teach an?

Journal Entry

Pretend you’re Jamie—write a journal entry about the interview.

PREVIEW

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Curriculum Connection
A1.2, A1.4, A2.2, A2.6

Exit Cards

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

Name: _____ | Mark

2 Truths and a Lie – Can you find the one that's not true?

	The Haida Nation uses traditional harvesting rules today.
	Indigenous people predict seasons by watching nature.
	Indigenous land practices harmed ecosystems in the past.

Name: _____ | Mark

2 Truths and a Lie – Can you find the one that's not true?

	The Haida Nation uses traditional harvesting rules today.
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PREVIEW

Name: _____ | Mark

2 Truths and a Lie – Can you find the one that's not true?

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Name: _____ | Mark

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Name: _____ | Mark

2 Truths and a Lie – Can you find the one that's not true?

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	Indigenous people predict seasons by watching nature.
	Indigenous land practices harmed ecosystems in the past.

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Curriculum Connection
A1.4, A2.3, A2.4, A3.1, A3.3

Topographical Map

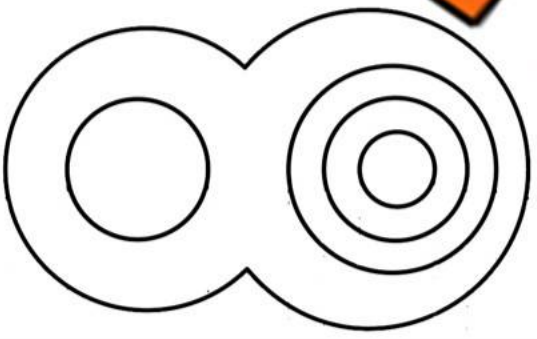


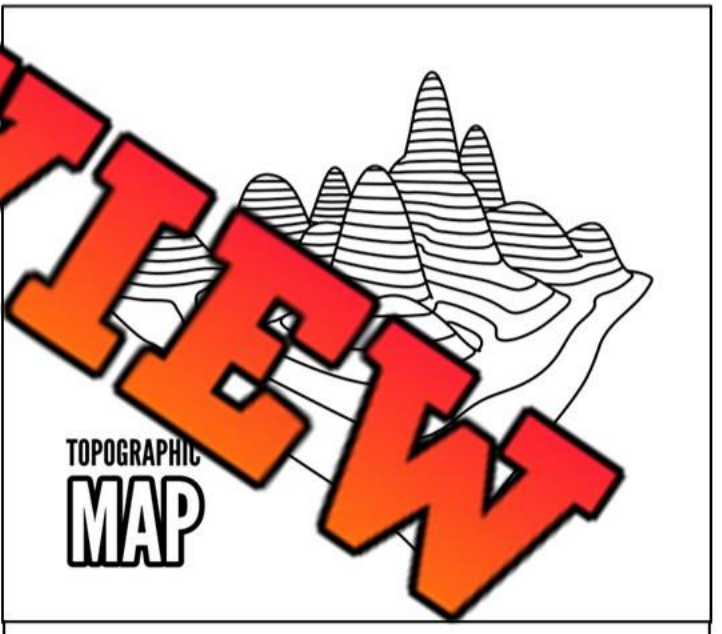
A **topographical map** is a special type of map that shows the shape and height of the land. It uses contour lines to represent elevation. **Each contour line connects points that are the same height above sea level.** When the lines are close together, it means the land is steep. When they are far apart, it means the land is flat or gently sloping.

In the picture, the model shows a hill with several steps going up to the peak. On the topographical map, each step is shown as a separate contour line. The smallest loop in the centre shows the highest point of the hill. As you move outward from the centre, each larger loop represents a lower elevation. This is how contour lines help u[illegible] the 3D shape of the land on a flat map.

PREVIEW

Exercise Draw the sh[illegible] of [illegible] matches this co[illegible]





In this picture, the lines go around each hill or mountain, showing how high or low the land is. **The smallest loops at the top show the highest points, and the bigger loops lower down show where the land is closer to the ground.** The lines are closer together on steep slopes and farther apart where the land rises slowly. Because **each line shows one height level**, we can see the shape of the land without needing to see it in real life.

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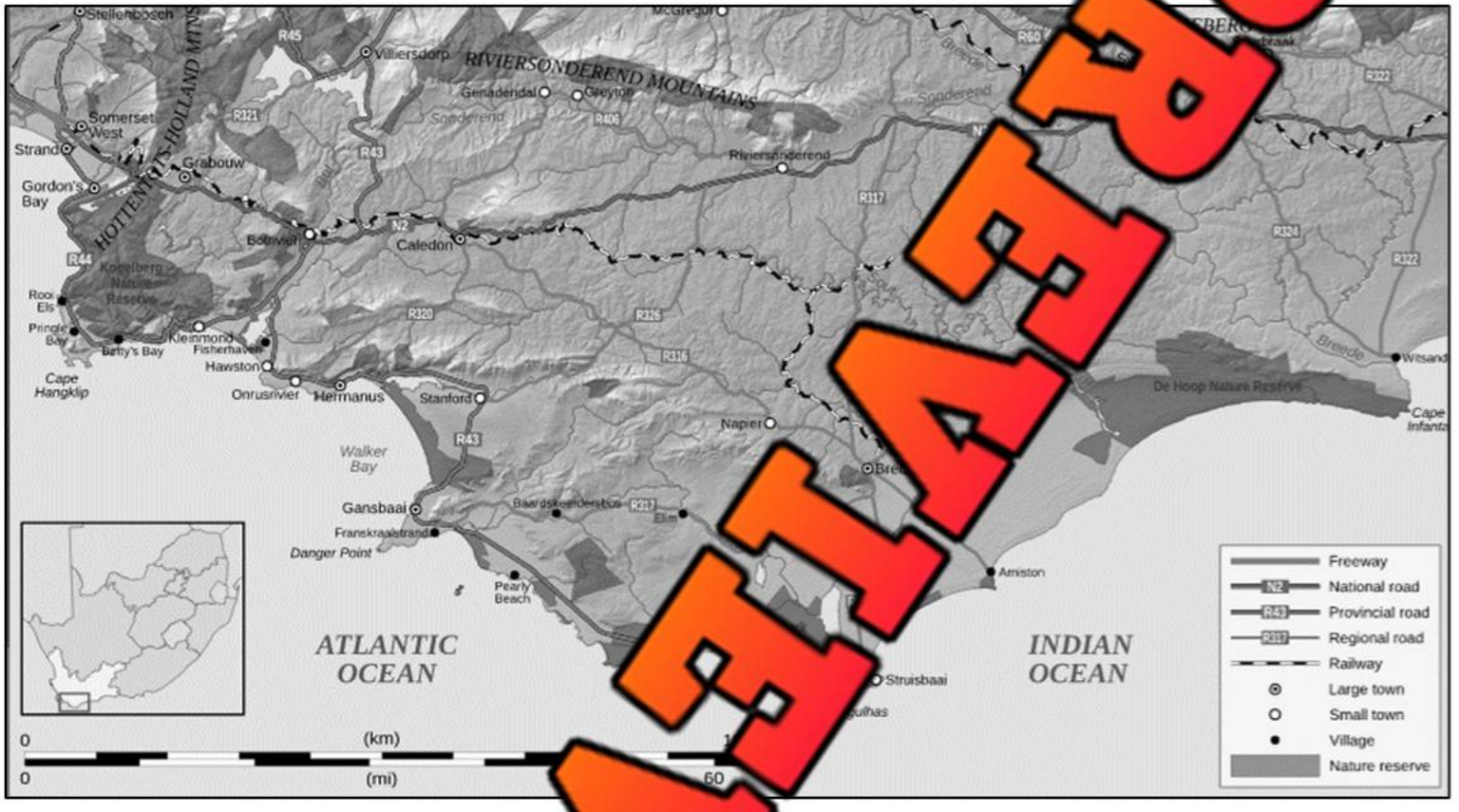
Name: _____

Curriculum Connection
A1.4, A2.3, A2.4, A3.1, A3.3

Reading A Topographical Map

Research Take a close look at the map below and answer the questions



1) What information does this topographical map tell us?

2) What specifically do you noti[illegible]on (Ex. Where are the roads and railway mainly located)?

PREVIEW

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Curriculum Connection
A1.4, A2.3, A2.4, A3.1, A3.3

Word Search

Find the words from the word bank.

Word Bank: Physical Geography Terms					
Erosion	Weathering	Glacier	Delta	Volcano	Mountain
Plateau	Valley	Tectonic	Magma	Lava	Sediment
Fault	Mantle	Crust	Earthquake	Climate	Landform



PREVIEW

Word Scramble

Unscramble the words from the word bank.

DLRAFMON		EDNSEMTI	
LAAPUTE		OUIMATNN	
MNEALT		ETNWIEGARH	
LAEGRCI		GAAMM	
ATKEAQERUH		ECITNOCT	

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Curriculum Connection
A1.1, A1.4

Role-Play: Humans And The Environment

Objective What are we learning about?

Students will explore how the environment affects human life and how human actions impact the environment, by acting out real-world scenarios and reflecting on both short-term and long-term effects for people and nature.

Materials What we need for our activity?

- Scenario cards (different situations) (provided)
- Props or costumes (optional)
- Timer or stopwatch



Instructions How will we complete our activity?

1) Divide the class into small groups of 4 to 5 students.
2) Provide each group with a scenario card that outlines a specific situation related to the topic being studied.
3) Give out roles to each student in the group, assigning them a character within the scenario, or let them decide and take roles.
4) If available, distribute props or costumes that may help students embody their roles more effectively.
5) Set the timer to allocate a specific amount of time for the groups to discuss and act out their scenarios.
6) Allow each group to present their role-play to the class.
7) After all groups have presented, initiate a class discussion to reflect on the different approaches and outcomes observed during the role-plays.
8) Distribute reflection sheets for students to express what they learned and felt during the activity.

PREVIEW

Name: _____ 98

Curriculum Connection
A1.1, A1.4

Criteria Use the criteria below to complete the activity.

Criteria	Description
Creativity	Show what your character thinks and feels. Use ideas that make the role-play more real and interesting.
Voice	Speak clearly and loudly so others can hear. Change your voice to match your character's feelings.
Actions	Use body movements, facial expressions, and actions that match your character's story.
Stay in R	your character. Don't break role until you're finished.
Tea	lpful. Take turns and make sure everyone joins.

Scenario Card out t cs below.

Scenario		Description
1	**Hurricane in the Coastal Town**	A small coastal town as be ful hurricane. Homes are damaged, streets are flood nd many been evacuated to a local school gym. The mayor is mee th co aders to decide how to get food and clean water to families. th p of volunteers is trying to rescue stranded pets. ore is upset because his shop was destroyed, and he wants hel reb wildlife officers are worried about seabirds whose nests ere away.
2	**The Logging Dispute**	In a forested area, a logging company has started cutting down large sections of trees. Workers are happy for the steady jobs, but hunters and campers are upset because the forest trails are gone. Heavy logging trucks are damaging small roads and creating noise. A nearby river has become muddy from soil washing into it, and fish numbers are dropping. Environmental groups are arriving to protest, while the company promises to plant new trees in the future.

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Curriculum Connection
A1.1, A1.4

Scenario Cards | Cut out the topics below.

Scenario		Description
3	**Pesticide Problem**	A farming community has been using chemical pesticides to protect crops. The crops look healthy, but bees and butterflies are disappearing at an alarming rate. A beekeeper is losing many hives, and the honey harvest is the smallest in years, leaving her worried about the future. Some residents fear chemicals are [illegible] into drinking water and harming families. Local farmers argue they [illegible]sticides to survive financially and feed the community. Scientists arrive to test t[illegible]d water, while anxious parents start petitions to reduce chem[illegible]ore[illegible] too late.
4	**The Melting Glacier**	A north[illegible]mmu[illegible]lacier has noticed that the glacier is melting faster each su[illegible]Elders re[illegible]r when the ice covered the whole valley, shining bright even[illegible]sun[illegible]ting ice is causing the river to flood each spring, damaging roads[illegible], and [illegible]nd. A group of hunters is concerned because the animals they de[illegible]on f[illegible]d are moving farther away into the mountains. Local lead[illegible]e deb[illegible]w[illegible]er to build a protective wall or move the village entirely[illegible]ground[illegible] guides are losing work because fewer tourists are coming [illegible]the[illegible]king beauty, and some fear the loss will destroy the town's ec[illegible]
5	**The Plastic Waste Crisis**	A lakeside town is seeing more and more plastic bottles, bags[illegible] wrappers in the water and along the shoreline. Tourists leave trash behind after picnics, and strong winds blow it into the lake, scattering it far and wide. Fish swallow small pieces of plastic, and a local fishing business is struggling because customers worry about contaminated fish reaching their tables. Volunteers try to organize clean-up days, but the trash keeps returning faster than it can be removed. Store owners debate switching to paper bags, but some think it will cost too much and hurt profit. Wildlife rescuers are finding more injured animals trapped in discarded plastic every week.

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Curriculum Connection
A1.1, A1.4

Scenario Cards | Cut out the topics below.

Scenario		Description
7	**The Factory Smoke**	A new factory on the edge of town is producing steel for construction. While it brings many jobs, it also releases thick black smoke into the air. People living nearby complain about a strong smell and soot covering their houses. The local clinic sees more patients with breathing problems. Children are not [illegible]ed to play outside on bad days. Company leaders say they are following [illegible] but residents demand better air filters and reduced emissions.
8	**Lake Taken Over**	A lake[illegible] has been overrun by an invasive species of fish. These fish are eat[illegible] that [illegible] species need to survive. The fishing industry is strugg[illegible]d ma[illegible] are losing their jobs. Scientists are trying to figure out a w[illegible]ove th[illegible]ive fish without harming other wildlife. A local festival that [illegible]es [illegible]ive fish is in danger of being cancelled. At the same time[illegible]ants [illegible]ing to create new dishes using the invasive fish to attract visitors.
9	**Wetland at Risk**	A wetland on the edge of a town is b[illegible]rain[illegible] houses. The project is bringing jobs, but the wetland is [illegible]o many b[illegible]ogs, and plants. Bird watchers and scientists are upset a[illegible]t th[illegible]ected. Construction workers are clearing trees and digging cha[illegible]o drain away. Heavy trucks are making the roads busy and noisy[illegible]e families are happy about new homes being built, but others worry about losing the natural flood protection the wetland provides.
10	**The Oil Spill**	A coastal community depends on fishing, but a recent oil spill has covered the harbour in thick sludge. Boats cannot leave, and the smell is strong. Fishermen fear losing the season's income. Volunteers scrub seabirds and clean the shoreline. The company responsible offers compensation, but some residents say it's not enough. Tourists cancel trips, and the local seafood restaurant struggles to find clean fish to serve.

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A1.1, A1.4

My Role Draw a picture of what your character did during the role-play.



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Name: _____ 102

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A1.1, A1.4

Rubric How did you do on the activity?

Criteria	1 Point	2 Points	3 Points	4 Points
Creativity	Did not try to pretend.	Tried a little but didn't add ideas.	Used imagination and helped make the scene better.	Used great ideas and made the role-play exciting and real.
Voice	Hard to hear or too quiet.	Sometimes clear, but not loud or strong.	Clear and matched the feelings of the character.	Loud, clear, and showed strong feelings with voice.
Actio[illegible]	Did [illegible]	A few actions, not always connected to role.	Used actions that matched the character's role.	Used many strong actions that were clear and realistic.
Stay in Role	A[illegible]ke themselv[illegible] the charact[illegible]	[illegible] acted [illegible] cha[illegible]	Mostly stayed in character during the scene.	Stayed in character the whole time.
Teamwork	Did not help or listen.	Hel[illegible]tle [illegible]	[illegible]ed others [illegible]d with the [illegible]	Shared, listened, and helped make the group's work better.

PREVIEW

Teacher Comments

_____

_____

_____

_____

_____

[illegible]rk

Student Comments – What Could You Do Better?

_____

_____

_____

_____

_____

Name: _____ Date: _____

Unit Test: Physical Patterns In A Changing World

Total	Mark
/	/

1) When two tectonic plates push together... a) Divergent Boundaries b) Convergent Boundaries c) Transform Boundaries d) All of the above	2) These mountains have magma inside... a) Fold Mountains b) Fault Block Mountains c) Volcanic Mountains d) All of the above
3) Which is a major type of volcano? a) Shield b) Strato c) Cinder Cone d) Ash Volcano	4) What is the number one cause of erosion? a) Wind b) Storms c) Water d) Humans
5) Which of the following is a strategy to control soil erosion? a) Windbreaks b) Deltas c) Terracing d) Reforestation	6) Which country has undergone many land reclamation projects? a) The Netherlands b) Ca c) [illegible]ne d) Aust
7) Which landform is built from layers of lava? a) Shield Volcano b) Plateau c) Fold Mountain d) Delta	8) Which type of valley is a[illegible] by glaciers? a) V-Shaped b) Flat-Bottom c) Crater d) U-Shaped
9) What landform is built by river sediment? a) Trench b) Glacier c) Delta d) Plateau	10) What side of a mountain is dry and windy? a) Windward b) Summit c) Leeward d) Glacier Side

PREVIEW

Define What do the terms below mean?

Mark /

Term	Definition – What does it mean?
Tectonic Plate	
Dyke	
Glacier	

PREVIEW

Short Answer Answer the q[illegible]ns

Mark /

1) What is erosion? Provide at least one e[illegible]mple.

2) What is the water cycle? How do mountains affect the water cycle?

3) What is a wetland? Provide 4 examples of wetlands.

Long Answer | Answer the questions below.

Mark /

1) How have human activities affected our physical environment? Make sure to include at least 5 ways in which humans have changed our environment.

2) How do ocean currents affect weather around the world? Include examples like the Gulf Stream, El Niño, or La Niña.

PREVIEW

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