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Google Slides Lessons Preview

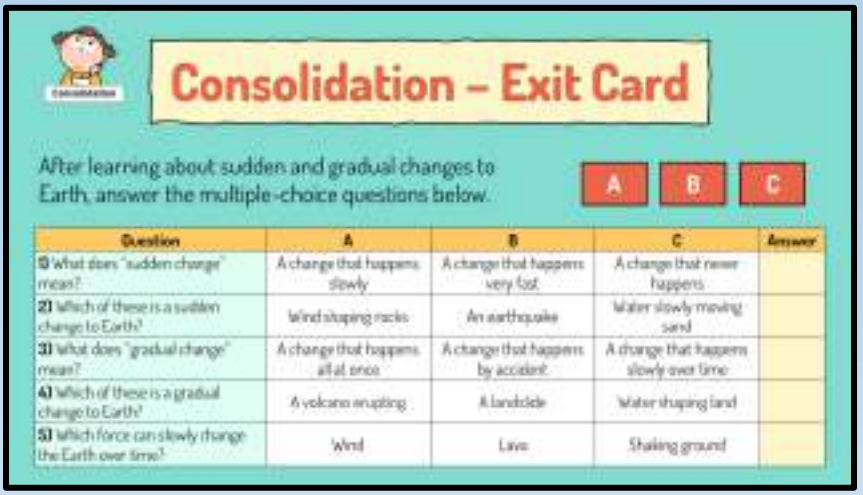
Alberta Science Curriculum
Earth Systems Unit – Grade 3

3-Part Lesson Format

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

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

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



Alberta Science Curriculum
Earth Systems Unit – Grade 3

Alberta Science Curriculum
Earth Systems Unit – Grade 3

Workbook Preview

Grade 3 – Science Unit

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

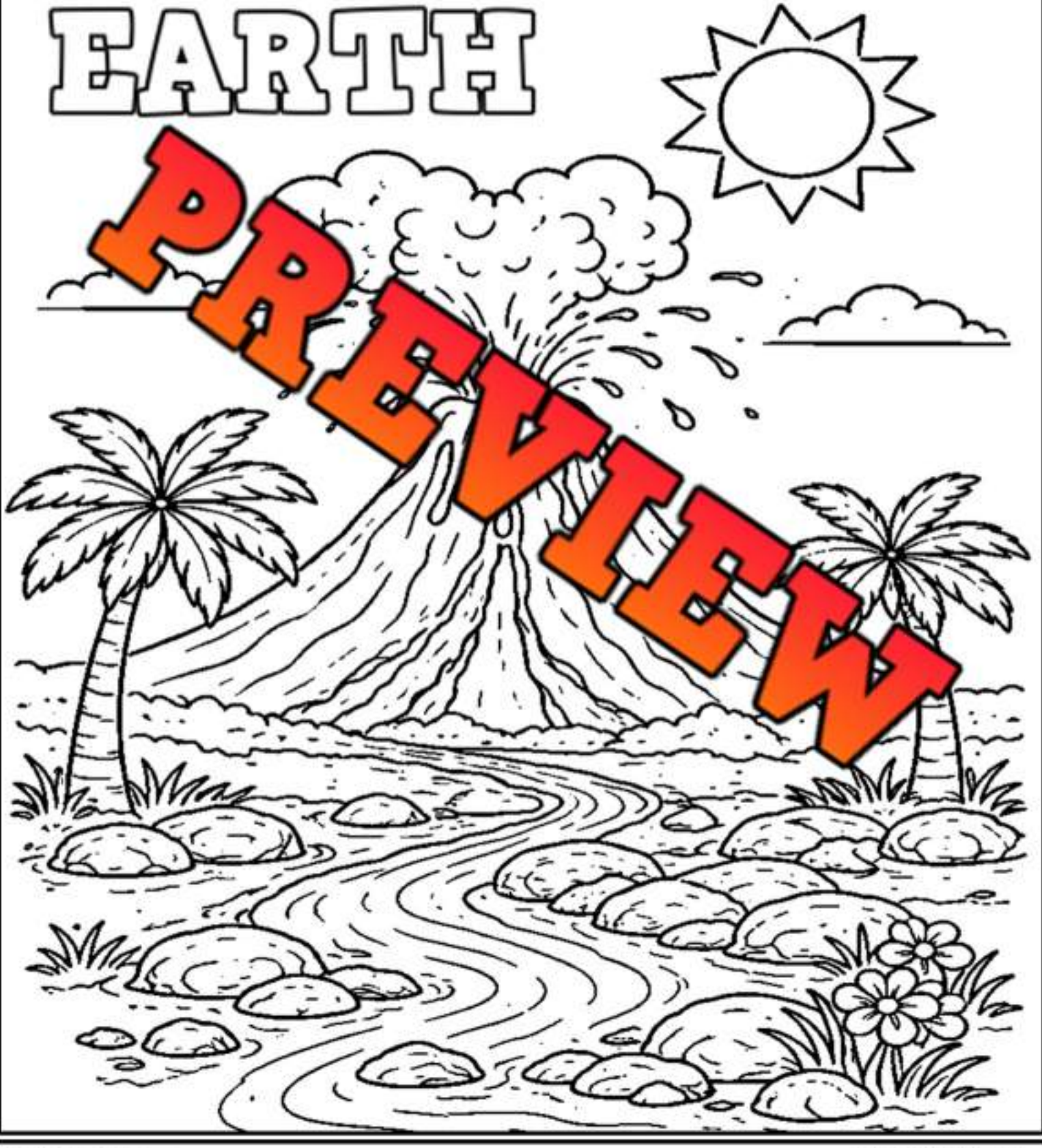
Guiding Question: What visible changes can be identified by examining Earth's surface?

	Learning Outcome – Students analyze changes in Earth's surface and explain how its layers hold stories of the past.	**Pages**
ES.1	Changes that can occur to Earth's surface over a long period of time include • mountains wearing down, rivers changing course, lakes and seas drying out and refilling, glaciers moving, advancing, and receding Natural events that can change Earth's surface in a short period of	7-31, 37-47, 63
ES.2	all of Canada. Melting glacier ice creates runoff that forms and maintains many of the major rivers in Alberta. Earth is warming up from natural and human causes, which is accelerating the melting of glaciers. Interactions with wind and water have shaped Earth's surface, including Alberta's badlands and the Grand Canyon in the United States.	24-36, 48-57, 64-65
ES.3	Human activities that can change Earth's surface include • living on the land, building towns and cities, getting and using resources, growing crops and farming (agriculture), polluting, stewardship Plant and animal activities can change Earth's surface, such as • overpopulation, using resources, parasite infestation; e.g., mountain pine beetle, animals burrowing	66-71

	Learning Outcome - Students analyze changes in Earth's surface and explain how its layers hold stories of the past.	**Pages**
ES.4	Earth's surface contains layers that have been deposited over long periods of time. Fossilized dinosaur bones found in many locations around the world show that dinosaurs lived on Earth millions of years ago. Millions of years ago, Earth's surface in Alberta included lush tropical forests and an inland sea that supported dinosaur life and the preservation of dinosaur bones. Fossilized dinosaur bones can be collected from the surfaces of Earth or by digging up (excavating) its layers. Fossilized dinosaur bones have been found in several locations in Alberta, such as • Alberta's badlands, the Grande Cache area, the Fort McMurray area Dinosaur Provincial Park, located in Alberta's badlands, has been classified as a UNESCO World Heritage Site. Many dinosaurs lived in Alberta, such as • Albertosaurus, Edmontosaurus, Nodosaurus, Tyrannosaurus Displays of fossilized dinosaur bones can be viewed in museums in Alberta such as the • Royal Tyrrell Museum in Drumheller, Philip J. Currie Dinosaur Museum in Wembley A scientist who studies fossilized dinosaur bones is called a paleontologist.	72-94
ES.5	Soil includes • living plants and animals, decaying plants and animals, rock particles, air, water Soil provides a habitat for many animals. Habitats are environments where plants or animals establish a home. Soil can change due to the influence of plants and animals, such as • plants and crops growing, worms tunneling and eating matter	95-119
	Computer Science - Learning Outcome	
CS.1	Students investigate creativity and its relationship to computational thinking	N/A

NAME: _____

CHANGING EARTH



Name: _____ 7

Curriculum Connection
ES.1

Sudden vs Gradual Changes to Earth

Changes to Earth: Sudden (Fast) and Gradual (Slow)

The Earth is always changing. Some changes happen very quickly because of strong forces like earthquakes, landslides, and volcanoes. Other changes happen slowly over a lot of time, like when wind and water shape the land.

Fast Ch[illegible]arth

Eart[illegible]e

Sometimes, p[illegible]s c[illegible]nge our Earth very quic[illegible]015, a[illegible]ake changed Mount Kina[illegible]ysia. mountain had a part called [illegible]'s and the earthquake damaged it.

Volcanoes

A volcano is a hole in the Earth's ground that can [illegible]a, ash[illegible]steam. When a volcano erupts, its lava can cool down and turn into ro[illegible]his[illegible] parts of the Earth. Volcanoes in Hawaii have even made new is[illegible]

Slow Changes to Earth

Wind, water, and ice can change the Earth slowly. This can happen through processes called erosion and weathering. Erosion is when parts of the Earth are worn away or moved. An example of erosion is when wind moves soil, glaciers scrape the ground, or water changes our coastlines. Weathering is when rocks break down into smaller pieces, but don't move. Both erosion and weathering shape the Earth slowly over time.

Name: _____ 8

Curriculum Connection
ES.1

Questions Answer the questions below using evidence from the text

1) What is the difference between sudden and gradual changes to Earth?

2) Write ex[illegible]les of sudden and gradual changes to Earth.

	Sudden	Gradual

Visualizing Draw what you w[illegible] pict[illegible] [illegible]ere reading. Explain the picture

Sudden or Gradual Is the example a gradual or sudden change?

1) A landslide destroys a forest	
2) A waterfall is formed after years of water erosion	
3) A glacier carved out the Cape Cod River	
4) An earthquake created fissures in the ground	

Name: _____ 9

Curriculum Connection
ES.1

Research - Sudden and Gradual Changes to Earth

Definitions	What do the terms below mean?

Term	Definition
Erosion	
Weathering	
osition	

Term	n
Glacier Erosion	
Water Erosion	
Wind Erosion	

Research	Research your own examples of sudden and gradual changes to the Earth

Sudden	
Gradual	

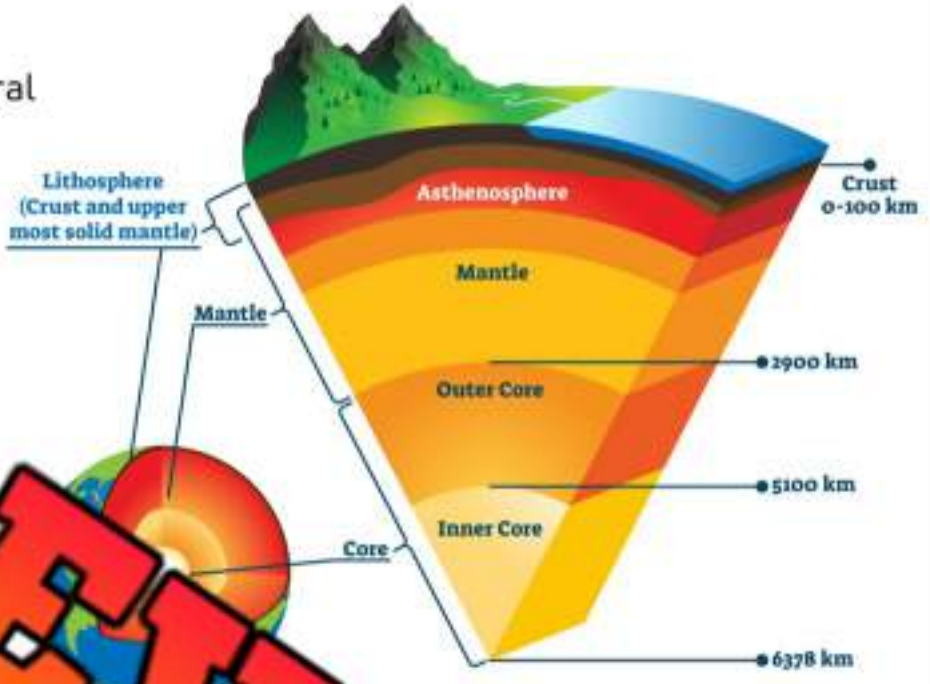
Name: _____ 10

Curriculum Connection
ES.1

Layers of Earth

Layers of the Earth

The Earth is made up of several layers, which are composed of different materials and have diffe[illegible]roperties. From th[illegible]f the Earth outw[illegible] lay[illegible]



The Inner Co[illegible]

The inner core is t[illegible]ddl[illegible] part of the Earth. It is m[illegible] up of solid iron and nickel. It is the hottest part of the Earth, with [illegible]eratur[illegible]00 degrees Celsius. The inner core is thought to be about the same s[illegible] the M[illegible]

The Outer Core

The outer core is made up of molten iron and nickel. It is [illegible]oler[illegible]ore. The outer core is a liquid.

The Mantle

The mantle is made of hot, molten rock. It is the largest layer of the Earth. The mantle is hot liquid rock that is always moving.

The Crust

The crust is the outermost layer of the Earth and is made up of solid rock. The crust is thin, but it is still about 35 kilometers thick. The crust is made of seven major plates, like jigsaw pieces.

Name: _____ 11

Curriculum Connection
ES.1

True or False Circle whether the statement is true or false

1) The Earth's mantle is solid	True	False
2) The crust is made of 7 big plates	True	False
3) The inner core is about the same size of the moon	True	False
4) The crust is the hottest layer of the Earth	True	False
5) The crust is the thinnest layer of Earth	True	False

Draw a diagram of the Earth and label each layer

Question Describe the layers of the Earth so someone who didn't know t[here] were layers

Curriculum Connection
ES.1

Exit Cards

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

Name: _____ Mark

Is the statement true or false?

1) The crust is made of hard rock.	True / False
2) The inner core is cooler than the crust.	True / False
3) The outer core is cooler than the inner core.	True / False
4) The mantle never moves inside the Earth.	True / False
5) The crust is the thickest layer.	True / False

Name: _____ Mark

Is the statement true or false?

1) The crust is made of hard rock.	True / False
2) The inner core is cooler than the crust.	True / False
3) The outer core is cooler than the inner core.	True / False
4) The mantle never moves inside the Earth.	True / False
5) The crust is the thickest layer.	True / False

Name: _____ Mark

Is the statement true or false?

1) The crust is made of hard rock.	True / False
2) The inner core is cooler than the crust.	True / False
3) The outer core is cooler than the inner core.	True / False
4) The mantle never moves inside the Earth.	True / False
5) The crust is the thickest layer.	True / False

Name: _____ 15

Curriculum Connection
ES.1

Mountains

Mountain Landform

A **mountain** is a landform that rises high above the surrounding ground. Mountains are usually higher than 300 metres above the ground, otherwise they are called hills. Mountains are made from rocks and earth.

Features of a Mountain

Mountains have two features – a sloped side of the mountain, and the summit, which is the top of the mountain. Mountains usually form together in a line that we call a mountain range. On a mountain range, there is one summit that is the top of all mountains. The mountain range will have several peaks, which are the tops of the other mountains in the range.

How Do Mountains Form?

There are four types of mountains.

1) Folded – form when two plates crash into each other.

2) Fault Block – Form when the Earth's crust cracks because of plates moving. When it cracks, one side of the crack can be higher than the other

3) Upwarped – form when magma underground pushes the crust up

4) Volcanic – form when a crack in the Earth's crust gets bigger and magma rises and spills out of the crack. Over time, the magma cools and a volcano grows.

Name: _____ 16

Curriculum Connection
ES.1

True or False

Circle whether the statement is true or false

1. Mountains have to be at least 50 metres tall	True	False
2. Folded mountains happen when plates crash into each other	True	False
3. Magma is only found above the ground	True	False
4. Volcanos form when magma rises out of a crack	True	False
5. Mounta[illegible] formed because of the Earth's plates	True	False

Questi[illegible]

[illegible]ns do you have after reading the information?

1)	
2)	

Questions

Use information from the text to sup[illegible]our a[illegible]

1) What is a mountain?

2) How are mountains made?

Name: _____ 17

Curriculum Connection
ES.1

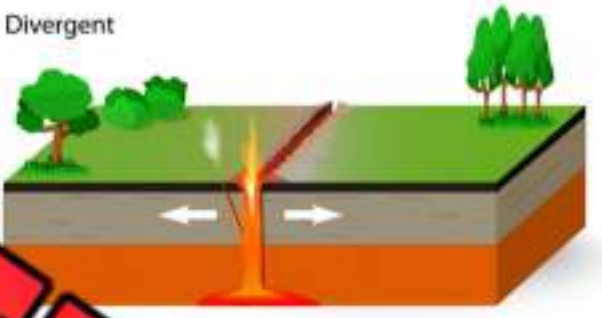
Plate Boundaries

Plate Boundaries

A **plate boundary** is where two plates meet. There are three types of plate boundaries – divergent, convergent, and trans

Diver Sprea en two plates move away fr er, divergent plate boundary.

Volcanic mountai m at boundaries because the magm ses the ground and then it cools.



Convergent (Colliding) – Happens when plates move towards each other and hit. Fold mountains happen at convergent plate boundaries. They happen because when the plates hit, one pla ves under the other. The plate that is denser or heavier, will often slide under the other plate. This pushes up the other plate, which makes a fold mountain.

Transform – Happens when plates slide past each other. Earthquakes can happen at these plate boundaries because the plates rub on each other. This friction makes a strong force that can shake the ground. The San Andreas fault zone in California is an example of a transform plate boundary.

Name: _____ 18

Curriculum Connection
ES.1

True or False

Circle whether the statement is true or false

1) Plate boundaries are where plates meet each other	True	False
2) Convergent boundaries are where plates move away from each other	True	False
3) Mountains are formed at transform plate boundaries	True	False
4) Divergent boundaries are where plates move away from each other	True	False
5) Heavier plates move under lighter plates	True	False

Define

...e plate boundaries?

Divergent Plate Boundary	
Convergent Plate Boundary	
Transform Plate Boundary	

Diagram

Draw a diagram of each type of plate boundary

Divergent Plate Boundary	**Convergent Plate Boundary**	**Transform Plate Boundary**

Name: _____ 19

Curriculum Connection
ES.1

Experiment - Types of Plate Boundaries

Background

What is the lab about?

The plates that make up part of our Earth's crust are constantly moving, shifting, and interacting with each other. As they float on the mantle, the plate boundaries can be convergent, divergent, or transform.

Materials

...ill need to complete the experiment

- A p... plate
- A thick su... ...e used ...but icing/frosting will work
- Two crackers – ...ed ... will also work

Procedure

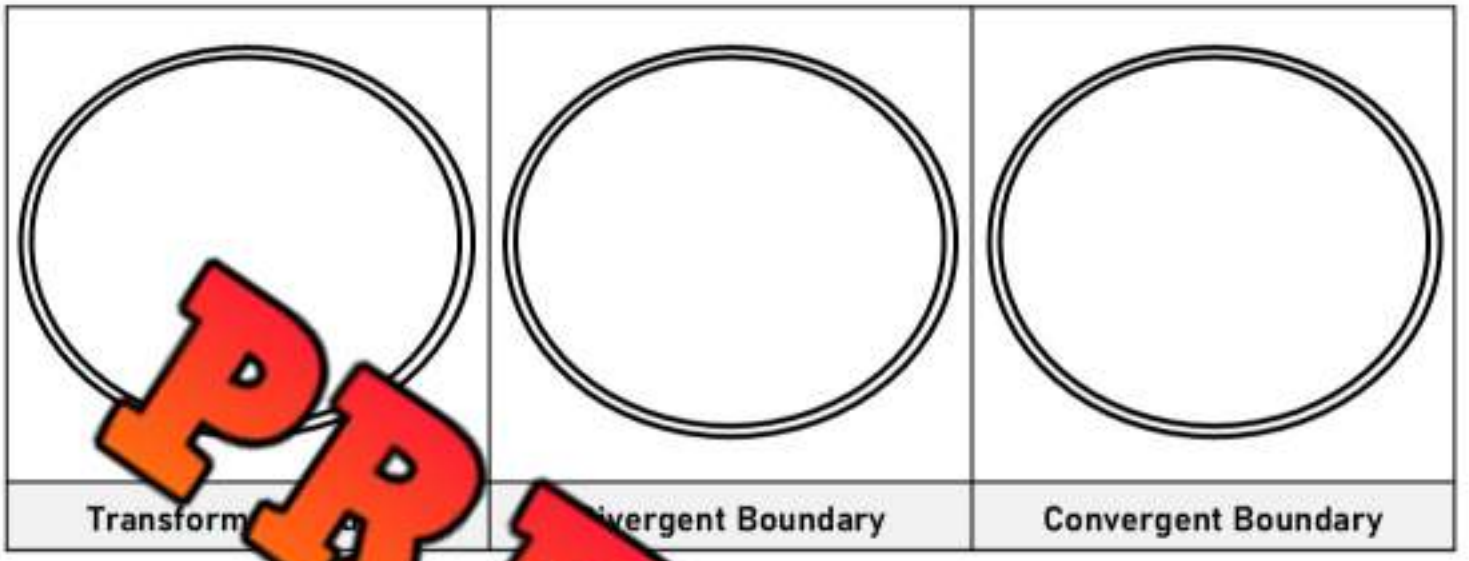
How you will co... ...he ...

1) Spread the thick substance on the ...er plate. This will be the mantle
2) Put two crackers on the mantle. The cracker represent the plates.
3) First perform the transform plate boundary by sliding the crackers by each other. They should rub against each other, as the friction causes earthquakes.
4) Next, perform a divergent plate boundary by pulling the crackers apart.
5) Lastly, perform a convergent plate boundary by pushing the crackers into each other. You may need to lift one cracker up to slide it past the other cracker. Make a folded mountain by cracking the cracker that went over top the other cracker.
6) Draw diagrams of your demonstrations on the back of this page.

Name: _____ 20

Curriculum Connection
ES.1

Observations Draw a diagram on the paper plates below. Use arrows to show the movement of the crackers (plates)



Transform	ivergent Boundary	Convergent Boundary

Results Answer t[illegible] below.

1) What is a plate boundary? W[illegible]at do[illegible]es [illegible]n?

2) How do plate boundaries make folded mountains?

3) What can form at a divergent plate boundary?

Name: _____ 21

Curriculum Connection
ES.1

The Rocky Mountains

How did the Rocky Mountains Form?

The Rocky Mountains are a mountain range that runs through the United States and Canada. They were formed because of the mo nt of the Earth's plates.

Th ountains formed because of th rth American plate. About 80 millio th North American plate o hit te. The Pacific Plate is a e th thin but heavy. When the p th went under the land plate. This made th n Plate move over top.

Now ne pushing on the of a likely cause the rug ed ar ed up over the floor. doe nen where you touch ad, it happens further in, to s the centre of the rug.

When the Rocky Mountains formed, the plates hit near the Pacific Ocean. But the same thing happened as above. The mountains formed about 1000 km inland. That is why the mountains are not right at the plate boundaries.

Name: _____ 22

Curriculum Connection
ES.1

Questions Answer the questions below using evidence from the text

1) Where are the Rocky Mountains?

2) How di cky Mountains form?

Visualizing Draw what yo ct u were reading. Explain the picture

True or False Circle whether the statement is true or false

1) The Rocky Mountains were formed by plate movement	True	False
2) Mountains always form where the plate boundaries are	True	False
3) The Rocky Mountains are only in Alberta	True	False
4) There are no plates in our oceans	True	False
5) The Rocky Mountains formed about 80 million years ago	True	False

Name: _____ 24

Curriculum Connection
ES.1, ES.2

Landform - Glaciers

What is a Glacier?

A **glacier** is a huge mass of ice that moves very slowly over land. The largest glacier in the world is L[illegible] Glacier, which is in Ant[illegible]

[illegible]00km w[illegible]m long, and 2.5k[illegible] is 40,000 kilometre[illegible]ed. I[illegible] is 48 times bigger than t[illegible] Calg[illegible] 58 times bigger than Edmonton.

How Glaciers Form

Glaciers are huge pieces of ice that s[illegible]ozen f[illegible]a[illegible] year. In colder regions, not all the snow and ice melts during the sp[illegible]d su[illegible]ths. This means more snow and ice pile on top of the old snow a[illegible]year.

Over time, massive chunks of snow and ice form[illegible] are[illegible]gl[illegible]ers. Most of the glaciers are in the Antarctic and Greenland, but gla[illegible]n nearly every continent, even Africa.

Glacial Erosion

As glaciers move slowly, they scrape and grind over the ground. This scraping and grinding can change the land around them. It can make valleys deeper, create lakes, and even make new mountains. This process is called glacial erosion.

Just like how we use tools to shape things, like when we use a hammer to make a sculpture, the glacier uses its weight and movement to shape the land. So, over thousands of years, glaciers can change the way our planet looks.

Name: _____ 25

Curriculum Connection
ES1, ES2

Questions Answer the questions below using evidence from the text

1) What is a glacier?

2) How do glaciers change our land?

Draw Draw mountains and glaciers sliding down valleys between the mountains

True or False Circle whether the statement is true or false

1) Glaciers move fast	True	False
2) Glaciers are any piece of ice	True	False
3) Glaciers scrape the land, changing it	True	False
4) Glaciers can carve out valleys, making them bigger	True	False
5) Most glaciers are found in Africa	True	False

Name: _____ 26

Curriculum Connection
ES1, ES2

Landform - Valleys

What is a Valley?

Valleys are long and deep areas of land that are found between hills and mountains. They look like large ditches. Pl[illegible]wo mountains or large hi[illegible]other. A valley [illegible] space [illegible]en these mountains.

How are Valleys Fo[illegible]?

Most valleys are formed b[illegible] that [illegible]wear down the soil and rocks. Imagine making a large mound [illegible] sa[illegible]. If you poured a lot of water over the middle of the mound, the wa[illegible] will fin[illegible] way t[illegible] bottom of the hill.

The result will be a valley that looks ju[illegible] a dit[illegible]ow valleys are formed. The only difference is that valleys take tho[illegible] mill[illegible] years to form.

Erosion

As river water flows towards a larger body of water, the speed of the water will break away the soil and land from the sides of the water. This is called erosion. Erosion will make a valley bigger and bigger.

Glaciers

Not all valleys are formed by rivers. Some valleys are formed by large, slowly moving bodies of ice called glaciers. As the glaciers slid across our land, they scraped and molded valleys.

Name: _____ 27

Curriculum Connection
ES1, ES2

Questions Answer the questions below using evidence from the text

1) What is a valley? Where do they form?

2) How ar ys formed? Explain two ways.

Draw Draw a picture of 2 a s with in between. Label the peaks and valley

True or False Circle whether the statement is true or false

1) Valleys form when people dig with shovels	True	False
2) Glaciers made valleys when they slid across the land	True	False
3) Rivers can erode valleys, making them bigger	True	False
4) Valleys are long and deep areas of land	True	False
5) Peaks are at the bottom of mountains	True	False

Name: _____ 28

Curriculum Connection
ES1, ES2

Experiment - Making a Valley

Research Question What are we learning about?

What is a valley? How do valleys change over time with the movement of water and sediment?

Materials What you will need for the experiment

1) La… …ainer
2) …
3) Cylinder … …ick … …tery
4) Water
5) Sand

Method How you will complete the … …ment

1) Fill a large tray or container with clay t… …e a f…
2) Slide the cylinder down the clay, making a riv… …inder … …acier that is scraping the land, digging a valley
3) Add some sand to it to the trench, simulating the bottom o… …
4) Pour a small amount of water on one side of the trench. Then rest of the one side of the container on something to tip it up. This should make the water run down the riverbed.
5) Observe how the water erodes the sand and the clay. Make notes on the back of the page.
6) Change the experiment by adding more water or tipping the container more, changing the flow of the water. Does this change the erosion?

Name: _____ 29

Curriculum Connection
ES1, ES2

Observations | What happened?

1) What happened when you poured the water into the container?

2) Did th[illegible]e the sand or clay more? Explain why that happened.

Results | What happened? Answer t[illegible]stions

1) How was the valley made? What did the c[illegible] re[illegible]

2) How did the valley change? What caused the change?

3) How do valleys form in real life? How do they change over time?

Name: _____ 35

Curriculum Connection
ES.2

From Ice to Ocean: The Great Journey of Water

1) Starting from the Freezing Cold

Our little water drop's journey begins at a big, icy place called the Columbia Icefield in the Rocky Mountains. This place is full of glaciers. When the sun comes out and warms up the ice, it starts to melt into water. Our little water drop is one of those that melts and starts its journey.

2) Dow

After ng, our p flows down the mountain, joi ter to become a small stream. eam iver known as the Athabasca w, ou water drop is part of this big low downhill.

3) A Quick Stop at Lake Athabasca

The Athabasca River flows and flows until it reache e nam e Athabasca. Our water drop, along with many others, rest for

4) Onward to the Slave River and Great Slave Lake

After its break, our water drop leaves Lake Athabasca and moves along with the water of the Slave River. This river takes our little friend to an even bigger lake, the Great Slave Lake.

5) The Final Stretch: Mackenzie River to the Arctic Ocean

After Great Slave Lake, our brave little water drop enters the Mackenzie River. This is the last river on its journey. It flows and flows until finally, it reaches its destination, the Arctic Ocean.

Name: _____ 36

Curriculum Connection
ES.2

Diagram Draw and label the landforms on the map, showing the journey water takes from a glacier to the ocean

Landforms
❑ Columbia Icefield
❑ A[illegible]asca R[illegible]
❑ Lake Athabasca
❑ Slave River
❑ Great Slave Lake
❑ Mackenzie River
❑ Arctic Ocean

Name: _____ 37

Curriculum Connection
ES.1

Activity: Glacier Coding Journey

Objective What are we learning about?

Through this activity, students can gain a basic understanding of coding concepts like sequences and algorithms. They also get to move around and act out the slow, but impactful, journey of a glacier.

Coding Leg What do the coding actions mean?

1) [illegible]ps)
2) Move back[illegible]
3) Turn left
4) Turn Right
5) Melt (sit down)
6) Grow (stand up)
7) Float (lay down)

Instructions How you [illegible]

1) Go over the coding actions with [illegible]ents
2) Have each student write a "program" usi[illegible] coding actions. They will write down the sequence of actions they want their partner to perform.
3) Split the class into pairs
4) Have them move into an area where they can move around freely
5) Have one partner start as the coder and the other as the glacier
6) The coder will read the program to the glacier and the glacier will perform the coding actions. Where will the glacier end up on its journey?
7) Have the students switch roles

Name: _____ 38

Curriculum Connection
ES.1

Program	Coding Instructions

run glacier program

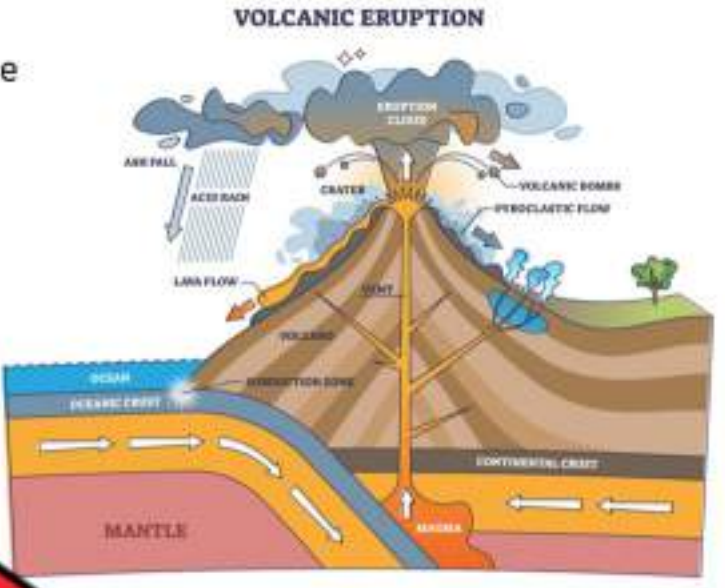
Name: _____ 41

Curriculum Connection
ES.1

Volcanoes

What is a Volcano?

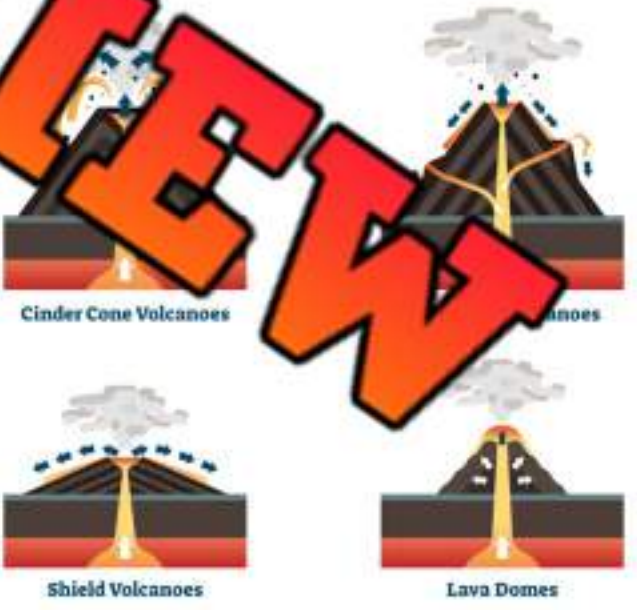
A volcano is a mountain with a hole at the top called a crater. Inside the volcano, there is hot, melted rock called magma. Sometim[illegible]essure builds up inside the volc[illegible]magma shoots out of th[illegible]sion. This is called an erupti[illegible]



When the [illegible]lands[illegible] of the volcano, it is c[illegible]hen [illegible] cools, it turns into rock and [illegible]ld[illegible]t[illegible]e volcano to make it bigger.

Types of Volcanoes

There are different types of volcanoes, like shield volcanoes, which are made mostly of lava flows and have gently sloping sides. Another type is cinder cone volcanoes, which are made mostly of volcanic ash and have steep sides.



Are Volcanoes Dangerous?

When a volcano erupts, it can be dangerous for people and animals living nearby. The eruption can shoot out hot ash, rocks, and lava, and can also cause landslides and floods. But on the other hand, volcanoes also help create new land and can make the land around them more fertile for plants to grow.

Name: _____ 42

Curriculum Connection
ES.1

True or False

Circle whether the statement is true or false

1) Volcanoes are always exploding	True	False
2) Volcanoes all look the same	True	False
3) A shield volcano is wider and a composite volcano is taller	True	False
4) The crater is the hole at the top of a volcano	True	False
5) Magma [illegible]ide a volcano	True	False

Questio[illegible]

[illegible]tion from the text to support your answer

1) What is a v[illegible]

2) Are volcanoes dangerous?

Draw

Draw a diagram of a volcano. Label the vent, ash, crater, lava, magm[illegible]canic bombs

Name: _____ 43

Curriculum Connection
ES.1

Experiment - Making a Volcano

Research Question
What are we learning about?

Can you make your favourite type of volcano? Can you make it erupt?

Materials
What you will need for the experiment

1) A s… …ttle (such as a water bottle)
2) …play d…
3) Baking s…
4) Vinegar
5) Food coloring (op…
6) A tray, large plate, or b… …he… …ow overflow

Method
How you will complete the e…perimen…

1) Place the small plastic bottle on the middle of … …te. You… …d cut the top off the bottle to make the volcano shorter.
2) Using the play dough or clay, make a volcano around the bo…tle … …ttle will be the inside of the volcano and the top of the bottle will be the c…ater.
3) Mix a small amount of baking soda and a few drops of food coloring (if desired) in a separate container.
4) Slowly pour the baking soda mixture into the volcano's crater.
5) Slowly pour vinegar into the volcano. The mixture of baking soda and vinegar will create a chemical reaction that will cause the volcano to "erupt."

Name: _____ 44

Curriculum Connection
ES.1

Observations | What happened?

What happened to the volcano? Explain using the terms: magma, erupt, and lava

Results | What happened? Answer the questions below.

1) What type of volcano did you build? Explain how you know.

2) What happened to the overflowing lava?

3) When lava overflows, what happens to it in real life?

4) Draw your volcano below.

Name: _____ 48

Curriculum Connection
ES.2

Weathering

Weathering

The term **weathering** means that rocks are broken down into smaller rocks. The weathering process is very slow and is a result of temperature changes, abrasion, and chemical reactions.

Temperature Changes - As the temperature changes from warm to freezing cold, rock[illegible]t. This happens because water gets into the cracks in [illegible]. When it freezes, it gets bigger as it changes into ice. As it gets bigger, it [illegible]n the rock.

Abrasion – Abrasion happens when [illegible] collide against each other and break down. This happens a lot to rocks at the bottom of a stream or river. The water moves the rocks so they bump into other rocks. This makes the rocks smoother as the corners of rocks are chipped off.

Abrasion can also happen when wind and water carry small pieces of rock that hit against bigger rocks. The bigger rocks can be broken down into small pieces called sediment. Sediment is like rock dust. Sediment can get compacted together to form a sedimentary rock.

Chemical Reactions – Rocks will breakdown when they react with water, air, or other chemicals. Acids from rain or chemicals humans add to water can also weather rocks.

Name: _____ 49

Curriculum Connection
ES.2

True or False

Circle whether the statement is true or false

1) Temperature changes can cause rocks to break	True	False
2) Weathering means rocks break apart	True	False
3) Sediments are large pieces of rock	True	False
4) When rocks hit each other, they can break apart	True	False
5) Rocks [illegible] bottom of a stream are rough	True	False

Questi[illegible]

[illegible]estions below using evidence from the text

1) How do roc[illegible]ered

2) Inference: What do you think happens to rock o[illegible] has [illegible]athered?

Visualizing

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

Name: _____ 51

Curriculum Connection
ES.2

Erosion - Wind, Water, Ice

Erosion

Weathering is the breaking down of rocks. **Erosion** is when the weathered rock gets moved to a new place. Erosion happens because of wind, water, and ice. Over a long time, these forces change our landscape by eroding them.

Water Er

Water i ne cause of erosion. Below is a list of the most significant form ater e

- Rainfall – l h e Earth's surface, it is called **splash erosion**. The raindrops ac ttle h move soil and destroy its structure.
- Rivers – at the bot ver, t r breaks up particles and caries them downstream. These part re pt. The flow of a river is often strong, which will break down ro soil a e edges of the river.
- Waves – the movement of water as waves werf h to polish rocks on the shorelines.

Wind Erosion

Wind is a major type of erosion, especially in dry areas. The soil in dry climates is lighter, which allows the wind to move this soil easier. Wind shapes sand dunes, which are hills of sand near oceans or in deserts.

Ice Erosion

Glaciers are so powerful that when they move, they carve out valleys and shape mountains. Glaciers erode the underlying rock by abrasion. In addition to glaciers, when water gets into rock and freezes, the ice can cause rocks to split.

Name: _____ 52

Curriculum Connection
ES.2

True or False

Circle whether the statement is true or false

1) Wind is the biggest cause of erosion	True	False
2) Rivers can cause erosion on the shorelines	True	False
3) When waves crash into the shore, they erode it	True	False
4) Erosion is only the breaking down of rocks	True	False
5) Erosion [illegible] movement of broken down rocks	True	False

Questi[illegible]er [illegible]estions below using evidence from the text

1) What is ero[illegible]

2) How does wind cause erosion?

Visualizing

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

Name: _____ 58

Curriculum Connection
ES.1

Meandering Streams

What is a Meandering Stream?

A **meandering stream** has a single channel that winds like a snake through a valley. Meanderi eams start as straight the wate lley, it often begins t erodes its way the easiest path. For if the path has softer rock on one side of the stream, it will begin to erode that side of the stream. Th arts d, or what scientist called the meander.

What Causes Meandering Streams?

As water flows through the stream, it pushes with a stronger f utside of the bend than on the inside of the bend. This erodes the outside of th rves more, making bigger bends.

To make the bends even curvier, the inside of the stream has a slower flow. This makes the eroded sediment more likely to deposit on the inside, creating even larger bends! This is because if the sediment is moving slow, it is more likely to stop moving. If it is moving fast, it will keep moving and cause more erosion.

Notice this is represented on the diagram - deposition on the inside and erosion on the outside.

Name: _____ 59

Curriculum Connection
ES.1

True or False

Circle whether the statement is true or false

1) Erosion happens on the inside of a curve more than the outside	True	False
2) Deposition happens on the inside of a curve more than the outside	True	False
3) Bendy streams start as straight streams	True	False
4) If water moves fast, the sediment will likely stop moving	True	False
5) Water m faster on the outside of a curve	True	False

Questio uestions below using evidence from the text

1) How do mea ms ? Why are they so bendy?

2) How does water in a stream cause e

Diagram

Draw a diagram of a meandering stream

Name: _____ 61

Curriculum Connection
ES.1

Lakes in Alberta: Drying and Refilling

Lakes in Alberta: Drying and Refilling

In Alberta, we have lots of beautiful lakes. Sometimes, these lakes can dry up, but don't worry! They can refill too.

When L... D...

Lak... ...ent reasons. Sometimes, it is because of less rain or snow. In sum... ...can ...o make the water in the lakes go up into the sky. This is called e... ...on. S... ...ry hot and there is not much rain, the lake can dry up.

A Special Lake: Medicine Lake

One special lake in Alberta is called Medicine L... It's really amazing! Sometimes, it looks like ... lake, but at other times, it looks almost empty. Thi... is because Medicine Lake has special underground holes, almost like drains in a bathtub.

When there is a lot of water, like in the spring, the lake fills up... ...t in other seasons, the water drains away underground, making the lake look empty. But don't worry, it always fills up again!

When Lakes Refill

Lakes can refill too! In the winter, the snow falls and when it melts, it goes into the lake. When it rains, the water also goes into the lake. So, even if a lake dries up in the summer, it can refill when it rains or when the snow melts.

Name: _____ 62

Curriculum Connection
ES.1

True or False Circle whether the statement is true or false

1) Lakes always have the same amount of water	True	False
2) Water can evaporate when it is hot	True	False
3) Medicine Lake drains like a bathtub	True	False
4) Lakes can never refill	True	False
5) Heavy snow melting can refill lakes	True	False

Questio Use in from the text to support your answer

1) Why do lake

2) How do lakes refill?

Questioning Write 2 questions you have about the reading

1)	
2)	

Curriculum Connection
ES.1

Exit Cards

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

Name: _____ Mark ____

Check only the true statements.

Statement	✓
Snow melting helps refill lakes.	
Lakes never fill up again.	
The sun causes evaporation.	
Medicine Lake is in Alberta.	
Rain makes lakes look empty.	
Medicine Lake never looks empty.	
Lakes dry up in winter.	
Snow melting fills the lakes.	

Name: _____ Mark ____

Check only the true statements.

Statement	✓
Snow melting helps refill lakes.	
Lakes never fill up again.	
The sun causes evaporation.	
Medicine Lake is in Alberta.	
Rain makes lakes look empty.	
Medicine Lake never looks empty.	
Lakes dry up in winter.	
Snow melting fills the lakes.	

Name: _____ Mark ____

Check only the true statements.

Statement	✓
Snow melting helps refill lakes.	
Lakes never fill up again.	
The sun causes evaporation.	
Medicine Lake is in Alberta.	
Rain makes lakes look empty.	
Medicine Lake never looks empty.	
Lakes dry up in winter.	
Snow melting fills the lakes.	

Name: _____ Mark ____

Check only the true statements.

Statement	✓
Snow melting helps refill lakes.	
Lakes never fill up again.	
The sun causes evaporation.	
Medicine Lake is in Alberta.	
Rain makes lakes look empty.	
Medicine Lake never looks empty.	
Lakes dry up in winter.	
Snow melting fills the lakes.	

Name: _____ 64

Curriculum Connection
ES.2

Wind/Water Shaping The Badlands

Wind and Water Work Together

In the Alberta Badlands, wind and water have worked together to make the land look very special. They help create the big cliffs and deep gullies we see today.

The Land of the Badlands

The Badlands is made of soft rock and dirt. The soil is made of dense clay that doesn't have many plants in it. It is a dry place because it doesn't rain much. This is why you don't see many trees or big plants growing in the Badlands.

Making the Badlands Look Special

When it rains a lot, the water runs down the hills and takes some of the dirt with it. When it's windy, the wind can also carry away bits of rock and dirt. What is left is only the hard rock. Over a lot of years, this has made the land in the Badlands look like it does now.

Creating the Hoodoos

One of the cool things you can see in the Badlands are the "hoodoos". Hoodoos are like tall, thin towers of rock that stick up from the ground. They are made when a hard rock on top protects the softer rocks below from the wind and rain.

So, when you see a hoodoo, you are seeing how wind and water can change the shape of the land!

Name: _____ 65

Curriculum Connection
ES.2

Questions Answer the questions below using evidence from the text

1) What do the Badlands look like?

2) H[illegible]d [illegible]ter change the Badlands?

Draw Draw a hoodoo in the Badlands

Name: _____ 66

Curriculum Connection
ES.3

How Humans Change Earth's Surface

Living on the Land

Making Our Homes: When we decide to live in a place, we need to prepare the land for our homes. We might have to clear a space, which could mean cutting down trees or moving rocks. This changes the land.

Planting Gardens: Sometimes, we plant gardens in our yards. We might plant flowers or vegetables. This means we change the types of plants that grow in that place.

Creating Paths: Even when we play in a park, we can make paths that weren't there before. Every time we walk the same way, we leave a mark. Over time, these marks can become paths.

Building Towns and Cities

Clearing Land: When we build towns and cities, we clear large areas to make space for buildings, roads, and parks. This is a big change to the land.

Building Infrastructure: We also dig into the Earth to put down pipes for water and cables for electricity. These changes are hidden under the ground, but they're still important.

Paving Roads and Building Bridges: When we build roads and bridges, we change the land too. Roads cover the ground with hard materials, and bridges allow us to cross rivers and valleys.

Name: _____ 67

Curriculum Connection
ES.3

Questions Use information from the text to support your answer

1) How do humans change the Earth's surface by living on the land?

2) How d[illegible]es and towns change the Earth's surface?

Draw Draw four ways humans chan[illegible]rth's [illegible]face

Name: _____ 70

Curriculum Connection
ES.3

The Impact of Plants/Animals on Earth's Surface

Overpopulation: Too Many Animals or Plants

Sometimes, there can be too many animals or plants living in one area. This is called overpopulation. Overpopulation can really change how the land looks and feels.

For example, if there are too many deer in a forest, they might eat all the leaves and plants. This can make the forest look bare and less green. It also means less food for other animals that also eat those plants.

Another problem can happen if there are too many plants of one kind. They might take all the nutrients from the soil. This can stop other plants from growing there. When the land changes, it affects all the living things in that area.

Pests and Parasites: The Mountain Pine Beetle's Impact

One example of a little creature causing big changes is the mountain pine beetle. This tiny bug makes its home inside pine trees. But it's not a good guest!

It harms the trees until they can't live anymore. When many trees die, it changes the look of the land. Whole forests can turn from green trees

Burrowing Animals: Changing the Earth from Underground

Some animals, like rabbits, moles, and groundhogs, love to dig holes in the ground. This digging is called burrowing.

When animals burrow, they change the surface of the Earth by creating new tunnels and holes. If you've ever tripped over a rabbit hole, you know just how much this can change a patch of land!

Name: _____ 71

Curriculum Connection
ES.3

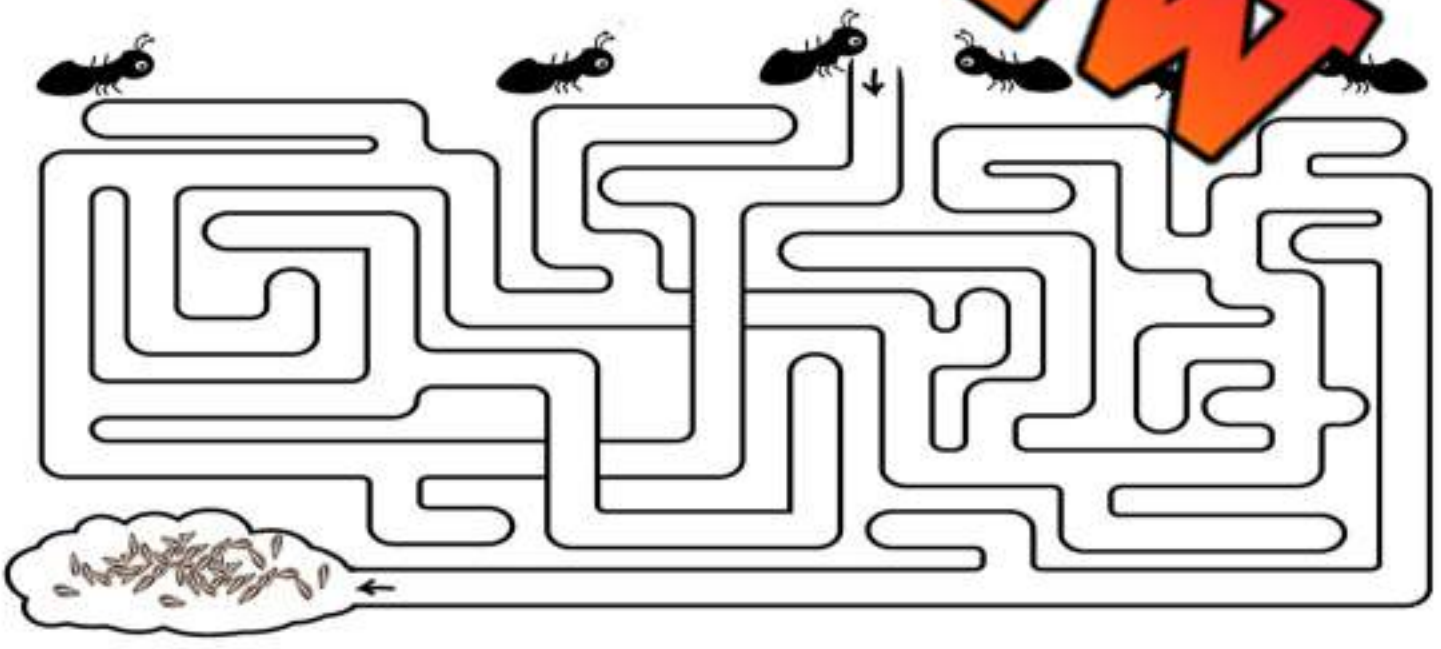
Questions Use information from the text to support your answer

1) How does overpopulation affect the Earth's surface?

2) How do Mountain Pine Beetle affect the Earth's surface?

3) How do burrowing th's surface?

Maze Draw the path the ants need to take to ir food



Name: _____ 72

Curriculum Connection
ES.4

Earth's Layers and Fossils

Earth's Layers: Like a Giant Sandwich

Our Earth is like a giant sandwich, but instead of bread and cheese, it has layers of rocks and soil. These layers were made over a long, long time. As time goes on, new layers are added on top. The older layers get squished down and become hard rocks.

Dino ago

A long e ago re your grandparents or great-great-grandparents were born, di ved o They roamed the lands, flew in the s ers.

How Dinosaurs Turn into Foss

Sometimes, a dinosaur would die ne ver o swamp. Its body would sink into the mud. O e, more and more mud and sand covered the din years, the dinosaur's bones turned into rock. We call these roc fos

Digging for Fossils

Today, scientists called paleontologists dig into the Earth's layers to d these fossils. By looking at which layer a fossil is found in, they can tell how old it is. The deeper the layer, the older the fossil!

Finding Dinosaurs in Fossils

Fossils are like a secret message from the past. They tell us what kinds of dinosaurs lived long ago. When we find a fossil, it's like finding a puzzle piece of history.

Name: _____ 73

Curriculum Connection
ES.4

True or False Circle whether the statement is true or false

1) The Earth has just one layer	True	False
2) Rocks and soil never move	True	False
3) New layers of rock and soil are on top of older layers	True	False
4) The deeper we find a fossil, the older it is	True	False
5) We kno saurs lived because we've found dinosaur fossils	True	False

Questi stions below using evidence from the text

1) What is a f

2) Is the Earth made of layers? Explain.

Draw Draw fossils below

Exit Cards

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

Name: _____

Circle the word that fits on the blank.

1) _____ are bones turned into rock.	Shells
	Fossils
2) A _____ digs to find fossils.	Paleontologist
	Astronaut
3) Dinosaur bones turned into _____ over time.	Fossils
	Rock
4) The _____ the layer, the older the fossil.	Deeper
	Higher
5) Fossils are found by digging into _____ .	Earth's layers
	History

Name: _____

Circle the word that fits on the blank.

1) _____ are bones turned into rock.	Shells
	Fossils
2) A _____ digs to find fossils.	Paleontologist
	Astronaut
3) Dinosaur bones turned into _____ over time.	Fossils
	Rock
4) The _____ the layer, the older the fossil.	Deeper
	Higher
5) Fossils are found by digging into _____ .	Earth's layers
	History

Name: _____

Circle the word that fits on the blank.

1) _____ are bones turned into rock.	Shells
	Fossils
2) A _____ digs to find fossils.	Paleontologist
	Astronaut
3) Dinosaur bones turned into _____ over time.	Fossils
	Rock
4) The _____ the layer, the older the fossil.	Deeper
	Higher
5) Fossils are found by digging into _____ .	Earth's layers
	History

Name: _____ 75

Curriculum Connection
ES.4

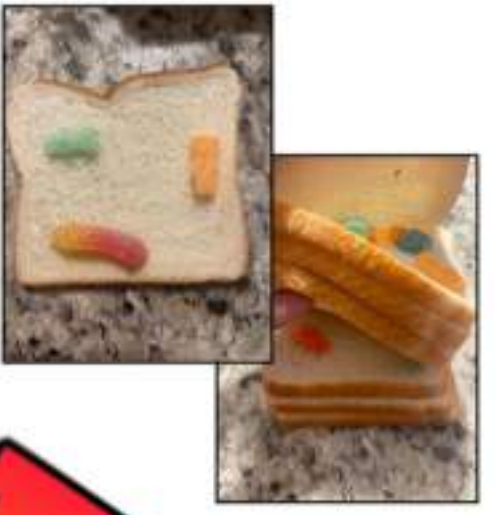
Experiment - Fossils

Research Question — What are we learning about?

How are fossils formed? What needs to happen for an animal to become a fossil?

Materials — t you will need for the experiment

- ❑ 7 e ve used 7 but if you're d his wit group, you could use 3 pieces for e
- ❑ Gummy be ter if texture on them that can en
- ❑ Gummy worms – th the b texture
- ❑ Plastic wrap



Method — How you will complete the experi

1) Put 3 or 4 candies on each slice of bread.
2) Layer the bread and keep adding candies between the layers
3) Wrap the layers of bread in plastic wrap
4) Put something heavy on top and let it compress the bread for at least 8 hours – we used books
5) Unwrap the plastic and carefully pull apart the layers. What do you see?

Name: _____ 76

Curriculum Connection
ES.4

Observations

What happened?

Results

the questions below

1) Wha the w gummy bears represent?

2) What did the weights on t res

3) Why was this experiment an example of how fossils ar had

4) Since the bread is soft, which type of rock did it represent? Explain.

Name: _____ 77

Curriculum Connection
ES.4

Dating Fossils - Relative Dating

Learning from Fossils

Fossils are remains of old plants and animals that help us understand life long ago. Scientists use different methods to find out how old f[illegible]are, and one way is relative dating.

Understandin[illegible]tin

Relative dating [illegible]reati[illegible]e of when things happened [illegible]lown[illegible] exact years. It involves look[illegible]whe[illegible] fossils are found and comparing thei[illegible]es.

For instance, if a scientist finds a fossil [illegible]an[illegible]re called a trilobite in one rock layer and a dinosaur fossil in a[illegible]ove it[illegible]know the trilobite lived before the dinosaur. This is based on a rule [illegible]lled[illegible] which says older rocks and fossils are found deeper in the gro[illegible]

Another way of relative dating is biostratigraphy, where scientists compare fossils from different rock layers. If one layer has a simple fish fossil and another layer has a more developed fish fossil, they know the layer with the simpler fish is older.

But remember, relative dating only tells us the order of events, not the exact age of fossils or rocks. For that, scientists use other methods, like carbon dating.

Name: _____ 78

Curriculum Connection
ES.4

True or False Circle whether the statement is true or false

1) Relative dating tells us the exact age of a fossil	True	False
2) The Paleozoic Era is older than the Cenozoic Era	True	False
3) Superposition means older fossils are not as deep	True	False
4) Relative dating gives us less information than carbon dating	True	False
5) Relativ[illegible] is complex and couldn't be done by a non-scientist	True	False

Questi[illegible] how old fossils are?

Draw Draw the dinosaurs from the different eras be[illegible]

Triassic Period	**Jurassic Period**	**C[illegible]od**
Coelophysis	Stegosaurus	Tyrann[illegible]us Rex

Triassic Period (230 – 200 MYA)	**Jurassic Period** (200 – 145 MYA)	**Cretaceous Period** (145 – 65 MYA)

A Long, Long Time Ago in Alberta

When Dinosaurs Roamed

Can you believe that a long, long time ago, millions of years ago, Alberta looked very different? It wasn't snowy or cold. Instead, Alberta w[illegible]led with lush, green forests. It was so [illegible] like a tropical rainforest! Ima[illegible] t[illegible]rywhere and big leaves rustlin[illegible].

In these f[illegible] here[illegible]saurs! Big dinosaurs, small din[illegible]saurs[illegible]te plants, and dinosaurs that [illegible]t. T[illegible] roamed around, eating, playing, and [illegible]eir d[illegible]r lives.

Alberta's Inland Sea

But forests were not the only thing in Alberta bac[illegible] There w[illegible]o a big sea, right in the middle of the land! This is called an "inland s[illegible] Ju[illegible]s today, this sea had lots of water and lots of animals living in it.

Preserving Dinosaur Bones

When dinosaurs died, their bodies sank into the soft mud at the bottom of the sea. Over time, more and more layers of mud, leaves, and sand covered them up. This is how the dinosaurs' bones became fossils.

The mud, leaves, and sand slowly turned into rock, but the dinosaur bones inside stayed the same. They turned into fossils, a kind of rock that keeps the shape of the dinosaur bones. That's why we can find dinosaur fossils in Alberta!

Name: _____ 80

Curriculum Connection
ES.4

True or False Circle whether the statement is true or false

1) Alberta used to have a sea running through it	True	False
2) Alberta has always been cold	True	False
3) Alberta had rainforests with tall trees	True	False
4) Alberta has always looked the way it does today	True	False
5) Alberta ea in it 500 years ago	True	False

Questio What w nt about Alberta when dinosaurs roamed?

Draw Draw a picture of a rainforest, like the ones fou be e ago

Name: _____ 81

Curriculum Connection
ES.4

Finding Fossils in Alberta's Badlands

Finding Fossils in Alberta's Badlands

The Badlands in Alberta are not like most places. They're a bit like a desert, with lots of hills and not many trees. But what makes them tru[illegible]cial are the treasures hidden inside th[illegible]inosaur fossils!

[illegible]saurs lived in this area. When they died, their bodies got covered by di[illegible]ve[illegible]illions of years, these layers turned into rock, and the dinosaur bo[illegible]ned i[illegible]. The Badlands were once full of water and plants, which helped [illegible] thes[illegible]saur bones really well.

Dinosaur Provincial Park: A Special [illegible]

Among the Badlands, there's an extra special [illegible] - Di[illegible]r Provincial Park. This park is a World Heritage Site because it [illegible]ne[illegible]dinosaur fossil fields in the world. That means we've found more [illegible]kinds[illegible]osaur fossils here than almost anywhere else!

Why Here and Not Other Places?

You might wonder why we find so many fossils in the Badlands and not in other places. That's because of the special conditions that existed here long ago. The area was once a big, flat floodplain. When a dinosaur died, its body was quickly covered by sediment brought in by water, which helped save the bones.

Today, wind and water slowly wear away the rocks in the Badlands. This helps to expose the hidden fossils. In many other places, the fossils might still be buried deep under the ground, or the conditions weren't right for fossils to form.

Name: _____ 82

Curriculum Connection
ES.4

True or False

Circle whether the statement is true or false

1) More dinosaurs have been found in the Badlands than other places	True	False
2) The Badlands have always been dry	True	False
3) Wind and water slowly wear away rocks in the Badlands	True	False
4) There are no more fossils on Earth	True	False
5) There are more fossils in the Badlands	True	False

Question

Why are many dinosaur fossils found in the Alberta Badlands?

Wordsearch

Find the words from the word bank

Word Bank	
Fossil	Badlands
Alberta	Desert
Hills	Trees
Dinosaur	Dirt
Buried	Deep

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

Curriculum Connection
ESA

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 to match each question on the left with the correct answer on the right.

Why are the Badlands special? ☐	☐ Wind and water erosion
What turned dinosaur bones into fossils? ☐	☐ Dirt and mud layers
Why are fossils found easily in the Badlands? ☐	☐ Hidden fossils

Name: _____ Mark

Draw a line to match each question on the left with the correct answer on the right.

Why are the Badlands special? ☐	☐ Wind and water erosion
What turned dinosaur bones into fossils? ☐	☐ Dirt and mud layers
Why are fossils found easily in the Badlands? ☐	☐ Hidden fossils

Name: _____ Mark

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Name: _____ Mark

Draw a line to match each question on the left with the correct answer on the right.

Why are the Badlands special? ☐	☐ Wind and water erosion
What turned dinosaur bones into fossils? ☐	☐ Dirt and mud layers
Why are fossils found easily in the Badlands? ☐	☐ Hidden fossils

Name: _____ 84

Curriculum Connection
ES.4

The Dinosaurs of Alberta

The Dinosaurs of Alberta

Albertosaurus

One of the dinosaurs that used to live right here in Alberta was the Albertosaurus. Albertosaurus was a large dinosaur, kind of like a T-Rex, but a bit smaller. It was a meat eater with sharp teeth. The name Albertosaurus means "Alberta lizard", and it's named after our province!

Edmontosaurus

EDMONTOSAURUS

Another dinosaur lived in Alberta was the Edmontosaurus. This dinosaur was a big plant eater. It was longer than a school bus is long! Edmontosaurus had a beak, kind of like a duck, which it used to eat plants.

Nodosaurus

The Nodosaurus also called Alberta home. This dinosaur was a plant eater too, but it was special because it was safe from meat eaters. Nodosaurus had armor on its back and spikes on its sides. It was like a walking fortress!

Tyrannosaurus

You probably know the last dinosaur on our list – the Tyrannosaurus! Even though we usually think of T-Rex living in other places, some Tyrannosaurus also lived in Alberta. They were one of the biggest meat-eating dinosaurs, with huge teeth and powerful jaws.

Name: _____ 85

Curriculum Connection
ES.4

Draw Draw and describe each of the dinosaurs found in Alberta below

Albertosaurus

Edmontosaurus

Nodosaurus

aurus

Name: _____ 86

Curriculum Connection
ES.4

Look up "dinosaurs found in Alberta" so you can learn more about the dinosaurs that lived in Alberta millions of years ago. Write anything you learned about them and draw a picture of them as well.

Research Learn more about the dinosaurs that lived in Alberta

Name: _____ 87

Curriculum Connection
ES.4

Research Learn more about the dinosaurs that lived in Alberta

Name: _____ 88

Curriculum Connection
ES.4

The Dinosaurs of Alberta

The Dinosaurs of Alberta

Long, long ago, dinosaurs roamed the place we now call Alberta. They were big and small, fast and slow, meat-eaters and plant-eaters.

Here are some of the special dinosaurs that lived in Alberta:

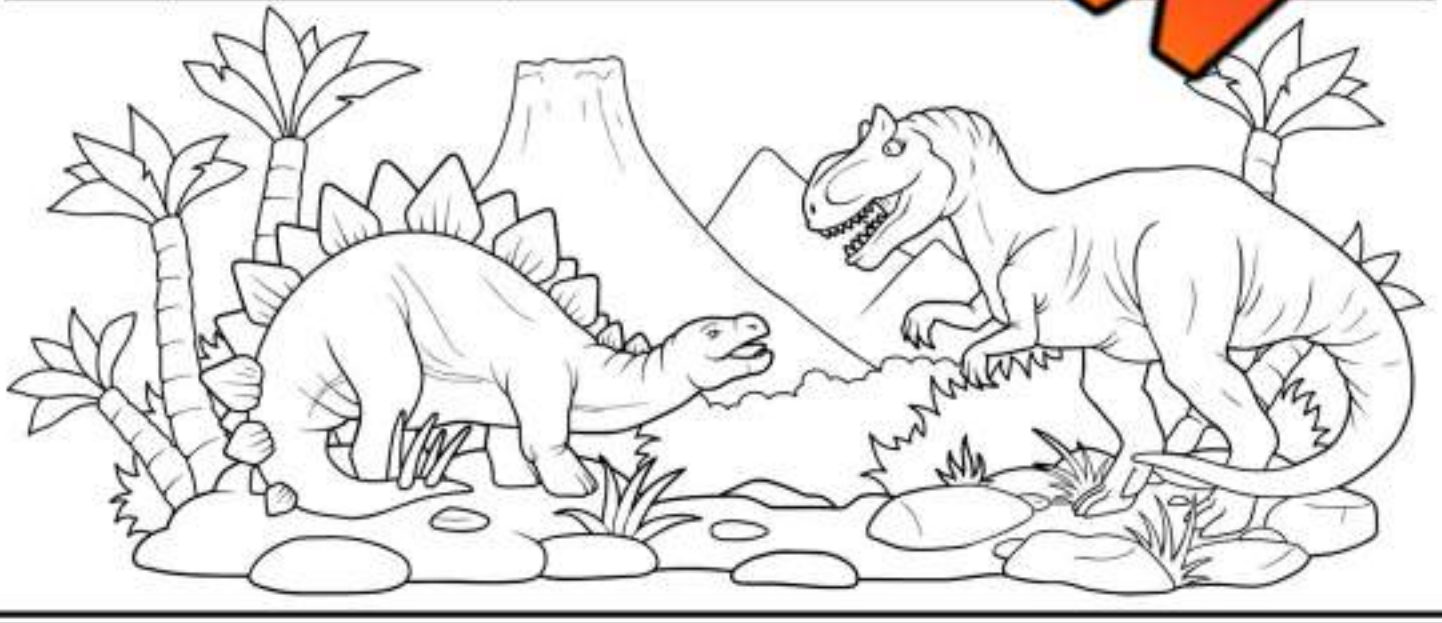
Dinosaur	Description
Albertosaurus	Albertosaurus was a meat-eater, a little smaller than T-Rex but just as fierce. It is named after Alberta.
Triceratops	Triceratops was a plant-eater with three horns and a shield around its head. It was as big as a truck!
Tyrannosaurus Rex (T-Rex)	The T-Rex is one of the most famous dinosaurs. It was a powerful meat-eater with big teeth.
Edmontosaurus	Edmontosaurus was a plant-eater that walked both on two legs and four legs as big as a school bus!
Stegosaurus	A dinosaur with bony plates and spikes on its back. It was a slow-moving plant-eater.
Pterodactyl	The Pterodactyl was not really a dinosaur, but a flying reptile that lived at the same time.
Brachiosaurus	The Brachiosaurus was one of the biggest dinosaurs. It had a long neck and ate plants from the tops of trees.
Velociraptor	Velociraptors were small but fast and clever hunters. They had sharp claws and worked together to catch their food.
Pachyrhinosaurus	Pachyrhinosaurus was a plant-eater like Triceratops, but it had a big bump on its nose instead of a horn.
Ankylosaurus	The Ankylosaurus was like a living tank, with a tough, armored back and a big club on its tail for protection.

Name: _____ 89

Curriculum Connection
ES.4

Matching Write the letter from the description beside the correct dinosaur

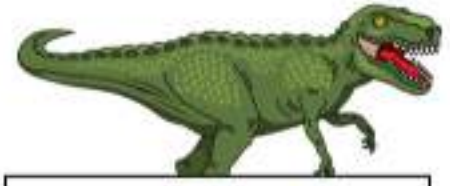
Answer	Dinosaur	Description
	Albertosaurus	A) Was one of the most famous dinosaurs. It was a powerful meat-eater with giant teeth.
	Triceratops	B) Was not really a dinosaur, but a flying reptile that lived at the same time.
	yrannosaurus (T-Rex)	C) Was a meat-eater, a little smaller than T-Rex but still fierce. It is named after Alberta.
	s	D) Was a small but fast hunter. They had sharp claws and worked together to catch their food.
		dinosaur with bony plates and spikes on its back. It low-moving plant-eater.
	Pteroda	living tank, with a tough, armored back and g clu ail for protection.
	Brachiosaurus	as th three horns and a large shield aroun t we g as a truck!
	Velociraptor	H) Was a ant-eat e Tr os, but it had a big bump on its no ad of
	Pachyrhinosaurus	I) Was one of the b ar long neck and ate plants from th ees.
	Ankylosaurus	J) Was a big plant-eater that ked and four. It was as tall as a school bus!

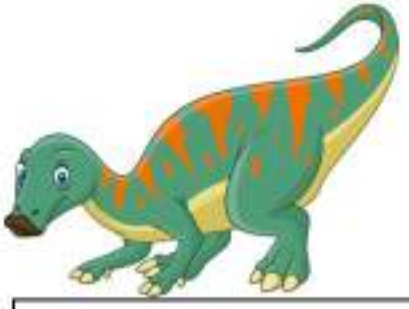


Name: _____ 90

Curriculum Connection
ES.4

Label From the list of dinosaurs from the other reading, label the dinosaurs below



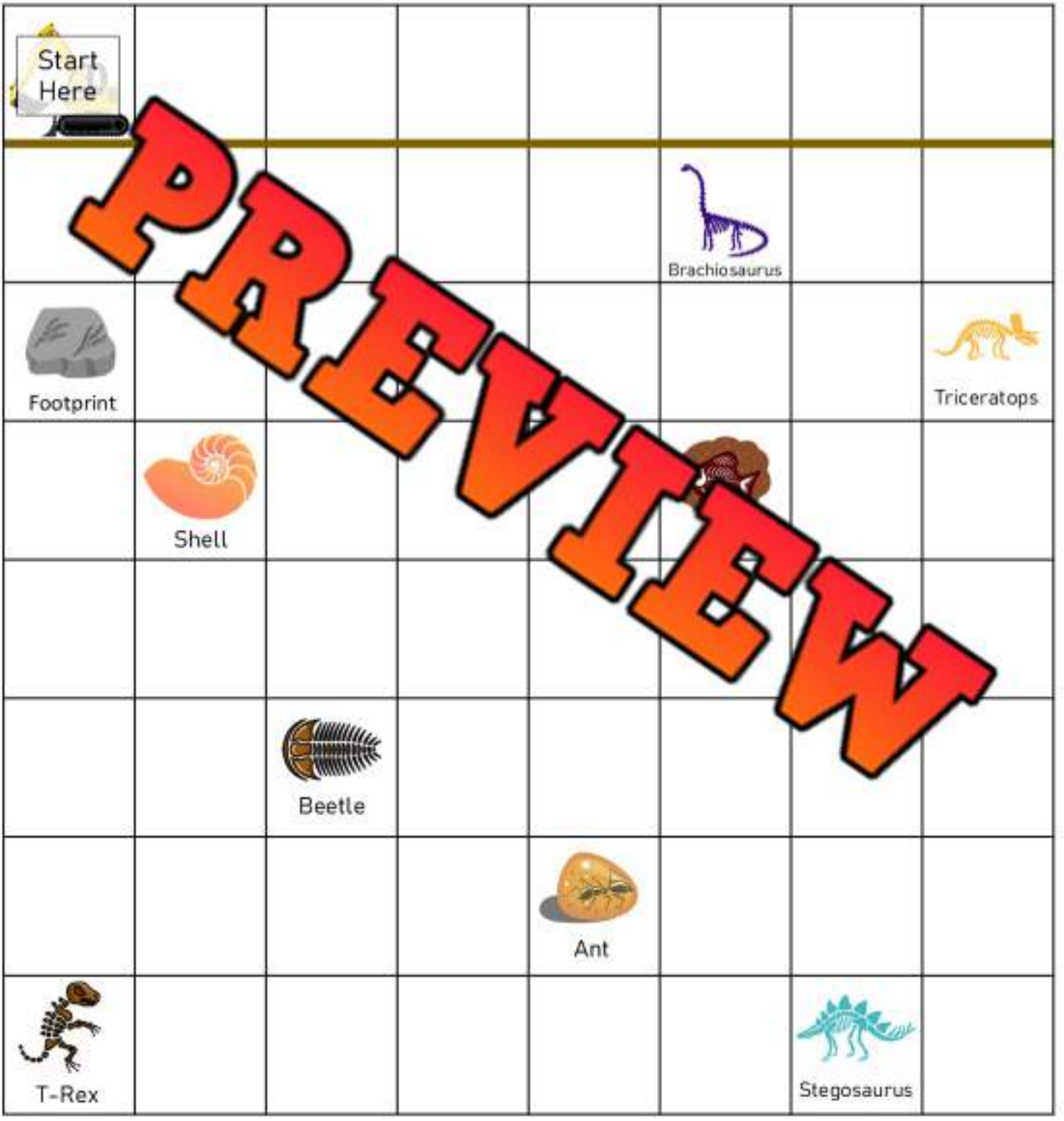


Name: _____ 91

Curriculum Connection
ESA

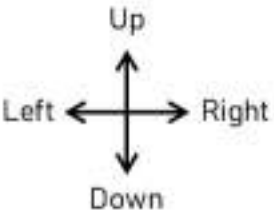
Coding Activity - Fossils

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



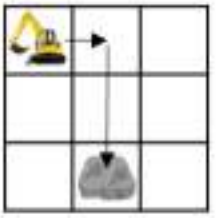
Name: _____ 92

Curriculum Connection
ES.4



Commands – Use the example below to learn the code

Move 1 right
Move 2 down



Digging

Tell the excavator where to dig to find the fossils

1) Find the footprint and triceratops

2) Find the shell and

3) Find the beetle, fish, and the triceratops

Name: _____ 93

Curriculum Connection
ES.4

Digging Tell the excavator where to dig to find the fossils. Use as few lines of code as possible. You can find them in any order.

4) Find the T-Rex, shell, ant, and fish

5) Find the fish, footprint, shell, beet[illegible] [illegible]tops

Name: _____ 94

Curriculum Connection
ES.4

IF/THEN Statements - Fossils

Directions Follow the if/then statements to move the excavator to the fossil

1)	If Albertosaurus is a dinosaur found in Alberta.	then	Move down 3 spots
2)	If Dinosaur Provincial Park is in Alberta.	then	Move right 5 spots
3)	If the Edmontosaurus was found in Toronto.	then	Move left 4 spots
4)	If di idn't live with humans	then	Move down 2 spots
5)	erta used to be a tropical forest.	then	Move right 3 spots
6)	If erator f dinosaur found in Alberta.	then	Move down 1 spot
7)	If dinosau e fou here in Alberta.	then	Move left 3 spots
8)	If dinosaurs like d,	then	Move left 7 spots
9)	If dinosaur fossils are j ock	then	Move right 2 spots
10)	If Alberta was once covered by a sea.	then	Move down 1 spot

Name: _____ 95

Curriculum Connection
ES.5

All About Soil

All About Soil

Soil is like a cake that is made from a lot of different ingredients. Soil has little bits of rock or sand, clay, dead plant and animal remains, fungi, and even manure – animal poop!

Soil also contains lots of little creatures! Earthworms are important for soil because they turn plant and animal remains into nutrients. They also dig through the soil. This helps loosen the soil so plants can grow better.

Importance of Soil

We need soil to provide plants with the minerals and nutrients they need to grow. This means that without soil, plants would not grow and without plants, humans could not survive. Soil is very important!

Interesting Facts About Soil

- Soil is alive! There are more microorganisms in a handful of soil than there are people on Earth
- Soil prevents floods because it soaks up and stores water
- Soil acts as a water filter as it filters out pollutants in our groundwater
- Without soil, humans could not survive because we need soil to grow plants
- Not all soil is the same. There are six main types of soil
- Sand is a type of soil that can grow some types of plants
- Darker soil is better for growing plants because it has more nutrients in it
- Erosion is the movement of soil from one place to another

Name: _____ 96

Curriculum Connection
ES.5

Questions

Answer the questions below using evidence from the text

1) What is soil? What is in it?

2) Why is [illegible] important to humans and animals?

Questioning

Write 3 qu[illegible]u h[illegible] soil

1)	
2)	
3)	

True or False

Is the statement true or false?

1) Soil is alive because it has living things in it	True	False
2) Soil is not very important to humans	True	False
3) Nothing grows in sand	True	False
4) The darker the soil, the better it is for growing plants	True	False
5) Worms make soil better for plants	True	False

Curriculum Connection
ES.5

Exit Cards

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

Name: _____ Mark ☐

Check only the true statements.

Statement	✓
There are fewer organisms in soil than people.	
Humans can live without soil easily.	
Sand is not a type of soil.	
Soil helps filter water from pollution.	
Darker soil has more nutrients in it.	
There are six main soil types.	
Soil is alive and full of life.	
All soil has the same nutrients.	
Soil can soak up rainwater.	

Name: _____ Mark ☐

Check only the true statements.

Statement	✓
There are fewer organisms in soil than people.	
Humans can live without soil easily.	
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Soil helps filter water from pollution.	
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Name: _____ Mark ☐

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Name: _____ Mark ☐

Check only the true statements.

Statement	✓
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Darker soil has more nutrients in it.	
There are six main soil types.	
Soil is alive and full of life.	
All soil has the same nutrients.	
Soil can soak up rainwater.	

Name: _____ 100

Curriculum Connection
ES.5

What Is In Our Soil?

What Is Soil Made Of?

Soil is made up of rocks, organic material, living organisms, and water. These four ingredients make one of the Earth's most important natural resources.

Rocks

We have seen rocks around our schoolyard or in our backyard. Rocks are slowly weathered, meaning they break down into small pieces of rock that form soil.

Weathering happens as rocks have to deal with rain and snow as well as heat and freezing temperatures. These factors break rocks into tiny grains of soil. Soil is made up of different sized rocks, broken down pieces of soil.

Organic Material

Soil also has organic material in it. **Organic material** is anything that was alive and is now dead. So the leaves that fell in the Fall season become organic material because they are now dead. Sticks, twigs, and even dead plants and animals are all organic material. Organic material is found on the top layer of soil.

Living Organisms

The soil also has many living organisms in it. Worms, moles, grubs, centipedes, slugs, mushrooms and many others all live in the soil. Most living things are found in the topsoil, which is the layer of soil close to the surface.

Water

Depending on the types of rocks in the soil, water could make up over 60% of the soil. Clay soils have a lot of water in them, making them fun to mould them!

Name: _____ 101

Curriculum Connection
ES.5

Questions Answer the questions below using evidence from the text

1) What four things are in soil?

_____

_____

2) How are each of the things below in soil?

Rocks	
Organic Material	
Living Organism	
Water	

Questions Answer the questions below using evidence from the

_____

_____

_____

_____

_____

_____

Name: _____ 102

Curriculum Connection
ES.5

Experiment - Soil Composition Test

Research Questions — What are we learning about?

Soil is usually made up of different types and textures of rocks. Soil could be mostly clay, silt, sand, or it could be a combination of all three. Today we will test soil from our environment to learn more about what is in it.

Materials — do we need for our experiment?

- Mason ja
- Water
- Shovel or trowel
- Dish soap

Method — How do we complete the experim

1. Find an area with soil that you can see – perhaps a g n o a ditch
2. Use the shovel to dig down about 20 cm
3. Fill the mason jar half full of soil
4. Add water to the mason jar so that it is three-quarters full
5. Add a teaspoon of liquid dish soap
6. Shake the jar for at least three minutes
7. Leave the jar for at least 24 hours and if the soil has heavy clay, leave it for 48 hours
8. Observe the different layers in your soil.

Name: _____ 103

Curriculum Connection
ES.5

Observations | Common results you may see

Soil Types	Common Results
Sandy Soil	Sandy particles will appear on the bottom of the jar. The water will be fairly clear.
Clay	The water will still look cloudy. There will be a thin layer of dirt particles on the bottom. The water stays cloudy because it takes [illegible]er for the clay particles to settle.
Peaty Soil	[illegible]e will [illegible] of floating pieces on the surface with a small [illegible]unt [illegible] on the bottom. The water will be a bit [illegible].
Chalky Soil	There will be a la[illegible]hite s[illegible]t on the bottom of the jar and the water wil[illegible]a grayi[illegible]tou[illegible]
Loamy Soil	The water will be clear and t[illegible]e in l[illegible]on the bottom with the smallest particl[illegible]top.

Observations | What did you notice?

Which type of soil is in your jar? Explain how you know.

_____

_____

_____

_____

Name: _____ 104

Curriculum Connection
ES.5

Diagram Draw the mason jar with the soils in it. Colour and label the layers

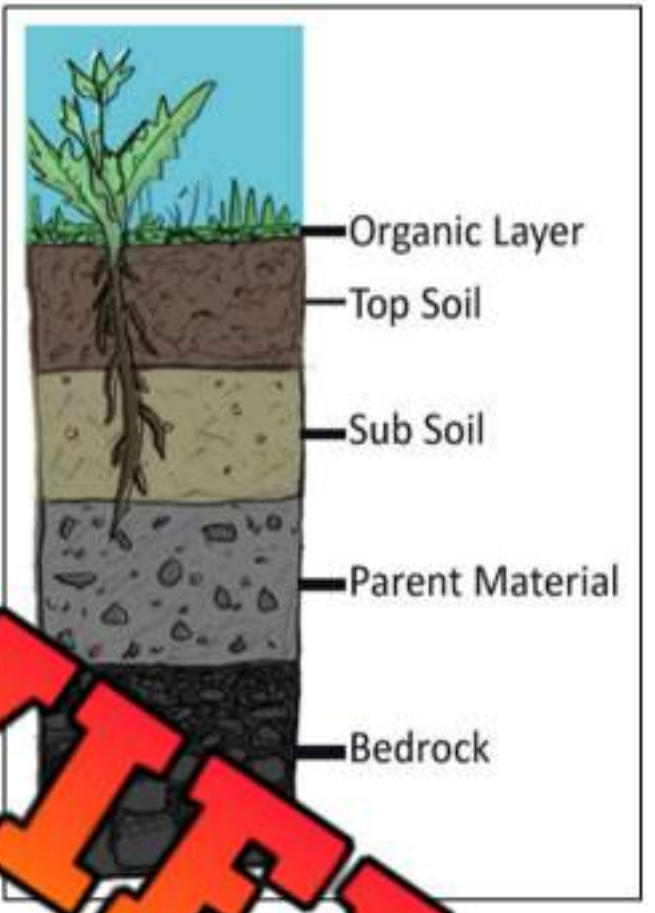
Name: _____ 105

Curriculum Connection
ES.5

Layers of Soil

Layers of Soil

Soil has many layers below what we see from the surface. Each layer has different types of soil in it.



Organic L... 5 cm)

- M... lea... s, twigs, dead animals, le... ss
- The organic ... l has ... decomposed yet ... ll se...

Topsoil (5 – 15 cm)

- Fairly thin layer where seeds beg... grow into sprouts
- Made from organic matter like broken down plants and animals as well as tiny rock partic...

Subsoil (15 – 75 cm)

- Made from clay, iron, and organic materials

Parent Material (75 – 200 cm)

- Made of mostly large rocks. Very difficult to dig beyond this layer!

Bedrock (2 m – 1000+ m)

- Bottom layer that is made up of a large solid rock. This layer cannot be dug using a shovel. Instead, a drill is needed to dig through, like when a well is dug.

Name: _____ 106

Curriculum Connection
ES.5

Questions Answer the questions below using evidence from the text

1) What are the different layers of soil made from?

2) What c...es would you have if you were digging a pool in your yard?

Draw Draw the things you ...se... F... er

Organic Layer	
Topsoil	
Subsoil	
Parent Material	
Bedrock	

Curriculum Connection
ES.5

Exit Cards

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

Name: _____ Mark

Circle the correct answer.

1) Which layer has clay and iron in it?	Organic layer / Subsoil
2) Which layer cannot be dug using a shovel.	Bedrock / Topsoil
3) Which layer is made of large rocks?	Parent material / Bedrock
4) Which layer is made up of dead plants?	Organic layer / Topsoil
5) Which layer has tiny rock particles?	Subsoil / Topsoil

Name: _____ Mark

Circle the correct answer.

1) Which layer has clay and iron in it?	Organic layer / Subsoil
2) Which layer cannot be dug using a shovel.	Bedrock / Topsoil
3) Which layer is made of large rocks?	Parent material / Bedrock
4) Which layer is made up of dead plants?	Organic layer / Topsoil
5) Which layer has tiny rock particles?	Subsoil / Topsoil

Name: _____ Mark

Circle the correct answer.

1) Which layer has clay and iron in it?	Organic layer / Subsoil
2) Which layer cannot be dug using a shovel.	Bedrock / Topsoil
3) Which layer is made of large rocks?	Parent material / Bedrock
4) Which layer is made up of dead plants?	Organic layer / Topsoil
5) Which layer has tiny rock particles?	Subsoil / Topsoil

Name: _____ 108

Curriculum Connection
ES.5

Questions Label the layers of soil below

Subsoil	Topsoil	Bedrock
Parent Material	Organic Material	

Matching Write the letter from the description beside the matching layer

	Subsoil	a) Made up of large solid rock
	Topsoil	b) Made up of twigs, leaves and other organic matter
	Organic Layer	c) Made of mostly large rocks
	Bedrock	d) Made from clay, iron, and other organic material
	Parent Material	e) Made of organic matter – decomposed plants and animals as well as some small rocks

Name: _____ 109

Curriculum Connection
ES.5

Experiment - Layers of Soil Model

Background
Label the layers of soil below

Soil is much more than just the dirt under our grass. Each layer is made-up of different particles and serves a specific purpose. Today we will be making a model representation of the layers of soil using yummy ingredients!

Materials
...ill you need for this experiment?

- Ch...ate an... ...otch chips mixed
- Chocolate ...
- Whole Oreos a... ...ush...
- Gummy worms
- Shredded coconut mixed w... gre... ...g
- Clear cups or glasses to hold the ...rs of s...
- Spoons
- Tape, sticky-notes or labels

Method
How you will complete the experiment

1. Drop an Oreo into the bottom to represent the bedrock
2. Put in a small handful of chocolate/butterscotch chips to represent the parent material
3. Spoon in the chocolate pudding to represent the subsoil
4. Toss in the crushed-up Oreos to portray the topsoil. Stick the gummy worms out of the topsoil
5. Sprinkle your coloured coconut on top, allowing the gummy worms to poke out.
6. Use tape, labels or sticky-notes to label each of the layers on the side of the cup.

Name: _____ 110

Curriculum Connection
ES.5

Diagram Draw a diagram of your cup with each layer of soil. Label the diagram

Results Answer the questions bel

1) What did you learn about the different lay soil?

2) If you were digging in your yard, which layer of soil would you struggle to dig through? Why?

Name: _____ 113

Curriculum Connection
ES.5

Different Uses of Earth's Materials

How Different Cultures Use Earth Materials

Earth materials are used to make many different things around the world. In some cultures, clay is still used to make houses, In other cultures, houses are made from sod. Read below to learn more about the different uses of Earth's materials around the world.

Adobe

When mix mu w together, it will dry and beco ick aterial that is called **ado** obe s ed to build houses in dry p orth A such as Texas, Mexico, and Arizona.

Sod Houses

Soddies are houses that are made of blocks ss a gine taking a shovel and digg nks o s to build a house with. The soil ea held together by the grass's roots uilt in the Prairies in the 1800's becau settlers did not have access to other building materials.

Clay Pots

Clay is used for pottery and construction projects around the world. When clay dries, it becomes hard like cement. This means it can be molded and shaped into pots or bricks that will become hard when dried. Pottery has been around for over 20,000 years!

Name: _____ 114

Curriculum Connection
ES.5

Draw and Write Draw the structures and write which Earth materials you would use

Adobe House	Soddie – Sod House	Clay Pot

True or False Circle whether the statement is true or false

1. Adobe houses are made from clay	True	False
2. Clay pots have been around for over 20,000 years	True	False
3. Sod houses are made from grass and soil	True	False
4. Clay can be used for pottery or bricks	True	False
5. Sod houses are still used often in Canada	True	False

Curriculum Connection
ES.5

Exit Cards

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

Name: _____ Mark

Circle the correct answer.

1) Which house is made of mud?	
Sod houses	Adobe houses
2) Which is used for pottery work?	
Adobe	Clay
3) Which becomes hard when dried?	
Clay	Sod
4) Pottery has been around for ____.	
20 000 years	30 000 years
5) Mixing straw and mud makes...	
Sod	Adobe

Name: _____ Mark

Circle the correct answer.

1) Which house is made of mud?	
Sod houses	Adobe houses
2) Which is used for pottery work?	
Adobe	Clay
3) Which becomes hard when dried?	
Clay	Sod
4) Pottery has been around for ____.	
20 000 years	30 000 years
5) Mixing straw and mud makes...	
Sod	Adobe

Name: _____ Mark

Circle the correct answer.

1) Which house is made of mud?	
Sod houses	Adobe houses
2) Which is used for pottery work?	
Adobe	Clay
3) Which becomes hard when dried?	
Clay	Sod
4) Pottery has been around for ____.	
20 000 years	30 000 years
5) Mixing straw and mud makes...	
Sod	Adobe

Name: _____ Date: _____

Unit Test - Changing Earth

Multiple Choice /10

1) What is able to make a valley? a) Water b) Wind c) Glacier d) Air	2) Where does the Columbia Icefield drain into? a) Pacific Ocean b) Arctic Ocean c) Atlantic Ocean d) Indian Ocean
3) What is [illegible] when it lands on Earth? a) Lava b) Magma c) Fire d) Ash	4) What are the 3 forms of erosion? a) Wind, water, fire b) Wind, fire, ice c) Fire, ice, water d) Wind, water, ice
5) Which type of erosion polish[illegible]on coastline a) Wind b) Water c) Ice d) Fire	[illegible]re the oldest fossils found? a) To[illegible]th b) [illegible]n lay[illegible]
7) Where are most fossils found in Alberta? a) Lake Athabasca b) Badlands c) Rocky Mountains d) Fort McMurray	8) When sedim[illegible]stop[illegible]led ___. a) Weathering b) Sediment c) Erosion d) Deposition
9) Why do many mountains form? a) When humans pile up dirt b) When we pile up garbage c) When the Earth's plates hit each other d) When the plates move away from each other	10) Millions of years ago, Alberta was... a) A warm rainforest b) A cold arctic c) A dry desert d) A frozen glacier

Definitions What do each of the words mean?

Term	Definition (what does it mean)
Glacier	
Land	

Label Name each

Triceratops		Stegosaurus
Brachiosaurus		T-Rex

Long Answer Answer the long answer questions. Each question is 5 marks

1) Do glaciers move? How do they change the Earth's surface?

2) What is a fossil? Where are they fou[illegible]y are s[illegible]ils found in the Badlands?