

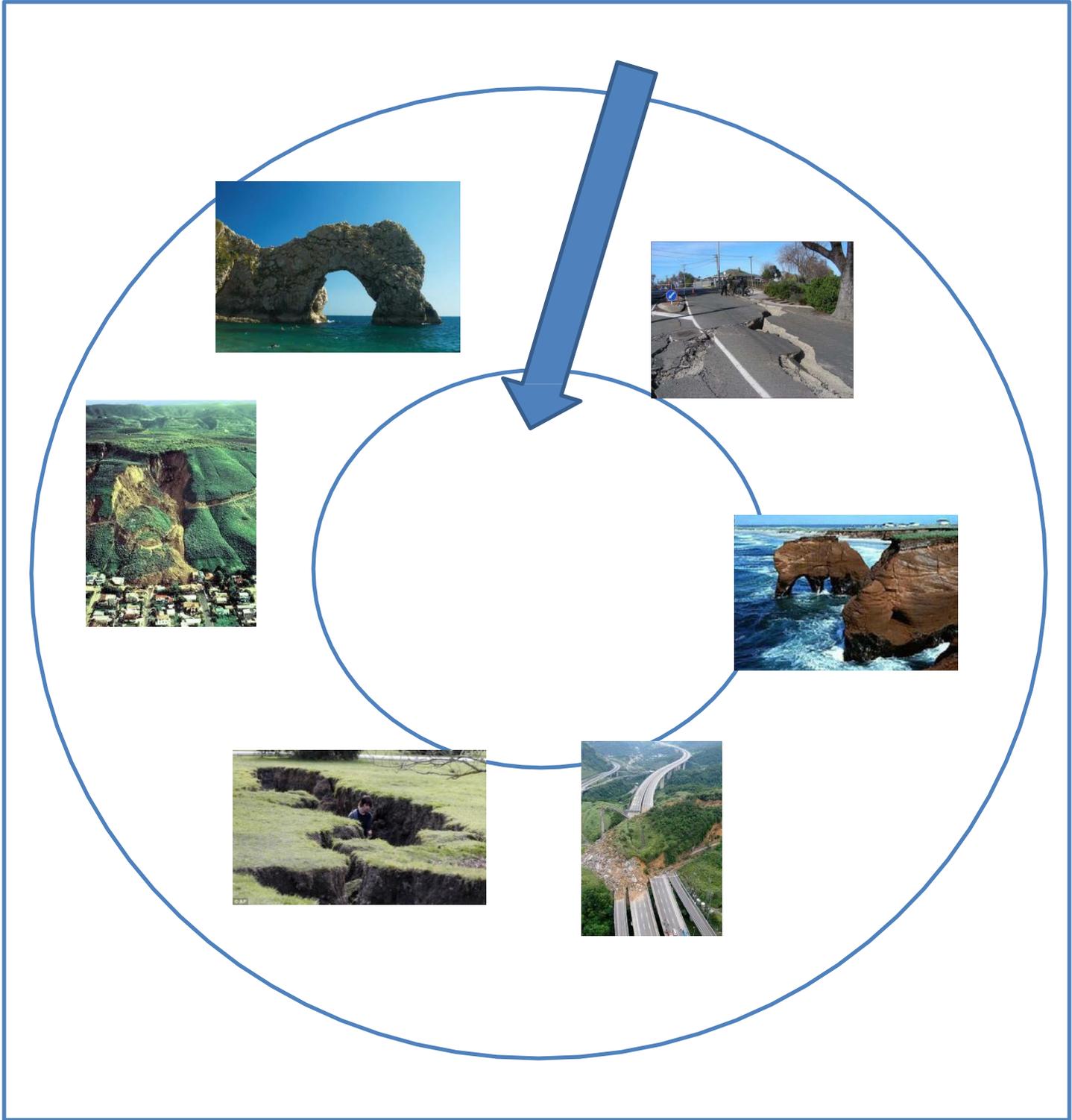
# The Changing Earth



phillipmartin.info

## Student Learning Journal

Name \_\_\_\_\_



# Cause Effect

## Linguistic Patterns

- \_\_\_\_\_ because \_\_\_\_\_.
- \_\_\_\_\_, so \_\_\_\_\_.
- Since \_\_\_\_\_, \_\_\_\_\_.
- Due to the fact \_\_\_\_\_, \_\_\_\_\_.
- \_\_\_\_\_, therefore \_\_\_\_\_.
- \_\_\_\_\_, consequently \_\_\_\_\_.

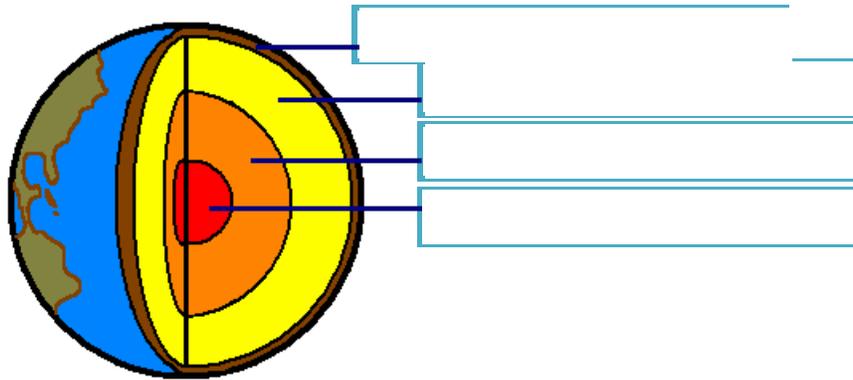
## Geologist Observation Process Grid

### Properties

<u>Rock Number and Sketch</u>	<u>Color &amp; Size</u> What color(s) is it? What size is it? (Is it light brown?)	<u>Pattern</u> What patterns or designs does it have?	<u>Luster</u> How does it look? (Is it shiny or dull?)	<u>Texture</u> How does it feel? (Is it rough, smooth, or bumpy)?	<u>Questions and Wonderings</u>
Rock # _____					
Rock # _____					
Rock # _____					
Rock # _____					

## Our Earth

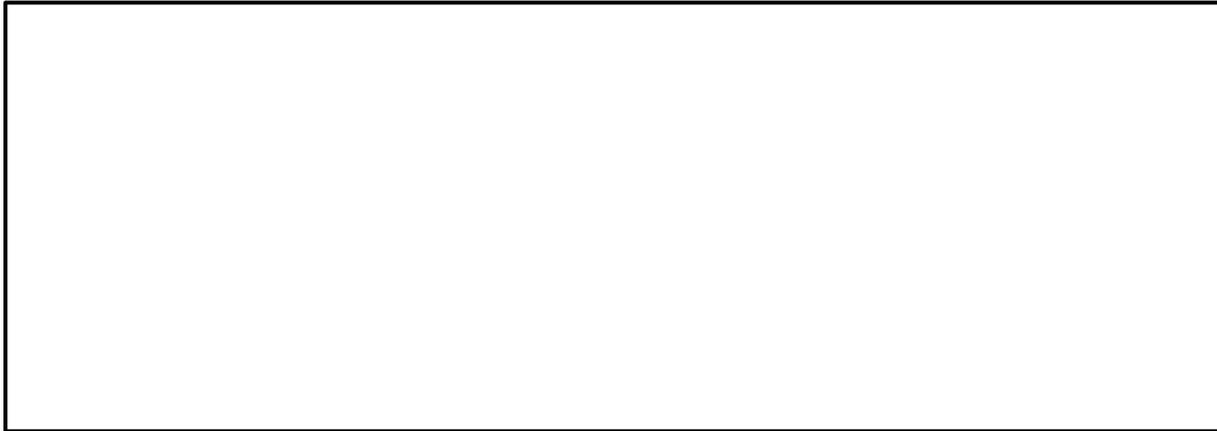
Our planet **Earth** is sphere-shaped and composed of four different layers; the **crust**, the **mantle**, the **outer core**, and the **inner core**.



**Crust:** The part of Earth that you can see, touch, and walk on is called the surface or crust. It is the thinnest of the four layers. The crust is composed of rock and soil. Decayed plants and leaves are part of the soil. The crust is divided into huge **plates**, or pieces like a jigsaw puzzle, that are always moving. They move just about as fast as your fingernails grow!

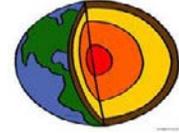
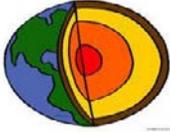


**Mantle:** Under the crust is a layer called the **mantle**. It is composed of rocks and metals. No one has ever gone down into the mantle, but we have been able to drill into the top edge of it. Sometimes the hot melted rocks in the mantle push up through cracks in the crust. This is called a **volcano**.



**Core:** Under the mantle is the **core**, which is the center of the earth. The core has two parts; the **outer core** and the **inner core**. The **outer core** is so hot that the rocks and minerals that make it up are liquid. The **inner core** is extremely hot, but it is solid. No one has ever been to the core; it is so deep that even our strongest drills cannot reach it.





## *The Mighty, Mighty Earth!*

### Chanting directions

(CORE students chant and stomp feet)

We are the core the mighty, mighty core!

Who are we?

(All other students respond)

You are the core the mighty, mighty core!

(MANTLE students chant and snap fingers)

We are the mantle the mighty, mighty mantle!

Who are we?

(All other students respond)

You are the mantle the mighty, mighty mantle!

(CRUST students clap that hands)

We are the crust the mighty might crust!

Who are we?

(All other students respond)

You are the crust the mighty, mighty crust!

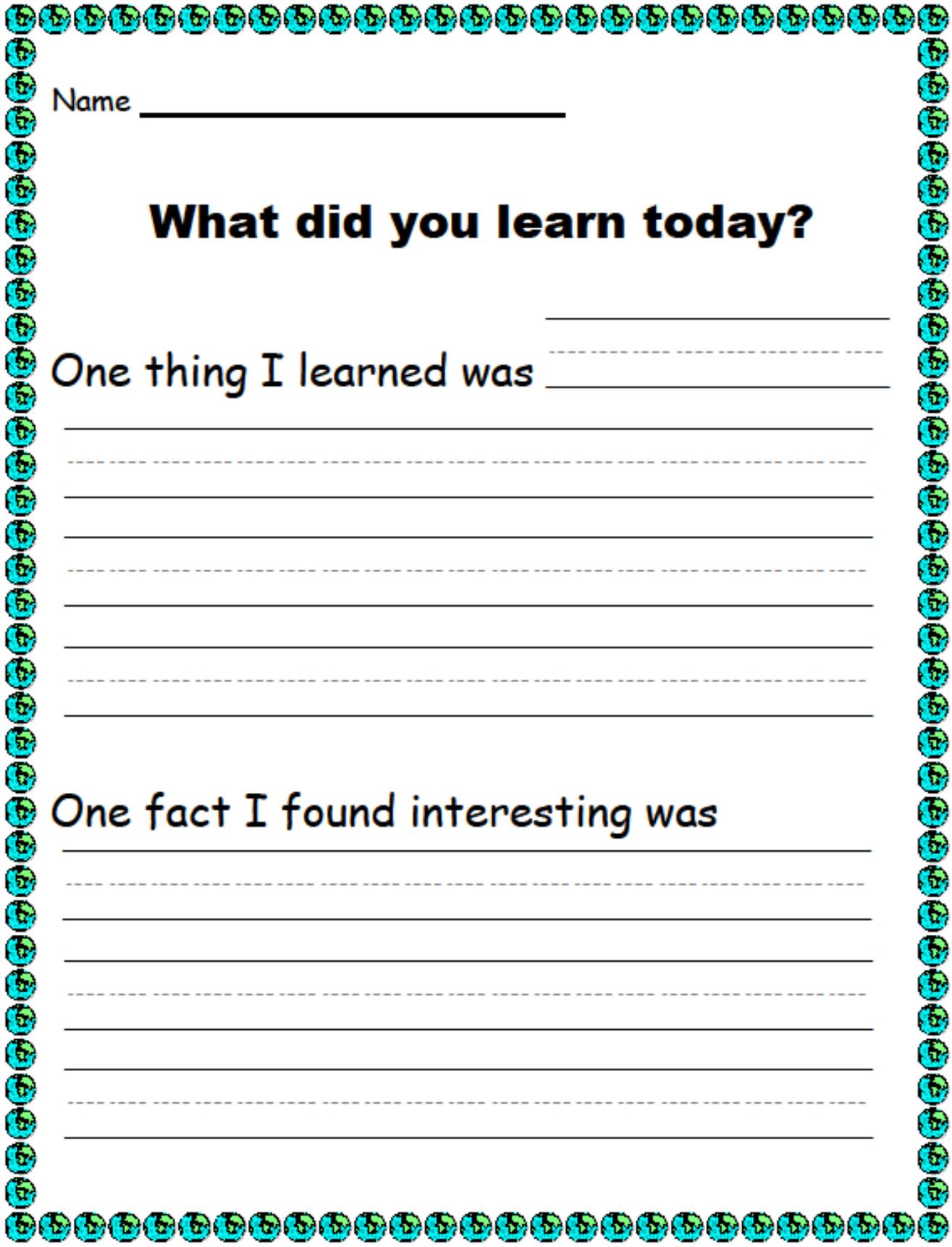
(All students chant and tap top of thighs)

WE ARE THE EARTH, *THE LAYERS OF THE EARTH!!!*

Who are we?

(All students shout)

WE ARE THE EARTH, *THE LAYERS OF THE EARTH!!!*



Name \_\_\_\_\_

## What did you learn today?

One thing I learned was \_\_\_\_\_

One fact I found interesting was \_\_\_\_\_

Name \_\_\_\_\_

### Extended Response: Be a Geologist

geologist	property	mineral
hardness	luster	

1. Draw a picture of your rock.
2. Describe the rock as a geologist. Use the word bank above.



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## Discussion Time



- I underlined \_\_\_\_\_ because \_\_\_\_\_.
- I was confused by \_\_\_\_\_.
- I was surprised to read \_\_\_\_\_.
- I wonder why \_\_\_\_\_.
- I circled this word because \_\_\_\_\_.
- I think \_\_\_\_\_ means \_\_\_\_\_ because  
\_\_\_\_\_.

# The Changing Earth *(chanted to Military Cadence)*

We know Earth changes fast and slow  
**Weathering** is a force you know  
Changing the shapes and sizes of rocks  
Slowly breaking, carving blocks

Sound off: **Weathering!**  
Sound off: **Changing Earth!**



**Water** freezes in rocks' cracks  
Breaking them apart, never going back  
**Waves** eat away at rocks and land  
Turning sea cliffs into beach sand

Sound off: **Weathering!**  
Sound off: **Changing Earth!**



**Wind** blows sand and wears rocks too,  
Like sandpaper, changing rough to smooth  
The wind has such amazing power  
It carves arches and rock towers

Sound off: **Weathering!**  
Sound off: **Changing Earth!**



**Earthquakes** shake causing plates to collide  
Mountains are formed, side by side  
**Volcanoes** erupt and lava flows  
That's how islands begin to grow

Sound off: **Earthquakes, Volcanoes!**  
Sound off: **Changing Earth!**



**Plants** in rocks grow very long  
Roots grow down, big and strong  
The rock begins to crack and break  
Soon one rock, two pieces make

Sound off: **Plants**  
Sound off: **Changing Earth!**



**People** walk and ride on a path  
Wearing down the land, just do the math  
Building roads, just you think  
Causes land to change, quick as a wink

Sound off: **People!**  
Sound off: **Changing Earth!**



## Rocks Change

Macmillan/McGraw-Hill California Science, Grade 2 (2008)

Earth Science Chapter 3/Lesson 2 (pgs. 142-145)

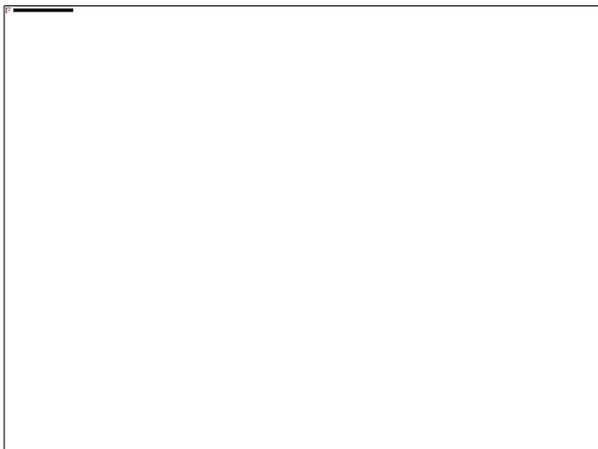
### How do rocks change?

Most rocks are very hard, but did you know that they can change size and shape? The way water and sand change rocks is called **weathering**. When water gets into the cracks of rocks, it can freeze and push against the rocks. The cracks get bigger and then the rocks break.



Look closely at the rocks.  
What do you think the  
water is doing to them?

When rocks slide down a hill, they may break and become smaller. The smaller rocks can then break down into sand. Tiny rocks can become part of the soil.



Strong winds can blow sand against  
rocks. Wind and sand wore this rock into  
an arch.

*How does weathering change the shape and size of rocks?*

## What other ways can rocks change?

Weathering is not the only thing that causes rocks to change. Earthquakes can change rocks, too. When Earth shakes, rocks rub against each other. They can break into smaller pieces.

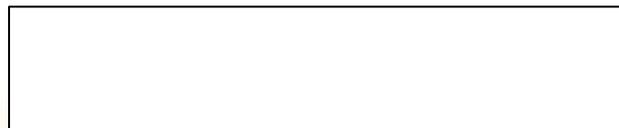
Plants can also change rocks. Plants can grow in soil inside the cracks of rocks. Sometimes the roots are so strong, they cause the rocks to break.



You know that rocks are made of minerals. Water can cause some minerals to change.



Water caused this copper penny to turn green and the copper in these rocks.



*What are some ways rocks can change?*



# Erosion

(sung to Row, Row, Row Your Boat)



**Erosion** slowly changes the land  
By moving rocks and sand  
Deposit them in another place  
**Changing Earth's face**

**Moving water** changes the land  
It moves the soil and sand  
Rivers carry the rocks down the cours  
**Erosion** is a force



**Rainfall** pitter-patters the ground  
It carries rocks around  
Into rivers and streams rocks fall  
**Erosion** changes it all



**Moving wind** changes the land  
Making piles of sand  
Wind builds sand dunes everywhere  
**Erosion** happens there



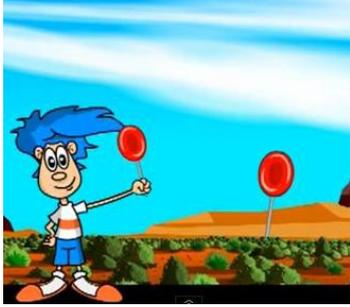
**A moving glacier** changes the land  
A powerful sheet of ice  
Moving rocks over the land  
Isn't **Erosion** grand?



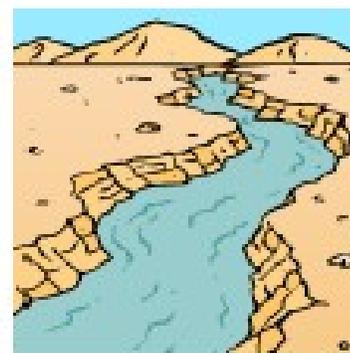
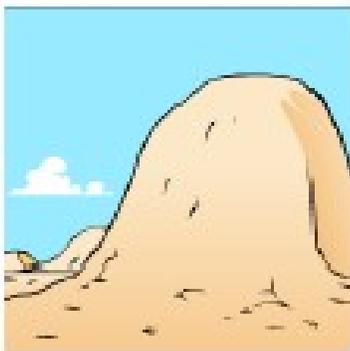
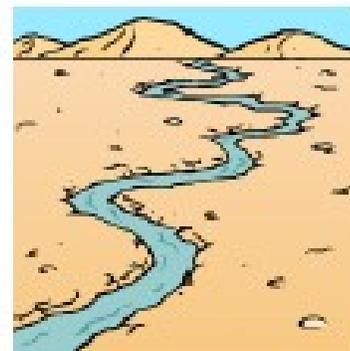
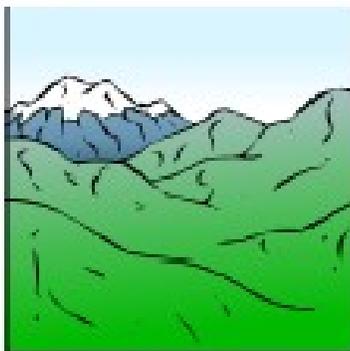
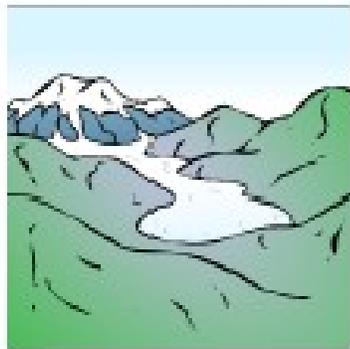
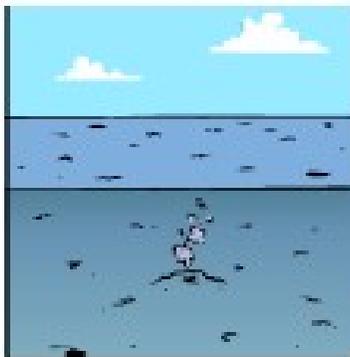
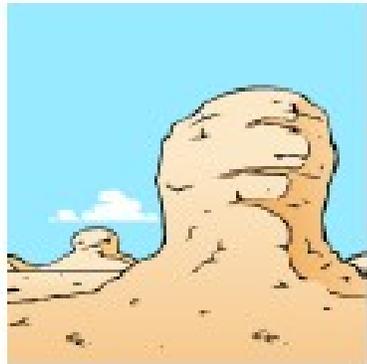
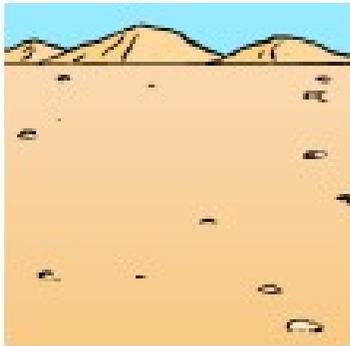
# What is Erosion? Note Taking Guide

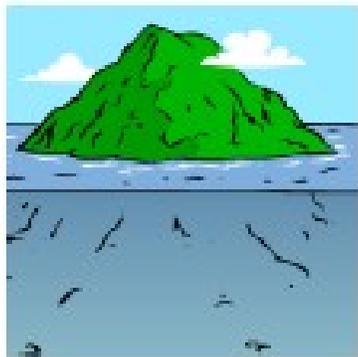
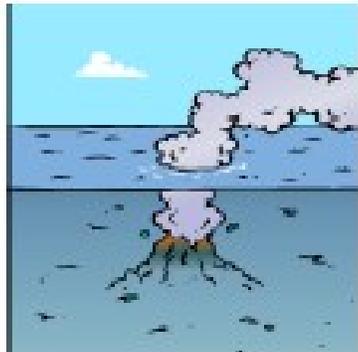
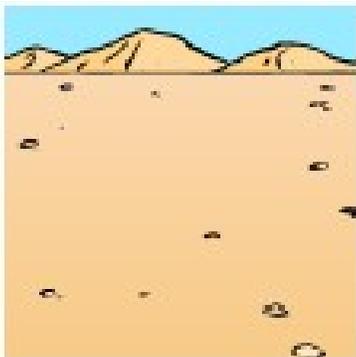
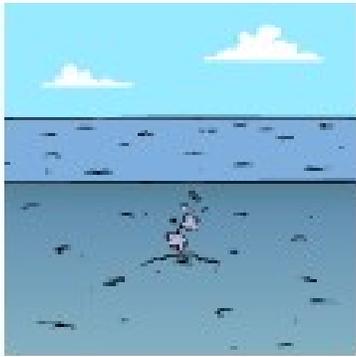
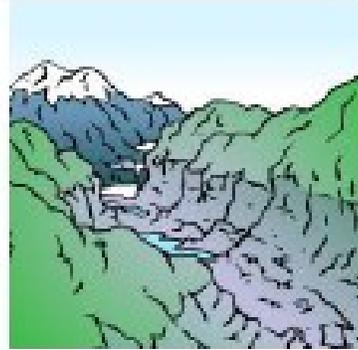


Interesting Facts	Text Dependent Questions	Answers
	<p>Circle the landforms.</p>      <p>How do you know something is a landform?</p>	
	<p>Water cuts and carves the earth to create different landforms. What is this process called?</p> 	

Interesting Facts	Text Dependent Questions	Answers
	<p>How does Billy's example of sucking on a lollipop help you understand <i>erosion</i>?</p> 	
	<p>Identify what mother nature uses to change the surface of the Earth?</p> 	
	<p>How does water help a tiny piece of rock get all the way to the ocean?</p> 	

Blank space for a title or heading.





# Erosion

Before

After


# Erosion

Before

After


## Extended Response: Erosion

Tell about the three ways that erosion can change the earth.

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Draw a picture to explain your thinking.

# The Changing Earth *(chanted to Military Cadence)*

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Building roads, just you think  
Causes land to change, quick as a wink



Sound off: **People!**  
Sound off: **Changing Earth!**



## Earthquakes

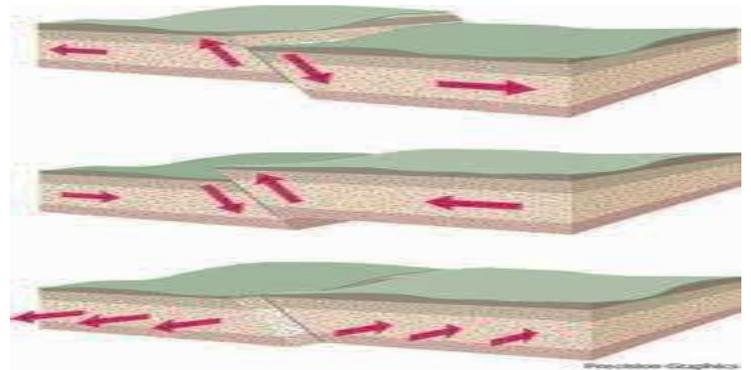
### *Forces That Rock the Earth*



Have you ever been busy doing something when the ground around you started shaking? Earthquakes destroy buildings and roads. They can also cause injury to many people. Scientists know what causes earthquakes, but they can't predict them fast enough to give people warning.

### What causes earthquakes?

Earth's *crust* is made up of enormous pieces called *plates*. These plates fit together just like pieces of a gigantic puzzle. The difference is that the earth's pieces are constantly moving.



This happens because they float on a layer of hot, soft rock. Sometimes plates can slide past one another. Other times, they can move away from each other or crash into each other. This movement causes earthquakes.

### How do earthquakes change the earth's surface?

Earthquakes change the Earth's surface in many ways. The plates are always moving which causes slow earthquakes. These slow earthquakes can create new mountains over many, many, years. Stronger earthquakes can cause quicker changes, such as landslides.



This is a landslide caused by a 6.5 earthquake in Taiwan.

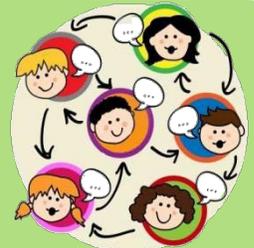
Also, the ground may split apart at the surface and the land may become uneven. When earthquakes occur in the ocean, they cause tsunamis which are strong waves. Tsunamis also change the earth's surface when they crash into the land. Whether earthquakes change the earth quickly, or over long periods of time, they have an impact on earth's surface.

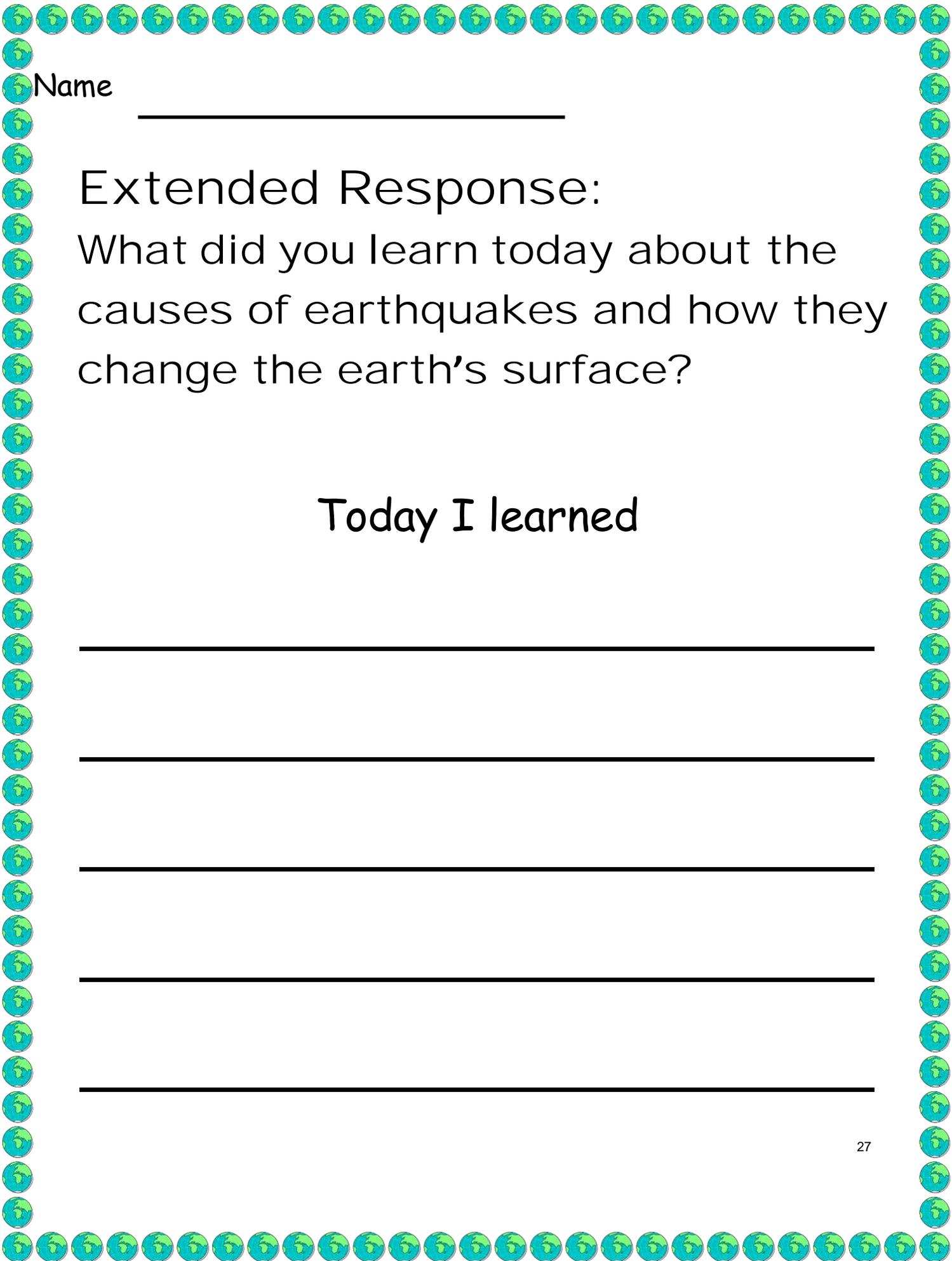


A tsunami in Japan.



San Francisco, 1989





Name \_\_\_\_\_

## Extended Response:

What did you learn today about the causes of earthquakes and how they change the earth's surface?

Today I learned

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## Volcanoes

### *More Than Mountains*

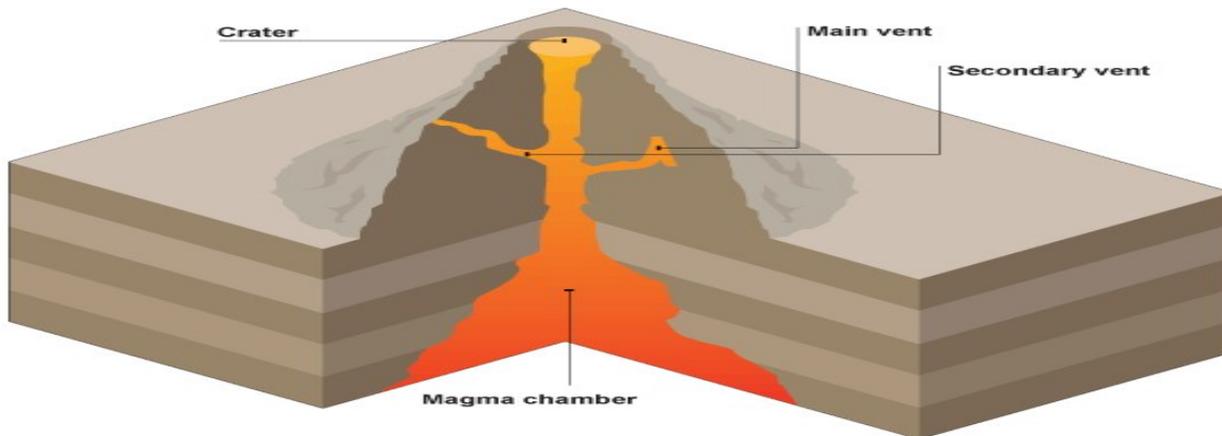


### What is a volcano?

Have you ever wondered about volcanoes? A volcano is not just a mountain. A volcano is an opening in the Earth's crust.

### How are volcanoes formed?

Volcanoes are formed when magma from inside the earth's mantle makes its way to the surface through an opening. Gases and a hot liquid rock called *magma*, flow through this opening. Magma is called *lava* when it reaches earth's surface. As the molten rock and ash cool, they form a volcano. Over time as the volcano continues to erupt, it will get bigger and bigger.



### Why do volcanoes erupt?

The pressure inside a volcano causes a volcano to erupt. When a volcano erupts, or explodes, it sends out rocks, fire, and smoke into the sky. Some eruptions have the power to blast apart an entire island.

### How do volcanoes change the earth's surface?

When volcanoes erupt, they change the Earth's surface. Lava flows from the volcano and cools as it touches the ground. This produces solid rock and makes the Earth's surface appear rough and uneven.



As these new materials build upon the Earth's surface, they create the cone-shape of volcanoes. This build-up of material can happen quickly or over long periods of time. The lava not only changes the appearance, but also the texture of the Earth's surface. In addition, the heat of the lava causes fires, which can change the surface of the Earth. These fires can destroy forests and communities.



There are other ways in which a volcanic eruption can impact the Earth's surface. Volcanoes can cause mudflows, avalanches, tsunamis, and cracks in the Earth's surface.



Whether volcanoes change the earth quickly or slowly, their impact has an effect on the earth's surface.

# Extended Response

Name

Before	After
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Explain what happens when a volcano erupts.

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# Fossil Bugaloo

Lyrics © 2004 by Emily Fuhr  
Othello School District

Adapted from "I'm a Crustacean" by Andy Brechtel  
Classroom Educational Use Only

I'm a paleontologist and I'm here to say  
I love to dig for fossils everyday  
Sometimes I find a skeleton with lots of bones  
Or just a small leaf that's turned to stone

Dinosaur eggs, animal bone, hardened tracks too  
Looking for fossils, Bugaloo.

Fossils can be found all around  
In rocks or mountains in the ground  
They tell about life long ago  
How things lived so now we know

Hardened shells, footprints, skeletons too  
Looking for fossils, Bugaloo.

Name \_\_\_\_\_ Date \_\_\_\_\_

## Make Your Own Imprints

It's easy to make your own imprints. When you're finished, have your classmates guess what the imprints are from.

### **What You Need**

Poster paint

Paper Towels

White Paper

Different Objects – sponge, leaf, button, small towel, cotton ball, shell

### **What to Do**

1. Dip an object into the paint.
2. Dab the object on a paper towel to remove the extra paint.
3. Press the object onto your paper.
4. Do this with each of your objects.



# How are Fossils Formed?

## Note Taking Guide

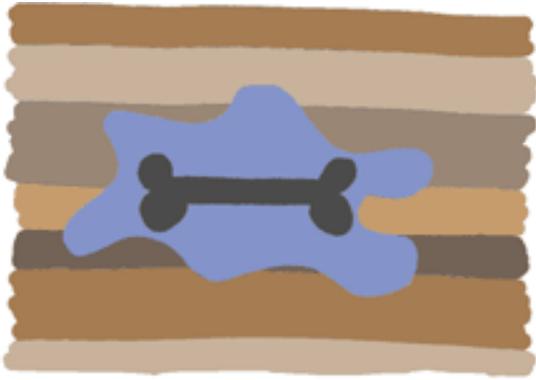


<i>Interesting Facts</i>	<i>Text Dependent Questions</i>	<i>Answers</i>
	 <p><i>What are fossils?</i></p>	<p><i>Fossils are the remains of ancient _____ and _____.</i></p> <p><i>They are at least _____ years old.</i></p> <p><i>They are found in the _____.</i></p>
	 <p><i>What can we learn from studying trace fossils?</i></p>	<p><i>By studying trace fossils we can learn how it _____</i></p> <p><i>and cared _____.</i></p>

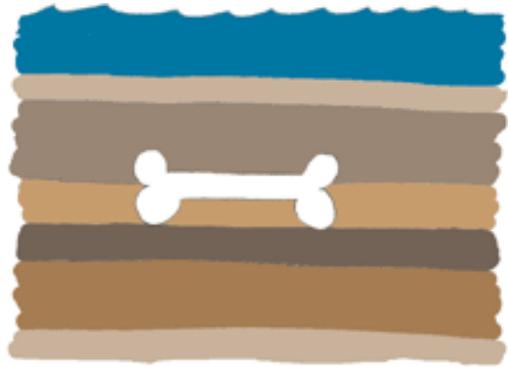
Interesting Facts	Text Dependent Questions	Answers
	<p>Franny tells us there are three types of fossils. What are they?</p> 	<p>The three types of fossils are:</p> <p>1. _____</p> <p>2. _____</p> <p>3. _____</p>
	<p>Dinosaur fossils remain hidden for millions of years. What causes the bones to be exposed?</p> 	<p>1. _____</p> <p>2. _____</p> <p>3. _____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>

# How Body Fossils are Formed

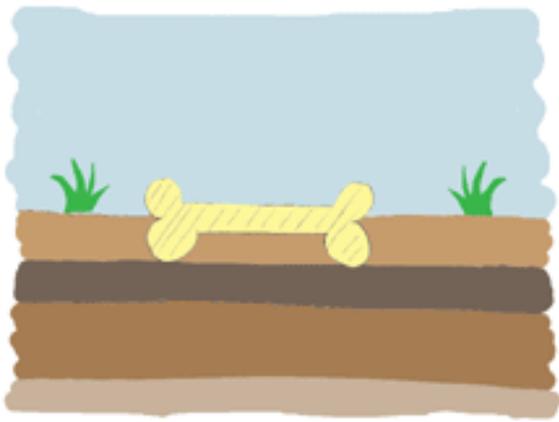
Millions of years go by covering the fossil with dirt and mud.



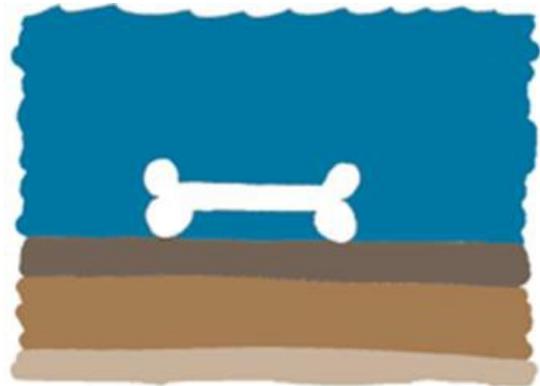
Mud covers the bones.



Rain, wind, and ice expose the bones.



An animal dies near water.





Pretend you are a geologist working out in the hot desert sun. You uncover a fish fossil. Explain how this fish ended up in the middle of the desert. What caused this to happen?

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# Our Changing Earth

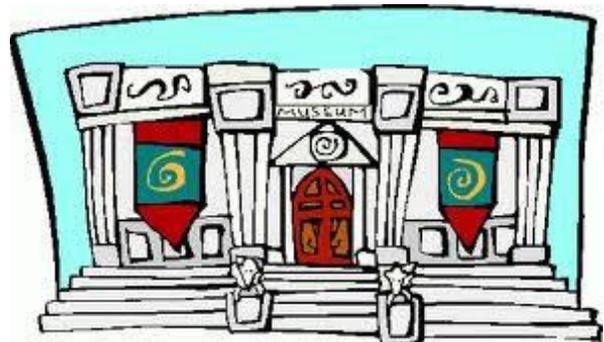
## Collaborative Presentation Directions

Your team of geologists has been asked by a local museum to design an exhibit entitled, "The Earth is Constantly Changing."

Your job is to create an artifact, or poster, that identifies the following:

1. A "before and after" picture of a change in the Earth's surface.
2. What caused this change?
3. Did this change happen quickly or slowly? About how long did it take?
4. Are there any clues from the past that help us understand this change?

Work with your team of geologists to create a colorful, detailed, and interesting artifact that includes all of the important information. Create something you would be proud to display at the museum! Have fun!





## Collaborative Presentation Rubric

Geologists: \_\_\_\_\_

### Content: The Artifact/Poster

#		Yes 😊	No ☹️
1.	The artifact, or poster, includes a <b><u>title.</u></b>		
2.	There is a " <b><u>before</u></b> " picture.		
3.	There is an " <b><u>after</u></b> " picture.		
4.	The <b><u>cause</u></b> of the change is identified.		
5.	The artifact shows whether this happened <b><u>quickly or slowly.</u></b>		
6.	The artifact is <b><u>neat and colorful.</u></b>		

### Delivery: The Presentation

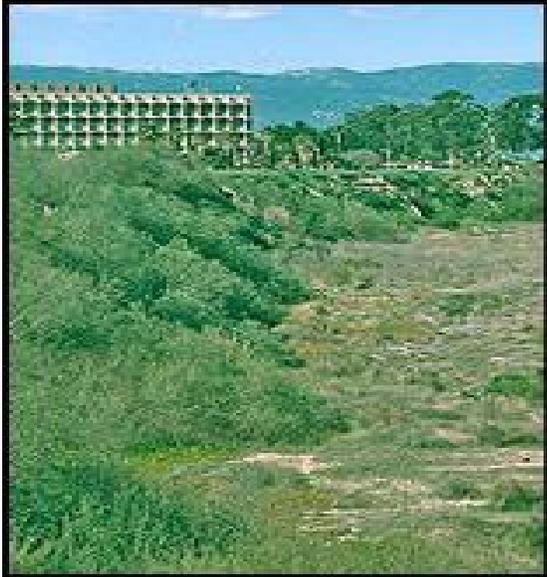
#		Yes 😊	No ☹️
1.	The geologists made <b><u>eye contact.</u></b> 🙄		
2.	The geologists spoke <b><u>loudly and clearly.</u></b>		
3.	The geologists <b><u>introduced themselves.</u></b>		
4.	The geologists <b><u>described their artifact/poster.</u></b>		
5.	The geologists had a <b><u>conclusion.</u></b>		

# Sample Poster

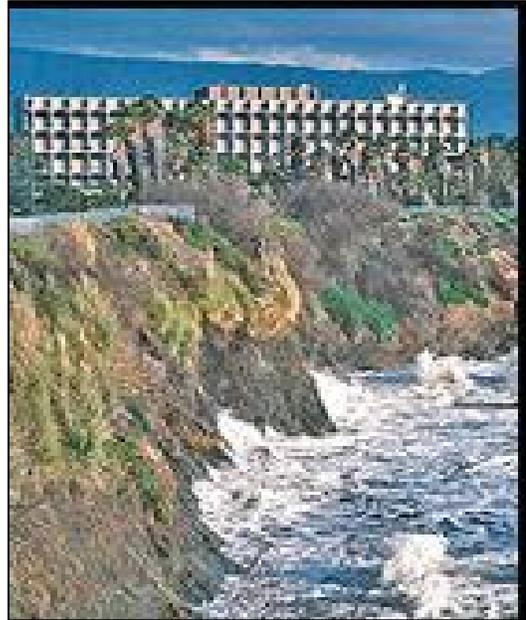
(Title)

# Our Changing Earth

"Before" Drawing



"After" Drawing



Cause



The land eroded, or was swept away, by the wind, water, and waves of the ocean.

Time



This kind of change to the earth happened very slowly. It would take thousands of years.

# Collaborative Project: Our Changing Earth



## Outline



### ✓ Greetings and Introductions

❖ Hi. My name is \_\_\_\_\_ . This is \_\_\_\_\_ , \_\_\_\_\_ , and \_\_\_\_\_ .

❖ We're here today to talk about our changing Earth.

✓ Tell about what your "before" picture shows.

❖ Before, the Earth may have looked like this...*(describe picture)*

✓ Tell people about what caused the Earth to change.

❖ The Earth changed because \_\_\_\_\_ .

*(volcano, wind, rain, ice, erosion, weathering, earthquake, etc.)*

❖ Something like this might happen

\_\_\_\_\_ (where?). (*In the desert,  
near the water, by a volcano, etc.*)

✓ Tell about what your "after" picture shows.

❖ After the \_\_\_\_\_, the Earth may look like  
this... (*describe picture*)

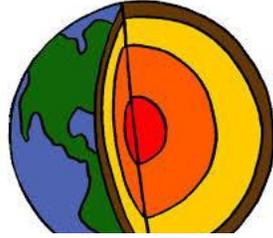
✓ Tell how long a change like this might take to happen.

❖ *This kind of change takes* \_\_\_\_\_.

✓ Conclusion

❖ Thank you for listening. We hope you enjoyed  
learning more about \_\_\_\_\_.

Throughout this unit, you have learned how the Earth is constantly changing. Answer the questions below.



Post-Assessment

Study and discuss the photographs with a partner. Use the questions in the box below.

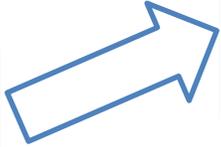
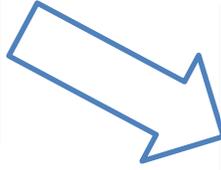


**Before**

**After**

- How did the earth change?
- What might have caused the change?
- How long did the change take?
- What might happen in the future?

With your partner, complete the one-sided cause and effect map to show what might have caused the change.



**After**

On your own, write a paragraph to explain what happened to the earth. Make sure to answer these questions.

- How did the earth change?
- What might have caused the change?
- Was the change fast or slow?
- What might happen in the future?



## Checklist for Revising and Editing

### Revising

My topic sentence tells how the earth changed.

I have at least two causes for the change.

I told if the change was fast or slow.

I used cause and effect language.

My concluding sentence told what might happen in the future.

### Editing

I capitalized the beginning word in each sentence.

I wrote complete sentences.

I ended each sentence with punctuation.

I checked my spelling.

