

# Earth's Surface



## *Changes to the Earth's Surface*

*Forces are constantly changing the earth's surface. These changes create earth structures called landforms. Some of the forces that change landforms are:*

- 1. flowing water, such as rivers and ocean waves*
- 2. rain, snow, hail, & sleet*
- 3. ice and glaciers*
- 4. wind (storms: hurricanes & tornadoes)*
- 5. abrasion (friction from other rocks or earth material)*
- 6. force of gravity*
- 7. plants, animals, and people*

**When these forces breakdown the earth's surface it is called weathering. When these forces move materials from the earth's surface it is called erosion.**

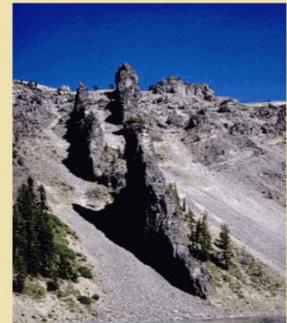
## *Physical Weathering*

*Physical weathering is the natural breakdown of earth material that is not caused by chemical changes. Physical weathering results in increased surface area for chemical reactions to occur on.*

- 1. when water expands as it freezes in cracks and then thaws*
- 2. when rocks are heated by day and cooled by night*
- 3. when the outer surface of rock peels like an onion skin, due to pressure release*
- 4. biological forces from plants, animals, and people (like when roots of plants break up the earth - root wedging)*

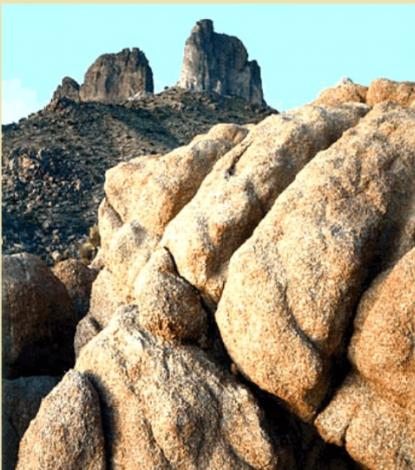


*Click on this picture to see a short video about physical weathering.*



## *Chemical Weathering*

*Chemical weathering changes the minerals that make up rock. For example, water and oxygen cause rust to form on certain minerals in rocks, causing the rocks to crumble. Pollutants in the air can create acid rain which erodes. Rain mixes with carbon dioxide to form an acid which creates caves.*



*Click on this picture to see a short video about chemical weathering.*

## *Weathering*

*Let's review:*

*Weathering is the breaking down of earth materials that is caused by forces on the earth's surface.*

*Weathering is constantly changing the landforms around us.*

*There are two types of weathering: chemical and physical.*



## *Weathering, Erosion & Deposition*

*Don't confuse weathering with erosion!*

*Weathering* breaks up the Earth's surface into small pieces called *sediment*. *Erosion* is the process of moving *sediments* from one place to another. *Deposition* is the process of dropping, or depositing, *sediments* in new locations.

*Weathering* —————> *Erosion* —————> *Deposition*

*Wind, water, gravity, ice, animals, and humans are all causes of erosion.*



*Click on the picture to see a video about erosion.*

*Draw a line to match each word with its definition.*



*Weathering*

*process of moving sediments from one place to another*

*Physical weathering*

*process of breaking rock into sediment*

*Chemical weathering*

*process of dropping sediment in new locations*

*Erosion*

*changing the minerals that make up rock*

*Deposition*

*physical breaking of the earth's surface*



*Decide if it is physical weathering, chemical weathering or erosion.*



*Wind carrying small bits of sand slowly wears away at a rock surface.*



Start/Stop  
Voting

**A** *Chemical*

**B** *Physical*

**C** *Erosion*

*Decide if it is physical or chemical weathering.*



*Water freezes, expanding a crack in a boulder.*



Start/Stop  
Voting

**A** *Chemical*

**B** *Physical*

*Decide if it is physical or chemical weathering.*



*Acid rainwater dissolves part of a limestone wall.*



Start/Stop  
Voting

**A** *Chemical*

**B** *Physical*

*Decide if it is physical or chemical weathering.*



*The roots of a plant cause cracks to form in a pavement.*



Start/Stop  
Voting

**A** *Chemical*

**B** *Physical*

Decide if it is physical weathering, chemical weathering or erosion.



*The pounding of the ocean waves wears away rocky cliffs.*



Start/Stop  
Voting

**A** Chemical

**B** Physical

**C** Erosion

*Decide if it is physical or chemical weathering.*



*Water and carbon dioxide react to form an acid which creates a cave.*



Start/Stop  
Voting

**A** *Chemical*

**B** *Physical*

*Decide if it is physical weathering, chemical weathering or erosion.*



*Your dog digs a hole in the garden.*



Start/Stop  
Voting

**A** *Chemical*

**B** *Physical*

**C** *Erosion*



*Chemical weathering is*



Start/Stop  
Voting

- A** *moving of rock particles*
- B** *breaking down of rock by changing its composition*
- C** *breaking down of rock without changing its composition*
- D** *erosion of rock*



*Erosion is*



Start/Stop  
Voting

- A** *process of breaking down materials*
- B** *excess of surface water*
- C** *the deposit of weathered sand*
- D** *the carrying away of weathered material*



## *Weathering*



Start/Stop  
Voting

- A** *can only be physical*
- B** *can only be chemical*
- C** *is physical or chemical breaking down of material*
- D** *is the removal of sediment*



I can explain the process of erosion and how it affects the surface of the earth.

## Watch Bill Nye and Erosion



**Look fors:** causes and effects of erosion.

## **Performance of Understanding:**

**List some causes and effects of erosion:**





I can understand:

**Erosion's Effect on  
Different Landforms**

Look for:

Wave action

Wind action

River action

Erosion on a mountain

Erosion on mountain with trees



**Performance** Draw pictures of each landform  
**of Understanding:** before and after the erosion  
process in a flip booklet.

Before

After

wave

wind

river

erosion on mountain  
without trees

erosion on mountain  
with trees



I can understand the erosion process with soil and water.



Be ready to answer the following questions in paragraph format with a topic sentence and 3 or more supporting details.

1. Does water have the power to change land?
2. How do plants help prevent soil erosion?



**Learning Target:**  
I can understand  
the process of:

**Performance of  
Understanding:**

After watching the video,  
sort the boxes showing the  
process of erosion in  
sequence according to what  
would happen 1st, 2nd, 3rd,  
4th, 5th, and last.



14 minute video



**A** Landslide carries away fragments of rock.

**B** Rainwater seeps through the soil.

**C** The whole side of a mountain gives away.

**D** Rainwater runs away over the rocks.

**E** Rainstorm falls over the land.

**F** Water carries rock, mud, or sand grains.

Rainstorm falls over the land.

Rainwater seeps through the soil.

Rainwater runs away over the rocks.

Water carries rock, mud, or sand grains.

The whole side of a mountain gives away.

Landslide carries away fragments of rock.

**A** Wind blows over desert.

**B** Fine sand blasts against rock.

**C** Arches, pinnacles, and dunes form.

**D** Sand and rock fill in low places like valleys.

**E** Rock formations erode away.

**F** Wind picks up grains of sand as it blows.

Wind blows over desert.

Wind picks up grains of sand as it blows.

Sand and rock fill in low places like valleys.

Fine sand blasts against rock.

Arches, pinnacles, and dunes form.

Rock formations erode away.

**A** Rain freezes in crack.

**B** Gravity causes part of rock to roll down hill.

**C** Ice expands in crack.

**D** Rock bumps into other rocks as it rolls.

**E** Rain seeps into cracks in rock.

**F** Rock breaks apart.

Rain seeps into cracks in rock.

Rain freezes in crack.

Ice expands in crack.

Rock breaks apart.

Gravity causes part of rock to roll down hill.

Rock bumps into other rocks as it rolls.

**I can understand:**



The Earth's surface is slowly, but constantly changing all around us.

Watch 17 minutes of the video and answer the questions

### **Performance of Understanding:**

. Students work in pairs to look outside for of examples of weathering and erosion

#### **Look Fors:**

- 1. Cracked cement and plants growing through cracks**
- 2. Check where water drips off buildings**
- 3. Look at rocks and the brick building**
- 4. Look for anything that has been changed by weather, wind, or gravity.**

I am learning to identify the 4 layers of the earth.



## A JOURNEY INSIDE THE EARTH

**6 minutes**

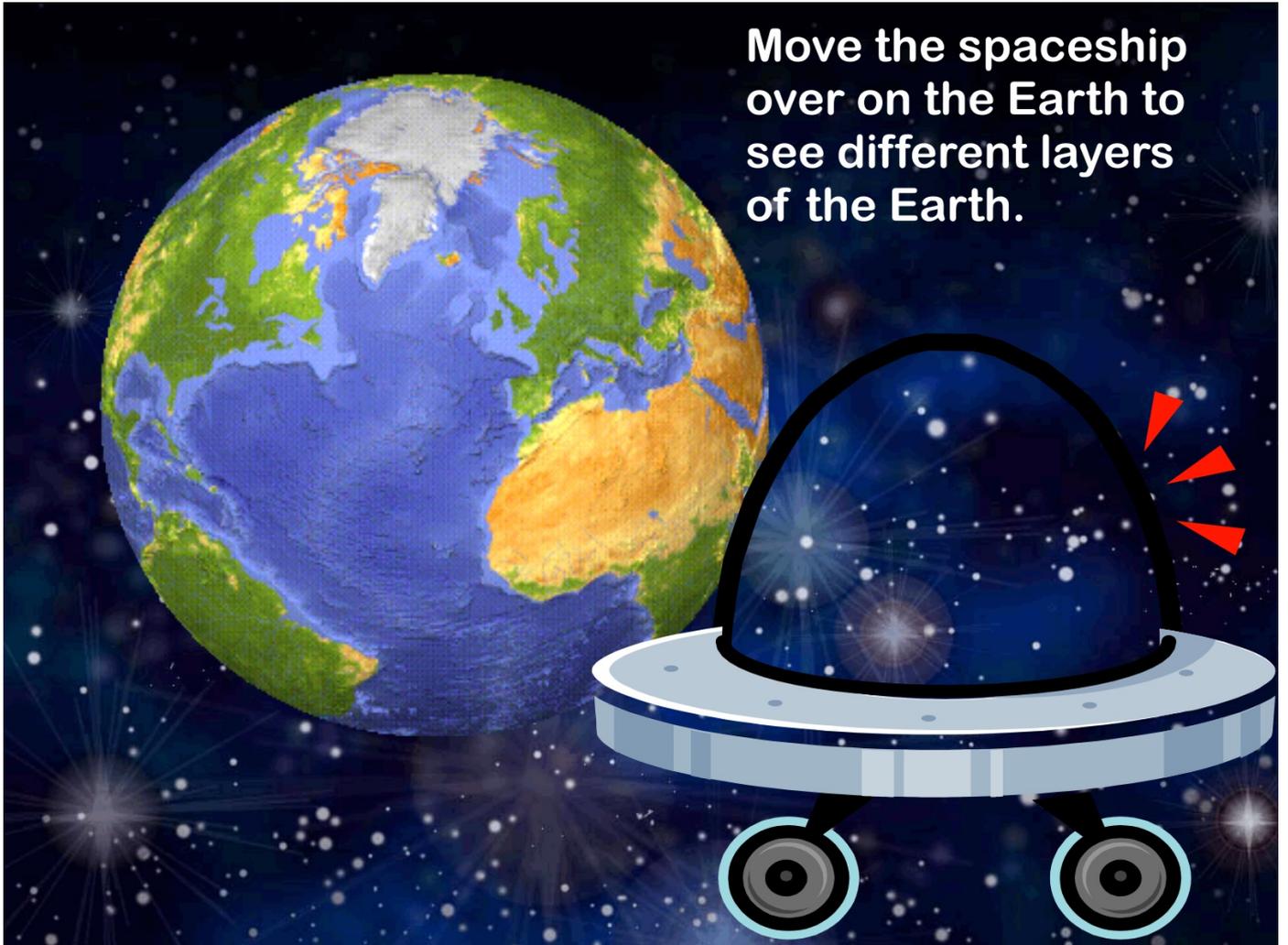
**Success Criteria:**

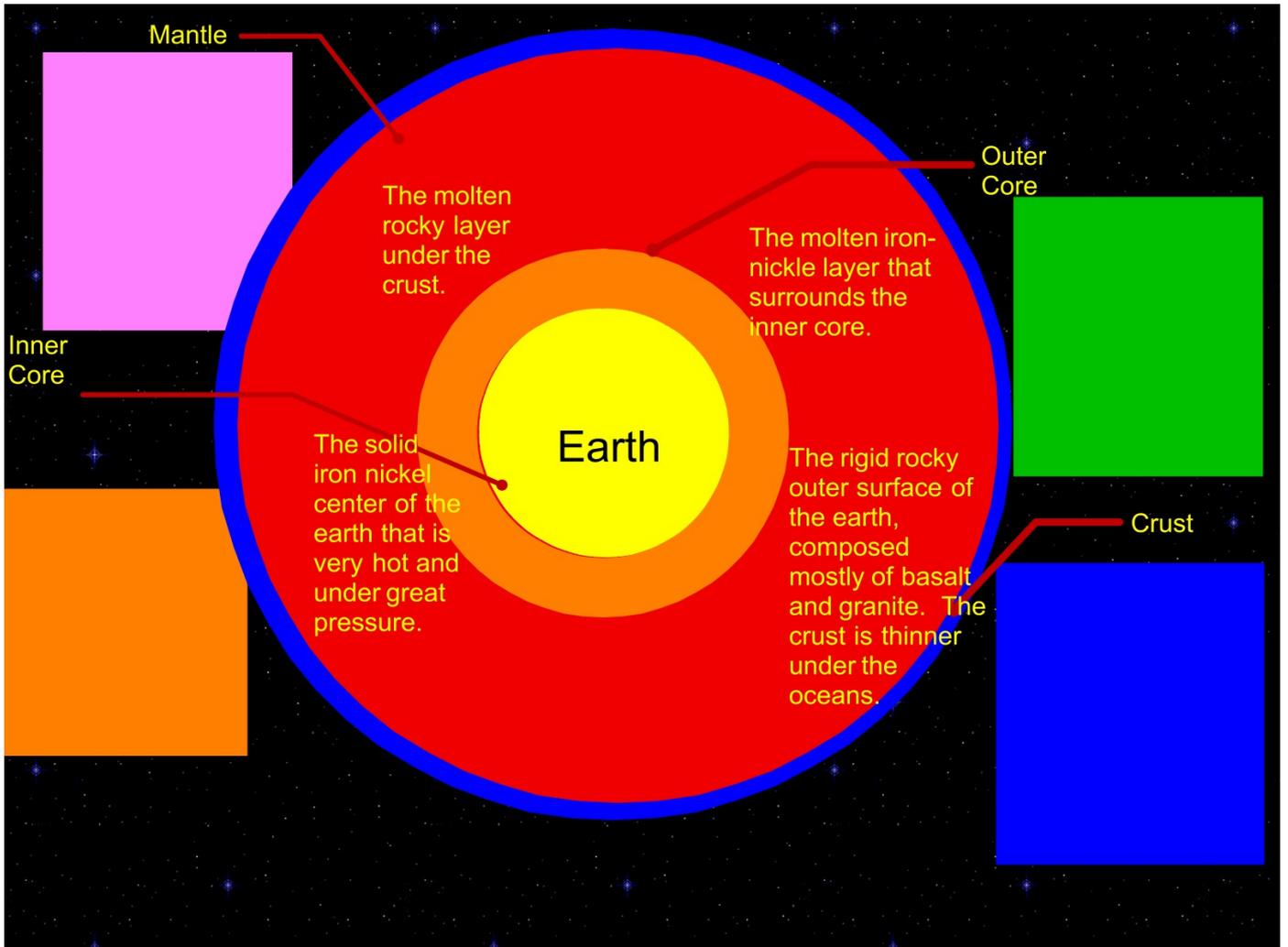
I will have labels of the 4 layers of the earth in my science notebook.

**Performance of Understanding:**

Create and label the layers of the earth using art materials.

Move the spaceship  
over on the Earth to  
see different layers  
of the Earth.





***Click below to Review  
the layers of the Earth:***

# Learning Target:

I am learning the theory of continental drift.



## Success Criteria:

I will have evidence from the science text and video that defines pangea and explains the theory of continental drift. 11/12 minutes

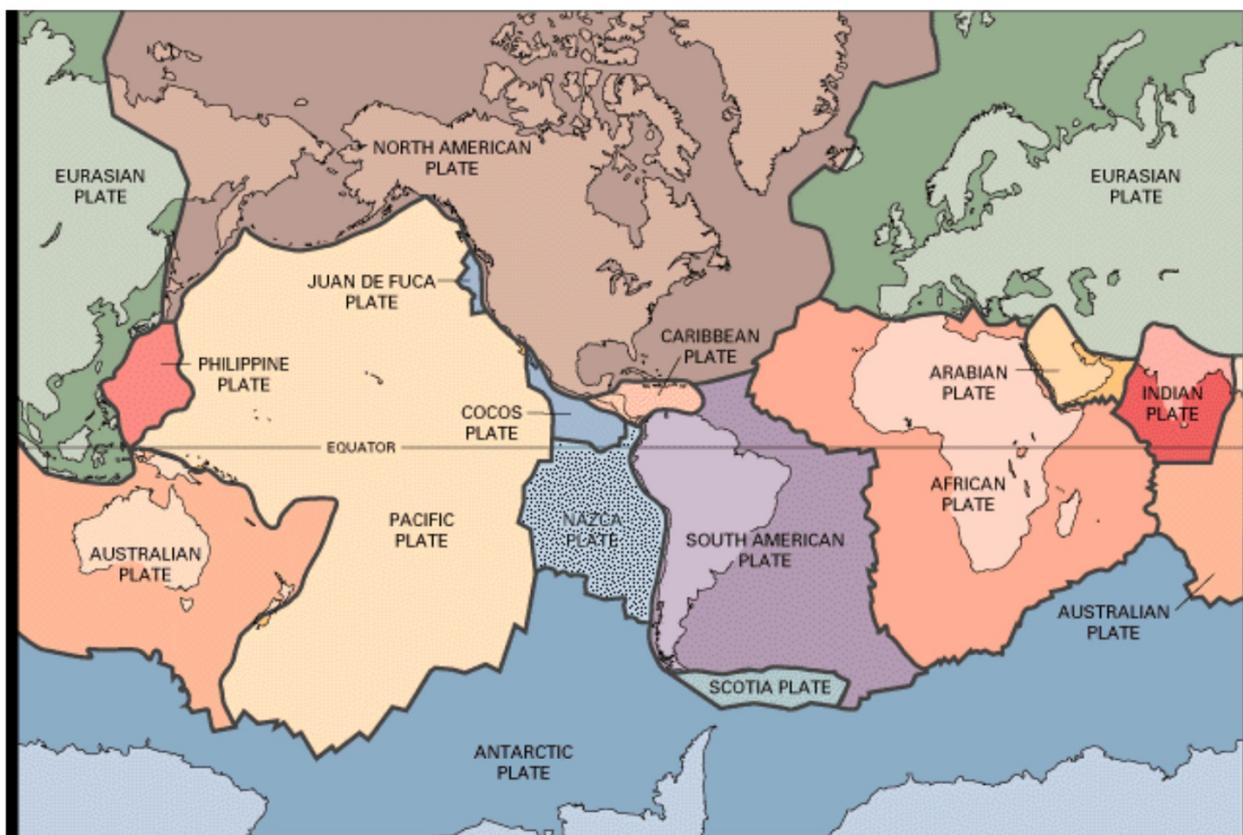
## Performance of Understanding:

Write a paragraph about the evidence that there was Pangea before the continental drift.

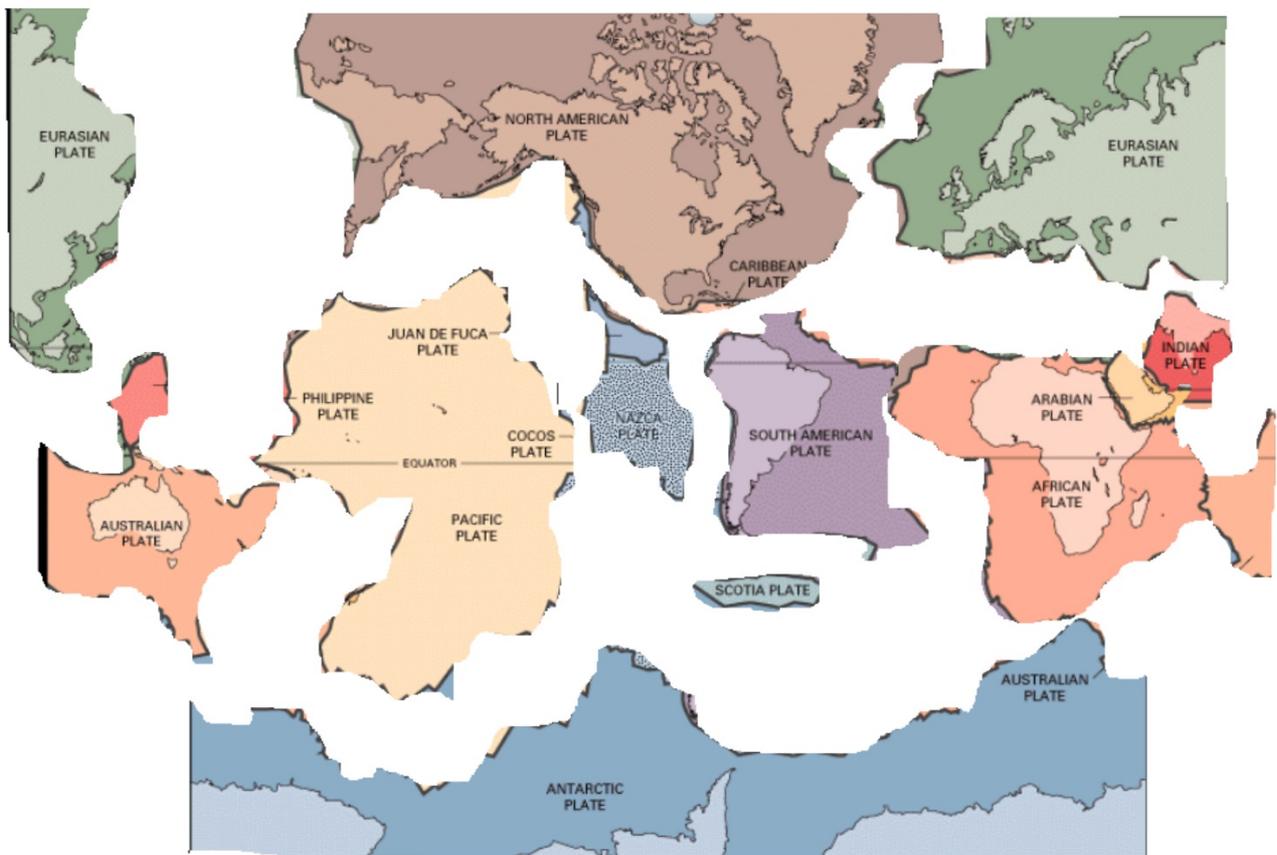
# World Map of current continents



# The Earth as a Puzzle-- Tectonic Plates



**Put the plates together.**



**Learning Target:** I am learning how tectonic plates change the Earth's surface.

**Success Criteria:**



**Know, Want, Learn**

- What do I **know**?
- What do I **want** to learn about this?
- What did I **learn** about this topic?



6 minutes



5 minutes



3 minutes

**Performance of Understanding:**



## Learning Target:

***I am learning to identify the characteristics of the Earth's tectonic plates.***

### ***Success Criteria:***

#### ***Performance of Understanding:***

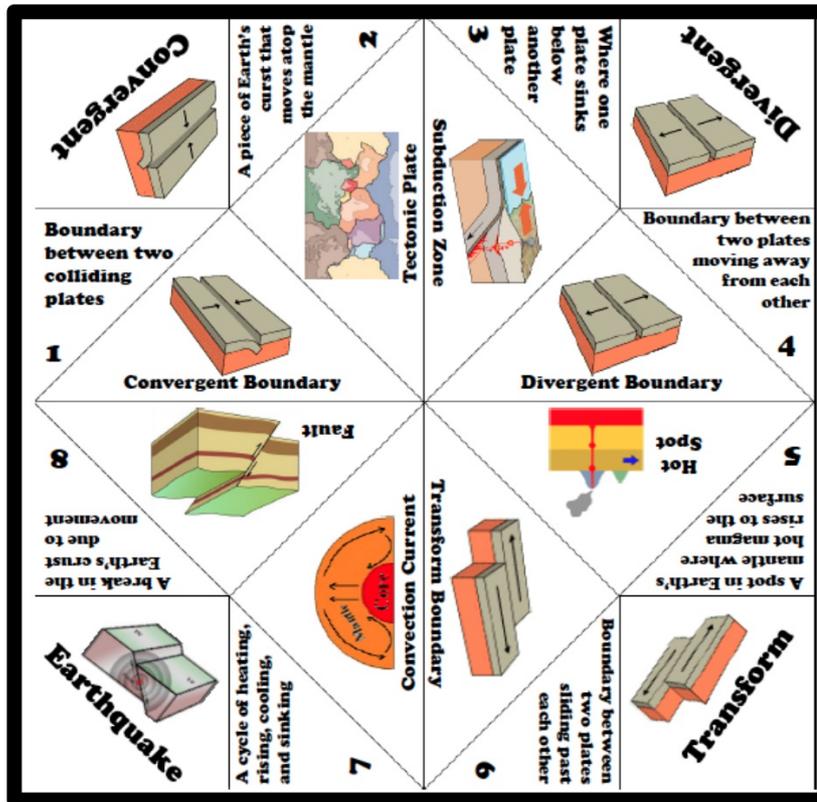
***I will make a **foldable cootie catcher** of the Earth's plates.***

**Divergent**

**Convergent**

**Transform**

[Click here to get the PDF](#)

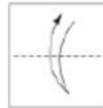


**Instructions:**

**Cut along the edges  
of the Cootie  
Catcher**



**Fold along the  
horizontal line**



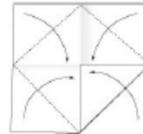
**Fold along the  
vertical line**



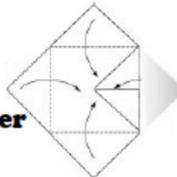
**Open it all up and  
flip it text down  
on the desk**



**Fold each  
corner to the  
center**



**Flip over and  
fold each corner  
to the center**



**Fold in half and  
put your fingers  
under the flaps**





# Learning Target:

I am learning to use evidence to explain how geological events change the Earth's surface.

**Bill Nye  
Earth's  
Crust**

## Success Criteria:

I will have an explanation of how volcanoes, earthquakes, and uplift affect Earth's surface in my science notebook.

## Performance of Understanding:

Match geological events to changes on the Earth's surface.

