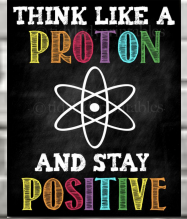




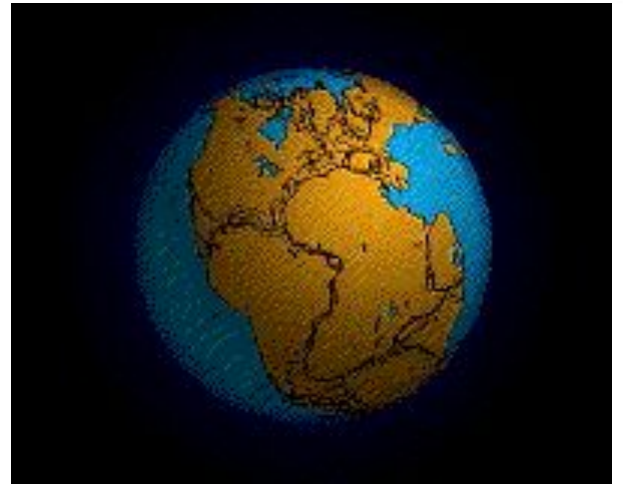
*November 6, 2020*

**Welcome to science class!**



Friday, Nov. 6, 2020

I can describe the observations of Alfred Wegener that led to his idea of continental drift.



November 6, 2020

Yá'át'ééh!   
sha'átchíní

Welcome to science  
class!





# ZOOM MEETING EXPECTATIONS

## MICROPHONE

When you enter the virtual meeting, mute yourself (if you aren't already). You can unmute yourself when it is your turn to speak.

## ETIQUETTE

Always be polite and respectful, pay attention to the speaker, and use the digital platform and its features appropriately.

## CONTRIBUTIONS

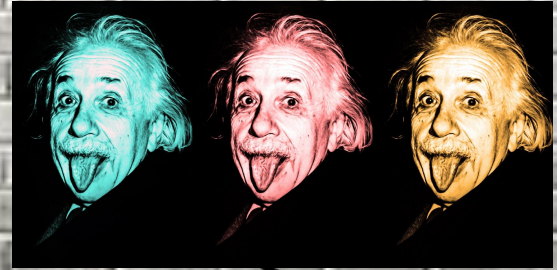
When you have something to contribute to the discussion, type it in the chat box OR use the "raise hand" button for the teacher to give you permission to unmute yourself so that you can speak.

## SOUND

If you can, wear headphones so you can hear better. Try your best to find a quiet place, free from distractions.

## QUESTIONS

When you have a question, type it in the chat box OR use the "raise hand" button so that you can unmute and ask your question.





# ZOOM MEETING EXPECTATIONS

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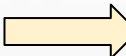
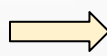
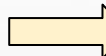
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## SOUND

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## QUESTIONS

When you have a question, type it in the chat box OR use the "raise hand" button so that you can unmute and ask your question.

New Host  4 minute wait  end meeting  4 minute wait  class ends

# November



Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	
1	2	3	4	5 Tutoring 6:00PM-7:00PM	6	7
8	9	10	11  Veterans Day	12	13 PTC 4-7PM	14
15	16	17	18	19 Tutoring 6:00PM-7:00PM	20	21
22	23	24	25	26	27	28
<b>Thanksgiving Break</b>						
29	30					



# Announcements

- **Earth Science textbooks are ready to be picked up at the school. This is the book for the rest of the year. Get yours as soon as possible.**
- **Zoom Students! Pick up Zoom material for Q2  
7:30am-4pm @ TMS**
- **Parent/Teacher Conferences - November 13 from 4-7pm  
Sign up begins Monday, November 9 on the website**



## Vocabulary

-continental  
drift  
-Pangaea  
-fossils  
-plate  
tectonics  
-rocks  
-minerals  
-Earth's crust  
-continental

# Agenda

- Kahoot! -Continents
- Announcement
- Class Discussion
- Review Vocabulary
- Interactive Plate Tectonics
- Independent Work

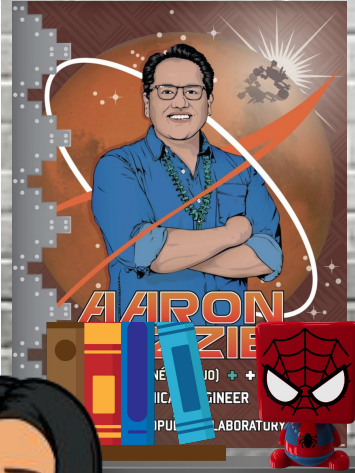


## Vocabulary

-continental  
drift  
-Pangaea  
-fossils  
-plate  
tectonics  
-rocks  
-minerals  
-Earth's crust  
-continental

# Announcements

- Zoom Students!  
Pick up Zoom material for Q2  
7:30am-4pm @ TMS
- Tutoring- Thursday @ 6PM
- November 13th- Parent Teacher  
Conference



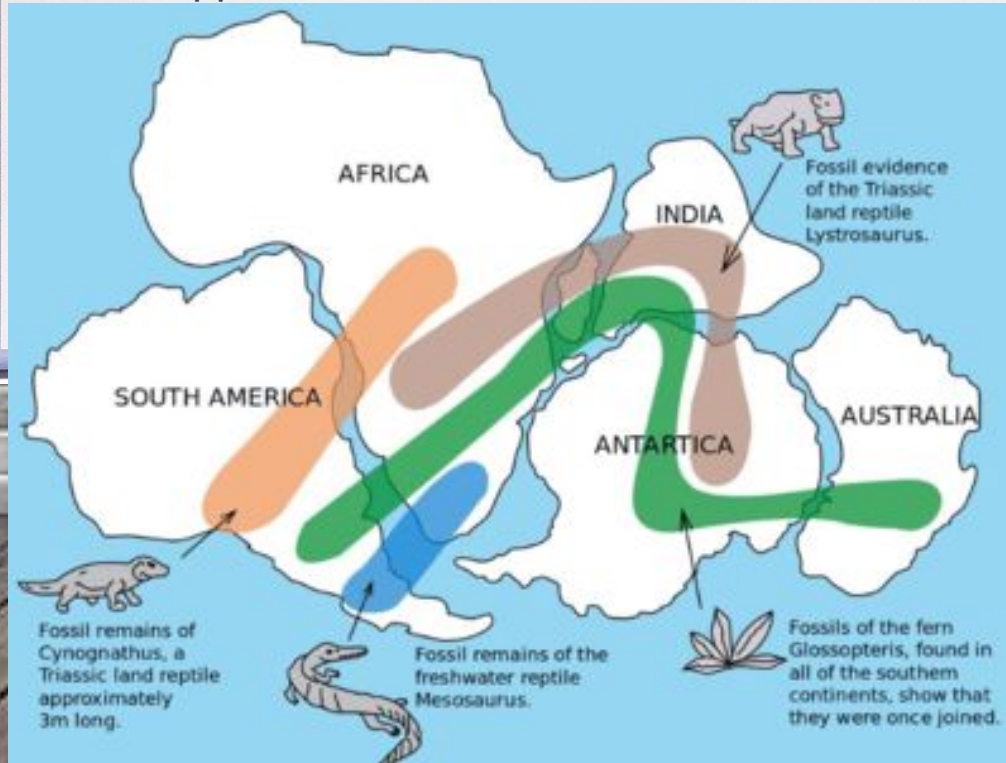


## Vocabulary

- continental drift
- Pangaea
- fossils
- plate tectonics
- rocks
- minerals
- Earth's crust
- continental

# Class Discussion

According to the continental drift hypothesis, the presence of similar fossils in South America and Africa supports which scientific idea?



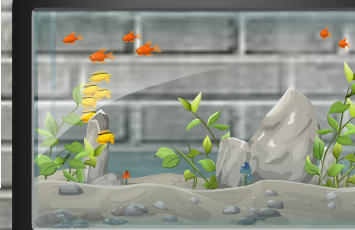


## Vocabulary

- continental drift
- Pangaea
- fossils
- plate tectonics
- rocks
- minerals
- Earth's crust
- continental

## Student Friendly Objective

I can construct a model to explain how the distribution of fossils and rocks, continental shapes, and seafloor structures provides evidence of the past plate motions.



## Vocabulary

- continental drift
- Pangaea
- fossils
- plate tectonics
- rocks
- minerals
- Earth's crust
- continental

## Essential Question(s)

How is Earth's surface constantly changing?

**DOK2**



A German scientist and meteorologist. He is most notable for his theory of continental drift, which he proposed in December 1912. This was the idea that the continents were slowly drifting around the Earth. He also had ideas about why the continents drift, which other scientists thought were impossible. His hypothesis was not accepted until the 1950s. Then several discoveries gave evidence of continental drift, and of the actual causes.



**Alfred Wegener**

Wegener, circa 1924–1930



**continental drift:** a hypothesis suggesting that continents are in constant motion on the surface of Earth



Pangaea (pan JEE uh):  
one supercontinent  
that all the continents  
were once part of



# Evidence That Continents Move

Wegener knew that he needed evidence to support his hypothesis of continental drift. The most obvious evidence was how the continents fit together like pieces of a puzzle. But other scientists were doubtful of his hypothesis. Wegener needed more evidence.





# Fossil Clues

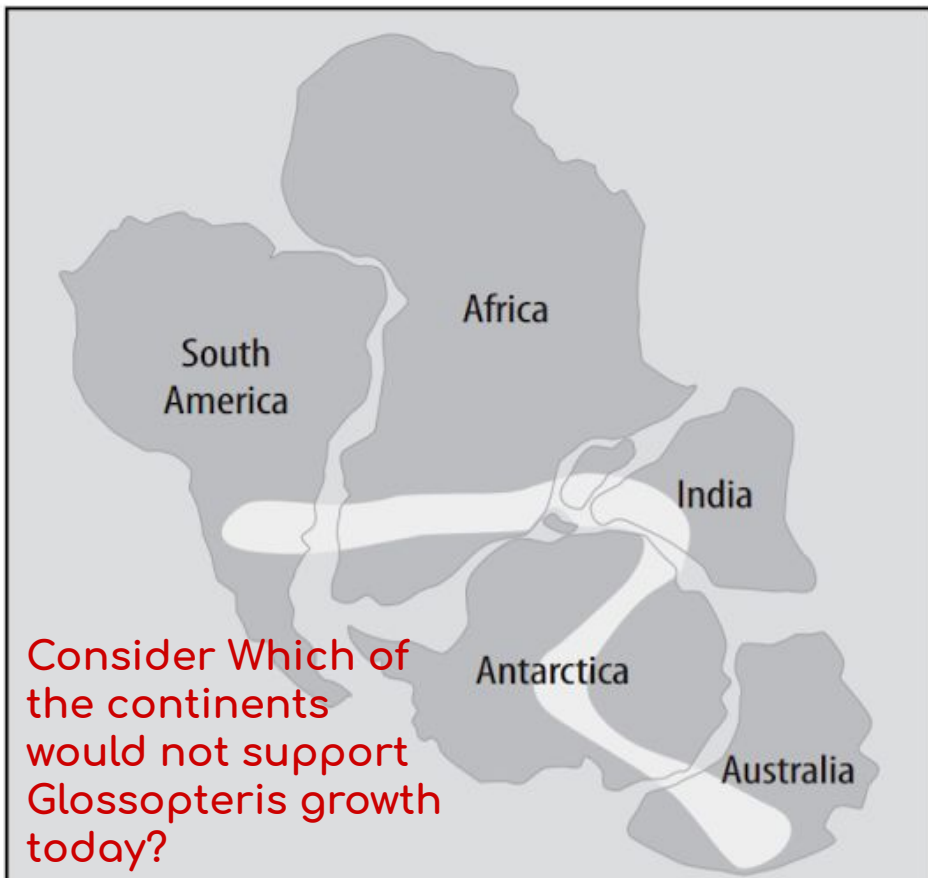
There are many animals and plants that live only on one continent. For example, lions live in Africa but not in South America. Because oceans separate the continents, animals cannot travel from one continent to another by natural means. However, fossils of similar organisms have been discovered on several continents that are now separated by oceans.



Glossopteris (glahs AHP tur us)



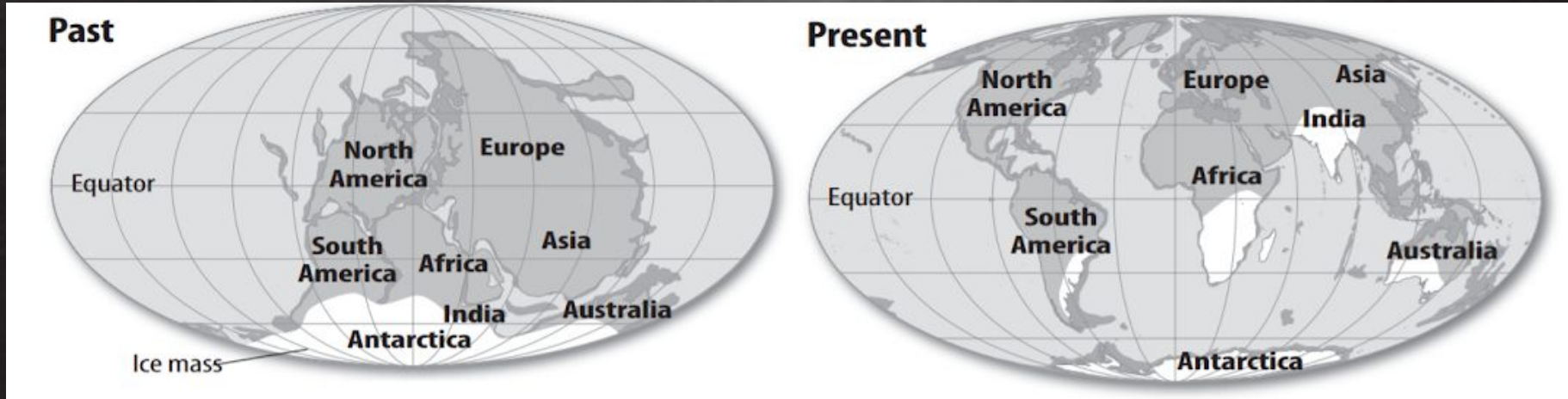
# Fossil Clues



Glossopteris (glahs AHP tur us)

# Climate Clues

- Coal beds are in Antarctica, a polar climate today. Yet coal formed from fossilized plants that lived long ago in warm, wet climates. This meant that Antarctica must have been warmer and wetter when these plants were alive.
- Glaciers were studied by Wegener, he pieced Pangaea together, he proposed that South America, Africa, India, and Australia were located closer to the South Pole 250 million years ago.





# Climate Clues



Glacial striations

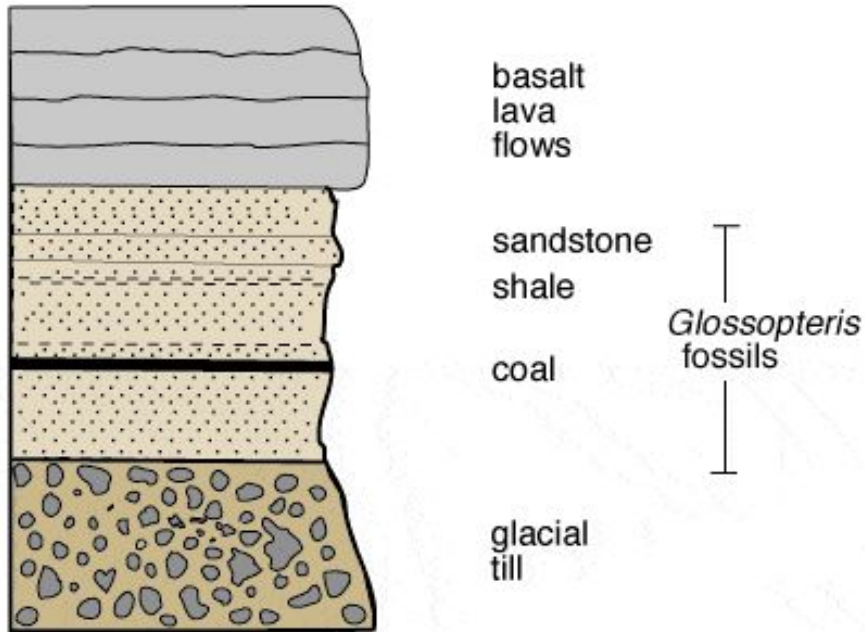


# Rock Clues

- The rock formations and mountain ranges seemed to have formed in the same way at the same time.
- Geologists have studied rocks from these eruptions. They found that the volcanic rocks from both continents were identical in chemistry and age.



# Rock Clues



Similar layers of rock were formed in Antarctica, Australia, South America, Africa, and India before Pangea broke apart. Glossopteris fossils were found in the rocks on each continent.

Wegener's Evidence

Similar Rock Layers

Found on Different

Continents

# Rock Clues

- Mountain Chains-More evidence came from the rocks that make up two mountain chains in Europe and North America.



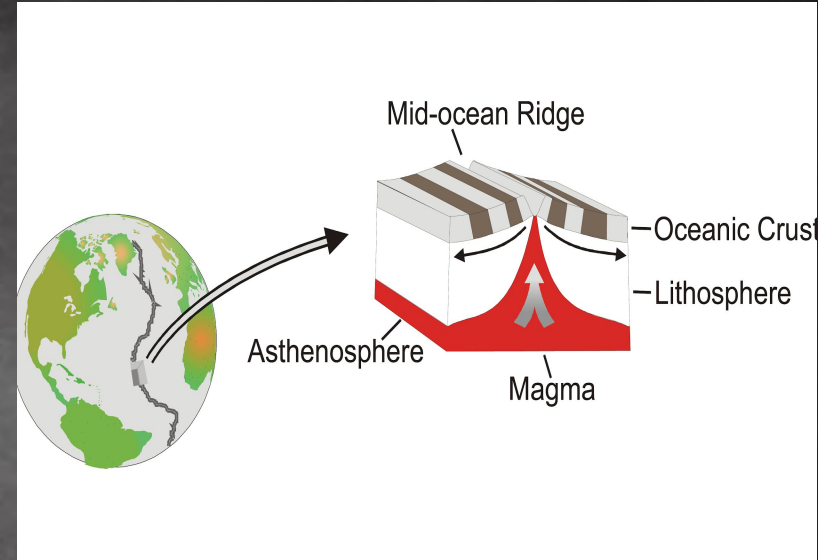
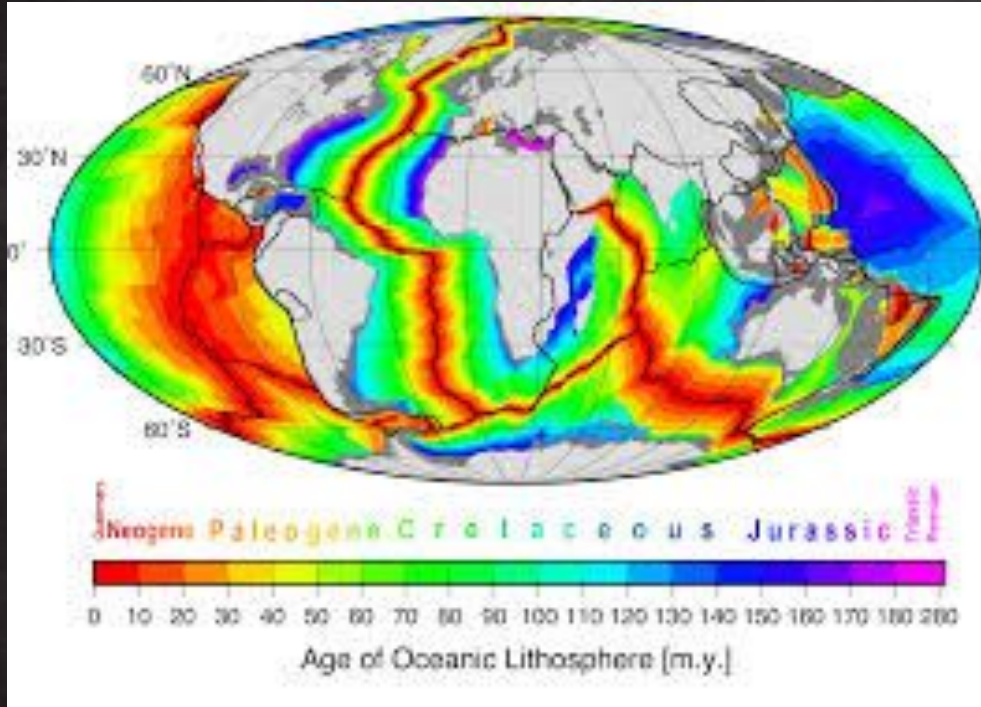


# FINALLY

The evidence for drifting continents was hidden on the seafloor. During Wegener's lifetime, scientists did not have the tools to determine what happened beneath the oceans. Wegener also could not have known what the seafloor looked like. The evidence needed to prove continental drift was not discovered until long after Wegener's death



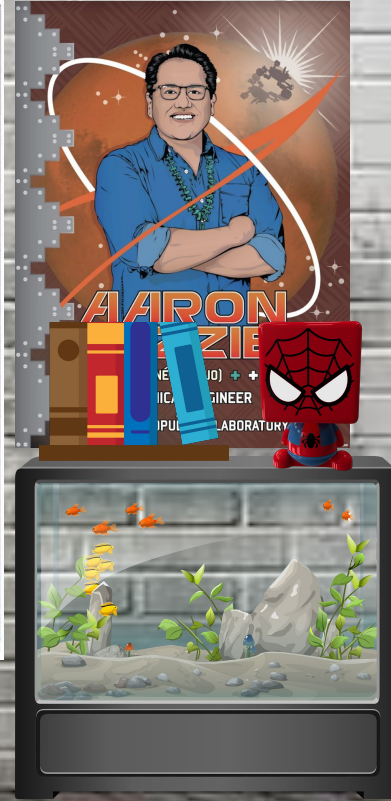
# Spreading of the Seafloor



The ocean depth is calculated by knowing how fast sound travels in the water (approximately 1,500 meters per second) and measuring the time it takes the sound to travel to the bottom and return. This method of seafloor mapping is called echosounding.

## Vocabulary

- continental drift
- Pangaea
- fossils
- plate tectonics
- rocks
- minerals
- Earth's crust
- continental





## Vocabulary

- continental drift
- Pangaea
- fossils
- plate tectonics
- rocks
- minerals
- Earth's crust
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## Assignment

**OPTION 1:** Cut the puzzle pieces from Zoom bag to recreate plate tectonics.

**OPTION 2:** Complete webquest part 1&2 on ClassDojo

REMINDER: Rock Cycle is due!

Upload it to  
ClassDojo

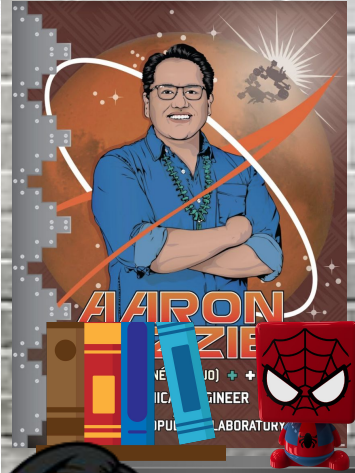
**DUE: Friday, Nov. 6th**



## Vocabulary

- continental drift
- Pangaea
- fossils
- plate tectonics
- rocks
- minerals
- Earth's crust
- continental

# Check Exit Ticket



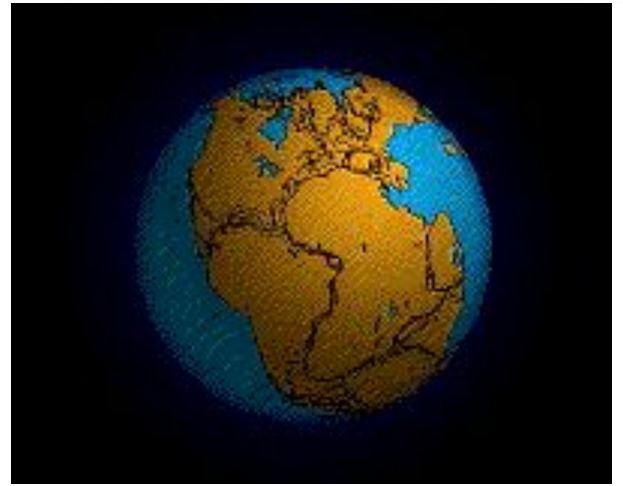
# Agenda

- Announcements
- Objective
- Essential Questions
- Vocabulary
- Video
- Lesson Slides
- Interactive Activity
- EXIT Ticket



Thursday, Nov. 5, 2020

I can describe the  
observations of Alfred  
Wegener that led to his idea  
of continental drift.



# ESSENTIAL QUESTIONS

1. Who was the scientist who studied the Earth's continents? What did he propose?  
DOK2
2. Compare the past and present of the Earth's continents? DOK2

# VOCABULARY

**continent**

**evidence**

**fossil**

**geologist**

**theory**







# Continental Drift: What's the Big Idea?



In science, a new idea has the power to change everything we thought we knew about our world. But how do scientists prove that their new ideas are correct?

Let's look at how one scientist tried to prove his idea.



# Continental Drift: What's the Big Idea?

## I Have a Theory About That...



It looks like South America and Africa could have fit together. Were they actually joined together at one time?

Scientists collect **evidence**, including objects they have found and things they have observed, as part of their research. Then, based on this evidence, they come up with a **theory** that explains how something occurs—or has occurred—in the natural world.

Scientists use **theories** to explain everything from how the universe began to why objects fall to the ground. In 1915, German scientist Alfred Wegener published a book to present a **theory** he called "**continental** drift." Wegener believed that the large pieces of land we call **continents** move over long periods of time. Even though Wegener found strong **evidence** to support his theory, not everyone accepted it from the start.

# Continental Drift: What's the Big Idea?

## Goals

Here are the big ideas we need to know:

The **continents** are in slow but constant motion, riding on top of pieces of Earth's crust called tectonic plates

The scientific community often refuses to accept new scientific **theories** that challenge existing ones

Scientists often use new evidence to build on other scientists' work and strengthen **theories**



PANGEA OVER TIME



# Continental Drift: What's the Big Idea?

## Vocabulary

Read these words and their definitions.

**continent** One of the large land masses on the Earth's surface

**evidence** The objects or the information observed to support a hypothesis

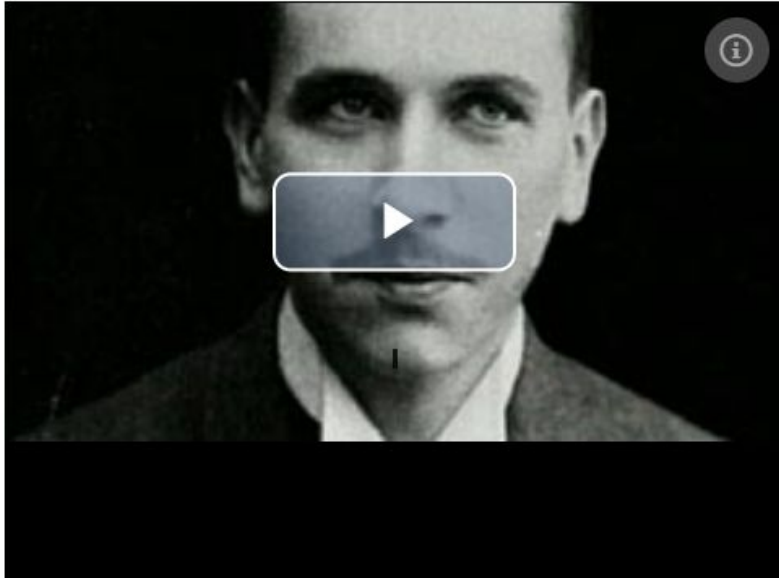
**fossil** Evidence in rock form of previous life

**geologist** Scientist who studies the history and structure of the Earth

**theory** An explanation of real life occurrences supported by lots of evidence



# Continental Drift: What's the Big Idea?



[Wegener Video](#)

According to Wegener's **theory**, there was only one large **continent** 300 million years ago. He named this continent *Pangaea* (from the Greek for "all the Earth," and pronounced "pan-GEE-uh"). *Pangaea* then split, and its pieces drifted, or moved, apart over millions of years to form today's **continents**. In fact, the continents are still drifting today. This video shows Wegener's **evidence** and explains the difficulty he had getting his ideas across to **geologists**—scientists who study the history and structure of Earth.

Now show what you have learned so far about continental drift by answering these four questions.

# Continental Drift: What's the Big Idea?

QUESTIONS:

1

2

3

4

**Continental drift is:**

- A. The current that pushed Wegener's hot air balloon.
- B. The movement of animals from Africa to South America.
- C. The movement of large land areas across Earth's surface.

# Continental Drift: What's the Big Idea?

QUESTIONS:

1

2

3

4

**Those who spoke against Wegener's observations made comments such as, "this is the theory of a weatherman." What did they mean by that?**

- A. That weathermen are not "real" scientists.
- B. That weathermen always get the weather wrong, so Wegener's theory could not be believed.
- C. That Wegener would probably change his theory every day, just like the weather changes.



# Continental Drift: What's the Big Idea?

QUESTIONS: 1 2 3 4

**In the video, how did Wegener use fossils (evidence of past life) of the Mesosaurus to support his idea that the continents must have been together at one time?**

A. He said he found a "land bridge" at the bottom of the Atlantic Ocean that had once connected Africa and South America but that must have collapsed.

B. He argued that these reptiles were too small to have swum the 5,000 miles between Africa and South America, where their fossils were found.

C. He pointed to fossils from the same Mesosaurus, half of it in Africa and half in South America.

# Continental Drift: What's the Big Idea?

QUESTIONS:

1

2

3

4

**Which of the following did Wegener NOT explain in his theory that might have made it stronger?**

A. How certain dinosaurs later evolved into birds.

B. What causes the continents to move.

C. How the Moon causes the tides.

# WHAT MAKES CONTINENTAL DRIFT A THEORY?

1. All of the continents seem to fit together like a puzzle



Current South America

Florida



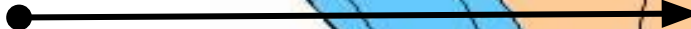
North America



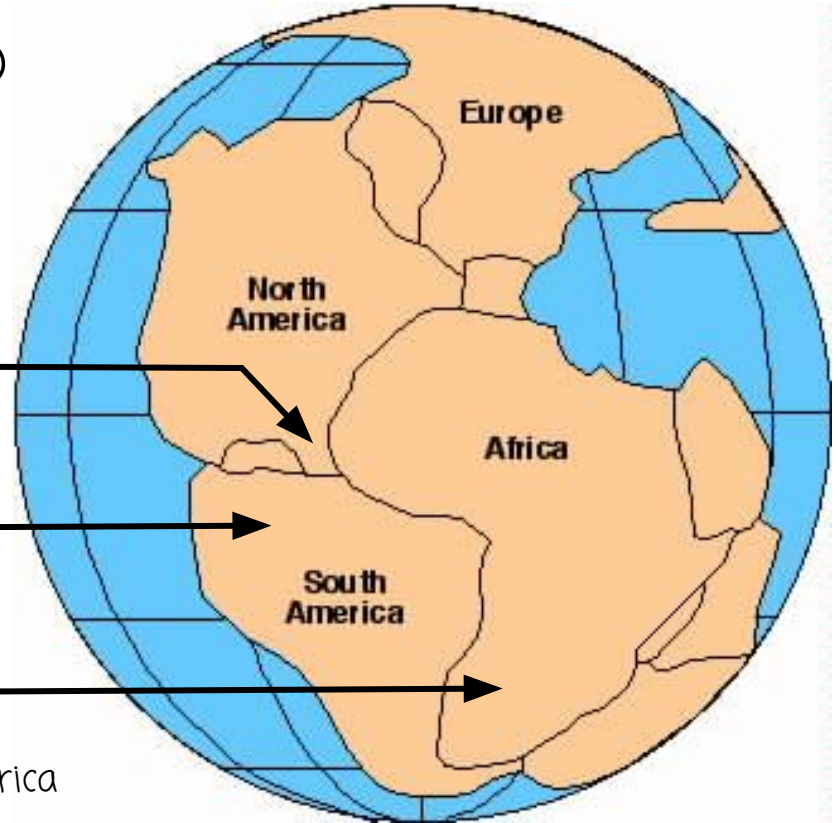
Africa



Current Africa



South America





# WHAT MAKES CONTINENTAL DRIFT A THEORY?

2. The same fossils have been found across continents.

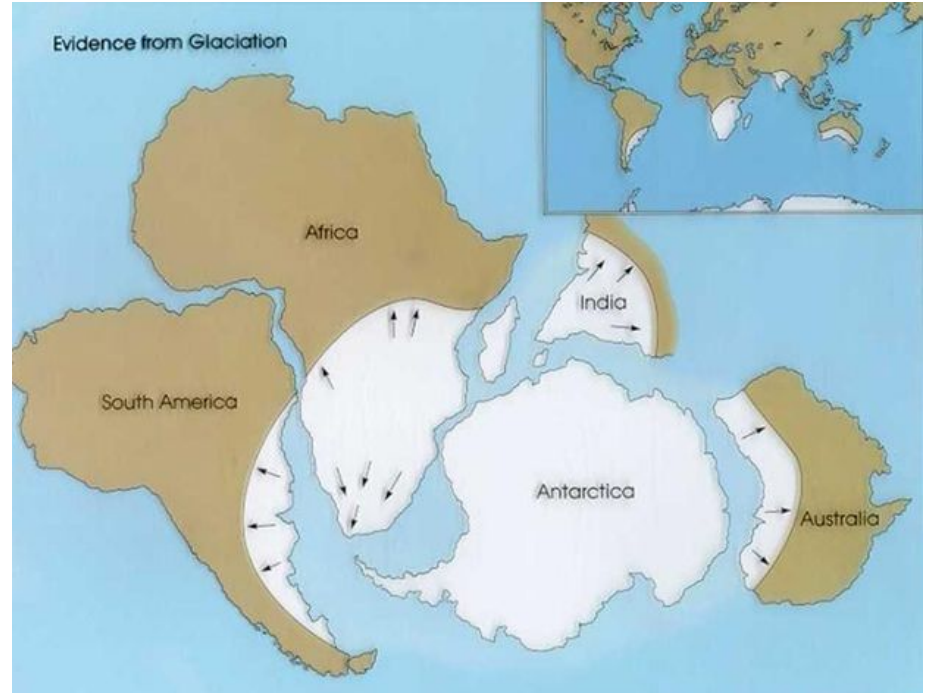
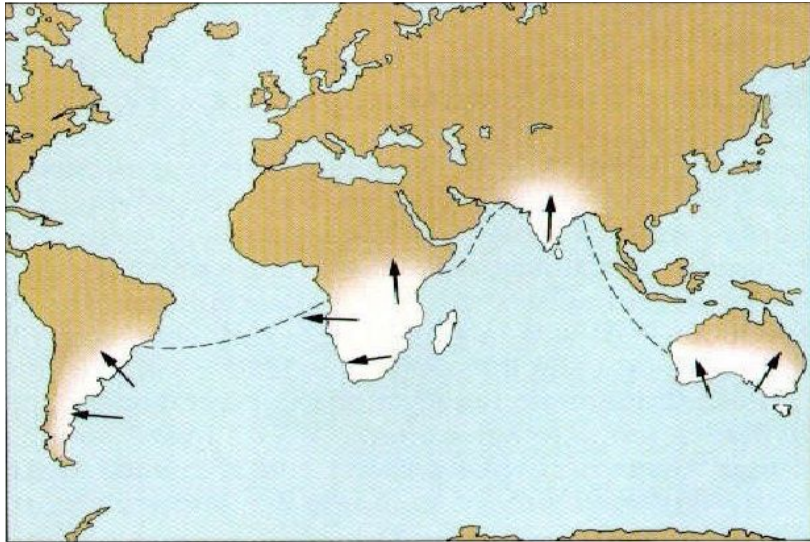
South America

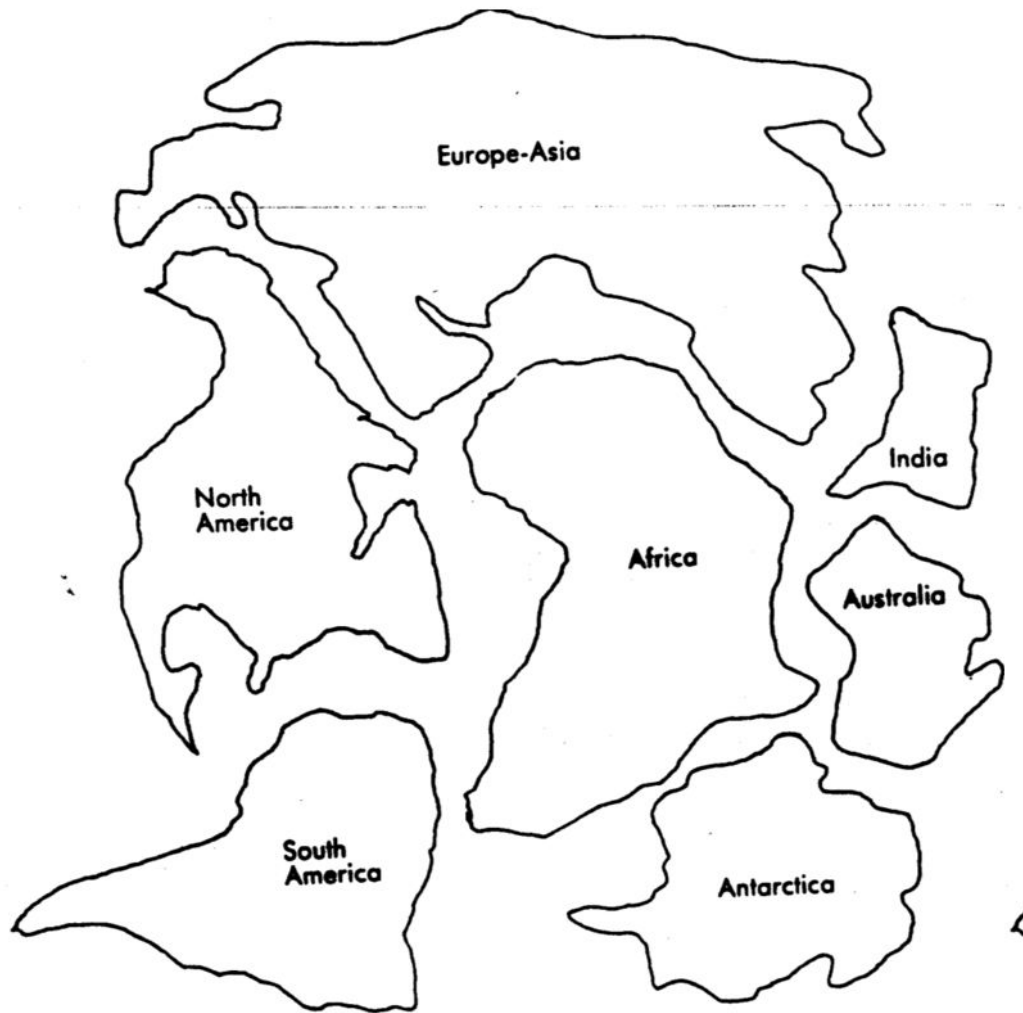
Africa



# WHAT MAKES CONTINENTAL DRIFT A THEORY?

3. Glacial deposits have been found across the southern parts of South America, Africa, India, and Australia.





Europe-Asia

North  
America

South  
America

Africa

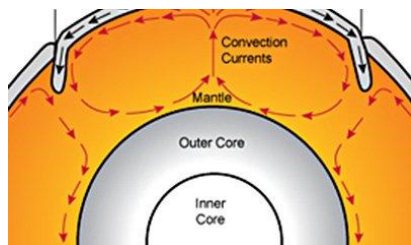
India

Australia

Antarctica

2





After reading the passage, write one to two sentences to answer the question below.

What was the major weakness of Wegener's **theory** of **continental** drift?



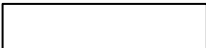

Scientists collect **evidence**, look for patterns in the evidence, and then test different ideas to explain these patterns. Only then do they put forth a **theory**. However, not every theory is accepted by other scientists.

As you read this passage, consider what Wegener was unable to prove to other scientists that caused them to reject his ideas at first.

Click to read [Plate Tectonics—Proof That Wegener Was Right](#) (PDF).



## Marking Text

Symbol	Direction
 ① ②	<b>Number the paragraphs.</b>  Start with #1 and continue in order until the end of the text or reading assignment. Circle the number, leaving room in margins. Like page numbers, paragraph numbers will act as a reference so you can easily refer to a specific section.
	<b>Circle key terms, names of people, places, theories, and dates</b>
	<b>Draw a box around formulas, values, and units.</b>
	<b>Underline or highlight claims and relevant information, definitions, and evidence.</b>

## Proof That Wegener Was Right

The first scientific theory to suggest that Earth's continents were once in different positions than they are now was Alfred Wegener's theory of continental drift. Looking at a map of the world, Wegener noticed something that interested him: the east coast of South America and the west coast of Africa looked like they might fit together like pieces in a puzzle. He then read about the work of some other scientists who suggested that South America and Africa were once connected by a strip of dry land called a land bridge.



## Testing his idea

Inspired by these findings, Wegener began looking for evidence to support his idea: that the continents were not fixed in place but rather had moved over time. Using evidence that included matching coastlines, shared rock and fossil types, and mountain ranges of the same age, he explained that places that are today far away from one another were at one time connected.





## **Why scientists doubted him**

In Wegener's mind, he had proven his theory. However, few experts in the field of geology at the time accepted that continents could move. After all, how could they push through Earth's solid crust? Because Wegener had not explained what caused the continents to move, his theory did not receive much support while he was still alive.

## **New evidence answers questions**

By the late 1960s, a group of scientists had developed a new theory based on evidence that had been collected since Wegener's death in 1930. It answered questions that Wegener's own theory had not. First, the scientists suggested that a transfer of heat caused the continents to move. This heat starts deep inside the Earth, rises to the surface, and returns underground in a circular pattern. The scientists also learned that Earth's crust is constantly being created and destroyed. This explained what happens to the crust as the continents drift. According to the new theory, crust is created at underwater mountain ranges called mid-ocean ridges. Crust gets destroyed at deep-ocean trenches, which are long and narrow ditches in the seafloor where pieces of crust are forced together.



## **Proof that Wegener was right**

With these new pieces of evidence, scientists explained the driving force behind continental drift that had been missing from Wegener's theory. By extending Wegener's original ideas, we now know that our planet's crust is broken into a dozen major pieces, called plates. Even though we may not notice it, these plates are in constant motion—or drifting, as Wegener put it. The name given to the new and improved theory is “plate tectonics”—with “tectonics” being the study of Earth's structure.



When responding:

<b>R</b>	estate
<b>A</b>	nswer
<b>C</b>	ite
<b>E</b>	vidence
<b>S</b>	ummary

<b>R</b>	estate
<b>A</b>	nswer
<b>C</b>	ite
<b>E</b>	vidence
<b>R</b>	easoning



.....Read to Learn.....

### Understanding Matter

Have you ever seen a rock that has more than one color? Why are different parts of the rock different in color? Why might some parts of the rock feel harder than other parts? The parts of the rock look and feel different because they are made of different types of matter. **Matter** is anything that has mass and takes up space.

Look around. Many types of matter surround you. In your classroom, you might see things made of metal, wood, or plastic. In a park, you might see trees, soil, or water in a pond. Look up at the sky. You might see clouds and the Sun. All of these things are made of matter.

Everything you can see is matter. However, some things you cannot see also are matter. Air, for example, is matter because it has mass and takes up space. Sound and light are not matter. Forces and energy also are not matter. To decide whether something is matter, ask yourself if it has mass and takes up space.

An **atom** is a small particle that is a building block of matter. In this lesson, you will explore the parts of an atom. You will read how atoms can differ. You also will read how different arrangements of atoms make up the many types of matter.

Reading Essentials

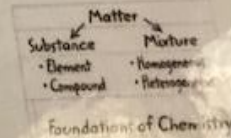
Study Check

#### Building Vocabulary

Write each vocabulary term in this lesson on an index card. Shuffle the cards. After you have studied the lesson, take turns picking cards with a partner. Each of you should define the term using your own words.

### FOLDABLES

Make a layered Foldable to summarize the lesson.



Foundations of Chemistry

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..... **Read to Learn** .....

### **Kinetic and Potential Energy**

When snow melts after a snowstorm, all three states of water are present. The snow is a solid, the melted snow is a liquid, and the air above the snow and ice contains water vapor, a gas. What causes particles to change state?

#### **Kinetic Energy**

Recall that the particles that make up matter are always moving. These particles have **kinetic energy**, the energy an object has due to its motion. The faster particles move, the more kinetic energy they have. Within a given substance, such as water, particles in the solid state have the least amount of kinetic energy. This is because they only vibrate in place. Particles in the liquid state move faster than particles in the solid state. Therefore, they have more kinetic energy. Particles in the gaseous state move quickly. They have the most kinetic energy of particles of a given substance.

**Temperature** is a measure of the average kinetic energy of all the particles in an object. Within a given substance, a rise in temperature means that the particles, on average, are moving at greater speeds. Therefore, the particles have more kinetic energy. For example, water molecules at 25°C are moving faster and have more kinetic energy than water molecules at 10°C.

**Mark the Text**

**Building Vocabulary** Skim this lesson and circle any words you do not know. If you still do not understand word after reading the lesson, look it up in the dictionary. Keep a list of these words and definitions to refer to when you study other chapters.

**Key Concept**

**1. Relate** How does temperature relate to particle motion?

Hi the  
and at

After reading the passage, write one to two sentences to answer the question below in CHAT.

What was the major weakness of Wegener's **theory** of **continental** drift?

## continent, evidence, fossils, geologist, theory

- 1, In explaining that Earth's continents were in motion, not fixed in place, Wegener pointed to certain  of plants and animals.
2. German scientist Alfred Wegener wrote a theory based on a giant  that he named Pangaea.
3. To explain his new idea, Alfred Wegener used different forms of  he collected from all around the world.
4. Alfred Wegener and his work on continental drift was looked down upon by many scientists because he was not a trained .
5. A  is an explanation for how the world works built on evidence and tests.



Choose **two** words from the vocabulary list and write a new sentence with both words in CHAT.

Vocabulary words: **continent, evidence, fossils, geologist, theory**



# QUESTIONS

Drag the green boxes to answer the questions.

What is it?

Who proposed the idea?

What was it called when all the continents formed one land mass?

What evidence is there for this idea?

Idea created by Alfred Wegener in 1912.

Hypothesized that continents once formed one land mass like a puzzle

climate change, rocks, fossils, puzzle-like fit

Pangaea

Head to:  
**CLASSDOJO**  
to complete today's EXIT ticket.

[www.classdojo.com](http://www.classdojo.com)

**HYP AJL**

# Exit Ticket

What evidence supports continental drift?

What evidence might we find here that might show the environment has changed over time?



For FRIDAY:



# Exit Ticket

Choose a question to answer.

## Level 1

Draw a diagram showing the arrangement of Pangaea.

## Level 2

What evidence did Wegener discover that led him to his idea of continental drift?

## Level 3

Explain how Wegener used the evidence he discovered to how the continents fitted together. Include a diagram.