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## ملخص وحل لبعض أسئلة الدرس الأول Continents Moving تحرك القارات من وحدة Earth Dynamic

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## التواصل الاجتماعي بحسب الصف السابع



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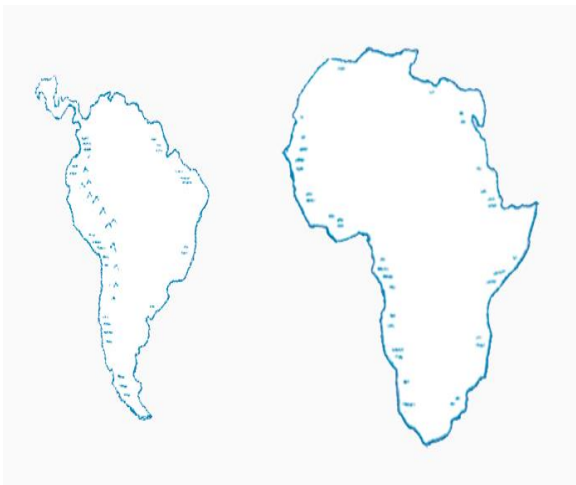
# Science Grade 7

## Module: Dynamic Earth Lesson 1: Moving continents

- **Understand the concept of Continental drift**
  - ✓ What is Pangaea?
  - ✓ Matching coastlines
- **Evidence from rock formation**
- **Evidence from rock formation**
- **Evidence from Coal Deposits**
- **Evidence from fossils**

- ✓ Continents
- ✓ Continental Drift
- ✓ Continental Shelf
- ✓ Pangaea
- ✓ Geologist
- ✓ Volcanic eruption
- ✓ Compaction
- ✓ Separated
- ✓ Fossils

Why do South America and Africa have matching coastlines?



1. Look at the outlines of South America and Africa. The green color represents the land above sea level. The blue areas along the coastlines are the continental shelves—areas of the continents that are under shallow water. Label the continental shelves on the image below.



2. What do you notice about the shapes of the continents including the continental shelves? What do you think the apparent fit of the continents suggests?

The eastern coast of South America and the western coast of Africa appear to fit together, which suggests they were once joined in the past.



**Why do some continents have matching shapes?**

Hundreds of years ago, mapmakers noticed a jigsaw- puzzle pattern as they made the first maps of the continents.

**Matching Coastlines** In 1912, Alfred Wegener, a German scientist, observed the fit of the continents and arrived at a creative explanation for this pattern. What did he conclude?



## The Continental Drift Hypothesis

1. What was Pangaea?

Pangaea was a supercontinent, or single landmass, composed of all of the continents on Earth.

2. Describe Wegener's continental drift hypothesis.

Continental drift suggests that over millions of years, Pangaea split up and the continents drifted over Earth's surface.



3. If you had discovered continental drift, how would you have tested your hypothesis? Use the space below to jot down ideas of the evidence you would collect and clues you would search for.

Answers might include the shapes of the continents, matching rock types, matching mountain ranges, or fossil clues.

Wegener argued that the continents were once joined together in a single supercontinent he named **Pangaea** and later drifted apart. He named this new hypothesis **continental drift**. Several types of evidence have been used to support the idea that Earth's continents were once joined and drifted slowly over time to their present positions.





# How do rocks provide evidence that continents move?

## 1. Evidence from rock formation

- **Wegener** reasoned that when Pangaea began to break apart, large geologic structure, such as mountain ranges, became separated as the continents drifted apart.
- Using this reasoning, Wegener thought that there should be areas of similar rock types on opposite sides of the Atlantic Ocean. Today, geologists can determine when these rocks formed.
- **For example**, geologists suggest that large-scale volcanic eruptions occurred on the western coast of Africa and the eastern coast of South America at about the same time hundreds of millions of years ago (The volcanic rocks from the eruptions are identical in both chemistry and age)

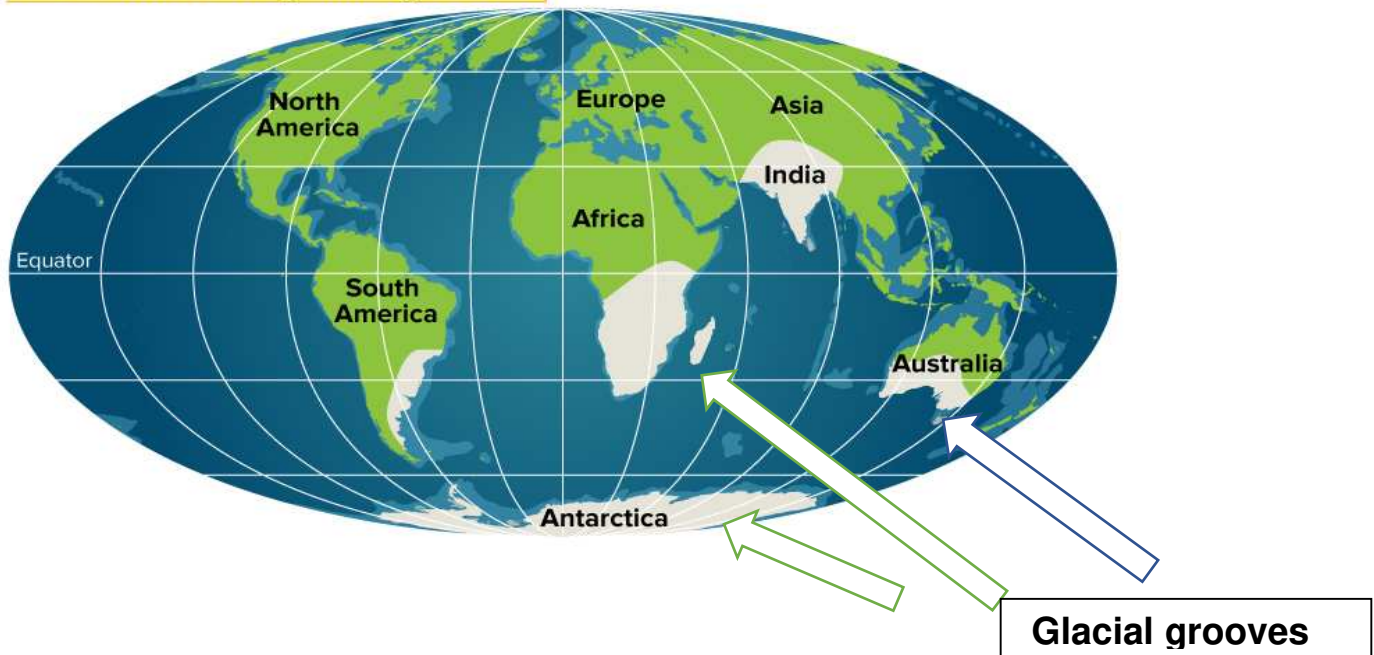
## 2. Evidence from Glacial features

- **Wegener** studied sediments in South America, Africa, India, and Australia. Beneath these sediments.
- **He** discovered 290-million-year-old glacial grooves, or deep scratches in rocks made as glaciers moved across land.





**Analyze** the map below. The white areas show the locations of glacial grooves.



**Interpret** the map. Could ice caps, similar to the one that covers Antarctica today, exist on these continents in their present locations? How do **patterns** of glacial features provide evidence of continental drift?

These areas are too warm to have massive ice sheets today. If the Southern Hemisphere continents could be reassembled into Pangaea, the presence of an ice sheet would explain the glacial features on these continents today.

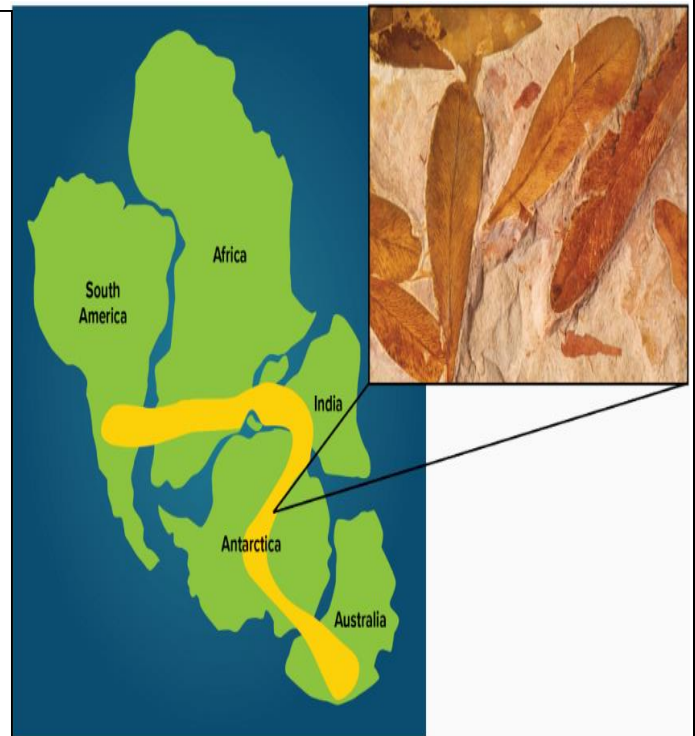
### 3. Evidence from Coal Deposits

- **Wegener** found additional evidence in rocks that the climates of some continents had changed drastically.
- **For example**, coal deposits have been found in Antarctica. Coal forms from the compaction of ancient swamp plants that grew in warm, wet regions. The presence of coal beds in Antarctica indicated that this frozen land once had a tropical climate.
- He concluded that Antarctica must have been much closer to the equator sometime in the geologic past.



## 4. Evidence from fossils

- Fossils provide evidence for continental drift, Fossils of *Glossopteris* (shown below), have been discovered in rocks from South America, Africa, India, Australia, and Antarctica. These continents are far apart today.



- Wegener reasoned that the area separating these fossils was too large to have a single climate. Also, because *Glossopteris* grew in temperate climates, these places must have been closer to the equator.

- Wegener also used fossils of various reptiles to support his hypothesis. Fossils of a **coastal reptile**, *Mesosaurus*-shown to the right-and two **terrestrial reptiles**, *Cynognathus* and *Lystrosaurus*, have been found on continents that are now separated by large oceans.



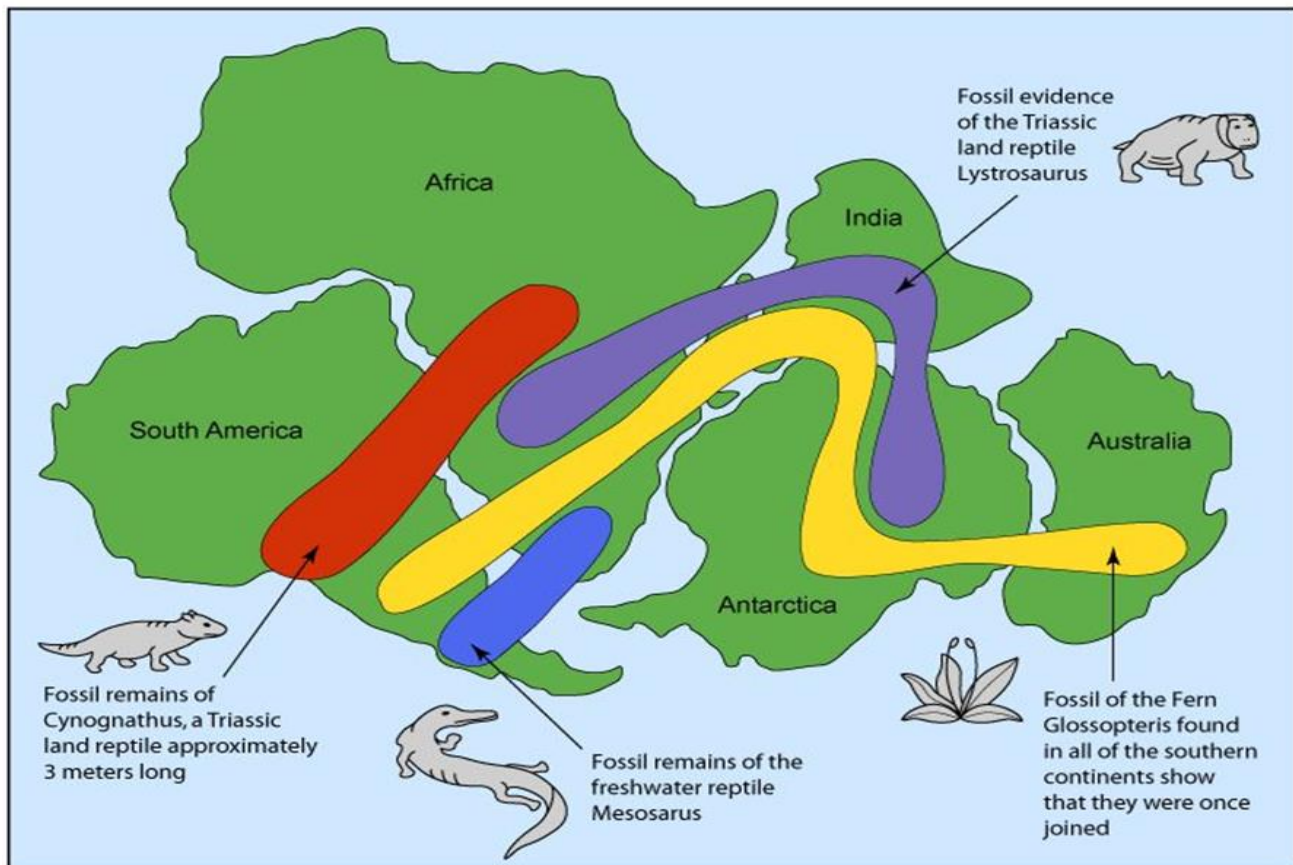
- Wegener reasoned that these creatures **could not have swam** the distances that now separate the fossil locations, which added to his cache of evidence.





**Conclusion:**

The similarity of rocks and fossils on continents now several thousand kilometers apart and separated by wide oceans suggests that the continents have not always been in their present positions. They must have been joined in the past.



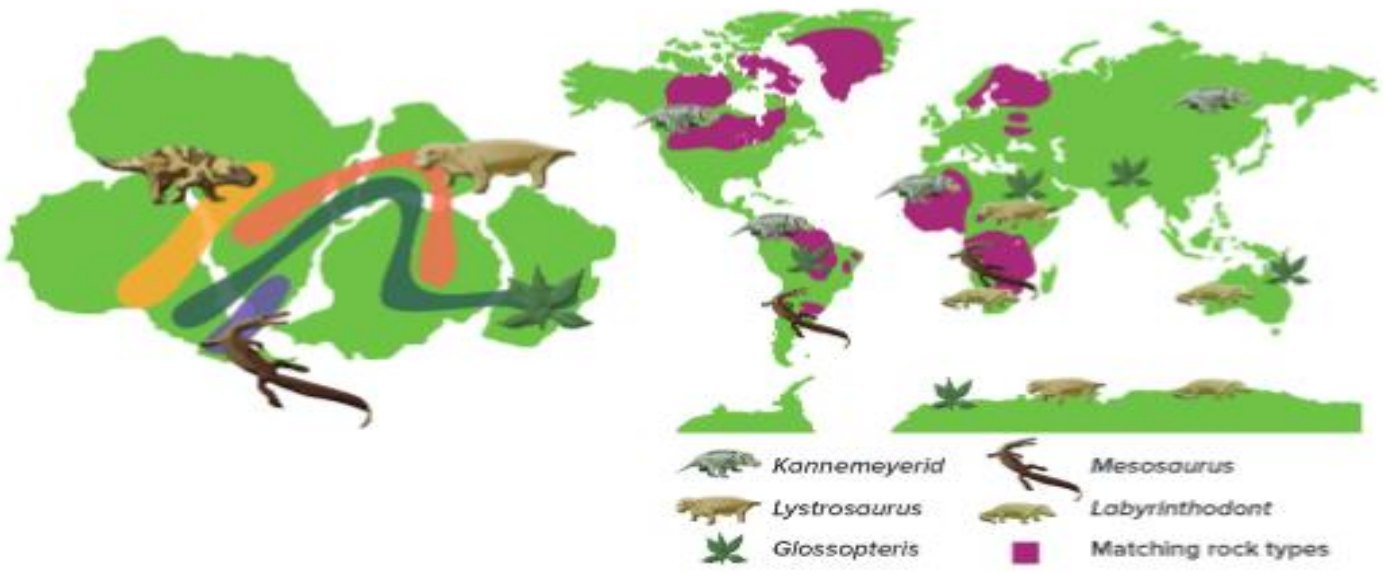
## Why did scientists argue against continental drift?

Alfred Wegener continued to support the continental drift hypothesis until his death in 1930. His ideas, however, were not widely accepted until nearly four decades later.

Wegener needed more scientific evidence to prove his hypothesis of continental drift. This evidence, however, was hidden on the seafloor between the drifting continents and was not discovered until long after Wegener's death.



Alfred Wegener found different types of evidence to help support the hypothesis of continental drift. He found fossils of a reptile called *Mesosaurus* on land areas that were once part of Pangaea. The locations where the fossils are found are shown in the figure below.



✚ Which statement below describes how the presence of *Mesosaurus* fossils in South America and Africa helps support the hypothesis of continental drift?

- A. A reptile would not have been able to swim across an entire ocean, so the landmasses must have been closer together.
- B. It shows that the climates of both continents were different during the time that *Mesosaurus* lived.
- C. This suggests that South America and Africa moved apart, but India, Antarctica, and Australia remained stationary.
- D. It shows that *Mesosaurus* could only exist on South America and Africa because all other continents were covered in ice.

1) The presence of the same \_\_\_\_\_ on several continents supports the hypothesis of continental drift.

- A) fossils
- B) rocks
- C) neither a nor b
- D) both a and b

2) Some early mapmakers thought that the coastline of South America matched the coastline of Asia.

- True
- False

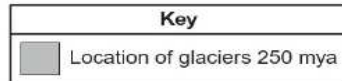
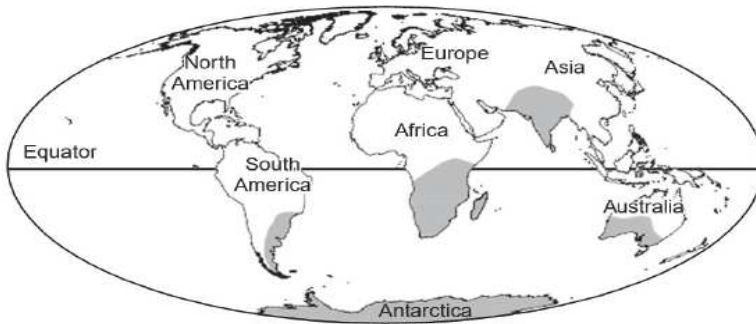


- 3) Scientists at the time rejected Wegener's hypothesis of continental drift because he could not explain how or why Earth's continents move.
- True
- False
- 4) A lack of explanation for continental drift prevented many scientists from accepting that a single supercontinent called \_\_\_\_ once existed.
- A) *Glomar*
- B) *Glossopteris*
- C) Pangaea
- D) Wegener
- 5) Matching \_\_\_\_ on different continents are evidence for continental drift.
- A) river systems
- B) rock structures
- C) weather patterns
- D) wind systems
- 6) \_\_\_\_ is a fossil fern that helped support Wegener's hypothesis of continental drift.
- A) *Gondwanaland*
- B) *Kannemeyeri*
- C) *Mesosaurus*
- D) *Glossopteris*
- 7) Wegener believed that the continents were assembled as part of a supercontinent about \_\_\_\_ years ago.
- A) 250 million
- B) 350 million
- C) 450 million
- D) 550 million





8) The map shows where glaciers existed 250 million years ago.



Which explanation is supported by the data in the map?

- A) Glaciers formed in the locations shown on the map because of a change in climate that caused the southern hemisphere to experience an ice age.
- B) Glaciers at one time covered most of the continents in the world, but the glaciers melted and the areas on the map are places where glaciers still remain.
- C) There is evidence of glaciers in the areas identified on the map because the current climate in those areas still supports glacier formation.
- D) There is evidence of glaciers in the areas identified on the map because the continents were once located near a polar region, but then over time the continents moved apart.

9) Why did Alfred Wegener believe that all of the continents once had been joined?

10) Identify two pieces of evidence used to support the hypothesis of continental drift. Describe how the evidence supports the hypothesis.

Answers :

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
D)	FALSE	TRUE	C)	B)	D)	A)	D)

Q9) The edges looked as if they would fit together like the pieces of a puzzle.

Q10) 1-Rocks of the same age and composition have been found on different continents, indicating that the rocks formed at the same time and place.

2-Fossils of land-dwelling organisms, such as *Cynognathus*, have been found on continents that are now separated by vast oceans.

**Thank  
you..**

