



Name: _____

Period: 7

Week: 4-5

Dates: 9/8-9/12

Unit: Plate Tectonics

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
7 No SCHOOL	8 E *VOCABULARY *FRAYER VOCAB	9 O *CONTINENTAL DRIFT NOTES *BACK TO SCHOOL NIGHT	10 E *SEA FLOOR SPREADING LAB	11 O HOME FB GAME *MID 1ST QRTR *PLATE TECTONICS NOTES
14 E	15 O *CA AGRICULTURE NOTES *O/C PRACTICE	16 E *WORKSHEETS	17 O *STUDY GUIDE *O/C PRACTICE	18 E HOME FB GAME *UNIT QUIZ *PACKET DUE *O/C PRACTICE

ASSIGNMENT	YOUR SCORE	TOTAL POINTS POSSIBLE
GOOD TO KNOW VOCABULARY WORDS		20
FRAYER MODEL VOCABULARY		20
CONTINENTAL DRIFT NOTES		60
SEA FLOOR SPREAD LAB		100
PLATE TECTONIC NOTES		40
9.1 CONTINENTAL DRIFT WORKSHEETS		40
9.2 SEA FLOOR SPREAD WORKSHEETS		40
9.3 THEORY OF PLATE TECTONICS WORKSHEETS		40
MEET CA AGRICULTURE NOTES		40
PLATE TECTONICS STUDY GUIDE		40
TOTAL		440

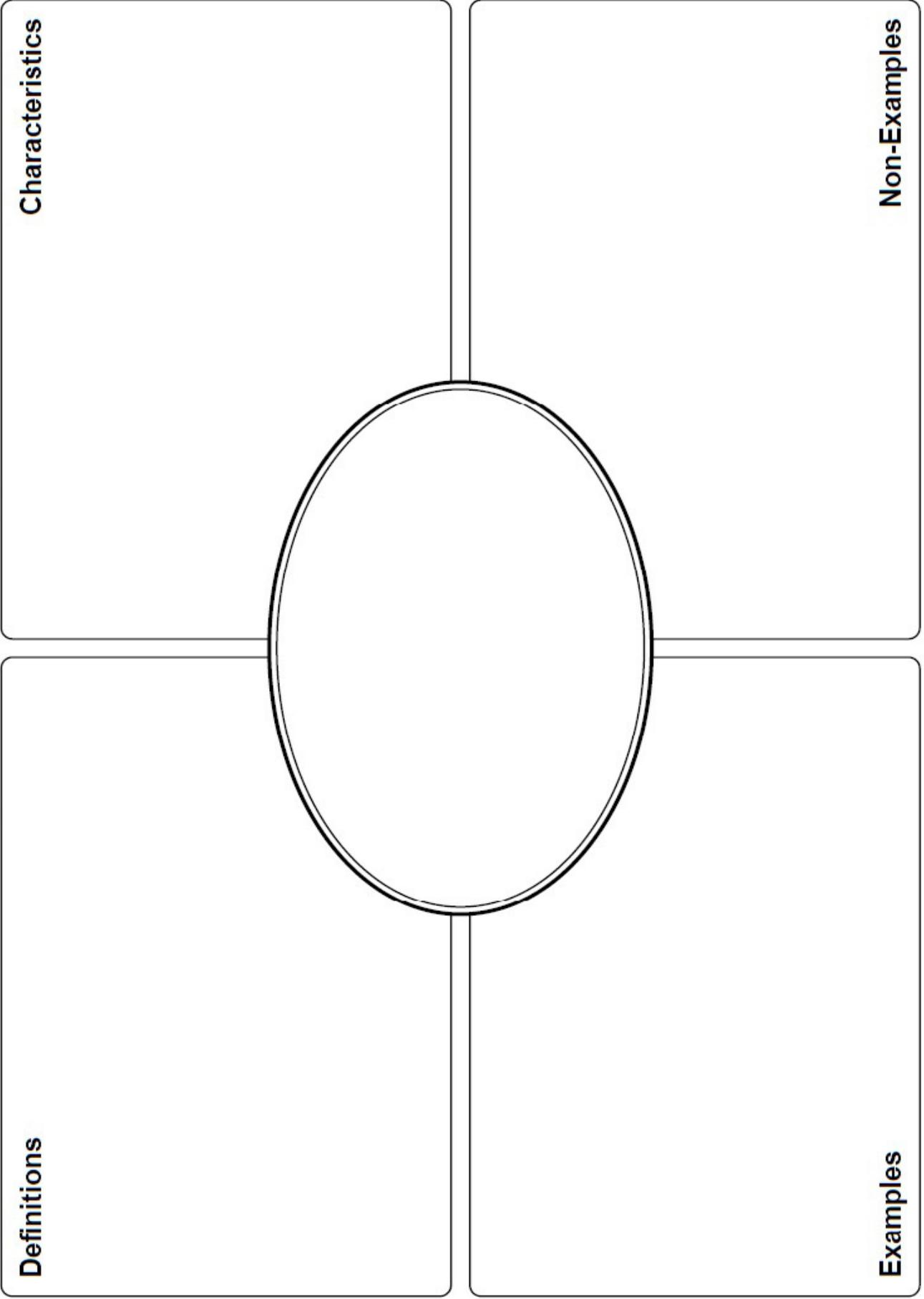
AG EARTH SCIENCE FACT OF THE WEEK

LEONARDO DA VINCI ONCE SAID, "WE KNOW MORE ABOUT THE MOVEMENT OF CELESTIAL BODIES THAN ABOUT THE SOIL UNDERFOOT." HOWEVER, SCIENTISTS ARE NOW ABLE TO TRACK THE MOVEMENT OF TECTONIC PLATES USING GPS!

GOOD TO KNOW VOCABULARY WORDS

Word	Definition
Plate Tectonics	
Plate	
Divergent Boundary	
Convergent Boundary	
Transform Fault Boundary	
Ocean Ridge	
Rift Valley	
Sea Floor Spreading	
Subduction Zone	
Trench	
Continental Volcanic Arc	
Volcanic Island Arc	
Normal Polarity	
Hot Spot	
Reverse Polarity	

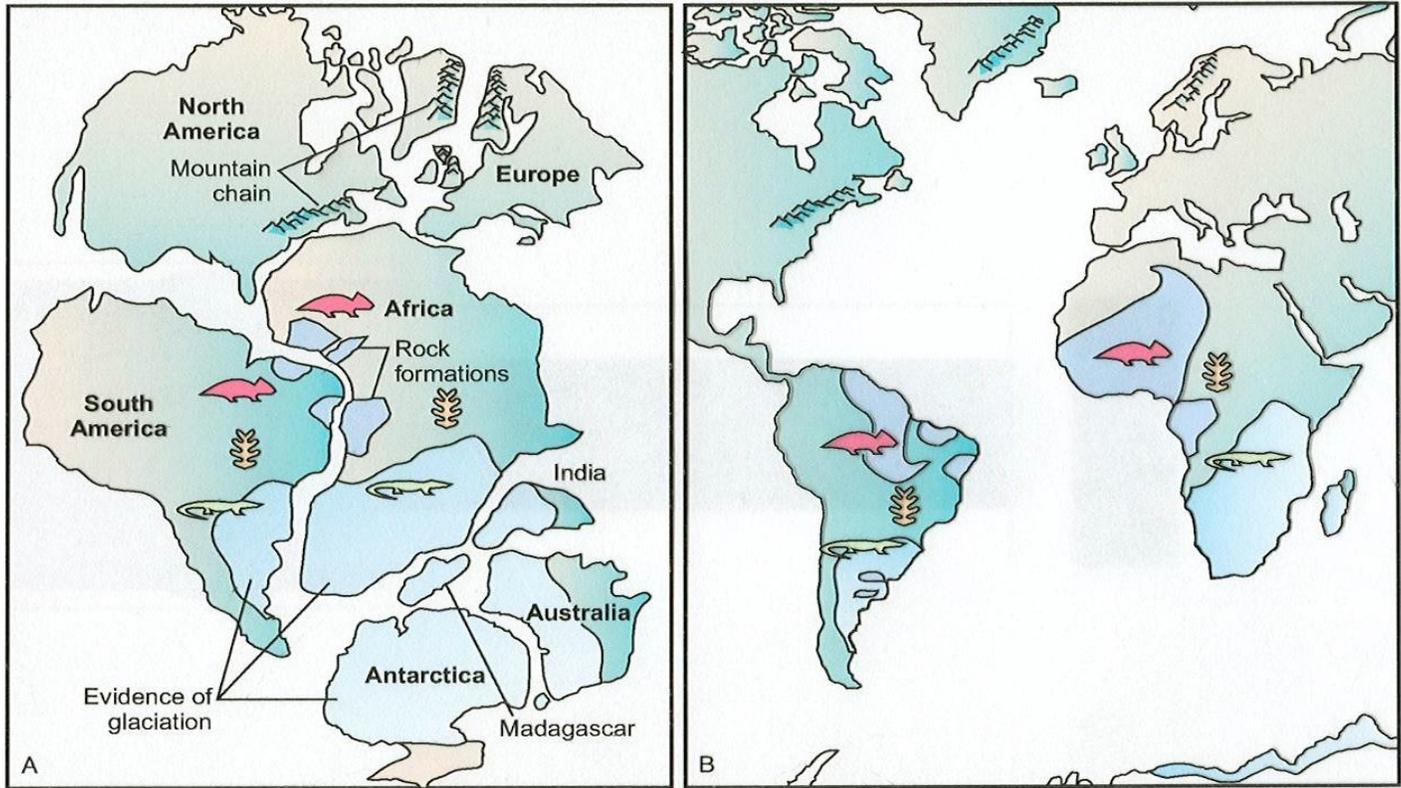
Frayer Model Diagram



Cue Column (titles, vocab, big ideas, test questions)	Continental Drift Notes
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Summary

(briefly describe the main concepts, major points)



🐉 Cynognathus
 🐊 Mesosaurus
 🌿 Glossopteris
 Matching rock types
 Glacial evidence



SEA FLOOR SPREAD- LAB



Purpose: The purpose of this lab is to have you utilize the age and position of rocks formations associated with the Mid Atlantic Ridge to support the hypothesis of sea floor spreading. The sea floor spreading hypothesis presents the idea that new crust is continually being formed at the center of mid-ocean ridge, which is causing the sea floor to spread apart. This is believed to be what causes the Earth's tectonic plates to move.

Materials:

- Metric ruler
- 6 different color pencils

Procedure:

1. Using the map in figure 12-1, color in the various rock formations associated with both the Mid Atlantic Ridge and East pacific ridge systems. Create a color key that shows the color associated with each specific rock age.
2. Calculate the average spreading rate associated with each ridge. To calculate the average spreading rate for the Mid Atlantic Ridge, use the following Procedure.

Show all work for full credit!

Measure the distance in centimeters from the Mid Atlantic Ridge to the interface between rock sequence 4 and 5 in three different places on your map. Record you answers below:

Measurement 1: _____cm

Measurement 2: _____cm

Measurement 3: _____cm

Determine the average distance of the three measurements to the nearest tenth a centimeter. Show your work and record answer below:

Average distance for 4 & 5 ridge: _____cm

Convert your average measurement into centimeters to kilometers by using the map scale of 1 centimeter= 500 kilometers. **This is done by multiplying the average distance in centimeters by 500 kilometers.** Record your answer to the nearest tenth of a kilometer.

Average distance: _____km

Knowing that the age of the interface between rock sequence 4 and 5 are approximately 118 million years old, calculate how far the rocks have moved in kilometers per year. This is done by dividing your average distance in kilometers by 118 million years. Record your answer below:

Distance rock moved per year: _____km

Now, determine the distance the rock moved in centimeters. This can be done by multiplying the rock moved in kilometers per year by 100,000. Record your answer below:

Distance rock moved per year: _____cm

Determine the rate of sea floor spread associated with the Mid Atlantic Ridge by multiplying the distance the rock moved in centimeters per year by 2. This determines the rate of sea floor spread because new rock is created on both sides of the ridge and is pushed outward. Record answer below:

Rate of sea floor spread for the Mid Atlantic Ridge per year: _____cm

Finally convert the above spreading rate into inches per year by dividing it by 2.5. (2.5cm= 1 inch) Record your answer below:

Rate of sea floor spread for the Mid Atlantic ridge per year: _____ in

To calculate the average spreading rate for the East Pacific ridge, use the following Procedure. **Show all work for full credit!**

Measure the distance in centimeters from the East Pacific ridge to the interface between rock sequence 3 and 4 in three different places on your map. Record your answers below:

Measurement 1: _____cm

Measurement 2: _____cm

Measurement 3: _____cm

Determine the average distance of the three measurements to the nearest tenth a centimeter. Show your work and record answer below:

Average distance for 3 & 4 ridge: _____cm

Convert your average measurement into centimeters to kilometers by using the map scale of 1 centimeter= 500 kilometers. This is done by multiplying the average distance in centimeters by 500 kilometers. Record your answer to the nearest tenth of a kilometer.

Average distance: _____km

Knowing that the age of the interface between rock sequence 3 and 4 are approximately 56 million years old, calculate how far the rocks have moved in kilometers per year. This is done by dividing your average distance in kilometers by 56 million years. Record you answer below:

Distance rocked moved per year: _____km

Now, determine the distance the rock moved in centimeters. This can be done my multiplying the rock moved in kilometers per year by 100,000. Record your answer below:

Distance rocked mover per year: _____cm

Determine the rate of sea floor spread associated with the East Pacific ridge by multiplying the distance the moved in centimeters per year by 2. This determines the rate of sea floor spread because new rock is created on both sides of the ridge and is pushed outward. Record answer below:

Rate of sea floor spread for the East Pacific ridge per year: _____cm

Finally convert the above spreading rate into inches per year by dividing it by 2.5. (2.5cm= 1 inch) Record your answer below:

Rate of sea floor spread for the East Pacific ridge per year: _____ in

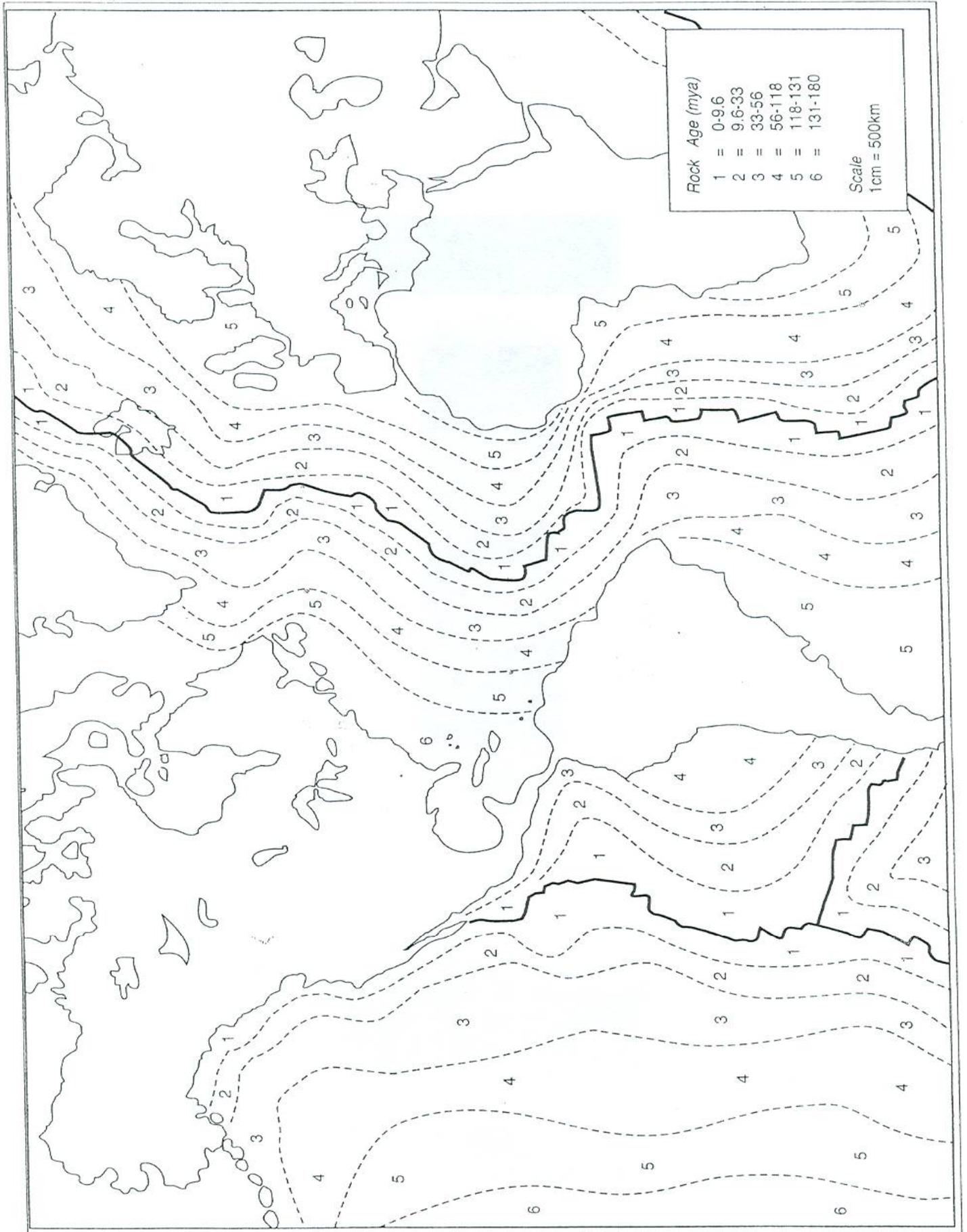
Sea Floor Spreading Lab Analysis Questions:

Describe how the mapping of rocks ages on the ocean floor helps to support the theory of continental drift and sea floor spreading.

Briefly explain how the rate of sea floor spreading can be determined in both the Atlantic and Pacific Oceans.

Are the average rate of sea floor spreading the same in both Atlantic and Pacific Oceans, and if not, how do they compare?

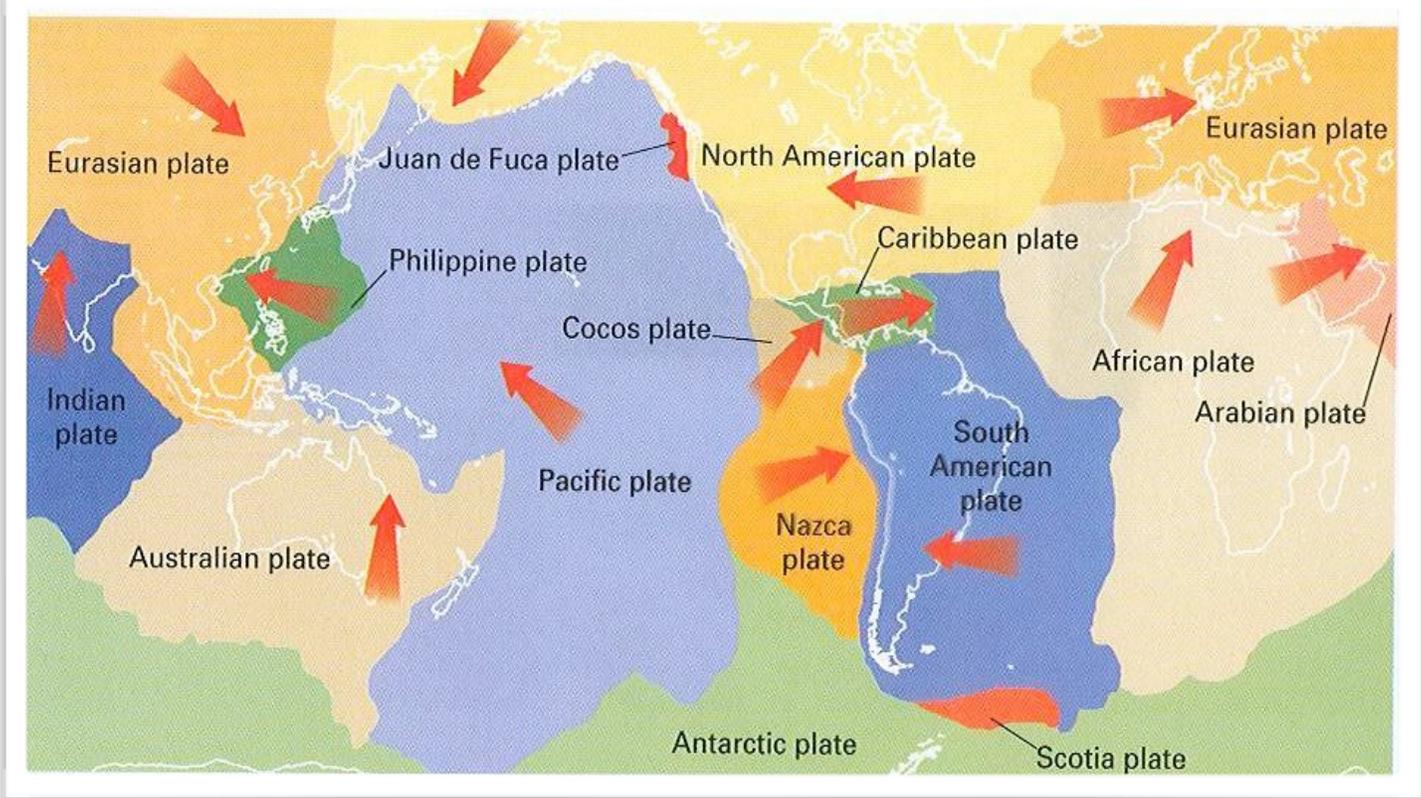
Explain how the discovery of sea floor spreading has helped the theory of continental drift.



Cue Column (titles, vocab, big ideas, test questions)	Plate Tectonic Notes
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Summary

(briefly describe the main concepts, major points)



Chapter 9 Plate Tectonics

Section 9.1 Continental Drift

This section explains the hypothesis of continental drift and the evidence supporting it.

Reading Strategy

Summarizing Fill in the table as you read to summarize the evidence of continental drift. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.

Hypothesis	Evidence
Continental Drift	a. continental puzzle
	b.
	c.
	d.

The Continental Puzzle

1. Wegener called Earth’s ancient supercontinent _____.

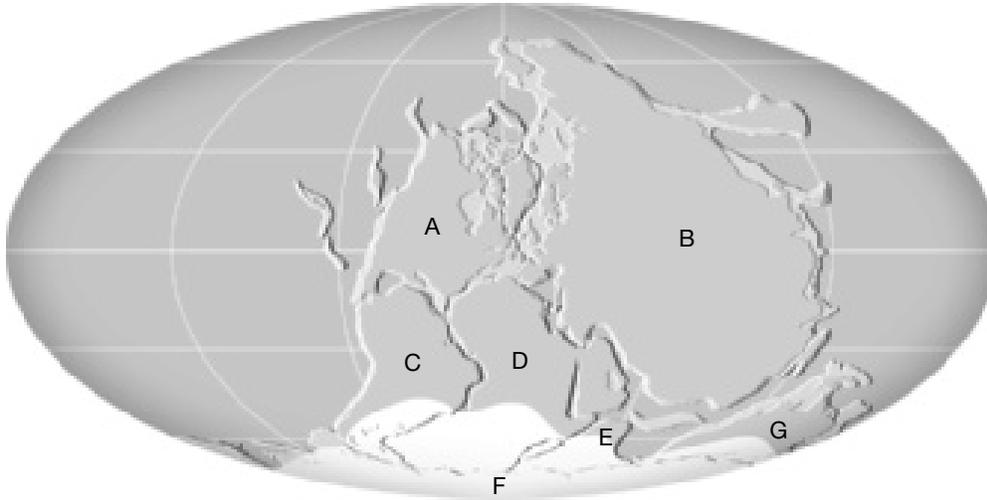
Evidence for Continental Drift

Match each example of continental drift with the type of evidence it is.

Example	Evidence for Continental Drift
_____ 2.  Similar mountain chains run through eastern North America and the British Isles.	a. rock types and structures
_____ 3. Land areas that show evidence of ancient glaciation are now located near the equator.	b. matching fossils
_____ 4. The Atlantic coastlines of South America and Africa fit together.	c. continental puzzle
_____ 5.  Remains of <i>Mesosaurus</i> are limited to eastern South America and southern Africa.	d. ancient climates
6.  _____ evidence for continental drift includes several fossil organisms found on different landmasses.	
7. Is the following sentence true or false? If the continents existed as Pangaea, the rocks found in a particular region on one continent should closely match in age and type those in adjacent positions on the adjoining continent. _____	

Chapter 9 Plate Tectonics

8. 🗎 The figure shows Earth’s ancient supercontinent as it appeared about 300 million years ago, according to Alfred Wegener. Write the letter that represents each of the following present-day continents.



- | | |
|-----------------------|---------------------|
| _____ Antarctica | _____ North America |
| _____ Europe and Asia | _____ Africa |
| _____ South America | _____ Australia |
| _____ India | |

Rejection of Wegener’s Hypothesis

9. Circle the letter of an example of one objection that critics had about Wegener’s continental drift hypothesis.
- Wegener could not provide any evidence to support continental drift.
 - Wegener could not propose a mechanism capable of moving the continents.
 - Wegener’s idea of the mechanism capable of moving the continents was physically impossible.
 - Wegener’s fossil evidence was not accurate.
10. Is the following sentence true or false? Most scientists in Wegener’s time supported his continental drift hypothesis.

11. Is the following sentence true or false? Wegener proposed that during continental drift, larger continents broke through the oceanic crust. _____
12. By 1968, data collected about the ocean floor, earthquake activity, and the magnetic field led to a new theory called _____.
13. The new theory that replaced Wegener’s hypothesis explained most geologic processes, including the formation of _____.

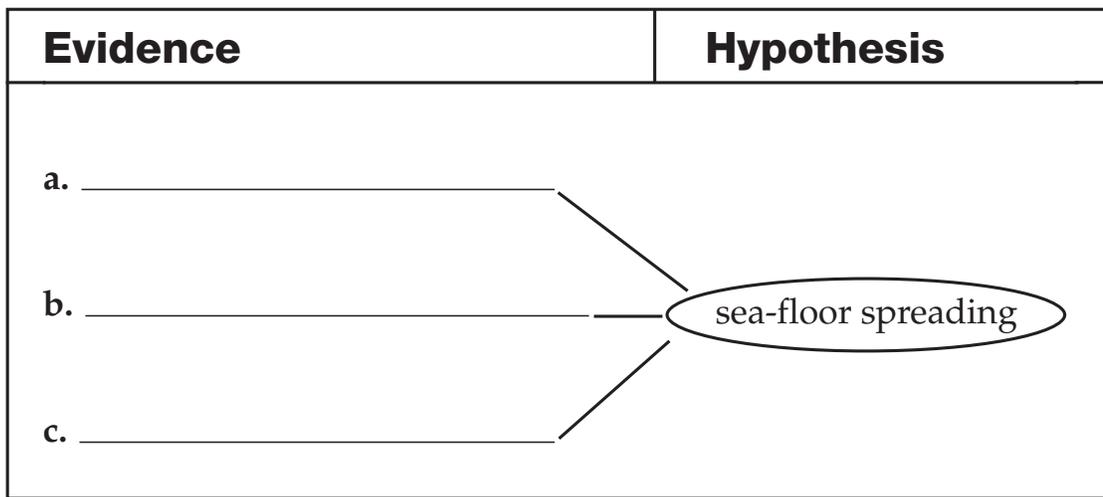
Chapter 9 Plate Tectonics

Section 9.2 Sea-Floor Spreading

This section discusses sea-floor spreading and subduction zones, and evidence for sea-floor spreading.

Reading Strategy

Identifying Supporting Evidence Copy the graphic organizer. After you read, complete it to show the types of evidence that supported the hypothesis of sea-floor spreading. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.



Exploring the Ocean Floor

Match each definition with its term.

_____	Definition	Term
_____	1. system that uses sound waves to calculate the distance to an object	a. sonar
_____	2. deep faulted structure found along a divergent boundary	b. rift valley
_____	3. elevated seafloor along a divergent boundary	c. oceanic ridge

The Process of Sea-Floor Spreading

4. Circle the letter of the description of a subduction zone.
 - a. where an oceanic plate is forced beneath a second plate
 - b. where an oceanic plate grinds past a second plate
 - c. where a continental plate grinds past a second plate
 - d. where an oceanic plate moves away from a second plate

Chapter 9 Plate Tectonics

Evidence for Sea-Floor Spreading

5. _____ has occurred when rocks formed millions of years ago show the location of the magnetic poles at the time of their formation.
6. Is the following sentence true or false? When magnetic mineral grains in a rock form, they become magnetized in the direction parallel to Earth’s existing magnetic field. _____
7. Circle the letter of the statement representing some of the strongest evidence of sea-floor spreading.
 - a. Similar fossils are found in North America and Europe.
 - b. Earth’s magnetic field periodically reverses polarity.
 - c. Strips of alternating polarity lie as mirror images across the ocean ridges.
 - d. Evidence of glaciation occurs on land in tropical and subtropical regions.
8. Circle the letter of the definition of reverse polarity.
 - a. the loss of magnetism by iron-rich mineral grains when heated
 - b. the gain of magnetism by iron-rich mineral grains when cooled
 - c. what rocks that show the same magnetism as the present magnetic field have
 - d. what rocks that show the opposite magnetism as the present magnetic field have
9. Is the following sentence true or false? Deep-focus earthquakes occur away from ocean trenches within the slab of lithosphere descending into the mantle. _____
10. Where do shallow-focus earthquakes occur relative to ocean trenches? _____

11. Circle the letter of the location of the oldest oceanic crust, according to ocean drilling data.
 - a. near the edges of continents
 - b. at the ridge crest
 - c. between the continental margins and ridge crest
 - d. deep in the asthenosphere
12. Circle the letter of the location of the youngest oceanic crust, according to ocean drilling data.
 - a. at the continental margins
 - b. at the ridge crest
 - c. between the continental margins and ridge crest
 - d. deep in the asthenosphere

Chapter 9 Plate Tectonics

Section 9.3 Theory of Plate Tectonics

This section discusses plate tectonics, including lithospheric plates and types of plate boundaries.

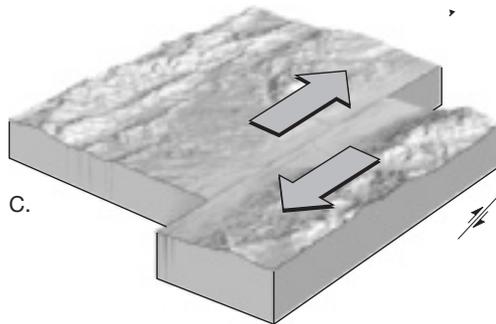
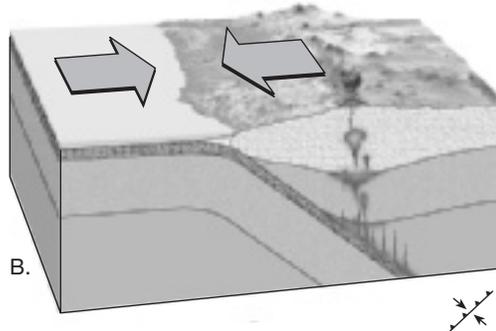
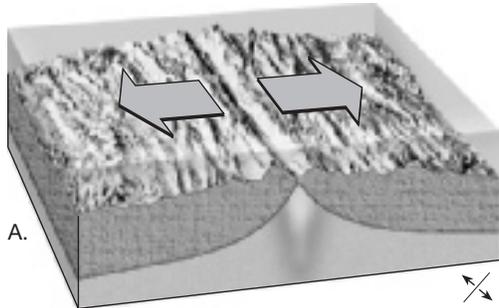
Reading Strategy

Comparing and Contrasting After you read, compare the three types of plate boundaries by completing the table. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.

Boundary Type	Relative Plate Motion
convergent	a.
divergent	b.
transform fault	c.

Earth's Moving Plates

1. Is the following sentence true or false? The lithospheric plates move at about 5 km per year. _____
2.  Identify each type of plate boundary shown in the figure.



- A. _____
 B. _____
 C. _____

3. Circle the letter of the type of plate boundary that occurs when two plates move together.
 - a. divergent
 - b. spreading center
 - c. convergent
 - d. transform fault

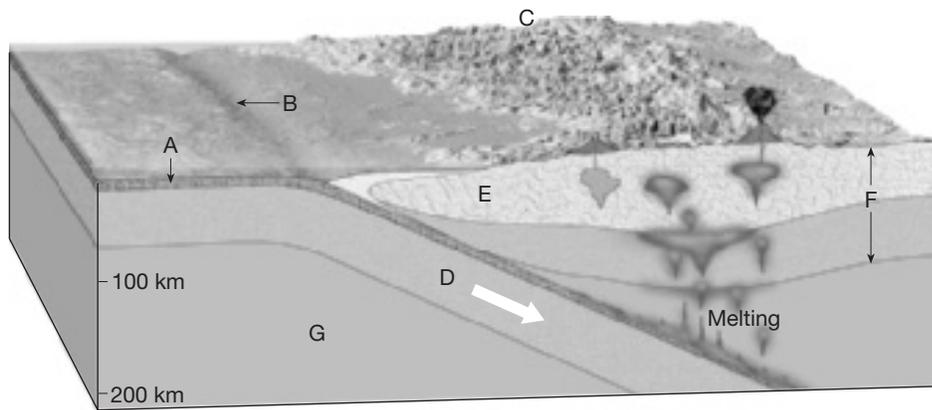
Chapter 9 Plate Tectonics

Divergent Boundaries

4. Is the following sentence true or false? Oceanic lithosphere is created at divergent boundaries. _____
5. Is the following sentence true or false? Divergent boundaries only occur on the ocean floor. _____

Convergent Boundaries

6. Select the appropriate letter in the figure that identifies each of the following features.



- _____ Subducting oceanic lithosphere
- _____ Oceanic crust
- _____ Trench
- _____ Continental volcanic arc
- _____ Continental lithosphere
- _____ Continental crust
- _____ Asthenosphere

7. Newly formed land consisting of an arc-shaped island chain is called a(n) _____.
8. Is the following sentence true or false? Mountains form as a result of a collision between two continental plates.

Transform Fault Boundaries

9. 🔄 What happens at a transform fault boundary? _____

10. Circle the letter of the example of a transform fault boundary that is NOT located in an ocean basin.

- | | |
|----------------------------|------------------------|
| a. the San Andreas Fault | b. the Aleutian Trench |
| c. the Himalayan mountains | d. the Nazca plate |

Cue Column (titles, vocab, big ideas, test questions)	CA Agriculture Notes
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Summary

(briefly describe the main concepts, major points)



PLATE TECTONICS- STUDY GUIDE

Directions: Take notes on **ALL** of the following topics on a **separate** sheet of paper. **Answer the questions in complete sentences or phrases.** Attach pages to packet when done.

- 1.The explanation of how coastal mountain ranges were formed, is best described by what theory?
- 2.What did Alfred Wegner hypothesize?
- 3.The theory of continental drift states that present day continents were once what?
- 4.Fossil records provide clues to earlier positions of what plates?
- 5.What fossil remains were found in both eastern South America and western Africa?
- 6.Rocks along the ocean floor near the mid-Atlantic ridge alternate what?
- 7.Where is the earth's oldest rocks found?
- 8.Where is the earth's youngest rock found?
- 9.Describe the theory of Plate Tectonics.
10. According to plate tectonics, the _____ is riding on _____. Kind of like wood floating on water.
11. What are the three types of plate boundaries?
12. Describe what is happening at divergent boundaries.
13. Describe what is happening at transform boundaries.
14. Describe what is happening at convergent boundaries.
15. Many scientists believe that lithosphere plate movement is caused by what?
16. What was the first bit of evidence that caused scientists to believe in the theory of continental drift?
17. As rock moves away from the Mid-Atlantic Ridge, what is it being replaced by?
18. Seafloor spreading occurs at what type of boundary?
19. What are some things that may occur at convergent boundary lines?
20. The transfer of heat through the movement of heated fluid material in the earth's crust is called?
21. Pieces of land bounded by faults that have different geologic features from those of neighboring land are most likely to be what type of terrain?
22. The theory of microplate tectonics provides an explanation of what?
- 23.What happens when plates with oceanic crust collide with a plate with continental crust?
- 24.Study analysis questions from the lab we completed this chapter: (*Seafloor Spread*)