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Name _____

Date _____

TECTONIC PLATES

Part I. Answer these questions after watching the [Tectonic Plate Demonstration Video](#)

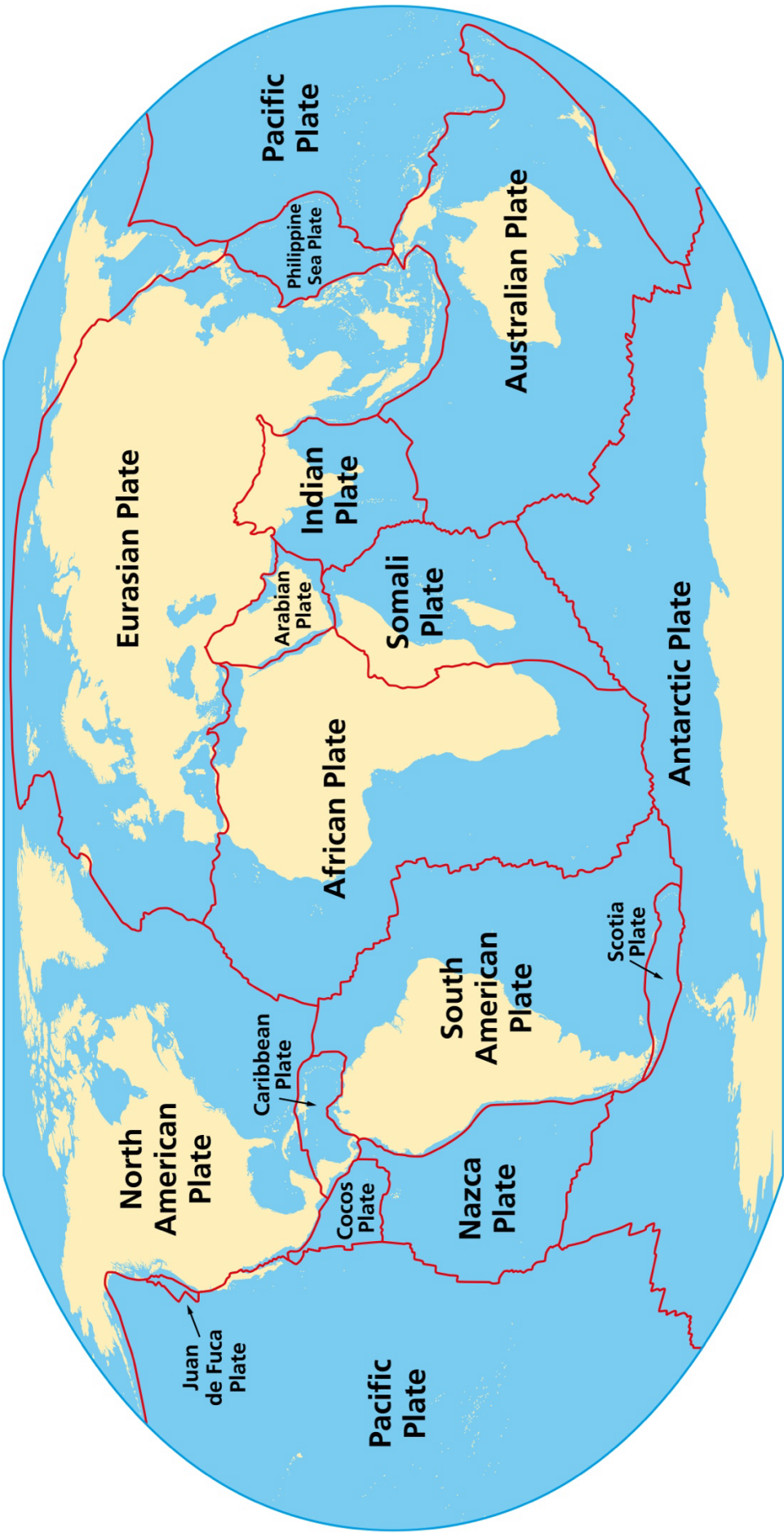
1. What is the difference between the continental rock and oceanic rock that makes up the tectonic plates?
2. When plates move, how can they change the Earth?
3. How fast do tectonic plates move?

Part II. To complete part II cut out the tectonic plates on the following page. Move your plates to demonstrate how tectonic plates interact along their boundaries.

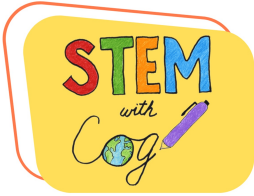
Divergent plate boundaries happen when two plates are moving apart. The Mid-Atlantic Ridge, which splits most of the Atlantic Ocean from the Arctic down towards the Antarctic is forming an underwater chain of mountains. *Slowly* move the African and Eurasians plates away from the North American and South American plates to show how they pull apart.

Convergent plate boundaries happen when two plates push against each other, which could result in volcanic or earthquake activity. If the boundary of one plate is made of oceanic rock and the boundary of the other plate is continental, one plate might "subduct" or bend and slide under the other plate. Which plate will slide under? (You can reason this out with the answer to question 1 and your knowledge of ocean floors.) This is currently happening in places where the Pacific Ocean Plate meets the North American plate. Slowly move your tectonic plates to demonstrate this in the Pacific Northwest where oceanic and continental rock meet.

Transform plate boundaries occur when two plates slide horizontally along each other. This is happening at the San Andreas Fault system between San Francisco and San Diego, California. If you have cut your pieces carefully, you can see why it might be more likely for them to move horizontally than for one plate to subduct under another. Why? Slowly move your tectonic plates to show how the plates slide.



For a challenge, use an orange and soft cheese to make a model of an Earth-like planet with tectonic plates. Peel the orange to make tectonic plates. Use blue acrylic paint to indicate where the oceanic rock is on your plates. Move your plates around to create divergent boundaries, convergent boundaries, and transform boundaries.



TECTONIC PLATES

Part I. Answer these questions after watching the [Tectonic Plate Demonstration Video](#)

1. What is the difference between the continental rock and oceanic rock that makes up the tectonic plates?

Oceanic rock is denser and thinner than continental rock

1. When plates move, how can they change the Earth?

They can rearrange to make continents, create mountains, trenches, and volcanoes.

2. How fast do tectonic plates move?

Plates move less than an inch a year.

Part II. To complete part II cut out the tectonic plates on the following page. Move your plates to demonstrate how tectonic plates interact along their boundaries.

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Convergent plate boundaries happen when two plates push against each other, which could result in volcanic or earthquake activity. If the boundary of one plate is made of oceanic rock and the boundary of the other plate is continental, one plate might “subduct” or bend and slide under the other plate. Which plate will slide under? (You can reason this out with the answer to question 1 and your knowledge of ocean floors.) This is currently happening in places where the Pacific Ocean Plate meets the North American plate. Slowly move your tectonic plates to demonstrate this in the Pacific Northwest where oceanic and continental rock meet. **Oceanic plates are deeper and denser, so they are more likely to subduct under the continental rock.**

Transform plate boundaries occur when two plates slide horizontally along each other. This is happening at the San Andreas Fault system between San Francisco and San Diego, California. If you have cut your pieces carefully, you can see why it might be more likely for them to move horizontally than for one plate to subduct under another. Why? Slowly move your tectonic plates to show how the plates slide.

At the boundary, both plates are continental rock, so one is less likely to subduct under the other.

TEACHER RESOURCES

NGSS Standard

Grade 4:

4-ESS2-2. Analyze and interpret data from maps to describe patterns of Earth's features.

Middle School:

MS-ESS2-2. Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.

MS-ESS2-3. Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.

DIRECTIONS:

Make a hard copy of the Tectonic Plate Map for each student in advance.

Show students the [Simple Model of Tectonic Plate](#) video.

AFTER THE VIDEO:

Step 1: Show students the Tectonic Plate Map and point out the red lines that are the boundaries of the tectonic plates on Earth. Show them how to draw along the lines with a marker to make sure they understand which lines to cut. Ask them to cut out the tectonic plates and arrange them as they are on Earth (as they were before cutting).

Step 2: If students can independently read and follow written directions, let them complete the activity and demonstrate divergent boundaries, convergent boundaries, and transform boundaries on their own.

If students will need help, do this activity as a whole group. Once they have their plates together to resemble our Earth, read the description of the divergent plates to them. Point out the mid-Atlantic Ridge that runs from almost the North Pole to just above Antarctica through the Atlantic Ocean. Ask them to demonstrate divergent boundary movement. Ask what is being built as these plates move apart. (A chain of mountains.)

Read the description of convergent plate boundaries. Point out the boundary between the Pacific Plate and the North American Plate in the Pacific Northwest (Washington and Canadian coast). Ask them where the Pacific Plate might subduct (where oceanic rock meets continental rock). Ask them to demonstrate convergent plate boundary movement where the oceanic rock is subducting under the continental rock.

Read the description of transform boundaries. Ask them where they see continental rock pushing against continental rock along the California coast. (the San Andreas Fault between San Francisco and San Diego). Ask them to demonstrate transform boundary movement at this place by sliding the plates horizontally, moving the Pacific Plate north, North American Plate south.