

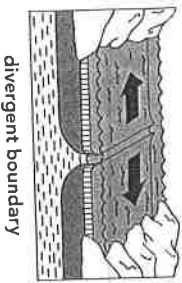
## Weekly Question

# Day 1

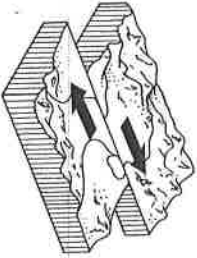
### What happens when two continents collide?

The most dramatic transformations of our planet's surface happen at the boundaries of the tectonic plates. As the plates move and interact, they constantly change shape. Crust is created, destroyed, or simply reformed, depending on the type of boundary between them. There are three types of boundaries: divergent, transform, and convergent.

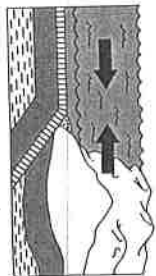
A divergent boundary occurs where two plates move away from each other. Here, new crust is created as lava seeps out of mid-ocean ridges. A transform boundary occurs where two plates slide past one another in opposite directions. Crust is neither created nor destroyed at a transform boundary. A convergent boundary occurs where two plates **converge** and one sinks under the other. Crust is destroyed along these boundaries as the sinking plate descends into the mantle. When two converging plates are carrying continents, a collision is only a matter of time.



divergent boundary



transform boundary



convergent boundary

Write **divergent**, **transform**, or **convergent** to name the type of boundary that fits each description.

1. One plate sinks under the other along this boundary.
2. New crust is created along this boundary.
3. One plate slides past another along this boundary.
4. Two plates spread apart along this boundary.
5. Continental collisions occur along this boundary.

## Big Idea 4

WEEK 3

### Vocabulary

**converge**  
kon-VERJ  
to come together,  
to move toward  
one another

## Weekly Question

# Day 2

### What happens when two continents collide?

When two plates converge, what happens next depends upon the composition of the plates. Remember that tectonic plates are made up of the lithosphere, which contains the crust. There are two types of crust: **continental** and **oceanic**. Continental crust is made of thick granite, a lightweight volcanic rock. In contrast, oceanic crust consists of thinner but heavier volcanic basalt. A plate may contain continental crust, oceanic crust, or both.

When the oceanic crust of one plate meets the continental crust of another, the oceanic plate sinks beneath the continental plate. This is because basalt is denser than granite. The process, called **subduction**, also occurs when two oceanic plates meet. In this case, however, the older plate is subducted below the younger plate because the older plate is colder, and therefore denser. When two continental plates converge, neither plate can be forced below the other because both are too **buoyant**. Instead, they collide.

### Vocabulary

**buoyant**  
BOY-ent  
able to float or rise

**subduction**  
sub-DUK-shun  
a geological process  
in which one plate  
is forced below  
another

A. Answer the questions.

1. When two oceanic plates meet, which plate gets subducted and why?  
\_\_\_\_\_
  2. Why does oceanic crust get subducted below continental crust, rather than the other way around?  
\_\_\_\_\_
  3. When two plates with continental crust converge, why are neither of them subducted?  
\_\_\_\_\_
- B. Which would take up more space, a pound of granite or a pound of basalt? Explain your answer.  
\_\_\_\_\_

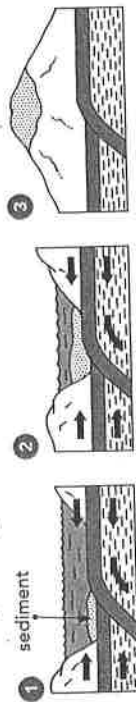
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## Weekly Question

Day 3  
What happens when two continents collide?

Before two continents collide, the ocean between them slowly disappears. The seafloor gets subducted into a trench that runs along the boundary between the two plates. As the seafloor is subducted, the two plates scrape against each other. This causes seafloor **sediment** to collect in the trench. When the oceanic crust is completely subducted, the trench collapses, and the marine sediment is forced up onto the approaching continents.

As the continents collide, the crusts of the two plates begin to buckle and **fracture**. Much of the continental crust is thrust upward, rising into peaks that, over millions of years, form mountain ranges extending the length of the border between the continents.



A. The events below describe how continental plates converge. Number the events in the correct order.

- \_\_\_ The seafloor slowly sinks into a trench between continents.
- \_\_\_ Sediment from the seafloor gets pushed onto the continents.
- \_\_\_ The continents collide.
- \_\_\_ The ocean floor is completely destroyed and the trench collapses.
- \_\_\_ Sediment accumulates in the trench.
- \_\_\_ Mountains form.

B. The fossils of marine animals and plants are often found at the tops of mountains. Explain how you think this is possible.

\_\_\_\_\_

\_\_\_\_\_

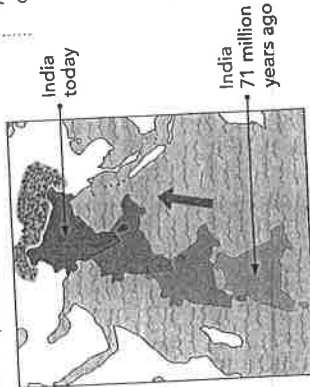
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## Weekly Question

Day 4  
What happens when two continents collide?

The Himalayas (him-uh-LAY-uhz) are a huge mountain range that stretches between Asia and India and provides a dramatic example of colliding continents. About 70 million years ago, the Indo-Australian Plate crashed into the Eurasian Plate. For the next 20 million years, the Tethys (TEE-thiss) Sea, which lay between Asia and the **subcontinent** of India, shrank as the two landmasses moved closer together. During this time, the oceanic crust of the Indo-Australian Plate was subducted under the continental crust of the Eurasian Plate. The Tethys Sea completely disappeared approximately 50 million years ago as the two continents collided.

The Himalayas have been rising steadily ever since. Although they are among the world's youngest mountains, they are also the tallest. Mount Everest, the highest peak of the Himalayas, rises 8,850 meters (29,035 feet) above sea level. And it is still growing!



A. Write true or false.

1. Today, the continents of Europe and Asia and the subcontinent of India form a single landmass. \_\_\_\_\_
2. The Tethys Sea disappeared 70 million years ago. \_\_\_\_\_
3. The Eurasian Plate was subducted under the Indo-Australian Plate. \_\_\_\_\_
4. India is a subcontinent of Asia. \_\_\_\_\_

B. Is the boundary between the Indo-Australian and Eurasian Plates a convergent, divergent, or transform boundary? Explain how you know.

\_\_\_\_\_

\_\_\_\_\_

## Weekly Question

### Day 5

# What happens when two continents collide?

A. Use the words in the box to complete the paragraph.

converge    subcontinent    fracture  
buoyant    subduction    sediment

When two tectonic plates \_\_\_\_\_, one plate sinks beneath another. This process is called \_\_\_\_\_. But because continental plates are \_\_\_\_\_, they cannot be subducted. When two continental plates meet, marine \_\_\_\_\_ is pushed up onto the approaching continents. As the continents collide, their crusts buckle and \_\_\_\_\_. The Himalayas were created in this manner when the \_\_\_\_\_ of India smashed into Eurasia.

B. Identify the type of boundary—**divergent, convergent, or transform**—indicated by each feature.

- colliding continents \_\_\_\_\_
- the Mid-Atlantic Ridge \_\_\_\_\_
- no crust created or destroyed \_\_\_\_\_
- plates moving toward each other \_\_\_\_\_
- crust being destroyed \_\_\_\_\_
- plates sliding past one another \_\_\_\_\_
- crust being created \_\_\_\_\_
- plates moving away from each other \_\_\_\_\_
- subduction of one plate beneath another \_\_\_\_\_



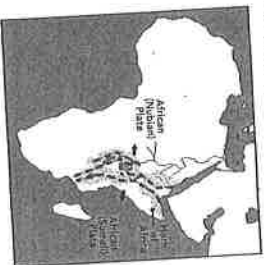
## Weekly Question

### Day 1

# What will Earth's surface look like in the future?

Over billions of years, Earth's surface has changed a great deal, and it will keep on changing as the continents continue to shift. Not only will continents collide, but they will also be torn apart. In fact, this is happening to Africa right now. Africa lies on the African Plate, which is in the process of splitting into two separate plates, the Nubian Plate and the Somali Plate. Today, the East African Rift Valley marks the boundary between these two **diverging** plates.

The East African Rift Valley runs 6,000 kilometers (3,700 miles) through twelve countries in eastern Africa. Like undersea rifts, the Rift Valley is volcanically active. It was formed as magma welled up under the lithosphere and pushed on the continent above, causing the crust to stretch and crack. As the continent splits apart, a new ocean will form between the two landmasses. The Horn of Africa will become an island. And what was once the Rift Valley will become a mid-ocean ridge.



A. Name the two plates that will form from the African Plate.

- \_\_\_\_\_
- \_\_\_\_\_

B. Answer the questions.

- Are the plates along the East African Rift Valley diverging, converging, or both? \_\_\_\_\_
- How is the East African Rift Valley similar to an undersea rift? What happens in both places? \_\_\_\_\_
- After Africa is torn apart, what will form between the two landmasses? \_\_\_\_\_



**Vocabulary**  
diverging  
dye-VER-jing  
moving away from  
each other

Name \_\_\_\_\_

## Weekly Question

## Day 2

### What will Earth's surface look like in the future?

In the United States, the region where tectonic activity is most noticeable is the state of California. California straddles the Pacific and North American Plates, which meet at a transform boundary. This type of boundary is marked by a transform **fault**, a crack in Earth's crust where two plates slide alongside each other in opposite directions. Movement of the plates along the fault is not continuous. Instead, **tension** builds between the plates over a period of time. Then, suddenly, the tension gets released in the form of an earthquake as the plates jerk past each other.

The San Andreas Fault separates the Pacific and North American Plates. The Pacific Plate is moving northwest along the North American Plate at a rate of about 5 centimeters (2 inches) per year. This means that in 10 million years, Los Angeles, which sits on the Pacific Plate, will be next to San Francisco, which sits on the North American Plate. Eventually, as the Pacific Plate moves north, it will merge with Alaska.



## Vocabulary

**fault**

a fracture in Earth's crust where rock is moving in different directions

**tension**

TEN-shun  
the state of being stretched between two opposing forces

Name \_\_\_\_\_

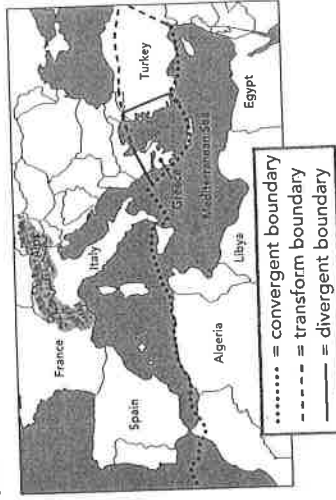
## Day 3

### Weekly Question

#### What will Earth's surface look like in the future?

Sometimes, the boundaries between plates are not clear. An area may contain fragments of plates, or **microplates**. One such area is the Mediterranean-Alpine region, which straddles the African and Eurasian Plates. When these plates began to converge 100 million years ago, the edges of both plates fractured completely, creating a complex system of convergent, divergent, and transform boundaries.

As Africa and Europe collided, the western part of the Tethys Sea disappeared. Continued **compression** of the African and Eurasian Plates caused the crust to create not only the peaks of the Alps, but also the basin of the Mediterranean Sea. Today, the African Plate is still traveling northward. Parts of this plate, including Italy and Greece, have already merged with Europe. As the African and Eurasian Plates continue to converge, the Mediterranean Sea will close. And in its place, the Mediterranean Mountains will form.



## A. Answer the questions.

1. How were the Alps created? Use the word **compression** in your answer.  
\_\_\_\_\_
2. What do you think will happen to Africa and Europe in the future? Will they drift apart or become one big continent? Explain your answer.  
\_\_\_\_\_

B. Explain in your own words why the boundary between the African and Eurasian Plates isn't clear.  
\_\_\_\_\_  
\_\_\_\_\_

Name \_\_\_\_\_

# Day 4

## Weekly Question What will Earth's surface look like in the future?

In 50 million years, Earth's surface will look nothing like it does today. Geologic processes happen so slowly that geologists can actually predict where the continents will be by then. It is projected that, as Africa forces its way north, Europe will rotate clockwise. Australia will move north and collide with Southeast Asia and China. And the coast of California will become the coast of southern Alaska.

Where will the continents be in 250 million years? This is not as easy to predict. Geologists now think that the continents come together to form a supercontinent about every 500 million years. There are two ways this could happen. The Atlantic Ocean may continue to widen, while the Pacific Ocean shrinks. This would cause North America to crash into Asia. The other possibility is that the Atlantic will close as the Pacific widens. In this case, North America would collide with Africa. Fifty million years after that, the supercontinent will begin to break up, and the cycle will start all over again.

### How Earth Might Look in 250 Million Years



No Pacific Ocean



No Atlantic Ocean

Write true or false.

1. Geologists can predict what the positions of the continents will be in 50 million years. \_\_\_\_\_
2. According to geologists, the continents form a single supercontinent about every 250 million years. \_\_\_\_\_
3. One way the continents may form another supercontinent would be for the Atlantic Ocean to close up. \_\_\_\_\_



Name \_\_\_\_\_

# Day 5

## Weekly Question What will Earth's surface look like in the future?

A. Use the words in the box to complete the paragraph.

diverging      tension      fault  
tectonic      compression

The \_\_\_\_\_ activity that occurs between plates involves two types of forces. The stretching that occurs between \_\_\_\_\_ plates and also between plates separated by a transform \_\_\_\_\_ is called \_\_\_\_\_. By comparison, the squeezing that occurs between converging plates is called \_\_\_\_\_.

B. Check the box next to the phrase that completes the analogy.

- Converge is to collide as \_\_\_\_\_.
- transform is to fault       transform is to rift
- diverge is to split       diverge is to fault

C. Compare the East African Rift Valley to the San Andreas Fault. Name one way in which they are alike and two ways in which they are different.

Alike: \_\_\_\_\_

Different: \_\_\_\_\_

