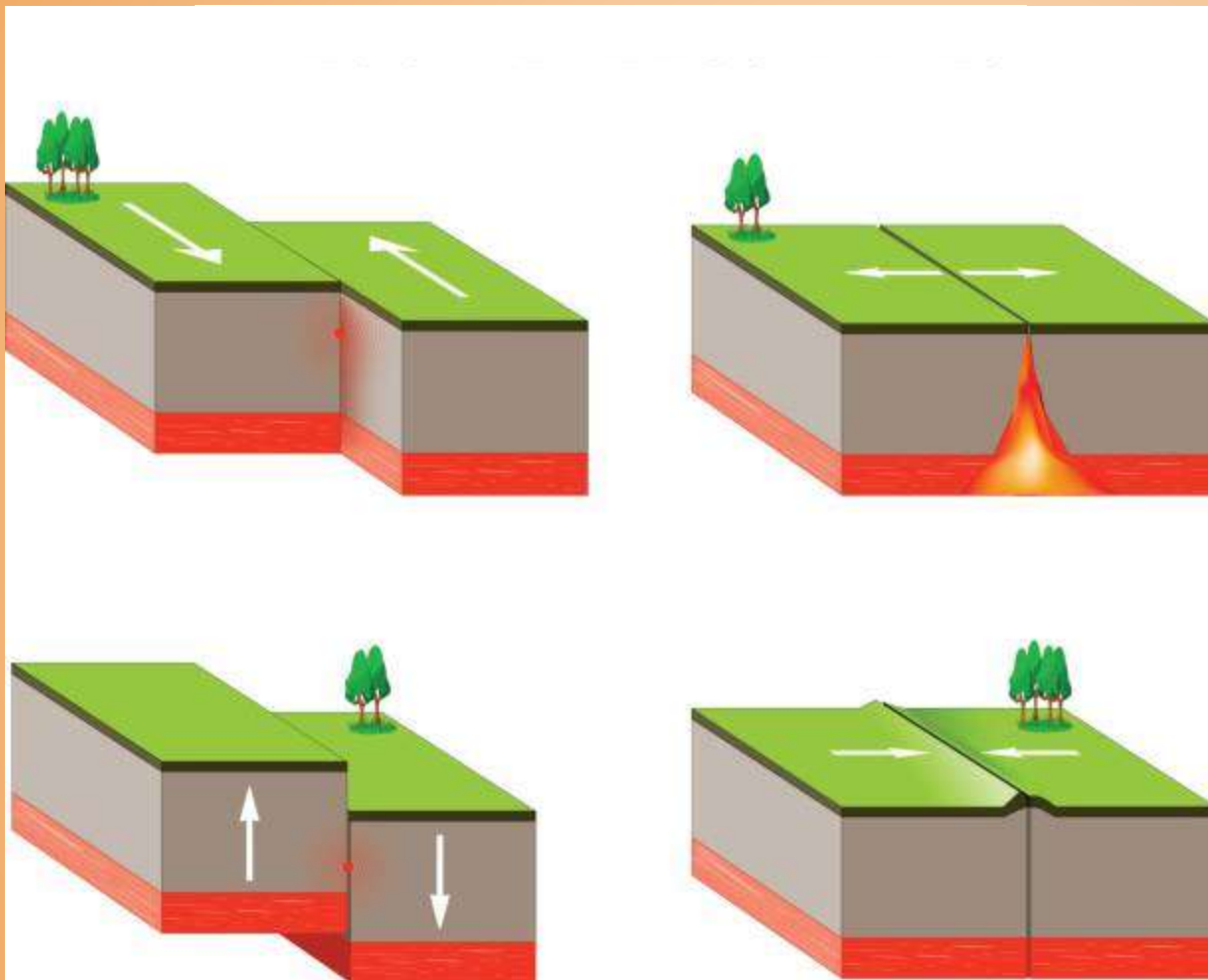


# Lesson 4:

# Earthquakes and

# Tsunamis





Before we start today's lesson, let's review...What is the theory of plate tectonics?



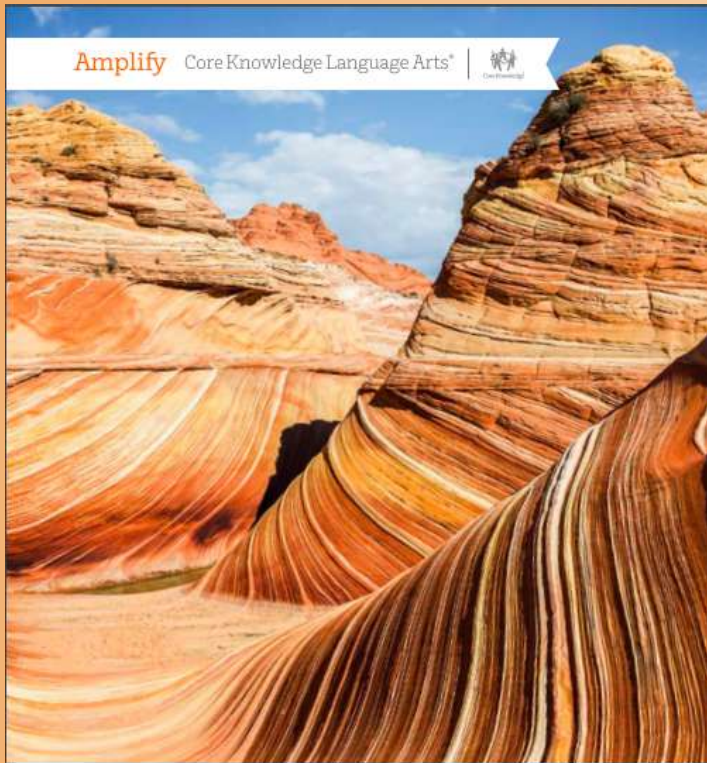
Do you remember what Sam said  
at the end of your homework  
page last night?



Sam's dad described an earthquake that the country of Chile had recently experienced. Sam said, "Hmmm . . . I wonder if earthquakes have anything to do with moving tectonic plates?"

Do you know the answer to Sam's  
question?





# We are going to be reading chapter 3: Earth's Shakes and Quakes

Before we start reading, let's go over  
some vocabulary first! Turn to Activity  
page 4.1 (workbook page 35)

Unit 5

Reader

Grade 4

**Geology: The Changing Earth**



NAME: \_\_\_\_\_

4.1

ACTIVITY PAGE

DATE: \_\_\_\_\_

### Vocabulary for “Earth’s Shakes and Quakes”

1. **eyewitness, n.** a person who has seen something happen and is able to describe it (22)
2. **experiment, n.** a scientific test to try out something in order to learn about it (24)
3. **fault, n.** a crack in Earth’s crust (**faults**) (24)
4. **heave, v.** 1. to move up and down over and over; 2. to lift, pull, push, or throw with a lot of effort (24)
5. **trigger, v.** to cause something to start or happen (**triggered**) (25)
6. **pinpoint, v.** to figure out the exact location of something (27)
7. **magnitude, n.** an earthquake’s strength (28)
8. **aftershock, n.** a smaller, weaker earthquake that often follows a main earthquake event (**aftershocks**) (29)
9. **tsunami, n.** a gigantic wave of seawater caused by an earthquake in oceanic crust (**tsunamis**) (30)
10. **surge, v.** to move forward quickly, suddenly, and with force (**surges**) (30)

Word(s) from the Chapter	Pronunciation	Page
Francesco Petrarch	/frənˈtʃesˈkoe/ /peˈtrark/	22
Richter	/ˈrɪkˈter/	28
tsunami	/ˈsoʊˈnoˈmee/	30

Let’s echo read the words  
and then we will discuss a  
few unfamiliar words!





### Chapter 3

## Earth's Shakes and Quakes

**THE BIG QUESTION**  
What happens beneath Earth's surface to cause earthquakes?

Italian writer Francesco Petrarch penned the following eyewitness account in the Middle Ages. Can you guess what he was writing about?

*"The floor trembled under my feet; when the books crashed into each other and fell down I was frightened and hurried to leave the room. Outside I saw the servants and many other people running anxiously to and fro. All faces were pale."*



Francesco Petrarch

If you said an earthquake, you're correct! People in northern Italy had good reason to be pale and frightened on a winter's day in 1348 CE. That day, a large earthquake struck. Thousands of people lost their lives.

Earthquakes are violent natural disasters that strike without warning. Suddenly, the ground begins to shake. Furniture topples over.

**THE BIG QUESTION**  
What happens beneath Earth's surface to cause earthquakes?

Turn to page 22 in your reader and follow along as we begin to read this chapter together.



Now that we have read pages 22 – 23, see if you and your speed dial 2 partner can answer the following questions...

How does the author describe earthquakes here?

Why are plate boundaries important?





## Pages 24 – 25

- As we read the first 2 paragraphs we are going to do an experiment/simulation
- Finish reading pages 24 and 25
- Think about and answer the following questions...
  - What role do faults play in earthquakes?
  - What effects of the 1906 San Francisco earthquake do you see in the image?





Read pages 26 – 27



Why do you think the author compares an earthquake's focus to a heart?

A modern seismograph, also called a seismometer, records the shaking of Earth's surface caused by seismic waves. A **seismogram** is the record a seismograph makes. A seismogram shows seismic waves as jagged up-and-down lines. Scientists compare multiple seismograms in order to pinpoint an earthquake's epicenter.

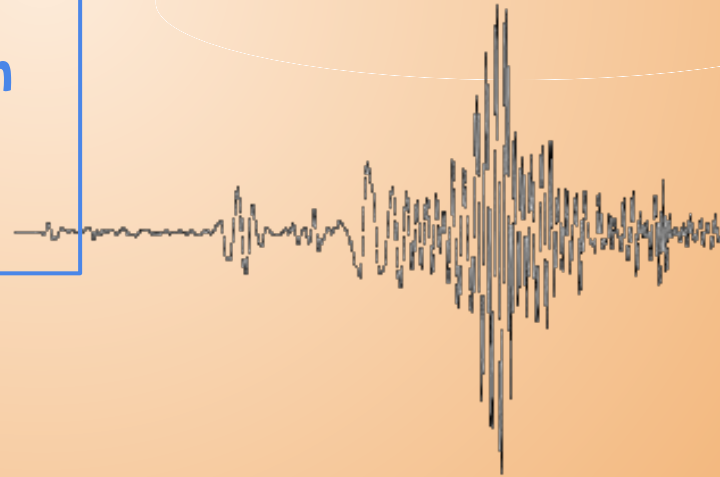
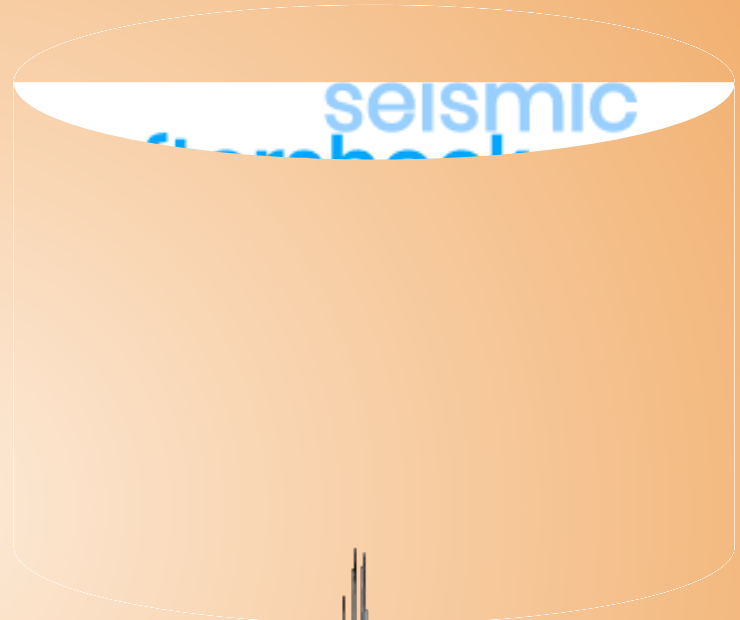
Why do scientists compare multiple seismograms to determine an earthquake's epicenter?



# Read pages 28 – 29

What do scientists use to measure the intensity of earthquakes? What scale do they use to report that measurement?

What is the difference between an earthquake and an aftershock?



Listen to page 30  
about earthquakes in  
the ocean



How are earthquakes and  
tsunamis connected?



Hmmm, let me go back  
to Sam's question...

Sam's dad described an earthquake that the country of Chile had recently experienced. Sam said, "Hmmm . . . I wonder if earthquakes have anything to do with moving tectonic plates?"

Based on what I have learned  
today, how should I answer Sam?



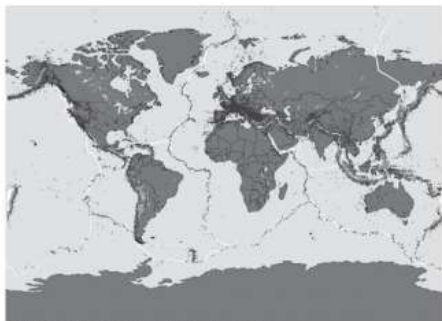


**Excerpt from “Earth’s Shakes and Quakes”**

Read the first full paragraph of the following excerpt aloud to a family member and answer the questions that follow.

objects tumble from shelves, and buildings may even collapse. In 1348 CE, people had no idea what caused earthquakes. Today we know that earthquakes are the result of powerful natural forces at work in Earth’s crust and mantle.

As you read in Chapter 2, scientists developed the theory of plate tectonics in the 1960s. The theory explains how Earth’s surface and interior change over very long periods of time. Some plates are pulling apart at their boundaries, other plates are colliding, and still others are sliding past each other. A lot happens at plate boundaries, including most earthquakes. In fact, one of the easiest ways to locate plate boundaries is to determine where earthquakes are occurring!



Locations of plate boundaries and past earthquake epicenters

# Let's take a look at your homework!



Use the text and the  
diagram on the front  
side to answer the 2  
questions on the  
back side.





# Word Work: fault

## Text Example:

“That sudden slipping is what happens at a fault.”

## Meaning:

a crack in Earth's crust

## Part of Speech:

noun



## My Example:

An earthquake occurs when a huge block of rock moves along a fault.

## Alternate Meaning:

responsible for wrongdoing



Meaning 1 – a crack in  
Earth's crust

Meaning 2 – responsibility  
for wrongdoing



OR



# COMMAS

My favorite summer activities are swimming in the pool  
picking peaches and going to the beach

Alfred Wegener was born on November 1 1880.

60 E. Broadway  
Bloomington MN 55425



NAME: \_\_\_\_\_

DATE: \_\_\_\_\_

4.3

TAKE-HOME

### Practice Commas

*For each item, insert a comma or commas in the appropriate location(s).*

1. My dad is from Austin Texas and my mom is from Minneapolis Minnesota.
2. She plays tennis soccer and basketball.
3. Opening night of his first play is scheduled for June 24 2015.
4. Yellowstone National Park  
P.O. Box 168  
Yellowstone National Park WY 82190

*Write a sentence for each of the following items. Be sure to use correct capitalization and punctuation. Each sentence should include at least one comma in its appropriate location.*

1. a date

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2. city and state or an address

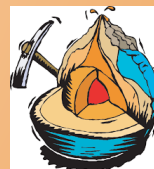
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In just a  
moment you  
will work on  
Activity Page  
4.3 to practice  
using commas.



# Suffix –ly

Remember, the suffix –ly means “in a \_\_\_\_\_ way”

easy or easily?

The crowd at the party was so large that I could \_\_\_\_\_ leave early without anyone noticing.

speedy or speedily?  
when

My grandmother’s farm animals move \_\_\_\_\_ to the barn  
they know it’s feeding time.

careful or carefully?  
eve



My hands were full, so I was \_\_\_\_\_ to avoid dropping

You have 8 minutes to work on Activity Pages 4.3 and 4.4





# WRITING: Format & Audience

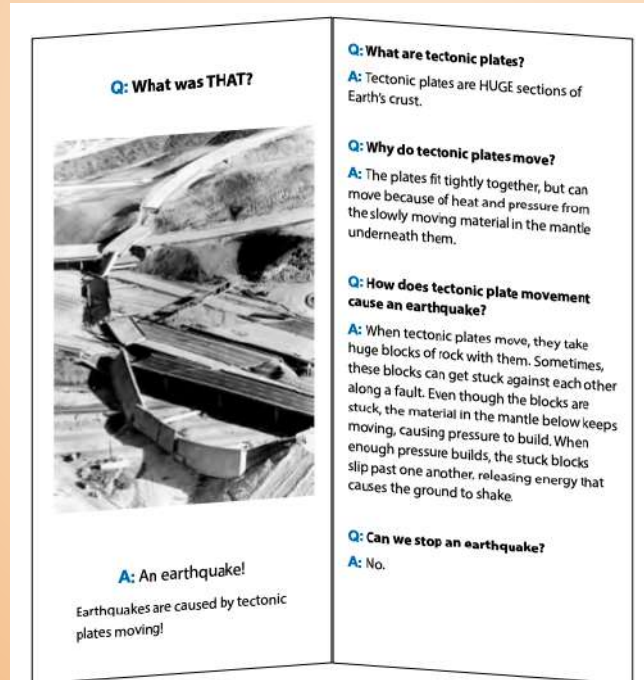
## Format

the design and arrangement of something (in this case a piece of writing)

# Pamphlet

## Audience

the person or group of people who read a particular piece of writing



Remember to do  
Activity page 4.2 and  
finish pages 4.3 and  
4.4 for homework

