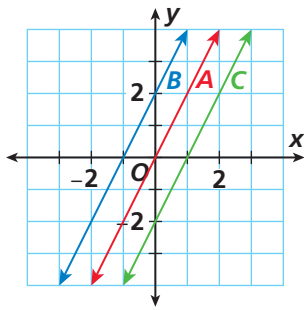# KCS@home

Eighth Grade
Math

Name _____

Derive and Interpret $y = mx + b$

I Can derive the equation for a line in the form $y = mx + b$ given the slope of the line and a point.

Spark Your Learning

PAIRS

Based on data from a science experiment, Sierra graphs Lines *A*, *B*, and *C*. Compare the lines. How are the graphs the same? How are the graphs different?
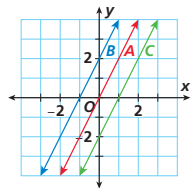
Turn and Talk What would be the equation of a line that passes through the origin and the point (1, −2)? Explain.

Name _____

Derive and Interpret $y = mx + b$

I Can derive the equation for a line in the form $y = mx + b$ given the slope of the line and a point.

Spark Your Learning 👥 PAIRS

Based on data from a science experiment, Sierra graphs Lines A, B, and C. Compare the lines. How are the graphs the same? How are the graphs different?

Possible answer: The lines are all parallel and have a slope of 2. Line A goes through the origin, so it can be written in $y = mx$ form. The equation is $y = 2x$. Lines B and C do not cross through the origin.

Turn and Talk What would be the equation of a line that passes through the origin and the point $(1, -2)$? Explain. See possible answer at the right.

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① Spark Your Learning

▶ MOTIVATE

Introduce the problem. **Ask students:** What do you know about straight lines? Have students discuss and share their answers with their partner or team members in a small group.

▶ PERSEVERE

If students need additional support, guide them by asking:

Q Assessing In what ways are the lines the same?
Possible answer: The slopes are the same.

Q Assessing How do the locations of the lines differ on the graph? Possible answer: The lines cross the y-axis in different locations.

Q Advancing • Use Tools Which tool could you use to solve the problem? Why is this tool more strategic? Students' choices of strategies and tools will vary.

Q Advancing Lines B and C are translations of Line A. If Line A has equation $y = mx$, what are the equations of Lines B and C? Line B: $y = mx + 2$; Line C: $y = mx - 2$

Turn and Talk If some students are having trouble writing an equation, suggest that they discuss with their partner the equation of a line through the origin. $y = -2x$; Possible answer: The line goes through the origin, so it has an equation of the form $y = mx$, and $(1, -2)$ is on the line, so $-2 = m(1)$, and $m = -2$.

▶ BUILD SHARED UNDERSTANDING

Select students who used various strategies and tools to share with the class how they solved the problem. Have students discuss why they chose a specific strategy or tool.

EL OPTIMIZE OUTPUT Critique, Correct, and Clarify
Point out to students that the slopes of the lines are related in some way. Encourage students to describe the similarities and review explanations with a partner. Encourage them to ask each other questions.

■ Did you solve the problem a different way?

■ Would you describe the process for solving the problem differently?
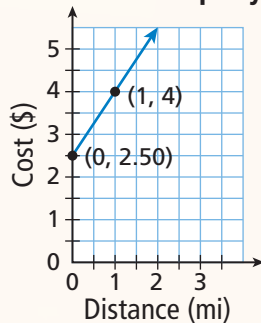
Scatter Plots

TAKEN for a RIDE

Use the graphs to answer the questions.

A. Find the rate of change in the graph. What does it represent?

Cost for Company A
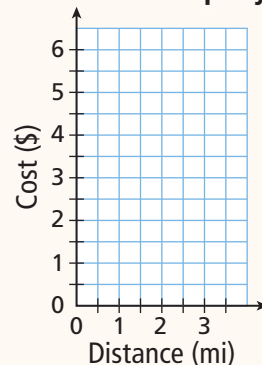

Cost ($) vs Distance (mi)
Points: (0, 2.50) and (1, 4)

_____

_____

B. Company B wants to compete with Company A. It will have the same initial fee as Company A, but a lower price per mile.

Write the equation of a function that could represent the total cost y of using Company B's ride-sharing service for a trip of x miles. Then graph your equation.

_____

_____

Cost for Company B

Cost ($) vs Distance (mi)

Turn and Talk

How does the equation you wrote for Company B indicate the initial fee and the rate of change?
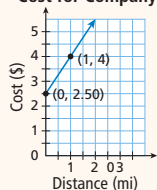
Scatter Plots

TAKEN for a RIDE

Use the graphs to answer the questions.

A. Find the rate of change in the graph. What does it represent?

Cost for Company A
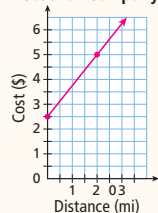

$1.50/mile; the price per mile driven

B. Company B wants to compete with Company A. It will have the same initial fee as Company A, but a lower price per mile.

Write the equation of a function that could represent the total cost *y* of using Company B's ride-sharing service for a trip of *x* miles. Then graph your equation.

Possible answer:

$y = 1.25x + 2.50$

Cost for Company B

Possible graph shown.

Turn and Talk

How does the equation you wrote for Company B indicate the initial fee and the rate of change?

Possible answer: The initial fee, in dollars, is equal to the constant term, 2.50. The rate of change, in dollars per mile, is equal to the coefficient of *x*, or 1.25.

COMMON ERRORS

Students' functions for Company B should have a *y*-intercept of 2.50 and a slope less than 1.50.

Watch for students who divide the change in *x*-values by the change in *y*-values when finding the rate of change for Company A. For these students, ask:

- How is the rate of change of a linear function related to its slope? What formula can you use to find the slope of a line?

Watch for students who say that the rate of change for Company A is $4 per mile. This evidence suggests that students may think the relationship for Company A is proportional and that the unit rate *r* can be determined from the point (0, 0) to point (1, 4). For these students, ask:

- Is the total fee per mile in the graph for Company A proportional? How do you know? How can you find the unit rate of a linear relationship that is not proportional?

TAKEN for a RIDE

Engage Students

Have students work in mixed-ability groups to complete the task. This task is designed to:

- activate prior knowledge that is essential for success in the upcoming module.
- challenge students to think critically and justify their reasoning.
- encourage cooperation, collaboration, and discourse within a group.

Guide Student Discussion

Listen for students who correctly use review vocabulary as part of their discourse. Students should be familiar with the terms *linear function*, *initial value*, *rate of change*, *y-intercept*, and *slope*. Ask students to explain what they mean if they use those terms.

Q **How can you determine the rate of change of a linear function?** Possible answer: Divide the change in *y*-values by the change in *x*-values for any two points on the graph.

Q **What is the initial value of the function for Company A, and what does it represent in this situation?** $2.50; Possible answer; The initial fee for taking a ride before any miles are driven.

Q **How much would it cost to take a 4-mile ride with Company A?** $8.50

Q **Would it make sense for Company B's function to have a negative rate of change? Why or why not?** no; Possible answer: A negative rate of change would mean the cost of a ride would decrease as the miles driven increase.

Extend the Task

- Have students determine how much money a passenger would save on a 5-mile ride with Company B compared to Company A, based on the equation they wrote for Company B.
- Have students write and graph a possible equation for Company C, which has the same rate per mile as Company A, but a lower initial fee.

Eighth Grade
Social Studies

8th Grade Social Studies

Immigration in 19th Century American

8.39 Identify the push-pull factors for Irish and German immigrants, and describe the impact of their arrival in the U.S. prior to the Civil War. (Remember, we included Chinese immigrants in last week's lesson.)

This is a follow up activity to last week's lesson on immigration. Reflect on your learning to complete this task.

Identify the push-pull factors for Irish, German and Chinese immigrants.

Immigrants	Push Factors	Pull Factors
Irish		
German		
Chinese		

How did the arrival of Irish immigrants impact the U.S. prior to the Civil War?

How did the arrival of German immigrants impact the U.S. prior to the Civil War?

How did the arrival of Chinese immigrants impact the U.S. prior to the Civil War?

EXPRESS YOUR OPINION: America continues to attract immigrants from around the world.   Have the attitudes of Americans toward immigrants changed? Cite examples to support your position.

Eighth Grade
ELA

Grade 8. ELA. Week 2

"Potato Chips" an excerpt from *Happy Accidents* by Joey Green

In 1853, a guest at the elegant Moon Lake Lodge resort in Saratoga Springs, New York, sent his order of French fries back to the kitchen several times because he wanted them cut thinner and cooked more thoroughly. At the time, the Moon Lake Lodge prepared French fries by slicing the potatoes lengthwise and frying the disks lightly to be eaten with a fork.

A chef named George Crum, the son of an African-American father and Native-American mother, agitated by the complaint, sliced the potatoes as thin as possible, fried them to a crisp in grease, topped them with salt, and sent them back out to the guest. Astonishingly, the guest loved Crum's potato chips. When other guests began asking for them as well, the Moon Lake Lodge added "Saratoga Chips" to the menu. In 1860, Crum opened his own restaurant- Crum's Place, near Saratoga Lake and placed a basket of potato chips on every table.

Crum never patented his invention or attempted wide-scale distribution. Other aspiring snack food entrepreneurs turned potato chips into an international phenomenon.

Interesting facts:
Lay's was the leading potato chip brand of the United States with about 1.7 billion U.S. dollars worth of sales in 2017, accounting for approximately 29.6 percent of the potato chip market that year.

The Popsicle is still popular and has annual sales today of 2 billion dollars.

Writing Prompts
This writing assignment is based on last week's reading of Shelby Pope's article, "How an 11-Year-Old Boy Invented the Popsicle," and the excerpt, "Potato Chips," from Joey Green's book titled *Happy Accidents*. Pope's article can be found in the week one student resources at knoxschools.org or by visiting commonlit.org.

Directions: Choose one of the following prompts and answer it in a complete essay or two-page short story.

Argument - Neither Frank Epperson nor George Crum benefited very much from the result of his invention. In an argumentative essay, argue whether or not taking the initiative to file for a patent is worthwhile for inventors. You may include additional research on patents and other inventions to support your claim.

Expository - Compare and contrast the invention of the popsicle to the invention of the potato chip. Explain how each inventor's choices resulted in someone else gaining financial benefit.

Narrative - Write a story about a day in the life of Frank Epperson or George Crum. For this story, you can write about the day he first created his invention, or show young Frank selling "Epsicles" in his neighborhood. Be sure to keep in mind that this will be a historical fiction narrative because Frank Epperson was born in 1908, and George Crum invented the potato chip in 1853.

Eighth Grade
Science

8th Grade Science: Week 2 April 13th
# Evidence of Earth's Interior - Review
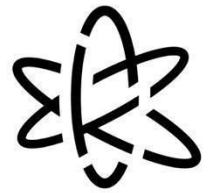
How are scientists able to study the Earth's interior without actually seeing it?
Geologists use evidence from **earthquakes**! When earthquakes occur they produce **seismic waves**. Geologists measure the seismic waves using a science tool called a **seismograph.** The **x-axis** tells how long the wave will last.
The two types of seismic waves that travel through the interior of Earth are **p waves and s waves**. The paths of p and s waves reveal areas inside Earth where the material changes from one state of matter to another.

During an earthquake, p waves are the first waves to travel through the Earth. P waves are able to travel through solid areas and are refracted through liquid areas inside Earth. S waves are the second waves to travel through the Earth and have a higher amplitude than p waves. S waves are able to travel through solid areas, but are absorbed through liquid areas inside Earth.
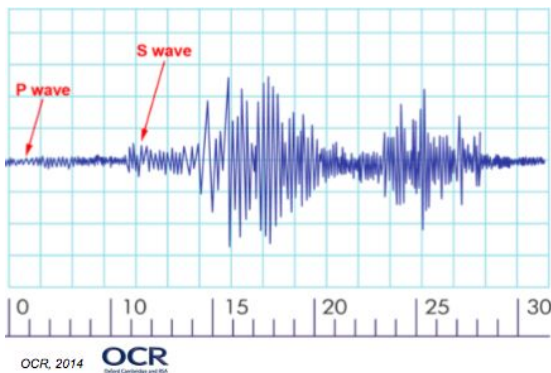
Complete the table comparing p and s waves.	p waves	s waves
Material wave travels through		
Relative amplitude		
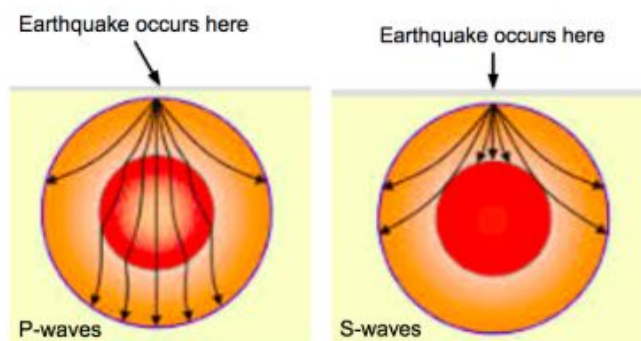
Because of seismic wave evidence, geologists know that Earth is made up of 3 main layers: *crust, mantle, core*. These layers vary in size, pressure, temperature, and **composition**.

The Crust In the summer, you might climb a mountain or hike down into a shaded valley. During each of these activities, you are interacting with Earth's crust, the layer of rock that forms Earth's outer skin. 🔑 **The crust is a layer of solid rock that includes both dry land and the ocean floor.** The main elements in the crust are oxygen and silicon

The Mantle About 40 kilometers beneath dry land, the rock in Earth's interior changes. Rock here contains more magnesium and iron than rock above it. The rock below the boundary is the solid material of the mantle, a layer of hot rock. 🔑 **The mantle is made of rock that is very hot, but solid.** Scientists divide the mantle into layers based on the physical characteristics of those layers. Overall, the mantle is nearly 3,000 kilometers thick.

The Core Below the mantle lies Earth's core. 🔑 **The core is made mostly of the metals iron and nickel. It consists of two parts—a liquid outer core and a solid inner core.** The outer core is 2,258 kilometers thick. The inner core is a solid ball. Its radius is 1,222 kilometers. The total radius of the core is 3,480 kilometers. Earth's core occupies the center of the planet.

Outer Core and Inner Core The outer core is a layer of molten metal surrounding the inner core. Despite enormous pressure, the outer core is liquid. The inner core is a dense ball of solid metal. In the inner core, extreme pressure squeezes the atoms of iron and nickel so much that they cannot spread out to become liquid.

   Currently, most evidence suggests that both parts of the core are made of iron and nickel. But scientists have found data suggesting that the core also contains oxygen, sulfur, and silicon.
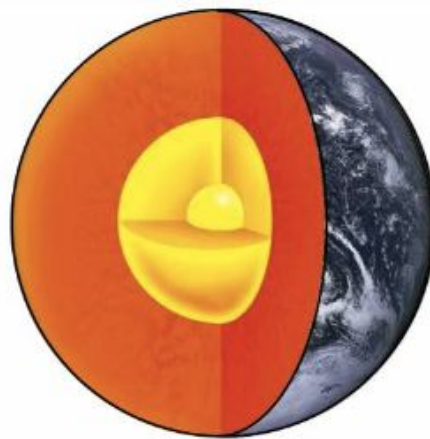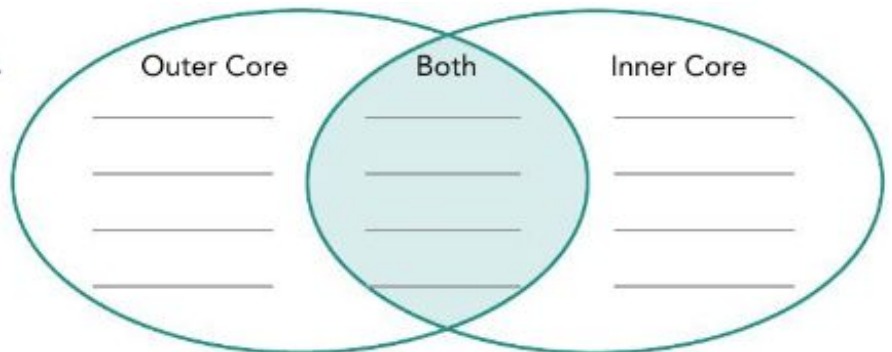

Pearson, 2019

The Core of It
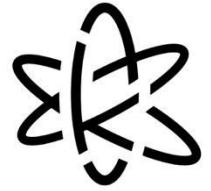
Earth's core consists of two separate layers.

✏️ **Review** Put each term below in its proper place in the Venn diagram.

solid metal	molten metal
iron	nickel
dense ball	liquid layer

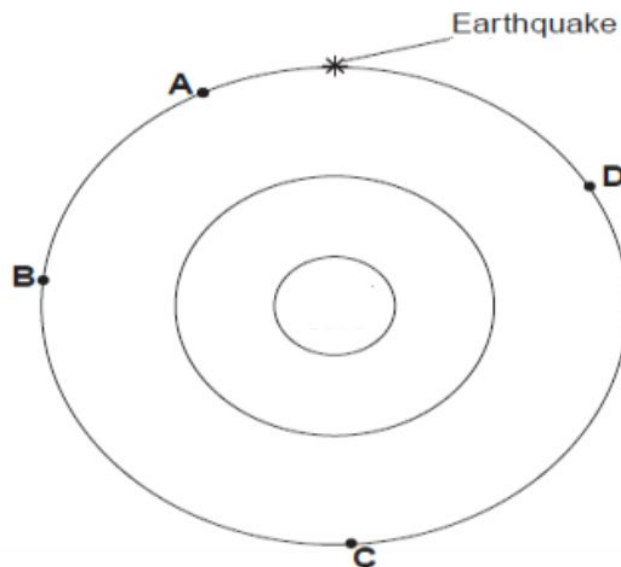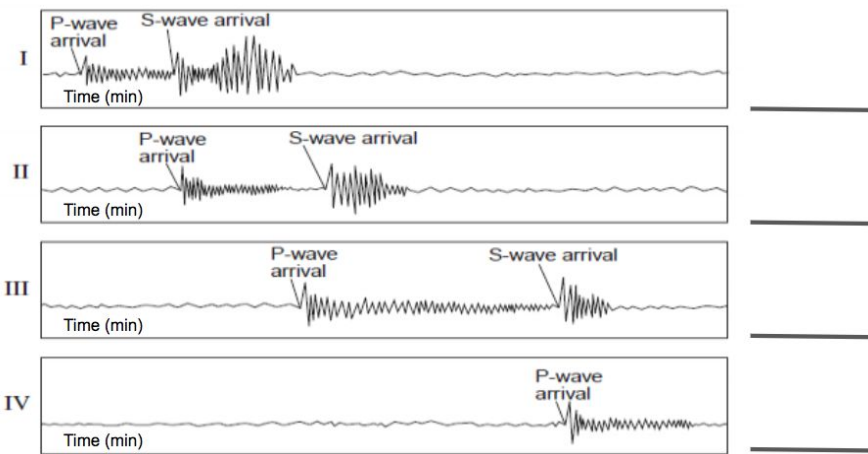Outer Core   Both   Inner Core

Pearson, 2019

2

8th Grade Science: Week 2 April 13th
Evidence of Earth's Interior - Activity

In this review activity, there are 4 seismographs at different locations on Earth (A, B, C, and D). An earthquake has occurred near location A and measured by seismographs at the different locations.

Part 1 - Analyze and interpret data from seismographs.

Directions: Match each seismic record to its seismograph location.

Part 2 - Develop a model of Earth's interior and show the path of seismic waves in Earth's interior.
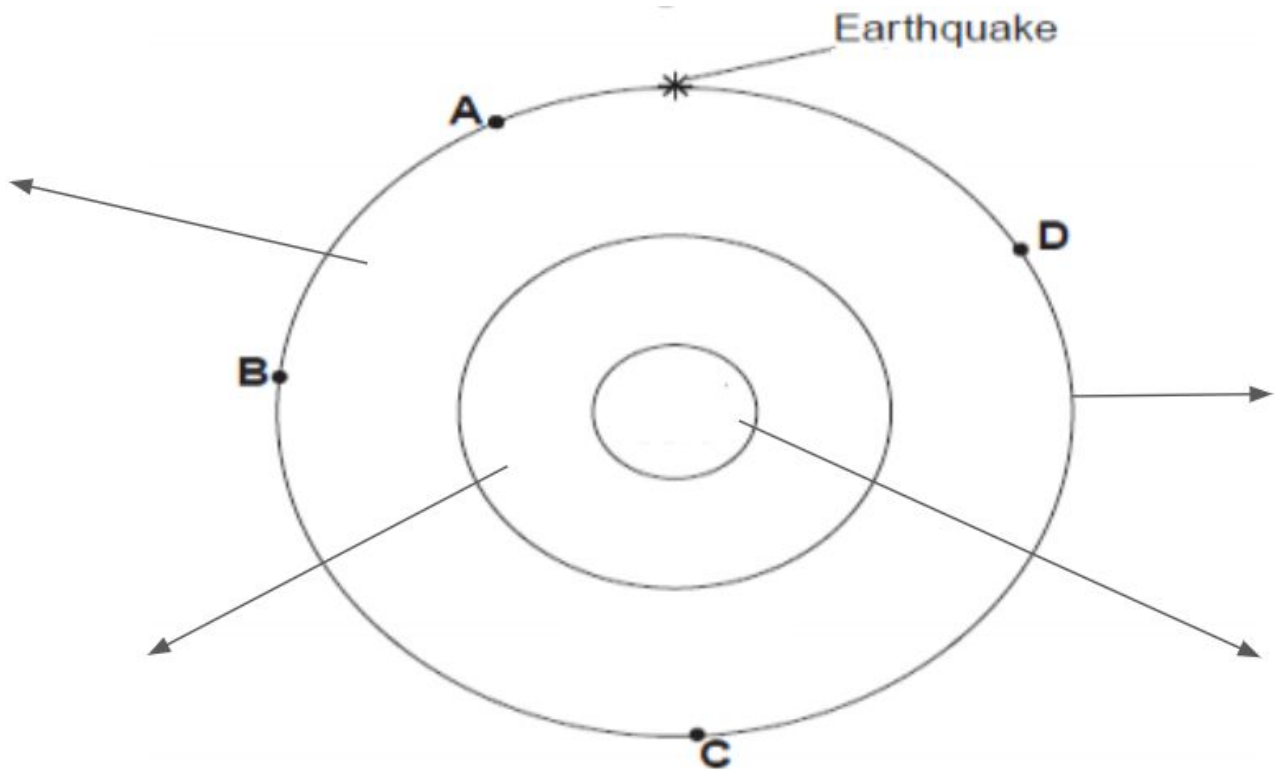
Directions: Complete steps 1 - 2.

Step 1. Label the layers of the Earth: *mantle, crust, inner core, outer core*.
Step 2. Use the key below to draw the path of the *p* and *s* **waves** from the earthquake to each of the 4 seismograph locations.
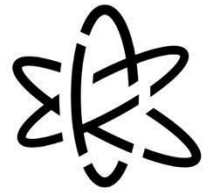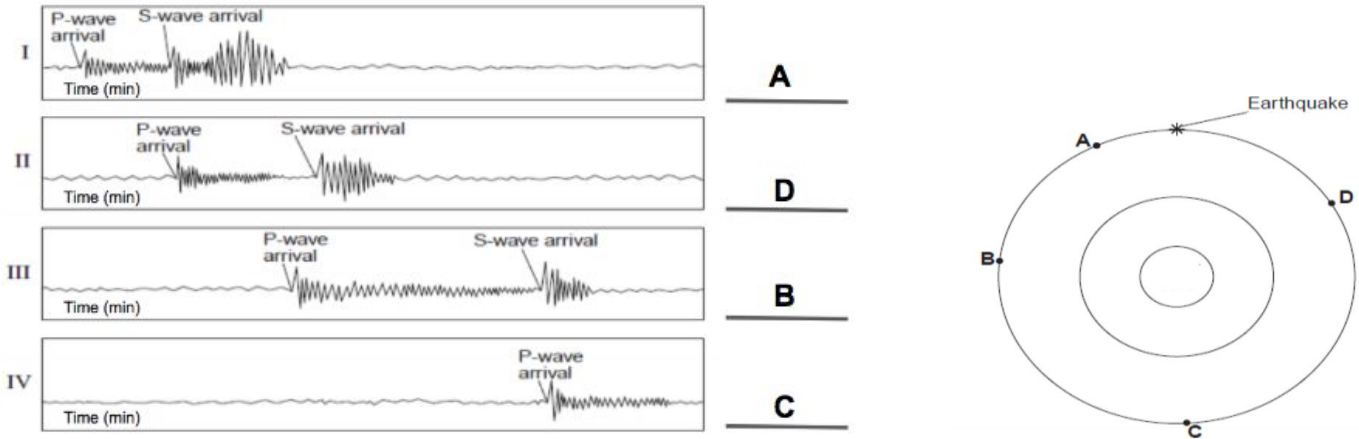   *Hint: refer to the diagram on page 1 of this lesson for help*

Key	
———	P-waves
- - - - -	S-waves

Earthquake

A.

B.

D

C.

Part 1 - Analyze and interpret data from seismographs.

Part 2 - Develop a model of Earth's interior and show the path of seismic waves in Earth's interior.