Name Date Class

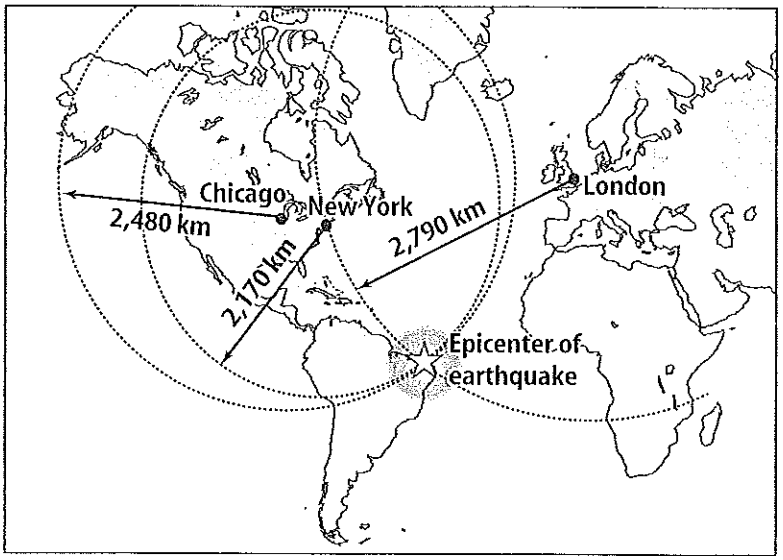
SECTION 2 Enrichment

Determining the Time of an Earthquake

Directions: *Read the information and study the table giving travel times of seismic waves from an earthquake. Then study the map identifying the epicenter of the earthquake to answer the questions below.*

Distance from epicenter (km)	Travel Time					
	Primary waves		Secondary waves		Surface waves	
	min	s	min	s	min	s
620	3	20	6	0	7	20
1,240	5	56	10	48	14	16
1,860	8	00	14	30	21	30
2,480	9	50	17	50	27	50
3,100	11	26	20	51	35	56
3,720	12	43	23	27	41	43

Seismologists use the distance from an epicenter plus the times of the arrival of primary, secondary, and surface waves to determine the time an earthquake begins.



1. On what continent did the earthquake occur?

   _____

2. How far was the earthquake from London? New York? Chicago?

   _____

   _____

3. How long did it take the primary waves to reach Chicago?

   _____

4. The primary waves reached Chicago at 9:00 A.M. When did the earthquake occur in Chicago time? What math operation did you use to determine the time of the earthquake?

   _____

5. The earthquake epicenter was located two time zones east of Chicago. What time was it in the time zone containing the epicenter when the earthquake began? _____

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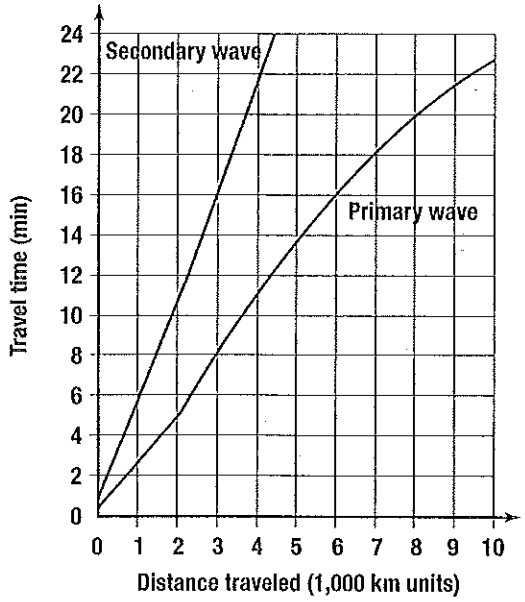
Name Date Class

SECTION 2 Reinforcement

Features of Earthquakes

Directions: *The graph below shows travel time in minutes and distance traveled for primary and secondary waves. Primary and secondary waves start at the same time but do not travel at the same speed. Study the graph. Use the graph to help answer the questions that follow.*



1. How long does it take for a primary wave to travel 2,000 km?

2. How long does it take for a secondary wave to travel 2,000 km?

3. How far does a secondary wave travel in 10 min? _____

4. How far does a primary wave travel in 10 min? _____

5. What happens to the time difference between primary and secondary waves as the distance traveled gets longer?

6. Suppose a primary and secondary wave both travel a distance of 4,000 km before they are picked up by a seismograph. Which wave will arrive first?

7. How much time lag at 4,000 km will there be between these two waves?

8. Suppose both a primary and secondary wave start together and travel for 5 min. Which wave will travel farther?