

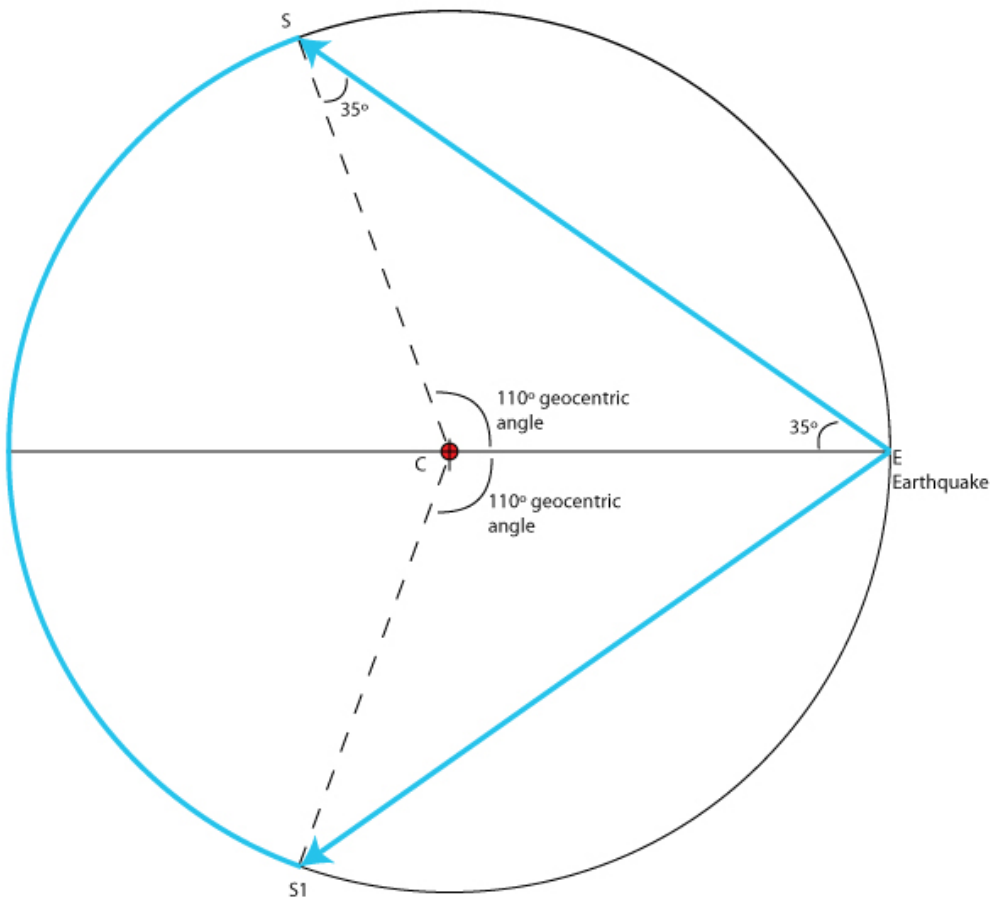
Student Instructions  
Part B

Materials- two large piece of paper

1. Using a compass or on graph paper draw a circle 20 cm in diameter to represent a cross-section of the Earth. Mark the center of the circle to represent the center of the Earth (C). Make an arbitrary mark on the circle to represent an earthquake epicenter (E).

2. With the center of the circle (C) as a vertex, use a protractor to measure an angle of 110 degrees with one leg of the angle intersecting the epicenter (E). Mark on the circle the other leg of the 110° angle, beginning of the shadow zone (S). Draw lines connecting all three points: E, C, and S.

3. Draw a mirror image using the same location for the center of Earth and Earthquake (E), and using a 110 degree angle in the lower portion of the circle.



4. Cut out the area contained within blue lines.

5. Place the vertex of the wedge shaped cut-out on a new circle representing the Earth with 20cm radius. Align the curved arc of the wedge with the opposite side of the circle. The point on the cone depicts an earthquake epicenter. Trace the straight edges ES and ES1 cutting through the circle (Earth) Repeat this procedure moving the "epicenter" to different locations along the circle.

Question: What pattern is emerging? What does it represent?

6. Draw a circle, using the center of the Earth, which just grazes the edges of the straight lines drawn in step 5. Measure the radius of this inner circle \_\_\_\_\_cm

The radius of the Earth = 6371km and radius of the modeled Earth = 20 cm; estimate the radius of the mantle-core boundary.

$$\frac{6371 \text{ km}}{20 \text{ cm}} = \frac{X \text{ km}}{\text{measured radius (cm)}}$$