Name: _____ Date: _____

BLM 4.P.2

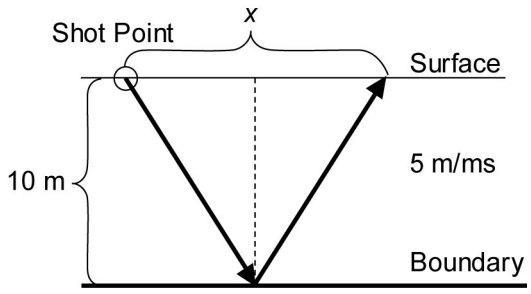
Performance Task

Tools
- grid paper

Technology Tools
- graphing calculators
- *The Geometer's Sketchpad®*
- computers

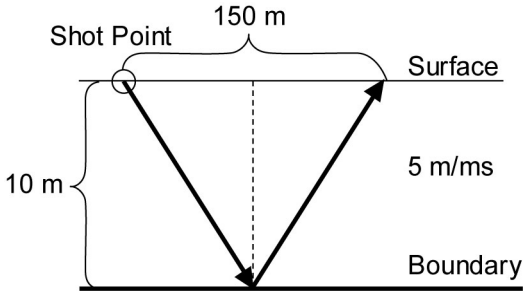
Related Resources
BLM T4 *The Geometer's Sketchpad®* 3
BLM T5 *The Geometer's Sketchpad®* 4
BLM G10 Grid Paper
BLM A8 Application
General Scoring Rubric

Seismic disturbances (shot point) result in vibrations that pass through the Earth. Sometimes, these vibrations pass through the Earth, strike a boundary, and reflect back to the surface. The path of the vibration is called a ray path (red lines). Imagine that there is a boundary 10 m below the Earth's surface and that the speed of the vibration, as it passes through the layer, is 5 m per millisecond. The value x is a distance, along the surface from the shot point, at which the vibration emerges.



a) Given that the vibration (ray path) comes out of the surface 150 m away from the shot point, what is the total length of the ray path?

b) Pick any value between 200 m and 300 m to represent a distance along the surface and find the total length of the ray path.



c) Given that the triangles, on either side of the dashed line, are equal, construct a formula that represents the total length of the ray path.

Hints:
1) Pythagorean theorem
2) Speed = $\frac{\text{Distance}}{\text{Time}}$

d) Use the formula that you constructed to determine the length of the ray path for 5 distances (50 m–150 m) along the surface from the shot point. Organize your data into a table, and construct a graph.