# Revealing the Earth's Inner Secrets: Basic Principles of Geophysics

Geology 1P Mr. Traeger

Name: _____ Period: _____ Date: _____

**Purpose**: The purpose of this activity is to familiarize students with the basic techniques and concepts of geophysics used for investigating Earth's interior.

**Procedure and Questions**

**Part 1: Internet Investigation ES0402: How Do We Know about Layers Deep within Earth?**

1. Go to Mr. Traeger's Website by 'Googling' 'Traeger 311.' Click on Internet Investigations link. Click on ES0402: How Do We Know about Layers Deep within Earth?
2. Answer the questions and fill in the diagrams on the Internet Investigations sheet on the back of this sheet.

**Part 2: Why do Seismic Waves Travel a Curving Path through Earth?**

1. Return to the Internet Investigations Links and click on link entitled: Part 2: Why do Seismic Waves Travel a Curving Path through Earth?
2. Watch the animation entitled 'Travel Times through Different Media.' The first part of the animation shows waves in a slower and faster medium. Do you think waves would travel faster in more dense or less dense rock material? Why?
3. Continue watching the animation entitled 'Travel Times through Different Media.' What is the difference between refraction and reflection and what does a wave refracting or reflecting depend on?
4. Watch the animation entitled 'Curving Seismic Paths through the Earth.' Why does the orange refracted wave get to the seismogram station before the direct blue wave?

**Part 3: How do P & S Waves Give Evidence for a Liquid Outer Core?**

1. Return to the Internet Investigations Links and click on link entitled: Part 3: How do P & S Waves Give Evidence for a Liquid Outer Core?
2. Watch the video entitled 'Intro. to Shadow Zones.' What is a shadow zone and what causes them to occur?
3. Continue watching the video entitled 'Intro. to Shadow Zones.' Fill in the blanks in the following statement. The P-wave shadow zone extends from _____ degrees to _____ degrees away from the earthquake focus (hypocenter).
4. Continue watching the video entitled 'Intro. to Shadow Zones.' How does the behavior of S waves beyond 104 degrees away from the earthquake focus (hypocenter) give evidence for a liquid outer core inside our planet?
5. Activate the Shadow Zone Rollover by clicking on the link 'Flash (154 kb)' next to it. Click Refresh if it does not load the first time. Summarize the information given in the chart below.

| P-wave Paths | P-wave Shadow | S-wave Paths | S-wave Shadow |
|---|---|---|---|
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