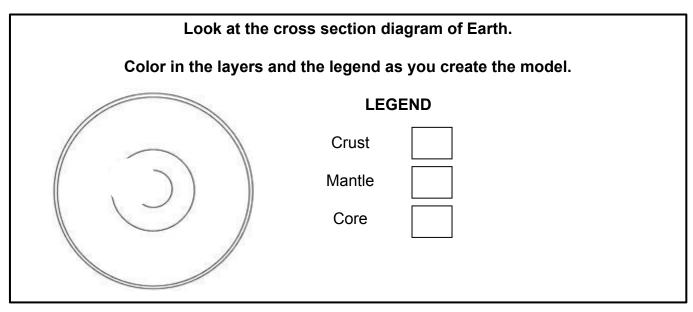


Name:

Date:

# Layers of Earth

Part I: Modeling Layers Based on Chemical Composition



- 1. What is the chemical composition (makeup) of most of the crust material?
- 2. Where is the crust found?
- 3. What is the chemical composition (makeup) of most of Earth's mantle material?
- 4. Why do you think the mantle materials sank lower in Earth (toward the center of gravity) as compared to the crust materials?



## Part I: Modeling Layers Based on Chemical Composition, continued

- 5. What is the chemical composition (makeup) of Earth's core?
- 6. Why do you think these core materials sank to Earth's center?
- 7. Which layer makes up the majority of Earth's interior?
- 8. Which layer is the thinnest when looking at a cross-section of Earth?
- 9. What characteristics or properties of Earth material are used to classify layers as crust, mantle and core?

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#### Part II: Modeling Layers Based on State of Matter

- 1. What are the three basic states of matter?
- 2. Which of the crust/mantle/core layers is located in the lithosphere?
- 3. What is the state of matter of the lithosphere?
- 4. Which layer that is classified based on chemical composition is also found in the asthenosphere?
- 5. What is unusual about the asthenosphere's state of matter?
- 6. Look at the model and think about a logical reason why the inner core is under more pressure than the outer core. What causes more pressure in the inner core?
- 7. What is a logical reason why the inner core's state of matter (solid) is different from the outer core's state of matter (liquid). Hint: Look at question 6 above.
- 8. Which characteristic or property of Earth material is used to classify layers as the lithosphere, asthenosphere, as well as the inner and outer core?



## Part III: Investigating Solids That Flow

#### Asthenosphere Plasticity Model

- 1. Press down gently on your bag that represents the asthenosphere. When you first press down gently on the bag, what does it feel like?
- 2. Now, poke the bag quickly. How does the asthenosphere respond?
- 3. The asthenosphere layer is a solid with **plasticity**. How does this substance act like a solid?
- 4. How does it act like a liquid?
- 5. Think about the asthenosphere's property of plasticity. How might the plasticity of the asthenosphere affect the layer directly above it--the lithosphere? How do you think the solid lithosphere and the flexible asthenosphere interact?



# **Reflections and Conclusions**

- 1. The crust, mantle, and overall core areas of Earth are classified and divided into layers based on—
- 2. The lithosphere, asthenosphere, inner core, and outer core areas of Earth are classified and divided into layers based on—
- 3. Which type, the 3-D clay half sphere or the 2-D cross-sectional diagram provides more advantages as a model? List the advantages of each in the space below.

| Advantages of:  |                             |  |
|-----------------|-----------------------------|--|
| 3-D half sphere | 2-D cross-sectional diagram |  |
|                 |                             |  |
|                 |                             |  |
|                 |                             |  |
|                 |                             |  |

4. Which type, the 3-D clay half sphere or the 2-D cross-sectional diagram, has more limitations as a model? List the limitations of each in the space below.

| Limitations of: |                             |  |
|-----------------|-----------------------------|--|
| 3-D half sphere | 2-D cross-sectional diagram |  |
|                 |                             |  |
|                 |                             |  |
|                 |                             |  |

5. Imagine that the cool and solid lithosphere layer is cracked into pieces, like the shell of a hard-boiled egg. Do you think the pieces might move around on the "flexible" asthenosphere? Why or why not?