

Earth Layers Model Challenge

Student Team Packet | Grades 6-8 | One Copy per Team of 3-4

Team members: _____

Date: _____ Class: _____ Team: _____

Driving Question

How can we create a model that accurately represents Earth's layers while recognizing that a classroom model cannot show everything about the real Earth?

Challenge and Success Criteria

Build a three-dimensional model that shows the correct order, relative thickness, and physical state of Earth's four major layers. Cut it open to reveal a labeled cross section.

- Include the crust, mantle, outer core, and inner core.
- Make the mantle the thickest layer and the crust the thinnest.
- Place the solid inner core at the center and the liquid outer core around it.
- Include a labeled color key.
- Identify at least two limitations of the model.

Materials and Safety

Four colors of modeling clay, paper plate, ruler, colored pencils, and a blunt plastic knife, craft stick, or dental floss for teacher-approved cutting. Goggles are not required. Do not use sharp tools or eat any laboratory materials.

Team Roles

Role	Responsibility
Materials manager	Organizes and returns supplies.
Model builder	Leads construction according to the plan.
Measurer/recorder	Measures, records, and completes the team packet.
Reporter/safety manager	Checks criteria and presents the team explanation.

Part 1: Review and Plan

Use the displayed Earth-layer information and your prior learning.

1. Which layer should be the thickest?

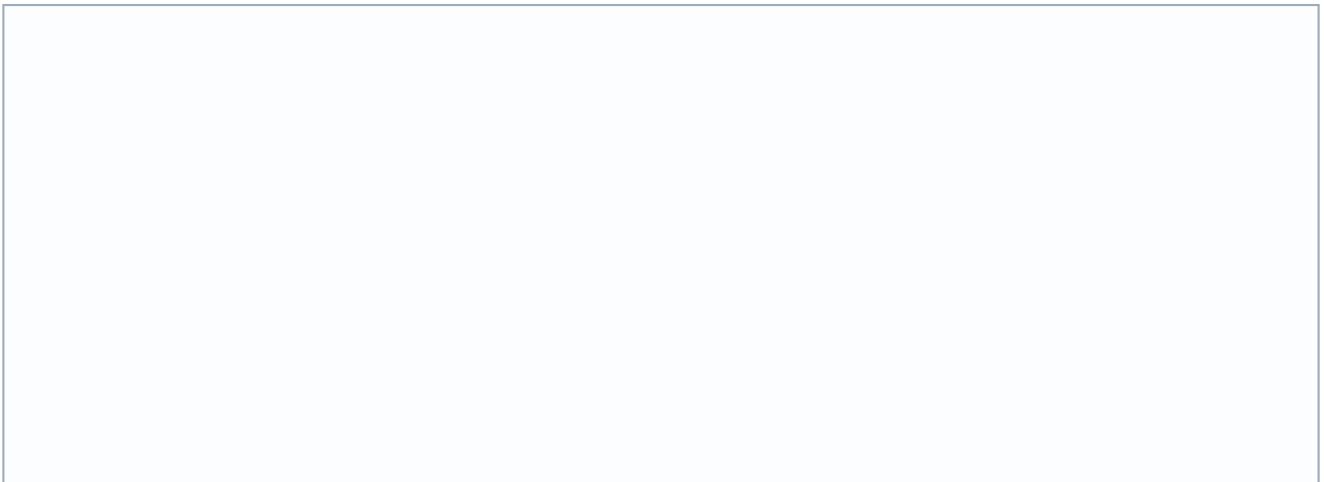
2. Which layer should be the thinnest?

3. Which layer is liquid?

4. Why can't a clay model be completely accurate?

5. What features must your model show?

Team plan: Draw and label your proposed model. Include colors and approximate layer thickness.



6. Which color will represent each layer?

7. How much clay should be used for each layer?

8. How will your team make the crust thin but still visible?

9. How will your model communicate that the outer core is liquid?

10. What criteria will determine whether your model is successful?

Part 2: Construct, Cut, Observe, and Improve

Construction Process

1. Form a small sphere for the inner core.
2. Surround it with the outer-core color.
3. Add a much thicker mantle layer.
4. Cover the model with a thin crust.
5. Measure and record the completed model's diameter.
6. Have the teacher check the layer order before cutting.
7. Cut the model in half using the approved blunt tool.

Completed model diameter: _____

11. What is the correct order of the layers from the outside toward the center?

12. What did you observe after cutting the model?

13. Are all layers the same thickness? Explain.

14. Which layer surrounds the inner core?

15. What is located at the center?

16. Which part of your model is most accurate?

17. Which layer is represented least accurately? Why?

18. Is the model's crust too thick compared with the real Earth? Explain.

19. Does the model communicate that the outer core is liquid? How?

20. What should your team change to improve the model?

Part 3: Improve and Explain

Make one evidence-based improvement or describe precisely what you would change.

21. What did your team change—or what would you change?

22. What observation or evidence caused you to make that decision?

Claim-Evidence-Reasoning

23. CLAIM: What does your model represent accurately?

24. EVIDENCE: Identify at least two model features that support your claim.

25. REASONING: Explain why those features represent Earth's structure.

26. LIMITATIONS: Identify at least two ways the model differs from the real Earth.

27. SCIENTIFIC-PROCESS REFLECTION: How did observation or evidence cause your team to revise its thinking or model?

Final Team Check

☐ Four layers ☐ Correct order ☐ Mantle thickest ☐ Crust thinnest ☐ Outer core labeled liquid ☐ Color key ☐ Two limitations ☐ Materials returned