

EARTH'S CORE AND DENSITY

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Course Name: 7th Grade Integrated

Core Curriculum Standard Fulfilled: Standard II; Students will understand the relationship between properties of matter and earth's structure.

Core Curriculum Objective Fulfilled: Objective 2; Analyze how density affects Earth's structure.

Intended Learning Outcomes (ILO's) Fulfilled

- 1f. Distinguish between factual statements and inferences.
- 3d. Solve problems appropriate to grade level by applying scientific principles and procedures.
- 4a. Provide relevant data to support their inferences and conclusions.
- 4f. Construct models to describe concepts and principles.
- 6d. Understand that science conclusions are tentative and therefore never final. Understandings based upon these conclusions are subject to revision in light of new evidence.

Time needed to Complete Inquiry: 15 – 25 minutes.

Inquiry: Guided. Can you assign relative densities to the different layers of the Earth, based on the information you have on-hand so far?

Prior Knowledge Needed: You may need to remind students of the data they collected in the “Calculating Density” and “Layered Separations” sections.

Introduction: Briefly discuss all the information that has been collected during the “Calculating Density” and “Layered Separations” activities.

Materials:

- paper
- pencil
- colored pencils (optional)

Procedures of the Investigation:

1. Have students draw a diagram of the earth's interior structure, showing the three (3) layers they have deduced so far. You can give them the names crust, mantle, and core assigned to the layers.

2. Break students into groups of four.
3. Explain to students that this is science, and we use data to make inferences. Not everyone's model will be the same, and your model will change as you get new information.
4. In their groups of four, students will come to a consensus of a model of Earth's interior structure based on the evidence at hand.
5. Using the data collected in the "Calculating Densities" exercise and the fact that Earth has an *average* density of about 5.5 g/cm³, assign relative densities to the different layers of the Earth's interior structure. Students will label each part of the Earth with the density that they feel can be justified with the information from the "Calculating Density" and "Layered Separations" activities.

Data Analysis: In their group, the students will develop a line of reasoning (explanation) based on the data and experiences they have had the last couple of days to defend their density assignments.

6. Each group will then present their model with evidence that helped shape their drawing to the class
7. As a class, the merits of each model presented will be discussed in its ability to use the data at hand. This is an important time to use formative assessment in assessing student understanding.
8. As a class, the students should come to a consensus that the most dense material will be found in the core and the least dense in the crust.
9. Students need to understand that they have inferred that the substances in the interior of the Earth will behave similar to the substances in the "Layered Separations" activity.