

Drawing Earth's Interior to Scale

Use page 24 in the book to look up most of this information:

Layer of the Earth	Average Depth (km)	Thickness (km)	Range of Temperature (°C)	Composition	State of Matter (solid or liquid?)
CRUST	0	32 km		(pg. 139)	
MANTLE	32 km		870-2200	O ₂ , Si, Fe, Mg	
OUTER CORE			2200-5000		
INNER CORE		(radius)	5000-5500		

Answer the following questions about the layers of the Earth:

1. Which layer is the thickest?
2. Which of the four main layers is liquid?
3. Where would you find the thinnest part of the crust?
4. If the inner core is the hottest part of earth's interior, why is it not molten?
5. Name an element contained in the crust that would most likely not be found in the core.

Something drawn to scale is usually smaller than life size with each part being proportional to another. To draw a scale drawing of the interior of the earth, you will need to carefully follow these steps:

1. You will be creating 3 circles, each with a different radius to represent the inner core, outer core, and mantle.
2. Find the widest radius possible that will fit on the paper or other material you are using.
3. Measure the width of the radius in centimeters. *Enter it here:* _____

4. Add the thickness of all four main layers together. *Enter it here:* _____
5. Divide the total thickness (step 4) by your radius (step 3). Round your answer to the nearest tenth. This is your scale. *Enter it here: **Scale is 1cm=**_____ **km***
6. Using the compass and your radius (step 3), draw the first circle. This will represent the crust.
7. Add the thickness of the outer and inner core together. *Enter it here:* _____
8. Divide that thickness (step 7) by your scale (step 5). *Enter it here:* _____
9. Widen your compass to the number of centimeters you calculated in step 8.
10. Draw the second circle. (Be sure to place the point of your compass in the same place as before).
11. Divide the thickness of the inner core by your scale (step 5). *Enter it here:* _____
12. Widen your compass to the number of centimeters you calculate in step 11.
13. Draw the third circle.

The thickness of the line you drew for your first circle represents the thickness of the crust. Even going over it with a marker will make it appear too thick for the drawing to be of correct scale to the earth's crust. The second circle represents the boundary between the mantle and the outer core. The third circle represents the inner core.

Your scale drawing must include labels with all of the following information:

- Four main layers of earth's interior to scale
- The thickness of each of these layers
- The depth of each layer
- The composition of each layer
- The state of matter (liquid or solid) of each layer
- The range of temperatures of the mantle, outer core, and inner core
- A definition and location of the asthenosphere and lithosphere (NOTE: you do not need to draw additional circles for these sub-layers).
- At the bottom right of your drawing, include your name and the scale you used. (For example, Scale: 1cm = 650km).

This project is worth 100 points. You can be creative with this project and make it a variety of ways (i.e. draw, paint, collage, build 3-D model). Your grade will be based on the following:

Points	Timeliness	Labels	Scale	Neatness
25	Project is turned in on time	All required labels are present and in proper, easy-to-read locations	Each layer is correctly drawn to scale	Very neat. Circles are near perfect, lines are straight, labels neatly placed
20	----	Most labels are present, some hard to read or missing	Drawn close to scale but one layer is slightly off.	Some circles are lopsided, some crooked lines, labels are somewhat neat
15	Turned in one day late	Half the labels are missing or some labels not placed correctly	More than one layer is obviously not to scale	Labels are hard to read. Lines are crooked and sloppy
10	----	Most labels are missing or placed incorrectly	Layers are not to scale, but it is apparent that an attempt was made	Some labels or other parts of the model are not recognizable
5	Turned in 2 days late	Almost all labels missing, or many labels incorrect or not recognized	Apparent that no attempt was made to draw layers to scale	Most labels and parts of the model are not recognizable
0	Turned in 3 days late	No labels present, or 3 days late	Not all layers drawn, or 3 days late	3 days late