

# Earth's Layers

Plot density vs depth to map the layers inside Earth

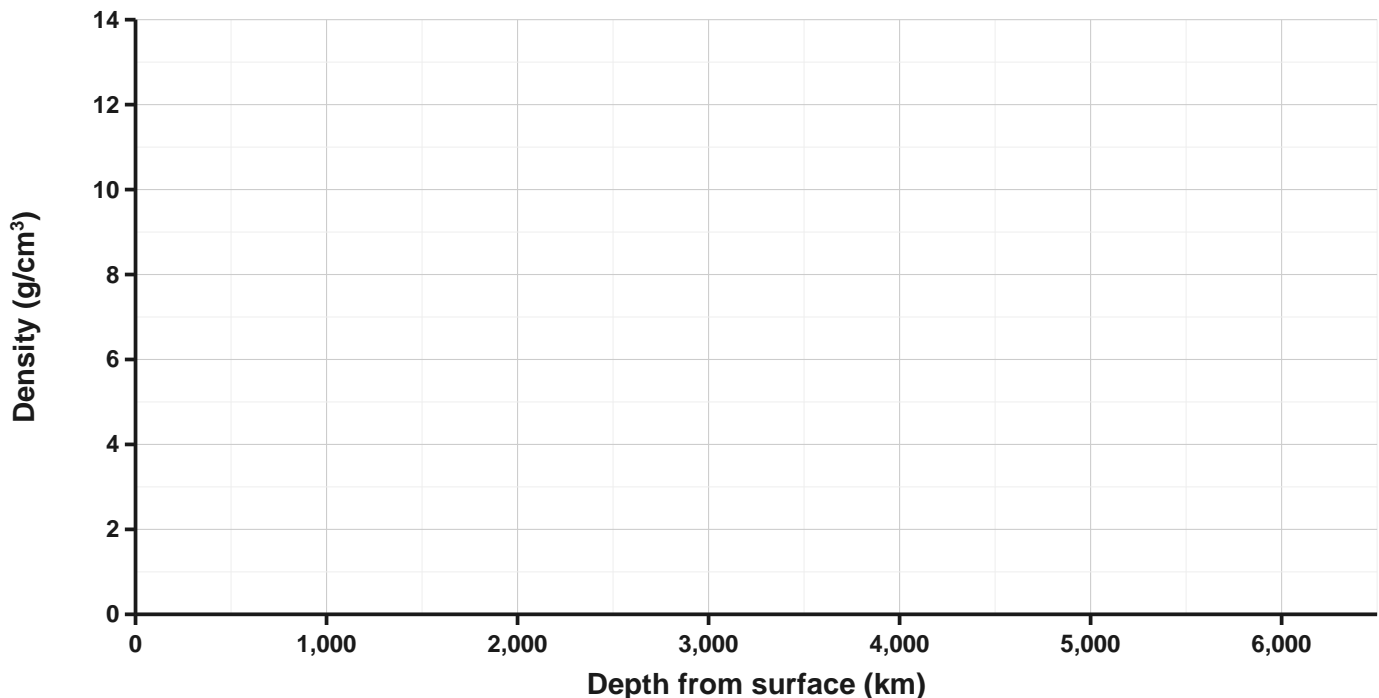
You are a **geologist**. Geologists study Earth's **interior** (the layers BELOW the surface, not the atmosphere ABOVE) by analyzing how density changes from the surface to the center. In this activity, you will plot real Earth density data (based on the PREM model) and use the patterns to describe Earth's structure. **The Outer Core rows are highlighted in pink because that is the only fully liquid layer.**

## Step 1: Plot the data points on the graph below.

Plot each row in the table as a single point on the graph. Then connect the points in order from top to bottom of the table.

Layer	Depth (km)	Density (g/cm <sup>3</sup> )	Notes
Crust	30	2.8	average
Upper Mantle	30	3.3	top of layer
Upper Mantle	660	4.0	bottom of layer
Lower Mantle	660	4.4	top of layer
Lower Mantle	2,890	5.6	bottom of layer
Outer Core	2,890	9.9	top of layer
Outer Core	5,150	12.2	bottom of layer
Inner Core	5,150	12.8	top of layer
Inner Core	6,371	13.0	center of Earth

**Density vs Depth Inside Earth**



## Step 2: Label the layers on your graph.

On your graph from Step 1, write the name of each of the five layers above its part of the line. Use the depth ranges below to help you find each layer:

<b>1. Crust</b>	Depth: 0 to 30 km	<i>(solid)</i>
<b>2. Upper Mantle</b>	Depth: 30 to 660 km	<i>(solid)</i>
<b>3. Lower Mantle</b>	Depth: 660 to 2,890 km	<i>(solid)</i>
<b>4. Outer Core</b>	Depth: 2,890 to 5,150 km	<i>(liquid)</i>
<b>5. Inner Core</b>	Depth: 5,150 to 6,371 km	<i>(solid)</i>

## Step 3: Reflection questions

1. Looking at your finished graph, what is the OVERALL pattern as you go deeper into Earth? Does density increase, decrease, or stay the same?

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2. At which depth on your graph does the BIGGEST density jump happen? How big is that jump (from what density to what density)?

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3. The line on your graph has TWO different patterns: sharp jumps at the boundaries and gradual rises within each layer. What do you think a sudden jump in density tells you about the material at that depth?

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4. The Outer Core is the only fully liquid layer. Looking at your graph, what would be ONE piece of evidence you could give to a friend to convince them that Earth's interior has separate layers (not just one uniform substance)?

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