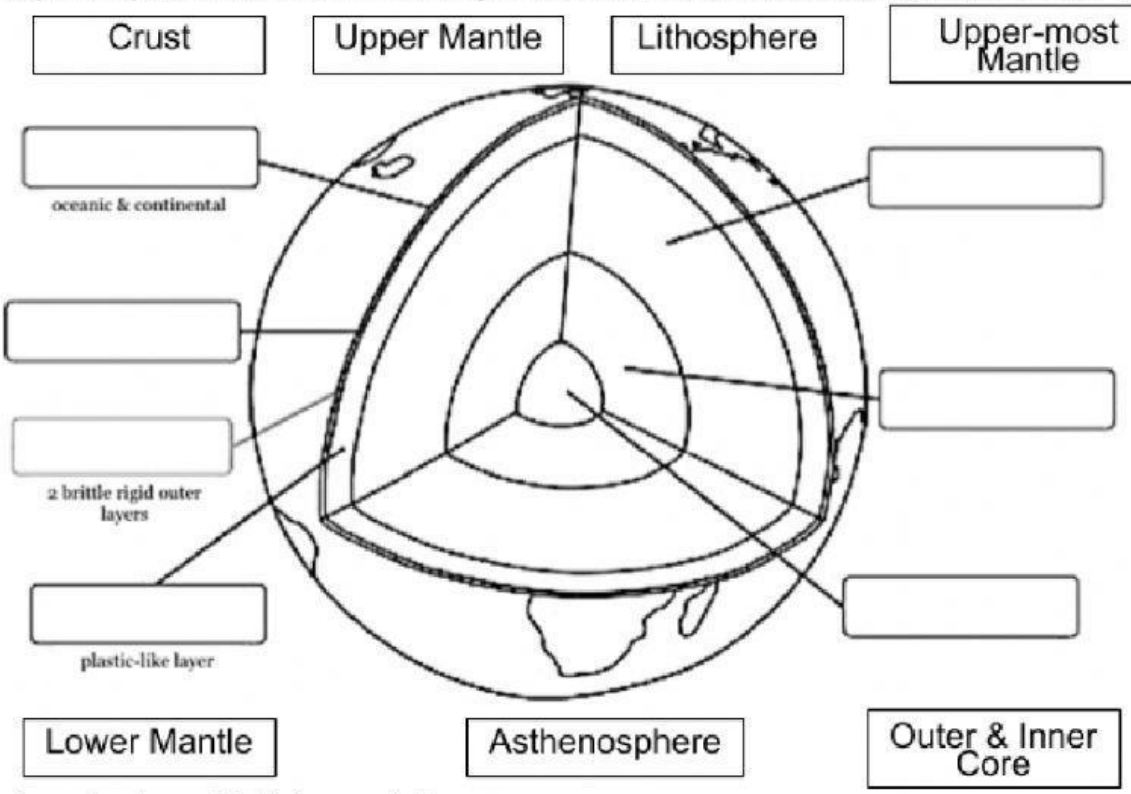
Earth's Interior WebQuest: Can you really dig a hole to China?

Name: _____ Class: _____

Websites: Earth's Structure Interactives | Volcano World Layers | BBC Interactive Journey to the Core | Nat Geo Core Data | PDF Encyclopedia Layers

1) Identify the layers of the Earth in the diagram below. If using Google Docs, double click to open 'drawing':



2) Complete the data table below as follows:

a) **Row 1:** Indicate the thickness of each layer.
b) **Row 2:** The diameter of the Earth is about 6430 km. Calculate the percent of Earth's diameter that each layer makes up. (Remember, in order to calculate %, you must divide - part/whole)
c) **Row 3:** Indicate the elements/composition for each layer.
d) **Row 4:** Indicate the phase of matter for each layer.
e) **Row 5:** Indicate the temperature range (°F) of each layer.

Row	Layer Property	Crust	Mantle	Outer Core	Inner Core
1)	Layer Thickness				
2)	% of Earth's Diameter				
3)	Elements/Composition				
4)	Phase of Matter				
5)	Temperature (°F) range				

LIVEWORKSHEETS

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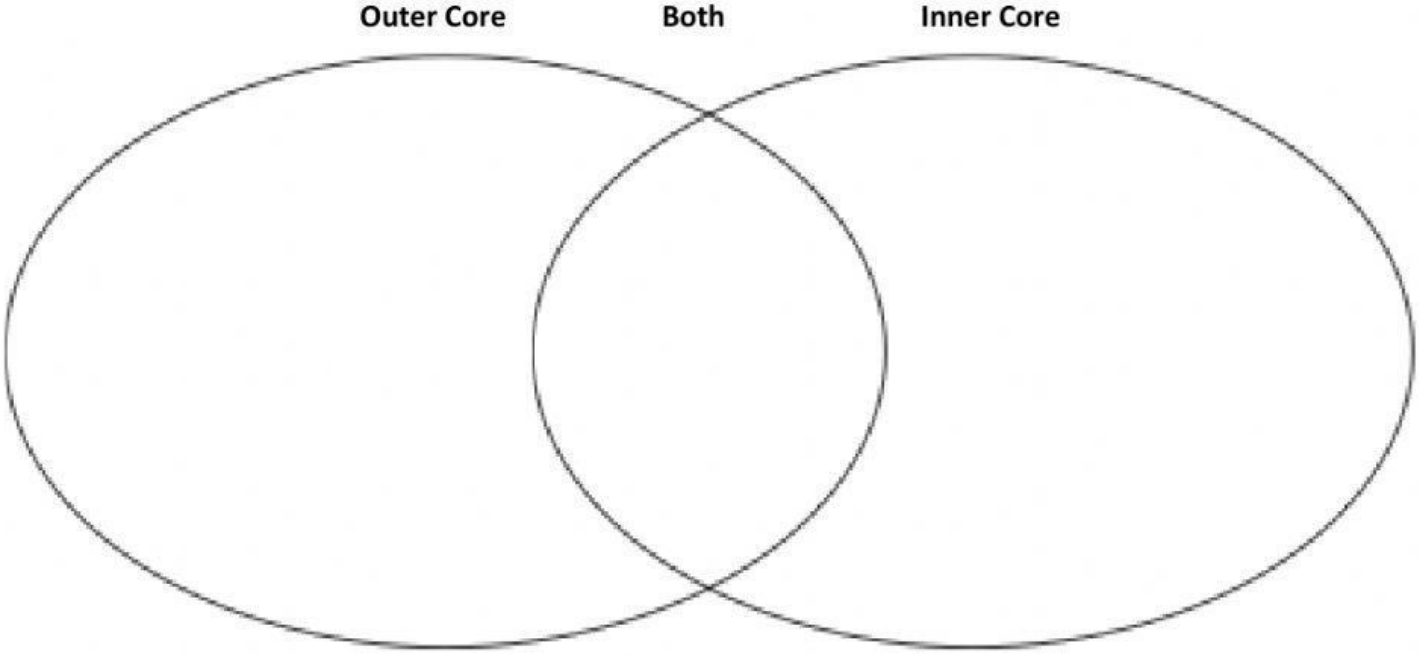
Directions: Answer the following questions in complete sentences:

3) What are the two types of crust, and what are their properties?

4) What causes the mantle to flow?

5) What is the driving force for tectonic plate movement, and which layer(s) are responsible?

6) Compare and contrast the **outer core** and **inner core** utilizing the Venn Diagram below:



7) Which layer(s) of the Earth have scientists been able to explore?

8) Why have scientists been unable to physically explore all of the layers of the Earth?

9) Conclusion: Use what you have learned to answer the Focus Question: Can you really dig a hole all the way to China? Justify your answer.

Google Doc Link: Click here for a page to make a copy to your own Google Drive!! Edit as you see fit!!

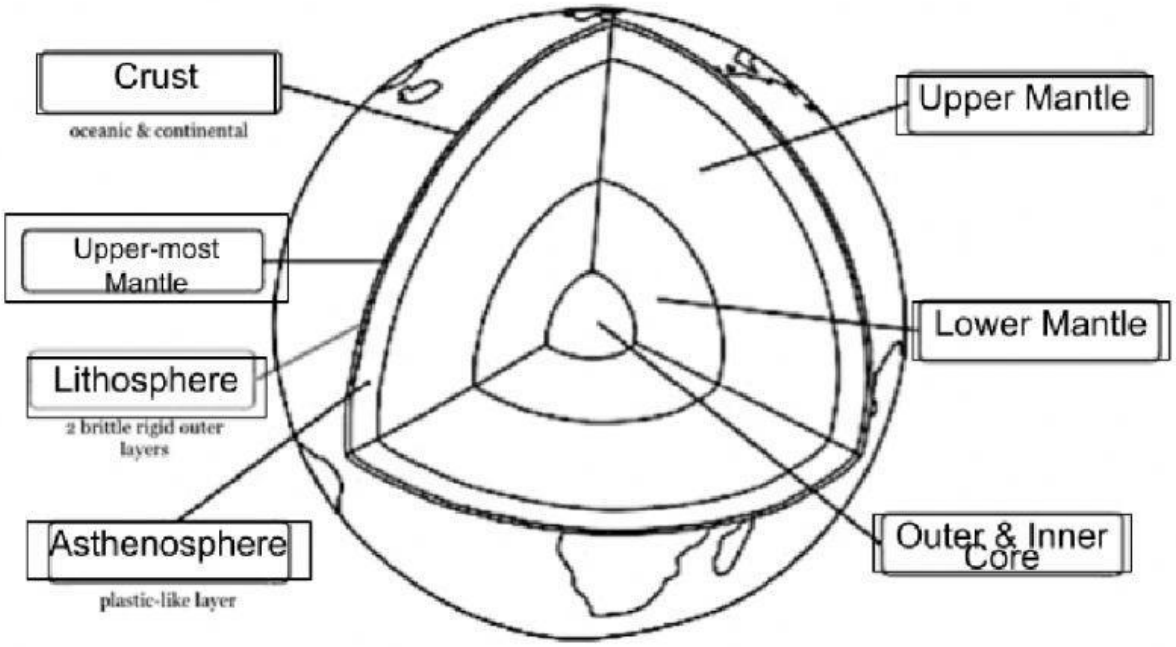
LIVEWORKSHEETS

EARTH'S INTERIOR WEBQUEST: CAN YOU REALLY DIG A HOLE TO CHINA?

ANSWER KEY

Websites: Earth's Structure Interactives | Volcano World Layers | BBC Interactive Journey to the Core | Nat Geo Core Data | PDF Encyclopedia Layers

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e) **Row 5:** Indicate the temperature range (˚F) of each layer.

Row	Layer Property	Crust	Mantle	Outer Core	Inner Core
1)	**Layer Thickness**	30 km (thickest)	2900 km	2300km	1200km
2)	**% of Earth's Diameter**	~ .466%	~ 45.1%	~ 31.1%	~ 18.7%
3)	**Elements/Composition**	Granite, basalt	peridotite	Nickel, iron	Nickel, iron
4)	**Phase of Matter**	solid	semisolid	liquid	solid
5)	**Temperature (˚F) range**	0-1600 ˚F	1600-4000 ˚F	4000-9000 ˚F	4000-9000 ˚F

LIVEWORKSHEETS

EARTH'S INTERIOR WEBQUEST: CAN YOU REALLY DIG A HOLE TO CHINA?

ANSWER KEY

Directions: Answer the following questions in complete sentences:

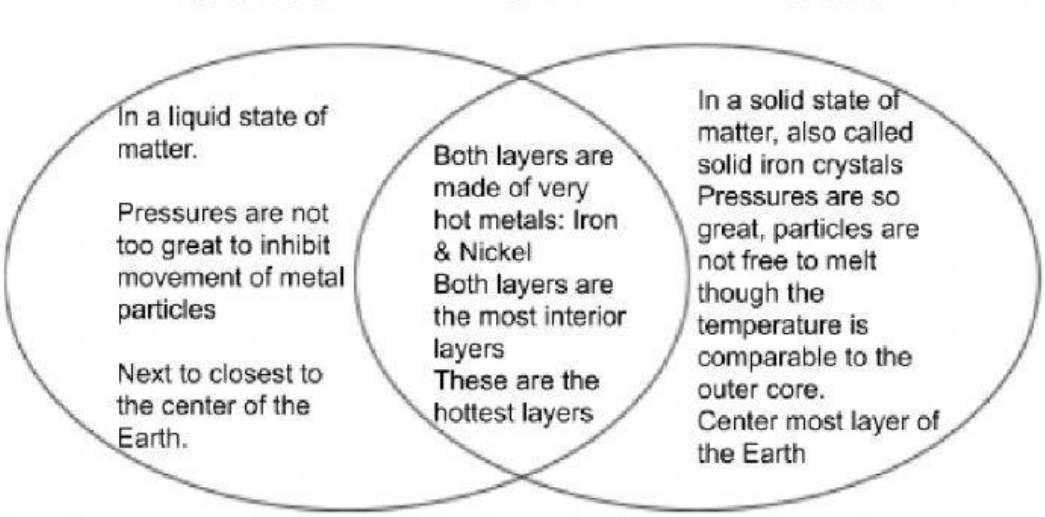
3) What are the two types of crust, and what are their properties?

Oceanic crust - more dense, underneath oceans
Continental crust - less dense than the oceanic crust, makes up the continents.

4) What causes the mantle to flow?
Convection currents in the mantle. The semisolid rock rises as it is heated by the core, and sinks as it cools when it comes in contact with the crust.

5) What is the driving force for tectonic plate movement, and which layer(s) are responsible?
The mantle is semi-solid, particularly the asthenosphere, and convection currents in the mantle move the asthenosphere like a conveyor belt.

6) Compare and contrast the **outer core** and **inner core** utilizing the Venn Diagram below:



7) Which layer(s) of the Earth have scientists been able to explore?
We have only been able to explore the crust. Temperatures and pressures are too great for us to go lower, and drills stop working around 7.6 miles into the crust, ~ 400 °F.

8) Why have scientists been unable to physically explore all of the layers of the Earth?
Temperatures and pressures are much too great for humans to survive. In fact, temperatures surpass those needed to bake cookies in the crust alone.

9) Conclusion: Use what you have learned to answer the Focus Question: Can you really dig a hole all the way to China? Justify your answer.
Accept any reasonable answers that provide support. No, we can not dig a hole to China, as temperatures and pressures are far too great for us to survive. Our technologies and drilling methods do not work to cut through the crust, let alone any further into the Earth. Max ~ 7.6 miles.

LIVEWORKSHEETS