

Name: _____ CLASS _____

LAYERS OF THE EARTH PROJECT

For this project you will make a **3D** model of the layers of the earth. Your project has **3 parts**: the 3D Model, the Labels/Scale & the Documentation. Most of the documentation will be done in school; the model/labels will be done at home.

This project is due Thursday April 11th.

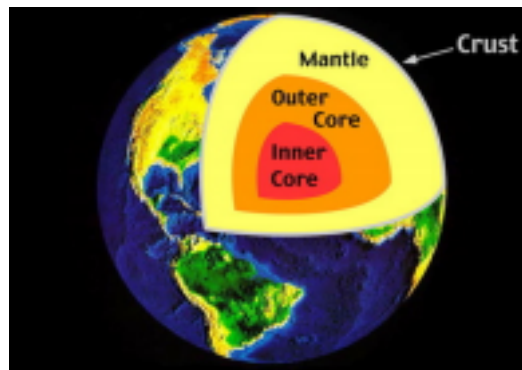
3D Model Your model must:

- ❖ Be 3 dimensional (not flat/poster) & built to scale
- ❖ Model the 4 main layers, show the difference between oceanic & the continental crust
- ❖ Be neat, complete, colorful and demonstrate time and effort

Labels/Information Key/Scale

All 7 layers below and the scale (for example 1 cm = 1, 000 km) must be **labeled on your model**. A key/table with your research information neatly written should accompany your project.

- **Oceanic Crust**
- **Continental Crust**
- **Lithosphere (label only)**
- **Asthenosphere (label only)**
- **Mantle**
- **Outer Core**
- **Inner Core**



Documentation Papers

1. *Layers of the Earth Research*
2. *Scaling Notes* (how the scale was calculated for their model)
3. *Project Reflection*

Green = done in class

Red = done at home

M.I.T. Earth Layer Video Response

<https://www.youtube.com/watch?v=NAHY6965o08>

1. How big is the earth from the center to the surface?

2. What happened as the earth cooled?

3. Add any information about the composition, state & interesting facts to the Layers of the Earth Research paper for your project.

4. Describe 2 ways that scientists can know about the inside of the earth:

A)

B)

5. Write a question that you have about the earth's layers?

Layers of the Earth Research - done in class

Use the resources: [MIT video](#) , [National Geographic](#) and [Science News](#) websites to fill in the information about the different layers of the earth. Use only **metric units** (km, Celcius). I did the crust as an example. There is a picture on page 7 showing where these layers are located.

Crust

Thickness: _____ - _____ km

Temperature Range: _____

State (Solid, Liquid, Gas): _____

Composition (what's it made out of): _____

Notes/Interesting Facts:

Lithosphere (extra credit)

Thickness: _____

Temperature Range: _____

State (Solid, Liquid, Gas): _____

Composition (what's it made out of): _____

Notes/Interesting Facts:

Asthenosphere (extra credit)

Thickness: _____

Temperature Range: _____

State (Solid, Liquid, Gas): _____

Composition (what's it made out of): _____

Notes/Interesting Facts:

Mantle

Thickness: _____

Temperature Range: _____

State (Solid, Liquid, Gas): _____

Composition (what's it made out of): _____

Notes/Interesting Facts:

Outer Core

Thickness: _____

Temperature Range: _____

State (Solid, Liquid, Gas): _____

Composition (what's it made out of): _____

Notes/Interesting Facts:

Inner Core

Thickness: _____

Temperature Range: _____

State (Solid, Liquid, Gas): _____

Composition (what's it made out of): _____

Notes/Interesting Facts:

Project Planner Green = done in class, Red = done at home

I know that my project is due **Thursday April 11**, and that the **model and labels are to be done at home**.

1. Here are the materials I think I will use:

Materials I have

Materials I need to get

Timeline Checklist

Check when Done	Due Date	Description
<input type="checkbox"/>	3/21	Signed Project paper due
<input type="checkbox"/>	3/26	Layers of the Earth Research Complete
<input type="checkbox"/>	3/26 - 4/3	Decide on materials to use for Model
<input type="checkbox"/>		Scaling Calculations
<input type="checkbox"/>	4/3 - 4/10	Build Model at Home
		Make Labels and Research Key
	Thursday 4/11	Project due in class for presentation

2. I think the model will take me about _____ hours to complete.

3. Please share anything below that you are concerned/worried about with this project

Scale Model Calculation

This will be done **IN CLASS**

1. Practice - Eiffel Tower model

Height of real tower = **300 m**

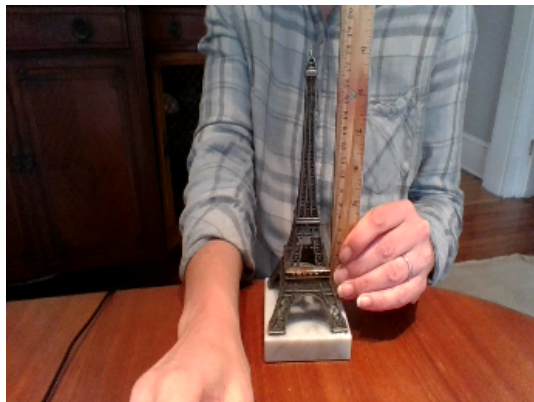
divided by

Height of model = _____ cm

Scale: 1 cm = _____ m

So **1 cm** of the tower model

represents _____ **meters** of the real Eiffel Tower.



2. Now let's do the same thing for your model of the Earth Layers.

Radius of the Earth = **6,371 km**

divided by

Radius or height of **your** model _____ cm (measure in cm)

Use radius (**from crust to the center**) if your model is like a whole pizza.

Use the entire height/width if your model is like a pizza slice.

$$6,371 / \text{_____} (\text{height of your model}) = \text{_____}$$

Scale: 1 cm = _____ km in your model

3. Calculate each layer's thickness for your model* by dividing the thickness of the layer (from your research) by what 1 cm equals in your scale (#2 above).

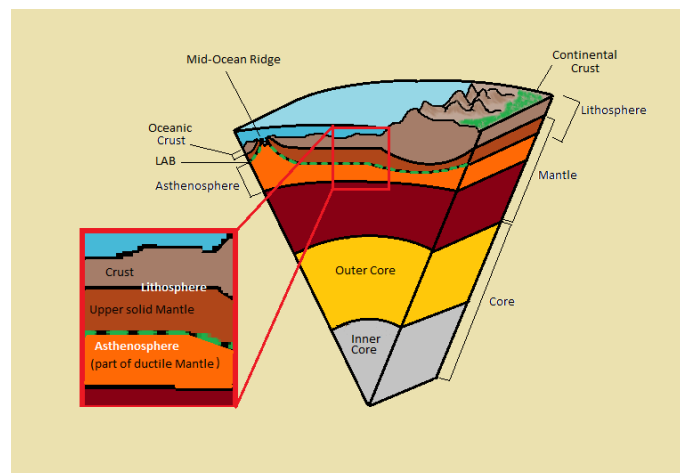
Layer name	Actual thickness (km) / your Scale (km)	Model Layer Size (cm)
Crust	30 km / _____	
Mantle	_____ / _____	
Outer Core	_____ / _____	
Inner Core*	_____ / _____	

* Decide if you are building from the center of the earth out (like a box or a vase) or showing the whole earth sliced in $\frac{1}{2}$ (wood circle, cake). If you are showing the whole earth cut in $\frac{1}{2}$, then the inner core thickness needs to be **doubled** so it appears as a circle.

This image shows a whole circle



This image shows a cut out from the center of the earth to the crust



'S EARTH PROJECT SCORING GUIDE

Describe what the project is made out of: _____

Scorer's name	1 Beginning 2 Approaching	3 Meeting 75-89%	4 Exceeding 90%-100%
3D Model & labels (peer score) _____/12 <small>Meet = 9-10.5</small>		<input type="checkbox"/> Model is 3D (not flat) <input type="checkbox"/> 4 main layers clearly shown <input type="checkbox"/> All 7 layers are labeled correctly <input type="checkbox"/> Can tell oceanic from continental crust <input type="checkbox"/> Shows time & effort	<input type="checkbox"/> Recycled or reusable material used <input type="checkbox"/> Shows a great deal of time & effort <input type="checkbox"/> Shows other properties
Research Notes & Information Key (Ms. Oakley scores) _____/10 <small>Meet = 7-8.75</small>		<input type="checkbox"/> Research notes are complete <input type="checkbox"/> Metric units used <input type="checkbox"/> Information Key is complete (thickness, state, composition & 2 interesting facts)	<input type="checkbox"/> Additional facts/ information are included <input type="checkbox"/> Lithosphere & asthenosphere researched
Scaling (Ms. Oakley scores) _____/5 <small>Meet = 3.75 - 4.25</small>		<input type="checkbox"/> Scaling calculation page is complete & mostly accurate <input type="checkbox"/> Model is mostly built to scale <input type="checkbox"/> Scale is shown on the project	<input type="checkbox"/> Scaling is extremely precise & accurate
Self Assessment (Ms. Oakley scores) _____/3 <small>Meet = 2.25 - 2.5</small>		<input type="checkbox"/> Reflection on work for this project is supported by evidence & thoughtful	

Teacher notes & score:

Total Points = _____ 30 = _____%

IN CLASS PROJECT REFLECTION

Answer in **full sentences** and support your answers with **evidence** from your project.

1. Explain the steps of what you did with your model to show the thickness of each layer:

2. Circle any other properties you tried to show in your model and explain/give an example of how you showed it? Temperature Shape Composition Density State of matter

3. All models have limitations - choose 1 limitation (something you did not show) in your model from the list in #2 and give a specific idea of how you **could** show that in a model. You can think about color and materials used - what could you add or change or do that would show or represent this property?
