I. Reading & writing assignment:

Read the sections from the following text books.

Write your understanding, at least 1 full page length summary, for each of the four parts.

New Theory of the Earth by D. L. Anderson

    i.   Planetary perspective, pages 1- 11.

    ii.   Let's take it from the top:

        the crust and upper mantle, pages 92-108.

    iii. The bowels of the Earth, pages 116- 123.

Geodynamics by D. L. Turcotte and G. Schubert

    iv. Heat transfer, pages 132-138.

II. Answer the following review questions.

1. What are the fundamental questions unanswered in terrestrial heat for geoscience?

2. What is the purpose of studying the HPE concentration determination in deep interior of the Earth?

3. Why are new techniques needed to determine the concentrations of HPE ?

4. What are the predominant radiogenic HPE and their radioactive isotopes?

II.

5. Find the Half lives of the following long lived isotopes.

Express them in units of billion years.

Suggested reading: Table of isotopes, by C. M. Lederer and V. S. Shirley

Chart of Nuclides by Knolls or GE.

Rubidium-87

Indium-115

Lanthanum-138

Neodymium-144

Samarium-147

Gadolinium-152

Lutetium-176

Hafnium-174

Rhenium-187

Platinum-190

Platinum-192

Explain the characteristics of the elements, such as refractory …

Do the above radioactive isotopes contribute to heat generation in the Earth?

III. Calculate the radiogenic heat released in different regions of the Earth. using the heat release Table (Turcotte and Schubert) and Fiorentini, and Earth's characteristics of this presentation.

IV. What are the sources of terrestrial heat?

12.091 Basics of Analysis with Antineutrinos from Heat Producing Elements – K, U, Th in the Earth
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