
THIRD TEST – STUDY SHEET

THE THIRD TEST

Part 1 – multiple choice or matching (40%)

Part 2 – short answer (30%)

Part 3 – long answer (30%)

Below is a review of the lecture material covered in the last section of the course. Remember, although I will not *specifically* ask questions on this exam regarding material in the first section, much of our understanding of the geological sciences is based in our understanding of how the modern Earth works, and the accumulation of tools that allow us to interpret ancient environments. The review sheet consists of a series of questions regarding the lecture material. Most of these questions can be answered in a couple of words or phrases, but for the purpose of studying, it would be helpful if you try to answer them in as much detail as possible. You might try to answer the questions, first, without looking at any notes, then move to your textbook and notes to help you answer them in more detail. Remember, you are not required to turn in any answers – this is for your own benefit in studying.

(hint) Do you know your geologic time scale? See Figure 1-13 in your textbook. Also make sure to know the relative order of evolutionary events in the Early Earth (see chapter facings for chapters 11, 12, 13).

SECTION 7 – THE EARLY EARTH (REVIEW CHAPTER 11)

- What is planetary differentiation, and how has it affected Earth structure?
- What are some early sources of heat within the early Earth, and what was its affect on planetary differentiation?
- What was the Earth's earliest atmosphere composed of, and where did this material come from?
- What is the source of dissolved chemicals in the Earth's earliest oceans?
- What may have been the sources for nutrients, water, and energy in the earliest Earth ecosystem?
- Explain the process, product, importance, and any unresolved issues regarding Miller-Urey's experiments on the origin of life.
- In what form is our earliest evidence for life on Earth?
- What might the earliest ecosystem have looked like? Do we have evidence for this? What?
- Is it likely that life has occurred (or does occur)on other planets? Support your answer with info from class regarding the requirements of life.

SECTION 8 – TOWARDS A MODERN ECOSYSTEM (REVIEW CHAPTER 12)

- What does the presence of prokaryotic fossils tell us about oxygen in the Earth's biosphere? Eukaryotes?
- Explain, in detail, the evidence for biospheric anoxia in Archean.
- What is the source of oxygen in the Earth's biosphere?
- What role does global tectonics play in the oxygenation of the Earth's biosphere?
- Can you diagram/explain the evolution of eukaryotes by way of symbiosis with different bacteria?
- What lines of evidence are used to determine that eukaryotes derive from endosymbiosis?
- What lines of evidence suggest that ediacara fossils were indeed animals?
- Name 4 lines of evidence that suggest the existence of animal life before the Cambrian explosion.
- What is the importance of Tommotian fauna in terms of understanding biomineralization?
- What might have been the driving forces behind biomineralization?

SECTION 9 – EARLY PALEOZOIC LIFE AND ENVIRONMENTS (REVIEW CHAPTER 10, 13)

- Describe how an expansion of ecologic niches might result in a diversity of new animal morphologies.
- Explain, in detail, how biomineralization may have resulted from increased oxygenation of the Earth's biosphere.
- Name three advantages to biomineralization and explain how this may have affected animal evolution.
- What may have been a driving factor in the diversification of animal life in the Ordovician? describe in detail.
- Describe, in detail, the effect of increased biospheric oxygen on the exploitation of the seafloor.
- Why would oxygen content of sediments inhibit bioturbation (the making of trace fossils)?
- How might the end Ordovician extinctions be explained as resulting from climatic change?
- Is a shift from aragonite to calcite mineralogy always indicative of global cooling? Why?
- What other environmental parameters affect the mineralogy of carbonate-shelled organisms?