

Test Three Preview

AST 101 Solar System

As before, your guide is the blue Course Outline. As you study for the test, you may find a number of the subjects mentioned below only in the textbook. The material for this test is more at the memorization level than the material covered in the previous tests. It may be easier to learn, but, between what is covered in class and textbook, there may be more of it.

In section E., regarding the Extra-solar planets, what are they, what are their orbits like, so far, what is the main surprise they have given us and what explanation given for these intriguing observations? Be able to describe the selection effect involved in discovering exoplanets.

A general remark on Basic Data: Several are given for each planet. Sometimes a specific property is distinctive for a particular planet and you should note its value. But the general rule is to know the size and distance values for all the planets, at the very least. These are the numbers that quantify your visualization of the Solar System. Quantitative visualization is an aspect of scientific understanding of physical reality.

Unit VIII., Section A, The Earth

Basic Data.

The age of the Earth

The 4 sources of energy that made the early Earth hot

The internal structure of the Earth. Know related terms plate tectonics, seismology, gravitational differentiation.

The 4 stages in planetary/satellite development. The 3 fundamental rock types of the crust

The composition of the atmosphere at first and now; where did the oxygen come from?

Global warming essential points: lines of evidence + meaning of “hockey stick” diagram

Regarding the origin and subsequent evolution of life on Earth know the following terms:

Snowball Earth, Cambrian Explosion: DNA, Natural Selection, Stromatalite The significance of the Miller-Urey experiment Possible places for life in our Solar System (You may skip the section “Life in Other Planetary Systems”

The Moon: Basic Data. Be able to describe the maria and highlands, as well as how the maria developed. Its internal structure and why maria appear only on the Moon’s near side. Its origin, specifically, the interplay between fact and theory—how the evidence has continually effected scientist’s thinking. Four hypotheses explaining the origin of the moon were presented. Only one stands tall as a theory, the theory accepted now. Note some evidence that has refuted the other three. Particularly note how the moon’s orbital plane bears on (supports, refutes, inconclusive?) each of the

4 lunar origin hypotheses. You need to know the names of these hypotheses, as well be able to describe them.

For Mercury, I have only a few helpful hints; little will be asked of it on the test. So I'll just list some major points to be sure to note re Mercury: Its density and implications for its internal structure. The resonance between its orbital and rotational periods. Surface appearance, in general. Scarps and what they imply for Mercury's early history. How has Mercury provided us some surprise?

Venus reminders are adequate on the Course Outline, except I want to add that you should come away from this study knowing what is peculiar about Venus's surface. Why does this planet, having basics stats most like our Earth, not have abundant life?) General Hint: All told, Earth will get more questions than the others, followed by the Moon, then Venus, then Mercury.

Revised Nov 2008