STUDY QUESTIONS

1) In the discussion of Earth’s shape we proposed a specific hypothesis. What was the hypothesis and why was it worded the way it was.
2) How many local observations were required to test this hypothesis?
3) Describe the experimental setup at each site.
4) Why was it important that the experiment be conducted at noon on the equinox?
5) Why were all the places measured at the same moment?
6) What did we measure at each place, and why?
7) What difference did we observe at each place?
8) Describe how each side of our small triangles corresponds to the larger triangle we were really interested in.
9) What did the (shadow length/stick length) ratio tell us?
10) When we had the experimental results from both of the northerly localities and compared them, what did we find and what did that imply?
11) What conclusion did we reach about our hypothesis. **Word the answer carefully.**
12) In testing this hypothesis, or any hypothesis (like the tentative answers to a crossword) how do we generally test the hypothesis?
13) How did Eratosthenes use an experiment like ours to estimate the Earth’s circumference?
14) How did his estimate compare to a modern one?
15) Once we had the Earth’s circumference, what did we use it for? Why did we care?
16) We briefly discussed Newton, whose math was a lot more complex (but only because he had tons more units to consider – mass, time, and acceleration units, not just degrees and distance). What did we learn from Professor Newton? Why did we care?
17) After reviewing the various rock types that commonly occur in Egypt, and considering their characteristics, we found a curious observation that needs explaining. What?
18) What is the logical hypothesis to explain this discrepancy
19) How many wells have been drilled to test this idea?
20) How can we determine the interior density of Earth?
21) Explain “elastic rebound”.
22) Tell what the two major types of **surface waves** are and briefly describe their motions and effects on buildings and other surface structures.
23) Tell the two major types of **body waves** and briefly describe their motion.
24) Tell two differences in the behavior of p- and s-waves as they propagate.
25) When a wave of any type reaches a density discontinuity, two things happen to the energy. What is a density discontinuity and what are the two things that happen?
26) When we draw a wave path of a body wave, we show it curved and concave toward the nearest surface. Why?
27) A wave path in a refracted wave is shown to change direction of propagation. If we know the density of the upper layer and the angle of refraction, what can we determine?
28) Briefly explain how a seismograph operates.
29) What are the focus and the epicenter of an earthquake?
30) How do we locate an epicenter? (Describe each step carefully.)
31) What is the Moho and, **very** simply, how was it discovered?
32) We know that the upper mantle has a density of 3.5 or so. How?
33) What is the G-discontinuity and how was it discovered?
34) What is the composition of continental crust and how do we know?
35) What is the composition of the oceanic crust and how do we know?
36) What is the composition of the mantle and how do we know?
37) What is the composition of the core and how do we know?
38) How do we know the core is molten?
39) Why do we think that the inner core is solid?
40) What are the lithosphere and asthenosphere?
41) Why does the continental crust stand higher than the oceanic crust?
42) What are mountain roots?
43) Where are most epicenters located?
44) What depths of foci do we find at ridges, transforms and trenches?
45) What is a Benioff zone (or Benioff-Wadati zone)?
46) What is the basis for the Richter scale? OR What is the difference between a 4 and a 5 on the Richter scale.
47) How much **energy** difference is there between a 5 and a 6 (or a 7 and an 8, or a 3.3 and a 4.3)?
48) Identify various plate margin types on a map or a cross-section.
49) Identify the parts of an ocean and the adjacent continental margins. Be able to do it for all three types and to identify which type is which (Atlantic, Japanese, and Andean).
50) Reproduce some part of the time scale in the correct order. Cambrian-Ordovician-Silurian is not correct. This is:

   Silurian

   Ordovician

   Cambrian