Chapter 9

Review Problems

2. What is differentiation, and how did it lead to the core-mantle-crust structures of the terrestrial worlds?

3. What do we mean by the lithosphere? How does lithospheric thickness vary among the five terrestrial worlds?

4. Summarize the process by which planetary interiors get hot and cool off. Why do large planets retain internal heat longer than smaller planets?

5. Why does Earth have a global magnetic field? Why don’t the other terrestrial worlds have similarly strong magnetic fields?

8. Why is the Moon so much more heavily cratered than Earth? Explain how crater counts tell us the age of a surface?

9. Summarize the ways in which a terrestrial world’s size, distance from the Sun, and rotation rate each affect its relative level of impact cratering, volcanism, tectonics, and erosion.

15. What evidence tells us that Venus was “repaved” about 750 million years ago? What might account for the lack of plate tectonics on Venus?

Quick Quiz

Choose the best answer to each of the following. Explain your reasoning with one or more complete sentences.

32. In general, what kind of planet would you expect to have the thickest lithosphere?
   (a) a large planet
   (b) a small planet
   (c) a planet far from the Sun

33. Which of a planet’s fundamental properties has the greatest effect on its level of volcanic and tectonic activity?
   (a) size
   (b) distance from the Sun
   (c) rotation rate

35. Which describes our understanding of flowing water on Mars?
   (a) It was never important.
   (b) It was important once, but no longer.
   (c) It is a major process on the Martian surface today.
38. On how many of the five terrestrial worlds has erosion been an important process? (Be sure that you explain why erosion is important on this many worlds and not more.)
(a) one
(b) two
(c) three or more