12.4 CHECK YOUR Understanding

1. Create a mnemonic to help you remember the names and the order of the planets.
2. Why are the first four planets called terrestrial planets? Why are they also called inner planets?
3. In a table, organize the features that the terrestrial planets share.
4. Describe how our planet is unique in the solar system.
5. List the planets with little or no atmosphere.
6. How does the presence of an atmosphere affect the conditions and features on the surface of a planet (Figure 12)?

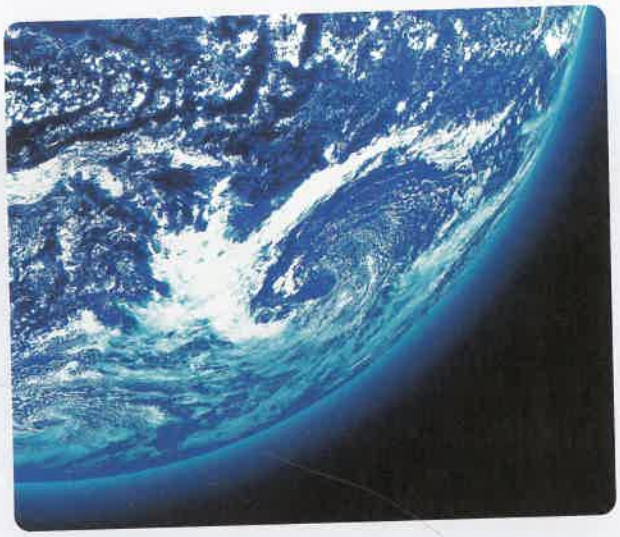

Figure 12

7. Why does Earth have so few visible craters?
8. Mercury is much closer to the Sun than Earth. With this in mind, account for Mercury's much colder nighttime surface temperature of −173 °C. Hint: Refer to Table 2 on page 391.
9. Why do some scientists believe that life may have existed on Mars?
10. In your own words, describe how astronomers reasoned the existence of Neptune before they could see it.
11. Describe one effect of Earth's magnetic field.
12. (a) What phenomena are visible in Figure 13?
    (b) What causes these phenomena?

Figure 13

13. Write your own theory to explain Uranus's rotation in the opposite direction. You don't need direct evidence to support your theory, but you should provide a reason why you think it might be true.
14. Identify and describe the three main categories of trans-Neptunian objects.
15. Using the distances in astronomical units, write three statements that compare the relative distances between pairs of planets or objects. For example, Saturn is approximately 9.5 times farther from the Sun than Earth.
16. Why do the gas giants have more moons than the terrestrial planets?
17. In a table, organize the properties that the gas giants share.
18. Is there a relationship between a planet's density and its distance to the Sun? Try to explain this relationship using the currently accepted theory for the formation of the solar system.
19. (a) List three criteria that could be used to distinguish the terrestrial planets from the gas giants. (Hint: See Table 2 on page 391.)
    (b) List two properties of planets that relate to their distance from the Sun.