Chapter Review

1. nebula
2. mantle
3. Sample answer: A nebula is a large cloud of gas and dust in interstellar space. The solar nebula is the cloud of gas and dust that formed our solar system.
4. Sample answer: The crust is the outermost layer of Earth. The mantle is the layer of rock between Earth's crust and core.
5. Sample answer: Rotation is the spin of a body on its axis. Revolution is the motion of a body that travels around another body in space.
6. Sample answer: Nuclear fusion is the combination of the nuclei of small atoms to form a large nucleus. A sunspot is a dark area of the photosphere of the sun that is cooler than the surrounding areas and that has a strong magnetic field.
7. C
8. B
9. C
10. D
11. C
12. C
13. B
14. C
15. A
16. Sample answer: A sunspot is a dark area of the photosphere of the sun that is cooler than the surrounding areas and that has a strong magnetic field. A solar flare is a region of extremely high temperature and brightness that develops on the sun's surface.
17. Sample answer: Scientists think that the oceans formed during Earth's second atmosphere, when the Earth was cool enough for rain to fall and stay on the surface. After millions of years of rainfall, water began to cover Earth, and formed a global ocean. The continents formed after the first few hundred million years and are made up of rocks that have melted and cooled many times.
18. Sample answer: Pressure and gravity may have become unbalanced in the solar nebula because of an external force such as a collision of the solar nebula with another nebula or from a nearby exploding star. This type of force, was strong enough to overcome the pressure of the nebula and trigger its collapse.
19. Sample answer: Nuclear fusion occurs when the nuclei of small atoms combine to form a larger nucleus. In the core of the sun, the temperature and pressure are very high. Therefore, hydrogen nuclei, which would normally repel each other, have enough energy to overcome this repulsive force and fuse into helium. This fusion process generates the sun's energy.
20. An answer to this exercise can be found at the end of the Teacher Edition.
21. Sample answer: Kepler could describe planetary orbits, but he could not explain why planets stay in their orbits. Newton's law of gravitation explained why the planets orbit the sun.
22. Sample answer: The ozone layer shielded Earth from most of the sun's harmful UV radiation and allowed more-complex life-forms to develop. If the ozone layer is damaged, some types of organisms could be threatened.
23. Sample answer: Kepler's first law of motion states that a planet revolves around the sun in an elliptical orbit. Kepler's second law of motion states that planets move faster when they are closer to the sun and slower when they are farther from the sun. Kepler's third law explains the relationship between the period of a planet's revolution and its semimajor axis. Planets that are farther from the sun have a longer period of revolution.
24. Kepler's first law of motion
25. Sample answer: The equation supports the law by allowing us to determine distances between a planet and the sun as the planet orbits the sun.
26. major axis

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