Chapter Review

1. Sample answer: Osmosis is the diffusion of water through a semipermeable membrane.

2. Sample answer: Exocytosis is the process cells use to remove large particles; endocytosis is the process cells use to move large particles into a cell.

3. photosynthesis

4. cellular respiration

5. Cytokinesis is the division of just the cytoplasm. Mitosis is the process in eukaryotic cells in which the nuclear material splits to form two new nuclei.

6. Active transport requires the cell to use energy to move substances. Passive transport does not require the cell to use any energy.

7. Cellular respiration releases stored energyby using oxygen. Fermentation releases stored energy without using oxygen.

8. C

9. A

10. D

11. C

12. Endocytosis and exocytosis are examples of active transport. In both processes the cell must change shape, wrap around a particle, and make other movements that require the cell to use energy.

13. Chloroplasts are needed for photosyn nuclear membrane dissolves, and the thesis. Cellular respiration requires mitochondria.

14. The first stage is cell growth and copying of DNA (duplication.) The second stage is mitosis, which involves separating the duplicated chromosomes. The third stage is cytokinesis (cell division), which results in two separate, identical cells.

15. An answer to this exercise can be found at the end of the Teacher Edition.

16. The plant on the left was given pure water. The plant on the right was given salt water. Osmosis occurred in both plants. In the plant on the left, water moved into the plant because the concentration of water was lower in the plant than in the soil. So, the plant on the left did not wilt. In the plant on the right, the water in the plant moved into the soil, where the concentration of water was lower. The concentration of water in the soil was lower becausethe water contained salt. As a result, the plant on the right wilted.

17. When there is plenty of oxygen, the cells can get energy from cellular respiration. When there is a lack of oxygen, the cell must use fermentation, which doesn’t produce as much energy. For fermentation to produce more energy, more food would be required.

18. a. The cell is a eukaryotic cell and will go through mitosis and cytokinesis. Prokaryotic cells have only one chro- mosome. b. Each new cell will receive a copy of each chromosome, so each new cell will have 10 chromosomes.

19. The cell is eukaryotic because it shows chromatids held together at a centromere. Prokaryotic cells do not have chromatids.

20. The cell is in mitosis because the chromosomes have already duplicated.

21. There are 12 chromatids. There are three pairs of homologous chromosomes.

22. There will be six chromosomes in each new cell.