Interactive Review

Encourage students to go to ClassZone.com for a detailed review of each section, including visuals and vocabulary practice.

Unit Resource Book, Vocabulary Practice, pp. 27–30

3.1 Cell Theory
Cells are the basic unit of life. The contributions of many scientists led to the discovery of cells and the development of the cell theory. The cell theory states that all organisms are made of cells, all cells are produced by other living cells, and the cell is the most basic unit of life.

3.2 Cell Organelles
Eukaryotic cells share many similarities. They have a nucleus and other membrane-bound organelles that perform specialized tasks within the cell. Many of these organelles are involved in making proteins. Plant and animal cells share many of the same types of organelles, but both also have organelles that are specific to the cells' unique functions.

3.3 Cell Membrane
The cell membrane is a barrier that separates a cell from the external environment. It is made of a double layer of phospholipids and a variety of embedded molecules. Some of these molecules act as signals; others act as receptors. The membrane is selectively permeable, allowing some but not all materials to cross.

3.4 Diffusion and Osmosis
Materials move across membranes because of concentration differences. Diffusion is the movement of molecules in a fluid or gas from a region of higher concentration to a region of lower concentration. Osmosis is the diffusion of water. Net water movement into or out of a cell depends on the concentration of the surrounding solution.

3.5 Active Transport, Endocytosis, and Exocytosis
Cells use energy to transport materials that cannot diffuse across a membrane. Active transport is the movement of molecules across a membrane from a region of lower concentration to a region of higher concentration—against a concentration gradient. The processes of endocytosis and exocytosis move substances in vesicles and also require energy.

Reviewing Vocabulary
1. cell membrane
2. rough endoplasmic reticulum (also accept ribosomes)
3. nucleus
4. centriole
5. mitochondrion
6. Golgi apparatus
7. cytoskeleton
8. endoplasmic reticulum (smooth)
9. Eukaryotic and prokaryotic cells are surrounded by a cell membrane. Only eukaryotic cells have a nucleus and membrane-bound organelles.
10. Both the cell wall and cell membrane surround the cell. The cell wall is a rigid structure, while the cell membrane is not.
11. Both diffusion and facilitated diffusion allow materials to cross a semipermeable membrane without the use of energy. In simple diffusion, a molecule capable of crossing the cell membrane will pass through on its own. Facilitated diffusion requires a transport protein and allows only specific types of molecules to pass.
12. An organelle carries out a specific function or set of functions within a cell.
13. Prokaryotes do not have a nucleus, or “nut.” Eukaryotes do have a nucleus.
**Reviewing Vocabulary**

**Labeling Diagrams**
In your notebook, write the vocabulary term that matches each numbered item below.

1. __________
2. __________
3. __________
4. __________
5. __________
6. __________
7. __________
8. __________

**Compare and Contrast**
Describe one similarity and one difference between the two terms in each of the following pairs.

9. eukaryotic, prokaryotic
10. cell wall, cell membrane
11. diffusion, facilitated diffusion

**Greek and Latin Word Origins**
12. The word *organelle* is the diminutive, or “tiny,” form of the Latin word for organs of the body. How is an organelle like a tiny organ?
13. The Greek word *karuon* means “nut.” The prefix *pro-* means “before,” and the prefix *eu-* means “true.” Thus, *prokaryote* means “before nut” and *eukaryote* means “true nut.” How do these meanings relate to structural differences between these two cell types?

**Reviewing MAIN IDEAS**

14. According to the cell theory, what is required for an object to be considered alive?

15. What role do membranes play in prokaryotic cells? in eukaryotic cells?

16. How do the cytoskeleton and the cytoplasm contribute to a cell’s shape?

17. You know that many organelles are involved in protein production. Briefly explain where proteins are made, modified, and packaged within a cell.

18. Explain what mitochondria do and why evidence suggests that they might have descended from free-living prokaryotes in the evolutionary past.

19. If you were looking through a microscope at an unknown cell, how might you determine whether it was a plant cell or an animal cell?

20. Cells are surrounded by a watery fluid, and they contain watery cytoplasm. Explain how the structure of the lipid bilayer is related to these two watery environments.

21. How are cells able to respond to signal molecules that are too large to enter the cytoplasm?

22. How do transport proteins make it easier for certain molecules to diffuse across a membrane?

23. Under what conditions would a molecule need to be actively transported across a membrane?

24. Do you think that endocytosis and exocytosis can occur within the same cell? Explain your reasoning.

16. The cytoskeleton is made up of a network of proteins that gives the cell a strong structure while constantly changing in response to the cell’s changing needs. The cytoplasm fills in the areas around the cytoskeleton, keeping the membrane from collapsing onto the cytoskeleton.

17. The nucleus has the DNA, which codes for proteins, and the nucleolus, which is where ribosomes are made. Ribosomes exit through nuclear pores, and some associate with the ER. Proteins made on the ribosomes may undergo modification in the ER. From the ER, they may be packaged into vesicles and sent to the Golgi apparatus for further modifications. A completed protein can be stored, released into the cell for use, released to the cell membrane for use, or excreted outside of the cell.

18. Mitochondria produce chemical reactions that convert simple food molecules into energy. They are similar to prokaryotes in that they contain their own DNA but no membrane-bound organelles.

19. Look for cell walls and chloroplasts (plant cell features) or centrioles (animal cell features).

20. The polar heads of the phospholipids can form hydrogen bonds with the polar water molecules. The nonpolar tails are sandwiched inside the membrane where they can’t react with the water.

21. Membrane receptors allow large ligands to bind to the outside of the cell. The receptor then changes physically, including the part inside the cell, which triggers a response.

22. Transport proteins can form a larger opening or pore that allows them to pass.

23. When the concentration of the molecule is higher on the other side of the membrane.

24. Yes, both are needed to move substances in and out of a cell and to maintain the cell’s volume.