Name _____ Date _____ Class _____

SECTION 1-3 SECTION SUMMARY

Looking Inside Cells

Guide for Reading

- **What role do the cell membrane and nucleus play in the cell?**
- **What functions do other organelles in the cell perform?**
- **How do bacterial cells differ from plant and animal cells?**

Inside a cell are tiny structures called **organelles,** which carry out specific functions in the cell. Some organelles include the cell wall, cell membrane, and nucleus.

The **cell wall** is a rigid layer of nonliving material that surrounds plant cells. It helps protect and support a cell. Although the cell wall is stiff, many materials can pass through it.

All cells have a **cell membrane.** In cells that do not have cell walls, the cell membrane is the outside boundary that separates the cell from its environment. There are tiny openings, or pores, in the cell membrane through which materials can enter or leave the cell. **One of the cell membrane's main functions is to control what substances come into and out of a cell.**

The **nucleus** is a large, oval structure that acts as the "brain" of the cell. **You can think of the nucleus as the cell's control center, directing all of the cell's activities.** The nucleus is surrounded by a nuclear membrane. Materials pass in and out of the nucleus through small openings, or pores, in the nuclear membrane. Floating in the nucleus are thin strands called **chromatin,** which contains the genetic material, or the instructions for cell functions. The nucleus also contains the nucleolus, a structure where ribosomes are made.

The **cytoplasm** is the region between the cell membrane and the nucleus. Many cell organelles are found in the cytoplasm. **The organelles function to produce energy, build and transport needed materials, and store and recycle wastes.** Rod-shaped organelles called **mitochondria** produce energy. A maze of passageways called the **endoplasmic reticulum** carries proteins and other materials from one part of the cell to another. Small, grainlike bodies called **ribosomes** produce proteins. Collections of sacs and tubes called **Golgi bodies** distribute proteins and other materials throughout the cell. In plants and some other organisms, large, green structures called **chloroplasts** capture energy from sunlight and use it to produce food for the cell. A large sac called a **vacuole** stores food and other materials in the cell. Small, round structures called **lysosomes** break down food and recycle old cell parts.

A bacterial cell is smaller than a plant or animal cell. **While a bacterial cell does have a cell wall and a cell membrane, it does not contain a nucleus.** Organisms whose cells lack a nucleus are **prokaryotes;** those whose cells have a nucleus are **eukaryotes.** In many-celled organisms, the cells are often quite different from each other. The structure of each kind of cell is suited to the function it carries out in the organism.