Chapter 2 Section 2 Name_____
The Cell

Topics	Notes, Diagrams, Drawings

Cell shape and movement	• Cells come in many shapes and sizes:
	  • Red blood cells
	  • Nerve cell
	  • Plant cell
	• Each cell structure (shape) is unique to the cell's function

Cell membrane	• Every cell is surrounded by a protective, flexible covering that protects the inside of a cell from the outside environment • Made of two macromolecules: lipids (phospholipid) & proteins
Cell wall	• Some cells in addition to having a cell membrane have a cell wall, stiff structure OUTSIDE the cell membrane • Plant cells, fungal cells, bacteria, and some protists • Protects the cell from viruses and and other harmful organisms • Can help maintain the cell's shape and give it structural support

Cell appendages	• Are often used for movement:
	  • Flagella: long, tail-like; whips back and forth to move a cell
	  • Cilia: short, hair-like; can move a cell or molecules away from a cell

Cytoplasm and cytoskeleton	• Fluid inside of a cell that contains water, salts, and other molecules: **cytoplasm** • Cytoplasm also contains **cytoskeleton**: network on threadlike proteins joined together • Gives cell its shape and helps it move (cilia and flagella made of same proteins as cytoskeleton)

Topics	Notes, Diagrams, Drawings

Cell Types	• Prokaryotic
	  • Most are unicellular organisms
	  • Very simplistic
	  • Do not have genetic material surrounded by a membrane
	• Eukaryotic
	  • Plants, animals, fungi, protists
	  • Contain organelles (specialized structures)
	  • Are bigger than prokaryotic cells
	  • Have genetic material surrounded by a membrane

Cell organelles	• Many small structures located inside the cell • "little organs" • These tiny structures perform certain functions that keep the cell (and the organism) alive
Nucleus	• Largest organelle inside a eukaryotic cell • Directs all cell activities, contains genetic information stored in DNA • DNA is organized into chromosomes • Contains proteins and a nucleolus • Surrounding the nucleus is a **nuclear envelope** (made of a lipid membrane), which contains pores and allows molecules to leave the nucleus

Manufacturing molecules	• Proteins perform various functions in the body, and are produced on **ribosomes** in the cell
	• **Ribosomes** can be found in the **cytoplasm** or **ER (endoplasmic reticulum)**
	• **ER** spreads from the nucleus throughout the cytoplasm
	  • **Rough ER: contains ribosomes,** site of **protein** production
	  • **Smooth ER**: does **not** contain ribosomes, site of **lipid** production

Topics	Notes, Diagrams, Drawings
Processing energy	• All living things require energy to survive • This energy is produced in specialized structures called **mitochondria** • Human heart: 1,000 of mitochondria inside, leg muscle cells, liver • Energy is released during chemical reactions and energy is stored (and then converted) in a molecules called ATP and used for cell growth, cell division, cell transport
Chloroplast	• Plant cells, some protists, algae • Organelles that use light energy, water, and carbon dioxide to produce glucose (food) for the cell during photosynthesis • The sugar can then be stored and used as a fuel when needed
Processing, transporting and storing materials	• **Golgi apparatus** prepares proteins for their specific jobs, packages them into **vesicles**, and then transports them • Vesicles may contain **lysosomes**, which aid in digestion and breaking down and recycling material within a cell • **Vacuoles** store water, waste material, and food • Plant cell: water vacuole