Cornell Notes: Ch1:L1, pgs 4-7

Discovering Cells	
What are Cells?	Cells are the basic units of structure and function in living things.
Cells:	Cells are the basic units of structure and function in living things. Cells form the parts of an organism and carry out all of its functions.
Cells and Structure	Cells determine the way living things are put together.
Structure:	What it is made of and how it is put together
Cells and Function	An organism's functions are the processes that allow it to live, grow, and reproduce. It includes obtaining oxygen, food, and water and getting rid of wastes.
Function:	Processes that allow an organism to live, grow, and reproduc
What is the Cell Theory?	The cell theory is a widely accepted explanation of the relationship between cells and living things.
Microscope:	An instrument that makes small objects look larger
Theory:	A well tested and widely accepted explanation of a natural phenomenon based on many observations and experimental results
Seeing Cells	Robert Hooke was the first to see dead cells (cork). Anton van Leeuwenhoek was the first to see live cells (pond water).
What the Cell Theory Says	1. All living things are composed of cells. 2. Cells are the basic units of structure and function in living things. 3. All cells are produced from other cells.

SUMMARY:

Cornell Notes Ch1: L2

Looking Inside Cells

How Do the Parts of a Cell Work?

Each kind of cell structure has a different function within the cell.

Cell Wall	The cell wall is a rigid layer that surrounds the cells of plants. It protects and support the cell.
Cell Membrane	The cell membrane controls which substances pass into or out of the cell. All cells have cell membranes.
Nucleus	The nucleus is the cell's control center and directs all of the cell's activity.
Chromatin	Chromatin fills the nucleus and contains the information for directing the cell.
Nucleolus	Ribosomes are made in the nucleolus which is contained in the nucleus.
Ribosomes	Ribosomes produce proteins.
Organelles	Cell structures that carry out specific functions within a cell.
Organelles in the Cytoplasm	The cells organelles are contained in the cytoplasm of the cell.
Cytoplasm	Cytoplasm is a clear gel-like fluid that fills most of the cell.
Mitochondria	Mitochondria convert energy stored in food to energy the cell can use. AKA "Power house"
Endoplasmic Reticulum	ER -An organelle with a network of membranes that produces many substances.
Golgi Apparatus	Receives proteins and other newly formed materials, packages them, and delivers them throughout the cell.
Vacuoles	Large storage sac for water, wastes, and food.
Chloroplasts	Green structures that capture energy from the sun and convert it into energy the cell can use.
Lysosomes	Contain substances that break down food particles and old cell parts.

SUMMARY

Cornell Notes Ch1:L2 (cont.)

Looking inside Cells (cont)	
 How do Cells Work Together in an Organism?	 In multicellular organisms, cells are organized into tissues, organs, and organ systems.
Multicellular	Made of many cells
Unicellular	Single-celled organism
Specialized Cells Examples:	Cells perform specific functions that benefit the entire organism. One type of cell does one job, while other types of cells do other jobs. red blood cells deliver oxygen, nerve cells send information
Cells Working Together	Specialized cells = division of labor
Tissue	A group of similar cells that work together to perform a specific task
Organ	Made of different kinds of tissues that function together
Organ system	Group of organs that work together to perform a major function

SUMMARY

Cells → Tissues → Organs → Organ Systems → Organism

Cornell Notes Ch 1, L 3 pgs 22-27 Chemicals Compounds in Cells

What Are Elements and Compounds?	Substances that supply raw materials that make up your blood, bones, muscles, etc. They also take part in cell processes.
Elements Examples	Found in your body; any single element is made of only one kind of atom Oxygen (O), Hydrogen (H)
elements	a pure substance that cannot be broken down into other substances by chemical or physical means
Compounds Examples	the smallest unit of a compound is a molecule Water (H_2O), Carbon Dioxide (CO_2)
compounds	a substance made of two or more elements chemically combined in a specific ratio
What Compounds Do Cells Need?	Organic compounds that living things need are carbohydrates, lipids, proteins, nucleic acids. Water is a necessary inorganic compound.
Carbohydrates	Examples: sugar, starch (complex) Food examples: pasta, potatoes, rice, etc. Found in the cell wall (cellulose) and the membrane
Carbohydrates	energy-rich organic compounds made of the elements carbon, hydrogen, oxygen
Lipids	Examples: fats, oils, waxes Fats and oils contain more energy than carbohydrates; fat stored for later use Found in cell membrane Food examples: whole milk, ice cream, fried food, oils
lipids	compounds that are mostly made of carbon, hydrogen and some oxygen
Proteins	Foods that are high in protein include meat, dairy products, fish, nuts, and beans; Found in parts of cell membrane and part of organelles
proteins	large organic molecules made of carbon, hydrogen, oxygen, nitrogen, and, in some cases, sulfur

(cont.) Cornell Notes Ch 1, L 3 pgs 22-27 Chemicals Compounds in Cells

enzymes	a group of proteins that speed up chemical reactions in living things
Nucleic acids	Foods high in nucleic acids are red meat, shellfish, mushrooms, and peas
nucleic acids	very long organic molecules (made of carbon, oxygen, hydrogen, nitrogen, and phosphorus) that contain the instructions that cells need to carry out all the functions of life
DNA	the genetic material that carries information about an organism and is passed from generation to generation; directs cell's functions
double helix	the shape of a DNA molecule
Water and Living Things	plays many important roles in cells; examples: 1) water takes part in chemical reactions; 2) helps cells keep their shape; 3) it helps keep the temperature of cells from changing rapidly; 4) key role in carrying substances into and out of cells

Summary 1:

Summary 2:

Cornell Notes Ch 1, L 4 pgs 28-33 The Cell in Its Environment

How Do Materials Move Into and Out of Cells?	Substance that can move into and out of a cell do so means of one of two processe: passive or active transport
Importance of the Cell Membrane	Every cell is surrounded by a cell membrane which allows certain substances to enter or leave the cell; it is a double layer of lipid molecules
selectively permeable	a property of cell membranes that allows some substances to pass across it, others cannot
Diffusion and Osmosis: Forms of Passive Transport	Sometimes moving materials across the membrane requires energy. Other times, it doesn't require energy.
passive transport	the movement of dissolved materials across a cell membrane without using the cell's energy
Diffusion	molecules are always moving; as molecules continue colliding and moving apart, they become less concentrated; they spread evenly through the space
diffusion	the process by which molecules move from an area of higher concentration to an area of lower concentration
Osmosis	water molecules pass into and out of a cell across the cell membrane
osmosis	the diffusion of water across the cell membrane
Facilitated Diffusion	another form of passive transport where molecules must pass through protein channels in the cell's membrane; example: sugar, no cell energy needed
Active Transport	molecules move from a low concentration to a higher concentration through protein channels using energy; examples: calcium, potassium, sodium
active transport	the movement of materials across a cell membrane using energy
Moving Large Particles	when particles are too large to cross the membrane, like food, the cell uses endocytosis and exocytosis
endocytosis	the cell membrane changes shape and the cell engulfs the particle

exocytosis	allows large particles to leave the cell

Summary: