

Cells Unit

Essential

CE.1 - Describe that large molecules in food (such as sugar) are broken down into smaller molecules to provide energy or materials that cells may use to build large molecules.

Level 3 Description	Sugar contains C, H, and O. Chemical elements are recombined in different ways to form different products. Describes that metabolism in cells uses food to provide molecules which then undergo chemical reactions to be broken down into smaller molecules to be used to build large molecules or continued to be broken down to release energy.
Level 4 Description	Energy is stored and released by the making of bonds. Backbones are used to make amino acids, etc. that can be assembled into larger molecules. Describe catabolic reactions including hydrolysis and anabolic reactions including dehydration synthesis with organic macromolecules and how they provide the cells with the necessary components for their metabolism.

CE.2 - Describe enzymes as proteins that speed up chemical reactions in cells.

Level 3 Description	Describes enzymes as proteins that speed up chemical reactions by lowering the activation energy.
Level 4 Description	Describes enzymes as proteins that speed up chemical reactions by lowering the activation energy. Describes how the structure of the enzyme is important to its functions and factors affecting enzymes activity.

CE.3 - Compare and contrast diffusion, osmosis and active transport.

Level 3 Description	Describe and give examples of diffusion, osmosis and active transport.
Level 4 Description	Describe, give examples of, compare and contrast diffusion, osmosis, and active transport and be able to predict outcomes based on their actions. Explain how an equilibrium is established as a result of diffusion.

Supporting

CS.1 - Identify the chemical structure and importance of proteins, lipids, carbohydrates, and nucleic acids.

Level 3 Description	Identify the building blocks of each of the macromolecules, give examples, and can describe their use.
Level 4 Description	Identify the building blocks of each of the macromolecules, their chemical composition, give examples, describe differences within a major macromolecule family, and can describe their use.

CS.2 - Name and describe the structure and function of major organelles.

Level 3 Description	Name and describe the function of the major organelles: nucleus, ribosome, cytoplasm, cell wall, cell (plasma) membrane, chloroplast, mitochondria, endoplasmic reticulum, golgi apparatus, vacuoles, lysosomes.
Level 4 Description	Compare and contrast plant and animal cells. Describes multiple differences between eukaryotic and prokaryotic cells and give examples.

CS.3 - Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

Level 3 Description	Define positive and negative feedback. Maintain a living system's internal conditions within certain limits.
Level 4 Description	Use the model to predict reactions.

CS.4 - Use a model to explain the hierarchical organization of systems that provide specific functions in organisms.

Level 3 Description	Describe the hierarchical organization of multicellular organisms.
Level 4 Description	Describes how systems interact to provide specific functions and interact with others to maintain homeostasis.