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|  | **Topic: Molecules: Proteins and Nucleic Acids****Learning Objective: I can explain how sugar molecules are rearranged to form other macromolecules.** |
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| **Essential Question**: What is the structure and function of proteins and nucleic acids?  |
| **Questions:**  | What are Proteins? * Proteins are very complex! Their specific structure determines their function.
	+ Structure:
		- Contain Carbon (C), Hydrogen (H), Oxygen (O), and Nitrogen (N) + “R” group (amino group)
		- Monomer (the bricks) = Amino Acids connected by “peptide bonds”
		- Polymer (the house) = Multiple amino acids => Peptides or PROTEINS
		- Peptide bonds connect amino acids to form polypeptide chains
		- One or more polypeptide chains make up a protein
	+ Function:
		- Immune System
			* Binding of antibodies (proteins) to foreign substances
		- Transport
			* Membrane transport proteins that move substances across cell membranes
			* Hemoglobin carries oxygen, iron, and other substances through the body in your blood.
		- Muscle Contraction
			* Certain muscle fibers work together to contract or extend.
		- Signaling
			* Hormones such as insulin regulate sugar levels in blood.
* 20 different amino acids exist

What are Nucleic Acids? * Structure:
	+ Contain elements Carbon (C), Hydrogen (H), Oxygen (O), Nitrogen (N), and Phosphorus (P)
	+ Monomer (Bricks)= Nucleotides
	+ Polymer (House)= DNA or RNA strand
* Function:
	+ Nucleic acids store and transmit hereditary information
	+ Located in the nucleus (DNA) and cytoplasm (RNA)
	+ Genes
		- Are the units of inheritance
		- Program the sequence of amino acids (monomers) which create genes
		- Programs your physical characteristics (like hair or eye color)
* Two Kinds of Nucleic Acids
	+ DNA (Deoxyribonucleic acid)
		- double stranded
		- Shaped like double helix (looks like a twisted ladder)
		- can self-replicate
		- makes up genes which code for proteins is passed from one generation to another
	+ RNA (Ribonucleic acid)
		- single stranded
		- functions in actual synthesis (creation) of proteins coded for by DNA

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| DNA | RNA |

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