

Unit # - 1 – Molecules of Life (2 weeks)

Standards Addressed	Student Learning Objectives for this Unit	Content Skills and Knowledge	Learning Activities and Instructional Strategies
<p>NSES Standards: Life Science Science as Inquiry Science & Technology History & Nature of Science</p> <p>PA STEE Standards: 3.2.10.A (sci. k) 3.2.10.B (app k) 3.2.10 C (meth) 3.3.10.A (liv frms) 3.3.10 B (str/fnc) 3.3.10.C (inherit) 3.3.10.D (evo) 3.6.10.A (biotech) 3.7.10.A (tools) 3.8.10 C (imp)</p> <p>1.2 read crit 1.4 writing 1.8 presentation</p> <p>2.2 comp/estimation 2.3 measurement/est 2.5 prob solving 2.6 data analysis</p>	<p>Students will understand:</p> <ul style="list-style-type: none"> ❑ The particles that make up atoms are protons, neutrons, and electrons. ❑ The main types of chemical bonds are covalent and ionic. ❑ The water molecule is polar, because there is an uneven distribution of electrons between the oxygen and hydrogen atoms. ❑ The pH scale and its' relationship to living systems. ❑ Four groups of organic compounds found in living things are carbohydrates, lipids, nucleic acids, and proteins. <ul style="list-style-type: none"> ○ Carbohydrates are the main source of energy in living things. ○ Lipids can be used to store energy and form membranes ○ Nucleic Acids store and transmit genetic information. ○ Proteins control cell processes and rates of reactions. ❑ Enzymes speed up chemical reactions that take place in cells. 	<p>Knowledge</p> <ul style="list-style-type: none"> ❑ Nature of Matter <ul style="list-style-type: none"> ○ Atom, nucleus, electron, element, compound, ionic bond, covalent bond. ❑ Properties of Water <ul style="list-style-type: none"> ○ Cohesion, adhesion, mixture, solution, solute, solvent, suspension, pH scale, acid, base, buffer. ❑ Carbon Compounds <ul style="list-style-type: none"> ○ Monomer, Polymer, carbohydrate, monosaccharide, polysaccharide, lipid, nucleic acid, nucleotide, ribonucleic acid, DNA, protein, amino acid. ❑ Chemical Reactions <ul style="list-style-type: none"> ○ Chemical reaction, reactant, product, activation energy, catalyst, enzyme, substrate. <p>Skills</p> <ul style="list-style-type: none"> ▪ Be able to use models to depict molecular structure. ▪ Test various organic molecules with indicators. ▪ Use various tools to test the relative strengths of solutions (pH) 	<p>Labs or Demonstrations: Identifying Organic Compounds in Foods Exploring the Role of Biological Catalysts</p> <p>Readings: Carbon Compounds(H) Molecules of Life (H)</p> <p>Worksheets: Water and Enzymes (h)</p> <p>Technology Links</p> <p>Cell “learning tools” - Contains many Molecule of Life references http://www.learningscience.org/lsc3acell.htm</p>

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Unit Modifications

- ❑ Carbon Compounds (Active Reading)
- ❑ Molecules of Life (Active Reading)
- ❑ Chemistry of Life (Vocabulary Review)

Unit Enrichments

- ❑ Measuring the Activity of Enzymes Detergents (Datasheets)
- ❑ Identifying Organic Compounds in Food (Datasheets)
- ❑ Analyzing Information/Interpreting Graphs (Science Skills)

Suggested Assessment Techniques for Unit

Core 1: Protein Synthesis: Replication, Transcription, and Translation

Core 2: The Origin of Eukaryotic Cells

Core 3: Core Concepts Assessment: Final Exam

Materials/Technology for Unit

- ❑ [Cell Biology Animations](#)