



## Mattawan Consolidated Schools

### AP Biology 11/12 Essential Standards Chart

Standard Description	Example Rigor	Prerequisite Skills	Common Assessment	When Taught?	Extension Standards
What is the essential standard to be learned? Describe in student friendly vocabulary.	What does proficient look like? Provide an example and/or description.	What prior knowledge, skills, and/or vocabulary is/are needed for a student to master this standard?	What assessments will be used to measure student mastery?	When will this standard be taught?	What will we do when students have learned the essential standard(s)?
Student can describe the impact of fitness on an ecosystem.	<ul style="list-style-type: none"> <li>- Student can describe how genetic variation benefits a population</li> <li>- Student can describe how adaptations increase fitness in an organism.</li> <li>- Student can apply fitness to the competitive exclusion principle.</li> </ul>	<ul style="list-style-type: none"> <li>- Feeding relationships (food webs, chains, pyramids)</li> <li>- Energy transfer</li> </ul>	Unit 1 exam  Unit 1 quiz	Unit 1 (Chs. 52, 54-56)	<ul style="list-style-type: none"> <li>- Biomagnification</li> <li>- Matter cycling</li> <li>- Effect on specific ecosystems (terrestrial and aquatic biomes)</li> <li>- Dissolved oxygen lab</li> </ul>
Student can describe how individual and social behaviors impact fitness of a population.	<ul style="list-style-type: none"> <li>- Student can describe the differences in individual, social, and learned behaviors.</li> <li>- Student can describe the origin</li> </ul>	<ul style="list-style-type: none"> <li>- Population dynamics</li> <li>- Inheritance through genetic material</li> </ul>	Unit 2 test  Animal Behavior Pill Bug Lab and report  Bess Beetle lab and report	Unit 2 (Chs. 51 and 53)	<ul style="list-style-type: none"> <li>- Types of population growth (Type 1, 2, 3, K-selected individuals, r-selected individuals)</li> <li>- Age structure diagram analysis</li> </ul>

	and evolution of behavior as it relates to fitness.				
Student can describe the complex structure and function of biomolecules necessary for survival.	<ul style="list-style-type: none"> <li>- Student can describe the specific bonds formed between monomers of lipids, carbohydrates, nucleic acids, and proteins.</li> <li>- Student can describe the function of each macromolecule <i>in depth</i>.</li> </ul>	<ul style="list-style-type: none"> <li>- Chemistry basics (subatomic particles, bonding)</li> <li>- Polar and nonpolar covalent bonding</li> <li>- Properties of water</li> <li>- Monomers and polymers of biomolecules</li> <li>- Hydrolysis and condensation/dehydration synthesis</li> <li>- Enzymes</li> </ul>	<p>Unit 3 Quiz</p> <p>Unit 3 Test</p> <p>Unit 3 Macromolecule project</p>	Unit 3 (Chs. 2-5)	<ul style="list-style-type: none"> <li>- Specific examples of monomers and polymers of each biomolecule</li> <li>- Protein conformation</li> </ul>
Student can describe the complex structure and function of the lipid bilayer.	<ul style="list-style-type: none"> <li>- Student can describe the lipid, protein, and carbohydrate components of the plasma membrane.</li> <li>- Student can describe the various forms of transport that occur across the membrane using scenario examples.</li> </ul>	<ul style="list-style-type: none"> <li>- Cell types (prokaryotic, eukaryotic, plant, animal)</li> <li>- Cell organelles and functions</li> <li>- Passive and active transport</li> </ul>	<p>Unit 4 test</p> <p>Diffusion and Osmosis Lab and Report</p>	Unit 4 (Chs. 6-7)	<ul style="list-style-type: none"> <li>- Hypotonic, hypertonic, and isotonic</li> <li>- Turgor pressure in plant cells; plasmolysis</li> <li>- % change in mass and graph analysis</li> <li>- Phosphorylation and use of ATP in movement</li> </ul>
Student can describe the process by which ATP is created in aerobic and anaerobic cellular respiration.	<ul style="list-style-type: none"> <li>- Student can describe the inputs and outputs of glycolysis, the Krebs cycle, and oxidative phosphorylation.</li> <li>- Student can describe the inputs</li> </ul>	<ul style="list-style-type: none"> <li>- Function of mitochondria</li> <li>- Membrane structure</li> <li>- Movement across membranes</li> <li>- Reactants and product of cellular respiration</li> </ul>	<p>Unit 5 Test</p> <p>Cellular Respiration Lab and Report</p> <p>Process Study Page</p>	Unit 5 (Ch. 9)	<ul style="list-style-type: none"> <li>- Redox reactions</li> <li>- Electron carriers</li> </ul>

	and outputs of lactic acid fermentation and alcoholic fermentation.	<ul style="list-style-type: none"> <li>- Phosphorylation</li> <li>- Enzyme functioning</li> </ul>			
Student can describe the process by which sugar components are created through photosynthesis.	<ul style="list-style-type: none"> <li>- Student can describe how light reactions create ATP and NADPH.</li> <li>- Student can describe how the Calvin Cycle creates glyceraldehyde-3-phosphate.</li> </ul>	<ul style="list-style-type: none"> <li>- Redox reactions</li> <li>- Membrane structure and movement</li> <li>- Reactants and products of cellular respiration</li> <li>- Oxidative phosphorylation</li> <li>- Electromagnetic spectrum and visible light</li> <li>- Plant pigments</li> <li>- Enzyme functioning</li> </ul>	<p>Unit 6 test (open note)</p> <p>Unit 6 Photosynthesis Lab and Report</p>	Unit 6 (Ch. 10)	<ul style="list-style-type: none"> <li>- Plant adaptations (C4, C3, CAM)</li> <li>- Cyclic electron flow</li> <li>- Light absorbance diagram analysis</li> </ul>
Student can describe how cell signalling leads to a larger system response.	<ul style="list-style-type: none"> <li>- Student can describe the steps of a signal transduction pathway.</li> <li>- Student can describe mechanisms of long distance and short distance signalling.</li> </ul>	<ul style="list-style-type: none"> <li>- Membrane structure</li> <li>- Protein structure</li> </ul>	<p>Unit 7 test</p> <p>Cancer Gene lab and Group Report</p>	Unit 7 (Chs. 11, 12, 16)	<ul style="list-style-type: none"> <li>- Applications to cell cycle and cancer</li> <li>- Telomeres and cell aging</li> <li>- Apoptosis</li> <li>- Blood glucose regulation</li> <li>- Epinephrine mechanism</li> </ul>
Student can describe the complex nature of inheritance and gene regulation.	<ul style="list-style-type: none"> <li>- Student can explain describe epistasis, polygenic inheritance, and polyploidy as they relate to inherited genes.</li> <li>- Student can describe gene</li> </ul>	<ul style="list-style-type: none"> <li>- Meiosis</li> <li>- Genetic crosses (monohybrid, dihybrid, incomplete dominance, codominance, sex-linked, test crosses)</li> <li>- Protein production</li> <li>- Gel electrophoresis</li> </ul>	<p>Unit 8 test</p> <p>pGlo lab and report</p> <p>Genetic cross practice</p>	Unit 8 (Chs. 13, 14, 17, 18, 46)	<ul style="list-style-type: none"> <li>- Polymerase chain reactions</li> </ul>

	regulation in prokaryotes and eukaryotes.				
Student can explain factors and events that impact natural selection.	<ul style="list-style-type: none"> <li>- Student can identify reproductive barriers and their effects on natural selection.</li> <li>- Student can describe how changes in genetic frequencies affect phenotypes in populations.</li> </ul>	<ul style="list-style-type: none"> <li>- Natural selection</li> <li>- Genetic variation</li> <li>- Evidence for evolution</li> </ul>	Unit 9 Test  Hardy-Weinberg lab and analysis packet	Unit 9 (Chs. 22, 23, 24, 26)	<ul style="list-style-type: none"> <li>- Chi-square analysis</li> <li>- Types of speciation</li> <li>- Cladograms</li> </ul>
Student can explain the chain of events of a pathogen breach in a living organism.	<ul style="list-style-type: none"> <li>- Student can describe the cells involved in the specific immune response.</li> </ul>	<ul style="list-style-type: none"> <li>-Body's defenses</li> <li>-Structure of viruses</li> <li>-Structure of bacteria</li> </ul>	Unit 10 Test  Unit 10 Quiz	Unit 10 (Chs. 19 and 43)	<ul style="list-style-type: none"> <li>- HIV</li> <li>- Retroviruses</li> <li>- Autoimmune diseases</li> <li>- Allergic reactions</li> </ul>
Student can describe the structure and function of plant cells and the organism as a whole	<ul style="list-style-type: none"> <li>- Student can describe the physical structures of a plant and their functions.</li> <li>- Student can describe the types of tissues and cells within a plant and their functions.</li> </ul>	<ul style="list-style-type: none"> <li>- Plant cell structure</li> <li>- Organelles and functions</li> <li>- Photosynthesis</li> </ul>	Unit 11 test questions on the final exam	Unit 11 (Ch. 35)	<ul style="list-style-type: none"> <li>- Plant hormones</li> </ul>