

Essential Standards Document

Collaborative Team: Biology

Unit #: 1 Nature of Science

Essential Standard:

- HS-LS1-3: Scientific inquiry is characterized by a common set of values that include: logical thinking, precision, open-mindedness, objectivity, skepticism, replicability of results, and honest and ethical reporting of findings
- HS-LS2-3: Most scientific knowledge is quite durable, but is, in principle, subject to change based on new evidence and/or reinterpretation of existing evidence.
- HS-LS2-6: Scientific argumentation is a mode of logical discourse used to clarify the strength of relationships between ideas and evidence that may result in revision of an explanation.

What is the Learning Target or Essential Question? <i>In student/parent-friendly terms (i.e. "I can..."). There should be multiple targets from 1 standard. There could just be 1 essential question.</i>	What Level of Thinking Does it Involve? <i>Depth of Knowledge (DOK 1-4)</i>	How will you formatively assess this learning target or response to your essential question? <i>Provide or link to a specific formative assessment that shows how you're evaluating students' specific knowledge or skills.</i>
Students can conduct experiments to collect, interpret, and share data.	DOK 2	Experimental Design Example
Students can use the metric system to collect data	DOK 1	Measurement Example
Students can use data/evidence to make a claim they can defend.	DOK 3	Data Example

Essential Standards Document

Collaborative Team: Biology

Unit #: 2 Cell Structure & Transport

Essential Standard:

- HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
- HS-LS1-6. Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.

What is the Learning Target or Essential Question? <i>In student/parent-friendly terms (i.e. "I can..."). There should be multiple targets from 1 standard. There could just be 1 essential question.</i>	What Level of Thinking Does it Involve? <i>Depth of Knowledge (DOK 1-4)</i>	How will you formatively assess this learning target or response to your essential question? <i>Provide or link to a specific formative assessment that shows how you're evaluating students' specific knowledge or skills.</i>
The student can identify and relate how the properties of water enable life to function on Earth.	DOK 1-2	Water Example
The student can identify and connect how the structures of the cell contribute to the functions of life.	DOK 1-4	Cell Structure/Function Example

Essential Standards Document

Collaborative Team: Biology

Unit #: 3 Cellular Energy

Essential Standard:

- HS-LS1-5. Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.
- HS-LS1-7. Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy.
- HS-LS2-3. Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions.

What is the Learning Target or Essential Question? <i>In student/parent-friendly terms (i.e. "I can..."). There should be multiple targets from 1 standard. There could just be 1 essential question.</i>	What Level of Thinking Does it Involve? <i>Depth of Knowledge (DOK 1-4)</i>	How will you formatively assess this learning target or response to your essential question? <i>Provide or link to a specific formative assessment that shows how you're evaluating students' specific knowledge or skills.</i>
The student can identify the reactants of photosynthesis and how each are used in the reaction.	DOK 1-4	Photosynthesis Example
The student can identify the reactants of cellular respiration and how each are used in the reaction.	DOK 1-4	Cellular Respiration Example
Students understand the products of each reaction are then used as the reactants for the other process.	DOK 2	Photosynthesis Example/Cellular Respiration Example
Students can relate how enzymes aid chemical reactions in living organisms.	DOK 3	Enzymes Example

Essential Standards Document

Collaborative Team: Biology

Unit #: 4 Cell Cycle and DNA Replication

Essential Standard:

- HS-LS1-4. Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.

What is the Learning Target or Essential Question? <i>In student/parent-friendly terms (i.e. "I can..."). There should be multiple targets from 1 standard. There could just be 1 essential question.</i>	What Level of Thinking Does it Involve? <i>Depth of Knowledge (DOK 1-4)</i>	How will you formatively assess this learning target or response to your essential question? <i>Provide or link to a specific formative assessment that shows how you're evaluating students' specific knowledge or skills.</i>
Students can explain the need for cells to be small.	DOK 1-3	Cell Size Example
Student can identify how organisms of different sizes utilize Mitosis in their growth and development.	DOK 1-2	Cell Cycle Example
Students can identify how cancer cells form and state why they are harmful to organisms.	DOK 3	Cell Cycle Example
Students know when DNA is replicated and why the process is important.	DOK 2	DNA Replication Example

Essential Standards Document

Collaborative Team: Biology

Unit #: 5 Protein Synthesis

Essential Standard:

- HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.
- (HS -LS1-1), All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells.
- HS-LS3-2. Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.

What is the Learning Target or Essential Question? <i>In student/parent-friendly terms (i.e. "I can..."). There should be multiple targets from 1 standard. There could just be 1 essential question.</i>	What Level of Thinking Does it Involve? <i>Depth of Knowledge (DOK 1-4)</i>	How will you formatively assess this learning target or response to your essential question? <i>Provide or link to a specific formative assessment that shows how you're evaluating students' specific knowledge or skills.</i>
Students can explain how sections of DNA is used to make functional proteins.	DOK 1-4	Central Dogma Example
Students can identify mutations and how each type affects protein structure and function.	DOK 1-4	Mutations Example

Essential Standards Document

Collaborative Team: Biology

Unit #: 6 Meiosis and Genetics

Essential Standard:

- HS-LS3-1. Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.
- HS-LS3-2. Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.
- HS-LS3-3. Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.

What is the Learning Target or Essential Question? <i>In student/parent-friendly terms (i.e. "I can..."). There should be multiple targets from 1 standard. There could just be 1 essential question.</i>	What Level of Thinking Does it Involve? <i>Depth of Knowledge (DOK 1-4)</i>	How will you formatively assess this learning target or response to your essential question? <i>Provide or link to a specific formative assessment that shows how you're evaluating students' specific knowledge or skills.</i>
Students can identify the types of cells created through the process of meiosis.	DOK 1-2	Meiosis Example
Students can explain how genetic variation can occur during the creation of sex cells.	DOK 1-4	Meiosis Example
Students will be able to predict the possible outcomes for offspring from parent genetic information.	DOK 1-4	Genetic Cross Example
Students can recognize and apply the different allele interactions and how each affects the expression of traits.	DOK 1-4	Heredity Example
Students can interpret the inheritance of traits through a pedigree.	DOK 1-4	Pedigree Example

Essential Standards Document

Collaborative Team: Biology

Unit #: 7 Evolution

Essential Standard:

- HS-LS4-2. Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment .
- HS-LS4-5. Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.

What is the Learning Target or Essential Question? <i>In student/parent-friendly terms (i.e. "I can..."). There should be multiple targets from 1 standard. There could just be 1 essential question.</i>	What Level of Thinking Does it Involve? <i>Depth of Knowledge (DOK 1-4)</i>	How will you formatively assess this learning target or response to your essential question? <i>Provide or link to a specific formative assessment that shows how you're evaluating students' specific knowledge or skills.</i>
Students can recognize the mechanisms by which populations evolve over time.	DOK 1-2	Mechanisms/Evidence of Evolution Example
Students can use evidence to support statements about the theory of Evolution.	DOK 1-4	Natural Selection Example
Students can explain how new species arise when environments change.	DOK 1-4	Speciation Example

Essential Standards Document

Collaborative Team: Biology

Unit #: 8 Ecology

Essential Standard:

- HS-LS2-1. Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales
- HS-LS2-2. Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales
- HS-LS2-6. Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.

What is the Learning Target or Essential Question? <i>In student/parent-friendly terms (i.e. "I can..."). There should be multiple targets from 1 standard. There could just be 1 essential question.</i>	What Level of Thinking Does it Involve? <i>Depth of Knowledge (DOK 1-4)</i>	How will you formatively assess this learning target or response to your essential question? <i>Provide or link to a specific formative assessment that shows how you're evaluating students' specific knowledge or skills.</i>
Students can organize an ecosystem into categories based on energy hierarchy.	DOK 1-2	Energy and Ecosystems Example
Students can classify interactions between organisms in an ecosystem.	DOK 1-4	Species Interactions Example
Students can predict how environmental factors impact the ecosystem.	DOK 1-4	Case Study Example