Essential Outcomes
Basic Life Science

1) Living organisms are made of simple elements as well as complex carbon compounds. With an understanding of these elements and compounds, you will be able to relate them to how living organisms function. (Standard 1 Cored Standard 2, 4)

Learning Goals:

a) Students will understand and explain structure and bonding of atoms. (B.1.6)
b) Students will recognize that atoms are the basic building blocks of molecules and compounds. (B. 1.9)
c) Students will be able to describe the four essential life molecules and their functions in organisms. (B.1.6, B.1.7, B.1.15)

2) The role and structure of DNA (Core Standard 4)

Learning Goals

a) Students will explain that every cell contains all DNA.
b) Students will illustrate the structure of DNA.

3) The role of DNA, Genetics, and Natural Selection (Core Standard 5)

Learning Goals

a) Students explain through genetics that certain traits are inherited.
b) Students identify and give examples of how traits are passed on from one generation to the next.
c) Students will explain the function and role of DNA.
d) Students will explain how traits are selected for survival.
e) Students will investigate how environmental conditions affect survival of organisms

4) Organisms get what they need to survive from their immediate environment. (Standard 1 Core Standard 5, 6)

Learning Goals:

a) Students will understand that organisms are affected by biotic and abiotic factors. (B.1.43)
b) Students will understand that the environment is organized into levels.
c) Students will understand that organisms have close relationships with each other.
d) Students will understand that energy flows through an ecosystem.
e) Students will understand that organic materials are recycled through the ecosystem.
f) Students will analyze and illustrate how matter, nutrients, and energy flows within an ecosystem. (B.1.44, B.1.42)

5) Life on Earth is found in communities made up of different species. To understand life on Earth, it is important to know about the variations, tolerances, and adaptations of plants and animals in these communities. (Standard 1 Core Standard 5, 6)

Learning Goals:

a) Students will use characteristics to distinguish biomes. (B.1.46, B.1.40)
b) Students will investigate and evaluate how ecosystems recover from disasters in stages. (B.1.39, B.1.42, B.1.41, B.1.40)

6) How a population of organisms grows is critical to the survival of its species. (Standard 1 Core Standard 6)

Learning Goals:

a) Students will critique how limiting factors and human involvement affect population growth. (B.1.45, B.1.42, B. 1.41)

7) Knowledge of biological diversity leads to strategies to protect the permanent loss of species from Earth. (Standard 1 Core Standard 5, 6)

Learning Goals:

a) Students will summarize how exotic species can disrupt an ecosystem. (B.1.38, B.1.41)
b) Students will understand and explain how human activities such as burning fossil fuels and habitat destruction can deliberately or inadvertently alter the equilibrium in ecosystems. (B.1.37, B.1.39, B.1.45, B.1.42)

Michigan City High School Basic Life Science				
Ongoing/All Year	**1st Quarter**	**2nd Quarter**	**3rd Quarter**	**4th Quarter**
Course Title	**Assessment**	**Assessment**	**Assessment**	**Assessment**
	Bundle #1	**Bundle** #2	**Bundle** #3	**Bundle** #4
	Instructional Strategies Reading Process Similarities and Differences Summarizing and Note Taking Homework and Practice Nonlinguistic Representation Cooperative Learning Advance Organizers Cues, Questioning Goal Setting Read Aloud	**Instructional Strategies** Reading Process Similarities and Differences Summarizing and Note Taking Homework and Practice Nonlinguistic Representation Cooperative Learning Advance Organizers Cues, Questioning Goal Setting Read Aloud	**Instructional Strategies** Reading Process Similarities and Differences Summarizing and Note Taking Homework and Practice Nonlinguistic Representation Cooperative Learning Advance Organizers Cues, Questioning Goal Setting Read Aloud	**Instructional Strategies** Reading Process Similarities and Differences Summarizing and Note Taking Homework and Practice Nonlinguistic Representation Cooperative Learning Advance Organizers Cues, Questioning Goal Setting Read Aloud

Basic Life Science Bundle #1 - Ecology

Standard Indicator: Ecology

1.37 The life an environment can support is regulated by limiting factors. Humans can also change the environment.
1.43 Organisms are influenced by living and nonliving factors in an environment.
1.44 Matter, nutrients, and energy flow within ecosystems.
1.47 Ecology studies the varieties and interactions of living things.
1.41 Human activities can deliberately or inadvertently alter the equilibrium in ecosystems.
1.42 Burning fossil fuels releases large amounts of carbon dioxide into the atmosphere.
1.45 Development of organisms are influenced by the physical and chemical environments.

<table>
<tr><th colspan="2">Declarative Knowledge</th><th colspan="2">Procedural Knowledge</th></tr>
<tr><td>Concepts</td><td>1. Organisms get what they need to survive from their immediate environment.</td><td rowspan="2">Processes</td><td rowspan="2">1. Scientific Method
2. Reading Process</td></tr>
<tr><td>Organizing Ideas</td><td>1. Students will understand that the environment is organized into levels.
2. Students will understand that organisms have close relationships with each other.
3. Students will understand that energy flows through an ecosystem.
4. Students will understand that organic materials are recycled through the ecosystem.</td></tr>
<tr><td>Details</td><td>1. Autotrophs are producers.
2. Heterotrophs are consumers.
3. Food chains and webs show energy flow.
4. Nitrogen Cycle
5. Carbon Cycle
6. Water Cycle</td><td rowspan="2">Skills</td><td rowspan="2">1. Analyze food chains and food webs.
2. Map reading
3. Cycle reading
4. Distinguish similarities and differences of organisms</td></tr>
<tr><td>Vocabulary</td><td>Food web Consumer
Heterotrophic Decomposer Food chain
Prey Producer Autotrophic
Predator Trophic Level Cycles</td></tr>
</table>

Basic Life Science #2 – Ecosystems and Biomes

Standard Indicator: Ecology

1.39 Ecosystems recover from disasters in stages.

1.38 The introduction of exotic species such as zebra mussels cause harm to native species and the environment.

1.46 Due to biodiversity, some living things will survive after large changes in an environment.

<table>
<tr><th colspan="4">Declarative Knowledge</th><th colspan="2">Procedural Knowledge</th></tr>
<tr><td>Concepts</td><td colspan="3">1. Life on Earth is found in communities made up of different species.</td><td rowspan="2">Processes</td><td rowspan="2">1. Scientific Method
2. Reading Process
3. Writing Process</td></tr>
<tr><td>Organizing Ideas</td><td colspan="3">1. Students use characteristics to distinguish biomes.
2. Students will investigate and evaluate how ecosystems recover from disasters in stages.</td></tr>
<tr><td>Details</td><td colspan="3">1. Primary succession builds on barren land.
2. Secondary succession rebuilds an ecosystem that has been damaged.
3. Identify stages of succession.
4. Populations build communities
5. Communities build ecosystems
6. Organisms have different niches
7. Organisms are adopted to their specific biome.
8. Similar biomes are spread throughout the world.
9. Limiting factors determine how many organisms can survive in an ecosystem</td><td rowspan="2">Skills</td><td rowspan="2">1. Analyze steps of succession
2. Compare populations and communities
3. Classify organisms by niche
4. Compare Biomes</td></tr>
<tr><td>Vocabulary</td><td>Ecology
Species
Succession
Ecosystem
Environment
Mutualism</td><td>Biome
Community
Habitat
Population</td><td>Terrestrial
Limiting factor
Diversity
Biosphere
Nich</td></tr>
</table>

Basic Life Science #3 – Genetics

Standard Indicator: Standard 4 Core Standard 5-1
Essential Outcome 7, 8, & 9

8.1.7 Explain why technology issues are rarely simple and one-sided because contending groups may have different values and priorities.
8.1.8 Explain that humans help shape the future by generating knowledge, developing new technologies, and communicating ideas to others.
8.4.1 Differentiate between inherited traits, such as hair color or flower color, and acquired skills, such as manners.
8.4.2 Describe that in some organisms, such as yeast or bacteria, all genes come from a single parent, while in those that have sexes, typically half of the genes come from each parent.
8.4.3 Recognize and describe that new varieties of cultivated plants, such as corn and apples, and domestic animals, such as dogs and horses, have resulted from selective breeding for particular traits.
8.4.7 Recognize and explain that small genetic differences between parents and offspring can accumulate in successive generations so that descendents are very different from their ancestors.

Declarative Knowledge		**Procedural Knowledge**	
Concepts	The role and structure of DNA.	**Process**	1. Scientific Method 2. Reading Applications 3. Writing Applications
Organizing Ideas	1. Students will recognize that every cell contains all DNA. 3. Students recognize that certain traits are inherited. 4. Students specify how traits are passed on from one generation to the next 5. Students will recognize the function and role of DNA.		
Details	1. Structure of Punnett square (alleles, genes, chromosomes determine heredity)	**Skills**	1. Analyze how DNA strand determine traits. 2. Utilize Punnett Squares to predict traits of offspring.
Vocabulary	Genes DNA structure Punnett square		

Basic Life Science Bundle #4 – Natural Selection and Evolution

Standard Indicator: Standard 4 Core Standard 5-2
Essential Outcome 8

8.4.3 Recognize and describe that new varieties of cultivated plants, such as corn and apples, and domestic animals, such as dogs and horses, have resulted from selective breeding for particular traits.

8.4.8 Describe how environmental conditions affect the survival of individual organisms and how entire species may prosper in spite of the poor survivability or bad fortune of individuals.

8.4.9 Recognize and describe that fossil evidence is consistent with the idea that human beings evolved from earlier species.

<table>
<tr><th colspan="2">Declarative Knowledge</th><th colspan="2">Procedural Knowledge</th></tr>
<tr><td>Concepts</td><td>1. The role of DNA, Genetics, and Natural Selection</td><td rowspan="2">Process</td><td rowspan="2">1. Scientific Method
2. Reading Applications
3. Writing Applications</td></tr>
<tr><td>Organizing Ideas</td><td>1. Students will specify how traits are selected for survival.
2. Students will investigate how environmental conditions affect survival of organisms.</td></tr>
<tr><td>Details</td><td>1. Recall the four key components of natural selection.
2. Organisms have common ancestry.
3. Evolution of organisms is an ongoing process.</td><td rowspan="2">Skills</td><td rowspan="2">1. Analyze change over time.
2. Compare fossil evidence of organisms to determine common ancestry.
3. Compare genetics to evolution.</td></tr>
<tr><td>Vocabulary</td><td>1. Natural selection</td></tr>
</table>

Basic Life Science Assessment Planning Guide Bundle #1

Essential Outcome: Organisms get what they need to survive from their immediate environment.					
Summative Assessment: Levels of the environment - 5 multiple choice Relationship with organism – 5 multiple choice Food web/food chain – design food web and food chain Ecosystem cycles – Draw diagrams of different cycles					
Describe Assessment and Timeline	**Method**	**Testing Knowledge**	**Testing Reasoning Skills**	**Testing Performance Skill**	**Products**
Formative 1: Students will understand that the environment is organized into levels. **Timeline:** 2-3 weeks	5 multiple choice	x			
Formative 2: Students will understand that organisms have close relationships with each other. **Timeline:** 2-3 weeks	5 multiple choice	x			
Formative 3: Students will understand that energy flows through an ecosystem. **Timeline:** 2-3 weeks	Given organisms design food web or food chain	x	x		x
Formative 4: Students will understand that organic materials are recycled through the ecosystem. **Timeline:** 2-3 weeks	Draw diagrams of the different cycles	x			x

Basic Life Science Assessment Planning Guide Bundle #2

Essential Outcome: Life on Earth is found in communities made up of different species.					
Summative Assessment: Characteristics of Biomes – multiple choice Recovery of ecosystems after a disaster – Matching or ordering					
Describe Assessment and Timeline	**Method**	**Testing Knowledge**	**Testing Reasoning Skills**	**Testing Performance Skill**	**Products**
Formative 1: Students use characteristics to distinguish biomes. **Timeline:** 3-4 weeks	Matching	x			
Formative 2: Students will investigate and evaluate how ecosystems recover from disasters in stages. **Timeline:** 3-4 weeks	Given a disaster and pictures organize the pictures by stages of recovery	x	x		x

Basic Life Science Assessment Planning Guide Bundle #3

Essential Outcome: The role and structure of DNA.					
Summative Assessment: Function of and location of DNA – multiple choice Inherited Traits – Multiple Choice How traits are passed from generation to generation – Multiple Choice					
Describe Assessment and Timeline	**Method**	**Testing Knowledge**	**Testing Reasoning Skills**	**Testing Performance Skill**	**Products**
Formative 1: Students will recognize that every cell contains all DNA. Students will recognize the function and role of DNA. **Timeline:** 2-3 weeks	Multiple Choice	x			
Formative 2: Students recognize that certain traits are inherited. **Timeline:** 2-3 weeks	Multiple Choice	x	x		
Formative 3: Students specify how traits are passed on from one generation to the next **Timeline:** 2-3 weeks	Given a set of traits Develop your own organism	x	x		x

Basic Life Science Assessment Planning Guide Bundle #4

Essential Outcome: The role of DNA, Genetics, and Natural Selection					
Summative Assessment: Natural Selection – multiple choice Traits vs. Natural Selection – multiple choice					
Describe Assessment and Timeline	**Method**	**Testing Knowledge**	**Testing Reasoning Skills**	**Testing Performance Skill**	**Products**
Formative 1: Students will specify how traits are selected for survival. **Timeline:** 3-4 weeks	Multiple Choice	x			
Formative 2: Students will investigate how environmental conditions affect survival of organisms. **Timeline:** 3-4 weeks	Given diagrams determine positive or negative effect on organisms	x	x		