6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

St. Joseph Public Schools

Science Curriculum

2018 - 2019

St. Joseph Public Schools Curriculum

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

Year at a Glance

Name of Unit	Learning Goals	Michigan Science Standards	Essential Questions
Where Have All the Creatures Gone? (1st MP) Learning Set #1: The Driving Question. • Lesson 1 • Lesson 2	Students will understand: • analyze interactions between organisms and between organisms and their environment. • analyze the difference between needs of a population and needs of an individual within the population. • construct questions about potential interactions in ecosystems that could explain a drop in a population of animals.	• • **MS-LS2-2.** Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. • **MS-LS2-5.** Evaluate competing design solutions for maintaining Biodiversity and Ecosystem services. • MS-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. • MS-LS1-3-Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.	What Can Cause Populations to Change? What Could Be Causing the Trout Population to Change?

St. Joseph Public Schools Curriculum

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

Where Have All the Creatures Gone? (1st MP) Learning Set #2: What is Food for Living Things? • Lesson 3 • Lesson 4	Students will understand: • identify various substances found in food. • describe the function food serves in organisms. • construct and defend an evidence based explanation about whether a specific substance counts as food. • identify the presence of a food substance in plant parts.	**MS-LS1-7.** Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism. **MS-LS2-3.** Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. **MS-LS1-6.** Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms. **MS-LS1-5.** Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.	Why Do Living Things Need Food? Where Do Living Things Get the Food They Need?
Where Have All The Creatures Gone? (1st MP) Learning Set #3 How Do Living Things Get Food from Other Organisms? • Lesson 5 • Lesson 6	Students will understand: • identify the type of relationships, such as predator/prey and producer/ consumer, that exist between the organisms in a food chain or food web. • analyze a change in a population in a food web to determine its direct and indirect effects. • analyze a food web to determine how changes in a population affect the entire food web.	**MS-LS2-2.** Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. **MS-LS1-4**. Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively. **MS-LS4-2**. Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms	Trout: Predator or Prey? Why Should We Care about an Invader? Could the Sea Lamprey Have a Major Impact as a Predator? Structure and Function in All Organisms

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

• Lesson 7 • Lesson 8	• analyze and describe the effects of an invasive species in an ecosystem. • analyze a variety of structures and related functions such as eating, moving, reproducing, and breathing. • analyze observational data to determine how an animal's structure contributes to its ability to obtain food and reproduce. • construct and defend evidence based explanations about how an organism's structures help it perform the functions necessary to survive. • analyze observational data to determine how an animal's structure contributes to its ability to get food and reproduce.	and between modern and fossil organisms to infer evolutionary relationships.	
Where Have All The Creatures Gone? (1st MP) Learning Set #4 How Do Organisms Compete? • Lesson 9 • Lesson 10	Students will understand: • identify the resources for which organisms within a population are competing. • identify the type of relationships, such as predator/prey or producer/ consumer relationships in an environment. • analyze data gathered from a model to find patterns that identify the resources and competitors of an invasive species (a new competitor). • analyze data gathered from a model to use patterns to determine a predator/prey relationship.	**MS-LS2-4.** Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. **MS-LS2-4.** Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.	How Can an Invader Affect an Ecosystem? How Does the Sea Lamprey Affect the Trout?

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

	• analyze graphs to determine the effects of adding a new predator to the ecosystem. • construct and defend an evidence based explanation about the predator/prey relationship in an ecosystem. • predict how populations will change when there is a change in their food web. • analyze graphs to identify the effect of adding a new predator to the ecosystem. • predict how the introduction of a new competitor will affect the population of native species.		
Where Have All The Creatures Gone? (1st MP) Learning Set #5 Do Abiotic Factors Affect Populations? • Lesson 11 • Lesson 12 • Lesson 13	Students will understand: • analyze data to determine the effects of an abiotic factor on an organism. • analyze data to determine the relationship between biotic and abiotic factors in an ecosystem. • analyze data to identify relationships between abiotic and biotic factors in an ecosystem. • use relationships between organisms to construct and defend evidence based explanations about how the addition of an invasive species affects the native species. • construct and defend evidence based explanations about how abiotic and	**MS-LS2-4.** Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. **MS-ESS3-3**. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. **MS-LS2-4.** Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. **MS-ESS3-5**. Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.	Are There Other Things that Affect Population? Are Abiotic Factors Affecting the Trout? What Can Cause a Population to Change?

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

	biotic factors in an ecosystem affect population sizes.		
What is Going on Inside Me? (2nd MP) Learning Set #1 What Is Inside Me? • Lesson 1 • Lesson 2 • Lesson 3	Students will understand: • describe cells from a multicellular organism. • think more deeply about the role of cells in the body. • ask empirical questions based on observations and compare characteristics of cells in single-celled organisms and multicellular organisms. • ask questions whose answers will help them explain why single- celled organisms are living things. • identify cells and their cell parts that are visible through a microscope. • analyze a system to determine its components and functions and how they interact. • use evidence to explain why the body is a system.	**MS-LS1-1.** Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells. **MS-LS1-3.** Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.	How Do I Do the Things I do? Where Else Can We Find Cells? Am I a System?
What is Going on Inside Me? (2nd MP) Learning Set #2 How Do Cells Get the Things They Need? • Lesson 4	Students will understand: • explain how the structures and processes of the digestive system provide energy and building materials to the body. • identify the levels of organization of structures in a body system. • analyze the functions of mechanical and chemical digestion in breaking food into simple molecules.	**MS-LS1-7.** Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism. **MS-LS2-2.** Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.	What is Breaking Food down inside Me? How Does Food Move n My Body? Where did the Oxygen go? How does my body grow and repair?

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

• Lesson 5 • Lesson 6 • Lesson 7	• analyze observations from experiments with a physical model and apply the findings to the body system. • explain how the structures and processes of the circulatory system move food to the cells. • construct a scientific explanation with claim, evidence, and reasoning of how a single celled organism obtains food, uses food for energy, and releases waste. • analyze results from an experiment with a physical model and apply the findings to how cells obtain food through diffusion. • design an experiment with a physical model to determine what substances can enter and leave cells through diffusion. • analyze how the structures and processes of the respiratory system move oxygen to the cells and carbon dioxide away from the cells. • analyze data from an experiment to support the claim that exhaled air contains less oxygen than inhaled air. • construct a scientific explanation to address where the oxygen goes in the body and how it is used. • describe how the circulatory and respiratory systems work together to meet the needs of the cell for food, air, and waste removal.	**MS-LS1-2.** Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function. **MS-LS1-4**. Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.	

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

	• compare different parts of the bone's structure. • identify mitosis as the process of nonsexual cell division that is the basis of growth and repair.		
What's Going On Inside Me? (2nd MP) Learning Set #3 Movement and Control Lesson 8 Lesson 9 Lesson 10 Lesson 11	Students will understand: • analyze data collected in experiments to determine how rates of respiration and circulation change to respond to the body's needs. • identify homeostasis as a characteristic of living things. • evaluate data to determine where food is used in the body. • construct a scientific explanation of where and how food is used in the body. • identify the basic structure and function of the nervous system. • analyze data to determine density of touch receptors. • construct a scientific explanation to answer the Driving Question and to address four areas: energy, systems, results, and control.	**MS-LS1-7.** Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism. **MS-LS2-2.** Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. **MS-LS1-2.** Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function. **MS-LS1-4**. Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.	Can My Systems Keep up the Pace? How Does all this Energize and Repair Me? How Does all this Work Together Inside Me? What is Going on Inside Me?
Why Do Organisms Look the Way They Do? (3rd MP) Learning Set #1:	Students will understand: • how to identify the traits of an organism. • how to identify the distinction between inherited and acquired traits.	• MS-LS3-2- Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.	The Same and Different You and Me? What Traits Get Passed On?

St. Joseph Public Schools Curriculum

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

Why Do I Look the Way I Do? • Lesson 1 • Lesson 2 • Lesson 3 • Lesson 4	• how to analyze data about the traits of an organism. • how to analyze data about inherited traits to determine if two traits are related • how to provide evidence to distinguish between the influence of inheritance and environment on traits. • how to use evidence to support claims about patterns in heredity data • how to analyze data to compare patterns between plant and animal data • how to develop claim, evidence, and reasoning for heredity data	• MS-LS1-4- Animals engage in characteristic behaviors that increase the odds of reproduction • **MS-LS3-1.** Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.	Can we Determine Patterns in Traits? Do Traits Show Patterns Over Multiple Generations?
Why Do Organisms Look the Way They Do? (3rd MP) Learning Set #2: How Does the Inside Affect the Outside • Lesson 5 • Lesson 6 • Lesson 7	Students will understand: • describe how heredity instructions are organized in chromosome pairs, one from each parent. • explain, using allele pairs, how an organism could carry instructions for a trait that the organism does not exhibit • construct a model to explain how genetic information gets passed from parents to offspring • explain how some genes are dominant over others. • explain a model of inheritance for human data	• MS-LS1-4 Plants reproduce in a variety of ways, sometimes depending on animal behavior and specialized features for reproduction • MS-LS3-2- Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation. • **MS-LS3-1.** Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.	How do instructions from our parents get inside us? How can I construct and explain a model of inheritance? How can I extend and apply the model of inheritance?

St. Joseph Public Schools Curriculum

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

Why Do Organisms Look the Way They Do? (3rd MP) Learning Set #3: Why Does Variation Matter? • Lesson 8 • Lesson 9 • Lesson 10 • Lesson 11	Students will understand: • explain how multiple genes can lead to variations of a trait • analyze data to describe the trait variations in the population • analyze data about the consequences of variation in a trait for survival. • analyze graphs comparing the distribution of traits of a subgroup in a population • construct an evidence-based explanation to account for the change of variation in a population. • analyze data to identify changes in the environment that influence the survival of a population • construct an evidence-based explanation to account for the change in variation of a population • apply and evaluate a model of natural selection with cases of population change • analyze traits to determine which traits are influenced by heredity, environment, or population change	• MS-LS3-2- Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation. • MS-LS3-1-Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism. • **MS-LS1-5.** Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms. • **MS-LS2-2.** Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. • **MS-LS4-4.** Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment. • **MS-LS4-6.** Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time. • **MS-LS4-5.** Gather and synthesize information about the technologies that have changed the way humans influence	What is variation in a population? Do variations between individuals matter? How are the peppered moths a good example of natural selection? How did the population of finches on the Galapagos islands change over time?

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

		the inheritance of desired traits in organisms.	
PLTW Medical Detectives (4th MP)	Students will understand: • how to research pathogens to diagnose and treat a particular illness. • how mutations in DNA can cause disease and how genetic diseases are passed through families • how DNA is used to solve crimes and identify suspects.	• (MS.PS3.4) an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample. • (MS.LS1.3) argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells. • (MS.LS1.5) a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms. • (MS-LS1-8) Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories. • MS.LS3.1-Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism. • (MS.LS4.5) and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.	Viruses and bacteria cause disease. How the nervous system works. DNA technology is used to solve crimes.

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

Science and Engineering Practices

1. Asking Questions and Defining Problems
2. Developing and Using Models
3. Planning and Carrying Out Investigations
4. Analyzing and Interpreting Data
5. Using Mathematics and Computational Thinking
6. Constructing Explanations and Designing Solutions
7. Engaging in Argument from Evidence
8. Obtaining, Evaluating, and Communicating Information

Book: Where have all the creatures gone?

Unit 1: Why Do Organisms Look the Way They Do?

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

Unit overview: (Narrative description of unit purpose)- In Learning Set 1, students are introduced to the Driving Question and the ecosystem mystery. Lesson 1 introduces biology as the study of living things and provides the opportunity to go outside and observe living things. Students use their observations and images of living things to raise initial questions about what could cause a population to change. This brainstorming activity is organized on the Driving Question Board. In the second lesson, students are introduced to the specific population they will be investigating: trout in the Great Lakes. They examine graphs of how this population has changed over time and read about the effect that decreasing trout has had on fisherman in the region.

Learning Goals:

Students will understand:

1. Biology is the study of organisms interactions between organisms and the environment.
2. Organisms have specific survival needs.
3. In order to understand a general question scientists sometimes look at a specific case.

Activities:

(Include labs, models, activities linked to a specific practice- e.g. *graphing motion lab- Practice #4*)

1. Conduct a field study to observe organisms interactions with their environment.

2. Examine graphs of how the Great Lakes trout population has changed over time and brainstorm questions that figure out the mystery of the declining trout

Science & Engineering Practices

Students will be able to:

1. Construct explanations and designing solutions. The explanation will include qualitative or quantitative relationships between variables that predict phenomena.
2. Engaging in argument from evidence
3. Analyzing and interpret data.

Cross Cutting Concepts

Patterns
Cause & Effect
Scale, Proportion & Quantity
Systems & System Models
Energy & Matter
Structure & Function
Stability & Change

Time Span: (Length of Unit)- 4 days

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

Assessment: (Methods used for formative and summative)
Summative test for Unit 1 "Why do Organisms look the way they do?"

Vocabulary and Key Concepts

Cell theory	Plant cell, animal cell, bacteria cell	nucleus
DNA/chromatin	Cell membrane	Cell wall
Biotic	Abiotic	Bioaccumulation
Ribosomes	Endoplasmic reticulum	Cytoplasm
Vacuole	Lysosomes	Mitochondria
Chloroplast	Cytoskeleton	Golgi apparatus
Biology	Organism	Carbohydrates
Observation	Biologist	Sugar
Interaction	Predator	Starch
Quantitative	Prey	Protein
Qualitative	Nutrients	Indicator
Producer	Photosynthesis	Food Chain
Consumer	Hydroponics	Food Web
Interconnect	Ecosystem	Invasive Species

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

Native Species	Internal	External
Structure	Function	Competition
Stable population	Unstable population	Fluctuation
Dioxin	Pollutant	Phosphorus

Unit 2: What is Food for Living Things?

Unit Overview:

In the second learning set, students focus on the food quadrant of the Driving Question Board: If starvation caused the trout population to decrease, do we know why? Why is food so important? In this learning set, students discover that food provides living things with building materials and the energy necessary to grow and do things. Students learn that food must contain one or more of the following: fat, protein, and/or carbohydrates. Students test various foods to determine if they contain these substances. This learning set explores photosynthesis, as students realize that everything they eat is connected to plants and that plants do not eat, so they must make their own food. Photosynthesis will be covered in a different IQWST unit, so this learning set does not go into detail about the process itself.

The second learning set introduces scientific principles, which are statements of general science knowledge. Principles about food and why it is important, agreed upon by the students, are recorded on a class list. Students use these principles to defend their claims in evidence-based explanations. With the teacher modeling and scaffolding the process, students construct one explanation and evaluate another. Students construct an explanation that defends the claim that water is not food. Constructing this explanation helps confront a common student conception that living things get energy from water. Students then help the teacher choose the most convincing explanation to defend the

claim that plants need food. Choosing between explanations allows students to evaluate why some explanations are more convincing than others, thereby helping solidify the components of an evidence-based explanation.

Learning Goals:

Students will

1. identify various substances found in food.
2. describe the function food serves in organisms.
3. construct and defend an evidence based explanation about whether a specific substance counts as food.
4. Students will identify the presence of a food substance in plant parts.

Activities:

1. Students analyze food labels to find evidence of what substances are found in various food.
2. Students test common foods and examine water for the presence of carbohydrates (starch and sugar), proteins, and fats.
3. Students trace the path of food and see that all food can be traced back to plants, then test seeds and a potato the presence of sugar and starch (a food source)

Science & Engineering Practices

Students will be able to:

1. Develop and use models to describe unobservable mechanisms.
2. Develop a model to describe phenomena
3. Construct a scientific explanation based on valid and reliable evidence obtained from source.

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

Cross Cutting Concepts

Patterns
Cause & Effect
Scale, Proportion & Quantity
Systems & System Models
Energy & Matter
Structure & Function
Stability & Change

Time Span: (Length of Unit)- 6 days

Assessment: (Methods used for formative and summative)

Unit 3: How do living things get food from other organisms?

Unit Overview:

In Learning Set 3, students return to the trout mystery and Driving Question Board using information about food to help determine what happened to the trout. This learning set begins with an introduction to food webs as students consider the possibility that maybe the trout is not getting enough food or has a predator. Students construct a preliminary

definition of the word *ecosystem* in this lesson that will be refined in Lesson 11. Students are introduced to the sea lamprey, an invasive species that eats trout. Students examine graphs of the sea lamprey population and consider the possibility that the sea lamprey is causing the trout population problems. This learning set concludes with students investigating what could make the sea lamprey a successful predator. While dissecting the sea lamprey, students learn that the structure of the sea lamprey makes it very good at attacking trout. This introduces students to the scientific principle that organisms have different structures that help them perform functions such as eating and reproducing.

Learning Goals:

Students will

1. identify the type of relationships, such as predator/prey and producer/ consumer, that exist between the organisms in a food chain or food web.
2. analyze a change in a population in a food web to determine its direct and indirect effects.
3. analyze a food web to determine how changes in a population affect the entire food web.
4. analyze and describe the effects of an invasive species in an ecosystem.
5. analyze a variety of structures and related functions such as eating, moving, reproducing, and breathing.
6. analyze observational data to determine how an animal's structure contributes to its ability to obtain food and reproduce.
7. construct and defend evidence-based explanations about how an organism's structures help it perform the functions necessary to survive.
8. analyze observational data to determine how an animal's structure contributes to its ability to get food and reproduce.

Activities:

1. Construct food chains and participate in an interactive food web model.
2. Compare the external structures of the sea lamprey and the perch.
3. Dissect and observe internal structures of sea lamprey and bony fish.
4. Analyze observational data to determine how an organism's structure contributes to its ability to obtain food and reproduce.

Science & Engineering Practices

Students will be able to:

1. Develop and use models to describe food chains and food webs.
2. Construct, use, and present oral written arguments supported by empirical evidence and scientific reasoning to support or refute an explanation for a phenomenon or a solution to a problem.
3. Construct an explanation that includes qualitative or quantitative relationships between variables that predict phenomena.
4. Apply scientific ideas to construct an explanation for real-world phenomena, examples, or events.

Cross Cutting Concepts

Patterns
Cause & Effect
Scale, Proportion & Quantity
Systems & System Models
Energy & Matter

Structure & Function
Stability & Change

Time Span: (Length of Unit)- 9 days

Assessment: (Methods used for formative and summative)
Summative test on "How do organisms get food from other organisms?"

Unit 4: How do organisms compete?

Unit Overview:

In Learning Set 4, students investigate the ways organisms affect one another. In Lesson 9, they work with a computer model of an ecosystem containing foxes, rabbits, and grass. They examine how the percentage of grass in this ecosystem affects the rabbit and fox populations, and then they construct a scientific principle about competition for resources. Students then examine the effects of an unknown invader on their computer ecosystem, observing population fluctuations to determine what the invading organism eats. This lesson concludes with students using the evidence-based explanation framework to guide a debate in which the class attempts to reach consensus regarding the invader's food source. This debate serves to help motivate the practice of evidence-based explanations. Trying to

convince one another of a claim helps students experience the importance of each of the elements of the explanation framework. For example, they realize that an explanation without evidence is not convincing.

In Lesson 10, students use their new understandings about how organisms can affect one another and how to read population graphs in order to analyze the trout mystery further. After examining their graphs, they realize that the trout's food source is increasing, not decreasing, so the trout must not be starving. Students then realize that while the sea lamprey appears to affect the trout, it is not the whole story. The trout population started to decrease before the sea lamprey entered the Great Lakes.

Learning Goals:

Students will

1. identify the resources for which organisms within a population are competing.
2. identify the type of relationships, such as predator/prey or producer/ consumer relationships in an environment.
3. analyze data gathered from a model to find patterns that identify the resources and competitors of an invasive species (a new competitor).
4. analyze data gathered from a model to use patterns to determine a predator/prey relationship.
5. analyze graphs to determine the effects of adding a new predator to the ecosystem.
6. construct and defend an evidence based explanation about the predator/prey
7. predict how populations will change when there is a change in their food web.

8. analyze graphs to identify the effect of adding a new predator to the ecosystem.
9. predict how the introduction of a new competitor will affect the population of native species.

Activities:

1. Students explore the NetLogo model to identify organisms in an ecosystem and how they interact.
2. Students examine populations graphs of the sea lamprey, trout and chub to determine the relationship between them.

Science & Engineering Practices

Students will be able to:

1. Analyze and interpret data to provide evidence for phenomena.
2. Construct an explanation that includes qualitative or quantitative relationships between variables that predict phenomena.
3. Construct an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem.
4. Apply scientific ideas to construct an explanation for real-world phenomena, examples, or events.

Cross Cutting Concepts

Patterns
Cause & Effect
Scale, Proportion & Quantity
Systems & System Models
Energy & Matter

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

Structure & Function
Stability & Change

Time Span: (Length of Unit)- 6 days

Assessment: (Methods used for formative and summative)

Unit 5: Do Abiotic Factors Affect Populations?

Unit Overview:

Learning Set 5 introduces abiotic factors and how they can affect organisms in ecosystems. This helps students finalize the definition of *ecosystem* as containing both biotic and abiotic factors. Students focus on dioxin, an abiotic factor affecting trout. Students examine graphs of dioxin and realize that it has been at unacceptable levels since the trout population started to decline. This is recorded on the Driving Question Board and is the final piece of the puzzle for students. Students review the data along with scientific principles to construct scientific explanations about what affected the trout population. Given the data they collected, there are three plausible and acceptable claims: (1) the sea lamprey affected the trout, (2) the dioxin made the trout population decrease, and (3) both the sea lamprey and dioxin affected the trout. The third claim is the most accurate, but each of these claims is acceptable and defensible, given what students learned. Finally, students debate their different interpretations of the data and recognize the

complexity that exists in ecosystems: each of the factors affects each of the populations. Students are provided the opportunity to apply what they have learned about how different factors affecting an ecosystem can impact populations.

Learning Goals:

Students will

1. Students will analyze data to determine the effects of an abiotic factor on an organism.
2. Students will analyze data to determine the relationship between biotic and abiotic factors in an ecosystem.
3. analyze data to identify relationships between abiotic and biotic factors in an ecosystem.
4. use relationships between organisms to construct and defend evidence based explanations about how the addition of an invasive species affects the native species.
5. construct and defend evidence based explanations about how abiotic and biotic factors in an ecosystem affect population sizes

Activities:

1. Brainstorm a list of biotic and abiotic factors in ecosystems then investigate the effect of moisture on earthworms in order to see how an abiotic factor can affect living things.
2. Analyze dioxin data and compare it to the data and compare it to the data they have previously examined on the trout, chub, and lamprey.
3. Construct scientific explanations to answer the questions, “What is causing the trout population to change?”

Science & Engineering Practices

Students will be able to:

1. Construct an explanation that includes qualitative or quantitative relationships between variables that predict phenomena.
2. Construct an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem.
3. Ask questions to identify and clarify evidence of an argument.

Cross Cutting Concepts

Patterns
Cause & Effect
Scale, Proportion & Quantity
Systems & System Models
Energy & Matter
Structure & Function
Stability & Change

Time Span: (Length of Unit)- 6 days

Assessment: (Methods used for formative and summative)

Book 2: What is going on inside me?

Unit 1: What is going on inside me?

Unit Overview:

Pictures and discussion of everyday physical activities and the body's responses, such as breathing hard or sweating, are used to spark questions about what could be happening inside our body to enable us to do these things. The goal of looking inside the body leads to the observation that our bodies contain cells, seen in samples taken from students' cheeks and skin and slides of heart cells. A Driving Question Board (DQB) is used to organize questions about what is inside the body and what cells have to do with helping the body do what it does. This motivates an exploration of cells in the environment around us in Lesson 2. Students observe living cells in samples of yogurt and pond water, determine that these cells are living things, and compare them to the cells found within multicellular organisms. The recognition that there are different levels of organization in living things motivates Lesson 3, an introduction to studying systems. Students dissect a simple system—a pen—to develop the idea of analyzing the structure and function of a system, its subsystems, and its parts. Students begin to apply the idea of systems, subsystems, and parts to the human body. The idea of disruptions to subsystems causing overall problems is introduced and becomes additional motivation to figure out how the subsystems work together to accomplish the body's needs.

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

Learning Goals:

Students will

1. describe cells from a multicellular organism.
2. think more deeply about the role of cells in the body.
3. ask empirical questions based on observations and compare characteristics of cells in single-celled organisms and multicellular organisms.
4. ask questions whose answers will help them explain why single-celled organisms are living things.
5. identify cells and their cell parts that are visible through a microscope.
6. analyze a system to determine its components and functions and how they interact.
7. use evidence to explain why the body is a system.

Activities:

1. Examine cells from students' wrist and cheek under a microscope.
2. Examine the single letter "e" under the microscope and draw what they observe.
3. Move pepper flakes, poppy seeds or rice under a microscope.
4. examine a sample of yogurt under the microscope to find bacteria.
5. examine pond water to analyze single celled organisms.
6. dissect a retractable ball point pen to identify the system's parts.

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

Science & Engineering Practices

Students will be able to:

1. Conduct an investigation to produce data to serve as the basis for evidence that meets the goals of an investigation.
2. Use an oral and written argument supported by evidence to support or refute an explanation or a model for a phenomenon.

Cross Cutting Concepts

Patterns
Cause & Effect
Scale, Proportion & Quantity
Systems & System Models
Energy & Matter
Structure & Function
Stability & Change

Time Span: (Length of Unit)- 9 days

Assessment: (Methods used for formative and summative)

Vocabulary and Key Concepts

Wet Mount	Field of View	Organism
Metabolism	System	Input and Output
Mechanical digestion	Chemical Digestion	Stomach
Protein	Small Intestine	Bile
Enzymes	Fat	Starch
Surface area	Absorption	Capillaries
Plasma	Diffusion	Osmosis
Cell Membrane	Oxygen	Carbon Dioxide
Mitosis	Homeostasis	

Unit 2: How do cells get the things they need?

Unit Overview:

The second learning set focuses the Driving Question on tracking food and energy through the body to figure out how the body gets the energy it needs from food. Students start with the digestive system in Lesson 4. They observe that there is evidence of a chemical reaction occurring at the first stage of digestion, in the mouth, as well as the mechanical processes of digestion. Following food down the esophagus and stomach, students observe how stomach acids break down fat and protein in a test-tube model. They examine the structures of the small intestine and see how

the food molecules are absorbed. In Lesson 5, students investigate the role of the circulatory system in moving food molecules around the body. Data of glucose levels in the blood are used to make the connection between taking in food and an increase of food molecules in the blood. Students then investigate how the blood plasma might be able to get food to the cells in the body. Students observe how water can enter and leave cells in experiments involving onion cells. They then use a physical model to investigate how sugar molecules might enter cells through a semipermeable membrane. Next, they test whether sugar can be used by single-celled organisms as a way of exploring whether this is what could be happening in the body's cells. Students investigate what happens with yeast in the presence of either plain water or a sugar solution and notice that the yeast increase in number in the presence of sugar and that they have released a gas as waste, indicating a use of the building materials and energy in the sugar.

In Lesson 6, students investigate why oxygen intake also increases with increased activity. With a simple experiment involving a candle and a jar, students demonstrate that there is less oxygen in the air we breathe out than in room air. They trace the oxygen through the respiratory system to find out where it goes and see the oxygen being carried through the blood along with the food molecules. Students consider the role of oxygen in combustion and construct an explanation of the role of oxygen in the breakdown of sugar molecules in order to supply energy to the cells. In Lesson 7, students investigate how food provides building materials along with energy. They see images of cell division and discuss where the mass needed for cell growth and division could be coming from. A reading about bone growth and healing of broken bones provides an example of how cell division explains growth and repair in the body.

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

Learning Goals:

Students will

1. explain how the structures and processes of the digestive system provide energy and building materials to the body.
2. identify the levels of organization of structures in a body system.
3. analyze the functions of mechanical and chemical digestion in breaking food into simple molecules.
4. analyze the observations from experiments with a physical model and apply the findings to the body system.
5. explain how the structures and process of the circulatory system move food to the cells.
6. construct a scientific explanation with claim, evidence, and reasoning of how a single-celled organisms obtains food, uses food for energy, and release waste.
7. analyze results from an experiment with a physical model and apply the findings to how cells obtain food through diffusion.
8. design an experiment with a physical model to determine what substances can enter and leave cells through diffusion.
9. analyze how the structures and processes of the respiratory system move oxygen to the cells and carbon dioxide away from the cells.
10. analyze data from an experiment to support the claim that exhaled air contains less oxygen goes in the body and how it is used.
11. describe how the circulatory and respiratory system work together to meet the needs of the cell for food, air, and waste removal.

Activities:

1. Observe the mechanical breakdown of a cracker in their mouth and the change in the taste of the cracker over time.
2. Observe the breakdown of an egg white cube in an acidic environment.
3. Compare the liquid absorbed by flat and folded strips of filter paper of equal length.
4. Observe onion cells under the microscope in plain water and then a salt solution.
5. Design an investigation to test the movement of starch and sugar across a cell membrane.
6. Compare how much balloons on test tubes inflate based on the amount of gas produced by a chemical reaction.
7. Students burn food to heat water, measuring temperature change during burning.
8. Examine the cross-section of a bone to observe its structure.

Science & Engineering Practices

Students will be able to:

1. Use an oral and written argument supported by evidence to support or refute an explanation or a model for a phenomenon.

2. Develop a model to describe unobservable mechanisms.
3. Construct an explanation that includes qualitative or quantitative relationships between variables that predict phenomena.
4. Develop and use a model to describe phenomena.

Cross Cutting Concepts

Patterns
Cause & Effect
Scale, Proportion & Quantity
Systems & System Models
Energy & Matter
Structure & Function
Stability & Change

Time Span: (Length of Unit)- 16 days

Assessment: (Methods used for formative and summative)

Unit 3: How do cells get the things they need?

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

Unit Overview:

In this learning set, students investigate how the interactions of the various body systems are coordinated. In Lesson 8, they investigate how increased exercise triggers increased activity of the circulatory and respiratory systems. Students consider how increased energy needs lead to an increased need for food and oxygen and the increased rate of chemical reactions to release the energy results in some heat loss, thus leading to increased body temperature. Lesson 9 brings together the understandings about processing food (from throughout the unit) to construct a scientific explanation of where and how food gets used in the body, tracing from food input to use of food for building materials and energy by the cells of the body. In Lesson 10, students examine how the nervous system coordinates the activity of the body's systems. Finally, in Lesson 11, students draw on their understandings from prior lessons to address the Driving Question and explain the consequences of various disruptions to the body systems.

Learning Goals:

Students will

1. analyze data collected in experiments to determine how rates of respiration and circulation change to respond to the body's needs.
2. identify homeostasis as a characteristic of living things.
3. evaluate data to determine where food is used in the body.
4. construct a scientific explanation of where and how food is used in the body.
5. identify the basic structure and function of the nervous system.
6. analyze data to determine density of touch receptors.
7. construct a scientific explanation to answer the Driving Question and to address four areas: energy, system, results, and control.

Activities:

1. Students record changes in heart and respiration rates during exercise and at rest.
2. Develop a scientific explanation that claims that cells are the units that use food in the body.

Science & Engineering Practices

Students will be able to:

1. Develop and use a model to describe phenomena.
2. Use an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem.

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

Cross Cutting Concepts

Patterns
Cause & Effect
Scale, Proportion & Quantity
Systems & System Models
Energy & Matter
Structure & Function
Stability & Change

Time Span: (Length of Unit)- 10 days

Assessment: (Methods used for formative and summative)
Summative test for this unit

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

Book 3: Why Do Organisms Look the Way They Do?

Overview: Unit 1: Learning Set 1: Why Do I Look the Way I Do? Lessons 1-4

The first learning set, composed of four lessons, focuses on the similarities and differences in traits. In Lesson 1, students first identify similarities and differences between organisms. These traits are then classified as inherited, acquired, or both. In the last activity, students are introduced to the idea that bodies carry *instructions* for specific traits, and DNA is identified as the molecule that carries these instructions. In Lesson 2, students investigate the distinction between inherited and acquired traits. They also start the first of two experiments using Wisconsin Fast Plants® in order to collect data about how traits are inherited in plants. In Lesson 3, students examine human pedigrees in order to determine patterns in how traits are inherited. They also collect the data from the plants and set up seeds in order to observe another generation of plants. Students use multiple generations of data for both humans and plants in Lesson 4 in order to support the patterns they have identified with data they have collected.

Learning Goals:

Students will understand:

- how to identify the traits of an organism.
- how to identify the distinction between inherited and acquired traits.
- how to analyze data about the traits of an organism.
- how to analyze data about inherited traits to determine if two traits are related
- how to provide evidence to distinguish between the influence of inheritance and environment on traits.
- how to use evidence to support claims about patterns in heredity data
- how to analyze data to compare patterns between plant and animal data
- how to develop claim, evidence, and reasoning for heredity data

Activities in this Unit:

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

1. Students will collect and analyze class data on selected human traits in order to determine if there are any patterns.
2. Students will taste brussel sprouts and PTC paper to determine if there is a connection between an inherited trait and the preference for certain foods.
3. Students will dissect flowers to investigate reproduction and inheritance in plants.
4. Students will analyze given pedigrees to determine patterns in inherited traits.
5. Students will grow Wisconsin Fast Plants with different colors of stems (green and purple) to determine if there is a pattern in inheritance.

Science and Engineering Practices:

Students will be able to:

1. Construct explanations and designing solutions. The explanation will include qualitative or quantitative relationships between variables that predict phenomena.
2. Engaging in argument from evidence
3. Analyzing and interpret data.

Cross Cutting Concepts
Patterns
Cause & Effect
Scale, Proportion & Quantity
Systems & System Models
Energy & Matter
Structure & Function
Stability & Change

Time Frame for Unit: Approximately 9-11 class periods for Lessons 1-4

St. Joseph Public Schools Curriculum

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

Overview: Learning Set 2: How Does the Inside Affect the Outside? Lessons 5-7-

The observations students made and the data they collected in the first Learning Set raised the question of how the DNA that carries instructions for traits can be passed from one generation to another. In Lesson 5, students compare cell division in somatic cells in order to understand the differences and how those differences serve specific functions. In the second activity, they investigate how instructions from the same set of parents can lead to different combinations of instructions in the offspring. In Lesson 6, students construct a model of inheritance in order to explain how genetic information gets passed from parents to offspring. Students use their model to explain the data they have collected on humans in Lesson 7.

Learning Goals:

Students will

- describe how heredity instructions are organized in chromosome pairs, one from each parent.
- explain, using allele pairs, how an organism could carry instructions for a trait that the organism does not exhibit
- construct a model to explain how genetic information gets passed from parents to offspring
- explain how some genes are dominant over others.
- explain a model of inheritance for human data

Activities in this Unit

1. Students will model possible gamete combinations of a fictional organism called an yllis.
2. Students will develop a model of inheritance that explains all of their observations and data about plants.
3. Students will test the model against the available evidence.

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

Science and Engineering Practices

Students will be able to:

4. Construct explanations and designing solutions. The explanation will include qualitative or quantitative relationships between variables that predict phenomena.
5. Engaging in argument from evidence
6. Analyzing and interpret data.

Cross Cutting Concepts
Patterns
Cause & Effect
Scale, Proportion & Quantity
Systems & System Models
Energy & Matter
Structure & Function
Stability & Change

Time Frame for Unit- Approximately 6-8 class periods

Learning Set 3: Why Does Variation Matter?

This learning set shifts the focus from individuals, and how genetic information gets passed on, to species and populations and variation within them. In Lesson 8, students investigate traits with multiple variations and analyze data about the distribution of those variations from three different populations. They also engage in an activity about how to best represent those data. The lesson concludes with a teacher-led exercise in order to develop the concept of a gene pool. Lesson 9

focuses on whether the variation of a trait within a population can affect the survival of individuals in that population. Using multiple sources of data, students investigate the story of the peppered moth and write an evidence-based explanation to account for the change in the frequency of color of the moths. In Lesson 10, students are engaged in an investigation of the finches on the Galapagos Island of Daphne Major. Using software that contains data collected by scientists, students try to discover why many finches died and why some were able to survive.

Students use the learned conceptual and mathematical knowledge to analyze the data and construct an evidence-based explanation to answer the questions. In the final lesson of the unit, students construct a consensus model of population change and are introduced to the concept of natural selection. They then apply that model to two cases. In the final activity, students return to the Driving Question and work in groups, choosing an organism to describe. They create a poster or storyboard that has designated areas for each of the four quadrants from the Driving Question Board. For each trait, students will indicate which of the four quadrants influenced the trait—is this a species characteristic? Environmental influence on individuals? Hereditary trait? Both heredity and environment? Environmental influence on population? The groups include the trait and the reasoning. After presenting their organism and its traits to the class, students engage in a final discussion to answer the Driving Question: Why Do Organisms Look the Way They Do?

Learning Goals:

Students will understand:

- explain how multiple genes can lead to variations of a trait
- analyze data to describe the trait variations in the population
- analyze data about the consequences of variation in a trait for survival.

- analyze graphs comparing the distribution of traits of a subgroup in a population
- construct an evidence-based explanation to account for the change of variation in a population.
- analyze data to identify changes in the environment that influence the survival of a population
- construct an evidence-based explanation to account for the change in variation of a population
- apply and evaluate a model of natural selection with cases of population change
- analyze traits to determine which traits are influenced by heredity, environment, or population change

St. Joseph Public Schools Curriculum

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

Activities in this Unit

1. Students will collect height data and create histograms to show more than two variations.
2. Students will analyze histograms of different populations.
3. Students will analyze natural selection in peppered moth population.

Science and Engineering Practices

Students will be able to:

7. Construct explanations and designing solutions. The explanation will include qualitative or quantitative relationships between variables that predict phenomena.
8. Engaging in argument from evidence
9. Analyzing and interpret data.

Cross Cutting Concepts
Patterns
Cause & Effect
Scale, Proportion & Quantity
Systems & System Models
Energy & Matter
Structure & Function
Stability & Change

Time Frame for Unit: Approximately 14-16 class periods

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

Vocabulary:

DNA	Genes	Alleles
Chromosomes	Inherited trait	Acquired trait
Sexual reproduction	Asexual reproduction	gamete
Pistil	Stigma	Style
Stamen	Anther	Filament
Ovary	Ovule	Pollen
Pedigree	Carrier	F1 generation
F2 generation	Meiosis	Mitosis
Variation	Natural selection	Dominant
Recessive	Genotype	Phenotype
Species	Pollination	Fertilization
Germinate	Histogram	Albinism
Melanin		

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

4 Marking Period: Medical Detectives- Project Lead the Way

Unit overview: (Narrative description of unit purpose)

Learning Goals:

Engineering Practices:
(Include labs, models, activities linked to a specific practice- e.g. *graphing motion lab- Practice #4*)

Time Span: (Length of Unit)

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

Assessment: (Methods used for formative and summative)

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

Vocabulary and Key Concepts

Unit 5: Energy Flow in Organisms and Ecosystems

Unit overview: (Narrative description of unit purpose)- Upon completion of this unit of study, students will have a basic understanding that cells provide a context for the plant processes of photosynthesis in the movement of matter and energy needed for the cell. Students can construct scientific explanations for the interactions of organisms to obtain matter and energy from an ecosystem to survive and grow. Students understand that sustaining life requires substantial energy and matter inputs, and that the structure and functions of organisms contribute to the capture, transformation, transport, release, elimination of matter and energy.
Students will be able to analyze and interpret data, develop models, construct arguments, and demonstrate a deeper understanding of the cycling of matter, the flow of energy, and resources in ecosystems. Students will consider biotic and abiotic factors in an ecosystem and the effects these factors have on populations. They will also understand that the limits of resources influence the growth of organisms and populations, which may result in competition for those limited resources.
Students will study patterns of interactions among organisms within an ecosystem. Students construct explanations for the interactions in ecosystems and the scientific, economic, political, and social justifications used in making decisions about maintaining biodiversity in ecosystems.

Learning Goals:

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

1. Organisms interact with each other and the environment.
2. How the ecosystem is organized.
3. How matter and energy cycles through the environment.
4. In any ecosystem, organisms and populations with similar requirements for food, water, oxygen, or other resources may compete with others for limited resources.
5. Interactions within ecosystems have patterns that can be used to identify cause and effect relationships.
6. Pattenrs of interactions can be used to make predictions about the relationships among and between organisms and abiotic components of ecosystems.
7. The transfer of energy can be tracked as energy flows through an ecosystem.
8. The atoms that make up the organisms in an ecosystem are cycled repeatedly between the living and nonliving parts of the ecosystem.

Engineering Practices:

(Include labs, models, activities linked to a specific practice- e.g. *graphing motion lab- Practice #4*)

Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.

Use cause and effect relationships to predict the effect of resource availability on organisms and populations in natural systems.

Observe and measure patterns of objects and events in ecosystems.

Recognize patterns in data and make warranted inferences about changes in populations.

Construct a convincing argument that supports or refutes claims for solutions about the natural and designed world(s).

Create design criteria for design solutions for maintaining biodiversity and ecosystem services.

Time Span: (Length of Unit)

30 days

Assessment: (Methods used for formative and summative)

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

Vocabulary and Key Concepts

Unit 5:

Michigan Science Standards	
Essential	Extension
• HS-LS1-5 Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy. • HS-LS1Construct 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. •	•

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

Unit 6: Title

Unit overview: (Narrative description of unit purpose)

Learning Goals:

Engineering Practices:
(Include labs, models, activities linked to a specific practice- e.g. *graphing motion lab- Practice #4*)

Time Span: (Length of Unit)

Assessment: (Methods used for formative and summative)

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

Vocabulary and Key Concepts

Unit 6:

Michigan Science Standards	
Essential	Extension
•	•

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

Unit 7: Title

Unit overview: (Narrative description of unit purpose)

Learning Goals:

Engineering Practices:
(Include labs, models, activities linked to a specific practice- e.g. *graphing motion lab- Practice #4*)

Time Span: (Length of Unit)

Assessment: (Methods used for formative and summative)

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

Vocabulary and Key Concepts

Unit 7:

Michigan Science Standards	
Essential	Extension
•	•

Unit 8: Title

Unit overview: (Narrative description of unit purpose)

Learning Goals:

Engineering Practices:
(Include labs, models, activities linked to a specific practice- e.g. *graphing motion lab- Practice #4*)

Time Span: (Length of Unit)

Assessment: (Methods used for formative and summative)

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

6th grade science curriculum- Unit Topics, Learning Goals, Science Standards, Essential Standards

Vocabulary and Key Concepts

Unit 8:

Michigan Science Standards	
Essential	Extension
•	•