

Oxford Area School District Science Scope and Sequence - Quarter 1:

Grade 4

3.1.4.A *Organisms and Cells*

- Classify plants and animals according to the physical characteristics that they share.
 - Describe the different resources that plants and animals need to live.
 - Identify differences in the **life cycles** of plants and animals.
 - Describe common functions living things share to help them function in a specific environment.
 - Construct and interpret **models** and diagrams of various animal and plant **life cycles**.
- Science as Inquiry
 - Distinguish between scientific fact and opinion.
 - Ask questions about objects, organisms, and events.
 - Understand that all scientific investigations involve asking and answering and comparing the answer with what is already known.
 - Plan and conduct a simple investigation and understand that different questions require different kinds of investigations.
 - Use simple equipment (tools and other technologies) to gather data and understand that this allows scientists to collect more information than relying only on their senses to gather information.
 - Use data/evidence to construct explanations and understand that scientists develop explanations based on their evidence and compare them with scientific knowledge.
 - Communicate procedures and explanations giving priority to evidence and understanding that scientists make their results public, describe their investigations so they can be reproduced, and review and ask questions about the work of other scientists.

3.1.4.C *Evolution*

- Identify different characteristics of plants and animals that help some populations survive and reproduce in greater numbers. Describe how environmental changes can cause **extinction** in plants and animals
- Describe plant and animal adaptations that are important to survival.
- Constancy and Change: Compare fossils to one another and to currently living organisms according to their anatomical similarities and differences.
- Science as Inquiry

Oxford Area School Science Scope and Sequence – Quarter 2:

Grade 4

3.1.4.B

Genetics

- Describe features that are observable in both parents and their offspring.
- Recognize that reproduction is necessary for the continuation of life.
- Patterns: Identify observable patterns in the physical characteristics of plants or groups of animals.
- Science as Inquiry

3.2.4.A

Chemistry

- Identify and classify objects based on their observable and measurable physical properties. Compare and contrast solids, liquids, and gases based on their properties.
- Demonstrate that materials are composed of parts that are too small to be seen without magnification.
- Demonstrate the conservation of **mass** during physical changes such as melting or freezing.
- Recognize that combining two or more substances may make new materials with different properties.
- Models: Use models to demonstrate the physical change as water goes from liquid to ice and from liquid to vapor.
- Science as Inquiry

3.2.4.B

Physics

- Explain how an object's change in motion can be observed and measured.
- Identify types of energy and their ability to be stored and changed from one form to another.
- Understand that objects that emit light often emit heat.
- Apply knowledge of basic electrical circuits to the design and construction of simple direct **current** circuits. Compare and contrast series and parallel circuits. Demonstrate that magnets have poles that repel and attract each other.
- Demonstrate how vibrating objects make sound and sound can make things vibrate.
- Demonstrate how light can be refracted, or absorbed by an object.
- Energy: Give examples of how energy can be transformed from one form to another.
- Science as Inquiry

Oxford Area School District Science Scope and Sequence – Quarter 3:

Grade 4

3.3.4.A *Earth Structure, Processes, and Cycles*

- Describe basic landforms. Identify the layers of the earth. Recognize that the surface of the earth changes due to slow processes and rapid processes.
- Identify basic properties and uses of Earth's materials including rocks, soils, water, and gases of the atmosphere.
- Recognize that fossils provide evidence about the plants and animals that lived long ago and the nature of the environment at that time.
- Recognize Earth's different water resources, including both fresh and saltwater. Describe phase changes in the forms of water on Earth
- Describe basic weather elements. Identify weather patterns over time.
- Models/Scale: Identify basic landforms using models and simple maps.
- Constancy/Change: Identify simple changes in the earth system as air, water, soil, and rock interact.
- Scale: Explain how basic weather elements are measured.
- Science as Inquiry

3.3.4.B *Origin and Evolution of the Universe*

- Identify planets in our **solar system** and their basic characteristics. Describe the earth's place in the **solar system** that includes the sun (a star), planets, and many moons. Recognize that the universe contains many billions of galaxies and that each galaxy contains many billions of stars.
- Scales: Know the basic characteristics and uses of telescopes.
- Patterns/Phases: Identify major lunar phases.
- Patterns: Explain time (days, seasons) using solar system motions.
- Science as Inquiry

Oxford Area School District Science Scope and Sequence – Quarter 4:

Grade 4

4.1.4

Ecology

- Explain how living things are dependent upon other living and nonliving things for survival.
- Explain what happens to an **organism** when its food supply, access to water, shelter or space (**niche / habitat**) is changed.
- Identify similarities and differences between living **organisms**, ranging from single-celled to multi-cellular **organisms** through the use of microscopes, video, and other media.
- Identify how matter cycles through an ecosystem. Trace how death, growth, and decay cycle **matter** through an **ecosystem**.
- Explain how most life on earth gets its energy from the sun.
- Explain how specific adaptations can help **organisms** survive in their **environment**.
- Explain that **ecosystems** change over time due to natural and/ or human influences.
- Science as Inquiry

4.2.4

Watersheds and Wetlands

- Describe the physical characteristics of a watershed. Identify and explain what determines the boundaries of a **watershed**.
- Identify water systems and their components as either **lotic** or **lentic**.
- Describe the characteristics of different types of **wetlands**.
- Explain how freshwater organisms are adapted to their environment. Explain the life cycles of organisms in a freshwater environment.
- Science as Inquiry

4.3.4

Natural Resources

- Identify ways humans depend on **natural resources** for survival. Identify resources used to provide humans with energy, food, employment, housing and water.
- Identify the geographic origins of various natural resources.
- Science as Inquiry

4.4.4

Agriculture and Society

- Describe the journey of local/global agricultural commodities from production to consumption.
- Describe how humans rely on the **food and fiber system**. Identify Pennsylvania's important agricultural products.
- Use scientific inquiry to investigate the composition of various soils.
- Identify how technology affects the development of civilizations through agricultural production.
- Science as Inquiry

4.5.4

Humans and the Environment

- Identify how people use natural resources in sustainable and non-sustainable ways.
- Determine the circumstances that cause humans to identify an **organism** as a **pest**.
- Describe how human activities affect the environment.
- Describe a waste stream. Identify sources of waste derived from the use of **natural resources**. Identify those items that can be **recycled** and those that can not. Describe how everyday activities may affect the **environment**.
- Identify different ways human health can be affected by pollution.
- Science as Inquiry

3.4.4.A
*The Scope of
Technology*

- Understand that tools, materials, and skills are used to make things and carry out tasks.
- Understand that systems have parts and components that work together.
- Describe how various relationships exist between **technology** and other fields.

3.4.4.B
*Technology
and Society*

- Explain how the use of **technology** affects the environment in good and bad ways.
- Describe how **technology** affects humans in various ways.
- Describe how the history of civilization is linked closely to technological development.
- Explain why new technologies are developed and old ones are improved in terms of needs and wants.

3.4.4.C
*Technology
and
Engineering
Design*

- Understand that there is no perfect design.
- Describe the engineering design process: Define a problem. Generate ideas. Select a solution and test it. Make the item. Evaluate the item. Communicate the solution with the others. Present the results.
- Explain how asking questions and making observations help a person understand how things work and can be repaired.

3.4.4.D
*Abilities for a
Technological
World*

- Investigate how things are made and how they can be improved.
- Recognize and use everyday symbols (e.g. icons, simple electrical symbols measurement) to communicate key ideas.
- Identify and use simple hand tools (e.g., hammer, scale) correctly and safely.
- Investigate and assess the influence of a specific **technology** or **system** on the individual, family, community, and environment.

3.4.4.E
*The
Designed
World*

- Identify tools and devices that have been designed to provide information about a healthy lifestyle.
- Identify the technologies in agriculture that make it possible for food to be available year round.
- Identify types of energy and the importance of energy conservation.
- Explain how information and communication systems allow information to be transferred from human to human.
- Recognize that a transportation **system** has many parts that work together to help people travel and to move goods from place to place.
- Identify key aspects of manufacturing processes (designing products, gathering resources and using tools to separate, form and combine materials in order to produce products).
- Understand that structures rest on foundations and that some structures are temporary, while others are permanent.

Science Curriculum – Grade 4			
Big Idea Living things depend on their habitat to meet their basic needs.			
Essential Questions			
<p>What conditions need to be met in order for an organism to survive in its environment?</p> <p>How do changes in the environment affect the ability of living things to meet their basic needs?</p>			
Concepts	Competencies	Resources	Assessments
<ul style="list-style-type: none"> • All living things depend directly or indirectly on air, water and soil. • Polluted air, water and soil can be harmful to living things. • Air, water and soil pollution can be prevented or reduced. • People depend on other living things and non-living things to provide for their basic needs. • People depend on agriculture for their basic needs including food, clothing and shelter. • Living things depend on other living things in their environment for survival. • Changes in the environment may affect the survival of living things in that environment. • The survival of living things is affected by changes in the food, 	<ul style="list-style-type: none"> • Identify ways living things and non-living things contribute to the survival of living things in their environment. • Illustrate how water, oxygen and carbon dioxide cycle through the environment. • Identify substances that can cause air, water and/or soil pollution and list ways to reduce their effects. • Explain why laws and regulations exist to help prevent extinction and give examples. • Identify a technological resource that can be used to aid the survival of a living organism. • Explain how an organism may respond/adapt to changes in its food, water, shelter or space. • Explain why laws and 	<p>Science Fusion 2017 - Unit 4</p>	

<p>water, shelter and space available to them.</p> <ul style="list-style-type: none"> • Living things adapt to changing environmental conditions or they may become extinct. • Laws and regulations exist to help protect organisms from becoming extinct. • Technological resources may be used to aid an organism's survival. 	<p>regulations exist to help prevent extinction and give examples.</p>		
<p>Vocabulary oxygen, carbon dioxide, technological resource, extinction</p>			

<p>Science Curriculum – Grade 4</p>			
<p>Big Idea Aquatic, terrestrial and human-made ecosystems consist of diverse living and non-living components that change over time and across geographic areas.</p>			
<p>Essential Questions</p> <p style="text-align: center;">How do the living and nonliving parts of ecosystems interact and change over time?</p> <p style="text-align: center;">How are aquatic, terrestrial, and human-made systems similar and different?</p>			
<p style="text-align: center;">Concepts</p>	<p style="text-align: center;">Competencies</p>	<p style="text-align: center;">Resources</p>	<p style="text-align: center;">Assessments</p>
<ul style="list-style-type: none"> • Pennsylvania has many types of ecosystems (aquatic, terrestrial, and human-made) with associated living and non-living components. • Aquatic systems can be lentic or lotic. Lentic systems consist of still water (e.g. ponds, lakes, swamps). Lotic systems 	<ul style="list-style-type: none"> • Compare and contrast the living and nonliving components of aquatic, terrestrial and human-made ecosystems. • Describe how an organism interacts with the living and nonliving parts of its ecosystem. • Explain how seasonal changes affect the 	<p>Science Fusion 2017 – Unit 4</p>	

<p>consist of moving water (e.g. creeks, rivers, streams).</p> <ul style="list-style-type: none"> • Terrestrial systems can be forest, meadow, school yard, corn fields, etc. • Plants and animals in an ecosystems have physical and behavioral responses to seasonal change. • Soil is a system composed of weathered rock and decomposed organic remains with living and non-living components. • Interactions occur between living (e.g. plants and animals) and nonliving (e.g. soil, water, temperature) parts of an ecosystem. • Wetlands are a major habitat in Pennsylvania for plants and animals. • Water changes form and function within the environment. 	<p>organisms in a local ecosystem.</p> <ul style="list-style-type: none"> • Compare the components and interactions in a local ecosystem with a similar one in a different geographic area. • Demonstrate how water changes from one phase to another within the environment (e.g., evaporation, condensation, etc.). • Explain how seasonal changes affect the organisms in a local ecosystem. 		
<p>Vocabulary lentic, lotic, lentic systems, lotic systems, wetlands, evaporation, condensation</p>			

Science Curriculum – Grade 4			
Big Idea The survival of living things is dependent upon their adaptations and ability to respond to natural changes in and human influences on the environment.			
Essential Questions			
<p>How do organisms survive in their environment?</p> <p>How do the characteristics of organisms affect their ability to survive when change occurs in their environment?</p>			
Concepts	Competencies	Resources	Assessments
<ul style="list-style-type: none"> • A habitat consists of food, water, shelter and space in a suitable arrangement. • When a habitat changes it affects the organism. • An organism must be able to adapt to changes in the environment or move to another location, otherwise it will die. • Organisms have physical and behavioral adaptations that enable them to survive in their habitat. (e.g., physical – shape of beaks, thickness of fur or fat, flat leaf vs needle; behavioral – migration, hibernation, playing dead). • The parts and characteristics of organisms (e.g. feathers, hibernation, leaf size) affect the ways they meet their needs in different environments (e.g. 	<ul style="list-style-type: none"> • Explain how the characteristics of an organism determine where it lives and how it survives in its environment. • Identify some natural and human caused events that can change an environment. • Explain how a particular change in the environment can affect the survival of an organism in that environment. • Identify an organism that has become extinct in Pennsylvania and explain how it became extinct. • Identify and explain the physical and behavioral characteristics of organisms that enable them to survive in their habitats. • Describe how inherited characteristics help organisms survive in their 	<p>Science Fusion 2017 – Unit 3</p>	

<p>wetlands, forests, ocean).</p> <ul style="list-style-type: none"> • Characteristics of organisms are inherited from their parents. • Natural events and human activities can change the environment. • Organisms are made of parts and have characteristics that make them similar and different. 	<p>habitats.</p> <ul style="list-style-type: none"> • Explain how a particular change in the environment can affect the survival of an organism in that environment. 		
<p>Vocabulary</p>			

<p>Science Curriculum – Grade 4</p>			
<p>Big Idea Humans depend upon the management and practices of agricultural systems.</p>			
<p>Essential Questions</p> <p style="padding-left: 40px;">How is agriculture important to our daily lives?</p> <p style="padding-left: 40px;">How has agricultural production changed over time?</p> <p style="padding-left: 40px;">How are agricultural products produced, processed, distributed, and consumed in our society?</p>			
<p style="text-align: center;">Concepts</p>	<p style="text-align: center;">Competencies</p>	<p style="text-align: center;">Resources</p>	<p style="text-align: center;">Assessments</p>
<ul style="list-style-type: none"> • Agricultural products provide people's basic needs and wants including food, clothing and shelter. • Agriculture produces products and by-products for human use. • Food, clothing and some 	<ul style="list-style-type: none"> • Explain how agriculture impacts daily lives. • Compare and contrast the journey of two agricultural products from their source to the consumer. • Illustrate how water, oxygen and carbon 	<p>Science Fusion 2017 – Unit 4 and Unit 9</p>	

<p>shelter are provided through agricultural practices.</p> <ul style="list-style-type: none"> • Common Pennsylvania crops provide food for the table and fiber for textiles used in clothing and shelter. • Technology, including various tools and machinery, assist in the production of agricultural products (food and fiber). • Various types of energy are used in the production of food and fiber. • Agricultural systems includes production, processing, distribution and consumption of products. • Plants and animals are natural resources that people use. • Different resources and raw materials are used to produce food and fiber products. • Agricultural practices and products have changed over time and may have caused negative impacts on the environment. 	<p>dioxide cycle through the environment.</p> <ul style="list-style-type: none"> • Describe how agricultural products and practices have changed over time. • Recognize ways that humans benefit from the use of water resources (e.g., agriculture, energy, recreation). 		
<p>Vocabulary agricultural production, products, by-products, oxygen, carbon dioxide cycle</p>			

Science Curriculum – Grade 4			
Big Idea Sustainable use of natural resources is essential to provide for the needs and wants of all living things now and in the future.			
Essential Questions			
<p>How are natural resources used to provide for the needs and wants of living things?</p> <p>What actions can humans take to ensure continued use of our natural resources?</p>			
Concepts	Competencies	Resources	Assessments
<ul style="list-style-type: none"> • All living things are dependent upon natural resources. • There are renewable and non-renewable natural resources. • Natural resources can be managed in a variety of ways (e.g., conservation and exploitation). • Natural resources include plants, animals, water, air, minerals and fossil fuels. • Natural resources have varying life spans. • Products and by-products come from natural resources and may be recycled, reused, composted, incinerated or discarded. • Human practices and changes in technology impact the environment. 	<ul style="list-style-type: none"> • Explain how the environment provides for the needs of the people. • Identify how renewable and nonrenewable resources are used in the local community. • Identify products and by-products of trees, plants and animals, (e.g., plastics, metal, aluminum, fabric, paper, cardboard). • Describe and give examples of everyday human activities and this may change the environment (e.g., food production, water consumption, solid waste production). • Identify products and by-products of natural resources and how they can be recycled, reused, composted, incinerated or discarded. 	<p>Science Fusion 2017 – Unit 4</p>	

<p>Vocabulary renewable, non-renewable</p>

<p>Science Curriculum – Grade 4</p>			
<p>Big Idea The health of all living things is directly related to the quality of the environment.</p>			
<p>Essential Questions</p> <p style="text-align: center;">What factors influence the quality of the environment?</p> <p style="text-align: center;">How can humans promote a healthy environment?</p>			
Concepts	Competencies	Resources	Assessments
<ul style="list-style-type: none"> • Natural processes and human practices impact the quality of the environment. • Any change within the environment may positively or negatively impact the health of living organisms (e.g., fire can be both positive or negative; flood, pollution, balance of predator/prey relationship, abundant food sources, building dams). • Biological pests compete with humans for resources and need to be controlled to ensure a healthy environment. • Environmental management practices are needed to ensure a 	<ul style="list-style-type: none"> • Describe actions that can prevent or reduce waste pollution. • Identify different methods for controlling specific pests in the home, school and community and their impacts on the environment. • Describe a change that can occur in the environment and explain the positive and negative effects on the system. • Identify things that cause sickness when put into the air, water and soil. 	<p>Science Fusion 2017 – Unit 4</p>	

<p>quality environment.</p> <ul style="list-style-type: none"> • Human and animal health can be affected by air, land and/or water pollution. • Humans can promote a healthy environment by preventing and/or decreasing air, water, and soil pollution. 			
<p>Vocabulary biological pests, environmental management</p>			

<p>Science Curriculum – Grade 4</p>			
<p>Big Idea People acting individually and/or as groups influence the environment.</p>			
<p>Essential Questions</p> <p>Why is it important to recognize human impact on the environment?</p>			
Concepts	Competencies	Resources	Assessments
<ul style="list-style-type: none"> • The health of an environment is dependent upon the quality of its parts. (i.e. air, water and soil). • Human actions affect environmental health. • Environmental health can be impacted by air, water, soil and land pollution. 	<ul style="list-style-type: none"> • Identify examples of air, water, soil and land pollutants, their sources, and their effects on the environment. • Identify litter, its effect on the environment and how it can be reduced. • Identify methods of managing pests and impacts of those methods on the environment. 	<p>Science Fusion 2017 – Unit 4</p>	

Vocabulary			

Science Curriculum – Grade 4			
Big Idea Environmental laws and regulations impact humans, the environment, and the economy in both positive and negative ways.			
Essential Questions <p style="text-align: center;">How are natural resources used to provide for the needs and wants of living things?</p> <p style="text-align: center;">What actions can humans take to ensure continued use of our natural resources?</p>			
Concepts	Competencies	Resources	Assessments
<ul style="list-style-type: none"> • Environmental laws and regulations exist, are managed and enforced at the local and state agencies. • Certain laws and regulations impact what we do with natural resources and waste materials (e.g., recycling). • Certain laws and regulations impact what we do in our schools and home. 	<ul style="list-style-type: none"> • Identify ways in which the environment is managed, conserved and protected. • Describe the role of the local and state agencies that deals with environmental laws and regulations. • Explain how a given law or regulation influences our daily routines at home and in school. • Describe the impact of a given law or regulation on what humans do with natural resources and waste materials. 	<p>Science Fusion 2017 – Unit 4</p>	

Vocabulary

Science Curriculum – Grade 4

Big Idea
A force is required to change an object’s speed or direction.

Essential Questions

How could you demonstrate that a force can change an object's motion (speed or direction)?

Concepts	Competencies	Resources	Assessments
<ul style="list-style-type: none"> • An object’s change in position can be observed and measured. • Changes in speed or direction of motion are caused by forces. • An object’s position can be described in terms of its relationship to another object or a stationary background. • The greater the force the greater the change in motion. 	<ul style="list-style-type: none"> • Design and conduct an investigation to answer a question about an object, organism or an event making and recording observations using appropriate tools and instruments. • Measure, describe, or classify organisms, objects and/or materials by basic characteristics, their changes, and their uses. • Design and conduct an investigation to answer a question about an object, organism or an event making and recording observations using appropriate tools and instruments. 	Science Fusion 2017 - Unit 11	

Vocabulary
speed, direction of motion, forces, force

Science Curriculum – Grade 4			
Big Idea Magnets and electricity produce related forces.			
Essential Questions			
What is the evidence that magnets and electricity produce forces?			
Concepts	Competencies	Resources	Assessments
<ul style="list-style-type: none"> • Magnets attract or repel other magnets. • Magnets attract certain kinds of materials. • Forces can attract or repel other objects. • Electric charges flowing through a wire can produce a measurable force on magnets and other objects. 	<ul style="list-style-type: none"> • Design and conduct an investigation to answer a question about an object, organism or an event making and recording observations using appropriate tools and instruments. • Measure, describe, or classify organisms, objects and/or materials by basic characteristics, their changes, and their uses. • Identify how technology is used to meet human needs, and describe its positive and negative impacts. 	Science Fusion 2017 – Unit 10	
Vocabulary attract, repel, electric charges			

Science Curriculum – Grade 4			
Big Idea Different characteristics of plants and animals help some populations survive and reproduce in greater numbers.			
Essential Questions How does the variation among individuals affect their survival?			
Concepts	Competencies	Resources	Assessments
<ul style="list-style-type: none"> • Individuals of the same kind differ in their characteristics, and sometimes the differences give individuals an advantage in surviving and reproducing creating a population with survival and reproductive advantages. • Organisms inherit characteristics from their parents. • Fossils can be compared to one another and to organisms according to their anatomical similarities and differences. • Some organisms that lived long ago are similar to existing organisms, but some are quite different. 	<ul style="list-style-type: none"> • Measure, describe, or classify organisms, objects and/or materials by basic characteristics, their changes, and their uses. • Describe relationships among parts of a natural or human-made system. 	<p>Science Fusion 2017 – Unit 3</p>	
Vocabulary			

Science Curriculum – Grade 4			
Big Idea The earth system changes constantly as air, water, soil, and rock interact, and the earth is a part of a larger sun, earth, moon system.			
Essential Questions			
<p>What is the evidence that the earth’s systems change?</p> <p>What predictable patterns of change can be observed on and from earth?</p>			
Concepts	Competencies	Resources	Assessments
<ul style="list-style-type: none"> • A system is made of parts, and the parts can interact. • Anything on or near the earth is pulled downward by the earth’s gravity. • Objects in the sky have patterns of movement that can be observed. • The Earth rotates on its axis once every 24 hours, giving rise to the cycle of night and day. The Earth’s rotation causes the sun, moon, stars, and planets to appear to orbit the Earth once each day. • When liquid water disappears, it turns into a gas (water vapor) in the air. It can reappear as a liquid when cooled or as a solid when cooled further. Clouds and fog are made up of tiny water droplets or ice crystals. When such droplets or crystals get large enough, they fall as precipitation. 	<ul style="list-style-type: none"> • Construct and use models to explain natural phenomena and make predictions and conduct investigations. • Communicate through speaking, writing, or drawing predictions, observations, and conclusions. 	<p>Science Fusion 2017 – Unit 5 and Unit 6</p>	

<ul style="list-style-type: none"> • Water from precipitation can seep into the ground, run off, or evaporate. • Most ground water eventually flows through streams, rivers and lakes and returns to the ocean. • Weather variables such as temperature, barometric pressure, wind direction and speed, cloud type, cloud cover, and precipitation can be observed measured and recorded to identify patterns. Basic weather conditions change in predictable patterns. • Rock is composed of different combinations of minerals. • Soils develop by the breakdown of rocks by weathering and the addition of organic material. Soil also contains many living organisms. • Earth processes occur over such long time spans and such large areas that maps and models are used to help understand them. 			
<p>Vocabulary axis, earth’s rotation, sun, moon, stars, planets, orbit, natural phenomena, predictions, investigations, clouds, fog, crystals, precipitation, weather variables, temperature, barometric pressure, wind direction, speed, cloud type, cloud cover, rock, minerals, soil, earth processes</p>			

Science Curriculum – Grade 4			
Big Idea All living things are made of parts that have specific functions.			
Essential Questions			
How do the structures and functions of living things allow them to meet their needs?			
Concepts	Competencies	Resources	Assessments
<ul style="list-style-type: none"> • Parts of living things work together to carry out life functions. • Each plant or animal has different structures that serve different functions in growth, survival, and reproduction. • Most living things need food, water, light, air, and a way to dispose of wastes. • Energy is needed for all organisms to stay alive and grow. • Living things can be grouped based on their similarities and differences. • Tools make it possible to observe living things or the parts of living things that are too small to be seen with the naked eye. 	<ul style="list-style-type: none"> • Describe relationships among parts of a natural or human-made system. 	Science Fusion 2017 – Unit 3	
Vocabulary			

Science Curriculum – Grade 4			
Big Idea Energy exists in many forms and can be changed from one form to another (transformed) as it moves through a system.			
Essential Questions			
How does energy change from one form to another as it moves through a system?			
Concepts	Competencies	Resources	Assessments
<ul style="list-style-type: none"> • Energy can be found in moving objects, light, sound, and heat. • Light from the sun is an important source of energy for living and nonliving systems, and some source of energy is needed for all organisms to stay alive and grow. • Vibrating objects make sound, and sound can make things vibrate. The bigger the vibration, the louder the sound. The faster the vibrations, the higher the perceived pitch. • To have a sound you need to have a source, a medium, and a receiver. • Moving objects in contact with each other produce heat, and electrical, mechanical, and living things often produce heat. • When warmer things are put with cooler things, the warmer things get cooler and the cooler things get 	<ul style="list-style-type: none"> • Trace the flow of energy though various living and nonliving systems. 	<p>Science Fusion 2017 – Unit 7 and Unit 8 and Unit 9</p>	

<p>warmer until all are at the same temperature.</p> <ul style="list-style-type: none"> • Electric circuits may produce or use light, heat, sound and magnetic energy. • Electric circuits require a closed pathway through which an electric current can pass. • Materials have different properties. Some materials transfer heat more rapidly than others or some materials conduct electricity better than others. 			
<p>Vocabulary vibration, pitch, heat, electric circuits, closed pathway</p>			

<p>Science Curriculum – Grade 4</p>			
<p>Big Idea Technology is created, used, and modified by humans.</p>			
<p>Essential Questions In what ways do humans create, use, and modify technologies?</p>			
<p>Concepts</p>	<p>Competencies</p>	<p>Resources</p>	<p>Assessments</p>
<ul style="list-style-type: none"> • A difference exists between the natural and the human-made world. • Humans use tools, technology, and devices to help them to do a variety of things. • Humans must plan, use 	<ul style="list-style-type: none"> • Explain and provide examples of the differences between the human-made, and the natural world including how they interact. • Describe how a variety of tools/instruments can be used to adapt the world 	<p>Science Fusion 2017 – Unit 2</p>	

<p>materials and select appropriate tools to complete a tasks.</p>	<p>based on a need or want.</p> <ul style="list-style-type: none"> • List technologies that are needed to do a variety of jobs (i.e. teacher, fireperson, baker, doctor etc). • Identify and describe materials found in technological areas. • Demonstrate the ability to plan and create things using a set of problem solving steps. • Explain and provide examples of the differences between the human-made, and the natural world including how they interact. 		
<p>Vocabulary human-made, natural</p>			

Science Curriculum – Grade 4			
Big Idea Technological literacy is the ability to use, assess, and manage technology around us.			
Essential Questions			
What is technology?			
Concepts	Competencies	Resources	Assessments
<ul style="list-style-type: none"> The technology around us may be good or bad. The technology we use affects the environment in a number of different ways. Throughout history technology has changed according to people's needs. 	<ul style="list-style-type: none"> List the good and/or bad characteristics of a technology. Explain how technology affects the environment. Describe how a technology in history has affected human needs. List the good and/or bad characteristics of a technology. 	Science Fusion 2017 – Unit 2	
Vocabulary			

Science Curriculum – Grade 4			
Big Idea Technological design is a creative process that anyone can do which may result in new inventions and innovations.			
Essential Questions			
How does technological design help create inventions and innovations?			
Concepts	Competencies	Resources	Assessments
<ul style="list-style-type: none"> Technological design process involves problem solving and designing solutions to problems. The design process includes identifying and investigating a problem, 	<ul style="list-style-type: none"> Describe each step in the engineering design process used to solve technological problems. Utilize the engineering design process to solve a problem. 	Science Fusion 2017 – Unit 2	

<p>generating ideas, developing objects, testing/evaluating, and sharing findings with others.</p> <ul style="list-style-type: none"> Asking questions and making observations help a person understand how technology works and may be modified. 	<ul style="list-style-type: none"> Explain the reason(s) why a design may not be perfect. Demonstrate the ability to communicate (i.e. written, oral, or visual) a solution to a problem. Communicate (i.e. written, oral or visual) an understanding of how something works after observing and asking questions of a problem. 		
<p>Vocabulary inventions, innovations, engineering design process</p>			

<p>Science Curriculum – Grade 4</p>			
<p>Big Idea Each area of technology has a set of characteristics that separates from others; however, many areas overlap in order to meet human needs and wants.</p>			
<p>Essential Questions</p>			
<p>Concepts</p>	<p>Competencies</p>	<p>Resources</p>	<p>Assessments</p>
<ul style="list-style-type: none"> Technology is designed to have an impact on a living being’s health. Ecosystems can be controlled by technology. Energy is produced in many forms and should not be wasted. Technology allows people to send messages to one another in a variety of ways. 	<ul style="list-style-type: none"> List several types of medical technologies and describe its purpose. Design and construct a mini-ecosystem (i.e. terrarium, aquarium etc.). List and describe several alternative energy sources. Identify different ways a message can be conveyed to another 	<p>Science Fusion 2017 – Unit 4 and Unit 9</p>	

<ul style="list-style-type: none"> • Different modes of transportation move people from one place to another. • Many processes and tools are used to make products. • Each structure is designed for a purpose. 	<p>person.</p> <ul style="list-style-type: none"> • List and provide example of the four modes of transportation. • Demonstrate the ability to use a number of tools to make a product. • List and describe the purpose of several different types of structures. 		
<p>Vocabulary technology, mini-ecosystem, terrarium, aquarium</p>			