Michigan District Lutheran School Curriculum *SCOPE & SEQUENCE*

Grade Level: 6	**Curricular Area: Science**				
Unit 1: **Science Processes** • **Inquiry, Reflection, and Social Implications**	**Unit 2:** **Physical Science** • **Properties of Matter** • **Changes in Matter**	**Unit 3:** **Life Science** • **Organization of Living Things** • **Ecosystems**	**Unit 4:** **Earth Science** • **Earth Systems** • **Fluid Earth**		

Michigan District Lutheran School Curriculum *OUTCOMES*

Curricular Area: Science (6th grade)

Unit 1: Science Processes

Outcome 1A:
(C) I.1All students will ask questions that help them learn about the world. All students will design and conduct investigations using appropriate methodology and technology. All students will learn from books and other sources of information. All students will communicate findings of investigations, using appropriate technology.
(R) II.1 All students will analyze claims for their scientific merit and explain how scientists decide what constitutes scientific knowledge. All students will show how science is related to other ways of knowing.
(PME) IV.1 All students will measure and describe the things around us.

Grade Level Content Expectations (GLCEs)	**Content Statement**	**Teaching the Faith Activities (I.F.)**
S.IR.06.01 Generate scientific questions based on observations, investigations, and research. S.IR.06.02 Design and conduct scientific investigations. S.IR.06.03 Use tools and equipment appropriate to scientific investigations. S.IR.06.04 Use metric measurement in an investigation. S.IR.06.05 Construct charts and graphs from data and observations. S.IR.06.06 Identify patterns in data. S.IR.06.07 Analyze information from data tables and graphs to answer scientific questions.	S.IR.06.1 Inquiry involves generating questions, conducting investigations, and developing solutions to problems through reasoning and observation. Inquiry includes an analysis and presentation of findings that lead to future questions, research, and investigations.	

Outcome 1B:
(C) I.1All students will ask questions that help them learn about the world. All students will design and conduct investigations using appropriate methodology and technology. All students will learn from books and other sources of information. All students will communicate findings of investigations, using appropriate technology.
(R) II.1 All students will analyze claims for their scientific merit and explain how scientists decide what constitutes scientific knowledge. All students will show how science is related to other ways of knowing.
(PME) IV.1 All students will measure and describe the things around us.

Grade Level Content Expectations (GLCEs)	**Content Statement**	**Teaching the Faith Activities (I.F.)**
S.IR.06.08 Evaluate the strengths and weaknesses of claims, arguments, and data. S.IR.06.09 Describe limitations in personal and scientific knowledge. S.IR.06.10 Identify the need for evidence in making scientific decisions. S.IR.06.11 Evaluate scientific explanations based on current evidence and scientific principles. S.IR.06.12 Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities. S.IR.06.13 Design solutions to problems using technology. S.IR.06.14 Describe the effect humans and other organisms have on the balance of the natural world. S.IR.06.15 Describe what science and technology can and cannot reasonably contribute to society. S.IR.06.16 Describe how science and technology have advanced because of the contributions of many people throughout history and across cultures.	S.IR.06.2 Reflecting knowledge is the application of scientific knowledge to new and different situations. Reflecting knowledge requires careful analysis of evidence that guides decision-making and the application of science throughout history.	

Michigan District Lutheran School Curriculum *TEACHER ACCOUNTABILITY RECORD*

Unit 1: Science Processes **Teacher Name: _____** **Grade Level: 6**	**Curricular Area: Science** **School Year:**				
Standards Benchmark or *GLCE* **(Italicized indicates the one used)**	**Dates Taught (month/day/initials):**				
S.IR.06.01 Generate scientific questions based on observations, investigations, and research.					
S.IR.06.02 Design and conduct scientific investigations.					
S.IR.06.03 Use tools and equipment appropriate to scientific investigations.					
S.IR.06.04 Use metric measurement in an investigation.					
S.IR.06.05 Construct charts and graphs from data and observations.					
S.IR.06.06 Identify patterns in data.					
S.IR.06.07 Analyze information from data tables and graphs to answer scientific questions.					
S.IR.06.08 Evaluate the strengths and weaknesses of claims, arguments, and data.					
S.IR.06.09 Describe limitations in personal and scientific knowledge.					
S.IR.06.10 Identify the need for evidence in making scientific decisions.					
S.IR.06.11 Evaluate scientific explanations based on current evidence and scientific principles.					
S.IR.06.12 Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities.					
S.IR.06.13 Design solutions to problems using technology.					
S.IR.06.14 Describe the effect humans and other organisms have on the balance of the natural world.					

S.IR.06.15 Describe what science and technology can and cannot reasonably contribute to society.					
S.IR.06.16 Describe how science and technology have advanced because of the contributions of many people throughout history and across cultures.					

Unit 2: Physical Science

Outcome 2A:
All students will describe how things around us move, explain why things move as they do, and demonstrate and explain how we control the motions of objects.
All students will relate motion to energy and energy conversions.
All students will measure and describe the things around us.
All students will explain what the world around us is made of.
All students will explain how visible changes in matter are related to atoms and molecules.

Grade Level Content Expectations (GLCEs)	**Content Statement**	**Integrating the Faith (I.F.)**
P.PM.06.17 Identify examples of chemical properties of matter. P.PM.06.18 Identify substances by their chemical properties. P.PM.06.19 Identify acids and bases using an acid/base indicator.	P.PM.06.1 Matter has chemical properties. The understanding of chemical properties helps to explain how new substances are formed.	• Explain what matter is, and describe how it can be changed from one form to another.

Outcome 2B:
All students will describe how things around us move, explain why things move as they do, and demonstrate and explain how we control the motions of objects.
All students will relate motion to energy and energy conversions.
All students will measure and describe the things around us.
All students will explain what the world around us is made of.
All students will explain how visible changes in matter are related to atoms and molecules.

Grade Level Content Expectations (GLCEs)	**Content Statement**	**Integrating the Faith (I.F.)**
P.PM.06.20 Identify the smallest component that makes up an element. P.PM.06.21 Describe how the elements within the periodic table are organized into families. P.PM.06.22 Identify that compounds are composed of two or more elements. P.PM.06.23 List examples of physical and chemical properties of elements and compounds.	P.PM.06.3 Elements are composed of a single kind of atom that are grouped into families with similar properties on the periodic table. Compounds are composed of two or more different elements. Each element and compound has a unique set of physical and chemical properties such as boiling point, density, color, conductivity, and reactivity.	• Define an atom and molecule.

Outcome 2C:
All students will describe how things around us move, explain why things move as they do, and demonstrate and explain how we control the motions of objects.
All students will relate motion to energy and energy conversions.
All students will measure and describe the things around us.
All students will investigate, describe and analyze ways in which matter changes.
All students will explain what the world around us is made of.

Grade Level Content Expectations (GLCEs)	**Content Statement**	**Integrating the Faith (I.F.)**
P.CM.06.24 Describe and illustrate changes in state, in terms of the arrangement and relative motion of the atoms or molecules. P.CM.06.25 Explain how mass is conserved as it changes from state to state in a closed system.	P.CM.06.1 Matter changing from state to state can be explained by using models which show that matter is composed of tiny particles in motion. When changes of state occur, the atoms and/or molecules are not changed in structure. When the changes in state occur, mass is conserved because matter is not created or destroyed.	

Outcome 2D:
All students will describe how things around us move, explain why things move as they do, and demonstrate and explain how we control the motions of objects.
All students will relate motion to energy and energy conversions.
All students will measure and describe the things around us.
All students will investigate, describe and analyze ways in which matter changes.
All students will explain what the world around us is made of.

Grade Level Content Expectations (GLCEs)	**Content Statement**	**Integrating the Faith (I.F.)**
P.CM.06.26 Identify evidence of chemical change through color, gas formation, solid formation, and temperature change. P.CM.06.27 Compare and contrast the chemical properties of a new substance with the original after a chemical change. P.CM.06.28 Describe the physical properties and chemical properties of the products and reactants in a chemical change.	P.CM.06.2 Chemical changes occur when two elements and/or compounds react and produce new substances. These new substances have different physical and chemical properties than the original elements and/or compounds. During the chemical change, the number and kind of atoms in the reactants are the same as the number and kind of atoms in the products. Mass is conserved during chemical changes. The mass of the reactants is the same as the mass of the products.	• Explain what a chemical reaction is, ways you can tell that a reaction has taken place, and what happens to the reacting matter. • Measure the masses before and after a chemical reaction to realize that matter is conserved.

Michigan District Lutheran School Curriculum *TEACHER ACCOUNTABILITY RECORD*

Unit 2: Physical Science **Teacher Name: _____** **Grade Level: 6**	**Curricular Area: Science** **School Year:**				
Standards Benchmark or *GLCE* **(Italicized indicates the one used)**	**Dates Taught** **(month/day/initials):**				
P.PM.06.17 Identify examples of chemical properties of matter.					
P.PM.06.18 Identify substances by their chemical properties.					
P.PM.06.19 Identify acids and bases using an acid/base indicator.					
P.PM.06.20 Identify the smallest component that makes up an element.					
P.PM.06.21 Describe how the elements within the periodic table are organized into families.					
P.PM.06.22 Identify that compounds are composed of two or more elements.					
P.PM.06.23 List examples of physical and chemical properties of elements and compounds.					
P.CM.06.24 Describe and illustrate changes in state, in terms of the arrangement and relative motion of the atoms or molecules.					
P.CM.06.25 Explain how mass is conserved as it changes from state to state in a closed system.					
P.CM.06.26 Identify evidence of chemical change through color, gas formation, solid formation, and temperature change.					
P.CM.06.27 Compare and contrast the chemical properties of a new substance with the original after a chemical change.					
P.CM.06.28 Describe the physical properties and chemical properties of the products and reactants in a chemical change.					

Unit 3: Life Science

Outcome 3A:
All students will investigate and explain how living things obtain and use energy.
All students will compare ways that living organisms are adapted (suited) to survive and reproduce in their environments and explain how species change through time.

Grade Level Content Expectations (GLCEs)	Content Statement	Integrating the Faith (I.F.)
L.OL.06.29 Classify organisms based on their source of energy for growth and development. L.OL.06.30 Distinguish between the ways in which consumers and decomposers obtain energy.	L.OL.06.6 All animals, including humans, are consumers that meet their energy by eating other organisms or their products. Consumers break down the structures of the organisms they eat to make the materials they need to grow and function. Decomposers, including bacteria and fungi, use dead organisms or their products to meet their energy needs.	• Explain why we need food. • State that the term "population" refers to a group of the same kind of organisms (e.g., black oak trees) living in a given area (e.g., Nicolet National Forest). • Analyze some past situation (e.g., passenger pigeon) to determine what caused the population to become extinct. • Discuss characteristics of desirable personalities and relate them to your own behavior.

Outcome 3B:
All students will explain how parts of an ecosystem are related and how they interact.
All students will explain how energy is distributed to living things in an ecosystem.
All students will compare ways that living organisms are adapted (suited) to survive and reproduce in their environments and explain how species change through time.

Grade Level Content Expectations (GLCEs)	Content Statement	Integrating the Faith (I.F.)
L.EC.06.31 List examples of populations, communities, and ecosystems.	**L.EC.06.1 Organisms of one species form a population. Populations of different organisms interact and form communities. Living communities and nonliving factors that interact with them form ecosystems.**	• Predict what factors might cause an increase or decrease of a given population. • State that the term "population" refers to a group of the same kind of organisms (e.g., black oak trees) living in a given area (e.g., Nicolet National Forest). • Analyze some past situation (e.g., passenger pigeon) to determine what caused the population to become extinct.

Outcome 3C:
All students will explain how parts of an ecosystem are related and how they interact.
All students will explain how energy is distributed to living things in an ecosystem.
All students will investigate and explain how communities of living things change over a period of time.
All students will compare ways that living organisms are adapted (suited) to survive and reproduce in their environments and explain how species change through time.

Grade Level Content Expectations (GLCEs)	**Content Statement**	**Integrating the Faith (I.F.)**
L.EC.06.32 Describe common ecological relationships between and among species and their environment. L.EC.06.33 Describe the role of decomposers in the transfer of energy in an ecosystem. L.EC.06.34 Explain how two organisms can be mutually beneficial and how that can lead to interdependency.	L.EC.06.2 Two types of organisms may interact with one another in several ways: They may be in a producer/consumer, predator/prey, or parasite/host relationship. Some organisms may scavenge or decompose another. Relationships may be competitive or mutually beneficial. Some species have become so adapted to each other that neither could survive without the other.	• Predict what factors might cause an increase or decrease of a given population. • State that the term "population" refers to a group of the same kind of organisms (e.g., black oak trees) living in a given area (e.g., Nicolet National Forest). • Analyze some past situation (e.g., passenger pigeon) to determine what caused the population to become extinct.

Outcome 3D:
All students will explain how parts of an ecosystem are related and how they interact.
All students will explain how energy is distributed to living things in an ecosystem.
All students will investigate and explain how communities of living things change over a period of time.
All students will compare ways that living organisms are adapted (suited) to survive and reproduce in their environments and explain how species change through time.

Grade Level Content Expectations (GLCEs)	Content Statement	Integrating the Faith (I.F.)
L.EC.06.35 Identify the factors in an ecosystem that influence changes in population size. L.EC.06.36 Identify the living and nonliving components in an ecosystem. L.EC.06.37 Describe how living and non-living factors cycle in an ecosystem.	L.EC.06.3 The number of organisms and populations an ecosystem can support depends on the biotic (living) resources available and abiotic (nonliving) factors, such as quality of light and water, range of temperatures and soil composition.	

Outcome 3E:
All students will explain how parts of an ecosystem are related and how they interact.
All students will explain how energy is distributed to living things in an ecosystem.
All students will investigate and explain how communities of living things change over a period of time.
All students will compare ways that living organisms are adapted (suited) to survive and reproduce in their environments and explain how species change through time.

Grade Level Content Expectations (GLCEs)	**Content Statement**	**Integrating the Faith (I.F.)**
L.EC.06.38 Predict how changes in one population might affect other populations based upon their relationships in a food web. L.EC.06.39 Describe how human beings are part of Earth's ecosystem and that human activities can purposefully or accidentally alter the balance in ecosystems.	L.EC.06.4 All organisms (including humans) cause changes in the environment where they live. Some of the changes are harmful to the organism or other organisms, whereas others are helpful.	.

Michigan District Lutheran School Curriculum *TEACHER ACCOUNTABILITY RECORD*

Unit 3: Life Science **Teacher Name: _____** **Grade Level: 6**	**Curricular Area: Science** **School Year:**				
Standards Benchmark or *GLCE* **(Italicized indicates the one used**	**Dates Taught** **(month/day/initials):**				
L.OL.06.29 Classify organisms based on their source of energy for growth and development.					
L.OL.06.30 Distinguish between the ways in which consumers and decomposers obtain energy.					
L.EC.06.31 List examples of populations, communities, and ecosystems.					
L.EC.06.32 Describe common ecological relationships between and among species and their environment.					
L.EC.06.33 Describe the role of decomposers in the transfer of energy in an ecosystem.					
L.EC.06.34 Explain how two organisms can be mutually beneficial and how that can lead to interdependency.					
L.EC.06.35 Identify the factors in an ecosystem that influence changes in population size.					
L.EC.06.36 Identify the living and nonliving components in an ecosystem.					
L.EC.06.37 Describe how living and non-living factors cycle in an ecosystem.					
L.EC.06.38 Predict how changes in one population might affect other populations based upon their relationships in a food web.					
L.EC.06.39 Describe how human beings are part of Earth's ecosystem and that human activities can purposefully or accidentally alter the balance in ecosystems.					

Unit 4: Earth Science

Outcome 4A:
All students will describe the relationship between the sun and the Earth.

Grade Level Content Expectations (GLCEs)	Content Statement	Integrating the Faith (I.F.)
E.ES.06.40 Describe how the sun produces light and heat for the Earth in terms of supporting life. E.ES.06.41 Demonstrate, using a model or drawing, the relationship between the sun's warming of the Earth and the water cycle as it applies to the atmosphere. E.ES.06.42 Describe the relationship between the sun's warming of the Earth's atmosphere and convection within the atmosphere and oceans. E.ES.06.43 Describe how the sun's warming of the Earth produces winds and ocean currents.	E.ES.06.1 The sun is the major source of Earth's energy for phenomena on Earth's surface.	

Outcome 4B:
All students will describe the earth's weather patterns..

Grade Level Content Expectations (GLCEs)	Content Statement	Integrating the Faith (I.F.)
E.ES.06.44 Compare and contrast the difference and relationship between climate and weather. E.ES.06.45 Describe how different weather occurs due to the constant motion of the atmosphere from the sun's energy reaching Earth's surface. E.ES.06.46 Explain how the temperature of the oceans affect the different climates on Earth because eater in the oceans holds a large amount of heat. E.ES.06.47 Describe relative humidity in terms of the moisture content of the air and the moisture capacity of the air, and how these depend on the temperature. E.ES.06.48 Describe conditions associated with frontal boundaries and the movement of major air masses and the jet stream across North America using a weather map.	E.ES.06.5 Global patterns of atmospheric and oceanic movement influence weather and climate.	• Predict from given sets of conditions or photographs where water, ice, or wind erosion would be most likely to result. • Describe a model as a way of trying to explain conditions where we have no direct evidence

Outcome 4C:
All students will describe the water cycle.
All students will describe the characteristics of water and demonstrate where water is found on earth.
All students will describe how materials cycle through an ecosystem and get reused in the environment.
All students will analyze how humans and the environment interact.

Grade Level Content Expectations (GLCEs)	Content Statement	Integrating the Faith (I.F.)
E.ES.06.49 Explain the water cycle and describe how evaporation, transpiration, condensation, cloud formation, precipitation, infiltration, surface runoff, groundwater, and absorption occur within the cycle. E.ES.06.50 Analyze the flow of water between the components of a watershed, including surface features and groundwater. E.ES.06.51 Demonstrate how water dissolves minerals and gases in the atmosphere in the process of the water cycle and carries them to oceans.	E.ES.06.6 Weather circulates through the earth's four spheres in what is known as the "water cycle".	

Outcome 4D:
All students will describe the earth's surface.
All students will describe and explain how the earth's features change over time.
All students will analyze effects of technology on the earth's surface and resources.
All students will analyze how humans and the environment interact.

Grade Level Content Expectations (GLCEs)	Content Statement	Integrating the Faith (I.F.)
E.ES.06.52 Explain how human activities change the surface of the Earth. E.ES.06.53 Describe the effects of deforestation and how it affects the growth and survival of other plants and animals. E.ES.06.54 Describe the origins of pollution in the atmosphere, geosphere, and hydrosphere, and how pollution impacts habitats, climatic change, and endangerment of species. E.ES.06.55 Describe how an overpopulated environment will become degraded due to the increased use of resources, which may lead to a reduction in the number and variety of plants and animals, and possible extinction of species.	E.ES.06.7 Human activities have changed the Earth's land, oceans and atmosphere resulting in the reduction of the number and variety of wild plants and animals sometimes causing extinction of species.	

Outcome 4E:
All students will describe the earth's atmosphere.

Grade Level Content Expectations (GLCEs)	Content Statement	Integrating the Faith (I.F.)
E.FE.06.56 Describe the composition and layers of the atmosphere (air, molecules, gas, water vapor, dust particles, ozone). E.FE.06.57 Explain the behavior of water in the atmosphere.	E.FE.07.1 The atmosphere is a mixture of nitrogen, oxygen and trace gases that include water vapor. The atmosphere has different physical and chemical composition at different elevations.	

Michigan District Lutheran School Curriculum *TEACHER ACCOUNTABILITY RECORD*

Unit 4: Earth Science **Teacher Name: _____** **Grade Level: 6**	**Curricular Area: Science** **School Year:**				
Standards Benchmark or *GLCE* **(Italicized indicated the one used)**	**Dates Taught** **(month/day/initials):**				
E.ES.06.40 Describe how the sun produces light and heat for the Earth in terms of supporting life.					
E.ES.06.41 Demonstrate, using a model or drawing, the relationship between the sun's warming of the Earth and the water cycle as it applies to the atmosphere.					
E.ES.06.42 Describe the relationship between the sun's warming of the Earth's atmosphere and convection within the atmosphere and oceans.					
E.ES.06.43 Describe how the sun's warming of the Earth produces winds and ocean currents.					
E.ES.06.44 Compare and contrast the difference and relationship between climate and weather.					
E.ES.06.45 Describe how different weather occurs due to the constant motion of the atmosphere from the sun's energy reaching Earth's surface.					
E.ES.06.46 Explain how the temperature of the oceans affect the different climates on Earth because eater in the oceans holds a large amount of heat.					
E.ES.06.47 Describe relative humidity in terms of the moisture content of the air and the moisture capacity of the air, and how these depend on the temperature.					
E.ES.06.48 Describe conditions associated with frontal boundaries and the movement of major air masses and the jet stream across North America using a weather map.					
E.ES.06.49 Explain the water cycle and describe how evaporation, transpiration, condensation, cloud formation, precipitation, infiltration, surface runoff, groundwater, and absorption occur within the cycle.					
E.ES.06.50 Analyze the flow of water between the components of a watershed, including surface features and groundwater.					

E.ES.06.51 Demonstrate how water dissolves minerals and gases in the atmosphere in the process of the water cycle and carries them to oceans.					
E.ES.06.52 Explain how human activities change the surface of the Earth.					
E.ES.06.53 Describe the effects of deforestation and how it affects the growth and survival of other plants and animals.					
E.ES.06.54 Describe the origins of pollution in the atmosphere, geosphere, and hydrosphere, and how pollution impacts habitats, climatic change, and endangerment of species.					
E.ES.06.55 Describe how an overpopulated environment will become degraded due to the increased use of resources, which may lead to a reduction in the number and variety of plants and animals, and possible extinction of species.					
E.FE.06.56 Describe the composition and layers of the atmosphere (air, molecules, gas, water vapor, dust particles, ozone).					
E.FE.06.57 Explain the behavior of water in the atmosphere.					