Michigan District Lutheran School Curriculum *SCOPE & SEQUENCE*

Grade Level: 7 **Curricular Area: Science**			
Unit 1: **Science Processes** • **Inquiry, Reflection, and Social Implications**	**Unit 2:** **Physical Science** • **Energy**	**Unit3:** **Life Science** • **Organization of Living Things** • **Heredity**	**Unit 4:** **Earth Science** • **Earth Systems** • **Earth in Space and Time**

Michigan District Lutheran School Curriculum *OUTCOMES*

Curricular Area: Science (Grade 7)

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.07.01 Generate scientific questions based on observations, investigations, and research. S.IR.07.02 Design and conduct scientific investigations. S.IR.07.03 Use tools and equipment appropriate to scientific investigations. S.IR.07.04 Use metric measurement in an investigation. S.IR.07.05 Construct charts and graphs from data and observations. S.IR.07.06 Identify patterns in data. S.IR.07.07 Analyze information from data tables and graphs to answer scientific questions. S.IR.07.08 Communicate and defend findings of observations and investigations using evidence.	S.IR.07.1 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.	

S.IR.07.09 Compare and contrast sets of data from multiple trials of a scientific investigation to draw conclusions. S.IR.07.10 Use multiple sources of information to evaluate strengths and weaknesses of claims, arguments, or data.		

Outcome1B:
(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.07.11 Evaluate the strengths and weaknesses of claims, arguments, and data. S.IR.07.12 Describe limitations in personal and scientific knowledge. S.IR.07.13 Identify the need for evidence in making scientific decisions. S.IR.07.14 Evaluate scientific explanations based on current evidence and scientific principles. S.IR.07.15 Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities. S.IR.07.16 Design solutions to problems using technology. S.IR.07.17 Describe the effect humans and other organisms have on the balance of the natural world. S.IR.07.18 Describe what science and technology can and cannot reasonably contribute to society. S.IR.07.19 Describe how science and technology have advanced because of the contributions of many people throughout history and across cultures.	S.IR.07.2 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: 7**	**Curricular Area: Science** **School Year:**				
Standards Benchmark or *GLCE* **(Italicized indicates the one used)**	**Dates Taught (month/day/initials):**				
S.IR.07.01 Generate scientific questions based on observations, investigations, and research.					
S.IR.07.02 Design and conduct scientific investigations.					
S.IR.07.03 Use tools and equipment appropriate to scientific investigations.					
S.IR.07.04 Use metric measurement in an investigation.					
S.IR.07.05 Construct charts and graphs from data and observations.					
S.IR.07.06 Identify patterns in data.					
S.IR.07.07 Analyze information from data tables and graphs to answer scientific questions.					
S.IR.07.08 Communicate and defend findings of observations and investigations using evidence.					
S.IR.07.09 Compare and contrast sets of data from multiple trials of a scientific investigation to draw conclusions.					
S.IR.07.10 Use multiple sources of information to evaluate strengths and weaknesses of claims, arguments, or data.					
S.IR.07.11 Evaluate the strengths and weaknesses of claims, arguments, and data.					
S.IR.07.12 Describe limitations in personal and scientific knowledge.					
S.IR.07.13 Identify the need for evidence in making scientific decisions.					
S.IR.07.14 Evaluate scientific explanations based on current evidence and scientific principles.					
S.IR.07.15 Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities.					

S.IR.07.16 Design solutions to problems using technology.					
S.IR.07.17 Describe the effect humans and other organisms have on the balance of the natural world.					
S.IR.07.18 Describe what science and technology can and cannot reasonably contribute to society.					
S.IR.07.19 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:
(PME) IV.1 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 identify and describe forms of energy.
(PCM) IV.2 All students will relate motion to energy and energy conversions.

Grade Level Content Expectations (GLCEs)	Content Statement	Integrating the Faith (I.F.)
P.EN.07.20 Demonstrate the evidence for kinetic energy in everyday experiences. P.EN.07.21 Demonstrate the evidence for potential energy in everyday experiences. P.EN.07.22 Illustrate how potential energy is transformed into kinetic energy in everyday experiences.	P.EN.07.1 Objects and substances in motion in kinetic energy. Objects and substances may have potential energy due to their relative positions in a system. Gravitational, elastic, and chemical energy are all forms of potential energy.	• Use creation to explain an energy pyramid that demonstrates how all things receive their "energy" first from God.

Outcome 2B:
(PME) IV.1 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 identify and describe forms of energy.
(PCM) IV.2 All students will investigate, describe and analyze ways in which matter changes. All students will explain how changes in matter are related to changes in energy and how living things and human technology change matter and transform energy. All students will relate motion to energy and energy conversions.

Grade Level Content Expectations (GLCEs)	Content Statement	Integrating the Faith (I.F.)
P.EN.07.23 Explain how different forms of energy can transfer chemical potential energy through a process called photosynthesis. P.EN.07.24 Explain why energy can be transferred while no energy is lost or gained in the transfer.	P.EN.07.2 Energy is transferred from a source to a receiver by radiation, conduction, and convection. When energy is transferred from a source to a receiver, the quantity of energy before the transfer is equal to the quantity of energy after the transfer.	

Outcome 2C: (PME) IV.1 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 identify and describe forms of energy.
(PCM) IV.2 All students will investigate, describe and analyze ways in which matter changes. All students will explain how changes in matter are related to changes in energy and how living things and human technology change matter and transform energy. All students will relate motion to energy and energy conversions.

Grade Level Content Expectations (GLCEs)	Content Statement	Integrating the Faith (I.F.)
P.EN.07.25 Identify that nuclear reactions take place in the sun, producing heat and light. P.EN.07.26 Explain how the light energy from the sun is transformed to heat energy on earth. P.EN.07.27 Explain how heat energy causes winds in the atmosphere and currents in the ocean. P.EN.07.28 Describe how light energy is converted to a form of energy that can be used by living things.	P.EN.07.4 Nuclear reactions take place in the sun producing heat and light. Only a tiny fraction of the light energy from the sun reaches Earth, providing energy to heat the Earth, and providing energy that results in winds, ocean currents, and storms. Light is also the primary source of energy for living things. In plants, light from the sun is transferred and stored as chemical potential energy through a process called photosynthesis.	

Outcome 2D: (PME) IV.1 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 identify and describe forms of energy.
(PCM) IV.2 All students will investigate, describe and analyze ways in which matter changes.
(PMV) IV.4 All students will describe sounds and sound waves. All students will measure and describe vibrations and waves. All students will explain how waves and vibrations transfer energy.

Grade Level Content Expectations (GLCEs)	Content Statement	Integrating the Faith (I.F.)
P.EN.07.29 Identify examples of waves. P.EN.07.30 Describe how waves are produced by vibrations in matter. P.EN.07.31 Predict the action of waves as they interact with matter.	P.EN.07.5 Waves transfer energy when they interact with matter. Examples of waves include sound waves, seismic waves, waves on water, and light waves.	• Compare the spreading of the Gospel with the ripples created by a dropping a stone into water. • Have students construct a telephone with plastic cups and fishing line and explore its function. • Have students use tuning forks of different pitches to compare the energy level of sound waves of different wavelengths.

Michigan District Lutheran School Curriculum *TEACHER ACCOUNTABILITY RECORD*

Unit 2: Physical Science **Teacher Name: _____** **Grade Level: 7**	**Curricular Area: Science** **School Year:**				
Standards Benchmark or *GLCE* **(Italicized indicates the one used)**	**Dates Taught** **(month/day/initials):**				
P.EN.07.20 Demonstrate the evidence for kinetic energy in everyday experiences.					
P.EN.07.21 Demonstrate the evidence for potential energy in everyday experiences.					
P.EN.07.22 Illustrate how potential energy is transformed into kinetic energy in everyday experiences.					
P.EN.07.23 Explain how different forms of energy can transfer chemical potential energy through a process called photosynthesis.					
P.EN.07.24 Explain why energy can be transferred while no energy is lost or gained in the transfer.					
P.EN.07.25 Identify that nuclear reactions take place in the sun, producing heat and light.					
P.EN.07.26 Explain how the light energy from the sun is transformed to heat energy on earth.					
P.EN.07.27 Explain how heat energy causes winds in the atmosphere and currents in the ocean.					
P.EN.07.28 Describe how light energy is converted to a form of energy that can be used by living things.					
P.EN.07.29 Identify examples of waves.					
P.EN.07.30 Describe how waves are produced by vibrations in matter.					
P.EN.07.31 Predict the action of waves as they interact with matter.					

Unit 3: Life Science

Outcome 3A: (LC) III.1 All students will apply an understanding of cells to the functioning of multicellular organisms, including how cells grow, develop and reproduce.

Grade Level Content Expectations (GLCEs)	Content Statement	Integrating the Faith (I.F.)
L.OL.07.32 Describe growth and development in terms of increase of cell number, cell size, and/or cell products. L.OL.07.33 Examine how through cell division, cells can become specialized for specific functions.	L.OL.07.2 Following fertilization, cell division produces a small cluster of cells that then differentiate by appearance and function to form the basic tissue of an embryo.	• Compare how God provides animals with the necessary characteristics to live in their own habitats to God's support of His chosen people through all generations. • Have students compare the support given by animal muscular systems to the support God gave the Israelites during their bondage in Egypt.Discuss how chromosome pairs determine what we will be just as the water and Word in Baptism determine who will be. How does mitosis remind us of Genesis 1:25? Explore with the class how mitosis in this respect is like original sin. Look up the following and explain what each says about our inheritance: Psalm 51:5; John 3:6; Ephesians 2:4-5; 4:22; Genesis 5:3; 6:5; 8:21; Romans 3:9-18; 7:18; 1 Corinthians 2:14; Matthew 7:17.1. Design a classification chart of animals in the basic shape of Noah's ark. • The same way that plants and animals fall into genus and species categories, Christians are classified into various groups called denominations. Trace the origin of various denominations within Christianity. • Compare the life cycle of simple

		organisms with the eternal life cycle of a Christian from Baptism to eternal life in heaven. • Review the Genesis account of creation.

Outcome3B:
(LO) III. 2 All students will use classification systems to describe groups of living things. All students will compare and contrast differences in the life cycles of living things. All students will investigate and explain how living things obtain and use energy. All students will analyze how parts of living things are adapted to carry out specific functions.

Grade Level Content Expectations (GLCEs)	Content Statement	Integrating the Faith (I.F.)
L.OL.07.34 Describe how organisms sustain life by obtaining, transporting, transforming, and eliminating matter. L.OL.07.35 Describe how organisms transform and release energy. L.OL.07.36 Describe the effects of limiting food to developing cells.	L.OL.07.3 Cells carry out the many functions needed to sustain life. They grow and divide thereby producing more cells. Food is used to provide energy for the work that cells do and as a source of molecular building blocks from which needed materials are assembled.	• Use a microscope to make a comparison of a plant cell to Noah's ark. • Examine a blood cell and the antigens that determine blood type. Then compare a life-saving transfusion to Jesus shedding His blood freely for us upon the cross. • The same way that plants and animals fall into genus and species categories, Christians are classified into various groups called denominations. Trace the origin of various denominations within Christianity. • Compare the life cycle of simple organisms with the eternal life cycle of a Christian from Baptism to eternal life in heaven. • Review the Genesis account of creation. • Compare the life cycle of seven-year locust to man's continual turning away from God.

Outcome3C:
(LO) III. 2 All students will use classification systems to describe groups of living things. All students will compare and contrast differences in the life cycles of living things. All students will investigate and explain how living things obtain and use energy. All students will analyze how parts of living things are adapted to carry out specific functions.

Grade Level Content Expectations (GLCEs)	Content Statement	Integrating the Faith (I.F.)
L.OL.07.37 Describe the importance of carbon dioxide in the process of food production. L.OL.07.38 Describe evidence that plants make and use food. L.OL.07.39 Predict what would happen to plants growing in high carbon dioxide atmospheres.	L.OL.07.5 Plants are producers; they use the energy from light to make sugar molecules from the atoms of carbon dioxide and water. Plants use these sugars along with minerals from the soil to form fats, proteins, and carbohydrates. These products can be used immediately, incorporated into the plant's cells as the plant grows, or stored for later use.	• Use a microscope to make a comparison of a plant cell to Noah's ark. • Celebrate the miracle of photosynthesis done only in green plant cells. • The same way that plants and animals fall into genus and species categories, Christians are classified into various groups called denominations. Trace the origin of various denominations within Christianity. • Compare the anchorage of a rhizoid to a Christian's anchorage in Christ. • Explore with your class the origin of the Feast of Unleavened Bread (Exodus 12:14-20). • Illustrate the life cycle of green plants with the life cycle of the church. • Have students compare the needs of the mosses and lichen to the spiritual needs of Christians. • Review the Genesis account of creation. • Analyze and compare the life-giving qualities of photosynthesis with the life-

		giving qualities of the Holy Spirit. • Discuss how God blesses us through each of the parts of the flowering plant. • Have students draw an analogy between the spread of pollen on the wind and the spread of Christianity during the days of the persecution in the early church. See Acts 8:1-4. • (Songs of Songs 2:1). List the qualities of the Rose of Sharon that remind us of our Savior. • How do beautiful plants help us to appreciate God? • Write a paragraph comparing the life cycle of a plant with that of a human being with a soul.

Outcome3D:
(LC) III.1 All students will apply an understanding of cells to the functioning of multicellular organisms, including how cells grow, develop and reproduce.
(LH) III. 3 All students will investigate and explain how characteristics of living things are passed on through generations. All students will explain why organisms within a species are different from one another.

Grade Level Content Expectations (GLCEs)	**Content Statement**	**Integrating the Faith (I.F.)**
L.HE.07.40 Compare how characteristics of living things are passed on through generations, both asexually and sexually. L.HE.04.41 Compare and contrast the advantages and disadvantages of sexual vs. asexual reproduction.	L.HE.07.1 Reproduction is a characteristic of all living systems; because no individual organism lives forever, reproduction is essential to the continuation of every species. Some organisms reproduce asexually. Other organisms reproduce sexually.	• Discuss how chromosome pairs determine what we will be just as the water and Word in Baptism determine who will be. How does mitosis remind us of Genesis 1:25? Explore with the class how mitosis in this respect is like original sin. Look up the following and explain what each says about our inheritance: Psalm 51:5; John 3:6; Ephesians 2:4-5; 4:22; Genesis 5:3; 6:5; 8:21; Romans 3:9-18; 7:18; 1 Corinthians 2:14; Matthew 7:17.1. Design a classification chart of animals in the basic shape of Noah's ark. • A living organism can reproduce. Compare this with "living faith: and God's command to be fruitful and multiply. • Experiment with fruit flies. As the flies continue to multiply, make an analogy to the growth of the Church by sending disciples out into the world. • Talk about human reproduction in the context of Law and Gospel, human sin and God's grace.

Outcome3E:
(LC) III.1 All students will apply an understanding of cells to the functioning of multicellular organisms, including how cells grow, develop and reproduce.
(LH) III. 3 All students will investigate and explain how characteristics of living things are passed on through generations. All students will explain why organisms within a species are different from one another.

Grade Level Content Expectations (GLCEs)	Content Statement	Integrating the Faith (I.F.)
L.HE.07.42 Explain that the traits of an individual are influenced by both the environment and the genetics of the individual. L.HE.04.43 Distinguish between acquired and inherited traits.	L.HE.07.2 The characteristics of organisms are influenced by heredity and environment. For some characteristics, inheritance is more important; for other characteristics, interactions with the environment are more important.	• Explore the diversity among animals from simple to complex organisms and the characteristics and niche given to them. Then compare these characteristics (talents) and niche (job) to the opportunities God has given us for service to Him. • The paramecium will automatically move toward light. Discuss how Christians are attracted to the "Light." Use 1 Peter 2:9; 1John 1:5; and john 8:12 as the basis for your discussion.

Michigan District Lutheran School Curriculum *TEACHER ACCOUNTABILITY RECORD*

Unit 3: Life Science **Teacher Name: _____** **Grade Level: 7**	**Curricular Area: Science** **School Year:**				
Standards Benchmark or *GLCE* **(Italicized indicates the one used)**	**Dates Taught** **(month/day/initials):**				
L.OL.07.32 Describe growth and development in terms of increase of cell number, cell size, and/or cell products.					
L.OL.07.33 Examine how through cell division, cells can become specialized for specific functions.					
L.OL.07.34 Describe how organisms sustain life by obtaining, transporting, transforming, and eliminating matter.					
L.OL.07.35 Describe how organisms transform and release energy.					
L.OL.07.36 Describe the effects of limiting food to developing cells.					
L.OL.07.37 Describe the importance of carbon dioxide in the process of food production.					
L.OL.07.38 Describe evidence that plants make and use food.					
L.OL.07.39 Predict what would happen to plants growing in high carbon dioxide atmospheres.					
L.HE.07.40 Compare how characteristics of living things are passed on through generations, both asexually and sexually.					
L.HE.04.41 Compare and contrast the advantages and disadvantages of sexual vs. asexual reproduction.					
L.HE.07.42 Explain that the traits of an individual are influenced by both the environment and the genetics of the individual.					
L.HE.04.43 Distinguish between acquired and inherited traits.					

Unit 4: Earth Science

Outcome 4A:
(ES) V.4 All students will describe and explain how objects in the solar system move.

Grade Level Content Expectations (GLCEs)	Content Statement	Integrating the Faith (I.F.)
E.ES.07.44 Describe the tilt of the earth's rotation axis in relationship to the earth's yearly orbit around the sun, and how different parts of the globe are oriented towards the sun at different times of the year. E.ES.07.45 Explain how the Earth's solstices are days when the sun is in the farthest northern and southern declinations. E.ES.07.46 Explain the Earth's equinox as the two yearly occurrences when the sun crosses the celestial equator.	E.ES.07.4 Seasons result from annual variations in the intensity of sunlight and length of day due to the tilt of the Earth's rotation axis relative to the plane of its yearly orbit around the sun.	

Outcome 4B:
(ES) V.4 All students will compare and contrast our planet and sun to the other planets and star systems.

Grade Level Content Expectations (GLCEs)	**Content Statement**	Integrating the Faith (I.F.)
E.ES.07.47 Describe the position of the Earth within our solar system. E.ES.07.48 Design a model that describes the relationship of the planets and the other objects (comets and asteroids) to the sun. E.ES.07.49 Compare and contrast the planets in terms of varying sizes, compositions, and surface features.	E.ST.07.1 The sun is the central and largest body in our solar system. Earth is the third planet from the sun in a system that includes other planets and their moons, as well as smaller objects, such as asteroids and comets.	

Outcome 4C:
(ES) V.4 All students will compare and contrast our planet and sun to the other planets and star systems.

Grade Level Content Expectations (GLCEs)	Content Statement	Integrating the Faith (I.F.)
E.ES.07.50 Describe the motion of planets and moons in terms of rotation on axis and orbits due to gravity. E.ES.07.51 Explain moon phases as they relate to the position of the moon in its orbit around the Earth, resulting in the amount of observable reflected light. E.ES.07.52 Recognize that nighttime objects (stars, constellations, Milky Way) and the sun appear to move because the Earth rotates on its axis and orbits the sun. E.ES.07.53 Recognize that it is the Earth's revolution around the sun that defines a year and the seasons. E.ES.07.54 Explain lunar and solar eclipses based on the relative positions of the Earth, moon, and sun, and the orbit of the moon. E.ES.07.55 Explain the oceans' tides as they relate to the gravitational pull and orbit of the moon.	E.ST.07.2 Gravity is the force that keeps most objects in the solar system in regular and predictable motion.	

Michigan District Lutheran School Curriculum *TEACHER ACCOUNTABILITY RECORD*

Unit 4: Earth Science **Teacher Name: _____** **Grade Level: 7**	**Curricular Area: Science** **School Year:**				
Standards Benchmark or *GLCE* **(Italicized indicates the one used)**	**Dates Taught** **(month/day/initials):**				
E.ES.07.44 Describe the tilt of the earth's rotation axis in relationship to the earth's yearly orbit around the sun, and how different parts of the globe are oriented towards the sun at different times of the year.					
E.ES.07.45 Explain how the Earth's solstices are days when the sun is in the farthest northern and southern declinations.					
E.ES.07.46 Explain the Earth's equinox as the two yearly occurrences when the sun crosses the celestial equator.					
E.ES.07.47 Describe the position of the Earth within our solar system.					
E.ES.07.48 Design a model that describes the relationship of the planets and the other objects (comets and asteroids) to the sun.					
E.ES.07.49 Compare and contrast the planets in terms of varying sizes, compositions, and surface features.					
E.ES.07.50 Describe the motion of planets and moons in terms of rotation on axis and orbits due to gravity.					
E.ES.07.51 Explain moon phases as they relate to the position of the moon in its orbit around the Earth, resulting in the amount of observable reflected light.					
E.ES.07.52 Recognize that nighttime objects (stars, constellations, Milky Way) and the sun appear to move because the Earth rotates on its axis and orbits the sun.					
E.ES.07.53 Recognize that it is the Earth's revolution around the sun that defines a year and the seasons.					
E.ES.07.54 Explain lunar and solar eclipses based on the relative positions of the Earth, moon, and sun, and the orbit of the moon.					
E.ES.07.55 Explain the oceans' tides as they relate to the gravitational pull and orbit of the moon.					