

## Sixth Grade Science Curriculum

### Grade Level Goal

In sixth grade, students will develop a knowledge base of life, physical, earth, and space science. They will use this knowledge to expand their curiosity of science and enhance problem-solving skills.

Unit Title	Density
Big Idea	The learner will understand the nature of science and demonstrate an ability to practice scientific reasoning by applying it to the design, execution, and evaluation of scientific investigations and to generate new questions based on those investigations.
Enduring Understanding	Every experiment provides useful results, whether or not the results match the hypothesis. Scientific investigations follow processes that require systematic and logical development, observation, and careful analysis. Scientific investigations generally lead to new questions. The foundation of scientific theory is replicable investigations. Through repeated inquiry, patterns emerge and theories are proposed.
Essential Questions	How does science help us answer questions about the world around us? What does it mean to question? What is scientific inquiry? Why do scientists conduct investigations?
Skills/Concepts	<ul style="list-style-type: none"> <li>• TLW investigate density using a guided inquiry process.</li> <li>• TLW explain how scientists construct and scientifically test theories.</li> <li>• Given a variety of metric measurement tools and common objects and substances, TLW collaboratively identify and explain when length, mass, weight, density, area, volume or temperature are appropriate to describe the properties of an object or substance and which measurement tools are appropriate.</li> <li>• TLW measure regularly-and irregularly-shaped objects to determine volume, mass, and density of each object.</li> </ul>
GLCE	<i>E1.1A; E1.1B; E1.1C; E1.1D; E1.1E; E1.1f; E1.1g; E1.1h; E1.2A; E1.2C; E1.2D; E1.1i;</i>
Catholic Social Teachings	--

Unit Title	Changes in States of Matter
Big Idea	TLW describe and illustrate changes in states of matter in terms of relative motion of atoms and molecules and explain conservation of mass as matter changes from state to state in a closed system.
Enduring Understandings	Each state of matter has unique physical properties. Gases are easily compressed, but liquids and solids do not compress easily. Solids have their own particular shapes. Liquids and gases take the shape of the container. Mass is conserved as matter changes from state to state in a closed system. Matter can be changed from one state to another through heating and cooling. Matter exists in different states: solids, liquids, and gases.
Essential Questions	How can heating or cooling change an object? What happens to matter when it changes from state to state?
Skills/Concepts	<ul style="list-style-type: none"> <li>• TLW compare and contrast the states of matter.</li> </ul>

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	<ul style="list-style-type: none"> <li>• TLW understand how matter can change from one state to another and back by heating and cooling.</li> <li>• TLW describe and illustrate changes in state.</li> <li>• TLW explain how mass is conserved as it changes from state to state in a closed system.</li> </ul>
GLCE	P.CM.06.12; P.CM.06.11
Catholic Social Teachings	--

Unit Title	Relationships of Organisms
Big Idea	TLW classify organisms based on their source of energy and describe patterns of relationships between organisms within an ecosystem.
Enduring Understandings	<p>Changes in one population might affect other populations based on their relationships in food webs.</p> <p>Common patterns of relationships exist between and among populations in an ecosystem.</p> <p>Ecosystems have both biotic (living) and abiotic (non-living) components.</p> <p>Human interaction within an ecosystem affects plant and animal populations.</p> <p>Organisms can be classified based on their source of energy for growth and development.</p>
Essential Questions	<p>How are organisms classified based on their source of energy?</p> <p>How can changes in one population affect other populations in a food web?</p> <p>What are biotic and abiotic factors in an ecosystem?</p> <p>What are the patterns of relationships between and among populations in an ecosystem?</p>
Skills/Concepts	<ul style="list-style-type: none"> <li>• TLW list examples of populations, communities and ecosystems.</li> <li>• TLW classify organisms based on their source of energy for growth and development.</li> <li>• TLW describe common patterns of relationships between and among populations.</li> <li>• TLW examine various situations that cause changes in ecosystems and populations and predict the effects on food webs.</li> </ul>
GLCE	L.EC.06.11; L.EC.06.31; L.OL.06.51; L.OL.06.52; L.EC.06.21; L.EC.06.22; L.EC.06.32; L.EC.06.23;
Catholic Social Teachings	Care of God's Creation

Unit Title	Environmental Impact of Organisms
Big Idea	TLW describe how all organisms (including humans) can alter the environment and predict possible consequences of overpopulation.
Enduring Understandings	<p>Humans are part of the Earth's ecosystem and can purposely or accidentally alter the balance of ecosystems.</p> <p>Possible consequences of overpopulation include species extinction, resource depletion, climate change, and pollution.</p>
Essential Questions	<p>How do humans alter the balance of ecosystems?</p> <p>What are possible consequences of overpopulation of organisms (including humans)?</p>
Skills/Concepts	<ul style="list-style-type: none"> <li>• TLW describe how human beings are part of the ecosystem of the Earth and that human activity can alter the balance in ecosystems.</li> <li>• TLW predict possible consequences of overpopulation of organisms.</li> </ul>

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	<ul style="list-style-type: none"> <li>• TLW identify the positive and negative consequences of construction and urban development and record their findings in a graphic organizer.</li> <li>• TLW identify the consequences of surface mining.</li> <li>• TLW identify pollutants and the source of these pollutants.</li> <li>• TLW collaboratively demonstrate the procedure used in water treatment.</li> <li>• TLW research the effect of a human activity on the environment and create a written report or oral presentation with visual aids.</li> </ul>
GLCE	L.EC.06.41; S.RS.06.17; L.EC.06.42;L.EC.06.41; S.RS.06.17; S.RS.06.18;
Catholic Social Teachings	Care of God’s Creation

Unit Title	Plate Tectonics Interior
Big Idea	TLW explain plate tectonic movement, layers of the Earth, and how a compass relates to the magnetic field of the Earth.
Enduring Understandings	Earth as a whole has a magnetic field that is detectable at the surface with a magnetic compass. Magnets can repel or attract other magnets. Magnets can also attract certain non-magnetic objects at a distance. Tectonic plates of the Earth constantly move centimeters every year. The Earth consists of layers.
Essential Questions	How does a magnetic compass work? How does the Earth compare to a magnet? How much do tectonic plates move each year? What are the layers of the Earth?
Skills/Concepts	<ul style="list-style-type: none"> <li>• TLW describe layers of the Earth as a lithosphere (crust and upper mantle), convecting mantle, and dense metallic core.</li> <li>• TLW explain plate tectonic movement and how the lithospheric plates move centimeters each year.</li> <li>• TLW demonstrate how major geologic events result from tectonic plate motions.</li> <li>• TLW describe the Earth as a magnet and compare the magnetic properties of the Earth to that of a natural or man-made magnet.</li> <li>• TLW explain how a compass works using the magnetic field of the earth and how a compass is used for navigation on land and sea.</li> </ul>
GLCE	<i>E.SE.06.53; E.SE.06.51; S.RS.06.19; E.SE.06.52; E.SE.06.61; E.SE.06.62;</i>
Catholic Social Teachings	--

Unit Title	Rocks and Minerals
Big Idea	TLW use minerals and the rock cycle to compare and contrast the formation of rock types.
Enduring Understandings	The rock cycle model explains the formation of igneous, metamorphic, and sedimentary rocks and that rocks are constantly forming and changing. Waves, wind, water, and glacier movement shape and reshape the land surface of the Earth by eroding rock in some areas and depositing sediments in other areas.
Essential Question	How does the rock cycle explain the formation of rock types and the changes they undergo?
Skills/Concepts	<ul style="list-style-type: none"> <li>• TLW compare and contrast the formation of rock types and demonstrate the similarities</li> </ul>

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	<p>and differences using the rock cycle model.</p> <ul style="list-style-type: none"> <li>TLW explain how waves, wind, water, and glacier movement, shape and reshape the land surface of the Earth by eroding rock in some areas and depositing sediments in other areas.</li> </ul>
GLCE	<i>E.SE.06.41; E.SE.06.12;</i>
Catholic Social Teachings	--

Unit Title	Rock Cycle
Big Idea	TLW relate plate tectonics to the formation of rocks and minerals and use the rock cycle to explain weathering, erosion, the formation of sediments, and how rock types can change over time.
Enduring Understandings	Rocks are composed of one or more minerals. Rocks change over time, due to processes such as cooling, erosion, weathering, heat, and pressure. The surface of Earth is not flat because earthquakes and volcanoes build up the Earth's surface even as wind, water, and ice erode it.
Essential Questions	If mountains are constantly eroding, why isn't the surface of the Earth completely flat? Why do rocks change over time?
Skills/Concepts	<ul style="list-style-type: none"> <li>TLW review the properties of minerals.</li> <li>TLW review the classification of rocks, discriminate among types of rocks, and use the rock cycle to explain that rocks are constantly forming and changing.</li> <li>TLW discover that weathering and erosion are destructive forces in the rock cycle that break rock into smaller particles.</li> <li>TLW explain the relationship between the rock cycle and plate tectonics theory regarding the origins of igneous, sedimentary, and metamorphic rocks.</li> </ul>
GLCE	E3.1A; E3.1B
Catholic Social Teachings	--

Unit Title	Soils
Big Idea	TLW compare and classify soils, explain how soils are formed, and relate the importance of soils to people.
Enduring Understandings	Describe how soil is a mixture of different particle sizes and textures, made up of weather-eroded rock and decomposed organic material. Physical and chemical weathering lead to erosion and the formation of soils and sediments.
Essential Questions	How are earth materials classified? How do we use earth materials each day? What are the origins of the different types of materials? What is soil and how is it formed? What types of materials make up the earth?
Skills/Concepts	<ul style="list-style-type: none"> <li>TLW explain how physical and chemical weathering lead to erosion and the formation of soils and sediments.</li> </ul>

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	<ul style="list-style-type: none"> <li>• TLW describe how soil is a mixture, made up of weather eroded rock and decomposed organic material.</li> <li>• TLW compare different soil samples based on particle size and texture.</li> </ul>
GLCE	E.SE.06.11; E.SE.06.13; E.SE.06.14;
Catholic Social Teachings	--

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