Science 6

State Standard Number	State Standard Area/Description	Unit Name	Course Topic Description
S	Science Processes		
S.IP	Develop an understanding that scientific inquiry and reasoning involves observing, questioning, investigating, recording, and developing solutions to problems.		
S.IP.M.1	Inquiry involves generating questions, conducting investigations, and developing solutions to problems through reasoning and observation.		
S.IP.06.11	Generate scientific questions based on observations, investigations, and research.	Unit 1	Introduction to the Scientific Method
S.IP.06.12	Design and conduct scientific investigations.	Unit 2	Designing Controlled Experiments
		Unit 4	The Scientific Method Project
S.IP.06.13	Use tools and equipment (spring scales, stop watches, meter sticks and tapes, models, hand lens, thermometer, models, sieves, microscopes) appropriate to scientific investigations.		
S.IP.06.14	Use metric measurement devices in an investigation.		
S.IP.06.15	Construct charts and graphs from data and observations.	Unit 3	Analyze Results and Draw a Conclusion
		Unit 4	The Scientific Method Project
S.IP.06.16	Identify patterns in data.	Unit 3	Analyze Results and Draw a Conclusion
S.IA	Develop an understanding that scientific inquiry and investigations require analysis and communication of findings, using appropriate technology.		
S.IA.M.1	Inquiry includes an analysis and presentation of findings that lead to future questions, research, and investigations.		

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S.IA.06.11	Analyze information from data tables and graphs to answer scientific questions.	Unit 3	Analyze Results and Draw a Conclusion
S.IA.06.12	Evaluate data, claims, and personal knowledge through collaborative science discourse.		
S.IA.06.13	Communicate and defend findings of observations and investigations using evidence.	Unit 3	Analyze Results and Draw a Conclusion
		Unit 4	The Scientific Method Project
S.IA.06.14	Draw conclusions from sets of data from multiple trials of a scientific investigation.		
S.IA.06.15	Use multiple sources of information to evaluate strengths and weaknesses of claims, arguments, or data.	Unit 3	Analyze Results and Draw a Conclusion
		Unit 4	The Scientific Method Project
S.RS	Develop an understanding that claims and evidence for their scientific merit should be analyzed. Understand how scientists decide what constitutes scientific knowledge. Develop an understanding of the importance of reflection on scientific knowledge and its application to new situations to better understand the role of science in society and technology.		
S.RS.M.1	Reflecting on knowledge is the application of scientific knowledge to new and different situations. Reflecting on knowledge requires careful analysis of evidence that guides decision-making and the application of science throughout history and within society.		
S.RS.06.11	Evaluate the strengths and weaknesses of claims, arguments, and data.		
S.RS.06.12	Describe limitations in personal and scientific knowledge.		
S.RS.06.13	Identify the need for evidence in making scientific decisions.		

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S.RS.06.14	Evaluate scientific explanations based on current evidence and scientific principles.		
S.RS.06.15	Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities.	Throughout the course	Throughout the course
S.RS.06.16	Design solutions to problems using technology.		
S.RS.06.17	Describe the effect humans and other organisms have on the balance of the natural world.	Unit 17	Energy Problems
S.RS.06.18	Describe what science and technology can and cannot reasonably contribute to society.		
S.RS.06.19	Describe how science and technology have advanced because of the contributions of many people throughout history and across cultures.		
P	Physical Science		
P.EN	Develop an understanding that there are many forms of energy (such as heat, light, sound, and electrical) and that energy is transferable by convection, conduction, or radiation. Understand energy can be in motion, called kinetic; or it can be stored, called potential. Develop an understanding that as temperature increases, more energy is added to a system. Understand nuclear reactions in the sun produce light and heat for the Earth.		
P.EN.M.1	Objects and substances in motion have 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.		

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P.EN.06.11	Identify kinetic or potential energy in everyday situations (for example: stretched rubber band, objects in motion, ball on a hill, food energy).	Unit 14	Introduction to Energy
P.EN.06.12	Demonstrate the transformation between potential and kinetic energy in simple mechanical systems (for example: roller coasters, pendulums).		
P.EN.M.4	Energy is transferred from a source to a receiver by radiation, conduction, and convection. When energy is transferred from one system to another, the quantity of energy before the transfer is equal to the quantity of energy after the transfer.		
P.EN.06.41	Explain how different forms of energy can be transferred from one place to another by radiation, conduction, or convection.		
P.EN.06.42	Illustrate how energy can be transferred while no energy is lost or gained in the transfer.	Unit 17	Energy Problems
P.CM	Develop an understanding of changes in the state of matter in terms of heating and cooling, and in terms of arrangement and relative motion of atoms and molecules. Understand the differences between physical and chemical changes. Develop an understanding of the conservation of mass. Develop an understanding of products and reactants in a chemical change.		
P.CM.M.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.		
P.CM.06.11	Describe and illustrate changes in state, in terms of the arrangement and relative motion of the atoms or molecules.	Unit 7	States of Matter
		Unit 14	Introduction to Energy

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P.CM.06.12	Explain how mass is conserved as a substance changes from state to state in a closed system.		
L	Life Science		
L.OL	Develop an understanding that plants and animals (including humans) have basic requirements for maintaining life which include the need for air, water and a source of energy. Understand that all life forms can be classified as producers, consumers, or decomposers as they are all part of a global food chain where food/energy is supplied by plants which need light to produce food/energy. Develop an understanding that plants and animals can be classified by observable traits and physical characteristics. Understand that all living organisms are composed of cells and they exhibit cell growth and division. Understand that all plants and animals have a definite life cycle, body parts, and systems to perform specific life functions.		
L.OL.M.5	Producers are mainly green plants that obtain energy from the sun by the process of photosynthesis. All animals, including humans, are consumers that meet their energy needs 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.		
L.OL.06.51	Classify producers, consumers, and decomposers based on their source of food (the source of energy and building materials).	Unit 20	Energy Flow in the Environment
L.OL.06.52	Distinguish between the ways in which consumers and decomposers obtain energy.	Unit 20	Energy Flow in the Environment

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L.EC	Develop an understanding of the interdependence of the variety of populations, communities and ecosystems, including those in the Great Lakes region. Develop an understanding of different types of interdependence and that biotic (living) and abiotic (non-living) factors affect the balance of an ecosystem. Understand that all organisms cause changes, some detrimental and others beneficial, in the environment where they live.		
L.EC.M.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.		
L.EC.06.11	Identify and describe examples of populations, communities, and ecosystems including the Great Lakes region.	Unit 19	Introduction to Ecology
L.EC.M.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.		
L.EC.06.21	Describe common patterns of relationships between and among populations (competition, parasitism, symbiosis, predator/prey).		
L.EC.06.22	Explain how two populations of organisms can be mutually beneficial and how that can lead to interdependency.		
L.EC.06.23	Predict how changes in one population might affect other populations based upon their relationships in the food web.		

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L.EC.M.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.		
L.EC.06.31	Identify the living (biotic) and nonliving (abiotic) components of an ecosystem.	Unit 19	Introduction to Ecology
L.EC.06.32	Identify the factors in an ecosystem that influence changes in population size.	Unit 21	Interactions in the Environment
L.EC.M.4	All organisms (including humans) cause change in the environment where they live. Some of the changes are harmful to the organism or other organisms, whereas others are helpful.		
L.EC.06.41	Describe how human beings are part of the ecosystem of the Earth and that human activity can purposefully, or accidentally, alter the balance in ecosystems.	Unit 17	Energy Problems
L.EC.06.42	Predict possible consequences of overpopulation of organisms, including humans, (for example: species extinction, resource depletion, climate change, pollution).	Unit 21	Interactions in the Environment
E	Earth Science		
E.SE	Develop an understanding of the properties of earth materials and how those properties make materials useful. Understand gradual and rapid changes in earth materials and features of the surface of Earth. Understand magnetic properties of Earth.		
E.SE.M.1	Soils consist of weathered rocks and decomposed organic materials from dead plants, animals, and bacteria. Soils are often found in layers with each having a different chemical composition and texture.		

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E.SE.06.11	Explain how physical and chemical weathering lead to erosion and the formation of soils and sediments.	Unit 31	The Rock Cycle
E.SE.06.12	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.		
E.SE.06.13	Describe how soil is a mixture, made up of weather eroded rock and decomposed organic material.		
E.SE.06.14	Compare different soil samples based on particle size and texture.		
E.SE.M.4	Rocks and rock formations bear evidence of the minerals, materials, temperature/pressure conditions, and forces that created them.		
E.SE.06.41	Compare and contrast the formation of rock types (igneous, metamorphic, and sedimentary) and demonstrate the similarities and differences using the rock cycle model.	Unit 31	The Rock Cycle
E.SE.M.5	The lithospheric plates of the Earth constantly move, resulting in major geological events, such as earthquakes, volcanic eruptions, and mountain building.		
E.SE.06.51	Explain plate tectonic movement and how the lithospheric plates move centimeters each year.	Unit 30	Introduction to Earth Science
E.SE.06.52	Demonstrate how major geological events (earthquakes, volcanic eruptions, mountain building) result from these plate motions.		
E.SE.06.53	Describe layers of the Earth as a lithosphere (crust and upper mantle), convecting mantle, and dense metallic core.	Unit 30	Introduction to Earth Science

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E.SE.M.6	Earth as a whole has a magnetic field that is detectable at the surface with a compass.		
E.SE.06.61	Describe the Earth as a magnet and compare the magnetic properties of the Earth to that of a natural or manufactured magnet.		
E.SE.06.62	Explain how a compass works using the magnetic field of the Earth, and how a compass is used for navigation on land and sea.		
E.ST	Develop an understanding that the sun is the central and largest body in the solar system and that Earth and other objects in the sky move in a regular and predictable motion around the sun. Understand that those motions explain the day, year, moon phases, eclipses and the appearance of motion of objects across the sky. Understand that gravity is the force that keeps the planets in orbit around the sun and governs motion in the solar system. Develop an understanding that fossils and layers of Earth provide evidence of the history of Earthâ€™s life forms, changes over long periods of time, and theories regarding Earthâ€™s history and continental drift.		
E.ST.M.3	Fossils provide important evidence of how life and environmental conditions have changed in a given location.		
E.ST.06.31	Explain how rocks and fossils are used to understand the age and geological history of the earth (timelines and relative dating, rock layers).		
E.ST.M.4	Earth processes seen today (erosion, mountain building, and glacier movement) make possible the measurement of geologic time through methods such as observing rock sequences and using fossils to correlate the sequences at various locations.		

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E.ST.06.41	Explain how Earth processes (erosion, mountain building, and glacier movement) are used for the measurement of geologic time through observing rock layers.		
E.ST.06.42	Describe how fossils provide important evidence of how life and environmental conditions have changed.		