

**KC4 Kindergarten Science Teaching Plan
(Aligned to the Michigan Science GLCE v.12.07)**

GLCE Code	KC4 Academic Standard/ Grade Level Content Expectation	KC4 Curriculum	From 2002 Version of KC4 Science
K:1	TLW demonstrate an understanding that scientific inquiry and reasoning involves observing, questioning, investigating, recording, and developing solutions to problems by using their five senses to explore the natural world.	Intro to Inquiry – Senses	K:2
Science Processes	Inquiry Process		
Statement S.IP.E.1	Inquiry involves generating questions, conducting investigations, and developing solutions to problems through reasoning and observation.		
S.IP.00.11	Make purposeful observation of the natural world using the appropriate senses.		
S.IP.00.12	Generate questions based on observations.		
S.IP.00.13	Plan and conduct simple investigations.		
S.IP.00.14	Manipulate simple tools (for example: hand lens, pencils, balances, non-standard objects for measurement) that aid observation and data collection.		
S.IP.00.15	Make accurate measurements with appropriate (non-standard) units for the measurement tool.		
S.IP.00.16	Construct simple charts from data and observations.		
Science Processes	Inquiry Analysis and Communication		
Statement S.IA.E.1	Inquiry includes an analysis and presentation of findings that lead to future questions, research, and investigations.		
S.IA.00.12	Share ideas about science through purposeful conversation.		
S.IA.00.13	Communicate and present findings of observations.		
S.IA.00.14	Develop strategies for information gathering (ask an expert, use a book, make observations, conduct simple investigations, and watch a video).		
Science Processes	Reflection and Social Implications		
Statement S.RS.E.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.00.11	Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities.		

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K:2	TLW compare the position and motion of an object in relation to other objects.	Physical Science – Force and Motion/ Position and Gravity	New
Physical Science	Force and Motion		
Statement P.FM.E.1	A position of an object can be described by locating the object relative to other objects or a background. The description of the motion of an object from one observer's view may be different from that reported from a different observer's view.		
P.FM.00.11	Compare the position of an object (for example: above, below, in front of, behind, on) in relation to other objects around it.		
P.FM.00.12	Describe the motion of an object (for example: away from or closer to) from different observers' views.		
Statement P.FM.E.2	Gravity- Earth pulls down on all objects with a force called gravity. With very few exceptions, objects fall to the ground no matter where the object is on the Earth.		
P.FM.00.21	Observe how objects fall toward the earth.		
K:3	TLW explain that a force is a push or pull and demonstrate those forces on objects.	Physical Science – Force	New
Statement P.FM.E.3	Force- A force is either a push or a pull. The motion of objects can be changed by forces. The size of the change is related to the size of the force. The change is also related to the weight (mass) of the object on which the force is being exerted. When an object does not move in response to a force, it is because another force is being applied by the environment.		
P.FM.00.31	Demonstrate pushes and pulls.		
P.FM.0.32	Observe that objects initially at rest will move in the direction of the push or pull.		
P.FM.00.33	Observe how pushes and pulls can change the speed or direction of moving objects.		
P.FM.00.34	Observe how shape (for example: cone, cylinder, sphere), size, and weight of an object can affect motion.		
K:4	TLW compare living and nonliving things and identify the basic requirements for life.	Life and Earth Science – Living/ Nonliving/ Basic Needs	K:1
Life Science	Organization of Living Things		
Statement L.OLE.1	Organisms have basic needs. Animals and plants need air, water, and food. Plants also require light. Plants and animals use food as a source of energy and as a source of building material for growth and repair.		

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L.OL.00.11	Identify that living things have basic needs.		
L.OL.00.12	Identify and compare living and nonliving things.		
Earth Science	Solid Earth		
Statement E.SE.E.1	Earth Materials- Earth materials that occur in nature include rocks, minerals, soils, water, and the gases of the atmosphere. Some Earth materials have properties which sustain plant and animal life.		
E.SE.00.11	Identify Earth materials (air, water, soil) that are used to grow plants.		

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1:1	TLW demonstrate an understanding that scientific inquiry and reasoning involves observing, questioning, investigating, recording, and developing solutions to problems by using measurement tools to investigate the natural world.	Inquiry – Tools of the Scientist	New
Science Processes	Inquiry Process		
Statement S.IP.E.1	Inquiry involves generating questions, conducting investigations, and developing solutions to problems through reasoning and observation.		
S.IP.01.11	Make purposeful observation of the natural world using the appropriate senses.		
S.IP.01.12	Generate questions based on observations.		
S.IP.01.13	Plan and conduct simple investigations.		
S.IP.01.14	Manipulate simple tools (for example: hand lens, pencils, balances, non-standard objects for measurement) that aid observation and data collection.		
S.IP.01.15	Make accurate measurements with appropriate (non-standard) units for the measurement tool.		
S.IP.01.16	Construct simple charts from data and observations.		
Science Processes	Inquiry Analysis and Communication		
Statement S.IA.E.1	Inquiry includes an analysis and presentation of findings that lead to future questions, research, and investigations.		
S.IA.01.12	Share ideas about science through purposeful conversation.		
S.IA.01.13	Communicate and present findings of observations.		
S.IA.01.14	Develop strategies for information gathering (ask an expert, use a book, make observations, conduct simple investigations, and watch a video).		
Science Processes	Reflection and Social Implications		
Statement S.RS.E.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.01.11	Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities.		
S.RS.01.12	Recognize that science investigations are done more than one time.		

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1:2	TLW classify objects by observable attributes and explain that objects have physical properties and may exist in different states.	Physical Science –Properties of Matter	K:4
Physical Science	Properties of Matter		
Statement P.P.M.E.1	Physical Properties- All objects and substances have physical properties that can be measured.		
P.PM.01.11	Demonstrate the ability to sort objects according to observable attributes such as color, shape, size, sinking or floating.		
Statement P.P.M.E.2	States of Matter- Matter exists in several different states: solids, liquids and gases. 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, but liquids and gases take the shape of the container.		
P.PM.01.21	Demonstrate that water as a solid keeps its own shape (ice).		
P.PM.01.22	Demonstrate that water as a liquid takes on the shape of various containers.		
1:3	TLW determine the interaction of magnets and other materials.	Physical Science –Magnets	New
Statement P.P.M.E.3	Magnets- Magnets can repel or attract other magnets. Magnets can also attract certain non-magnetic objects at a distance.		
P.PM.01.31	Identify materials that are attracted by magnets.		
P.PM.01.32	Observe that like poles of a magnet repel and unlike poles of a magnet attract.		
1:4	TLW identify the needs and life cycle of animals.	Life and Earth Science –Needs and Life Cycles of Animals	2:2 3:1
Life Science	Organization of Living Things		
Statement L.O.L.E.1	Life Requirements- Organisms have basic needs. Animals and plants need air, water, and food. Plants also require light. Plants and animals use food as a source of energy and as a source of building material for growth and repair.		
L.OL.01.13	Identify the needs of animals.		

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Statement L.OL.E.2	Life Cycles- Plants and animals have life cycles. Both plants and animals begin life and develop into adults, reproduce, and eventually die. The details of this life cycle are different for different organisms.		
L.OL.01.21	Describe the life cycle of animals including the following stages: egg, young, adult; egg, larva, pupa, adult.		
Earth Science	Solid Earth		
Statement E.SE.E.1	Earth Materials- Earth materials that occur in nature include rocks, minerals, soils, water, and the gases of the atmosphere. Some Earth materials have properties which sustain plant and animal life.		
E.SE.01.12	Describe how Earth materials contribute to the growth of plant and animal life.		
1:5	TLW identify characteristics of animals that are passed from parents to young and classify young animals based on those characteristics.	Life Science – Heredity	1:1
Life Science	Heredity		
Statement L.HE.01.11	Observable Characteristics- Plants and animals share many, but not all, characteristics of their parents.		
L.HE.01.11	Identify characteristics (for example: body coverings, beak shape, number of legs, body parts) that are passed on from parents to young.		
L.HE.01.12	Classify young animals based on characteristics that are passed on from parents (for example: dogs/puppies, cats/kittens, cows/calves, chicken/chicks).		
1:6	TLW describe weather conditions and identify the role of the Sun in determining our weather.	Earth Science – Weather	K:3 2:3
Earth Science	Earth Systems		
Statement E.ES.E.1	Solar Energy- The sun warms the land, air and water and helps plants grow.		
E.ES.01.11	Identify the sun as the most important source of heat which warms the land, air, and water of the Earth.		
E.ES.01.12	Demonstrate the importance of sunlight and warmth in plant growth.		
Statement E.ES.E.2	Weather- Weather changes from day to day and over the seasons.		
E.ES.01.21	Compare daily changes in the weather related to temperature (cold, hot, warm, cool); cloud cover (cloudy, partly cloudy, foggy) precipitation		

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	(rain, snow, hail, freezing rain); wind (breezy, windy, calm).		
E.ES.01.22	Describe and compare weather related to the four seasons in terms of temperature, cloud cover, precipitation, and wind.		
E.ES.01.23	Describe severe weather events.		
E.ES.01.24	Describe precautions that should be taken for human safety during severe weather conditions (thunderstorms, lightning, tornadoes, high winds, blizzards, hurricanes).		
Statement E.ES.E.3	Weather Measurement- Scientists use tools for observing, recording, and predicting weather changes.		
E.ES.01.31	Identify the tools that might be used to measure temperature, precipitation, cloud cover and wind.		
E.ES.01.32	Observe and collect data of weather conditions over a period of time.		

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2:1	TLW demonstrate an understanding that scientific inquiry and reasoning involves observing, questioning, investigating, recording, and developing solutions to problems by using measurement tools to investigate the natural world.	Inquiry – Tools of the Scientist	New
Science Processes	Inquiry Process		
Statement S.IP.E.1	Inquiry involves generating questions, conducting investigations, and developing solutions to problems through reasoning and observation.		
S.IP.02.11	Make purposeful observation of the natural world using the appropriate senses.		
S.IP.02.12	Generate questions based on observations.		
S.IP.02.13	Plan and conduct simple investigations.		
S.IP.02.14	Manipulate simple tools (for example: hand lens, pencils, balances, non-standard objects for measurement) that aid observation and data collection.		
S.IP.02.15	Make accurate measurements with appropriate (non-standard) units for the measurement tool.		
S.IP.02.16	Construct simple charts from data and observations.		
Science Processes	Inquiry Analysis and Communication		
Statement S.IA.E.1	Inquiry includes an analysis and presentation of findings that lead to future questions, research, and investigations.		
S.IA.02.12	Share ideas about science through purposeful conversation.		
S.IA.02.13	Communicate and present findings of observations.		
S.IA.02.14	Develop strategies and skills for information gathering and problem solving (books, internet, ask an expert, observation, investigation, technology tools).		
Science Processes	Reflection and Social Implications		
Statement S.RS.E.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.02.11	Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities.		
S.RS.02.13	Recognize that when a science investigation is done the way it was done before, similar results are expected.		
S.RS.02.15	Use evidence when communicating scientific ideas.		
S.RS.02.16	Identify technology used in everyday life.		

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2:2	TLW classify objects by observable attributes and measure length, volume, and weight of objects.	Physical Science – Physical Properties	2:4
Physical Science	Properties of Matter		
Statement P.PM.E.1	Physical Properties- All objects and substances have physical properties that can be measured.		
P.PM.02.12	Describe objects and substances according to their properties (color, size, shape, texture, hardness, liquid or solid, sinking or floating).		
P.PM.02.13	Measure the length of objects using rulers (centimeters) and meter sticks (meters).		
P.PM.02.14	Measure the volume of liquids using common measuring tools (measuring cups, measuring spoons).		
P.PM.02.15	Compare the weight of objects using balances.		
2:3	TLW classify objects as single substances or mixtures.	Physical Science – Mixtures	4:8
Statement P.PM.E.4	Material Composition- Some objects are composed of a single substance, while other objects are composed of more than one substance.		
P.PM.02.41	Classify objects as single substances (ice, silver, sugar, salt) or mixtures (salt and pepper, mixed dry beans).		
2:4	TLW identify the needs of plants, describe the life cycle of flowering plants, and identify characteristics of plants that are passed from parents to young.	Life Science – Needs, Life Cycle, and Heredity of Plants	2:1 3:1
Life Science	Organization of Living Things		
Statement L.OL.E.1	Life Requirements- Organisms have basic needs. Animals and plants need air, water, and food. Plants also require light. Plants and animals use food as a source of energy and as a source of building material for growth and repair.		
L.OL.02.14	Identify the needs of plants.		
Statement L.OL.E.2	Life Cycles- Plants and animals have life cycles. Both plants and animals begin life and develop into adults, reproduce, and eventually die. The details of this life cycle are different for different organisms.		
L.OL.02.22	Describe the life cycle of familiar flowering plants including the following stages: seed, plant, flower, and fruit.		

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Life Science	Heredity		
Statement L.HE.E.1	Observable Characteristics- Plants and animals share many, but not all, characteristics of their parents.		
L.HE.02.13	Identify characteristics of plants (for example: leaf shape, flower type, color, size) that are passed on from parents to young.		
2:5	TLW identify sources, uses, properties, and movement of water.	Earth Science – Water	2:5
Earth Science	Fluid Earth		
Statement E.FE.E.1	Water- Water is a natural resource and is found under the ground, on the surface of the earth, and in the sky. It exists in three states (liquid, solid, gas) and can go back and forth from one form to another.		
E.FE.02.11	Identify water sources (wells, springs, lakes, rivers, oceans).		
E.FE.02.12	Identify household uses of water (drinking, cleaning, food preparation).		
E.FE.02.13	Describe the properties (visible, flowing, melting, dew) of water as a liquid (lakes, rivers, streams, oceans).		
E.FE.02.14	Describe the properties (hard, visible, freezing, ice) of water as a solid (ice, snow, iceberg, sleet, hail).		
Statement E.FE.E.2	Water Movement- Water moves in predictable patterns.		
E.FE.02.21	Describe how rain collects on the surface of the Earth and flows downhill into bodies of water (streams, rivers, lakes, oceans) or into the ground.		
E.FE.02.22	Describe the major bodies of water on the Earth's surface (lakes, ponds, oceans, rivers, streams).		
2:6	TLW describe the major landforms of the surface of the Earth.	Earth Science – Landforms	1:3
Earth Science	Solid Earth		
Statement E.SE.E.2	Surface Changes- The surface of Earth changes. Some changes are due to slow processes, such as erosion and weathering, and some changes are due to rapid processes, such as landslides, volcanic eruptions, and earthquakes.		
E.SE.02.21	Describe the major landforms of the surface of the Earth (mountains, plains, plateaus, valleys, hills).		

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3:1	TLW demonstrate an understanding that scientific inquiry and reasoning involves observing, questioning, investigating, recording, and developing solutions to problems by investigating gravity.	Inquiry and Physical Science – Gravity	3:8
Science Processes	Inquiry Process		
Statement S.IP.E.1	Inquiry involves generating questions, conducting investigations, and developing solutions to problems through reasoning and observation.		
S.IP.03.11	Make purposeful observation of the natural world using the appropriate senses.		
S.IP.03.12	Generate questions based on observations.		
S.IP.03.13	Plan and conduct simple and fair investigations.		
S.IP.03.14	Manipulate simple tools that aid observation and data collection (for example: hand lens, balance, ruler, meter stick, measuring cup, thermometer, spring scale, stop watch/timer).		
S.IP.03.15	Make accurate measurements with appropriate units (centimeters, meters, Celsius, grams, seconds, minutes) for the measurement tool.		
S.IP.03.16	Construct simple charts and graphs from data and observations.		
Science Processes	Inquiry Analysis and Communication		
Statement S.IA.E.1	Inquiry includes an analysis and presentation of findings that lead to future questions, research, and investigations.		
S.IA.03.11	Summarize information from charts and graphs to answer scientific questions.		
S.IA.03.12	Share ideas about science through purposeful conversation in collaborative groups.		
S.IA.03.13	Communicate and present findings of observations and investigations.		
S.IA.03.14	Develop research strategies and skills for information gathering and problem solving.		
S.IA.03.15	Compare and contrast sets of data from multiple trials of a science investigation to explain reasons for differences.		
Physical Science	Force and Motion		
Statement P.FM.E.2	Gravity- Earth pulls down on all objects with a force called gravity. With very few exceptions, objects fall to the ground no matter where the object is on the Earth.		
P.FM.03.22	Identify the force that pulls objects towards the Earth.		

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Science Processes	Reflection and Social Implications		
Statement S.RS.E.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.03.11	Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities.		
S.RS.03.14	Use data/samples as evidence to separate fact from opinion.		
S.RS.03.15	Use evidence when communicating scientific ideas.		
S.RS.03.16	Identify technology used in everyday life.		
S.RS.03.17	Identify current problems that may be solved through the use of technology.		
S.RS.03.18	Describe the effect humans and other organisms have on the balance of the natural world.		
S.RS.03.19	Describe how people have contributed to science throughout history and across cultures.		
3:2	TLW compare and contrast the motion of objects in terms of speed, direction, and the forces exerted on the object.	Physical Science – Force and Speed	3:8
Physical Science	Force and Motion		
Statement P.FM.E.3	Force- A force is either a push or a pull. The motion of objects can be changed by forces. The size of the change is related to the size of the force. The change is also related to the weight (mass) of the object on which the force is being exerted. When an object does not move in response to a force, it is because another force is being applied by the environment.		
P.FM.03.35	Describe how a push or a pull is a force.		
P.FM.03.36	Relate a change in motion of an object to the force that caused the change of motion.		
P.FM.03.37	Demonstrate how the change in motion of an object is related to the strength of the force acting upon the object and to the mass of the object.		
P.FM.03.38	Demonstrate when an object does not move in response to a force, it is because another force is acting on it.		
Statement P.FM.E.4	Speed- An object is in motion when its position is changing. The speed of an object is defined by how far it travels divided by the amount of time it took to travel that far.		

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P.FM.03.41	Compare and contrast the motion of objects in terms of direction.		
P.FM.03.42	Identify changes in motion (change direction, speeding up, slowing down).		
P.FM.03.43	Calculate the speed of an object based on the distance it travels divided by the amount of time it took to travel that distance.		
3:3	TLW explain the properties of light and sound and how people perceive these forms of energy.	Physical Science – Sound and Light	2:6
Physical Science	Energy		
Statement P.EN.E.1	Forms of Energy- Heat, electricity, light, and sound are forms of energy.		
P.EN.03.11	Identify light and sound as forms of energy.		
Statement P.EN.E.2	Light Properties- Light travels in straight lines. Shadows result from light not being able to pass through an object. When light travels at an angle from one substance to another (air and water), it changes direction.		
P.EN.03.21	Demonstrate that light travels in a straight line and that shadows are made by placing an object in a path of light.		
P.EN.03.22	Demonstrate what happens to light when it travels from water to air (straw half in water looks bent).		
Physical Science	Properties of Matter		
Statement P.PM.E.5	Conductive and Reflective Properties- Objects vary to the extent they absorb and reflect light energy and conduct heat and electricity.		
P.PM.03.51	Demonstrate how some materials are heated more than others by light that shines on them.		
P.PM.03.52	Explain how we need light to see objects: light from a source reflects off objects and enters our eyes.		
Physical Science	Energy		
Statement P.EN.E.3	Sound- Vibrating objects produce sound. The pitch of sound varies by changing the rate of vibration.		
P.EN.03.31	Relate sounds to their sources of vibrations (for example: a musical note produced by a vibrating guitar string, the sounds of a drum made by the vibrating drum head).		
P.EN.03.32	Distinguish the effect of fast or slow vibrations as pitch.		

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3:4	TLW classify plants and relate characteristics and functions of observable parts that allow them to live in their environment.	Life Science – Plants	3:2; 3:3
Life Science	Organization of Living Things		
Statement L.OL.E.3	Structures and Functions- Organisms have different structures that serve different functions in growth, survival, and reproduction.		
L.OL.03.31	Describe the function of the following plant parts: flower, stem, root and leaf.		
Statement L.OL.E.4	Classification- Organisms can be classified on the basis of observable characteristics.		
L.OL.03.41	Classify plants on the basis of observable physical characteristics (roots, leaves, stems, and flowers).		
Life Science	Evolution		
Statement L.EV.E.1	Environmental Adaptation- Different kinds of organisms have characteristics that help them to live in different environments.		
L.EV.03.11	Relate characteristics and functions of observable parts in a variety of plants that allow them to live in their environment (for example: leaf shape, thorns, odor, color).		
3:5	TLW classify animals and relate characteristics and functions of observable structures that allow them to live in their environment.	Life Science – Animals	3:2; 3:3
Life Science	Organization of Living Things		
Statement L.OL.E.3	Structures and Functions- Organisms have different structures that serve different functions in growth, survival, and reproduction.		
L.OL.03.32	Identify and compare structures in animals used for controlling body temperature, support, movement, food-getting, and protection (for example: fur, wings, teeth, claws).		
Statement L.OL.E.4	Classification- Organisms can be classified on the basis of observable characteristics.		
L.OL.03.42	Classify animals on the basis of observable physical characteristics (backbone, skin, shell, limbs, scales).		
Life Science	Evolution		
Statement L.EV.E.1	Environmental Adaptation- Different kinds of organisms have characteristics that help them to live in different environments.		
L.EV.03.12	Relate characteristics and functions of observable body parts to the ability of animals to live in their environment (for example: sharp teeth, claws, color, body covers).		

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3:6	TLW describe different types of materials from the Earth and their uses.	Earth Science – Earth Materials	4:5
Earth Science	Solid Earth		
Statement E.SE.E.1	Earth Materials- Earth materials that occur in nature include rocks, minerals, soils, water, and the gases of the atmosphere. Some Earth materials have properties which sustain plant and animal life.		
E.SE.03.13	Recognize and describe different types of earth materials (mineral, rock, clay, boulder, gravel, sand, soil).		
E.SE.03.14	Recognize that rocks are made up of minerals.		
Statement E.SE.E.3	Using Earth Materials- Some Earth materials have properties that make them useful either in their present form or designed and modified to solve human problems. They can enhance the quality of life as in the case of materials used for building or fuels used for heating and transportation.		
E.SE.03.31	Identify Earth materials used to construct some common objects (for example: bricks, buildings, roads, glass).		
E.SE.03.32	Describe how materials taken from the Earth can be used as fuels for heating and transportation.		
3:7	TLW identify and describe natural causes of change in the Earth’s surface.	Earth Science – Surface Changes	4:4
Statement E.SE.E.2	Surface Changes- The surface of Earth changes. Some changes are due to slow processes, such as erosion and weathering, and some changes are due to rapid processes, such as landslides, volcanic eruptions, and earthquakes.		
E.SE.03.22	Identify and describe natural causes of change in the Earth’s surface (erosion, glaciers, volcanoes, landslides, and earthquakes).		
3:8	TLW identify and classify renewable and nonrenewable natural resources and describe the human impact on the environment.	Earth Science – Natural Resources	1:5; 3:5
Earth Science	Earth Systems		
Statement E.ES.E.4	Natural Resources- The supply of many natural resources is limited. Humans have devised methods for extending their use of natural resources through recycling, reuse, and renewal.		
E.ES.03.41	Identify natural resources (metals, fuels, fresh water, farmland, and forests).		
E.ES.03.42	Classify renewable (fresh water, farmland, forests) and non- renewable (fuels, metals) resources.		

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E.ES.03.43	Describe ways humans are protecting, extending, and restoring resources (recycle, reuse, reduce, renewal).		
E.ES.03.44	Recognize that paper, metal, glass, and some plastics can be recycled.		
Statement E.ES.E.5	Human Impact- Humans depend on their natural and constructed environment. Humans change environments in ways that are helpful or harmful for themselves and other organisms.		
E.ES.03.51	Describe ways humans are dependent on the natural environment (forests, water, clean air, earth materials) and constructed environments (homes, neighborhoods, shopping malls, factories, and industry).		
E.ES.03.52	Describe helpful or harmful effects of humans on the environment (garbage, habitat destruction, land management, renewable and non-renewable resources).		

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GLCE Code	KC4 Academic Standard/ Grade Level Content Expectation	KC4 Curriculum Code	From 2002 Version of KC4 Science
4:1	TLW demonstrate an understanding that scientific inquiry and reasoning involves observing, questioning, investigating, recording, and developing solutions to problems by estimating and measuring weight, mass and volume.	Inquiry and Physical Science – Estimation and Measurement	New
Science Processes	Inquiry Process		
Statement S.IP.E.1	Inquiry involves generating questions, conducting investigations, and developing solutions to problems through reasoning and observation.		
S.IP.04.11	Make purposeful observation of the natural world using the appropriate senses.		
S.IP.04.12	Generate questions based on observations.		
S.IP.04.13	Plan and conduct simple and fair investigations.		
S.IP.04.14	Manipulate simple tools that aid observation and data collection (for example: hand lens, balance, ruler, meter stick, measuring cup, thermometer, spring scale, stop watch/timer, graduated cylinder/beaker).		
S.IP.04.15	Make accurate measurements with appropriate units (centimeters, meters, Celsius, grams, seconds, minutes) for the measurement tool.		
S.IP.04.16	Construct simple charts and graphs from data and observations.		
Science Processes	Inquiry Analysis and Communication		
Statement S.IA.E.1	Inquiry includes an analysis and presentation of findings that lead to future questions, research, and investigations.		
S.IA.04.11	Summarize information from charts and graphs to answer scientific questions.		
S.IA.04.12	Share ideas about science through purposeful conversation in collaborative groups.		
S.IA.04.13	Communicate and present findings of observations and investigations.		
S.IA.04.14	Develop research strategies and skills for information gathering and problem solving.		
S.IA.04.15	Compare and contrast sets of data from multiple trials of a science investigation to explain reasons for differences.		

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Science Processes	Reflection and Social Implications		
Statement S.RS.E.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.04.11	Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities.		
S.RS.04.14	Use data/samples as evidence to separate fact from opinion.		
S.RS.04.15	Use evidence when communicating scientific ideas.		
S.RS.04.16	Identify technology used in everyday life.		
S.RS.04.17	Identify current problems that may be solved through the use of technology.		
S.RS.04.18	Describe the effect humans and other organisms have on the balance of the natural world.		
S.RS.04.19	Describe how people have contributed to science throughout history and across cultures.		
Physical Science	Properties of Matter		
Statement P.PM.E.1	Physical Properties- All objects and substances have physical properties that can be measured.		
P.PM.04.16	Measure the weight (spring scale) and mass (balances in grams or kilograms) of objects.		
P.PM.04.17	Measure volumes of liquids and capacities of containers in milliliters and liters.		
P.PM.04.18	Demonstrate the use of centimeter cubes poured into a container to estimate the container's capacity.		
4:2	TLW compare different forms of energy and describe how temperature relates to energy.	Physical Science – Forms of Energy	4:7
Physical Science	Energy		
Statement P.EN.E.1	Forms of Energy- Heat, electricity, light, and sound are forms of energy.		
P.EN.04.12	Identify heat and electricity as forms of energy.		
Statement P.EN.E.4	Energy and Temperature- Increasing the temperature of any substance requires the addition of energy.		

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P.EN.04.41	Demonstrate how temperature can be increased in a substance by adding energy.		
P.EN.04.42	Describe heat as the energy produced when substances burn, certain kinds of materials rub against each other, and when electricity flows through wire.		
P.EN.04.43	Describe how heat is produced through electricity, rubbing, and burning.		
4:3	TLW demonstrate a magnetic field and explain how objects are affected by the strength of the magnet and the distance from the magnet.	Physical Science – Magnets	3:9
Statement P.P.M.E.3	Magnets- Magnets can repel or attract other magnets. Magnets can also attract certain non-magnetic objects at a distance.		
P.P.M.04.33	Demonstrate magnetic field by observing the patterns formed with iron filings using a variety of magnets.		
P.P.M.04.34	Demonstrate that non-magnetic objects are affected by the strength of the magnet and the distance away from the magnet.		
4:4	TLW design and create simple circuits and an electromagnet, and classify objects as good or poor conductors of heat and electricity.	Physical Science – Electrical Circuits	5:6; 5:7; 7:6; 8:6
Statement P.EN.E.5	Electrical Circuits- Electrical circuits transfer electrical energy and produce magnetic fields.		
P.EN.04.51	Explain how electrical energy is transferred and changed through the use of a simple circuit.		
P.EN.04.52	Create a simple working electromagnet and explain the conditions necessary to make the electromagnet.		
Statement P.P.M.E.5	Conductive and Reflective Properties- Objects vary to the extent they absorb and reflect light energy and conduct heat and electricity.		
P.P.M.04.53	Identify objects that are good conductors or poor conductors of heat and electricity.		
4:5	TLW compare and contrast states of matter and explain how matter can change from one state to another.	Physical Science – States of Matter	3:7
Statement P.P.M.E.2	States of Matter- Matter exists in several different states: solids, liquids, and gases. 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, but liquids and gases take the shape of the container.		
P.P.M.04.23	Compare and contrast the states (solids, liquids, gases) of matter.		

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Physical Science	Changes in Matter		
Statement P.CM.E.1	Changes in State- Matter can be changed from one state (liquid, solid, gas) to another and then back again. This may be caused by heating and cooling.		
P.CM.04.11	Explain how matter can change from one state (liquid, solid, gas) to another by heating and cooling.		
4:6	TLW explain that organisms have basic needs and identify organisms as part of a food web.	Life Science – Life Requirements and Interactions	4:1
Life Science	Organization of Living Things		
Statement L.OL.E.1	Life Requirements- Organisms have basic needs. Animals and plants need air, water, and food. Plants also require light. Plants and animals use food as a source of energy and as a source of building material for growth and repair.		
L.OL.04.15	Determine that plants require air, water, light, and a source of energy and building material for growth and repair.		
L.OL.04.16	Determine that animals require air, water, and a source of energy and building material for growth and repair.		
Life Science	Ecosystems		
Statement L.EC.E.1	Interactions- Organisms interact in various ways including providing food and shelter to one another. Some interactions are helpful: others are harmful to the organism and other organisms.		
L.EC.04.11	Identify organisms as part of a food chain or food web.		
4:7	TLW explain how variations in physical characteristics give organisms an advantage and how environmental changes can produce changes in food webs.	Life Science – Survival and Changes in the Environment	4:2
Life Science	Evolution		
Statement L.EV.E.2	Survival- Individuals of the same kind differ in their characteristics, and sometimes the differences give individuals an advantage in surviving and reproducing.		
L.EV.04.21	Identify individual differences (for example: color, leg length, size, wing size) in organisms of the same kind.		
L.EV.04.22	Identify how variations in physical characteristics of individual organisms give them an advantage for survival and reproduction.		

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Life Science	Ecosystems		
Statement L.EC.E.2	Changed Environment Effects- When the environment changes, some plants and animals survive to reproduce; others die or move to new locations.		
L.EC.04.21	Explain how environmental changes can produce a change in the food web.		
4:8	TLW explain how fossils provide evidence of the history of the Earth.	Earth Science – Fossils	4:5
Earth Science	Earth in Space and Time		
Statement E.ST.E.3	Fossils- Fossils provide evidence about the plants and animals that lived long ago and the nature of the environment at that time.		
E.ST.04.31	Explain how fossils provide evidence of the history of the Earth.		
E.ST.04.32	Compare and contrast life forms found in fossils and organisms that exist today.		
4:9	TLW compare and contrast characteristics and predictable patterns of movement of the Sun, Moon, and Earth.	Earth Science – Sun, Moon, and Earth	3:6; 4:6
Earth Science	Earth in Space and Time		
Statement E.ST.E.1	Characteristics of Objects in the Sky- Common objects in the sky have observable characteristics.		
E.ST.04.11	Identify common objects in the sky, such as the sun and the moon.		
E.ST.04.12	Compare and contrast the characteristics of the sun, moon and Earth, including relative distances and abilities to support life.		
Statement E.ST.E.2	Patterns of Objects in the Sky- Common objects in the sky have observable characteristics and predictable patterns of movement.		
E.ST.04.21	Describe the orbit of the Earth around the sun as it defines a year.		
E.ST.04.22	Explain that the spin of the Earth creates day and night.		
E.ST.04.23	Describe the motion of the moon around the Earth.		
E.ST.04.24	Explain how the visible shape of the moon follows a predictable cycle which takes approximately one month.		
E.ST.04.25	Describe the apparent movement of the sun and moon across the sky through day/night and the seasons.		

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5:1	TLW demonstrate an understanding that scientific inquiry and reasoning involves observing, questioning, investigating, recording, and developing solutions to problems by comparing and contrasting the impact of contact and non-contact forces on the motion of an object.	Inquiry – Forces and Motion	New
Science Processes	Inquiry Process		
Statement S.IP.M.1	Inquiry involves generating questions, conducting investigations, and developing solutions to problems through reasoning and observation.		
S.IP.05.11	Generate scientific questions based on observations, investigations, and research.		
S.IP.05.12	Design and conduct scientific investigations.		
S.IP.05.13	Use tools and equipment (spring scales, stop watches, meter sticks and tapes, models, hand lens) appropriate to scientific investigations.		
S.IP.05.14	Use metric measurement devices in an investigation.		
S.IP.05.15	Construct charts and graphs from data and observations.		
S.IP.05.16	Identify patterns in data.		
Science Processes	Inquiry Analysis and Communication		
Statement S.IA.M.1	Inquiry includes an analysis and presentation of findings that lead to future questions, research, and investigations.		
S.IA.05.11	Analyze information from data tables and graphs to answer scientific questions.		
S.IA.05.12	Evaluate data, claims, and personal knowledge through collaborative science discourse.		
S.IA.05.13	Communicate and defend findings of observations and investigations using evidence.		
S.IA.05.14	Draw conclusions from sets of data from multiple trials of a scientific investigation.		
S.IA.05.15	Use multiple sources of information to evaluate strengths and weaknesses of claims, arguments, or data.		
Physical Science	Force and Motion		
Statement P.FM.M.2	Force Interactions- Some forces between objects act when the objects are in direct contact (touching), such as friction and air resistance, or when they are not in direct contact (not touching), such as magnetic force, electrical force, and gravitational force.		
P.FM.05.21	Distinguish between contact forces and non-contact forces.		

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P.FM.05.22	Demonstrate contact and non-contact forces to change the motion of an object.		
Science Processes	Reflection and Social Implications		
Statement 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.05.11	Evaluate the strengths and weaknesses of claims, arguments, and data.		
S.RS.05.12	Describe limitations in personal and scientific knowledge.		
S.RS.05.13	Identify the need for evidence in making scientific decisions.		
S.RS.05.15	Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities.		
S.RS.05.16	Design solutions to problems using technology.		
S.RS.05.17	Describe the effect humans and other organisms have on the balance in the natural world.		
S.RS.05.19	Describe how science and technology have advanced because of the contributions of many people throughout history and across cultures.		
5:2	TLW describe what happens when two forces (balanced or unbalanced) act upon an object.	Physical Science – Forces	5:9; 6:9; 8:5
Statement P.FM.M.3	Force- Forces have a magnitude and direction. Forces can be added. The net force on an object is the sum of all of the forces acting on the object. The speed and/or direction of motion of an object changes when a non-zero net force is applied to it. A balanced force on an object does not change the motion of the object (the object either remains at rest or continues to move at a constant speed in a straight line).		
P.FM.05.31	Describe what happens when two forces act on an object in the same or opposing directions.		
P.FM.05.32	Describe how constant motion is the result of balanced (zero net) forces.		
P.FM.05.33	Describe how changes in the motion of objects are caused by a non-zero net (unbalanced) force.		
P.FM.05.34	Relate the size of change in motion to the strength of unbalanced forces and the mass of the object.		
5:3	TLW describe the motion of an object in terms of distance, time, and direction and illustrate how motion can be	Physical Science – Speed	6:9

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	represented on a graph.		
Statement P.FM.M.4	Speed- Motion can be described by a change in position relative to a point of reference. The motion of an object can be described by its speed and the direction it is moving. The position and speed of an object can be measured and graphed as a function of time.		
P.FM.05.41	Explain the motion of an object relative to its point of reference.		
P.FM.05.42	Describe the motion of an object in terms of distance, time and direction, as the object moves, and in relationship to other objects.		
P.FM.05.43	Illustrate how motion can be measured and represented on a graph.		
5:4	TLW identify selected body systems and explain how they work together to perform specific activities.	Life Science – Animals and Body Systems	3:4; 4:3; 6:4; 7:2
Life Science	Organization of Living Things		
Statement L.OL.M.4	Animal Systems- Multicellular organisms may have specialized systems that perform functions which serve the needs of the organism.		
L.OL.05.41	Identify the general purpose of selected animal systems (digestive, circulatory, respiratory, skeletal, muscular, nervous, excretory, and reproductive).		
L.OL.05.42	Explain how animal systems (digestive, circulatory, respiratory, skeletal, muscular, nervous, excretory, and reproductive) work together to perform selected activities.		
5:5	TLW classify organisms based on anatomical features.	Life Science – Classification	8:2
Statement L.EV.M.2	Relationships Among Organisms- Similarities among organisms are found in anatomical features, which can be used to infer the degree of relatedness among organisms. In classifying organisms, biologists consider details of internal and external structures to be more important than behavior or general appearance.		
L.EV.05.21	Relate degree of similarity in anatomical features to the classification of contemporary organisms.		
5:6	TLW distinguish between inherited and acquired traits and explain the influence of the environment and genetics on the individual.	Life Science – Genetic Traits	7:1
Life Science	Heredity		
Statement L.HE.M.1	Inherited and Acquired Traits - 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.		
L.HE.05.11	Explain that the traits of an individual are influenced by both the environment and the genetics of the individual.		

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L.HE.05.12	Distinguish between inherited and acquired traits.		
5:7	TLW describe physical characteristics of an organism and explain how behavioral characteristics help organisms survive in their environment.	Life Science – Species Adaptation	New
Life Science	Evolution		
Statement L.EV.M.1	Species Adaptation and Survival- Species with certain traits are more likely than others to survive and have offspring in particular environments. When an environment changes, the advantage or disadvantage of the species' characteristics can change. Extinction of a species occurs when the environment changes and the characteristics of a species are insufficient to allow survival.		
L.EV.05.11	Explain how behavioral characteristics (adaptation, instinct, learning, habit) of animals help them to survive in their environment.		
L.EV.05.12	Describe the physical characteristics (traits) of organisms that help them survive in their environment.		
L.EV.05.13	Describe how fossils provide evidence about how living things and environmental conditions have changed.		
L.EV.05.14	Analyze the relationship of environmental change and catastrophic events (for example: volcanic eruption, floods, asteroid impacts, tsunami) to species extinction.		
Science Processes	Reflection and Social Implications		
Statement 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.05.11	Evaluate the strengths and weaknesses of claims, arguments, and data.		
S.RS.05.12	Describe limitations in personal and scientific knowledge.		
S.RS.05.13	Identify the need for evidence in making scientific decisions.		
S.RS.05.15	Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities.		
S.RS.05.16	Design solutions to problems using technology.		
S.RS.05.17	Describe the effect humans and other organisms have on the balance in the natural world.		
S.RS.05.19	Describe how science and technology have advanced because of the contributions of many people throughout history and across cultures.		

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5:8	TLW explain the causes of the seasons.	Earth Science – Seasons	7:3
Earth Science	Earth Systems		
Statement E.ES.M.6	Seasons- Seasons result from annual variations in the intensity of sunlight and length of day due to the tilt of the axis of the Earth relative to the plane of its yearly orbit around the sun.		
E.ES.05.61	Demonstrate using a model, seasons as the result of variations in the intensity of sunlight caused by the tilt of the Earth on its axis, and revolution around the sun.		
E.ES.05.62	Explain how the revolution of the Earth around the sun defines a year.		
5:9	TLW design a model that describes the position and relationship of the Sun, the planets, and other objects of the solar system.	Earth Science – Solar System	6:7; 7:3
Earth Science	Earth in Space and Time		
Statement E.ST.M.1	Solar System- 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.		
E.ST.05.11	Design a model that describes the position and relationship of the planets and other objects (comets and asteroids) to the sun.		
Statement E.ST.M.2	Solar System Motion- Gravity is the force that keeps most objects in the solar system in regular and predictable motion.		
E.ST.05.21	Describe the motion of planets and moons in terms of rotation on axis and orbits due to gravity.		
E.ST.05.22	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.ST.05.23	Recognize that nighttime objects (stars and constellations) and the sun appear to move because the Earth rotates on its axis and orbits the sun.		
E.ST.05.24	Explain lunar and solar eclipses based on the relative positions of the Earth, moon, and sun, and the orbit of the moon.		
E.ST.05.25	Explain the tides of the oceans as they relate to the gravitational pull and orbit of the moon.		

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6:1	TLW demonstrate an understanding that scientific inquiry and reasoning involves observing, questioning, investigating, recording, and developing solutions to problems by illustrating and explaining changes in state of matter in terms of relative motion of atoms and molecules.	Inquiry – Changes in State of Matter	New
Science Processes	Inquiry Process		
Statement 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.		
S.IP.06.12	Design and conduct scientific investigations.		
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.		
S.IP.06.16	Identify patterns in data.		
Science Processes	Inquiry Analysis and Communication		
Statement S.IA.M.1	Inquiry includes an analysis and presentation of findings that lead to future questions, research, and investigations.		
S.IA.06.11	Analyze information from data tables and graphs to answer scientific questions.		
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.		
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.		
Physical Science	Changes in Matter		
Statement P.CM.M.1	Changes in State- 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		

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	relative motion of the atoms or molecules.		
P.CM.06.12	Explain how mass is conserved as it changes from state to state in a closed system.		
Science Processes	Reflection and Social Implications		
Statement 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.		
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.		
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.		
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.		
6:2	TLW identify kinetic and potential energy and explain the transformation between the two in simple mechanical systems.	Physical Science – Kinetic and Potential Energy	5:9
Physical Science	Energy		
Statement P.EN.M.1	Kinetic and Potential Energy- 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.		
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).		
P.EN.06.12	Demonstrate the transformation between potential and kinetic energy in simple mechanical systems (for example: roller coasters, pendulums).		

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6:3	TLW explain radiation, conduction, and convection and how heat is transferred from one place to another.	Physical Science – Energy Transfer	7:6
Statement P.EN.M.4	Energy Transfer- 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.		
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.		
6:4	TLW classify organisms based on their source of energy and distinguish among ways in which organisms obtain energy.	Life Science – Relationships of Organisms	6:3
Life Science	Organization of Living Things		
Statement L.OL.M.5	Producers, Consumers, and Decomposers- 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.		
L.OL.06.51	Classify organisms (producers, consumers, and decomposers) based on their source of energy for growth and development.		
L.OL.06.52	Distinguish between the ways in which consumers and decomposers obtain energy.		
Statement L.EC.M.2	Relationships of Organisms- 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.		
6:5	TLW identify the interactions and interdependence of populations, communities, and ecosystems and explain the factors that affect ecosystems.	Life Science – Environmental Factors	5:4; 6:3

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Statement L.EC.M.3	Biotic and Abiotic Factors- 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.		
L.EC.06.32	Identify the factors in an ecosystem that influence changes in population size.		
Life Science	Ecosystems		
Statement L.EC.M.1	Interactions of Organisms- 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	List examples of populations, communities, and ecosystems including the Great Lakes region.		
Statement L.EC.M.4	Environmental Impact of Organisms- 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.		
L.EC.06.42	Predict possible consequences of overpopulation of organisms, including humans, (for example: species extinction, resource depletion, climate change, pollution).		
6:6	TLW explain plate tectonic movement, layers of the Earth, and how a compass relates to the magnetic field of the Earth.	Earth Science – Plate Tectonics /Interior	New
Statement E.SE.M.5	Plate Tectonics- 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.		
E.SE.06.53	Describe layers of the Earth as a lithosphere (crust and upper mantle), convecting mantle, and dense metallic core.		
Statement E.SE.M.6	Magnetic Field of Earth- 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 man-made 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.		

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6:7	TLW explain causes of plate tectonics and the resulting geologic events.	Earth Science – Plate Tectonics Results/ Earth’s Surface	5:5
Statement E.SE.M.5	Plate Tectonics- The lithospheric plates of the Earth constantly move, resulting in major geological events, such as earthquakes, volcanic eruptions, and mountain building.		
E.SE.06.52	Demonstrate how major geological events (earthquakes, volcanic eruptions, mountain building) result from these plate motions.		
Statement E.ST.M.4	Geologic Time- 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.		
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.		
6:8	TLW use minerals and the rock cycle to compare and contrast the formation of rock types.	Earth Science – Rocks and Minerals	New
Statement E.SE.M.4	Rock Formation- 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.		
6:9	TLW will explain how fossils provide important evidence of the how life and environmental conditions have changed over time.	Earth Science – Fossils	7:4
Earth Science	Earth in Space and Time		
Statement E.ST.M.3	M.3 Fossils- 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.06.42	Describe how fossils provide important evidence of how life and environmental conditions have changed.		
6:10	TLW compare and classify soils, explain how soils are formed, and relate the importance of soils to people.	Earth Science – Soils	New
Earth Science	Solid Earth		

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Statement E.SE.M.1	Soil- 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.		
E.SE.06.11	Explain how physical and chemical weathering lead to erosion and the formation of soils and sediments.		
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.		

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7:1	TLW demonstrate an understanding that scientific inquiry and reasoning involves observing, questioning, investigating, recording, and developing solutions to problems by identifying evidence of chemical change.	Inquiry and Physical Science – Chemical Change	8:9
Science Processes	Inquiry Process		
Statement S.IP.M.1	Inquiry involves generating questions, conducting investigations, and developing solutions to problems through reasoning and observation.		
S.IP.07.11	Generate scientific questions based on observations, investigations, and research.		
S.IP.07.12	Design and conduct scientific investigations.		
S.IP.07.13	Use tools and equipment (spring scales, stop watches, meter sticks and tapes, models, hand lens, thermometer, models, sieves, microscopes, hot plates, pH meters) appropriate to scientific investigations.		
S.IP.07.14	Use metric measurement devices in an investigation.		
S.IP.07.15	Construct charts and graphs from data and observations.		
S.IP.07.16	Identify patterns in data.		
Science Processes	Inquiry Analysis and Communication		
Statement S.IA.M.1	Inquiry includes an analysis and presentation of findings that lead to future questions, research, and investigations.		
S.IA.07.11	Analyze information from data tables and graphs to answer scientific questions.		
S.IA.07.12	Evaluate data, claims, and personal knowledge through collaborative science discourse.		
S.IA.07.13	Communicate and defend findings of observations and investigations.		
S.IA.07.14	Draw conclusions from sets of data from multiple trials of a scientific investigation to draw conclusions.		
S.IA.07.15	Use multiple sources of information to evaluate strengths and weaknesses of claims, arguments, or data.		
Science Processes	Reflection and Social Implications		
Statement 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.07.11	Evaluate the strengths and weaknesses of claims, arguments, and data.		

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S.RS.07.12	Describe limitations in personal and scientific knowledge.		
S.RS.07.13	Identify the need for evidence in making scientific decisions.		
S.RS.07.14	Evaluate scientific explanations based on current evidence and scientific principles.		
S.RS.07.15	Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities.		
S.RS.07.16	Design solutions to problems using technology.		
S.RS.07.17	Describe the effect humans and other organisms have on the balance of the natural world.		
S.RS.07.18	Describe what science and technology can and cannot reasonably contribute to society.		
S.RS.07.19	Describe how science and technology have advanced because of the contributions of many people throughout history and across cultures.		
Physical Science	Changes in Matter		
Statement P.CM.M.2	Chemical Changes- 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.		
P.CM.07.21	Identify evidence of chemical change through color, gas formation, solid formation, and temperature change.		
7:2	TLW classify substances by their physical and chemical properties, and explain the relationship of elements to the periodic table.	Physical Science – Properties of Matter	4:8; 6:8; 7:8
Physical Science	Properties of Matter		
Statement P.PM.M.1	Chemical Properties- Matter has chemical properties. The understanding of chemical properties helps to explain how new substances are formed.		
P.PM.07.11	Classify substances by their chemical properties (flammability, pH, acid-base indicators, reactivity).		
Statement P.PM.M.2	Elements and Compounds- 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.		

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P.PM.07.21	Identify the smallest component that makes up an element.		
P.PM.07.22	Describe how the elements within the Periodic Table are organized by similar properties into families (highly reactive metals, less reactive metals, highly reactive nonmetals, and some almost completely non-reactive gases).		
P.PM.07.23	Illustrate the structure of molecules using models or drawings (water, carbon dioxide, salt).		
P.PM.07.24	List examples of physical and chemical properties of elements and compounds (boiling point, density, color, conductivity, reactivity).		
7:3	TLW demonstrate and explain chemical changes in terms mass and physical and chemical properties of reactants and products.	Physical Science – Changes in Matter	6:8
Physical Science	Changes in Matter		
Statement P.CM.M.2	Chemical Changes- 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.		
P.CM.07.21	Identify evidence of chemical change through color, gas formation, solid formation, and temperature change.		
P.CM.07.22	Compare and contrast the chemical properties of a new substance with the original after a chemical change.		
P.CM.07.23	Describe the physical properties and chemical properties of the products and reactants in a chemical change.		
7:4	TLW identify examples of waves and explain how waves transfer energy when they interact with matter.	Physical Science – Waves and Energy	5:8; 6:10; 7:7
Physical Science	Energy		
Statement P.EN.M.3	Waves and Energy-Waves have energy and transfer energy when they interact with matter. Examples of waves include sound waves, seismic waves, waves on water, and light waves.		
P.EN.07.31	Identify examples of waves, including sound waves, seismic waves, and waves on water.		
P.EN.07.32	Describe how waves are produced by vibrations in matter.		

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P.EN.07.33	Demonstrate how waves transfer energy when they interact with matter (for example: tuning fork in water, waves hitting a beach, earthquake knocking over buildings).		
7:5	TLW explain that organisms are made of cells that may specialize for a particular purpose and that cells function in similar ways in all organisms.	Life Science – Cell Structure and Function	6:1
Life Science	Organization of Living Things		
Statement L.OL.M.2	Cell Functions- All organisms are composed of cells, from one cell to many cells. In multicellular organisms, specialized cells perform specialized functions. Organs and organ systems are composed of cells, and function to serve the needs of cells for food, air, and waste removal. The way in which cells function is similar in all living organisms.		
L.OL.07.21	Recognize that all organisms are composed of cells (single cell organisms, multicellular organisms).		
L.OL.07.22	Explain how cells make up different body tissues, organs, and organ systems.		
L.OL.07.23	Describe how cells in all multicellular organisms are specialized to take in nutrients, which they use to provide energy for the work that cells do and to make the materials that a cell or organism needs.		
L.OL.07.24	Recognize that cells function in a similar way in all organisms.		
7:6	TLW explain that organisms grow through an increase in cell number and/or cell size and develop through cell specialization.	Life Science – Cell Growth and Development	New
Statement L.OL.M.3	Growth and Development- 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.		
L.OL.07.31	Describe growth and development in terms of increase of cell number and/or cell size.		
L.OL.07.32	Examine how through cell division, cells can become specialized for specific functions.		
7:7	TLW compare sexual and asexual reproduction of organisms for the continuation of genetic characteristics.	Life Science – Reproduction	5:2; 6:2
Life Science	Heredity		
Statement L.HE.M.2	Reproduction- 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.		

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L.HE.07.21	Compare how characteristics of living things are passed on through generations, both asexually and sexually.		
L.HE.07.22	Compare and contrast the advantages and disadvantages of sexual vs. asexual reproduction.		
7:8	TLW explain the process of photosynthesis.	Life Science – Photosynthesis	6:2
Physical Science	Energy		
Statement P.EN.M.4	Energy Transfer- 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.		
P.EN.07.43	Explain how light energy is transferred to chemical energy through the process of photosynthesis.		
Statement L.OL.M.6	Photosynthesis- 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 cells of a plant as the plant grows, or stored for later use.		
L.OL.07.61	Recognize the need for light to provide energy for the production of carbohydrates, proteins and fats.		
L.OL.07.62	Explain that carbon dioxide and water are used to produce carbohydrates, proteins, and fats.		
L.OL.07.63	Describe evidence that plants make, use and store food.		
7:9	TLW explain how the Sun produces energy and how it impacts phenomena on Earth.	Physical Science and Earth Science – Solar Energy	New
Statement P.EN.M.6	Solar Energy Effects- 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.		
P.EN.07.61	Identify that nuclear reactions take place in the sun, producing heat and light.		
P.EN.07.62	Explain how only a tiny fraction of light energy from the sun is transformed to heat energy on Earth.		
Earth Science	Earth Systems		
Statement E.ES.M.1	Solar Energy- The sun is the major source of energy for phenomena on the surface of the Earth.		
E.ES.07.11	Demonstrate, using a model or drawing, the relationship between the warming		

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	by the sun of the Earth and the water cycle as it applies to the atmosphere (evaporation, water vapor, warm air rising, cooling, condensation, clouds).		
E.ES.07.12	Describe the relationship between the warming of the atmosphere of the Earth by the sun and convection within the atmosphere and oceans.		
E.ES.07.13	Describe how the warming of the Earth by the sun produces winds and ocean currents.		
7:10	TLW describe weather conditions and explain the influence of the atmosphere and oceans on weather and climate.	Earth Science – Weather and Atmosphere	6:6; 7:5
Statement E.ES.M.7	Weather and Climate- Global patterns of atmospheric and oceanic movement influence weather and climate.		
E.ES.07.71	Compare and contrast the difference and relationship between climate and weather.		
E.ES.07.72	Describe how different weather occurs due to the constant motion of the atmosphere from the energy of the sun reaching the surface of the Earth.		
E.ES.07.73	Explain how the temperature of the oceans affects the different climates on Earth because water in the oceans holds a large amount of heat.		
E.ES.07.74	Describe weather conditions associated with frontal boundaries (cold, warm, stationary, and occluded) and the movement of major air masses and the jet stream across North America using a weather map.		
Earth Science	Earth Systems		
Statement E.ES.M.1	Solar Energy- The sun is the major source of energy for phenomena on the surface of the Earth.		
E.ES.07.11	Demonstrate, using a model or drawing, the relationship between the warming by the sun of the Earth and the water cycle as it applies to the atmosphere (evaporation, water vapor, warm air rising, cooling, condensation, clouds).		
E.ES.07.12	Describe the relationship between the warming of the atmosphere of the Earth by the sun and convection within the atmosphere and oceans.		
E.ES.07.13	Describe how the warming of the Earth by the sun produces winds and ocean currents.		
Earth Science	Fluid Earth		
Statement E.FE.M.1	Atmosphere- 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.		
E.FE.07.11	Describe the atmosphere as a mixture of gases.		
E.FE.07.12	Compare and contrast the composition of the atmosphere at different		

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	elevations.		
7:11	TLW explain the water cycle and analyze the flow of water in the environment.	Earth Science – Water Cycle	5:3
Statement E.ES.M.8	Water Cycle- Water circulates through the four spheres of the Earth in what is known as the “water cycle.”		
E.ES.07.81	Explain the water cycle and describe how evaporation, transpiration, condensation, cloud formation, precipitation, infiltration, surface runoff, ground water, and absorption occur within the cycle.		
E.ES.07.82	Analyze the flow of water between the components of a watershed, including surface features (lakes, streams, rivers, wetlands) and groundwater.		
Earth Science	Earth Systems		
Statement E.ES.M.1	Solar Energy- The sun is the major source of energy for phenomena on the surface of the Earth.		
E.ES.07.11	Demonstrate, using a model or drawing, the relationship between the warming by the sun of the Earth and the water cycle as it applies to the atmosphere (evaporation, water vapor, warm air rising, cooling, condensation, clouds).		
E.ES.07.12	Describe the relationship between the warming of the atmosphere of the Earth by the sun and convection within the atmosphere and oceans.		
E.ES.07.13	Describe how the warming of the Earth by the sun produces winds and ocean currents.		
7:12	TLW explain how human activities have consequences on the environment.	Earth Science – Human Impact on the Environment	7:5; 8:3; 8:4
Statement E.ES.M.4	Human Consequences- Human activities have changed the land, oceans, and atmosphere of the Earth resulting in the reduction of the number and variety of wild plants and animals sometimes causing extinction of species.		
E.ES.07.41	Explain how human activities (surface mining, deforestation, overpopulation, construction and urban development, farming, dams, landfills, and restoring natural areas) change the surface of the Earth and affect the survival of organisms.		
E.ES.07.42	Describe the origins of pollution in the atmosphere, geosphere, and hydrosphere, (car exhaust, industrial emissions, acid rain, and natural sources), and how pollution impacts habitats, climatic change, threatens or endangers species.		

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Science Processes	Reflection and Social Implications		
Statement 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.		
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S.RS.07.19	Describe how science and technology have advanced because of the contributions of many people throughout history and across cultures.		