Michigan Science Grade Level Content Expectations, 2007	ESS Presentations
Kindergarten	
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.	Marvellous Materials Materials Matter Changing Materials Mysterious Magnets Hot and Cold Growing Up Animals and Plants Senses Living Things Light and Dark Feel the Force Weather
S.IP.00.12 Generate questions based on observations.	Mysterious Magnets Hot and Cold Living Things
S.IP.00.13 Plan and conduct simple investigations.	Hot and Cold Living Things
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.	Senses
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.	Materials Matter Hot and Cold Senses

K-2 Product
3-5 Product

S.IA.00.14 Develop strategies for information gathering (ask an expert, use a book, make observations, conduct simple investigations, and watch a video).	Mysterious Magnets Hot and Cold Living Things Materials Matter Senses
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.	Marvellous Materials Materials Matter Changing Materials Mysterious Magnets Hot and Cold Growing Up Animals and Plants Senses Living Things Light and Dark Feel the Force
P.FM.E.1 Position- A position of an object can be described by locating the object relative to other objects or a background.	
P.FM.00.11 Describe 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 direction of a moving object (for example: away from or closer to) from different observers' views.	
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.	Feel the Force
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 on objects that can move.	Feel the Force
P.FM.00.32 Observe that objects initially at rest will move in the direction of the push or pull.	Feel the Force

P.FM.00.33 Observe how pushes and pulls can change the speed or direction of moving objects.	Feel the Force
P.FM.00.34 Observe how shape (for example: cone, cylinder, sphere) and mass of an object can affect motion.	
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.00.11 Identify that living things have basic needs.	Living Things
L.OL.00.12 Identify and compare living and nonliving things.	
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 that occur in nature (sand, rocks, soil, water).	Rocks Soil
E.SE.00.12 Describe how Earth materials contribute to the growth of plant and animal life.	Growing Plants
Grade One	
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.	Marvellous Materials Materials Matter Changing Materials Mysterious Magnets Hot and Cold Growing Up Animals and Plants Senses Living Things Light and Dark Feel the Force Magnets Springs Growing Plants Rocks Soil Shadows Weather

S.IP.01.12 Generate questions based on observations.	Mysterious Magnets Hot and Cold Living Things Growing Plants Shadows
S.IP.01.13 Plan and conduct simple investigations.	Mysterious Magnets Hot and Cold Living Things Growing Plants Shadows Springs
S.IP.01.14 Manipulate simple tools (for example: hand lens, pencils, rulers, thermometers, rain gauges, balances, non-standard objects for measurement) that aid observation and data collection.	Weather Springs Growing Plants
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.	Senses
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.	Materials Matter Hot and Cold Senses Springs Growing Plants Rocks
S.IA.01.14 Develop strategies for information gathering (ask an expert, use a book, make observations, conduct simple investigations, and watch a video).	Mysterious Magnets Hot and Cold Living Things Growing Plants Shadows Springs
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.	

S.RS.01.11 Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities.	Marvellous Materials Materials Matter Changing Materials Mysterious Magnets Hot and Cold Growing Up Animals and Plants Senses Living Things Light and Dark Feel the Force Magnets Springs Growing Plants Rocks Soil Shadows Weather
S.RS.01.12 Recognize that science investigations are done more than one time.	
P.PM.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.	Marvellous Materials Materials Matter
P.PM.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).	Hot and Cold
P.PM.01.22 Demonstrate that water as a liquid takes on the shape of various containers.	
P.PM.E.3 Magnets- Magnets can repel or attract other magnets. Magnets can also attract magnetic objects. Magnets can attract and repel at a distance.	
P.PM.01.31 Identify materials that are attracted by magnets.	Mysterious Magnets
P.PM.01.32 Observe that like poles of a magnet repel and unlike poles of a magnet attract.	Magnets
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.01.13 Identify the needs of animals.	Living Things
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.	Growing Up
L.HE.E.1 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.	Growing Up
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).	Growing Up
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.	Weather
E.ES.01.12 Demonstrate the importance of sunlight and warmth in plant growth.	Growing Plants Living Things
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 (rain, snow, hail, freezing rain); wind (breezy, windy, calm).	Weather
E.ES.01.22 Describe and compare weather related to the four seasons in terms of temperature, cloud cover, precipitation, and wind.	Weather
E.ES.01.23 Describe severe weather characteristics.	
E.ES.01.24 Describe precautions that should be taken for human safety during severe weather conditions (thunder and lightning, tornadoes, strong winds, heavy precipitation).	
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.	Weather
E.ES.01.32 Observe and collect data of weather conditions over a period of time.	Weather
Grade Two	
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.	Marvellous Materials Materials Matter Changing Materials Mysterious Magnets Hot and Cold Growing Up Animals and Plants Senses Living Things Light and Dark Feel the Force Magnets Springs Growing Plants Rocks Soil Shadows Weather
S.IP.02.12 Generate questions based on observations.	Mysterious Magnets Hot and Cold Living Things Growing Plants Shadows
S.IP.02.13 Plan and conduct simple investigations.	Mysterious Magnets Hot and Cold Living Things Growing Plants Shadows Springs
S.IP.02.14 Manipulate simple tools (ruler, meter stick, measuring cups, hand lens, thermometer, balance) that aid observation and data collection.	Weather Springs Growing Plants Soil

S.IP.02.15 Make accurate measurements with appropriate units (meter, centimeter) for the measurement tool.	Weather Springs Growing Plants Soil
S.IP.02.16 Construct simple charts and graphs from data and observations.	Senses
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.	Materials Matter Hot and Cold Senses Springs Growing Plants Rocks
S.IA.02.14 Develop strategies and skills for information gathering and problem solving (books, internet, ask an expert, observation, investigation, technology tools).	Mysterious Magnets Hot and Cold Living Things Growing Plants Shadows Springs
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.	Marvellous Materials Materials Matter Changing Materials Mysterious Magnets Hot and Cold Growing Up Animals and Plants Senses Living Things Light and Dark Feel the Force Magnets Springs Growing Plants Rocks Soil Shadows Weather
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.	Materials Matter Hot and Cold Senses Springs Growing Plants Rocks
S.RS.02.16 Identify technology used in everyday life.	
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).	Marvellous Materials Materials Matter Changing Materials Hot and Cold
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 (graduated measuring cups, measuring spoons, graduated cylinders, and beakers).	Soil
P.PM.02.15 Compare the weight of objects using balances.	
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 Recognize that some objects are composed of a single substance (water, sugar, salt) and others are composed of more than one substance (salt and pepper, mixed dry beans).	Separating Mixtures
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.	Living Things Growing Plants
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.	Plant Reproduction
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.	
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).	
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).	Pollution
E.FE.02.13 Describe the properties of water as a liquid (visible, flowing, shape of container and recognize rain, dew, and fog as water in its liquid state.	Changing State
E.FE.02.14 Describe the properties of water as a solid (hard, visible, frozen, cold) and recognize ice, snow, and hail as water in its solid state.	Changing State

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.	Water Cycle
E.FE.02.22 Describe the major bodies of water on the Earth's surface (lakes, ponds, oceans, rivers, streams).	
Grade Three	
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.	Habitats Food Chains Insulators and Conductors Changing State Separating Mixtures Friction Circuits Body Systems Plant Reproduction Water Cycle Days and Seasons The Moon Sounds Adaptations Interdependence Microorganisms Gravity Forces Reflection and Refraction Erosion, Transportation and Deposition Pollution Electromagnets Fossils Our Solar System Predicting the Weather Energy Forms

S.IP.03.12 Generate questions based on observations.	Separating Mixtures Friction Circuits Plant Reproduction Sounds Forces
S.IP.03.13 Plan and conduct simple and fair investigations.	Separating Mixtures Friction Circuits Plant Reproduction Sounds Forces Insulators and Conductors Gravity
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).	Gravity Changing State
S.IP.03.15 Make accurate measurements with appropriate units (centimeters, meters, Celsius, grams, seconds, minutes) for the measurement tool.	Changing State
S.IP.03.16 Construct simple charts and graphs from data and observations.	Friction Forces
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.	Friction Forces
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.	Insulators and Conductors Separating Mixtures Friction Plant Reproduction Days and Seasons
S.IA.03.14 Develop research strategies and skills for information gathering and problem solving.	Insulators and Conductors Separating Mixtures Friction Plant Reproduction Gravity Forces

S.IA.03.15 Compare and contrast sets of data from multiple trials of a science investigation to explain reasons for differences.	
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.	Habitats Food Chains Insulators and Conductors Changing State Separating Mixtures Friction Circuits Body Systems Plant Reproduction Water Cycle Days and Seasons The Moon Sounds Adaptations Interdependence Microorganisms Gravity Forces Reflection and Refraction Erosion, Transportation and Deposition Pollution Electromagnets Fossils Our Solar System Predicting the Weather Energy Forms

S.RS.03.14 Use data/samples as evidence to separate fact from opinion.	Insulators and Conductors Separating Mixtures Friction Plant Reproduction Gravity Forces
S.RS.03.15 Use evidence when communicating scientific ideas.	Insulators and Conductors Separating Mixtures Friction Plant Reproduction Gravity Forces
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.	Pollution Habitats Adaptations Interdependence
S.RS.03.19 Describe how people have contributed to science throughout history and across cultures.	
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.	Gravity
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.	Forces
P.FM.03.36 Relate a change in motion of an object to the force that caused the change of motion.	Forces
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.	Forces Gravity
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.	Forces Friction

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 in a standard amount of time.	
P.FM.03.41 Describe 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 Relate the speed of an object to the distance it travels in a standard amount of time.	
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.	Energy Forms
P.EN.E.2 Light Properties- Light travels in a straight path. 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 path and that shadows are made by placing an object in a path of light.	Reflection and Refraction Shadows
P.EN.03.22 Observe what happens to light when it travels from air to water (a straw half in the water and half in the air looks bent).	Reflection and Refraction
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).	Sounds
P.EN.03.32 Distinguish the effect of fast or slow vibrations as pitch.	Sounds
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.	Reflection and Refraction
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.	Growing Plants Plant 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, scales).	Adaptations
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).	

L.OL.03.42 Classify animals on the basis of observable physical characteristics (backbone, body coverings, limbs).	Habitats
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 (leaf shape, thorns, odor, color).	
L.EV.03.12 Relate characteristics and functions of observable body parts to the ability of animals to live in their environment (sharp teeth, claws, color, body coverings).	Habitats Adaptations
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, fertile soil, and forests).	Water Cycle Pollution
E.ES.03.42 Classify renewable (fresh water, fertile soil, forests) and non-renewable (fuels, metals) resources.	
E.ES.03.43 Describe ways humans are protecting, extending, and restoring resources (recycle, reuse, reduce, renewal).	Pollution
E.ES.03.44 Recognize that paper, metal, glass, and some plastics can be recycled.	Pollution
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).	Pollution Habitats Adaptations Interdependence
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, water, and air).	Rocks Soil Water Cycle
E.SE.03.14 Recognize that rocks are made up of minerals.	

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).	Erosion, Transportation and Deposition
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 (bricks, buildings, roads, glass).	
E.SE.03.32 Describe how materials taken from the Earth can be used as fuels for heating and transportation.	
Grade Four	
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.	Habitats Food Chains Insulators and Conductors Changing State Separating Mixtures Friction Circuits Body Systems Plant Reproduction Water Cycle Days and Seasons The Moon Sounds Adaptations Interdependence Microorganisms Gravity Forces Reflection and Refraction Erosion, Transportation and Deposition Pollution Electromagnets Fossils Our Solar System Predicting the Weather Energy Forms
S.IP.04.12 Generate questions based on observations.	Separating Mixtures Friction Circuits Plant Reproduction Sounds Forces

S.IP.04.13 Plan and conduct simple and fair investigations.	Separating Mixtures Friction Circuits Plant Reproduction Sounds Forces Insulators and Conductors Gravity
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).	Gravity Changing State
S.IP.04.15 Make accurate measurements with appropriate units (millimeters centimeters, meters, milliliters, liters, Celsius, grams, seconds, minutes) for the measurement tool.	Changing State
S.IP.04.16 Construct simple charts and graphs from data and observations.	Friction Forces
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.	Friction Forces
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.	Insulators and Conductors Separating Mixtures Friction Plant Reproduction Days and Seasons
S.IA.04.14 Develop research strategies and skills for information gathering and problem solving.	Insulators and Conductors Separating Mixtures Friction Plant Reproduction Gravity Forces
S.IA.04.15 Compare and contrast sets of data from multiple trials of a science investigation to explain reasons for differences.	

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.	Habitats Food Chains Insulators and Conductors Changing State Separating Mixtures Friction Circuits Body Systems Plant Reproduction Water Cycle Days and Seasons The Moon Sounds Adaptations Interdependence Microorganisms Gravity Forces Reflection and Refraction Erosion, Transportation and Deposition Pollution Electromagnets Fossils Our Solar System Predicting the Weather Energy Forms
S.RS.04.14 Use data/samples as evidence to separate fact from opinion.	Insulators and Conductors Separating Mixtures Friction Plant Reproduction Gravity Forces

S.RS.04.15 Use evidence when communicating scientific ideas.	Insulators and Conductors Separating Mixtures Friction Plant Reproduction Gravity Forces
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.	Pollution Habitats Adaptations Interdependence
S.RS.04.19 Describe how people have contributed to science throughout history and across cultures.	
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.	Energy Forms
P.EN.E.4 Energy and Temperature- Increasing the temperature of any substance requires the addition of energy.	
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.	Energy Forms
P.EN.04.43 Describe how heat is produced through electricity, rubbing, and burning.	Energy Forms
P.EN.E.5 Electrical Circuits- Electrical circuits transfer electrical energy and produce magnetic fields.	
P.EN.04.51 Demonstrate how electrical energy is transferred and changed through the use of a simple circuit.	Circuits
P.EN.04.52 Demonstrate magnetic effects in a simple electric circuit.	Electromagnets
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.	Gravity
P.PM.04.17 Measure volumes of liquids in milliliters and liters.	
P.PM.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.04.23 Compare and contrast the states (solids, liquids, gases) of matter.	Changing State
P.PM.E.3 Magnets- Magnets can repel or attract other magnets. Magnets can also attract magnetic objects. Magnets can attract and repel at a distance.	
P.PM.04.33 Demonstrate magnetic field by observing the patterns formed with iron filings using a variety of magnets.	Magnets
P.PM.04.34 Demonstrate that non-magnetic objects are affected by the strength of the magnet and the distance away from the magnet.	Magnets
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.04.53 Identify objects that are good conductors or poor conductors of heat and electricity.	Insulators and Conductors
P.CM.E.1 Changes in State- Matter can be changed from one state (liquid, solid, gas) to another and then back again. Heating and cooling may cause changes in state.	
P.CM.04.11 Explain how matter can change from one state (liquid, solid, gas) to another by heating and cooling.	Changing State
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.	Living Things Growing Plants Plant Reproduction
L.OL.04.16 Determine that animals require air, water, and a source of energy and building material for growth and repair.	Living Things Habitats Food Chains
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 (color, leg length, size, wing size, leaf shape) in organisms of the same kind.	Adaptations
L.EV.04.22 Identify how variations in physical characteristics of individual organisms give them an advantage for survival and reproduction.	Adaptations
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.	Food Chains Interdependence

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.	Interdependence
E.ST.E.1 Characteristics of Objects in the Sky- Common objects in the sky have observable characteristics.	
E.ST.04.11 Identify the sun and moon as common objects in the sky.	Days and Seasons 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.	Our Solar System
E.ST.E.2 Patterns of Objects in the Sky- Common objects in the sky have predictable patterns of movement.	
E.ST.04.21 Describe the orbit of the Earth around the sun as it defines a year.	Days and Seasons
E.ST.04.22 Explain that the spin of the Earth creates day and night.	Days and Seasons
E.ST.04.23 Describe the motion of the moon around the Earth.	The Moon
E.ST.04.24 Explain how the visible shape of the moon follows a predictable cycle which takes approximately one month.	The Moon
E.ST.04.25 Describe the apparent movement of the sun and moon across the sky through day/night and the seasons.	Days and Seasons The Moon
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.	Fossils
E.ST.04.32 Compare and contrast life forms found in fossils and organisms that exist today.	Fossils