Course Description: This curriculum has been written to align with the revised MO Learning Standards for Science (approved by the state board of education in April of 2016). This curriculum has been written as a guide for utilizing this resource to teach the revised MO Learning Standards for Science.

Fourth Grade Science Scope and Sequence

	Unit	Timeframe
1	**The Scientific Process**	**3 weeks**
2	**Plants and Animals**	**6 weeks**
3	**Land and Water Unit**	**6 weeks**
4	**Electricity**	**5 weeks**
5	**Measurement**	**5 weeks**
6	**Force and Motion**	**6 weeks**

Unit 1
The Scientific Process

Standards addressed:
ESS1.C.1 Plan and carry out fair tests in which variables are controlled and failure points considered to identify aspects of a model or prototype that can be improved.

Essential Questions:
What is a Fair Test?

Learning Targets:
Students will be able to conduct an experiment using the scientific method.

Content Vocabulary: variable, independent variable, dependent variable, hypothesis, experiment, observation, conclusion, testable

Resources
Study Jams: The Scientific Process video

Standard(s)	Topic	Number of Days
ESS1.C.1	**Components of an Experiment**	2 weeks
ESS1.C.1	**Conducting Experiments**	1 week

Unit 2
Plants and Animals

Standards addressed:
4.LS1.A Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and plant reproduction. [Clarification Statement: Examples of structures could include thorns, stems, roots, colored petals, heart, stomach, lung, brain, and skin.]

Essential Questions:
Which plant or animal will be able to survive in a specific environment based on its adaptations and/or behavior?

Learning Targets:
Students will understand what is needed for plants/animals to survive in different habitats.
Students will apply adaptations/or functions of plants and animals to design a new species for a certain environment.
Students will understand how the brain responds to different stimuli.

Content Vocabulary:
Stimuli, internal structure, external structure, habitat, reproduction, survival, seed dispersal, life cycle

Resources
Science textbook, *Why Can't the Armadillo Cross the Road?*

Standard(s)	Topic	Number of Days
4.LS1.A	**Plant Characteristics/Parts of Plants**	3 day
4.LS1.A	**Plant Reproduction/Life Cycle**	2 days
4.LS1.A	**Biomes/Ecosystems**	4 days
4.LS1.A	**Create Plant for an Ecosystem**	3 days
4.LS1.A	**Brain Processing**	1 day
4.LS1.A	**Animal Adaptations**	3 days
4.LS1.A	**Animal Creation**	6 days

Unit 3
Land and Water

Standards addressed:
4.ESS2.A Plan and conduct scientific investigations or simulations to provide evidence how natural processes (e.g.

weathering and erosion) shape Earth's surfaces.
4.ESS2.B Analyze and interpret data from maps to describe patterns of Earth's features. [Clarification Statement: Maps can include topographic maps of Earth's land and ocean floor, as well as maps of the locations of mountains, continental boundaries, volcanoes, and earthquakes.]
4.ESS3.A Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans. [Clarification Statement: Examples of solutions could include designing an earthquake resistant building and improving monitoring of volcanic activity.]

Essential Questions:
How does weather and/or the erosion process create and/or change Earth's surfaces, materials, landforms, or bodies of water?
In what ways can we solve simple environmental problems resulting from human activity?

Learning Targets:
Students will determine strategies to prevent erosion.

Content Vocabulary:
Erosion, stream table,

Resources
Science textbook, Basic Landforms powerpoint, Volcanoes, Earthquakes, Mountain Building Slideshow

Standard(s)	Topic	Number of Days
4.ESS2.A 4.ESS3.A	**Stream Tables**	4 weeks
4.ESS2.A	**Formation of Landforms**	1 week
4.ESS2.A	**Plate Tectonics**	2 days
4.ESS2.B	**Topography**	2 days

Unit 4
Electricity

Standards addressed:
4.PS3.B.1 Provide evidence to construct an explanation of an energy transformation(e.g. temperature change, light, sound, motion, and magnetic effects)
4.PS3.B.2 Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.

Essential Questions:
How do you construct a complete electrical circuit?
How do you design and construct an electrical device using existing materials that can be used to perform a task?

Learning Targets:

Students will know how to create a complete circuit.
Students will be able to classify materials as conductors or insulators.

Content Vocabulary:
Conductor, insulator, open and closed circuits, energy transfer, switch, electrons, energy conversion, circuit breaker

Resources
Science Textbook, *The Atoms Family* video, *Bill Nye the Science Guy Atoms* video, Proof of Energy Transfer powerpoint, Conductors and Insulators Powerpoint,

Standard(s)	Topic	Number of Days
4.PS3.B.2	**Electrical Circuits**	1 week
	Flow of Electrons	2 days
4.PS3.B.1 4.PS3.B.2	**Resistance**	2 days
4.PS3.B.1 4.PS3.B.2	**Energy Transfer**	2 days
4.PS3.B.1 4.PS3.B.2	**Conductors and Insulators**	2 days
	Electromagnets	2 days
4.PS3.B.1 4.PS3.B.2	**Assessment and Performance Task**	2 weeks

Unit 5
Measurement

Standards addressed:
4.PS2.A.A Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict further motion
4.PS2.B.2 Predict how changes in either the amount of force applied to the object or the mass of an object affects the motion (speed and direction) of an object
Math:
4.GM.C.6.a Solve problems involving measurements and conversion of measurements from larger units to smaller units.
(Know the relative sizes of measurement units within one system of units. Convert measurements in a larger unit in terms of a smaller unit.)
4.GM.C.7 Use the four operations to solve problems involving distances, intervals of time, liquid volume, weight of objects and money

Essential Questions:

What are the different systems of measurements?
How do measurements help us prove scientific concepts?

Learning Targets:
Students will be able to convert measurements.

Content Vocabulary:
Terms for standard and metric measurement, volume, capacity, spring scale, graduated cylinder, weight, mass, gallon, pint, quart, cup

Resources
Science Textbook, Weight vs. Mass slideshow, Platform Spring Scale Slideshow,

Standard(s)	Topic	Number of Days
	Customary Length	1 week
	Metric Length	1 week
	Customary Capacity	1 week
	Metric Capacity	1 week
	Weight/Mass	1 week

Unit 6
Force and Motion

Standards addressed:
4.PS2.A.1 Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.
4.PS2.A.2 Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.
4.PS2.B.1 Plan and conduct a fair test to compare and contrast the forces (measured by a spring scale in Newtons) required to overcome friction when an object moves over different surfaces (i.e., rough/smooth).
4.PS2.B.2 Predict how changes in either the amount of force applied to an object or the mass of the object affects the motion (speed and direction) of the object.
4.PS3.A Use evidence to construct an explanation relating the speed of an object to the energy of that object.
4.ETS1.C Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Essential Questions:
How does the strength and direction of the force affect the motion of an object? How does the mass of the object affect the force necessary to move the object?

Learning Targets:
Students will understand how force applies to the movement of an object.
Students will be able to manipulate variables to create more or less movement of an object.

Content Vocabulary:
Force, friction, catapult, motion, gravity, inertia, static electricity

Resources
Science textbook, BrainPop video on force, *Bill Nye the Science Guy Inertia, Science Max: Friction* video, *Science Court: Gravity* video, *Science Mas: Simple Machines, Science Court: Simple Machines,* BrainPop video *Inclined Plane* and *Lever, Mystery Science: Waves of Sound* lesson

Standard(s)	Topic	Number of Days
	Force and Motion	3 days
	Inertia	1 day
	Static Electricity	3 days
	Friction	1 day
	Gravity	2 days
	Newton's Law	2 days
4.ETS1C	**Design Balloon Racers**	5 days
4.PS2.A.1	**Predict object's motion and future motion**	1 day
4.PS2.B.1	**Force to Overcome Friction**	1 day
4.PS2.B.2	**Predict how Force and Mass Change Motion**	1 day
4.PS3.A	**Relate Speed to Energy**	1 day
4.PS2.A.2	**Balanced and Unbalanced Forces**	1 day
4.PS3.C	**Simple Machines**	3 days