

Enduring Understanding # 1: Scientific inquiry affords all learners opportunities to make observations, pose questions, develop hypotheses, design and conduct investigations, and analyze data to draw conclusions.				
Kindergarten Benchmarks				
Students will understand	Essential Questions	Students will know the/that	Students will be able to	Notes
1.1 Questioning: Scientists use observations to pose questions about the world around them.	-What do scientists observe? -What do scientists ask? -What makes good questions?	-Thinking, questioning, and observing develop important scientific skills.	-Develop questions independently about their world.	
1.2 Investigating: Scientists use an inquiry process to find answers to questions.	-How do we use scientific investigations to find answers to questions?	-Scientific inquiry is a method that will provide answers to questions.	-Conduct a scientific investigation.	
1.3 Data Collection & Analyzing: Scientists collect, measure, analyze, and organize their data in logical ways as part of a scientific process.	-How can we collect data to compare, contrast, group, and explain ideas?	-Scientists collect data to develop their ideas. -Scientists compare and contrast information to find solutions.	-Observe, count, manipulate and group many and varied objects. -Analyze their findings.	
1.4 Communicating: Scientists routinely communicate and collaborate with others in an attempt to build knowledge and understanding.	-How do we record and share our discoveries?	-Scientists collaborate. -Scientists follow rules and procedures correctly.	-Record and explain information in a variety of ways. -Collaborate with others in a scientific inquiry.	

Enduring Understanding # 2: Exploring systems, order, and organizations in our natural and designed world are integral to understanding the scientific disciplines and their interdependence.				
Kindergarten Benchmarks				
Students will understand	Essential Questions	Students will know the/that	Students will be able to	Notes
2.1 Everything is a part of a system. 2.2 Animals and plants react to the conditions of their environment. 2.3 Living things have needs.	-What is an environment? -What are the differences and similarities of trees? -What are the differences and similarities of animals?	-Plants and animals require care. -Animals and plants have life cycles. -Both plants and animals have needs.	-Observe, compare, contrast, & communicate about the similarities and differences of trees and animals. -Identify and describe a good environment for animals and trees.	<i>FOSS Kit: Animals Two by Two</i>

	-How are living things alike and different?			
2.4 Materials have many observable properties including texture, odor, mass, color, and the ability to react with other substances. 2.5 Objects can be described and sorted by the properties of materials from which they are made. 2.6 Objects are made from one or more materials.	-What is a property? -What are some natural resources?	-Properties can be observed and compared using their senses. -Some objects can be recycled to create new forms. -Natural resources exist in our world. -Different woods and paper have different properties.	-Demonstrate two ways to transform paper. -Compare and observe the properties of paper. -Observe, compare, contrast report properties of wood. -Report the uses of paper and wood.	<i>FOSS Kit: Wood & Paper</i>
2.7 Weather changes daily and over the seasons.	How do weather changes affect the growth of trees? Of animals?	-Some trees change during the seasons. -Different seasons require different behavior of animals including humans.	-Observe compare and record the seasonal changes of trees. -Use scientific tools to record daily changes in weather.	<i>FOSS Kit: Trees</i>

Enduring Understanding # 3: Both contemporary and historical scientific understandings inform technological, ethical, cultural and life decisions.

Kindergarten Benchmarks

Students will understand	Essential Questions	Students will know the/that	Students will be able to	Notes
3.1 Tools are used to help with scientific investigations. 3.2 There are many ways to communicate scientific information.	-How do tools help us answer scientific questions? -What does it mean to answer a scientific question? What is fair and truthful in science?	-A variety of tools can be used to gather information.	-Make decisions based on their scientific investigations.	
3.3 It is an ethical responsibility to recycle our natural resources	-Why do we recycle? -Why is it important?	-Resources are materials we get from the environment to meet our needs.	-Recognize that resources can be extended through recycling and decreased use.	
3.4 People from many cultures including Montana American Indians have helped the	How do American Indians utilize nature? -What did American Indians	American Indians have always been scientists.	Discuss how American Indians utilized what they learned from nature in their everyday	<i>See IEFA coach for implementation plans.</i>

world.	learn from nature?	lives.	
--------	--------------------	--------	--

Enduring Understanding # 1: Scientific inquiry affords all learners opportunities to make observations, pose questions, develop hypotheses, design and conduct investigations, and analyze data to draw conclusions.				
Grade One Benchmarks				
Students will understand	Essential Questions	Students will know the/that	Students will be able to	Notes
1.1 Questioning: Scientists use observations to pose questions about the world around them.	-What do scientists observe? -What do scientists ask? -What makes a good question? -What is a hypothesis?	-Thinking, questioning, and observing begins the scientific process.	-Write a simple scientific question. -With support, develop a hypothesis.	
1.2 Investigating: Scientists use an inquiry process to find answers to questions.	-How do we use scientific inquiry to find answers to questions?	-Scientific inquiry is a process to discover answers to questions.	-With support, design and conduct a simple investigation.	
1.3 Data Collection & Analyzing: Scientists collect, measure, analyze, and organize their data in logical ways as part of a scientific process.	-How can we collect data to compare, contrast, organize, and explain ideas?	-Data collection helps develop ideas. -Comparing and contrasting data leads to solutions. -Data collection must be accurate in order to be useful in making valid and reliable conclusions.	-Observe, record, and analyze findings. -Judge the strength of the data collected.	
1.4 Communicating: Scientists routinely communicate and collaborate with others in an attempt to build knowledge and understanding.	-In what ways can we record and communicate our results?	-Scientists make the results of an investigation public. -Scientists observe and ask questions about others' investigations.	-Record and explain data in a variety of ways. -Collaborate with others in many and varied ways.	

Enduring Understanding # 2: Exploring systems, order, and organizations in our natural and designed world are integral to understanding the scientific disciplines and their interdependence.				
Grade One Benchmarks				
Students will understand	Essential Questions	Students will know the/that	Students will be able to	Notes
2.1 Plants have needs. 2.2 Plants have different growing parts. 2.3 Plants have life	-What are the basic needs of plants? -What are the different parts of a plant?	-Plants can only survive in environments where their needs are met. -The functions of the plant parts.	-Identify and observe the basic needs of plants. -Identify and observe different plant parts and	<i>FOSS Kit: New Plants</i>

cycles. 2.4 Plants are part of environmental systems.	-What is the life cycle of a plant? -What part do plants play in the environmental system?	-Life cycles vary for different plants. -Change is essential in the environmental system.	record different plant life cycles. -Observe changes in the environmental system caused by plants.	
2.5 Objects can be balanced in many ways. 2.6 Counterweights can be used to help balance objects. 2.7 Some objects and systems exhibit rotational motion. 2.8 Pushing or pulling changes the motion of an object. 2.9 The amount and position of mass affects the rotational and rolling motion of objects.	-What is a stable balance position? -How can the balance of objects be changed? -What is rotational & rolling motion? -How can the motion of objects be changed? -How does the amount and position of mass affect rotation and rolling?	-Most systems are stable and balanced. -Counterweights are useful tools. -There are different ways to initiate rotational & rolling motion. -Pushing and pulling is how motion is changed. -There are different ways to initiate and affect rotational and rolling motion.	-Observe, compare, and communicate balance and stability within a variety of systems. -Use counterweight to balance certain objects. -Observe, compare, and communicate rotational motions. -Identify basic pushes and pulls. -Communicate observations and comparisons of rotational and rolling motion.	<i>FOSS Kit: Balance and Motion</i>
2.10 Pebbles, sand, & silt have a variety of properties. 2.11 Pebbles, sand, & silt are an integral part of the Earth's natural resources. 2.12 Soil is a mixture of materials.	-What are the observable properties of rocks and soil? -Why are rocks and soil a valuable resource for humans? -What is soil?	-Properties are a way to help us sort. -Rocks and soil provide resources. -Soils vary from place to place.	-List and describe observable properties of rocks and soil. -Explain how rocks and soil are used by humans. -Sort and compare different soils.	<i>FOSS Kit: Pebbles, Sand, and Silt</i>

Enduring Understanding # 3: Both contemporary and historical scientific understandings inform technological, ethical, cultural and life decisions.

Grade One Benchmarks

Students will understand	Essential Questions	Students will know the/that	Students will be able to	Notes
3.1 Tools have always been a part of our world. 3.2 Safety is important	-Why do we use tools?	-People have always had problems and invented tools and techniques to solve the problems.	-Recognize the value and importance of tools.	
3.3 It is our ethical responsibility to take care of the Earth.	-Why is recycling important?	-Recycling extends resources.	-List and identify resources to be recycled.	
3.4 People from many cultures including Montana American Indians have included science practices in	-What science practices did American Indians use in their everyday lives? -How important	-Plants from various reservations in Montana. -Scientists often work in teams to	-Discuss how American Indians make use of plants in their everyday lives.	<i>Implementation work for this benchmark will be available from IEFA coach.</i>

their everyday lives.	are and were plants to Montana American Indian families?	contribute to end results.		
-----------------------	--	----------------------------	--	--

Enduring Understanding # 1: Scientific inquiry affords all learners opportunities to make observations, pose questions, develop hypotheses, design and conduct investigations, and analyze data to draw conclusions.

Grade Two Benchmarks

Students will understand	Essential Questions	Students will know the/that	Students will be able to	Notes
1.1 Questioning: Scientists use observations to pose questions about the world around them.	-What do scientists observe? -What do scientists ask? -What makes a good question? -How do scientists form a hypothesis?	-Thinking, questioning, and observing begins the scientific process. -Hypotheses frame the investigation.	-Develop authentic questions about science. -Create a hypothesis to frame a scientific problem. -Determine what makes a good question.	
1.2 Investigating: Scientists use an inquiry process to find answers to questions.	-How do we use scientific investigations to find answers to questions?	-Scientific inquiry is a method to test a hypothesis.	-Conduct a scientific investigation. -Test a hypothesis	
1.3 Data Collection & Analyzing: Scientists collect, measure, analyze, and organize their data in logical ways as part of a scientific process.	-How do we know when something is valid? -How do we know when information is reliable?	- Data collection must be accurate and carefully recorded to be valid and reliable.	-Observe, record, analyze, and interpret findings.	
1.4 Communicating: Scientists routinely communicate and collaborate with others in an attempt to build knowledge and understanding.	-How do we communicate our results?	-Scientists collaborate through shared responsibility to the scientific process. -Scientists follow rules and procedures correctly.	-Record, explain, and display information in a variety of ways. -Collaborate with others in a scientific inquiry.	

Enduring Understanding # 2: Exploring systems, order, and organizations in our natural and designed world are integral to understanding the scientific disciplines and

their interdependence.

Grade Two Benchmarks

Students will understand	Essential Questions	Students will know the/that	Students will be able to	Notes
2.1 Living things are part of small and large systems. 2.2 Systems are changed by other systems. 2.3 Living things have life cycles and vary according to species and habitat.	-What is an insect? What are the characteristics of an insect? -How do different insects change during their life cycle? -What are the basic needs of insects?	-There is great diversity in the animal kingdom. -Insects are part of the animal kingdom. -Life cycles of insects -Characteristics of simple and complete metamorphosis.	-Classify insects -Observe similarities and differences. -Observe and record the behaviors of insects at various stages of the life cycle.	<i>FOSS Kit: Insects</i>
2.4 Matter exists in three fundamental states (solid, liquid and gas).	-What is a property? -What are properties of a solid? A liquid? -What might happen when solids are mixed with water? -What might happen when liquids are mixed with water?	-Solids are one state of matter that can be sorted by properties. -Liquids are one state of matter that can be sorted by properties.	-Compare and contrast solids and liquids. -Observe, describe, and sort solids and liquids. -Observe, describe, record, and organize interactions between solids/liquids and water.	<i>FOSS Kit: Solids and Liquids</i>
2.5 Weather systems are impacted by various systems. 2.6 Air takes up a space and interacts with other systems.	-What is weather? -How do scientists monitor and record it? -What is air? -How does air interact with objects? - -	-Meteorologists observe weather with instruments. -Weather systems follow predictable cycles. -Air takes up space and interacts with other objects.	-Graph monthly and seasonal weather conditions. -Use instruments to monitor and record weather accurately. -Observe the force of air pressure.	<i>FOSS Kit: Air and Weather</i>

Enduring Understanding # 3: Both contemporary and historical scientific understandings inform technological, ethical, cultural and life decisions.

Grade Two Benchmarks

Students will understand	Essential Questions	Students will know the/that	Students will be able to	Notes
3.1 Tools have always been a part of our world. 3.2 Safety is important.	-How do tools help us be better scientists? -How do we show safety in science?	-Names and uses of some scientific tools. -The importance of safe practices in science.	-Identify the uses of many and varied scientific tools. -Discuss the safety practices of their classroom during scientific investigation.	
3.3 Scientists	-What are	-Scientists have	-Record and	

respect the environment.	variables that affect our environment? -What does it mean to be ethical? -What are some ethical implications of scientific investigations?	the ability to contribute important knowledge. -Scientific investigation impacts our world in various ways.	report data accurately. -Listen carefully to other's scientific findings. -Identify scientific work that has made both positive contributions and negative impacts in our world.	
3.4 Respect for the earth is important from a scientific and cultural perspective.	-What does how Montana American Indian uses of the buffalo tell us about their respect for Mother Earth?	-Indian people were keen observers of nature. -Indian people utilized their understanding of nature to stay alive.	-Identify many and various ways American Indians had to observe nature and learn how to use its resources to live. -Discuss lifeway changes for Montana American Indians.	*We have the concept of respect in both of these. <i>(Read and hear NA stories with various cultural connections.) See IEFA coach for more.</i>

Enduring Understanding # 1: Scientific inquiry affords all learners opportunities to make observations, pose questions, develop hypotheses, design and conduct investigations, and analyze data to draw conclusions.

Grade Three Benchmarks

Students will understand	Essential Questions	Students will know the/that	Students will be able to	Notes
1.1 Questioning: Scientists use observations to pose questions about the world around them.	-What makes a good scientific question? -Why did that happen? -How do scientific questions drive the inquiry process?	-They need to ask questions to solve problems about the world around them.	-Write scientific questions. -Evaluate and alter their own questions based on observations. -Use metric tools.	
1.2 Investigating: Scientists use an inquiry process to find answers to questions.	-What would happen if I did this differently? -What is a fair test? -What steps do I need to take to test my question?	-They can change the variables one at a time. -Steps in scientific inquiry - 5Es relate back to the inquiry process.	-Design and conduct an investigation. -Make predictions when various parts (variables) of the investigation are changed.	
1.3 Data Collection & Analyzing:	-How do my data answer my	-Scientific investigations	-Make charts and write explanations	

Scientists collect, measure, analyze, and organize their data in logical ways as part of a scientific process.	<p>questions?</p> <p>-How can I prove my conclusion is accurate?</p> <p>-What tools do I use to collect data?</p> <p>-What data will I collect during the investigation?</p>	<p>require multiple data to support valid and reliable conclusions.</p> <p>-There is more than one way to collect data.</p> <p>-There may be more than one right answer.</p>	<p>of the investigations.</p> <p>-Collect, organize, and use data to formulate a conclusion.</p>	
1.4 Communicating: Scientists routinely communicate and collaborate with others in an attempt to build knowledge and understanding.	<p>-Can I explain the process used to reach my conclusion?</p> <p>-Can I use my data to explain conclusions to others effectively?</p>	<p>-Errors are part of the investigative process.</p> <p>-Scientists communicate their results in a variety of ways.</p> <p>-Their conclusions are communicated by showing evidence for conclusions.</p>	<p>-Communicate results and outcomes.</p> <p>-Explain the process to reach a conclusion.</p>	

Enduring Understanding # 2: Exploring systems, order, and organizations in our natural and designed world are integral to understanding the scientific disciplines and their interdependence.

Grade Three Benchmarks

Students will understand	Essential Questions	Students will know the/that	Students will be able to	Notes
2.1 Plants and animals are organisms. 2.2 There are specific stages in life cycles.	<p>-What is an organism?</p> <p>-How do organisms develop and change?</p> <p>-How are organisms unique?</p>	<p>-Organisms have forms habitats, and behaviors.</p>	<p>-Observe and compare development and/or behaviors of an organism.</p> <p>-Describe and sort organisms in terms of properties.</p>	<i>FOSS Kit: Structures of Life</i>
2.3 The necessity of measurement in the areas of length, mass, temperature and volume. 2.4 That metrics are a globally accepted unit of measurement.	<p>-What do we measure and for what purpose?</p> <p>-What type of measurement is most appropriate for a given investigation?</p>	<p>-Scientific investigation requires measurement for comparison and testing a hypothesis.</p>	<p>-Choose the appropriate type of measurement in a particular investigation.</p> <p>-Use measurement tools appropriately.</p> <p>-Discuss the relationship of measurement in math and science.</p>	<i>FOSS Kit: Measurement</i>
2.5 Earth is composed of different minerals. 2.6 These minerals	<p>-How can rocks be classified?</p> <p>-What are some of the physical</p>	<p>-Rocks are composed of minerals.</p> <p>-Rocks can be</p>	<p>-Identify various properties of rocks.</p> <p>-Classify rocks and minerals according to</p>	<i>FOSS Kit: Earth Materials</i>

have different characteristics that can be identified and classified.	properties of rocks?	separated into their components. -Minerals cannot be physically separated into other materials.	their properties.	
---	----------------------	--	-------------------	--

Enduring Understanding # 3: Both contemporary and historical scientific understandings inform technological, ethical, cultural and life decisions.

Grade Three Benchmarks

Students will understand	Essential Questions	Students will know the/that	Students will be able to	Notes
3.1 Technology can help or harm the environment. -Technology can either be a tool or a result of scientific investigation. 3.2 Investigations must be conducted safely.	-Could the use of technology in scientific investigation cause irreversible harm?	-Technology plays a key role in scientific investigation.	-Choose appropriate technology to conduct scientific investigations.	
3.3 Doing possible harm in scientific investigation requires ethical questioning.	-What are some ethical implications of the results of scientific investigation?	-Scientific investigation may impact ethics, culture or life systems.	-Develop ethical questions relating to scientific investigation.	
3.4 Scientific investigation can result in cultural or life changes.	-Will scientific investigation be a benefit to cultures or life systems?	-Traditional Native American stories tell about interpretations of the world around them.	-Anticipate possible impacts that the investigation may have on cultures and life systems.	<i>See IEFA coach for implementation plan.</i>

Enduring Understanding # 1: Scientific inquiry affords all learners opportunities to make observations, pose questions, develop hypotheses, design and conduct investigations, and analyze data to draw conclusions.

Grade Four Benchmarks

Students will understand	Essential Questions	Students will know the/that	Students will be able to	Notes
1.1 Questioning: Scientists use observations to pose questions about the world around them.	-What makes a good scientific question? -Why did that happen? -How do scientific questions drive the inquiry process?	-They need to ask questions to solve problems about the world around them.	-Write scientific questions. -Evaluate and alter their own questions based on observations.	

<p>1.2 Investigating: Scientists use an inquiry process to find answers to questions.</p>	<ul style="list-style-type: none"> -What would happen if I did this differently? -What is a fair test? -What steps do I need to take to test my question? 	<ul style="list-style-type: none"> -They can change the variables one at a time. -Steps in scientific inquiry -How the 5Es relate back to the inquiry process. 	<ul style="list-style-type: none"> -Design and conduct an investigation. -Make predictions when various parts (variables) of the investigation are changed. 	
<p>1.3 Data Collection & Analyzing: Scientists collect, measure, analyze, and organize their data in logical ways as part of a scientific process.</p>	<ul style="list-style-type: none"> -How do my data answer my questions? -How can I support my conclusion is accurate? -What tools do I use to collect data? -What data will I collect during the investigation? 	<ul style="list-style-type: none"> -Scientific investigations require multiple data to support valid and reliable conclusions. -There is more than one way to collect data. -There may be more than one right answer. 	<ul style="list-style-type: none"> -Make charts and write explanations of the investigations. -Collect, organize, and use data to formulate a conclusion. 	
<p>1.4 Communicating: Scientists routinely communicate and collaborate with others in an attempt to build knowledge and understanding.</p>	<ul style="list-style-type: none"> -Can I explain the process used to reach my conclusion? -Can I use my data to explain conclusions to others effectively? 	<ul style="list-style-type: none"> -Errors are part of the investigative process. -Scientists communicate their results in a variety of ways. -Their conclusions are supported by data 	<ul style="list-style-type: none"> -Communicate results and outcomes. -Explain the process to reach a conclusion. 	

Enduring Understanding # 2: Exploring systems, order, and organizations in our natural and designed world are integral to understanding the scientific disciplines and their interdependence.

Grade Four Benchmarks

Students will understand	Essential Questions	Students will know the/that	Students will be able to	Notes
<p>2.1 The human body is made up of different systems. 2.2 Each system in the human body has its own form and function.</p>	<ul style="list-style-type: none"> -What are the functions of the bones in the skeletal system? -How does the human skeleton compare and contrast with other mammals? -What are the purposes and functions of different joints in the human skeletal 	<ul style="list-style-type: none"> -The skeleton is a system of bones that have their own purpose and function. -The skeletons of humans and mammals have many similarities. -When muscles work, they contract. -Muscles are connected to bones using tendons. 	<ul style="list-style-type: none"> -Assemble an articulated skeleton. -Compare a human skeleton to that of another mammal. -Describe the functions of different bones in the human body -Identify the 3 types of joints. -Describe a joint in the human skeletal system. -Compare human skeletal joints to 	<p><i>FOSS Kit: Human Body</i></p>

	<p>system?</p> <ul style="list-style-type: none"> -How do muscles work? -How do body parts work together to complete a task? 	<ul style="list-style-type: none"> -Ligaments attach bone to bone. -A stimulus triggers a response. -Our senses are what detect stimuli. 	<p>mechanical structures.</p> <ul style="list-style-type: none"> -Explain how muscles work to move bones. -Describe how bones and muscles are connected to each other. -Explain the bones, joints, and muscles that move when the hand and foot respond. -Describe how the senses detect stimuli. 	
--	--	---	---	--

Enduring Understanding # 2: Exploring systems, order, and organizations in our natural and designed world are integral to understanding the scientific disciplines and their interdependence.

Grade Four Benchmarks

Students will understand	Essential Questions	Students will know the/that	Students will be able to	Notes
<p>2.3 Magnets have certain observable and predictable properties.</p> <p>2.4 Electricity in circuits can provide energy.</p> <p>2.5 Magnetism and electricity are related forms of energy.</p>	<p>-How and why do magnets interact?</p> <p>-What are the properties of magnets?</p> <p>-What types of energy can be produced related to electricity?</p> <p>-How do magnets help humans?</p>	<p>-Magnets attract certain types of metal objects.</p> <p>-Magnets attract & repel.</p> <p>-Magnetism can be induced to other pieces of metal.</p> <p>-Electricity only flows through pathways called circuits.</p> <p>-Circuits have many different parts that can change their functioning.</p> <p>-Magnets can be created with electricity.</p> <p>-Magnets have purpose in a real-world context.</p>	<p>-Explain why magnets only attract to certain metals.</p> <p>-Identify the properties of magnets that make them attract & repel.</p> <p>-Create temporary magnets.</p> <p>-Identify the properties of a closed and open circuit.</p> <p>-Compare how parallel and series circuits work.</p> <p>-Create an electromagnet.</p>	<p><i>FOSS Kit: Magnetism and Electricity</i></p> <p>Suggestion is to do this unit first.</p>
<p>2.6 Water which covers most of the earth moves through the earth, oceans, and atmosphere in the water cycle.</p>	<p>-What changes occur when water changes states?</p> <p>-How do the properties of water affect how it interacts with our surroundings?</p> <p>-How can water work for us?</p>	<p>-Water has several observable properties</p> <p>-Water expands & contracts</p> <p>-Density changes based on temp.</p> <p>-Different states of matter have different characteristics</p> <p>-Water interacts with the environment</p>	<p>-Identify & describe properties of water in its 3 different states</p> <p>-Explain the processes that take place in the water cycle</p> <p>-Explain how water affects the world around us (dams, floods, erosion, water power, weathering, building up sediment)</p>	<p><i>Foss Kit: Water</i></p>

Enduring Understanding # 3: Both contemporary and historical scientific understandings inform technological, ethical, cultural and life decisions.

Grade Four Benchmarks

Students will understand	Essential Questions	Students will know the/that	Students will be able to	Notes
<p>3.1 Historical scientific information has changed as new technologies have changed the study of science.</p>	<p>-How has technology improved our understanding of the human body?</p> <p>-How have advances in energy shaped our world?</p>	<p>-Knowledge of the structure of the human body changed significantly with the invention of x-ray machines, MRI, & other medical</p>	<p>-Give examples of how historical scientific information has changed as new technologies have changed the study of science.</p>	

		technology. -Looking for alternative forms of energy is vital in today's world due to present and past energy consumption and the effects on our planet.	-Use metric tools.	
3.2 Scientific investigation requires the highest level of ethical consideration in both design and communication.	-What ethical considerations need to be taken while conducting investigations?	-An ethical choice means doing what is considered the common good versus the best for an individual. -Some investigations require ethical considerations.	-Conduct investigations that are ethical sound to produce viable and reproducible results.	
3.3 Many cultures throughout history have had many and varied understandings of science.	-How did/does water influence the lives of all Montanans—historically and currently, including American Indians?	-Water had significant meaning in the lives of American Indians. -The movement people, including Native Americans were affected by water.	-Identify the meaning(s) of water to American Indians.	This could be a great interdisciplinary link to social studies (see grade 4 Montana Unit Water Story/Indian Reading Series/Crow Native Waters: Sharing the Source/Native Waters/Montana State University

Enduring Understanding # 1: Scientific inquiry affords all learners opportunities to make observations, pose questions, develop hypotheses, design and conduct investigations, and analyze data to draw conclusions.

Grade Five Benchmarks

Students will understand	Essential Questions	Students will know the/that	Students will be able to	Notes
1.1 Questioning: Scientists use observations to pose questions about the world around them.	-How are the generated problem, knowledge and content relevant to me? -What do I need to inquire about? -What questions do my observations generate? -How do we move from observation to generating questions?	-Questions begin investigations. -Good questions are many and varied and should be edited as a common practice. -Questioning begins with observation and then generates research.	-Question for a purpose based on their observations. -Hypothesize reasonable outcomes based on observations. -Use Hypotheses to guide the investigation toward reasonable outcomes. -Classify, infer, analyze, and generalize.	
1.2 Investigating: Scientists use an inquiry process to find answers to questions.	-Why is this investigation important? What is in it for me? -What can I do with this knowledge? -What steps do I need to create new information	-Inquiry is an iterative process.	-Observe purposefully and independently in order to help design their own investigations. - Base their results and conclusions on their own data and observations.	
1.3 Data Collection & Analyzing: Scientists collect, measure, analyze, and	-How do I assess what I know and what I need to find out? -What resources are	-Answer leads to more questions. - Resources are available to help answer the	-Determine which information is relevant. -Evaluate resources. -Infer, analyze and	

organize their data in logical ways as part of a scientific process.	applicable to answering the question?	question.	interpret data to draw conclusions. -Measure and record accurate data. -Use appropriate measurement tools, tables, graphs, and charts.	
1.4 Communicating: Scientists routinely communicate and collaborate with others in an attempt to build knowledge and understanding.	-How do I collaborate with others? -What information is relevant to share with others?	-Collaboration takes place in all steps of the inquiry process. -Listening, thinking and sharing takes place in collaboration.	-Compare findings collaboratively. -Present findings in a variety of formats. -Accept suggestions from peers to improve investigations.	

--	--	--	--	--

Enduring Understanding # 2: Exploring systems, order, and organizations in our natural and designed world are integral to understanding the scientific disciplines and their interdependence.

Grade Five Benchmarks

Students will understand	Essential Questions	Students will know the/that	Students will be able to	Notes
<p>2.1 Variables need to be controlled and manipulated in fair experiments.</p> <p>2.2 The motion of an object can be described by its position, direction of motion and speed.</p> <p>2.3 That motion can be measured and represented on a graph.</p>	<p>-What is a variable?</p> <p>-What is a controlled/fair experiment?</p> <p>-How do you design and conduct controlled experiments?</p> <p>-How do variables affect pendulums?</p> <p>-How does surface area affect buoyancy?</p> <p>-What is a system in terms of an experiment?</p> <p>-How do variables affect the distance an object can travel?</p> <p>-How do forces affect the trajectory of objects?</p>	<p>- A variable is anything that you can change within an experiment that could affect the outcome.</p> <p>- A fair experiment has only one variable that is changed.</p> <p>- Once a variable has been changed the experimental results must be compared to a standard.</p> <p>- Capacity is the maximum volume a container can hold.</p> <p>- A system is a set of objects that is working together.</p> <p>- Increasing or decreasing the amount of force determines the distance an object can travel.</p> <p>- The mass of an object affects the force needed to make an object a trajectory.</p>	<p>- Design and conduct experiments.</p> <p>- Change only one variable at a time in a controlled experiment.</p> <p>- Compare experimental results to a standard.</p> <p>- Use experimental results to predict outcomes of future experiments.</p> <p>- Identify interrelated objects as systems.</p>	<p><i>FOSS Kit: Variables</i></p>

Enduring Understanding # 2: Exploring systems, order, and organizations in our natural and designed world are integral to understanding the scientific disciplines and their interdependence.

Grade Five Benchmarks

Students will understand	Essential Questions	Students will know the/that	Students will be able to	Notes
	<ul style="list-style-type: none"> -How do levers function? -How do pulleys function? -How do simple machines make work easier? 	<ul style="list-style-type: none"> - Simple machines (levers and pulleys) make work easier. - An advantage is a gain in effort, distance, or change of direction resulting from the use of a simple machine. - Effort is the force needed to move a load or overcome a resistance. - A fulcrum is the point where a lever arm pivots. - Load is a mass lifted or a resistance overcome by a lever. - A single moveable pulley system provides a mechanical advantage for its user. - A single fixed pulley system provides no mechanical advantage but changes the direction of the effort. - A two-pulley system can be made with one fixed and one moveable pulley in which the effort is applied upward to provide a greater advantage. -Amount of work put into a system is equal to the work output of the system. 	<ul style="list-style-type: none"> -Demonstrate how a simple machine such as a lever can gain an advantage in a work situation. - Discover the relationships between the parts of a lever. - Observe the behavior of different kinds of levers and single fixed/single moveable pulley systems. - Identify class I, II, and III levers - Measure the efforts needed to balance and move the loads. - Build, diagram and measure lever and pulley systems. - Record and graph data to determine the relationship between the effort force needed to move a load. - Predict and calculate the effort needed to move a load with a lever and pulley. 	<p><i>FOSS Kit: Levers and Pulleys</i></p>

2.4 People are capable of creating simple machines that make work easier.				
---	--	--	--	--

Enduring Understanding # 2: Exploring systems, order, and organizations in our natural and designed world are integral to understanding the scientific disciplines and their interdependence.

Grade Five Benchmarks

Students will understand	Essential Questions	Students will know the/that	Students will be able to	Notes
2.5 Food contains several nutrient groups which contribute to healthful nutrition.	<ul style="list-style-type: none"> -What is food? -Of what is food made? -How do nutrients contribute to healthful nutrition? 	<ul style="list-style-type: none"> - Fat is a nutrient found in foods. - Foods can contain different kinds of fats i.e. saturated and unsaturated. - Sugar is a simple carbohydrate - Carbon dioxide can be produced as a by-product of chemical reactions within different organisms. - The sour taste of foods is due to acids. - Calories are a measure of the amount of energy in food. - Labels on food packages provide nutritional information on carbohydrates, proteins, fats, vitamins and calories. 	<ul style="list-style-type: none"> - Use indicators to identify nutritional components in food. - Relate taste of food to nutrients. - Organize and communicate results of experiments. - Compare our results with a known standard. - Interpret nutritional information on food packages. - Design and analyze menus for nutritional content. 	<i>FOSS Kit: Food and Nutrition</i>

Enduring Understanding # 3: Both contemporary and historical scientific understandings inform technological, ethical, cultural and life decisions.

Grade Five Benchmarks

Students will understand	Essential Questions	Students will know the/that	Students will be able to	Notes
3.1 Technology changes our ability to understand our world.	<ul style="list-style-type: none"> -How does technology influence my life and the lives of others? -What is technology? 	<ul style="list-style-type: none"> -Humans create technology to change or adapt to our world. -Technology impacts our world in both predictable and unpredictable ways. 	<ul style="list-style-type: none"> -Identify technology in their surroundings. -Determine or identify the impacts of technology. -Identify significant technological advances. -Use metric tools. 	
3.2 Ethical decisions and scientific understanding impact one another.	<ul style="list-style-type: none"> -How have past contributions in science influenced current understanding of the world? -How does 	<ul style="list-style-type: none"> -Science understanding permeates all aspects of our lives. 	<ul style="list-style-type: none"> -Identify instances of ethical decisions that have been changed by science understanding. 	

	scientific understanding affect so many aspects of our lives? -What is a scientific understanding?			
3.3 Past and present diverse cultures have contributed to today's science.	-How have American Indians of the past and present contributed to science?	-Past and present contributions made by American Indians to science.	-Identify and discuss the contributions that American Indians have made in science.	See the IFEA coach for implementation plans.

Enduring Understanding # 1: Scientific inquiry affords all learners opportunities to make observations, pose questions, develop hypotheses, design and conduct investigations, and analyze data to draw conclusions.

Grade Six Benchmarks

Students will understand	Essential Questions	Students will know the/that	Students will be able to	Notes
1.1 Questioning: Scientists use observations to pose questions about the world around them.	-How are the generated problem, knowledge and content relevant to me? -What do I need to inquire about? -What questions do my observations generate? -How do we move from observation to generating questions?	-Questions begin investigations. -Good questions are many and varied and should be edited as a common practice. -Questioning begins with observation and then generates research.	-Question for a purpose based on their observations. -Hypothesize reasonable outcomes based on observations. -Use Hypotheses to guide the investigation toward reasonable outcomes. -Classify, infer, analyze, & generalize.	
1.2 Investigating: Scientists use an inquiry process to find answers to questions.	-Why is this investigation important? What is in it for me? -What can I do with this knowledge? -What steps do I need to create new information	-Inquiry is an iterative process.	-Observe purposefully and independently in order to help design their own investigations. - Base their results and conclusions on their own data and observations.	
1.3 Data Collection & Analyzing: Scientists collect, measure, analyze, and organize their data in logical ways as part of a scientific process.	-How do I assess what I know and what I need to find out? -What resources are applicable to answering the question?	-AN answer leads to more question. -Which resources are available to help answer the question.	-Determine which information is relevant. -Evaluate resources. -Infer, analyze and interpret data to draw conclusions. -Measure and record accurate data -Use appropriate measurement tools, tables, graphs, and charts.	
1.4 Communicating:	-How do I	-Collaboration takes	-Compare findings	

<p>Scientists routinely communicate and collaborate with others in an attempt to build knowledge and understanding.</p>	<p>collaborate with others? -What information is relevant to share with others?</p>	<p>place in all steps of the inquiry process. -Listening, thinking and sharing takes place in collaboration.</p>	<p>collaboratively. -Present findings in a variety of formats. -Accept suggestions from peers to improve investigations.</p>	

Enduring Understanding # 2: Exploring systems, order, and organizations in our natural and designed world are integral to understanding the scientific disciplines and their interdependence.

Grade Six Benchmarks

Students will understand	Essential Questions	Students will know the/that	Students will be able to	Notes
2.1 Ecosystems constantly change and adapt. 2.2 Biological and physical systems influence and react to these changes. 2.3 Living things interact with biotic and abiotic components of their environments.	-How do I interact with my environment? -How does my environment affect me? -What is an environment? -What is an ecosystem? What is the difference? -What is a living organism?	-How living organisms respond to environmental factors. -How to determine what a living organism is. -Changes that happen in the ecosystem may or may not be affected by every variable. -Growth and survival depend upon adaptation.	-Identify abiotic and biotic factors that influence living organisms. -Determine which variables affect organisms. -Create and manipulate life systems to show how organisms respond to environmental factors.	<i>FOSS Kit: Environments</i>
2.4 Matter can have many forms 2.5 Energy is a fundamental part of all physical and chemical changes. 2.6 Chemistry is the study of how substances react with other substances.	-What forms of energy do I use? -How do we affect chemical changes and how do they affect us and our environment? -What is difference between a mixture and a solution? - How are they alike? - How are they different?	- Characteristics of mixtures and solutions. -Chemical reactions occur when we combine two substances. -Results of chemical reactions are observable and predictable. -Hierarchy of the formation of matter.	-Name or list many forms of energy students use every day. -Create tables and/or charts which illustrate the differences between mixtures and solutions. -Identify common mixtures and solutions. -Explain the ripple effect.	<i>FOSS Kit: Mixtures and Solutions</i>
2.7 Forces on earth are constantly changing the geological features.	-What effect do the changing geological earth features have on the biological and physical systems in the earth? -How are they interrelated?	-Many variables affect geological features. -Earth is in constant flux -We can make inferences from the past to predict changes in the future. -Landforms develop through constructive and destructive forces. -Agents of change.	-Describe or illustrate how each of the agents of change impact a landform -Observe a surrounding, create a model, and relate that model to a natural form. -Describe agents which influenced topography and predict future topography. -Interpret representations accurately relative to actual landforms.	<i>FOSS Kit: Landforms</i>

Enduring Understanding # 3: Both contemporary and historical scientific understandings inform technological, ethical, cultural and life decisions.

Grade Six Benchmarks

Students will understand	Essential Questions	Students will know the/that	Students will be able to	Notes

<p>3.1 Technology changes our ability to understand our world.</p>	<p>-What are some changes in understanding that technological advances have caused? -How have world views changed over time as a result of technological developments?</p>	<p>- Discoveries in physical, life and earth sciences allow us to improve technology to change our lives. -How technology can cause environmental degradation or conservation. -Resource depletion can be the result of technological development.</p>	<p>-Compare and contrast the thinking of past generations to current thinking. -Use technology to research their ideas. -Use metric tools.</p>	
<p>3.2 Scientific understanding informs ethnic life decisions.</p>	<p>-What are the different points of view on how scientific understanding has informed ethnic life decisions?</p>	<p>-Certain ethnic groups are more susceptible to various diseases, such as diabetes in American Indians.</p>	<p>-Discuss how scientific understanding informs life decisions for American Indians.</p>	