

**Gilford School District  
Grade 4 - Science**

Geology - Rocks and Minerals		
Proficiencies	Content	Skills
How are rocks formed?	Rock as being composed of different combinations of materials	use appropriate tools to measure and graph data
What causes rocks to break down?	specific uses of Earth materials	analyze and compare data from a variety of age-appropriate sources such as newspapers and websites.
What can the formation of rocks and minerals tell us about how the Earth has changed?	physical properties to sort, describe, or classify different Earth materials	Use a variety of tools and formats to summarize and communicate the results of observations
How do we use rocks and minerals?		apply a variety of age-appropriate strategies to address real life issues.
What is the difference between rocks and minerals?	Use simple tools	build a concept map to understand a complex problem
		organize observations and data into tables, charts, and graphs.
	observations for a given purpose	ask questions and plan investigations to find the answers
	use observations and inferences	compile data gathered through observations to record and present results using tally charts, tables, and graphs.
	standard units of measurement	use evidence to construct explanations.
		use a variety of equipment and software packages to enter, process, display, and/or communicate information in different forms using text, tables, pictures and sound.
	classify according to several attributes and show method of classification	plan and conduct a scientific investigation in group settings.
	compare method of classifying based on the goal	engage in group decision making activities. role-play different points of view on an issue.
	ask questions about objects, organisms, and events in their local environment	keep a journal to record observations, recognizing patterns, summarizing findings, and reflecting on the observations.
	use questions to investigate and practical problem-solve plan a step-by-step process to solve a practical problem or to carry out a "fair test" of a simple scientific question	establish ongoing communication with students from communities or countries to share and compare data. collaborate with other learners by letters, phone, or online.

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<p>select an activity and justify it as an effective means of collecting appropriate data</p> <p>follow a set of procedures</p> <p>plan and test ideas through guided experiments</p> <p>identify and use appropriate tools</p> <p>compile and display data in various formats</p> <p>select an appropriate format to represent data or observations</p> <p>identify and suggest possible explanations for patterns</p> <p>analyze data and identify discrepancies</p> <p>site evidence or data to support conclusions</p> <p>determine if an observation or measurement supports a given scientific explanation</p> <p>draw a conclusion to answer an initial question based on the evidence collected</p> <p>recognize that sometimes scientists have different explanations for the same set of observations which usually lead them to make more observations to resolve the differences</p> <p>realize that results of similar scientific investigations seldom turn out exactly the same but if the differences are large it's important to figure out why</p> <p>know when comparisons might not be fair because some conditions might not be the same</p>	<p>describe Earth materials such as gases found in the atmosphere, rocks, soils, and water in its liquid and solid states</p> <p>describe rock as being composed of different combinations of minerals</p> <p>given information about Earth materials explain how their characteristics lend themselves to specific uses</p> <p>given certain Earth materials (soils, rocks, or minerals) use physical properties to sort, classify, and/or describe them</p> <p>distinguish between the three categories of rocks (metamorphic, igneous, and sedimentary) and describe the processes that create them</p> <p>identify minerals by their physical properties, such as color, texture, and cleavage, and describe simple tests used in the identification process</p> <p>explain that smaller rocks come from the breaking and weathering of larger rocks and bedrock</p> <p>use results from an experiment to draw conclusions about how water interacts with earth materials</p> <p>explain how wind, water, or ice shape and reshape the Earth's surface</p> <p>recognize and describe the Earth's surface as mostly covered by water</p>
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	<p>explain that scientific investigations may take many different forms</p> <p>realize that scientists' explanations about what happens in the world come partly from what they observe, and partly from what they think</p> <p>demonstrate that if something consists of many parts, the parts usually influence one another</p> <p>provide examples that demonstrate that something may not work as well (or at all) if a part of it is missing, broken, worn out, mismatched, or misconnected</p> <p>know that seeing how a model works after changes are made to it may suggest how the real thing would work if the same changes were done to it</p> <p>use geometric figure, number sequences, graphs, diagrams, and picture as scientific models</p> <p>recognize that most everything has limits on how big or small it can be</p> <p>observe that some small changes can be detected by taking measurements</p> <p>understand that some changes are so slow or so fast that they are hard to see</p> <p>complete an assigned task when given a specific role in a group</p> <p>give specific feedback about work of others</p> <p>demonstrate a basic conservation action such as recycling or a schoolyard habitat project</p>	<p>explain that most of Earth's water is salt water which found in the oceans and that fresh water is found in rivers, lakes, underground sources and glaciers.</p> <p>identify some jobs/careers that require knowledge and use of Earth science content and/or skills</p> <p>explain that materials may be composed of parts that are too small to be seen without magnification</p> <p>use measures of weight (data) to demonstrate that the whole equals the sum of its parts</p> <p>recognize that substances can be classified by observable properties</p> <p>explain that some materials can exist in different states; and describe the distinct physical properties of each state of matter</p> <p>explain how some materials, such as water, can change from one state to another by heating or cooling</p> <p>collect and organize data of physical properties in order to classify objects or draw conclusions about objects</p> <p>understand that materials are used in certain products based on their properties such as strength and flexibility</p> <p>demonstrate how to use tools such as magnifiers to gather data and extend the senses</p> <p>describe how some tools can be used to modify natural materials by processes such as separating, shaping, and joining to produce new materials</p>
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	<p>develop questions based upon their observations about the natural world and design a simple investigation</p> <p>develop questions that help them learn about the environment; and design and conduct simple investigations</p> <p>locate and collect information about the environment and environmental and natural resources topics</p> <p>use reliable information to answer questions</p> <p>organize information to search for relationships and patterns concerning the environment and environmental topics</p> <p>identify and investigate issues in their local environments and communities</p> <p>describe the design process of a logical progression for transforming ideas into reality</p> <p>describe how people have used tools throughout history and provide examples of how many of these tools are still in use today</p> <p>provide examples illustrating that throughout history, people of all ages and from all walks of life have made significant contributions to the field of science and technology</p> <p>access information from a variety of media sources</p>	
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Magnetism and Electricity		
Proficiencies	Content	Skills
<p>How can electricity in circuits produce light, sound, heat, and magnetic effects?            What is the relationship between electricity and magnets?            What are the properties of insulators and conductors?            How do electrical circuits work?            What parts are used to create an electrical circuit?</p>	<p>materials may be composed of parts too small to be seen without magnification.            measures of weight show how the whole equals the sum of the parts.            substances can be classified by observable properties.              some materials can exist in different states of matter. physical properties of each state of matter can be described.            some materials change from one to another by heating or cooling.              predictions or categories are generated about the effects of heating or cooling of the state of common materials (solids, liquids or gases).              data will be collected and organized about physical properties in order to classify or draw conclusions about objects and their characteristic properties (e.g. temperature, color, size, shape, weight, texture, flexibility).              energy has the ability to create change              various form of energy exist, such as electrical, light, heat, and sound.              electricity in circuits can produce light, heat, sound, and magnetic effects.</p>	<p>explain that materials may be composed of parts too small to be seen.              use measures of weights to show that the whole equals the sum of its parts.              Recognize and sort objects by their ability to insulate or conduct electricity              Learn the essential parts of an electrical circuit.              Investigate the properties of magnetism in relation to other objects (attract/repel).            Compare the materials that have the ability to conduct electricity.            Construct electromagnets.              Observe magnetism that is produced by electricity flowing through a wire.            find out how the number of turns of wire in a coil affects the strength of an electromagnet.            classifications made based on observations of properties</p>

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	<p>simple circuits will be identified and described.</p> <p>conductors and insulators of electricity are identified and described.</p> <p>the observable effects of energy can be predicted (a light bulb lights or hands warm up) when given a specific example (simple closed circuit or rubbing hands together) or illustration.</p> <p>evidence gathered if or how (experiment, observe, or predict) heat might move from one object to another</p> <p>identification and classification of materials that magnets will or will not attract</p> <p>magnets attract or repel each other. electrically charged material pulls on all other materials and can attract or repel other charged materials.</p> <p>earth's gravitational force pulls any object toward it.</p>	<p>explain that some materials can exist in different states, and describe the distinct physical properties of each state of matter.</p> <p>explain how some materials, such as water, can change from one state to another by heating or cooling.</p> <p>predict or categorize (solid, liquid, or gas) what might happen to common materials when heated or cooled.</p> <p>Collect and organize or draw conclusions about the physical properties of objects.</p> <p>Recognize that energy can create change.</p> <p>Identify the various forms of energy.</p> <p>recognize that electricity in circuits can produce light, heat, and magnetic effects.</p> <p>Given an example, predict an observable effect of energy.</p> <p>observe or predict how heat might move from one object to another.</p> <p>explain that electrically charged material pulls on all other materials and can attract or repel other charged materials.</p> <p>understand the earth's gravitational force.</p> <p>predict how a change in force might affect the position, direction of motion, or the speed of an object.</p> <p>Understand that materials are used in certain products based on their properties.</p>
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	<p>observations with descriptions will be made of magnetic properties (attracts, repels, or has no effect) on another object.</p> <p>data will support predictions how a change in force (greater/less) might affect the position, direction of motion or speed of an object.</p> <p>materials are used in certain products based on their properties (strength, flexibility).</p> <p>products are made using a combination of technologies (electrical motors and magnets).</p> <p>tools (magnifiers and rulers) are used to gather data. some tools can be used to modify natural materials by processes such as separating, shaping and joining, to produce new materials.</p> <p>sources of energy used in NH's transportation system (public and private) will be identified and described. manufactured products are designed to solve a problem or meet a need. examples given to illustrate how natural materials can be manufactured into finished products leading to mass production (objects in large quantity are almost identical).</p> <p>some jobs/careers require knowledge and use of physical science content.</p> <p>complete an assigned task when given a specific role in a group</p>	<p>Recognize that products are made by combining technologies.</p> <p>Demonstrate how tools are used to gather data.</p> <p>Describe how tools modify natural products to form new materials.</p> <p>Give examples and describe sources of energy used in NH's transportation systems.</p> <p>Explain that manufactured products are designed to solve a problem/meet a need.</p> <p>illustrate and explain how natural materials are used in manufacturing.</p> <p>Identify careers that need and use physical science.</p> <p>analyze and compare data from a variety of age-appropriate sources such as newspapers and websites.</p> <p>apply a variety of age-appropriate strategies to address real life issues.</p>
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	<p>Use simple tools</p> <p>access information from a variety of media sources</p> <p>analyze data and identify discrepancies</p> <p>Cite evidence to support conclusions or pose another question</p> <p>communicate ideas to others</p> <p>compile and display data in various formats</p> <p>Critical thinking skills: observation, recording data, inference, classify, question, and investigate.</p> <p>demonstrate that if something consists of many parts, the parts usually influence one another</p> <p>demonstrate that some features of things may stay the same when other features change</p> <p>describe how people have used tools throughout history and provide examples of how many of these tools are still in use today</p> <p>describe the design process of a logical progression for transforming ideas into reality</p> <p>Design and execute a scientific investigation in order to collect data</p> <p>Design scientific investigations</p> <p>determine if an observation or measurement supports a given scientific explanation</p>	<p>ask questions and plan investigations to find the answers</p> <p>build a concept map to understand a complex problem</p> <p>collaborate with other learners by letters, phone, or online.</p> <p>collect and organize data of physical properties in order to classify objects or draw conclusions about objects</p> <p>compile data gathered through observations to record and present results using tally charts, tables, and graphs.</p> <p>demonstrate how to use tools such as magnifiers to gather data and extend the senses</p> <p>Demonstrate the use of various tools to extend the senses to gather data</p> <p>engage in group decision making activities.</p> <p>establish ongoing communication with students from communities or countries to share and compare data.</p> <p>explain that materials may be composed of parts that are too small to be seen without magnification</p> <p>Identify some jobs/careers that require knowledge and use of life science content and/or skills</p> <p>keep a journal to record observations, recognizing patterns, summarizing findings, and reflecting on the observations.</p> <p>organize observations and data into tables, charts, and graphs.</p> <p>plan and conduct a scientific investigation in group settings.</p> <p>recognize that substances can be classified by observable properties</p>
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	<p>develop questions based upon their observations about the natural world and design a simple investigation draw a conclusion to answer an initial question based on the evidence collected</p> <p>explain that scientific investigations may take many different forms</p> <p>follow a set of procedures</p> <p>give specific feedback about work of others identify and suggest possible explanantions for patterns identify and use appropriate tools Involvement in collaborative group settings know that seeing how a model works after changes are made to it may suggest how the real thing would work if the same changes were done to it know when comparisons might not be fair because some conditions might not be the same</p> <p>Make and record observations observations for a given purpose observe that some small changes can be detected by taking measurements Organize data in order to analyze and suggest possible explanations plan a step-by-step process to solve a practical problem or to carry out a "fair test" of a simple scientific question plan and test ideas through guided experiments</p> <p>provide examples illustrating that throughout history, people of all ages and from all walks of life have made significant contributions to the field of science and technology</p>	<p>role-play different points of view on an issue.</p> <p>understand that materials are used in certain products based on their properties such as strength and flexibility</p> <p>use a variety of equipment and software packages to enter, process, display, and/or communicate information in different forms using text, tables, pictures and sound.</p> <p>Use a variety of tools and formats to summarize and communicate the results of observations use appropriate tools to measure and graph data use evidence to construct explanations.</p>
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	<p>provide examples that demonstrate that something may not work as well (or at all) if a part of it is missing, broken, worn out, mismatched, or misconnected</p> <p>realize that results of similar scientific investigations seldom turn out exactly the same but if the differences are large it's important to figure out why</p> <p>realize that scientists' explanations about what happens in the world come partly from what they observe, and partly from what they think</p> <p>recognize that most everything has limits on how big or small it can be</p> <p>recognize that sometimes scientists have different explanations for the same set of observations which usually lead them to make more observations to resolve the differences</p> <p>Scientific investigation</p> <p>select an activity and justify it as an effective means of collecting appropriate data</p> <p>select an appropriate format to represent data or observations</p> <p>use evidence or data to support conclusions</p> <p>standard units of measurement</p> <p>use geometric figure, number sequences, graphs, diagrams, and picture as scientific models</p> <p>understand that some changes are so slow or so fast that they are hard to see</p> <p>use observations and inferences</p> <p>use questions to investigate and practical problem-solve</p> <p>use reliable information to answer questions</p> <p>Use simple tools</p> <p>Use standard forms of measurement</p>	
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Environment		
Proficiencies	Content	Skills
What is an ecosystem?	Use simple tools	Recognize and identify various ways living things are grouped
How does the climate effect the habitat/plants/animals?	Critical thinking skills: observation, recording data, inference, classify, question, and investigate.	Sort and classify living things based on evidence
What adaptations allow a plant to survive in a particular environment?	Use standard forms of measurement	Recognize functions of certain structures and systems of living organisms
How do animal adaptations help animals survive?	Design scientific investigations	Identify and explain how physical structures of organisms impact survival
What are behavioral adaptations animals have to meet their needs?	Design and execute a scientific investigation in order to collect data Follow precedures	Identify the basic needs of plants and animals in order to stay alive Distinguish between inherited characteristics and those affected by the environment on plants and animals
	Organize data in order to analyze and suggest possible explanations	Recognize life cycles of different organisms
	Cite evidence to support conclusions or pose another question	Describe the reproductive processes of different plants
	Different forms of scientific investigation to focus on physical, biological, and social questions	Predict, sequence, or compare the life stages of organisms
	Influence of environmental factors on eachother	Describe how the nature of an organism's environment (living organisms with non-living parts) affect patterns of behavior
	Patters of change in environments	Recognize the flow of energy through food webs and its impact on survival
	Involvement in collaborative group settings	Identify interaction of plants and animals, including seed dispersal, pollination, shelter, and nesting.
	Classification of all organisms	Provide examples of different effects from environmental changes on organisms
	Specific functions of structures and systems of living organisms related to survival, growth, and reproduction	Provide examples of adaptation over time in response to environmental changes
	Basic needs of plants and animals for survival	Using information, explain how environmental changes cause organisms to respond
	Difference between inherited characteristics and environmental influences on plants and animals	Identify similarities and differences when comparing fossils with living organisms and other fossils

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	<p>Life cycles vary for different organisms</p> <p>Life stages for different plants and animals</p> <p>Environmental influences, including non-living factors, on patterns of behavior for different organisms</p> <p>Energy is transferred through food webs in an ecosystem</p> <p>Sources of energy in a food web</p> <p>Interaction of plants and animals for survival in an ecosystem</p> <p>Impact of environmental changes over time on groups of different organisms</p> <p>Responses of organisms to environmental changes</p> <p>Relationship of fossils to living organisms</p> <p>Advantage of individual characteristics within the same species on survival</p> <p>Use of internal and external cues to influence behavior of organisms</p> <p>Function of physical structures of humans and animals</p> <p>Inherited and learned characteristics of humans</p> <p>Knowledge and use of life science content and/or skills in various jobs/careers</p> <p>Examples of materials that can be recycled/reused and those that cannot</p> <p>Examples of technology that have changed the environment and the positive or negative impact</p> <p>Disposal of waste and its impact on the environment</p>	<p>Recognize differences in characteristics within the same species and advantages in survival and reproduction</p> <p>Recognize impact of internal and external cues on behavior of living things (plants, animals, and humans)</p> <p>Identify and compare the physical structures of humans and animals</p> <p>Distinguish between inherited and learned characteristics in humans</p> <p>Recognize various mechanical devices to record and describe living organisms</p> <p>Demonstrate the use of various tools to extend the senses to gather data</p> <p>Identify some jobs/careers that require knowledge and use of life science content and/or skills</p> <p>Distinguish between materials between recycled/reused materials and those that cannot</p> <p>Provide examples of technology that have changed the environment and its impact on the the environment</p> <p>Explain how to dispose of waste so it does not harm the environment</p>
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