Grade 4	Unit 1: Sound		Suggested Length: 3 weeks
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
1. What is sound? 2. Why do sounds differ? 3. How do sound waves travel?	**Program of Studies** ❑ *PS5 Students will understand that sounds are caused by vibrating objects.* ❑ *PSI1 Students will ask simple scientific questions that can be answered through observations.* ❑ *PSI2 Students will use simple equipment (e.g., aquarium), tools (e.g., magnifiers, spoons), skills (e.g., observing, pouring), technology (e.g., video discs), and mathematics in scientific investigations.* ❑ *PSI3 Students will use evidence (e.g., observations) from simple scientific investigations and scientific knowledge to develop reasonable explanations.* ❑ *SI4 Design and conduct different kinds of simple scientific investigations.* ❑ *SI5 Communicate (e.g., graph, write) designs, procedures, and results of scientific investigations.* ❑ *AC1 Students will use science to design simple technological solutions (e.g., paper clips, stapler) to problems.* ❑ *AC2 Students will describe the role of science and technology in dealing with local issues (e.g., landfill location).* ❑ *AC3 Students will examine the role science plays in everyday life.* **Core Content** ❑ **SC-04-1.2.3 Students will:** ❑ **explain that sound is a result of vibrations, a type of motion;** ❑ **describe pitch (high, low) as a difference in sounds that are produced and relate that to the rate of vibration.**	❑ Sound ❑ Sound wave ❑ Amplitude ❑ Wave length ❑ Loudness ❑ Pitch	❑ Compare how a tuning fork vibrates when struck against different objects. Create a graphic organizer that compares how different materials vibrate when struck with a tuning fork. DOK 3 ❑ Create a cup phone to demonstrate the way sound is conducted through solids and travels from place to place. DOK 2

Grade 4	Unit 1: Sound		Suggested Length: 3 weeks
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
	Vibration is a type of motion that can be observed, described, measured and compared. Sound is produced by vibrating objects. The pitch of the sound can be varied by changing the rate of vibration. The relationship between rates of vibration and produced sounds can be described and graphed. DOK 3 ❑ Ask simple scientific questions that can be investigated through observations combined with scientific information. ❑ Use simple equipment in scientific investigations: magnifiers, magnets, use simple tools in scientific investigations, metric rulers, thermometers, skills in scientific investigations (e.g., classifying, predicting), technology (e.g., electronic media, calculators, www Web). ❑ Use evidence (e.g., observations, data) from simple scientific investigations and scientific knowledge to develop reasonable explanations ❑ Design and conduct different kinds of simple scientific investigations. ❑ Communicate (e.g. draw, graph, or write), findings of procedures, observations, and scientific investigations. ❑ Distinguish between natural objects and objects made by humans and examine the interaction between science and technology. ❑ Technology (e.g. thermometer, hand lens) is used to study science, while science provides theories for technology. ❑ Science is used to design simple technological solutions to problems (e.g. use understanding of heat transfer in designing an insulated container for ice cubes).		❑ Collect and analyze data about how sounds are made by using a ruler to produces sound when ruler is struck. Observe how sounds differ. DOK 1 ❑ Investigate sounds caused by vibrating objects. Design comparative studies to gather information on sound produced by vibrating (e.g. plucked) rubber bands. Identify variables (e.g. thickness, tension, length). Investigate to determine how variables influence sound produced when a rubber band is plucked. DOK 3 ❑ Arrange glass bottles in order of water levels, strike the bottles, and construct a graph that displays the pitch of the bottles. (Musical Bottles Activity) DOK 3 ❑ Literature/Media Links: Magic School Bus "Inside the Haunted House", Sound Laser Disc-schedule time in library, Let's Form a Band, All About Sound, *All About Sound*, and *Making Sounds*. ❑ Recognize that sound energy can be carried from one place to another by waves. ❑ Observe how sounds differ. ❑ Compare and contrast loudness and pitch. ❑ Recognize that sound travels through different media. ❑ **CATS-like unit test (multiple choice and Open Response on vibration (cup phone)** DOK 3

Grade 4	Unit 2: Light		Suggested Length: 3 weeks
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
1. How does light travel? 2. How can light be reflected? 3. How can light be refracted? 4. How can an object absorb light?	**Program of Studies** ❑ *PS9 Students will understand that light travels in a straight line until it strikes an object. Light can be reflected, refracted, or absorbed by objects.* ❑ *PSI1 Students will ask simple scientific questions that can be answered through observations.* ❑ *PSI2 Students will use simple equipment (e.g., aquarium), tools (e.g., magnifiers, spoons), skills (e.g., observing, pouring), technology (e.g., video discs), and mathematics in scientific* investigations. ❑ *PSI3 Students will use evidence (e.g., observations) from simple scientific investigations and scientific knowledge to develop reasonable explanations.* ❑ *SI4 Design and conduct different kinds of simple scientific investigations.* ❑ *SI5 Communicate (e.g., graph, write) designs, procedures, and results of scientific investigations.* ❑ *AC1 Students will use science to design simple technological solutions (e.g., paper clips, stapler) to problems.* ❑ *AC2 Students will describe the role of science and technology in dealing with local issues (e.g., landfill location).* ❑ *AC3 Students will examine the role science plays in everyday life.* **Core Content** ❑ **SC-04-4.6.4 Students will:** ❑ **analyze models/representations of light in order to generalize about the**	❑ Reflection ❑ Refraction ❑ Absorption	❑ Demonstrate that holding a mirror near a sunlit window or flashlight can reflect light, and reflect the light onto a nearby wall. DOK 1

Grade 4	Unit 2: Light		Suggested Length: 3 weeks
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
	behavior of light. ❑ **represent the path of light as it interacts with a variety of surfaces (reflecting, refracting, absorbing). Light can be observed as traveling in a straight line until it strikes an object.** **Light can be reflected by a shiny object (e.g., mirror, spoon), refracted by a lens (e.g., magnifying glass, eyeglasses) or absorbed by an object (e.g., dark surface). DOK 3** ❑ Ask simple scientific questions that can be investigated through observations combined with scientific information. ❑ Use simple equipment in scientific investigations: magnifiers, magnets, use simple tools in scientific investigations, metric rulers, thermometers, skills in scientific investigations (e.g., classifying, predicting), technology (e.g., electronic media, calculators, www Web). ❑ Use evidence (e.g., observations, data) from simple scientific investigations and scientific knowledge to develop reasonable explanations ❑ Design and conduct different kinds of simple scientific investigations. ❑ Communicate (e.g. draw, graph, or write), findings of procedures, observations, and scientific investigations. ❑ Distinguish between natural objects and objects made by humans and examine the interaction between science and technology. ❑ Technology (e.g. thermometer, hand lens) is used to study science, while science provides theories for technology. ❑ Science is used to design simple technological	❑ Prism ❑ Technology	❑ Refract a beam of light from a flashlight by using a magnifying glass. DOK 1 ❑ Demonstrate how different colors absorb different amount of light by using a flashlight and different colors of construction paper. DOK 1 ❑ Recognize that light travels in straight line by using hole punched index cards and a light bulb. Students will arrange the cards around on a table until they can see the light through all three cards at once. DOK 1 ❑ (Science Book), Bill Nye – Light and Optics, The Magic School Bus- "Bright Idea". DOK 1 ❑ Explain how light travels and describe what happens when light hits an object. DOK 1 ❑ Explain how light and color is related. DOK 1 ❑ **CATS - like assessment and open response on how light reflects off of certain objects**. DOK 3

Grade 4	Unit 2: Light		Suggested Length: 3 weeks
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
	solutions to problems (e.g. use understanding of heat transfer in designing an insulated container for ice cubes). ❑ Examine how designing and conducting scientific investigations fosters an understanding of issues related to natural resources (e.g. scarcity), demonstrate how the study of science (e.g. aquariums, living systems) helps explain changes in environments, examine the role of science and technology in communities (e.g. location of landfills, new housing developments). ❑ Examine the role science plays in everyday life.		

Grade 4	Unit 3: Electricity and Magnetism		Suggested Length: 3 – 4 weeks
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
1. What is static electricity? 2. What is an electrical current? 3. What are the two types of electrical circuits and how do they differ? 4. What is an electromagnet?	**Program of Studies** ❑ *PS7 Students will understand that electrical currents move through electrical circuits. Electricity in circuits can produce light, heat, sound, and magnetic effects.* ❑ *PSI1 Students will ask simple scientific questions that can be answered through observations.* ❑ *PSI2 Students will use simple equipment (e.g., aquarium), tools (e.g., magnifiers, spoons), skills (e.g., observing, pouring), technology (e.g., video discs), and mathematics in scientific investigations.* ❑ *PSI3 Students will use evidence (e.g., observations) from simple scientific investigations and scientific knowledge to develop reasonable explanations.* ❑ *SI4 Design and conduct different kinds of simple scientific investigations.*		

Grade 4	Unit 3: Electricity and Magnetism		Suggested Length: 3 – 4 weeks
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and <u>Assessment</u> Student will:
	❑ *SI5 Communicate (e.g., graph, write) designs, procedures, and results of scientific investigations.* ❑ *AC1 Students will use science to design simple technological solutions (e.g., paper clips, stapler) to problems.* ❑ *AC2 Students will describe the role of science and technology in dealing with local issues (e.g., landfill location).* ❑ *AC3 Students will examine the role science plays in everyday life.* **<u>Core Content</u>** ❑ **SC-04-4.6.3 Students will evaluate a variety of models/representations of electrical circuits (open, closed, series and/or parallel) to:** ❑ **make predictions related to changes in the system;** ❑ **compare the properties of conducting and non-conducting materials.** **Electricity in circuits can produce light, heat and sound. Electrical circuits require a complete conducting path through which an electrical current can pass. Analysis of a variety of circuit models creates an opportunity to make predictions about circuits, as well as to demonstrate an understanding of the concepts of open and closed circuits and basic conducting and non-conducting materials. DOK 3** ❑ Ask simple scientific questions that can be investigated through observations combined with scientific information. ❑ Use simple equipment in scientific investigations: magnifiers, magnets, use	❑ Charge ❑ Static electricity ❑ Electric field ❑ Electric current ❑ Circuit ❑ Electric cell ❑ Conductor ❑ Insulator ❑ Resistor ❑ Series circuit ❑ Parallel circuit ❑ Magnet ❑ Magnetic pole ❑ Magnetic field ❑ Electromagnet ❑ Conducting path ❑ Magnetism ❑ Repel	❑ Define static electricity and recognize that electrically charged objects attract or repel each other. DOK 1 ❑ Recognize that electricity can be converted to other forms of energy such as heat, light and motion. DOK 1 ❑ Recognize that magnets have two poles, labeled north and south and that like pole repel each other while unlike poles attract using magnets. DOK 2 ❑ Classify objects that attract to magnets and explain the propertied and explain the properties they have in common. DOK 3 ❑ Create static electricity using various objects. DOK 1 ❑ Design and build a series circuit and a parallel circuit. DOK3 ❑ Design a complete circuit. DOK 3 ❑ Use a conductor tester to detect if material is a conductor or an insulator. DOK 2 ❑ Construct a simple electromagnet in order to show all electric currents produce magnetic effects. DOK 3 ❑ Bill Nye Electrical Current Magnetism, Static Electricity, All About Electricity, and All About Magnets. The Magic School Bus-“Getting Energized”, The Magic School Bus- “Gets Charged”. DOK 3 ❑ **<u>CATS - like assessment with an open response on</u>**

Grade 4	Unit 3: Electricity and Magnetism		Suggested Length: 3 – 4 weeks
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
	simple tools in scientific investigations, metric rulers, thermometers, skills in scientific investigations (e.g., classifying, predicting), technology (e.g., electronic media, calculators, www Web). ❑ Use evidence (e.g., observations, data) from simple scientific investigations and scientific knowledge to develop reasonable explanations ❑ Design and conduct different kinds of simple scientific investigations. ❑ Communicate (e.g. draw, graph, or write), findings of procedures, observations, and scientific investigations. ❑ Technology (e.g. thermometer, hand lens) is used to study science, while science provides theories for technology. ❑ Examine the role science plays in everyday life.		**closed circuit and magnets.**

Grade 4	Unit 4: Energy, Heat, and States of Matter		Suggested Length: 3 – 4 weeks
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
1. What are the 3 states of matter? 2. How can matter be measured and compared? 3. What are some useful properties of matter? 4. What are	**Program of Studies** ❑ *PSI2 Students will use simple equipment (e.g., aquarium), tools (e.g., magnifiers, spoons), skills (e.g., observing, pouring), technology (e.g., video discs), and mathematics in scientific investigations.* ❑ *PSI3 Students will use evidence (e.g., observations) from simple scientific investigations and scientific knowledge to develop reasonable explanations.* ❑ *SI4 Design and conduct different kinds of simple scientific investigations.* ❑ *SI5 Communicate (e.g., graph, write) designs,*		

Grade 4	Unit 4: Energy, Heat, and States of Matter		Suggested Length: 3 – 4 weeks
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and <u>Assessment</u> Student will:
chemical and physical changes? 5. How does heat affect matter? 6. How can thermal energy be transferred? 7. How is energy used?	*procedures, and results of scientific investigations.* ❑ *AC1 Students will use science to design simple technological solutions (e.g., paper clips, stapler) to problems.* ❑ *AC2 Students will describe the role of science and technology in dealing with local issues (e.g., landfill location).* ❑ *AC3 Students will examine the role science plays in everyday life.* **<u>Core Content</u>** ❑ **SC-04-1.1.1 Students will explain how matter, including water, can be changed from one state to another.** **Materials can exist in different states – solid, liquid and gas. Some common materials, such as water, can be changed from one state to another by heating or cooling. Resulting cause and effect relationships should be explored, described and predicted. DOK 3** ❑ **SC-04-4.6.5 Students will:** ❑ **identify ways that heat can be produced (e.g. burning, rubbing) and properties of materials that conduct heat better than others;** ❑ **describe the movement of heat between objects.** **Heat can be produced in many ways such as burning or rubbing. Heat moves from a warmer object to a cooler one by contact (conduction) or at a distance. Some materials absorb and conduct heat better than others. Simple investigations can**	❑ Matter ❑ Mass ❑ Solid ❑ Liquid ❑ Gas ❑ Volume ❑ Density ❑ Solution ❑ Dissolve ❑ Solubility ❑ Buoyancy ❑ Physical change ❑ Chemical change ❑ Chemical reaction ❑ Conduction ❑ Convection ❑ Radiation ❑ Cooling ❑ Heating ❑ Solar energy ❑ Fuel ❑ Temperature ❑ Heat ❑ Conservation	❑ Conclude that matter has 3 forms and recognize heat can cause changes in the states of matter and complete an experiment that concludes air takes up space. DOK 3 ❑ Measure the masses of various items and use numerical data to measure, describe and compare the physical properties of matter. DOK 2 ❑ Identify bouncy as a physical property of matter and observe what happens to two solid materials placed in water by making boats. DOK 2 ❑ Describe a physical and chemical change by observing what happens in a short time to a penny when it is placed in vinegar and compare it to a penny when it is held close to vinegar. DOK 2 ❑ Make predictions and conclude that vinegar causes corrosion. DOK 2 ❑ Compare the time it takes for a metal rod to transfer heat form one end to the other as compared to a wooden stick. DOK 3 ❑ Create a spiral out of construction paper and compare the behavior of the spiral over an active and non-active light bulb. DOK 3 ❑ Construct a solar cooker and use a thermometer to compare the thermal energy of the cooker in the shade and direct sunlight. After collecting the data, discuss how radiation affects the earth's atmosphere. DOK 2 ❑ Observe how conduction relates to cooking and explain the transfer of energy. DOK 1

Grade 4	Unit 4: Energy, Heat, and States of Matter		Suggested Length: 3 – 4 weeks
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
	illustrate that metal objects conduct heat better than wooden objects. DOK 2 ❑ Ask simple scientific questions that can be investigated through observations combined with scientific information. ❑ Use simple equipment in scientific investigations: magnifiers, magnets, use simple tools in scientific investigations, metric rulers, thermometers, skills in scientific investigations (e.g., classifying, predicting), technology (e.g., electronic media, calculators, www Web). ❑ Use evidence (e.g., observations, data) from simple scientific investigations and scientific knowledge to develop reasonable explanations ❑ Design and conduct different kinds of simple scientific investigations. ❑ Communicate (e.g. draw, graph, or write), findings of procedures, observations, and scientific investigations. ❑ Technology (e.g. thermometer, hand lens) is used to study science, while science provides theories for technology. ❑ Science is used to design simple technological solutions to problems (e.g. use understanding of heat transfer in designing an insulated container for ice cubes). ❑ Examine how designing and conducting scientific investigations fosters an understanding of issues related to natural resources (e.g. scarcity), demonstrate how the study of science (e.g. aquariums, living systems) helps explain changes in environments, examine the role of science and technology in communities (e.g. location of landfills, new housing developments). ❑ Examine the role science plays in everyday		❑ Explain how a convection box works using a simple diagram. DOK 2 ❑ Recognize that thermal energy is the motion of particles of matter by measuring changes in a balloon as it is heated and infer what causes the change. DOK 1 ❑ Explain that adding or removing heat from substance can change its state of matter and recognize that thermal energy can be transferred. DOK 2 ❑ Explain that energy can come from the sun and identify ways to produce and use thermal energy. DOK 2 ❑ **CATS - like unit test (multiple choice and open responses). DOK 3** ❑ **CATS - like assessment with an open response on the transfer of heat. DOK 3** ❑ **Open Response questions on matter and energy. DOK 3**

Grade 4	Unit 4: Energy, Heat, and States of Matter		Suggested Length: 3 – 4 weeks
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
	life.		

Grade 4	Unit 5: Weather		Suggested Length: 3 – 4 weeks
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
1. What makes up the Earth's atmosphere? 2. How do air masses affect weather? 3. How is weather predicted? 4. What instruments are used to predict weather?	**Program of Studies** ❑ *ESS7 Students will understand that weather changes from day to day and over the seasons. Weather can be described by observing and measuring temperature, wind direction and speed, and precipitation.* ❑ *PSI1 Students will ask simple scientific questions that can be answered through observations.* ❑ *PSI2 Students will use simple equipment (e.g., aquarium), tools (e.g., magnifiers, spoons), skills (e.g., observing, pouring), technology (e.g., video discs), and mathematics in scientific invention.* ❑ *PSI3 Students will use evidence (e.g., observations) from simple scientific investigations and scientific knowledge to develop reasonable explanations* ❑ *SI4 Design and conduct different kinds of simple scientific investigations.* ❑ *SI5 Communicate (e.g., graph, write) designs, procedures, and results of scientific investigations.* ❑ *AC1 Students will use science to design simple technological solutions (e.g., paper clips, stapler) to problems.* ❑ *AC2 Students will describe the role of science and technology in dealing with local issues (e.g., landfill location).* ❑ *AC3 Students will examine the role science plays in everyday life.*		

Grade 4	Unit 5: Weather		Suggested Length: 3 – 4 weeks
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
	Core Content ❑ **SC-04-1.1.1 Students will explain how matter, including water, can be changed from one state to another.** **Materials can exist in different states – solid, liquid and gas. Some common materials, such as water, can be changed from one state to another by heating or cooling. Resulting cause and effect relationships should be explored, described and predicted. DOK 3** ❑ **SC-04-2.3.3 Students will make generalizations and/or predictions about weather changes from day to day and over seasons based on weather data.** **Weather changes from day to day and over seasons. Weather can be described by observations and measurable quantities such as temperature, wind direction, wind speed and precipitation. Data can be displayed and used to make predictions. DOK 3** ❑ Ask simple scientific questions that can be investigated through observations combined with scientific information. ❑ Use simple equipment in scientific investigations: magnifiers, magnets, use simple tools in scientific investigations, metric rulers, thermometers, skills in scientific investigations (e.g., classifying, predicting), technology (e.g., electronic media, calculators, www Web). ❑ Use evidence (e.g., observations, data) from	❑ Water cycle ❑ Cycle ❑ States of matter ❑ Solid ❑ Liquid ❑ Gas ❑ Precipitation ❑ Evaporation ❑ Condensation ❑ Atmosphere ❑ Technology ❑ Wind direction ❑ Speed direction ❑ Data ❑ Front ❑ Anemometer ❑ Air pressure ❑ Greenhouse effect ❑ Barometer ❑ Troposphere ❑ Air mass ❑ Humidity ❑ Hygrometer	❑ Explain how the water cycle can happen in a closed living system and in a bottle. (Open response) DOK 2 ❑ Describe the composition of Earth's atmosphere. DOK1 ❑ Compare and contrast the layers of the atmosphere. Design an illustration, which identifies and explains the layers of the atmosphere. DOK 2 ❑ Observe and infer how air takes up space by placing a cup with a paper towel stuffed inside it and place it in a bowl full of water and observe what happens. DOK 1 ❑ Read a barometer and thermometer. DOK 1 ❑ Observe a ruler move when a balloon suspended from it is popped, and infer from this that even though air can't be seen, it has mass. DOK 1 ❑ Create a hypothesis about how fast the wind is blowing using observations and the chart on D-11of your Science book. Construct a windsock, using construction and tissue paper, to test your hypothesis and the speed of wind. DOK 2 ❑ Construct barometers to measure changes in air pressure using glass bottle balloon, bowls, and water. Through observation, students will gain an understanding of air masses and convection. DOK 2 ❑ Web quest http://www.mrspeimann.homestead.com ❑ **CATS -like Test Weather Open Response Weather Map**

Grade 4	Unit 5: Weather		Suggested Length: 3 – 4 weeks
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
	simple scientific investigations and scientific knowledge to develop reasonable explanations ❑ Design and conduct different kinds of simple scientific investigations. ❑ Communicate (e.g. draw, graph, or write), findings of procedures, observations, and scientific investigations. ❑ Distinguish between natural objects and objects made by humans and examine the interaction between science and technology. ❑ Technology (e.g. thermometer, hand lens) is used to study science, while science provides theories for technology. ❑ Science is used to design simple technological solutions to problems (e.g. use understanding of heat transfer in designing an insulated container for ice cubes). ❑ Examine how designing and conducting scientific investigations fosters an understanding of issues related to natural resources (e.g. scarcity), demonstrate how the study of science (e.g. aquariums, living systems) helps explain changes in environments, examine the role of science and technology in communities (e.g. location of landfills, new housing developments). ❑ Examine the role science plays in everyday life.		

Grade 4	Unit 6: Motion & Simple Machines		Suggested Length: 6 weeks
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
1. What is motion?	**Program of Studies** ❑ *PSI2 Students will use simple equipment (e.g., aquarium), tools (e.g., magnifiers, spoons),*		

Grade 4	Unit 6: Motion & Simple Machines		Suggested Length: 6 weeks
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
2. What effects do forces have on objects? 3. What are forces in nature? 4. How do simple machines help us do work?	*skills (e.g., observing, pouring), technology (e.g., video discs), and mathematics in scientific investigations.* ❑ *PSI3 Students will use evidence (e.g., observations) from simple scientific investigations and scientific knowledge to develop reasonable explanations.* ❑ *SI4 Design and conduct different kinds of simple scientific investigations.* ❑ *SI5 Communicate (e.g., graph, write) designs, procedures, and results of scientific investigations.* ❑ *AC1 Students will use science to design simple technological solutions (e.g., paper clips, stapler) to problems.* ❑ *AC2 Students will describe the role of science and technology in dealing with local issues (e.g., landfill location).* ❑ *AC3 Students will examine the role science plays in everyday life.* **Core Content** ❑ **SC-04-1.2.1 Students will interpret or represent data related to an object's straight-line motion in order to make inferences and predictions of changes in position and/or time.** **An object's motion can be described by measuring its change in position over time such as rolling different objects (e.g., spheres, toy cars) down a ramp. Collecting and representing data related to an object's motion provides the opportunity to make comparisons and draw conclusions. DOK 3** ❑ **SC-04-1.2.2 Students will infer causes and effects of pushes and pulls (forces) on**	❑ Position ❑ Frame of reference ❑ Relative motion ❑ Speed ❑ Gravity ❑ Weight ❑ Friction ❑ Acceleration ❑ Motion ❑ Push ❑ Pull ❑ Newton's Law ❑ Force ❑ Pressure ❑ Momentum ❑ Work ❑ Movement	❑ Identify ways to describe motion and define frame of reference by writing directions to get from a place you have chosen in your school. DOK 3 ❑ Define force, demonstrate how forces are added and subtracted, and measure forces using a spring scales. DOK 2 ❑ Recognize the relationships between gravity and weights by using different amounts of force to move the same object over different surfaces. DOK 3 ❑ Identify and describe parts of a lever and observe and measure what happens using a lever. DOK 2 ❑ Identify and describe the parts of a wheel and axle. DOK 2 ❑ Identify and describe the parts of the pulley and the different types of pulleys by investigating how pulleys can move objects. DOK 2 ❑ Describe how an inclined plan makes work easier and

Grade 4	Unit 6: Motion & Simple Machines		Suggested Length: 6 weeks
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
	objects based on representations or interpretations of straight-line movement/motion in charts, graphs, and qualitative comparisons. **The position and motion of objects can be changed by pushing or pulling. The amount of change is related to the force (defined as the strength of the push or pull) and the mass of the object(s) used. The force with which a ball is hit illustrates this principle. Cause and effect relationships, along with predicted consequences related to the strength of pushes and pulls (force) on an object's position and motion should be explored and qualitatively compared. DOK 3**	❑ Mass ❑ Cause ❑ Effect ❑ Simple machines ❑ Lever ❑ Pulley ❑ Ramp ❑ Inclined plane ❑ Wheel ❑ Axle ❑ Fulcrum ❑ Resistance ❑ Effort ❑ Screw ❑ Wedge	identify the relationship between screws, wedges, and inclined planes. DOK 3 ❑ Explain how simple machines help us do work. DOK 2 ❑ **CATS like assessment with an open response on motion**.

Grade 4	Unit 7: Earth Science & Space Science		Suggested Length: 6 weeks
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
1. How can rocks be classified? 2. What is the rock cycle? 3. What are the layers of the earth? 4. What causes volcanoes and Earthquakes?	**Program of Studies** ❑ *PSI2 Students will use simple equipment (e.g., aquarium), tools (e.g., magnifiers, spoons), skills (e.g., observing, pouring), technology (e.g., video discs), and mathematics in scientific investigations.* ❑ *PSI3 Students will use evidence (e.g., observations) from simple scientific investigations and scientific knowledge to develop reasonable explanations.* ❑ *SI4 Design and conduct different kinds of simple scientific investigations.* ❑ *SI5 Communicate (e.g., graph, write) designs, procedures, and results of scientific investigations*.		

Grade 4	Unit 7: Earth Science & Space Science		Suggested Length: 6 weeks
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
5. What can we learn from fossils? 6. How do fossils and fossil fuels form? 1. How does Earth and its moon move? 2. How do objects move in the solar system? 3. What are the planets like? 4. How do people study the solar system?	❑ *AC1 Students will use science to design simple technological solutions (e.g., paper clips, stapler) to problems.* ❑ *AC2 Students will describe the role of science and technology in dealing with local issues (e.g., landfill location).* ❑ *AC3 Students will examine the role science plays in everyday life.* **Core Content** ❑ **SC-04-2.3.1 Students will** ❑ **classify earth materials by the ways that they are used;** ❑ **explain how their properties make them useful for different purposes.** **Earth materials provide many of the resources humans use. The varied materials have different physical properties that can be used to describe, separate, sort and classify them. Inferences about the unique properties of the earth materials yield ideas about their usefulness. For example, some are useful as building materials (e.g., stone, clay, marble), some as sources of fuel (e.g., petroleum, natural gas), or some for growing the plants we use as food. DOK 2** ❑ **SC-04-3.5.1 Students will use representations of fossils to:** ❑ **draw conclusions about the nature of the organisms and the basic environments that existed at the time;** ❑ **make inferences about the relationships to organisms that are alive today.**	❑ Metamorphic ❑ Igneous ❑ Sedimentary ❑ Mahl's scale ❑ Core ❑ Mantle ❑ Crust ❑ Minerals ❑ Natural resources ❑ Fossil fuels ❑ Fossils ❑ Luster ❑ Cleavage ❑ Shine ❑ Color	❑ Recognize and describe the layers of the earth by measuring how thick the layers of an apple are and comparing them. DOK 2 ❑ Draw, label and explain the layers of the earth. DOK 2 ❑ Identify rocks and minerals by their characteristics. DOK 3 ❑ Explain what causes an earthquake and describe where earthquakes occur by making a model with post it notes. DOK 2 ❑ Identify, describe the 3 types of volcanoes and how they form and discuss the positive and negative affects on the land. DOK 3 ❑ Compare the three of fossil fuels. DOK 2 ❑ Describe the formation of coal. DOK 2 ❑ Explain where petroleum and natural gas are found. DOK 2 ❑ Connect chapter concepts with the history of science. DOK 2 ❑ Describe the motions of the Earth and the moon and explain how these motions cause moon phases. DOK 1 ❑ Relate a day and year to the motions of the Earth? DOK 3 ❑ Describe what causes seasons. DOK 3 ❑ Create a model that shows how the planet in the solar system moves. DOK 1 ❑ Demonstrate the two motions of planets – revolution and rotation. DOK 1 ❑ Describe characteristics of the solar system and

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	Fossils found in Earth materials provide evidence about organisms that lived long ago and the nature of the environment at that time. Representations of fossils provide the basis for describing and drawing conclusions about the organisms and basic environments represented by them. DOK 3		distinguish between planets, asteroids and comets. DOK 2 ❑ Construct scale models of the solar system and explain how the planets are divided. DOK 2 ❑ Construct and use a simple telescope and compare and contrast radio and optical telescopes. DOK 2 ❑ Describe the difference between crewed missions and space probes. DOK 1
	❑ **SC-04-2.3.2 Students will describe and explain consequences of changes to the surface of the Earth, including some common fast changes (e.g., landslides, volcanic eruptions, earthquakes), and some common slow changes (e.g., erosion, weathering).** **The surface of the Earth changes. Some changes are due to slow processes such as erosion or weathering. Some changes are due to rapid processes such as landslides, volcanic eruptions and earthquakes. Analyzing the changes to identify cause and effect relationships helps to define and understand the consequences. DOK 3**	❑ Magma ❑ Lava ❑ Plates ❑ Weathering ❑ Erosion	❑ **CATS like unit test (multiple choice and open response).**
	❑ **SC-04-2.3.4 Students will identify patterns, recognize relationships and draw conclusions about the Earth-Sun system by interpreting a variety of representations/ models (e.g., diagrams, sundials, distance of sun above horizon) of the sun's apparent movement in the sky.** **Changes in movement of objects in the sky have patterns that can be observed, described and modeled. The Sun appears to move across the sky in the same way every day, but the Sun's apparent path changes slowly over seasons. Data collected can be**	❑ Seasons ❑ Moon phases ❑ Day ❑ Night ❑ Inner planets ❑ Outer planets ❑ Gas giants ❑ Orbit ❑ Revolution ❑ Rotation ❑ Axis ❑ Solar system ❑ Star ❑ Planet	

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	used to identify patterns, recognize relationships and draw conclusions about the Earth and Sun system. DOK 3 ❑ *SC-04-2.3.5 Students will understand that the moon moves across the sky on a daily basis much like the Sun. The observable shape of the moon can be described as it changes from day to day in a cycle that lasts about a month.* ❑ **SC-04-4.6.2 Students will:** ❑ **analyze data/evidence of the Sun providing light and heat to earth;** ❑ **use data/evidence to substantiate the conclusion that the Sun's light and heat are necessary to sustaining life on Earth.** **Simple observations, experiments and data collection begin to reveal that the Sun provides the light and heat necessary to maintain the temperature of Earth. Evidence collected and analyzed should be used to substantiate the conclusion that the sun's light and heat are necessary to sustain life on Earth. DOK 3**	❑ Asteroid ❑ Comet	

Grade 4	Unit 8: Life Science		Suggested Length: 6 weeks
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
1. What are animals? 2. What are plants with seeds?	**Program of Studies** ❑ *PSI2 Students will use simple equipment (e.g., aquarium), tools (e.g., magnifiers, spoons), skills (e.g., observing, pouring), technology (e.g., video discs), and mathematics in scientific investigations.* ❑ *PSI3 Students will use evidence (e.g.,*		

Grade 4	Unit 8: Life Science		Suggested Length: 6 weeks
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and <u>Assessment</u> Student will:
3. What are the basic needs of animals? 4. How do animals' body parts help them meet their needs? 5. How do animals' behaviors help them meet their needs? 6. What do plants need to live? 7. How do leaves, stems, and roots help plants live? 8. How do plants reproduce? 9. What are systems? 10. What makes up an ecosystem? 11. What are habitats and niches? 12. What are tropical rainforests and	*observations) from simple scientific investigations and scientific knowledge to develop reasonable explanations.* ❑ *SI4 Design and conduct different kinds of simple scientific investigations.* ❑ *SI5 Communicate (e.g., graph, write) designs, procedures, and results of scientific investigations.* ❑ *AC1 Students will use science to design simple technological solutions (e.g., paper clips, stapler) to problems.* ❑ *AC2 Students will describe the role of science and technology in dealing with local issues (e.g., landfill location).* ❑ *AC3 Students will examine the role science plays in everyday life.* **<u>Core Content</u>** ❑ **SC-04-3.4.1 Students will:** ❑ **compare the different structures and functions of plants and animals that contribute to the growth, survival and reproduction of the organisms;** ❑ **make inferences about the relationship between structure and function in organisms.** **Each plant or animal has structures that serve different functions in growth, survival and reproduction. For example, humans have distinct body structures for walking, holding, seeing and talking. Evidence about the relationship between structure and function should be used to make inferences and draw conclusions. DOK 3**	❑ Arthropod ❑ Invertebrates ❑ Vertebrates ❑ Organisms ❑ Adaptations ❑ Camouflage ❑ Mimicry ❑ Protective coloring ❑ Hibernation ❑ Migration ❑ Appendages ❑ Behavioral adaptation ❑ Structural adaptation ❑ Roots ❑ Stem ❑ Leaves ❑ Reproduction ❑ Germination ❑ Pollination ❑ Seeds	❑ Identify features of animals by comparing vertebrates and invertebrates and giving examples. DOK 2 ❑ Identify seeds as reproductive parts of cells by comparing pine seeds with tomato seeds through a drawing. DOK 2 ❑ Recognize that all animals have five basic needs (food, water, shelter, oxygen, climate) by using mealworms in an investigation – display mealworms in habitat. DOK 2 ❑ Investigate and identify how bird beaks (adaptations) help birds meet their needs by using various tools. DOK 3 ❑ Describe and shows animals body parts, adaptations, coloring meets their needs. DOK 3 ❑ Identify how animal behavior's helps meet their needs. DOK 2 ❑ Distinguish between instinctual behavior and learned behavior. DOK 2 ❑ Discuss how adaptations affect how animals interact with the environment. DOK 2 ❑ Create a wheel, which shows the life cycle of a frog

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Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
coral reefs? 13. What kinds of changes occur in ecosystems? 14. How do people change the ecosystem? 15. What are some ways people can help the environment?	❑ *SC-04-3.4.2 Students will understand that things in the environment are classified as living, nonliving and once living. Living things differ from nonliving things. Organisms are classified into groups by using various characteristics (e.g., body coverings, body structures).* ❑ **SC-04-3.4.3 Students will compare a variety of life cycles of plants and animals in order to classify and make inferences about an organism.** **Plants and animals have life cycles that include the beginning of life, growth and development, reproduction and death. The details of a life cycle are different for different organisms. Models of organisms' life cycles should be used to classify and make inferences about an organism. DOK 3** ❑ **SC-04-3.4.4 Students will identify some characteristics of organisms that are inherited from the parents and others that are learned from interactions with the environment.** **Observations of plants and animals yield the conclusion that organisms closely resemble their parents at some time in their life cycle. Some characteristics (e.g., the color of flowers, the number of appendages) are passed to offspring. Other characteristics are learned from interactions with the environment, such as the ability to ride a bicycle, and these cannot be passed on to the next generation. Data related to inherited versus learned characteristics can be used to draw	❑ Seedling ❑ Photosynthesis ❑ Chlorophyll ❑ Oxygen ❑ Carbon dioxide ❑ Life cycle ❑ Environment ❑ Biome ❑ Shelter ❑ Climate ❑ Instinct ❑ Metamorphosis ❑ Fish ❑ Reptiles ❑ Amphibians ❑ Mammals ❑ Insects ❑ Birds ❑ Prey ❑ Predator ❑ Scavenger ❑ Decomposers ❑ Herbivore ❑ Omnivore ❑ Carnivore ❑ Food chain ❑ Energy pyramid ❑ Closed living system ❑ Nocturnal ❑ Systems ❑ Reduce ❑ Recycle ❑ Redesign ❑ Reuse ❑ Conservation ❑ Preservation	(Life Cycle of a Wood Frog). DOK 1 ❑ Organize a booklet, which shows the life cycle of a bean plant (germination book). DOK 1 ❑ Identify ways animals behave to enable them to meet their needs. DOK 2 ❑ Distinguish between instructional behavior and learned behavior. DOK 1 ❑ Conclude that monarch butterflies travel certain routes to meet their needs in different seasons by using a map and colored pencils. DOK 2 ❑ Observe how seeds germinate by conducting an investigation, which involves growing and measuring alfalfa and bean seed in a plastic cup. DOK 3 ❑ Identify the four basic needs of plants and photosynthesis. DOK 3 ❑ Give examples of plant adaptations and explain how the plant adaptations enable plants to survive in different environments. DOK 3 ❑ Identify the roles of leaves, stems and roots and how they help plants live. DOK 2 ❑ Describe the ways plants reproduce and give examples of how seeds are spread. DOK 2 ❑ Describe what makes up an ecosystem and the basic parts of an ecosystem. DOK 1 ❑ Explain how living things in ecosystems or organized by observing and ecosystem outside of the school where students can conclude that in any given area organisms are interacting. DOK 1 ❑ Explain how plants and animals interact and change their environment and give examples of habitats, niches and biomes. DOK 3 ❑ Create a memory game, which identify animals and their roles using index cards, animal books and crayons. DOK 2 ❑ Identify animals' roles in the food chain, energy pyramid and food web and create a food chain that clearly shows the roles. DOK 3 ❑ Explain how tropical rain forest and coral reefs are alike and describe the resources of rain forests and coral reefs

Grade 4	Unit 8: Life Science		Suggested Length: 6 weeks
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
	conclusions about various groups of organisms. DOK 2 ❑ **SC-04-4.6.1 Students will analyze patterns and make generalizations about the basic relationships of plants and animals in an ecosystem (food chain).** **Plants make their own food. All animals depend on plants. Some animals eat plants for food. Other animals eat animals that eat the plants. Basic relationships and connections between organisms in food chains, including the flow of energy, can be used to discover patterns within ecosystems. DOK 2** ❑ **SC-04-4.7.1 Students will make predictions and/or inferences based on patterns of evidence related to the survival and reproductive success of organisms in particular environments.** **The world has many different environments. Distinct environments support the lives of different types of organisms. When the environment changes some plants and animals survive and reproduce and others die or move to new locations. Examples of environmental changes resulting in either increase or decrease in numbers of a particular organism should be explored in order to discover patterns and resulting cause and effect relationships between organisms and their environments (e.g., structures and behaviors that make an organism suited to a particular environment). Connections and conclusions should be made based on**		and tell why they are important. DOK 2 ❑ Create a biome box (diorama), which shows organisms in a biome in their roles. (producers, consumers, herbivores, carnivores, omnivores). DOK 2 ❑ Identify three examples of a salt-water community and conclude that living things in salt-water communities meet their need in different ways. DOK 3 ❑ Observe what happens when fresh water and saltwater meets using blue dye and float an egg on salt water. DOK 2 ❑ Describe how people affect ecosystems and give examples of changes people cause. DOK 2 ❑ Identify natural resources and describe ways peoples can conserve natural resources and create posters about protecting resources. (Conservation poster). DOK 3 ❑ **CATS like unit test (multiple choice and open responses).** ❑ **Life Science open responses.**

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Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
	the data. DOK 3 ❑ **SC-04-4.7.2 Students will:** ❑ **describe human interactions in the environment where they live;** ❑ **classify the interactions as beneficial or harmful to the environment using data/evidence to support conclusions.** **All organisms, including humans, cause changes in the environment where they live. Some of these changes are detrimental to the organism or to other organisms; other changes are beneficial (e.g., dams benefit some aquatic organisms but are detrimental to others). By evaluating the consequences of change using cause and effect relationships, solutions to real life situations/dilemmas can be proposed. DOK 3**		