

**Southington Public Schools  
Curriculum Map**

**Subject:** Science

**Grade:** 5

UNIT TITLE	#1 Sound Energy	#2 Light Energy	#3 Technology & Vision	#4 Senses & Signals	#5 Earth/Moon/Sun	#6 Variables
<b>CONTENT</b>	<b>Sound Energy:</b> <ul style="list-style-type: none"> <li>• Production</li> <li>• Transmission               <ul style="list-style-type: none"> <li>• Change Pitch &amp; Volume</li> </ul> </li> </ul>	<b>Light Energy:</b> <ul style="list-style-type: none"> <li>• Transmission</li> <li>• Reflected, Refracted, Absorbed</li> <li>• How we see objects/ colors</li> </ul>	<ul style="list-style-type: none"> <li>• Compare/Contrast</li> <li>• Eye and Camera</li> <li>• Uses/Design of technology tools to enhance vision</li> </ul>	<ul style="list-style-type: none"> <li>• Human Senses:</li> <li>• Structure &amp; Functions</li> <li>• Signals/Stimuli</li> <li>• Nervous System</li> </ul>	<ul style="list-style-type: none"> <li>• Earth Revolution/Rotation</li> <li>• Cycles of Day/Night</li> <li>• Moon Phases</li> </ul>	<b>Controlled Experimentation:</b> <ul style="list-style-type: none"> <li>• Scientific Inquiry</li> <li>• Variables</li> <li>• Design/Conduct Experiments</li> </ul>
<b>STATE STANDARDS</b>	5.1 Sound and light are forms of energy. <ul style="list-style-type: none"> <li>• Sound is a form of energy that is produced by the vibration of objects and is transmitted by the vibration of air and objects.</li> </ul> 5a. Explore how sound is produced and transmitted. 5b. Explore and explain how pitch and volume can be changed. B INQ.1 Make observations and ask questions about objects. B INQ.2 Seek relevant information in books, magazines and electronic media.	5.1 Sound and light are forms of energy. <ul style="list-style-type: none"> <li>• Light is a form of energy that travels in a straight line and can be reflected by a mirror, refracted by a lens, or absorbed by objects.</li> </ul> B19. Describe how light is absorbed and/or reflected by different surfaces. B20. Describe how light absorption and reflection allow one to see shapes and colors of objects. B INQ.1 Make observations and ask questions about objects.	5.4 Humans have the capacity to build and use tools to advance the quality of their lives <ul style="list-style-type: none"> <li>• Advances in technology allow us to acquire new information about our world.</li> </ul> B24 – Compare and contrast the structures of the human eye with those of the camera. B25 – Describe the uses of different instruments, such as eye glasses, magnifiers, periscopes and telescopes, to enhance our vision.	5.2 Perceiving and responding to information about the environment is critical to the survival of organisms. <ul style="list-style-type: none"> <li>• The sense organs perceive stimuli from the environment and send signals to the brain through the nervous system.</li> </ul> B21 – Describe the structure and function of the human senses and the signals they perceive. B INQ.1 Make observations and ask questions about objects. B INQ.2 Seek relevant information in books, magazines and electronic media.	5.3 Most objects in the solar system are in a regular and predictable motion. <ul style="list-style-type: none"> <li>• The positions of the Earth and moon relative to the sun explain the cycles of day and night, and the monthly moon phases.</li> </ul> B.22 – Explain the cause of day and night based on the rotation of the Earth on its axis. B.23 – Describe the monthly changes in the appearance of the moon, based on the moon’s orbit around the Earth	B INQ.1 Make observations and ask questions about objects. B INQ.3 Design and conduct simple investigations. B INQ.4 Employ simple equipment and measuring tools to gather data and extend the senses. B INQ.5 Use data to construct reasonable explanations. B INQ.6 Analyze, critique and communicate investigations using words, graphs and drawings.

<p><b>STATE STANDARDS</b></p>	<p>B INQ.3 Design and conduct simple investigations.  B INQ.4 Employ simple equipment and measuring tools to gather data and extend the senses.  B INQ.5 Use data to construct reasonable explanations.  B INQ.6 Analyze, critique and communicate investigations using words, graphs and drawings.  B INQ.7 Read and write a variety of science-related fiction and non-fiction texts.  B INQ.8 Search the Web and locate relevant science information.  B INQ.9 Use measurement tools and standard units (e.g., centimeters, meters, grams, kilograms) to describe objects and materials.  B INQ.10 Use mathematics to analyze, interpret and present data.</p>	<p>B INQ.2 Seek relevant information in books, magazines and electronic media.  B INQ.3 Design and conduct simple investigations.  B INQ.4 Employ simple equipment and measuring tools to gather data and extend the senses.  B INQ.5 Use data to construct reasonable explanations.  B INQ.6 Analyze, critique and communicate investigations using words, graphs and drawings.  B INQ.7 Read and write a variety of science-related fiction and non-fiction texts.  B INQ.8 Search the Web and locate relevant science information.  B INQ.9 Use measurement tools and standard units (e.g., centimeters, meters, grams, kilograms) to describe objects and materials.</p>	<p>B INQ.1 Make observations and ask questions about objects.  B INQ.2 Seek relevant information in books, magazines and electronic media.  B INQ.3 Design and conduct simple investigations.  B INQ.4 Employ simple equipment and measuring tools to gather data and extend the senses.  B INQ.5 Use data to construct reasonable explanations.  B INQ.6 Analyze, critique and communicate investigations using words, graphs and drawings.  B INQ.7 Read and write a variety of science-related fiction and non-fiction texts.  B INQ.8 Search the Web and locate relevant science information.</p>	<p>B INQ.3 Design and conduct simple investigations.  B INQ.4 Employ simple equipment and measuring tools to gather data and extend the senses.  B INQ.5 Use data to construct reasonable explanations.  B INQ.6 Analyze, critique and communicate investigations using words, graphs and drawings.  B INQ.7 Read and write a variety of science-related fiction and non-fiction texts.  B INQ.8 Search the Web and locate relevant science information.  B INQ.9 Use measurement tools and standard units (e.g., centimeters, meters, grams, kilograms) to describe objects and materials.  B INQ.10 Use mathematics to analyze, interpret and present data.</p>	<p>B INQ.1 Make observations and ask questions about objects.  B INQ.2 Seek relevant information in books, magazines and electronic media.  B INQ.3 Design and conduct simple investigations.  B INQ.4 Employ simple equipment and measuring tools to gather data and extend the senses.  B INQ.5 Use data to construct reasonable explanations.  B INQ.6 Analyze, critique and communicate investigations using words, graphs and drawings.  B INQ.7 Read and write a variety of science-related fiction and non-fiction texts.  B INQ.8 Search the Web and locate relevant science information.</p>	<p>B INQ.9 Use measurement tools and standard units (e.g., centimeters, meters, grams, kilograms) to describe objects and materials.  B INQ.10 Use mathematics to analyze, interpret and present data.</p>
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<p><b>STATE STANDARDS</b></p>		<p>B INQ.10 Use mathematics to analyze, interpret and present data.</p>			<p>B INQ.9 Use measurement tools and standard units (e.g., centimeters, meters, grams, kilograms) to describe objects and materials. B INQ.10 Use mathematics to analyze, interpret and present data.</p>	
<p><b>ASSESSMENT</b></p>	<p><b><u>PERFORMANCE TASK</u></b></p> <p>You are a designer at a factory that makes toy instruments. Your goal is to reduce cost of making toy instruments.</p> <p>You need to design, construct, and demonstrate a toy instrument that is able to produce both high and low sounds (pitch) and loud and soft sounds (amplitude) so that it can be useful for an instrumental music teacher.</p> <p>You must convince the factory owner that you can reduce</p>	<p><b><u>PERFORMANCE TASK</u></b></p> <p>You are a builder of houses and have been hired to build two vacation houses for an important customer. You have been asked to use the LIGHT concepts of reflection, absorption, transparent, translucent, opaque, and color in your design plan. Compare and contrast the materials you would use in building a house in Maine and one in Florida. Explain and justify your selection choices based on your knowledge of</p>	<p><b><u>PERFORMANCE TASK</u></b></p> <p>Your job as a scientist is to develop a tool that will allow you to see objects better than with just your own eyes. This tool must contain lenses or mirrors or both.</p> <p>You must describe how it works and how it lets you acquire new information about your world.</p>	<p><b><u>PERFORMANCE TASK</u></b></p> <p><b>CSDE: Embedded Performance Task CATCH IT</b></p> <p><u>Part 1:</u> Compare the reaction times of different people (as they catch a ruler dropped from the air). Prepare all the steps to the Scientific Method (question, variables, collect and record data, calculate average time, interpret the data and write conclusion).</p> <p><u>Part 2:</u> What Affects Reaction Time? Explore what conditions you think</p>	<p><b><u>PERFORMANCE TASK</u></b></p> <p>You are an astronomer who has been asked to explain to other students how we have our day, month and yearly calendar. Use your knowledge of the relationships of the sun, Earth and moon to determine why you must include phases.</p> <p>Part of your explanation can include pictures or models or</p>	<p><b><u>PERFORMANCE TASK</u></b></p> <ul style="list-style-type: none"> <li>◆ A toy company has hired you to design and run an experiment that deals with the following topic: How does weight affect the flight of paper airplanes?</li> <li>◆ You and your partner are scientists. You are responsible for designing and testing your experiment.</li> <li>◆ The audience is the maker of a paper airplane toy company.</li> <li>◆ You and your partner have been asked to design and run</li> </ul>

<p><b>ASSESSMENT</b></p>	<p>the production cost by using limited and low cost materials of a toy instrument.</p> <p><b>Standards and Criteria for Success:</b> Your instrument should:</p> <ul style="list-style-type: none"> <li>~use available (recycled) materials</li> <li>~be able to be duplicated using your illustrated design plan and explanation (written and oral)</li> <li>~make high and low, loud and soft sounds</li> </ul>	<p>principles of light and color.</p>		<p>might affect how fast someone can react. Design an experiment to investigate this problem: include specific question, procedure, data collection, show results in bar graph, interpret data and write conclusion that supports the data.</p>	<p>demonstrations, however it must also have written explanations. Prepare your presentation for other grades 4-6 students.</p>	<p>an experiment that tests the affect of weight on paper airplane flight (suggestions: types of paper, add paper clips, etc). Student should come up with and choose the placement of weights.</p> <ul style="list-style-type: none"> <li>◆ You need to design an experiment. Be sure to test only the variable of weight! You will need to graph your results. You will present your findings to the toy makers upon completion.</li> <li>◆ Your presentation needs to include: <ul style="list-style-type: none"> <li>○ Question/Problem</li> <li>○ Hypothesis</li> <li>○ Materials</li> <li>○ Independent Variables</li> <li>○ Dependent Variables</li> <li>○ Control</li> <li>○ Procedure</li> </ul> </li> </ul>
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	<p><b><u>OTHER EVIDENCE</u></b></p> <ul style="list-style-type: none"> <li>• Design noisemakers for New Year’s Eve or a birthday party with diagrams and demonstrate</li> <li>• Describe noisiest and quietest room in your house and explain why they are that way</li> <li>• Explain how pitch and volume can be changed.</li> <li>• Explain/compare a ship/sub’s sonar to a bat’s echolocation</li> <li>• Test and explain why two ears are better than one</li> <li>• Explain “noise pollution” and suggest and defend ways to control/reduce it</li> <li>• Journal Writing</li> <li>• Venn Diagram</li> <li>• Quizzes</li> <li>• Test</li> </ul>	<p><b><u>OTHER EVIDENCE</u></b></p> <ul style="list-style-type: none"> <li>• Demonstrate how light can be reflected and refracted.</li> <li>• Compare/contrast reflection &amp; refraction.</li> <li>• Design a secret code using reflection.</li> <li>• Explain how light can be reflected, refracted, or absorbed.</li> <li>• Compare the structures and functions of the eye with a camera.</li> <li>• Compare/contrast convex vs. concave lenses.</li> <li>• Experiment and explain why two eyes are better than one (binocular vision).</li> </ul>	<p><b><u>OTHER EVIDENCE</u></b></p> <ul style="list-style-type: none"> <li>• Drawings of eye and camera with parts labeled and functions described.</li> <li>• Explanation of how eye and camera are similar.</li> <li>• Model of periscope and description of how it works.</li> <li>• Describe how lenses correct eyesight problems.</li> <li>• Compare/Contrast convex and concave lenses.</li> <li>• Worksheets</li> <li>• Venn Diagrams</li> <li>• Quizzes</li> <li>• Test</li> </ul>	<p><b><u>OTHER EVIDENCE</u></b></p> <ul style="list-style-type: none"> <li>• Journal entries</li> <li>• Venn diagrams ( compare 2 senses)</li> <li>• Web assignments</li> <li>• Teacher observations</li> <li>• Quizzes</li> <li>• Test</li> <li>• Expository writing on a chosen sense</li> <li>• Responses to open ended questions</li> <li>• Drawing of eye</li> <li>• Worksheets</li> <li>• Explain how the senses get information to the brain and how the brain responds.</li> <li>• Graphs</li> <li>• Experimental design and complete lab reports (data collection &amp; representations)</li> </ul>	<p><b><u>OTHER EVIDENCE</u></b></p> <ul style="list-style-type: none"> <li>• Explain what causes day and night</li> <li>• Drawings of models of earth’s rotation and revolutions</li> <li>• Describe why the moon looks different throughout the month</li> <li>• Demonstrations of rotation and revolution</li> <li>• Calendar of moon phases</li> <li>• Calendar of day and night times</li> <li>• Student website navigation to find information</li> <li>• Teacher created worksheets</li> <li>• Venn Diagrams to compare the movements of the sun, earth and moon</li> </ul>	<p><b><u>OTHER EVIDENCE</u></b></p> <ul style="list-style-type: none"> <li>• Student response sheets from each investigation</li> <li>• Variables journals</li> <li>• Math problems of the week</li> <li>• Interdisciplinary extensions (Project ideas)</li> <li>• Science stories activities</li> <li>• End of module assessments (FOSS)</li> <li>• Graphs</li> <li>• Quizzes (teacher created)</li> <li>• Teacher Observations</li> <li>• Designed Controlled Experiment</li> <li>• Short answer questions</li> <li>• Narrative Assessment Questions</li> <li>• Variables Identified Worksheet</li> </ul>

- Debate pros and cons of light “pollution” and astronomers’ observation/research of space.
  - What are some of the ways to cut down glare of lights used at night? (colored lights, frosted lamp covers or shades).
  - Where else could telescopes be placed for better viewing? (forest, mountain, away from city).
- Experiment Results
- Journal writing: (Describe how life would be different if the only sources of light were natural sources.)
- Drawings/Diagrams
- T-Charts

- Phases of moon draw flip-book
- Journal writing
- K-W-L Chart
- Quizzes
- Tests

- Independent Investigation Presentation

		<ul style="list-style-type: none"> <li>• Venn Diagrams</li> <li>• Quizzes</li> <li>• Test</li> </ul>				
<b>SKILLS</b>	<ul style="list-style-type: none"> <li>• Perform experiments with sound</li> <li>• Demonstrate the volume and pitch of sounds and how they can be changed.</li> <li>• Communicate – describe how sounds are made</li> <li>• Apply skills to design new sound producing devices.</li> <li>• Design sound experiments to change pitch or volume.</li> <li>• Compare and Contrast the volume and pitch of sounds produced.</li> <li>• Compare the speed of sound in different objects.</li> </ul>	<ul style="list-style-type: none"> <li>• Draw and label the electromagnetic spectrum.</li> <li>• Investigate how mirrors affect the direction of light.</li> <li>• Investigate reflection and refraction of light using mirrors and lenses.</li> <li>• Investigate and determine which objects can be transparent, translucent, or opaque to light.</li> <li>• Measure angle of reflection and describe how this concept is used in the real world.</li> <li>• Design and conduct experiments to investigate light properties.</li> </ul>	<ul style="list-style-type: none"> <li>• Describe the functions and label all the parts of the eye.</li> <li>• Describe the process of how we see.</li> <li>• Explain why it's necessary to have the brain to see.</li> <li>• Describe the parts of a camera.</li> <li>• Describe how the camera works to take pictures and label all the parts.</li> <li>• Compare and contrast the human eye and a camera</li> <li>• Investigate convex and concave lenses and determine which to use to correct vision problems (near and far sightedness).</li> <li>• Draw diagrams to show which type of lens is used to correct vision problems.</li> </ul>	<ul style="list-style-type: none"> <li>• describe the structures and functions of the human senses</li> <li>• identify five scents as presented on cotton balls (i.e. rubbing alcohol, floral, spice, garlic, tuna oil)</li> <li>• map their tongues according to taste sensations for sweet, bitter, salty, sour</li> <li>• describe unseen objects by physical characteristics (smooth/ rough, wet/dry, hot/cold, hard/soft)</li> <li>• explain why the brain is the most essential component of the nervous system where stimuli is received and messages are sent.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain why we have day and night</li> <li>• Describe the physical characteristics and location of the earth, moon and the sun in the solar system.</li> <li>• Demonstrate with models and drawings how the earth rotates and revolves with the sun and the moon.</li> <li>• Describe how Earth's rotation and revolution affect time.</li> <li>• Draw the different phases of the moon over a time period of one month.</li> <li>• Explain why the moon looks different throughout the month.</li> </ul>	<ul style="list-style-type: none"> <li>• Design and conduct controlled experiments</li> <li>• Investigate to determine what variables affect the number of cycles a pendulum makes in a unit of time.</li> <li>• Relate pendulum length to the number of cycles it makes in a unit of time.</li> <li>• Predict the behavior of new materials, pendulums boats, using a graph.</li> <li>• Observe and compare the buoyancy of materials. Conduct controlled experiments.</li> </ul>

SKILLS						
	<ul style="list-style-type: none"> <li>• Observe and compare sounds to develop discrimination ability.</li> <li>• Communicate with others using a code.</li> <li>• Learn that sound originates from a source that is vibrating and is detected at a receiver such as the human ear.</li> <li>• Explain the relationship between the pitch of a sound and the physical properties of the sound source (e.g., length of vibrating object, frequency of vibrations and tensions of string).</li> <li>• Compare methods to amplify sound at the source and at the receiver.</li> <li>• Compare how sound travels through solids, liquids and air.</li> </ul>	<ul style="list-style-type: none"> <li>• Compare/contrast reflection &amp; refraction of light.</li> <li>• Demonstrate how white light can be separated into colors using a prism.</li> <li>• Demonstrate how light travels in a straight path.</li> <li>• Classify materials based on their ability to transmit light (transparent, translucent, opaque).</li> <li>• Demonstrate symmetry of an object using mirrors.</li> <li>• Use mirrors positioned in a maze that will allow light to travel from one end to another.</li> <li>• Investigate why 2 eyes are better than one.</li> <li>• Explain what happens to light when it strikes different types of matter.</li> </ul>	<ul style="list-style-type: none"> <li>• Describe how a magnifier works and investigate how we can see very small objects with magnifiers and microscopes.</li> <li>• Explain how a telescope works .</li> <li>• Describe the difference between a light and a radio telescope.</li> <li>• Use a magnifier, micro-viewer or microscope to make small objects larger.</li> <li>• Make and use a periscope to see objects (out of sight, around corners or above eyesight).</li> <li>• Explain the difference between lenses and mirrors.</li> </ul>	<ul style="list-style-type: none"> <li>• describe instances where response to sensory stimuli can result in life saving decisions.</li> <li>• explain how we see</li> <li>• describe perception of visual stimulus as presented by nurse during vision screening</li> <li>• describe perception of hearing stimuli as presented by the nurse during hearing screening</li> <li>• measure the affects of stimulus/response investigations</li> <li>• design and conduct experiments to investigate variable that affect reaction time</li> </ul>	<ul style="list-style-type: none"> <li>• Explain why the appearance of the moon affects the duration of the month.</li> <li>• Explain how our calendar (day, month, year) is based on relationships between the sun, Earth, moon.</li> </ul>	<ul style="list-style-type: none"> <li>• Relate the capacity of boats to the mass they can hold before sinking.</li> <li>• Organize information on graphs.</li> <li>• Observe and compare the behavior of a standard plane system to a modified one.</li> <li>• Relate the effect of variables to the distance the plane travels.</li> <li>• Predict outcomes of plane flights.</li> <li>• Organize and communicate the results of investigations.</li> <li>• Relate the effect of variables to the trajectory of objects.</li> <li>• Measure the height and distance an object travels.</li> <li>• Use data to make predictions.</li> </ul>



<b>SKILLS</b>	<ul style="list-style-type: none"> <li>• Use knowledge of physics of sound to solve sound challenges.</li> <li>• Acquire vocabulary associated with physics of sound.</li> <li>• Compare how sound travels through different mediums.</li> <li>• Compare natural and manmade sounds.</li> <li>• Explain the path of vibration from outer ear to the brain.</li> </ul>					<ul style="list-style-type: none"> <li>• Compare multiple trials of the same variable and calculate averages of the outcomes.</li> <li>• Observe and compare the characteristics of model-plane flight.</li> <li>• Identify variables that might affect the flight of a model plane.</li> <li>• Relate the length of flight to the number of winds on a rubber band powering a propeller.</li> <li>• Create graphs to look for relationships between variables and the flight of model planes.</li> <li>• Make concrete, pictorial, and two-coordinate graphs of experimental results.</li> <li>• Use graphs to look for errors and make predictions.</li> <li>• Measure capacity in metric units.</li> </ul>
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<b>SKILLS</b>						<ul style="list-style-type: none"><li>• Draw conclusions about relationships with variables.</li></ul>
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