

7<sup>th</sup> Grade Science Curriculum Map, Mohonasen Central Schools

MOHONASEN CENTRAL SCHOOL DISTRICT  
Curriculum Map for 7<sup>th</sup> Grade Science  
TEXTBOOK: Life Science

MONTH	UNITS	STANDARDS	CHAPTERS	KEY IDEAS/CONCEPTS	PERFORMANCE INDICATORS/SKILLS
September / October	Lab Safety Measurement Scientific Method	STANDARD 1 – Analysis, Inquiry, and Design (Mathematical Analysis) Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate, to pose questions, seek answers, and develop solutions.  STANDARD 1- Analysis, Inquiry, and Design (Scientific Inquiry)	Chapter 1	Key Idea: 1 Abstraction and symbolic representation are used to communicate mathematically.  Key Idea 3 : Critical thinking skills are used in the solution of mathematical problems.  Key Idea 2: Beyond the use of reasoning and consensus, scientific inquiry involves the testing of proposed explanations involving the use of conventional techniques and procedures and usually requiring considerable ingenuity.	M1.1 Extend mathematical notation and symbolism to include variables and algebraic expressions in order to describe and compare quantities and express mathematical relationships.  M1.1c Apply mathematical equations to describe relationships among variables in the natural world.  M3.1a Use appropriate scientific tools to solve problems about the natural world.  S2.1c Design and conduct an experiment to test a hypothesis.  S2.1d Use appropriate tools and conventional techniques to solve problems about the natural world, including: measuring, observing, describing, classifying, & sequencing  S2.2d Identify independent variables (manipulated), dependent variables (responding), and constants in a simple controlled experiment.  S2.3 Carry out their research proposals, recording observations and measurements (e.g., lab notes, audiotape, computer disk, videotape) to help assess the explanation.
	MAJOR UNDERSTANDINGS	SUPPLEMENTAL CONTENT & LEARNING STRATEGIES		LAB THEMES	ASSESSMENTS
		Anticipatory set Graphic Organizers Co-operative Learning Groups Student Exploration Groups Lecture Teacher demonstrations Reinforcement activities Brainstorming Reflective Writing		Volume, Length, Mass Scientific Method Lab Safety	Metric Measurement lab The Better Buy Lab Battle of the Paper Towels Lab Metric Lab Practical Measurement, Scientific Method, Safety, Graphing unit test Science Starters

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October	Scientific Method Density Graphing  Characteristics of Life	Standard 4: The Living Environment Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.		Key Idea 5: Organisms maintain a dynamic equilibrium that sustains life. Introduction: All organisms must be able to obtain and use resources, grow, reproduce, and maintain stable internal conditions while living in a constantly changing external environment. Organisms respond to internal or environmental stimuli. Key Idea 1: Living things are both similar to and different from each other and from nonliving things. Introduction: Living things are similar to each other yet different from nonliving things. The cell is a basic unit of structure and function of living things (cell theory). For all living things, life activities are accomplished at the cellular level. Human beings are an interactive organization of cells, tissues, organs, and systems. Viruses lack cellular organization.	S 3.1 Design charts, tables, graphs, and other representations of observations in conventional and creative ways to help them address their research question or hypothesis.  Performance Indicator 5.1. Compare the way a variety of living specimens carry out basic life functions and maintain dynamic equilibrium.  Performance Indicator 1.1. Compare and contrast the parts of plants, animals, and one-celled organisms.
	MAJOR UNDERSTANDINGS	SUPPLEMENTAL CONTENT & LEARNING STRATEGIES		LAB THEMES	ASSESSMENTS
	5.1c All organisms require energy to survive. The amount of energy needed and the method for obtaining this energy vary among cells. Some cells use oxygen to release the energy stored in food. 5.1g The survival of an organism depends on its ability to sense and respond to its external environment.	Anticipatory set Graphic Organizers Co-operative Learning Groups Student Exploration Groups Lecture Teacher demonstrations Reinforcement activities Brainstorming Reflective Writing Computer Simulations		Density Characteristics of Life	Case of the Living Matter Lab Science Starters Quizzes

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November	Cells Microscope Plant/Animal Cell	Standard 4: The Living Environment Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	Chapter 3 Chapter 4	Key Idea 1: Living things are both similar to and different from each other and from nonliving things. Introduction: Living things are similar to each other yet different from nonliving things. The cell is a basic unit of structure and function of living things (cell theory). For all living things, life activities are accomplished at the cellular level. Human beings are an interactive organization of cells, tissues, organs, and systems. Viruses lack cellular organization.	Performance Indicator 1.1. Compare and contrast the parts of plants, animals, and one-celled organisms
	MAJOR UNDERSTANDINGS	SUPPLEMENTAL CONTENT & LEARNING STRATEGIES		LAB THEMES	ASSESSMENTS
	<p>1.1a Living things are composed of cells. Cells provide structure and carry on major functions to sustain life. Cells are usually microscopic in size.</p> <p>1.1b The way in which cells function is similar in all living things. Cells grow and divide, producing more cells. Cells take in nutrients, which they use to provide energy for the work that cells do and to make the materials that a cell or an organism needs.</p> <p>1.1c Most cells have cell membranes, genetic material, and cytoplasm. Some cells have a cell wall and/or chloroplasts. Many cells have a nucleus.</p> <p>1.1e Cells are organized for more effective functioning in multicellular organisms. Levels of organization for structure and function of a multicellular organism include cells, tissues, organs, and organ systems.</p>	<p>Anticipatory set Graphic Organizers Co-operative Learning Groups Student Exploration Groups Lecture Teacher demonstrations Reinforcement activities Brainstorming Reflective Writing</p>		<p>Cell Sizing Microscope Usage Plant/Animal Cell</p>	<p>Building a Eukaryotic Cell The Letter "e" Lab Quizzes Plant and Animal Cells Lab Cell Parts and Microscope Test</p> <p>Science Starters</p>

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MONTH	UNITS	STANDARDS	CHAPTERS	KEY IDEAS/CONCEPTS	PERFORMANCE INDICATORS/SKILLS
December	Cell Processes Photosynthesis Respiration Mitosis	Standard 4: The Living Environment Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	Chapter 4	Key Idea 1: Living things are both similar to and different from each other and from nonliving things. Introduction: Living things are similar to each other yet different from nonliving things. The cell is a basic unit of structure and function of living things (cell theory). For all living things, life activities are accomplished at the cellular level. Human beings are an interactive organization of cells, tissues, organs, and systems. Viruses lack cellular organization.  Key Idea 2: Organisms inherit genetic information in a variety of ways that result in continuity of structure and function between parents and offspring. Introduction: Every organism requires a set of instructions for specifying its traits. This information is found in the genes of cells. As organisms reproduce, these instructions are passed from one generation to the next.	Performance Indicator 1.1. Compare and contrast the parts of plants, animals, and one-celled organisms.  Performance Indicator 2.1. Describe sexual and asexual mechanisms for passing genetic materials from generation to generation.
	MAJOR UNDERSTANDINGS	SUPPLEMENTAL CONTENT & LEARNING STRATEGIES	LAB THEMES	ASSESSMENTS	
	2.1a Hereditary information is contained in genes. Genes are composed of DNA that makes up the chromosomes of cells. 2.1d In asexual reproduction, all the genes come from a single parent. Asexually produced offspring are genetically identical to the parent.  1.1h Living things are classified by shared characteristics on the cellular and organism level. In classifying organisms, biologists consider details of internal and external structures. Biological classification systems are arranged from general (kingdom) to specific (species).	Anticipatory set Graphic Organizers Co-operative Learning Groups Student Exploration Groups Lecture Teacher demonstrations Reinforcement activities Brainstorming Reflective Writing Computer Simulation	Osmosis/Diffusion Mitosis Dichotomous Key Lab	Potato Takes a Plunge Lab Incredible Shrinking Egg Mitosis Activity  Science Starters Quizzes	

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MONTH	UNITS	STANDARDS	CHAPTERS	KEY IDEAS/CONCEPTS	
January	Classification Survey of Kingdoms Viruses and Bacteria	Standard 4: The Living Environment Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	Chapter 9 Chapter 10	Key Idea 1: Living things are both similar to and different from each other and from nonliving things. Introduction: Living things are similar to each other yet different from nonliving things. The cell is a basic unit of structure and function of living things (cell theory). For all living things, life activities are accomplished at the cellular level. Human beings are an interactive organization of cells, tissues, organs, and systems. Viruses lack cellular organization.	Performance Indicator 1.1. Compare and contrast the parts of plants, animals, and one-celled organisms.  Performance Indicator 2.1. Describe sexual and asexual mechanisms for passing genetic materials from generation to generation.
	MAJOR UNDERSTANDINGS	SUPPLEMENTAL CONTENT & LEARNING STRATEGIES		LAB THEMES	ASSESSMENTS
	1.1h Living things are classified by shared characteristics on the cellular and organism level. In classifying organisms, biologists consider details of internal and external structures. Biological classification systems are arranged from general (kingdom) to specific (species).	Anticipatory set Graphic Organizers Co-operative Learning Groups Student Exploration Groups Lecture Teacher demonstrations Reinforcement activities Brainstorming Reflective Writing Computer Simulation	Dichotomous Key Lab Making a Model of a Virus	USS Adventure Lab Shape Island Lab Classify the States Lab Dichotomous Key State Assessment Science Starters Quizzes Model of a Virus Lab Science Sleuths Computer Simulations	

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MONTH	UNITS	STANDARDS	CHAPTERS	KEY IDEAS/CONCEPTS	PERFORMANCE INDICATORS/SKILLS
January / Continued	Survey of the Kingdoms Protists and Fungi	Standard 4: The Living Environment Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	Chapter 10 Chapter 11	Key Idea 5: Organisms maintain a dynamic equilibrium that sustains life. Introduction: All organisms must be able to obtain and use resources, grow, reproduce, and maintain stable internal conditions while living in a constantly changing external environment. Organisms respond to internal or environmental stimuli.  Key Idea 4: The continuity of life is sustained through reproduction and development. Introduction: The survival of a species depends on the ability of a living organism to produce offspring. Living things go through a life cycle involving both reproductive and developmental stages. Development follows an orderly sequence of events.	Performance Indicator 5.1. Compare the way a variety of living specimens carry out basic life functions and maintain dynamic equilibrium.  Performance Indicator 4.4. Observe and describe cell division at the microscopic level and its macroscopic effects.
	MAJOR UNDERSTANDINGS	SUPPLEMENTAL CONTENT & LEARNING STRATEGIES		LAB THEMES	ASSESSMENTS
	5.1b An organism's overall body plan and its environment determine the way that the organism carries out the life processes.  5.1c All organisms require energy to survive. The amount of energy needed and the method for obtaining this energy vary among cells. Some cells use oxygen to release the energy stored in food. 4.4a In multicellular organisms, cell division is responsible for growth, maintenance, and repair. In some one-celled organisms, cell division is a method of asexual reproduction.	Anticipatory set Co-operative Learning Groups Student Exploration Groups Lecture Teacher demonstrations Reinforcement activities Brainstorming Reflective Writing Graphic Organizers		Protists Fungi	Science Starters Quizzes Protist Mobile/Project My Moldy Garden

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MONTH	UNITS	STANDARDS	CHAPTERS	KEY IDEAS/CONCEPTS	PERFORMANCE INDICATORS/SKILLS
February	Review for Midterm Earth Science Review Plants	Standard 4: The Living Environment Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	Chapter 12 Chapter 13	Key Idea 4: The continuity of life is sustained through reproduction and development. Introduction: The survival of a species depends on the ability of a living organism to produce offspring. Living things go through a life cycle involving both reproductive and developmental stages. Development follows an orderly sequence of events. Key Idea 5: Organisms maintain a dynamic equilibrium that sustains life. Introduction: All organisms must be able to obtain and use resources, grow, reproduce, and maintain stable internal conditions while living in a constantly changing external environment. Organisms respond to internal or environmental stimuli. Key Idea 6: Plants and animals depend on each other and their physical environment Introduction: An environmentally aware citizen should have an understanding of the natural world. All organisms interact with one another and are dependent upon their physical environment. Energy and matter flow from one organism to another. Matter is recycled in ecosystems. Energy enters ecosystems as sunlight, and is eventually lost from the community to the environment, mostly as heat.	Performance Indicator 4.3. Observe and describe developmental patterns in selected plants and animals (e.g., insects, frogs, humans, seed-bearing plants).  Performance Indicator 4.4. Observe and describe cell division at the microscopic level and its macroscopic effects.  Performance Indicator 5.1. Compare the way a variety of living specimens carry out basic life functions and maintain dynamic equilibrium.  Performance Indicator 6.2. Provide evidence that green plants make food and explain the significance of this process to other organisms.
	MAJOR UNDERSTANDINGS	SUPPLEMENTAL CONTENT & LEARNING STRATEGIES		LAB THEMES	ASSESSMENTS
	4.3e Patterns of development vary among plants. In seed-bearing plants, seeds contain stored food for early development. Their later development into adulthood is characterized by varying patterns of growth from species to species.  4.4a In multicellular organisms, cell division is responsible for growth, maintenance, and repair. In some one-celled organisms, cell division is a method of asexual reproduction.  5.1a Animals and plants have a great variety of body plans and internal structures that contribute to their ability to maintain a balanced condition.  5.1b An organism's overall body plan and its environment determine the way that the organism carries out the life processes.  6.2a Photosynthesis is carried on by green plants and other organisms containing chlorophyll. In this process, the Sun's energy is converted into and stored as chemical energy in the form of a sugar. The quantity of sugar molecules increases in green plants during photosynthesis in the presence of sunlight.	Anticipatory set Co-operative Learning Groups Student Exploration Groups Lecture Teacher demonstrations Reinforcement activities Brainstorming Reflective Writing Graphic Organizers		Germination Annual Rings Vascular System Flower Dissection	Celery Lab Science Starters Vegetative Propagation of Plants Tree Cookies Lab Microscopic Leaf Drawing Lab Flower Dissection Quizzes Plant Unit Test

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MONTH	UNITS	STANDARDS	CHAPTERS	KEY IDEAS/CONCEPTS	PERFORMANCE INDICATORS/SKILLS	
March/April	Animals Ecology	Standard 4: The Living Environment Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	Chapters 15, 16, 17  Chapter s 19, 20, 21	Key Idea 5: Organisms maintain a dynamic equilibrium that sustains life. Introduction: All organisms must be able to obtain and use resources, grow, reproduce, and maintain stable internal conditions while living in a constantly changing external environment. Organisms respond to internal or environmental stimuli. Key Idea 6: Plants and animals depend on each other and their physical environment Introduction: An environmentally aware citizen should have an understanding of the natural world. All organisms interact with one another and are dependent upon their physical environment. Energy and matter flow from one organism to another. Matter is recycled in ecosystems. Energy enters ecosystems as sunlight, and is eventually lost from the community to the environment, mostly as heat.  Key Idea 7: Human decisions and activities have had a profound impact on the physical and living environment	Performance Indicator 5.1. Compare the way a variety of living specimens carry out basic life functions and maintain dynamic equilibrium. Performance Indicator 6.2 Provide evidence that green plants make food and explain the significance of this process to other organisms  Performance Indicator 7.1 Describe how living things including humans depend upon the living and nonliving environment for their survival.	
	MAJOR UNDERSTANDINGS		SUPPLEMENTAL CONTENT & LEARNING STRATEGIES		LAB THEMES	ASSESSMENTS
	5.1d 5.1e 6.1a 6.1b 6.1c 6.2a 6.2b The major source of atmospheric oxygen is photosynthesis. Carbon dioxide is removed from the atmosphere and oxygen is released during photosynthesis 6.2c Green plants are the producers of food which is used directly or indirectly by consumers. 7.1a A population consists of all individuals of a species that are found together at a given place and time. Populations living in one place form a community. The community and the physical factors with which it interacts compose an ecosystem. 7.1b Given adequate resources and no disease or predators, populations (including humans) increase. Lack of resources, habitat destruction, and other factors such as predation and climate limit the growth of certain populations in the ecosystem 7.1c In all environments, organisms interact with one another in many ways. Relationships among organisms may be competitive, harmful, or beneficial. Some species have adapted to be dependent upon each other with the result that neither could survive without the other 7.1d Some microorganisms are essential to the survival of other living things.	Anticipatory set Co-operative Learning Groups Student Exploration Groups Lecture Teacher demonstrations Reinforcement activities Brainstorming Reflective Writing Graphic Organizers	Animal Diversity Bioethics Food Web Energy Pyramid	Invertebrate Lab Animal Insanity Lab Science Starters Quizzes Ecology Lab		

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TEXTBOOK: Physical Science

MONTH	UNITS	STANDARDS	CHAPTERS	KEY IDEAS/CONCEPTS	PERFORMANCE INDICATORS/SKILLS
May	Potential + Kinetic Energy  Speed  Velocity Acceleration	Standard 4 The Physical Setting  Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	Chapter 5  Chapter 9	Key Idea 5: Energy and matter interact through forces that result in changes in motion.  Key Idea 4: Energy exists in many forms, and when these forms change energy is conserved.	5.1. Describe different patterns of motion of objects.  5.2. Observe, describe, and compare effects of forces (gravity, electric current, and magnetism) on the motion of objects.  4.1. Describe the sources and identify the transformations of energy observed in everyday life  4.5 Describe situations that support the principle of conservation of energy.
	MAJOR UNDERSTANDINGS	SUPPLEMENTAL CONTENT & LEARNING STRATEGIES		LAB THEMES	ASSESSMENTS
	5.1a The motion of an object is always judged with respect to some other object or point. The idea of absolute motion or rest is misleading 5.1b The motion of an object can be described by its position, direction of motion, and speed. 5.1c An object's motion is the result of the combined effect of all forces acting on the object. A moving object that is not subjected to a force will continue to move at a constant speed in a straight line. An object at rest will remain at rest. 5.1d Force is directly related to an object's mass and acceleration. The greater the force, the greater the change in motion.  4.1c Most activities in everyday life involve one form of energy being transformed into another. For example, the chemical energy in gasoline is transformed into mechanical energy in an automobile engine. Energy, in the form of heat, is almost always one of the products of energy transformations 4.1d Different forms of energy include heat, light, electrical, mechanical, sound, nuclear, and chemical. Energy is transformed in many ways 4.1e Energy can be considered to be either kinetic energy, which is the energy of motion, or potential energy, which depends on relative position  4.5a Energy cannot be created or destroyed, but only changed from one form into another 4.5b Energy can change from one form to another, although in the process some energy is always converted to heat. Some systems transform energy with less loss of heat than others	Anticipatory set Co-operative Learning Groups Student Exploration Groups Lecture Teacher demonstrations Reinforcement activities Brainstorming Reflective Writing Graphic Organizers	Potential and Kinetic Energy  Speed  Velocity	Science Starters Quizzes Speed of Toys  Bouncy Ball Lab Ramp and Ball lab	

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May/June	Forces and Friction Gravity Projectile Motion  Newton's Laws Simple Machines Work and Power	Standard 4: The Physical Setting Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	Chapter 5 Chapter 6 Chapter 8	Key Idea 5: Energy and matter interact through forces that result in changes in motion. Introduction: Examples of objects in motion can be seen all around us. These motions result from an interaction of energy and matter. This interaction creates forces (pushes and pulls) that produce predictable patterns of change. Common forces would include gravity, magnetism, and electricity. Friction is a force that should always be considered in a discussion of motion. When the forces acting on an object are unbalanced, changes in that object's motion occurs. The changes could include a change in speed or a change in direction. When the forces are balanced, the motion of that object will remain unchanged. Understanding the laws that govern motion allows us to predict these changes in motion.	Performance Indicator 5.2. Observe, describe, and compare effects of forces (gravity, electric current, and magnetism) on the motion of objects.  Performance Indicator 5.1. Describe different patterns of motion of objects.
	MAJOR UNDERSTANDINGS 5.1d Force is directly related to an object's mass and acceleration. The greater the force, the greater the change in motion. 5.1c An object's motion is the result of the combined effect of all forces acting on the object. A moving object that is not subjected to a force will continue to move at a constant speed in a straight line. An object at rest will remain at rest. 5.2d Friction is a force that opposes motion. 5.2e A machine can be made more efficient by reducing friction. Some common ways of reducing friction include lubricating or waxing surfaces. 5.2a Every object exerts gravitational force on every other object. Gravitational force depends on how much mass the objects have and on how far apart they are. Gravity is one of the forces acting on orbiting objects and projectiles.  5.2e A machine can be made more efficient by reducing friction. Some common ways of reducing friction include lubricating or waxing surfaces.  5.2c Machines transfer mechanical energy from one object to another.  5.2g Simple machines include a lever, a pulley, a wheel and axle, and an inclined plane. A complex machine uses a combination of interacting simple machines, e.g., a bicycle  5.2f Machines can change the direction or amount of force, or the distance or speed of force required to do work	SUPPLEMENTAL CONTENT & LEARNING STRATEGIES  Anticipatory set Co-operative Learning Groups Student Exploration Groups Lecture Teacher demonstrations Reinforcement activities Brainstorming Reflective Writing Graphic Organizers	LAB THEMES  Falling Objects Newton's Laws of Motion	ASSESSMENTS  Science Starters Quizzes Rocket Lab Newton 1 <sup>st</sup> Law Lab	

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MONTH	UNITS	STANDARDS	CHAPTERS	KEY IDEAS/CONCEPTS	PERFORMANCE INDICATORS/SKILLS
June	Review For Final Exam  Earth Science Review  *Sound  *Light *(if time permits)	Standard 4: The Physical Setting Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.	Chapter 20 Chapter 21 Chapter 23 Chapter 22	Key Idea 4: Energy exists in many forms, and when these forms change energy is conserved. Introduction: An underlying principle of all energy use is the Law of Conservation of Energy. Simply stated, energy cannot be created or destroyed. Energy can be transformed, one form to another. These transformations produce heat energy. Heat is a calculated value which includes the temperature of the material, the mass of the material, and the type of the material. Temperature is a direct measurement of the average kinetic energy of the particles in a sample of material. It should be noted that temperature is not a measurement of heat.	Performance Indicator 4.4. Observe and describe the properties of sound, light, magnetism, and electricity
	MAJOR UNDERSTANDINGS	SUPPLEMENTAL CONTENT & LEARNING STRATEGIES		LAB THEMES	ASSESSMENTS
	4.4a Different forms of electromagnetic energy have different wavelengths. Some examples of electromagnetic energy are microwaves, infrared light, visible light, ultraviolet light, x-rays, and gamma rays. 4.4b Light passes through some materials, sometimes refracting in the process. Materials absorb and reflect light, and may transmit light. To see an object, light from that object, emitted by or reflected from it, must enter the eye.  4.4c Vibrations in materials set up wavelike disturbances that spread away from the source. Sound waves are an example. Vibrational waves move at different speeds in different materials. Sound cannot travel in a vacuum.	Anticipatory set Co-operative Learning Groups Student Exploration Groups Lecture Teacher demonstrations Reinforcement activities Brainstorming Reflective Writing Graphic Organizers		Pitch Waves  Mirrors  Prisms	Musical Bottles Musical Instrument Which Light is Hottest Law of Reflection Quizzes Science Starters Refraction lab