

ELEMENTARY SCIENCE

The Sharon Public Schools continues to endorse a philosophy of science education sustaining the idea that the best science learning takes place as students are actively engaged in the process of science. Process science encourages students to contribute in activities describing objects and events, asking questions, making meaning, assembling knowledge, testing ideas, employing math skills and communicating results through verbal and written means. We expect our students to refine and redefine their science process skills; thinking critically and creatively leads to a more comprehensive and memorable science experience. These foundations in science are provided for and enhanced by a strong science program, which contributes to a student’s conceptual and applied understanding of science.

Grade Two

Mealworms

In this unit, children use their senses to gather information about mealworms. They record details of the life cycles of mealworms and investigate to find out how mealworms are adapted to their habitat. The children use science process skills as they conduct experiments to answer questions about mealworms.

Strand 1: Life Science

Understanding Students will understand that:	Questions	Knowledge Students will know that:	Skills Students will be able to:	Technology Possible Products or Outcomes:
Living things grow, reproduce, and need food, air, water, and shelter.	How do living and non-living things differ? What do organisms need to survive? How can a habitat for mealworms be built?	<ul style="list-style-type: none"> • Living things differ from non-living things by their ability to grow and reproduce. • Organisms need food, air, water, and shelter. 	<ul style="list-style-type: none"> • Differentiate between living and non-living things. • List four things that organisms need to survive. 	<ul style="list-style-type: none"> • Use <i>Kidspiration</i>, “Super Grouper”, to identify living and non-living things. • Use <i>Kidspiration</i> to create a web identifying what living things need to survive. • Use BBC Schools interactive website, <i>Plants and Animals in the Local Environment</i>. http://www.bbc.co.uk/schools/scienceclips/ages/6_7/plants_animals_env.shtml
Organisms have life cycles and life cycles vary for	How can powers of observation be used to	• Scientists use their senses to observe the natural	• Observe the changes in form during the life cycle	• Use <i>Kid Pix</i> to draw and label the life cycle of a

different things.	<p>learn about mealworms?</p> <p>What is the life cycle of a mealworm (grain beetle)?</p> <p>How can observations of the life cycle be recorded using words and pictures?</p> <p>How can a Venn diagram be used to compare the life cycles of butterflies and mealworms?</p>	<p>world.</p> <ul style="list-style-type: none"> • A mealworm undergoes metamorphosis to become a grain beetle. • Butterflies and grain beetles undergo metamorphosis to complete their life cycles. 	<p>of a grain beetle.</p> <ul style="list-style-type: none"> • Draw and record the stages of metamorphosis of a mealworm to a beetle. • Compare and contrast the life cycles of butterflies and grain beetles. 	<p>mealworm..</p> <ul style="list-style-type: none"> • Use a digital camera and <i>Timeliner</i> to create a timeline of your classroom mealworms' metamorphosis. • Use <i>Kidspiration</i>, "Venn Diagram", to compare and contrast the life cycles of butterflies and green beetles.
Organisms are grouped according to the characteristics that they share.	<p>How can a diagram be used to show the body parts of beetles?</p> <p>Why are mealworms classified as insects?</p>	<ul style="list-style-type: none"> • A grain beetle has three body parts and six legs. • Beetles are classified as insects because of their characteristics 	<ul style="list-style-type: none"> • Draw a diagram to show the body parts of a beetle. • Recognize that a beetle is classified as an insect because it has three body parts and six legs. 	<ul style="list-style-type: none"> • Use <i>Kid Pix</i> to draw a diagram to show the body parts of a beetle. • Use BBC Schools interactive website <i>Variation</i> to group organisms by their characteristics. http://www.bbc.co.uk/schools/scienceclips/ages/6_7/variation.shtml • Use <i>Sammy's Science House</i>, "Sorting Station", to discover how plants and animals are classified. • Use <i>Kidspiration</i>, "Animal Classification" to group animals according to the characteristics they share.
Organisms are adapted to their habitat.	<p>How does a mealworm respond to changes in light?</p>	<ul style="list-style-type: none"> • Mealworms have adaptations that allow them to survive. 	<ul style="list-style-type: none"> • Describe at least two adaptations that allow mealworms to survive. • Design an experiment 	<ul style="list-style-type: none"> • Use <i>Kidspiration</i> to web the adaptations that allow mealworms to survive.

	How does temperature affect mealworms? How can an experiment be designed to answer questions about mealworms?		that will answer a question about mealworms.	
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Organisms Depend on Soil for Life

In this unit, children continue to study the natural world. They use their senses to examine soil samples and they note and record similarities and differences. Through outdoor investigations, they discover that soil types vary in different places. The children come to understand the importance of soil as they learn about food chains and how organisms depend on soil. They also adopt a tree to observe and record seasonal changes.

Strand 2: Life Science

Understanding Students will understand that:	Questions	Knowledge Students will know that:	Skills Students will be able to:	Technology Possible Products or Outcomes:
Different kinds of soils have different properties.	What does soil look like? Does soil always look the same? What can be found in soil? How does water affect soil?	<ul style="list-style-type: none"> • Sand has the largest particles. • Clay has the smallest particles. • Particles of organic matter can be found in loam. 	<ul style="list-style-type: none"> • Different kinds of soil can be found in different places. • Use a hand lens to observe and compare three different soil types. • Recognize sand, clay, and loam by their properties. 	<ul style="list-style-type: none"> • Use <i>Science Court</i>, “Soil”, as a whole class presentation activity. • Use <i>Kidspiration</i> to web the various properties of sand, soil and clay.
Organisms depend on soil for life.	What is a food chain? How is soil important in a food chain? How do trees and soil need each other?	<ul style="list-style-type: none"> • Living organisms need soil to help produce food. • Trees help soil by providing shade and a tree’s roots keep soil from shifting. 	<ul style="list-style-type: none"> • Describe a simple food chain. • Give at least two examples of how organisms depend on soil. • Explain how trees help soil. 	<ul style="list-style-type: none"> • Use <i>Kidspiration</i> to make a simple food chain.

<p>The life cycle of a tree begins with a seed that grows in soil.</p> <p>Trees change with the seasons.</p>	<p>What is the life cycle of a tree?</p> <p>How does a tree compare to me?</p> <p>How does a tree change with the seasons?</p> <p>What organisms live in trees?</p> <p>What adaptations allow organisms to live above, at, or below ground level?</p>	<ul style="list-style-type: none"> • The life cycle of a tree begins with a seed in soil. The seed sprouts into a sapling that matures into a mature tree. At the end of its life cycle, the tree dies. • Trees change with the seasons. • Trees provide habitats for many different organisms. 	<ul style="list-style-type: none"> • Demonstrate the life cycle of a tree. • Compare the seasonal changes of a tree. • Explain why trees are important. • Recognize that adaptations allow organisms to live in the soil, on the soil, or above the soil. 	<ul style="list-style-type: none"> • Draw and label the parts of a tree using <i>KidPix</i>. • Use <i>KidPix</i> to draw a deciduous tree in each of the seasons. • Adopt a tree, take a digital picture each month and make a slide show or use <i>Timeliner</i> to put the pictures on a timeline. Describe each photo. • Use <i>Sammy's Science House</i>, "Acorn Pond", to explore the pond in different seasons. • Find an online partner and exchange information about a local tree.
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Sound Unit

In this unit, children investigate sound. Hands-on activities allow them to discover that sound is caused by vibrations. They experiment to change sound by altering pitch and volume. They learn how humans hear and they culminate their study by designing instruments that produce sound.

Strand 3: Physical Science

Understanding Students will understand that:	Questions	Knowledge Students will know that:	Skills Students will be able to:	Technology Possible Products or Outcomes:
<p>Humans and other animals interact with the environment through their sense of hearing.</p>	<p>What are some ways that people and animals depend on sound?</p>	<ul style="list-style-type: none"> • Humans and animals use sounds to communicate their wants and needs. 	<ul style="list-style-type: none"> • Give examples of why sound is important to humans and other animals. 	<ul style="list-style-type: none"> • Use <i>Kidspiration</i> to web reasons why sound is important. • Use a laptop with a digital microphone to record everyday sounds, then create a <i>PowerPoint</i> presentation lesson including sounds and

				pictures.
Sound is produced by objects vibrating back and forth.	<p>How are sounds made? How is the sound of the human voice made?</p> <p>What is volume?</p> <p>How can you alter volume?</p> <p>What is pitch?</p> <p>How can you alter pitch?</p>	<ul style="list-style-type: none"> • Sounds are made by objects vibrating back and forth. • The vibrations produce sound waves. • Volume is the loudness of a sound. • Pitch is the highness or lowness of a sound. • The more rapidly an object vibrates, the higher the pitch. • The longer an object is, the less rapidly it will vibrate. 	<ul style="list-style-type: none"> • Understand that vibrating objects produce sound. • Discriminate between volume and pitch. • Recognize that when objects vibrate with a lot of force, the sound is louder. • Demonstrate with a rubber band that the longer the vibrating object, the lower the pitch. 	<ul style="list-style-type: none"> • Use <i>Science Court</i>, “Sound”, as a whole class presentation activity. • Use <i>Kid Pix</i> to create a “Sounds in Our Environment” slideshow, including a riddle, picture and recording of the sound.
Sound waves travel differently through different materials.	<p>How does sound travel?</p> <p>What can sound travel through?</p> <p>How can an object be identified by the sound it makes?</p> <p>How can materials be used to design an instrument that produces sound?</p>	<ul style="list-style-type: none"> • Sound waves are like the waves in water. • Sound waves can travel through air, water, and solid objects. • Sound changes as it passes through different materials. 	<ul style="list-style-type: none"> • Compare sound waves to waves in water. • Demonstrate how sound changes as it travels through air, water, and a solid object. • Design an instrument that produces sound. 	<ul style="list-style-type: none"> • Use Virtual Instruments websites to explore sound. http://www.lhs.berkeley.edu/shockwave/jar.html http://www.philtulga.com/Panpipes.html
We hear sound when sound waves enter the ear, hit the eardrum, and cause the eardrum to vibrate	<p>How does the human ear work?</p>	<ul style="list-style-type: none"> • Sound is sent down the air canal. • Sound waves hit the eardrum, causing it to vibrate. • The vibrations are interpreted as sound. 	<ul style="list-style-type: none"> • Create a model of how we hear using a cardboard tube, a balloon piece, and two rubber bands. • Explain how the model works. 	<ul style="list-style-type: none"> • Use BBC Schools websites to explore sound and hearing. <i>Changing Sounds</i> http://www.bbc.co.uk/schools/scienceclips/ages/9_10/changing_sounds.shtml

				<i>Sound and Hearing</i> http://www.bbc.co.uk/schools/scienceclips/ages/5_6/sound_hearing.shtml
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Water Cycle Unit

Investigating water and the water cycle allows children to learn more about the physical world. In this unit, they learn that matter commonly exists in three states and that water can exist as a solid, a liquid, or a gas. By doing different experiments, children identify the properties of water as it changes form. They also recognize that water is an important natural resource that should be conserved.

Strand 4: Earth/Space Science

Understanding Students will understand that:	Questions	Knowledge Students will know that:	Skills Students will be able to:	Technology Possible Products or Outcomes:
Most matter exists in three states: solid, liquid, or gas.	What is matter? What are the three states of matter?	<ul style="list-style-type: none"> • Matter is anything that takes up space and has mass. • Matter exists mainly in three states: solid, liquid, or gas. 	<ul style="list-style-type: none"> • Name the three states of matter. 	<ul style="list-style-type: none"> • Use <i>Kid Pix</i> to draw the three states of matter in which water can exist. Label and include properties and how each is affected by temperature.
Water is a liquid that is affected by temperature changes.	What are the properties of water? How is water affected by temperature?	<ul style="list-style-type: none"> • Water is a liquid because it pours easily and it takes the shape of its container. • When heat is removed from water, the water freezes and becomes ice. • When water is heated a lot, it boils and turns into steam. 	<ul style="list-style-type: none"> • Identify water as a liquid. • Explain that water turns to ice when frozen. • Explain that water turns to steam when boiled. 	<ul style="list-style-type: none"> • Use <i>Drippy the Raindrop The Land of Snow and Ice</i> to learn about the properties of water. http://www.kimballmedia.com/Drippy/DrippysWorldTrialStories/LandOfSnowAndIce/Entry.htm
Water is made of molecules that stick together.	How are water droplets formed? What is surface tension?	<ul style="list-style-type: none"> • Cohesion is the force that holds water molecules together. • Because of cohesion, water molecules form droplets. • Surface tension is caused 	<ul style="list-style-type: none"> • Prove that water molecules ‘stick together’ by using water, a straw, and waxed paper. • Demonstrate that surface tension forms a thin cover on water. 	

		<p>by water molecules attracting each other.</p> <ul style="list-style-type: none"> • Surface tension is like a thin cover on a liquid. 		
<p>Water on Earth cycles in different forms in repeating patterns.</p>	<p>What is the water cycle?</p> <p>What is evaporation?</p> <p>What is condensation?</p> <p>What is precipitation?</p> <p>How does water exist in all three states of matter?</p> <p>Why should water be conserved?</p>	<ul style="list-style-type: none"> • Evaporation, condensation, and precipitation are the steps in the water cycle. • Evaporation occurs when water changes from a liquid to a gas. • Condensation occurs when water vapor is cooled to become a liquid. • The rain, snow, sleet, or hail that fall to Earth after condensation occurs are called precipitation. • Water exists as a liquid when it can be poured, a gas when it evaporates and becomes water vapor, and a solid when it freezes into ice. • Water is a natural resource that should be protected and used wisely. 	<ul style="list-style-type: none"> • Describe the water cycle. • Identify how water can exist in the three different states of matter. • Infer the importance of water conservation. 	<ul style="list-style-type: none"> • Use <i>Science Court “Water Cycle”</i>, as a whole class presentation activity. • Draw and label the water cycle using <i>Kid Pix</i>. • Use <i>Drippy the Raindrop To the Mountains and Back</i> to learn about the water cycle. • http://www.kimballmedia.com/Drippy/DrippysWorldTrialStories/ToMountainsAndBack/Entry.htm • Use <i>Kid Pix</i> to create a poster showing ways to conserve water.

Use the websites to enhance the student learning:

Life Science

Plants & Animals in the local environment - http://www.bbc.co.uk/schools/scienceclips/ages/6_7/plants_animals_env.shtml

Mealworm Life Cycle - <http://EnchantedLearning.com/subjects/insects/beetles/mealworm/mealwormlifecycle.shtml>

The Great Plant Escape - <http://www.urbanext.uiuc.edu/gpe/case2/facts.html>

Soil Science Education - <http://ltpwww.gsfc.nasa.gov/globe/>

Physical Science

Ear Anatomy - <http://www.enchantedlearning.com/subjects/anatomy/ear/index.shtml>

Changing Sounds - http://www.bbc.co.uk/schools/scienceclips/ages/9_10/changing_sounds.shtml

Sound and Hearing - http://www.bbc.co.uk/schools/scienceclips/ages/5_6/sound_hearing.shtml

Send a Sound Card - <http://www.sci.mus.mn.us/sound/soundcard/top.html>

Virtual Instrument Juice Bottle Jingles - <http://www.lhs.berkeley.edu/shockwave/jar.html>

Pan Pipes: <http://www.philtulga.com/Panpipes.html>

Earth/Space Science

Thirstin's Water Cycle - http://www.epa.gov/safewater/kids/flash/flash_watercycle.html

Drippy the Raindrop To the Mountains and Back- an online story book that can be spoken.

<http://www.kimballmedia.com/Drippy/DrippysWorldTrialStories/ToMountainsAndBack/Entry.htm>

Drippy the Raindrop The Land of Snow and Ice -

<http://www.kimballmedia.com/Drippy/DrippysWorldTrialStories/LandOfSnowAndIce/Entry.htm>