Seymour Public Schools Curriculum

Grade Two Science Curriculum

The Seymour School District believes that every student needs and deserves a rich and challenging education in science. Quality education in science is an integral part of the core curriculum for our students. Students should be enabled to achieve the learning goals and standards outlined in Connecticut's science framework.

Such an education will promote essential understandings of the natural world and nurture student's abilities to apply scientific knowledge to make informed and logical judgments about personal and societal issues. Such an education requires that the fundamental approach to science is a creative process for investigating, reasoning, critiquing and communicating about ideas, not as a static body of facts to be memorized.

We believe that learning science is important for all students in order to prepare them to be informed individuals and citizens and to participate in a wide range of scientific and technological careers. Understanding the interconnections between science and technology, and their shared impact on environmental and societal issues, is essential in order to preserve and improve life on Earth.

Learning experiences in science should lead all students to:

- Understand and apply basic concepts, principles and theories of biology, chemistry, physics, earth and space sciences and their interrelationships;
- Recognize and participate in scientific endeavors which are evidence based and use inquiry skills that lead to a greater understanding of the world;
- Identify and solve problems through scientific exploration, including the formulation of hypotheses, design of experiments, use of technology, analysis of data and drawing of conclusions;
- Select and use properly appropriate laboratory technology, equipment and material, including measuring and sensing devices;
- Understand and use existing and emerging technologies which have an effect on society and the quality of life, including personal academic and work environments;
- Analyze the possibilities and limits of science and technology in order to make and defend decisions about societal issues; and
- Understand that the way in which scientific knowledge is formulated is crucial to the validity of that knowledge.

Teachers plan units and lessons that contain current, accurate and meaningful content that is aligned with the district curriculum. Through professional development, teachers keep up-to-date with the latest scientific advances in their discipline. They set a context for scientific learning that is relevant to students in class. Engaging students in extended, where developmentally appropriate scientific investigations that motivate student effort and interest in scientific learning are planned. Students are provided with a safe environment in which to participate in scientific investigations an have the resources needed to support their learning;

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Students are assessed regularly to build an understanding instruction is adjusted to accommodate students with diverse needs, abilities and interests. Students are encouraged to pursue the study of advanced science and science-related careers.

Parents play an essential role in ensuring a quality educational program in science by encouraging their children to participate in high-level science courses and activities, both in and out of school and to talk to their children about science they learn at school and showing interest in scientific content, processes and ideas, and by providing their children with access to science resources, such as museums, libraries and the Internet.

CMT
The science portion of the test is administered to students in Grades 5 and 8. The CMT science assessments measure what students have learned over several years about core science concepts and about how scientific inquiry is done. The assessments include questions related to concepts in life science, physical science and earth science and how those concepts apply to real world issues and technologies.

EMBEDDED TASKS
To assess students' understanding of inquiry and the nature of science, the CMT science assessment includes some questions framed within the CONTEXT of the curriculum-embedded performance tasks developed by the Connecticut State Department of Education. The embedded tasks engage students in focused explorations of science concepts using all the inquiry practices described in the science framework. Each embedded task is designed to be part of a larger learning unit described in the science framework, and teachers decide when and how to incorporate them into the curriculum. These inquiry investigations demonstrate how students use science inquiry practices to deepen understanding of a science concept.

CSDE 2008

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2.1 Properties of Matter

August/September/October 22 Days

SUBTOPIC	DAYS	LESSON/ASSESSMENT	CT STANDARD	SOURCE
Investigation 1 – Solids	1 Day	Part 1-Introduce Solids	2.1.1; 2.1.2; 2.1.3	FOSS Kit – Solids and Liquids
	1 Day	Part 2-Sort Solid Objects	2.1.1; 2.1.2; 2.1.3	FOSS Kit – Solids and Liquids
	2 Days	Part 3-Construct with Solids/Student Sheet	2.1.1; 2.1.2; 2.1.3	FOSS Kit – Solids and Liquids
Investigation 2 – Liquids	2 Days	Part 1-Liquids in Bottles	2.1.4 & 2.1.5	FOSS Kit – Solids and Liquids
	1 Day	Part 2-Properties of Liquids	2.1.4 & 2.1.5	FOSS Kit – Solids and Liquids
	2 Days	Part 3-Liquid Level/Student Sheet Liquids in Containers	2.1.4 & 2.1.5	FOSS Kit – Solids and Liquids
Investigation 3 – Bits and Pieces	2 Days	Part 1-Solids in Containers	2.1.4 & 2.1.5	FOSS Kit – Solids and Liquids
	2 Days	Part 2-Separating Soup Mix	2.1.4 & 2.1.5	FOSS Kit – Solids and Liquids
	1 Day	Part 3-Solids in Bottles	2.1.4 & 2.1.5	FOSS Kit – Solids and Liquids
	1 Day	Part 4-Separting Beads with a Screen/Student Sheet	2.1.4 & 2.1.5	FOSS Kit – Solids and Liquids
Investigation 4 – Solids and Liquids with Water	3 Days	Part 1-Solids and Water	2.1.4 & 2.1.5	FOSS Kit – Solids and Liquids
	2 Days	Part 2-Liquids and Water/Student Sheet	2.1.4 & 2.1.5	FOSS Kit – Solids and

				Liquids
	2 Days	Part 3-The Toothpaste Investigation	2.1.4 & 2.1.5	FOSS Kit – Solids and Liquids

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2.4 Science and Technology

Concept 1 – Plants and Animals as Food Sources

November 18 Days

SUBTOPIC	DAYS	LESSON/ASSESSMENT	CT STANDARD	SOURCE
Five Food Groups	1 Day/ Ongoing	KWL Chart for the Five Major Food Groups	2.4.1 – 2.4.4	http://www.mypyramid.gov http://www.nutritionexplorations.org http://www.5aday.com http://www.healthyteacher.com
Breakfast Survey	2 Days	Survey Student Breakfast Choices and Graph	2.4.1 – 2.4.4	
Need for Five Basic Food Groups	1 Day	Students try to perform a task without the use of their thumb or one of their fingers to illustrate the need for foods from all five food groups.	2.4.1 – 2.4.4	
			2.4.1-2.4.4	RESOURCES NEEDED (Could be developed based on these websites)

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2.4 Science and Technology

Concept 2 – Human Nutritional Needs

December 17 Days

SUBTOPIC	DAYS	LESSON/ASSESSMENT	CT STANDARD	SOURCE
Acquisition of Food	1 Day/ ongoing	KWL on where their food comes from	2.4.1-2.4.7	http://www.mypyramid.gov http://www.nutritionexplorations.org http://www.5aday.com http://www.healthyteacher.com
Ethnic Foods	1 Day	Students will discuss different ethnic foods and why they think different cultures have different food choices.	2.4.1-2.4.7	
			2.4.1-2.4.4	RESOURCES NEEDED (Could be developed based on these websites)

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2.3 The Changing Earth

Concept 1 – Soil Description

January/February 25 Days

SUBTOPIC	DAYS	LESSON/ASSESSMENT	CT STANDARD	SOURCE
Investigation 1 – First Rocks	1 Day	Part 1-Three Rocks	2.3.1-2.3.6	FOSS Kit – Pebbles, Sand, & Silt
	1 Day	Part 2-Washing Three Rocks	2.3.1-2.3.6	FOSS Kit – Pebbles, Sand, & Silt
	1 Day	Part 3-First Sorting/Student Sheet	2.3.1-2.3.6	FOSS Kit – Pebbles, Sand, & Silt
	1 Day	Part 4-Sorting Games	2.3.1-2.3.6	FOSS Kit – Pebbles, Sand, & Silt
	1 Day	Part 5-Start a Rock Collection	2.3.1-2.3.6	FOSS Kit – Pebbles, Sand, & Silt
Investigation 2 – River Rocks	1 Day	Part 1-Screening River Rocks	2.3.1-2.3.6	FOSS Kit – Pebbles, Sand, & Silt
	1 Day	Part 2-River Rocks by Size	2.3.1-2.3.6	FOSS Kit – Pebbles, Sand, & Silt
	2 Days	Part 3-Sand and Silt	2.3.1-2.3.6	FOSS Kit – Pebbles, Sand, & Silt
	2 Days	Part 4-Exploring Play/Student Sheet	2.3.1-2.3.6	FOSS Kit – Pebbles, Sand, & Silt
Investigation 3 – Using Rocks	1 Day	Part 1-Rocks in Use/Student Sheet	2.3.1-2.3.6	FOSS Kit – Pebbles, Sand, & Silt
	1 Day	Part 2-Looking at Sand Paper	2.3.1-2.3.6	FOSS Kit – Pebbles, Sand, & Silt
	1 Day	Part 3-Sand Sculptures	2.3.1-2.3.6	FOSS Kit – Pebbles, Sand, & Silt

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	3 Days	Part 4-Clay Beads	2.3.1-2.3.6	FOSS Kit – Pebbles, Sand, & Silt
	2 Days	Part 5-Making Bricks	2.3.1-2.3.6	FOSS Kit – Pebbles, Sand, & Silt
Investigation 4 – Soil Exploration	3 Days	Part 1-Homemade Soil	2.3.1-2.3.6	FOSS Kit – Pebbles, Sand, & Silt
	1 Day	Part 2-Soil Search	2.3.1-2.3.6	FOSS Kit – Pebbles, Sand, & Silt
	2 Days	Part 3-Studying Local Soil	2.3.1-2.3.6	FOSS Kit – Pebbles, Sand, & Silt

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2.3 The Changing Earth

Concept 2 – Soils Support the Growth of Plants

March/April ___ Days

SUBTOPIC	DAYS	LESSON/ASSESSMENT	CT STANDARD	SOURCE
Plants Need Soil		Plants need soil to grow	2.3.1	Covered in FOSS Kit -New Plants
Soil as a Habitat		Some organisms live in the soil and some live on the soil	2.3.2	RESOURCES NEEDED
Crop Quality Depends on Soil Quality		Quality of a plants growth are effected by soil quality	2.3.3	RESOURCES NEEDED
Altering Soil		People can improve the properties of soil by adding nutrients, water, or air	2.3.4	RESOURCES NEEDED

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2.2 Structure and Function

April/May/June __ Days

SUBTOPIC	DAYS	LESSON/ASSESSMENT	CT STANDARD	SOURCE
Plants	Ongoing for 1 month	Activity 1-Brassica Seeds	2.2.1-2.2.9	FOSS Kit – New Plants
	Ongoing for 1 month	Activity 2-Grass and Grain Seeds	2.2.1-2.2.9	FOSS Kit – New Plants
	Ongoing for 1 month	Activity 3-Stems	2.2.1-2.2.9	FOSS Kit – New Plants
	Ongoing for 1 month	Activity 4-Bulbs and Roots	2.2.1-2.2.9	FOSS Kit – New Plants

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Grade: two	**Subject: Science**
CSDE Standard	**Properties of Matter**
Enduring Understanding	**Solids tend to maintain their own shapes, while liquids tend to assume the shapes of their containers, and gases fill their containers fully.**
Essential Question	***How does the structure of matter affect the properties and uses of materials?***
Content Standard:	**2.1 – Materials can be classified as solid, liquid or gas based on their observable properties.**
Performance Expectations (Student outcomes)	**GRADE-LEVEL EXPECTATIONS:** **1. All materials (matter) take up space. Matter can be classified by whether it is in solid, liquid or gas form. Each state of matter has unique properties.** **2. Solids are the only state of matter that keep their own shape. A solid's shape can only be changed if a force is applied to it, such as hammering, slicing or twisting. Solids can be hard, soft, bouncy or stretchy.** **3. Solids take up a certain amount of space (volume); the volume does not change if the solid is placed in different containers.** **4. Liquids do not have their own shape; they go to the bottom of a container and take on the shape of the part of the container they occupy. Liquids pour and flow from a higher point to a lower point; some liquids flow faster than others.**

	5. Liquids have a definite volume. When a liquid is poured into different containers, the shape of the liquid may change, but the volume does not. **6. Gases do not have a definite shape; they take on the shape of whatever container they occupy. For example, the air in an inflated balloon can be squeezed and reshaped.** **7. Gases do not have a definite volume; they spread out in all directions to fill any size container, or they keep spreading in all directions if there is no container. For example, blowing even a small amount of air into a balloon immediately fills the entire balloon; the smell of baking bread eventually fills the entire house and even outside.**

Strategies/Modes (examples)	**Materials/Resources (examples)**	**Assessments (examples)**
	KEY SCIENCE VOCABULARY: property, classify, matter, state of matter, solid, liquid, gas, volume Need additional resources for 2.1.6 and 2.1.7	**CMT Expected Performances** **A 18. Describe differences in the physical properties of solids and liquids.**
2.1.1; 2.1.2; 2.1.3 <u>Investigation 1: Solids</u> Students explore solid objects, such as pieces of wood, plastic, and metal. They observe, describe, and sort the objects according to their properties. They construct towers (and other structures), using the properties inherent in the materials to accomplish the task. Students will: ❖ Explore a number of different solid materials. ❖ Describe properties of solid materials. ❖ Recognize solids as different from other states of matter. ❖ Sort solids by their properties. ❖ Describe how the properties of solid materials can have specific uses in construction.	FOSS Science Kit: Solids and Liquids	

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Part 1: Introduce Solids How can solids be described? (45 minutes) Students are introduced to a variety of solid materials-cloth, wood, metal, plastic, paper, and rubber. After a period of free exploration students describe the properties of the objects and develop vocabulary in order to communicate those properties. ❖ Solids are one state of matter. ❖ Solid materials have properties that separate them from other states of matter. ❖ We use our senses to observe the properties of solids. Part 2: Sort Solid Objects In what ways are some solids the same? (45 minutes) Students sort a set of solid objects in a variety of ways to discover similarities among the solids. ❖ Solids can be sorted by their properties. We use our senses to observe the properties of solids. ❖ Solid materials have properties that separate them from other states of matter. Part 3: Construct With Solids How can the properties of solids be used? (one or two 45-60 minute sessions) Students use solid materials to build structures-towers, bridges, and tunnels-finding the best materials to use for each application. ❖ Solid materials have distinct uses based on their properties.		**Pre-assessment (optional)** **Anecdotal Notes** **Student Sheet** **Students compare and contrast** **Teacher Observation** **Students identify properties of a solid uses for specific purposes in construction.**

❖ Engineers are scientists who use their knowledge of materials to design useful objects and structures 2.1.4; 2.1.5 <u>Investigation 2: Liquids</u> Students investigate liquids in a variety of settings to become familiar with their properties. A number of games are used to rehearse precise liquids vocabulary. Students also use representational materials to enhance their understanding of the unique behaviors of liquids. In liquids, students will: ❖ Observe the properties of a variety of liquid materials. ❖ Record information about properties of liquids. ❖ Play games to practice vocabulary associated with liquids. ❖ Investigate and record the level nature of liquid as it flows from one stable position to another. ❖ Investigate the appearance and behavior of liquids in containers. ❖ Develop definitions of solids and liquids based on their observations and comparisons. Part 1: Liquids in Bottles How do liquids differ from each other? (60-75 minutes or two sessions of 40 minutes) Students investigate different liquids to develop their concepts of a liquid. They work at a center to tip, swirl, shake, roll, and otherwise investigate seven liquids in small, clear plastic bottles: plain water, corn syrup, liquid detergent, liquid hand soap, oil, fabric softener, and colored water.	**FOSS Science Kit: Solids and Liquids**	**Anecdotal Notes** **Teacher Observation** **Students use new vocabulary accurately:** **Bubbly** **Has color** **Colorless** **Flow** **Foams** **Level** **Liquid** **Pour** **Property** **Shake** **Surface** **Tornado** **Translucent** **Transparent** **Viscous**

❖ Liquids are one state of matter. ❖ Liquids have many properties. ❖ Liquids pour and flow. Part 2: Properties of Liquids How do liquids differ from each other? (45 minutes) Students describe properties of liquids. Their descriptive language is used as a springboard to develop precise vocabulary for properties of liquids. Vocabulary is practiced with liquid-vocabulary card games. ❖ Liquids have many properties. Part 3: Liquid Level		**Teacher observation or student sheet** **Students' drawings show that liquids take the shape of their container.** **(*Liquids in Containers*)** **Students observe that the liquid surface remains level as the bottle tips** **Anecdotal Notes** **Anecdotal Notes**

How do liquids flow when a bottle is tipped upside down? How does the same amount of liquid look in various shapes of containers? In what ways are all liquids the same? (60-75 minutes or two sessions of 40 minutes) ❖ Liquids pour and flow. ❖ Liquids take the shape of their container. ❖ The surface of liquid is level with respect to the ground. ❖ Solids and liquids have distinct properties that separate them as two states of matter. 2.1.4; 2.1.5 Investigation 3: Bits and Pieces Students work with beans, rice, and cornmeal to find out how solids behave when the pieces are small. They shake, rattle, and roll the materials in bottles, pour them from container to container, and separate then using screens. Students will: ❖ Experience solid materials as pieces, grains, and particles. ❖ Observe the behavior of small solids in various settings. ❖ Combine and separate solid materials of different particle sizes. ❖ Compare the behavior of solids and liquids in smaller settings. Part 1:Solids in Containers Are these materials solids or liquids? (60-75 minutes or two sessions of 40 minutes) Students work in learning centers with solid materials representing five particle sizes; cornmeal, rice, and three different beans. Students investigate the properties of the	**FOSS Science Kit: Solids and Liquids**	**Teacher Observation** **Students compare liquids and solids** **Student Sheets** **Students choose screens of appropriate size to separate solids.** **(*Bead Mix A and Bead Mix B*)**

materials, one at a time, by pouring them from one container to another. Part 2: Separating Soup Mix How can mixtures of solid particles be separated? (60-75 minutes or two sessions of 40 minutes) Students use screens of three sizes to separate a mixture of five solid materials ❖ Mixtures of solid particles can be separated with a screen. ❖ Solid materials come in all sizes and shapes. Part 3: Separating Beads with a Screen How do you know which screens to use for separating a mixture of solids? (30-40 minutes) Students work with representational materials to demonstrate their understanding of the use of screens to separate mixtures. They look at representations of bead mixtures and select a representation of a screen that could be used to separate the mixture. ❖ Senses of sight, hearing, and touch can be used to observe the properties of materials. ❖ Particles of solid materials can pour like liquids, but unlike liquids they maintain their shape. ❖ The behavior of small solids has similarities to and differences from that of liquids. 2.1.4; 2.1.5		**Anecdotal Notes** **Student Sheet** **Students accurately record observations.** **(*Liquid with Water*)**

Investigation 4: Solids and Liquids with Water Students investigate interactions between solids and water and liquids and water. They observe, describe, record, and organize the results. In the culminating activity students test toothpaste to determine if it is a solid or a liquid. ❖ Some solids change when mixed with water; others do not ❖ Some solids dissolve in water; evaporation leaves the solid behind. ❖ Some liquids mix with water; other liquids form a layer above or below water. Part 1: Solids and Water What happens when different solids are mixed with water? How can a mixture of water and solids be separated? (Three 45-minute sessions) Students investigate mixtures made of water and familiar solid materials. They observe and discuss the changes that occur immediately and set the mixture aside for a day. Students observe the mixtures, note changes, and graph the changes. They attempt to return the solids to their starting condition by drying. ❖ Some solids change when mixed with water; others do not. ❖ Some solids dissolve in water; evaporation leaves the solid behind. ❖ Water can be separated from a mixture through evaporation. Part 2: Liquids and Water What happens when water is mixed with different liquids? (45 minutes + 20 minutes the next day)	**FOSS Science Kit: Solids and Liquids**	**Teacher Observation** **Students support their opinions with evidence.**

Students add water to bottles of familiar liquids. They observe changes that occur immediately, then tip the bottles gently, and finally shake them vigorously. The results of the mixing are observed and recorded after a day of settling. ❖ Some liquids mix with water. ❖ Some liquids form a layer above or below water. Part 3: Toothpaste Investigation Is toothpaste a solid, a liquid, a mixture, or some other form of matter? (45 minutes + 20 minutes the next day) Students apply their knowledge of solids and liquids to determine if toothpaste is solid or liquid.		

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Grade: two	**Subject: Science**
CSDE Standard	**Structure and Function**
Enduring Understanding	**The life cycles of flowering plants include seed germination, growth, flowering, pollination and seed dispersal.**
Essential Question	**How are organisms structured to ensure efficiency and survival?**
Content Standard:	**2.2 – Plants change their forms as part of their life cycles.**
Performance Expectations (Student outcomes)	**GRADE-LEVEL EXPECTATIONS:** 1. **Flowering plants progress through a sequenced life cycle. First, seeds sprout (germinate), then seedlings grow into adult plants with leaves and flowers. If the flowers are pollinated, seeds develop that will grow into new plants to continue the life cycle.** 2. **Roots, stems, leaves, flowers and seeds are structures that develop during different stages of the plant's life cycle.** 3. **Seeds contain the beginnings of a new plant (embryo) and the food (energy source) the new plant needs to grow until it is mature enough to produce its own food. Different plant varieties produce seeds of different size, color and shape.** 4. **Environmental conditions, such as temperature, amount of light, amount of water and type of soil, affect seed germination and plant development.** 5. **A plant's seed will grow into a new plant that resembles but is not identical to the parent plant or to other new plants. For example, marigold plants produce marigold seeds that grow into new marigold plants. Individual marigolds, however, vary in height, number of leaves, etc.** 6. **Seedlings are young plants that produce the structures that will be needed by the plant to survive in its environment: Roots and leaves begin to grow and take in nutrients, water and air; and the stem starts to grow**

	towards sunlight. 7. **Adult plants form more leaves that help the plant collect sunlight and air to make its food. They produce flowers that are the structures responsible for reproduction.** 8. **Flowers have structures that produce pollen, attract pollinators and produce seeds that can grow into new plants. Some flowers have structures that develop into fruits, berries or nuts that contain the seeds that can grow into new plants.** 9. **Some seeds fall to the ground and germinate close to the parent plant; other seeds are carried (dispersed) by wind animals, or water to places far away. The structure of the seed is related to the way it is dispersed.**

Strategies/Modes (examples)	**Materials/Resources (examples)**	**Assessments (examples)**
	KEY SCIENCE VOCABULARY: life cycle, structures (body parts), seed, germinate, reproduce, flower, pollen, pollinator, seed dispersal	**CMT Expected Performances** **A 19. Describe the life cycles of flowering plants as they grow from seeds, proceed through maturation and produce new seeds.** **A 20. Explore and describe the effects of light and water on seed germination and plant growth.**
<u>Note: Rock, Sand, and Silt should be covered before New Plants.</u>		
2.2.1-2.2.9; 2.3.1; 2.3.2-2.3.4 <u>New Plants Module</u> Activity 1: Brassica Seeds Each student plants tiny rapid-cycling brassica seeds in a planter cup. The cups are kept in a tray under a continuous light source. The brassica plants grow and develop for a month while the students care for, observe, and record the complete life cycle. ❖ Plants are living organisms ❖ Seeds are alive and grow into new plants. ❖ As plants grow they develop roots,	**FOSS Science- New Plants Module** **Vocabulary:** Alive, brassica, bud, change, dead, fertilizer, flower, germination, grow, leaf, plant, root, seed, seedpod, soil, sprout, stem	**Label the parts of a mature brassica plant.**

stems, leaves, buds, flowers, and seeds in a sequence called a life cycle. Activity 2: Grass and Grain Seeds Students plant their own miniature lawns with rye grass and alfalfa. Periodically the lawns are mowed to observe the response of grass and alfalfa to cutting. Next students plant individual wheat seeds in clear soda straws in order to observe in detail how grain seeds germinate and grow. ❖ Plants are living organisms. ❖ Seeds are alive. ❖ Seeds grow into new plants. ❖ Plants need water and light to grow. ❖ Some plants die and some plants continue to grow after they are mowed. Activity 3: Stems Students make new plants from stems of house plants. They put sections of stems from mints, ivies, and other plants into water and look for evidence that a new plant is forming. Stem pieces that develop roots are planted to make new plants. Students also plant pieces of potatoes (modified stems) and observe them grow into plants. New plants can grow from parts of mature plants. Plants need water and light to grow. Some stems can develop roots when placed in water. The locations on stems where leaves, twigs, and roots (usually) develop are called nodes. Activity 4: Bulbs and Roots	**Vocabulary:** Bud, change, different, fertilizer, germination, grain, grass, grow, lawn, leaf, mold, plant, root, same, seed, soil, sprout, stem, structure **Vocabulary:** Alive, bud, cutting, fertilizer, grow, leaf, node, plant, root, soil, sprout, stem	**Organize growing and mowing pictures.** **Plant oat seeds in straws.** **Grow new plants from leaves: African violets, jade plants, coleus** **Draw pictures of a bulb as it develops over time.**

Students plant onion bulbs and garlic cloves in moist cotton and observe as they develop into new plants. Later they plant parts of produce-store roots-carrots and radishes-to discover which parts will develop into new plants. ❖ Bulbs are alive. ❖ Bulbs need water to start growing and water and light to continue growing. ❖ Parts of roots (the part near the stem) will grow into new plants; other parts will not.	**Vocabulary:** Bud, bulb, leaf, plant, root, sprout, stem, vermiculite	

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CSDE Standard	***The Changing Earth***
Enduring Understanding	**Soils can be described by their color, texture and capacity to retain water.**
Essential Question	***How do materials cycle through the Earth's systems?***
Content Standard:	**2.3 – Earth materials have varied physical properties which make them useful in different ways.**
Performance Expectations (Student outcomes)	**GRADE-LEVEL CONCEPT 1: ◆ Soils can be described by their color, texture and capacity to retain water.** **GRADE-LEVEL EXPECTATIONS:** **1. Soil is a mixture of pieces of rock (particles), living and once living things (humus), water and air. The components of soil can be separated using sieves and settlement tests.** **2. There are different types of soil that vary from place to place. Soil properties can be observed and compared. Soils can be classified by properties such as color, particle size, or amount of organic material (humus). Digging a deep hole shows that soils are often found in layers that have different colors and textures.** **3. The size of the particles in soils gives the soil its texture. Soils can be classified by how they feel: Sandy soils feel gritty, silty soils feel powdery, clay soils feel sticky, and soils with small rocks feel rough and scratchy.** **4. The broken rocks that make up soils can be tiny (silt and clay), medium (sand), or large (pebbles). Soils can be classified by the size of their particles.** **5. A soil's texture affects how it packs together; soils that pack together tightly hold less air and water than soils that stay loosely packed.** **6. There are different types of soil that vary from place to place. Some soil types are suited for supporting the weight of buildings and highways; other soil types are suited for planting food crops or forest growth.**

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Strategies/Modes (examples)	Materials/Resources (examples)	Assessments (examples)
	KEY SCIENCE VOCABULARY: soil, property, classify, mixture, particle, humus, sand, silt, clay, texture, nutrients	**CMT Expected Performances** **A 21. Sort different soils by properties, such as particle size, color and composition.** **A 22. Relate the properties of different soils to their capacity to retain water and support the growth of certain plants.**
<u>Note: Pebbles, Sand, and Silt should be covered before New Plants.</u> 2.3.1 -2.3.6 Pebbles, Sand, and Silt Module Investigation 1: First Rocks Students are introduced to the mineral portion of the planet on which they live. They investigate several kinds of rocks an begin to understand the properties of rocks. Students rub rocks, wash rocks, sort rocks and describe rocks. They also begin to organize a class rock collection. ❖ Rocks have a variety of properties including color, hardness, shape, texture, and size. ❖ Rocks can be sorted by their properties. ❖ Rocks are all around us. ❖ Rocks are the solid materials of the earth. Part 1: Three Rocks How are rocks different? What happens when rocks rub together? (40-50 minutes) Students investigate and sort a set of six rocks. They gather information about the rocks by matching the rock samples and	**FOSS Science: Pebbles, Sand, and Silt Module** **Vocabulary:** basalt, collection, crystal, different, dull, flat, geologist, group, large, museum, pointed, rock, rough, round, same, scoria, shape, small, smooth, sort, striped, texture, tuff	**Anecdotal notes** **Student Sheet (Check for observation skills,**

rubbing them together. ❖ Rocks have a variety of properties. ❖ When rocks rub together, some (softer) rocks may be chipped or scratched, or make rock dust. Part 2: Washing Three Rocks What happens when rocks are washed? (40-50 minutes) Students wash their samples to see how the rocks change when they are wet and what happens to the wash water. ❖ Rocks have a variety of properties. ❖ When rocks are washed in water, the colors or sparkling qualities are enhanced. Part 3: First Sorting How are some rocks the same? (40-50 minutes) Students are introduced to river rocks. They listen to the story *Peter and the Rocks* and use ideas from the story and Part 2 to sort their river rocks. ❖ Rocks can be sorted by their properties. Part 4: Sorting Games How many ways can rocks be sorted? (40-50 minutes) Students use sorting mats to play sorting games with the river rocks. ❖ Rocks can be sorted by their properties. Part 5: Start a Rock Collection What rocks can we find around us?		**good descriptions, and use of new vocabulary.)** ***Rock Record*** **Anecdotal notes** **Teacher Observation** **Check for sorting skills.** **Anecdotal notes**

(30-40 minutes) Students start to organize a classroom rock collection. ❖ Rocks are all around us. ❖ Rocks are the solid material of the earth.		**Anecdotal notes**
Investigation 2: River Rocks Students investigate a river rock mixture of earth materials of different sizes. They separate the rocks, using a series of three screens to identify five sizes of rocks; large pebbles, large gravel, small gravel, and sand. They add water to a vial of sand to discover silt and clay. ❖ Rocks can be categorized by size. ❖ Screens and water can be used to sort the sizes of earth materials. ❖ Five sizes of rocks, from smallest to largest are clay, silt, sand, gravel, and pebbles.		**Student sheet/ Teacher observation** **Check for ability to observe and sort** ***Sand, Gravel, and Pebbles***
Part 1: Screening River Rocks How can rocks be sorted by size? (50-60 minutes) Students separate a river rock mixture, using a set of three screens. At the end of the separation, students discover they have five sizes of materials: large pebbles, small pebbles, large gravel, small gravel, and sand. ❖ Screens can be used to sort the sizes of earth materials. ❖ Rock sizes include sand, small gravel, large gravel, small pebbles, and large pebbles.		**Student Sheet** **Check for ability to observe for good descriptions.** ***Sand and Clay Drawings***
Part 2: River Rocks by Size How else can rocks be sorted by size?		**Student Sheet** **Check for ability to observe and compare.**

(40-50 minutes) Students use a student sheet to reinforce the idea of grouping rocks based on size. ❖ Rocks can be categorized visually by size? ❖ Rock sizes include sand, small gravel, large gravel, small pebbles, and large pebbles. ❖ Rocks larger than pebbles are cobbles. ❖ Rocks larger than cobbles are boulders. Part 3: Sand and Silt Is there an earth material smaller than sand? (30-40 minutes; plus 20 minutes the next day) Students take a close look at sand and separate sand particles from silt particles, which are smaller than the sand, by mixing the sand with water and allowing the particles to settle. They observe that the sand settles to the bottom and the silt forms a layer on top of the sand. ❖ Sand often contains smaller particles, called silt. ❖ Water can be used to sort the sizes of earth materials. Part 4: Exploring Clay Is there an earth material smaller than silt? (Two 30-minute sessions) ❖ Students investigate the properties of very small rock particles, clay. ❖ Clay particles are very small, even smaller than silt. Investigation 3: Using Rocks Students learn how people use earth		***Bottle Drawing*** **Anecdotal notes** **Anecdotal notes**

materials to construct objects. They make rubbings from sandpaper, sculptures from sand, decorative jewelry from clay, and bricks from clay soil. They go on a schoolyard field trip to look for places where earth materials occur naturally and where people have incorporated earth materials into building materials. ❖ Earth materials are natural resources. ❖ The properties of different earth materials make suitable for specific uses. ❖ Earth materials can be used in a variety of constructions. Part 1: Rocks in Use How do people use earth materials? (40-50 minutes) Students learn how people use rocks as natural resources to construct objects and to make useful materials. They start by looking outside the school building for places where earth materials can be found naturally or as building materials. ❖ Earth materials are natural resources. ❖ The properties of different earth materials make each suitable for specific uses. ❖ Earth materials are natural resources. ❖ The properties of different earth materials make each suitable for specific uses. ❖ Earth materials are commonly used in the construction of building and streets. Part 2: Looking at Sandpaper What does sand do for the sandpaper? (15-20 minutes for each group of students) Students observe sandpaper and compare it	**Vocabulary:** asphalt, bead, brick, build, coarse, concrete, fine, harden, matrix, medium, mortar, sandpaper, sculpture, sidewalk, texture	**Anecdotal notes** **Anecdotal notes** **Student sheet** **Students observe uses for earth materials.** ***Uses of Earth Materials***

to sand. They make and compare rubbings of three grades of sandpaper. ❖ The properties of different earth materials make each suitable for specific uses. ❖ Earth materials are used to make sculptures. Part 3: Sand Sculptures How else can sand be used? (40-50 minutes) Students mix sand with a cornstarch matrix to make durable sand sculptures. ❖ The properties of different earth materials make each suitable for specific uses. ❖ Earth materials are used to make sculptures. Part 4: Clay Beads What can be made with clay? (30-40 minutes plus 20 minutes 2 or 3 days) Students use clay to make beads or something decorative, which they paint and keep as a memento of their investigation of clay. Part 5: Making Bricks How are bricks made? (20 minutes for each group of students; 30 minutes a week later when bricks are dry) Students make adobe clay bricks with a mixture of clay soil, dry grass or weeds, and water. After the bricks dry, they can be used to build a class wall. ❖ The properties of different earth materials make each suitable for specific uses. ❖ Simple bricks are made by combining		**Teacher Observation** **Assess students' skills at using plates, screens, and vials for separating soil.** **Anecdotal notes** **Student sheet** **Check for ability to observe and record.** ***Soil Drawings***

clay soil with plant material. Investigation 4: Soil Exploration Students put together and take apart soils. They are introduced to humus as an ingredient in soil. Homemade and local soils are compared, using techniques introduced in Investigation 2. ❖ Soil is a mixture of earth materials. ❖ Soils vary from place to place. ❖ Soils have properties of color and texture. ❖ Soils differ in their abilities to support plants. ❖ Soils can be composed of humus and different amounts and sizes of rocks. Part 1: Homemade Soil What's in dirt? (three 30-40 minute sessions) Students put together and take apart soils. They are introduced to humus, an important soil ingredient. They mix together homemade soil containing sand, gravel, pebbles, and humus. They shake some of the soil on a paper plate and observe what happens. They use screens to separate the homemade soil. They shake soil and water together in a vial and draw their observations. ❖ Soil is a mixture of earth materials. ❖ Humus is decayed material from plants and animals. ❖ The ingredients of soil can be observed by mixing soil with water, shaking it, and letting it settle. Part 2: Soil Search Are all soils the same? (20 minutes for class introduction and wrap-	**Vocabulary:** alike, amount, different, humus, ingredient, sample, soil	

up; 15 minutes for each group to collect soil) Students go on a schoolyard field trip to collect soil samples. They try to find soil in as many places as possible: next to sidewalks, near trees, and in landscaped areas. ❖ Soils vary from place to place. ❖ Soils have properties of color and texture. ❖ Different soils differ n their ability to support plants. Part 3: Studying Local Soil How do soils differ? (two 40-minute sessions) Students study their schoolyard soil samples. They shake some of the soil with water in vials and draw the results. They compare the vials and drawings of their schoolyard samples with the vials and drawings of the homemade soil. ❖ Soils can be composed of humus and different amounts and sizes of rocks.		

Seymour Public Schools Curriculum

Grade: two	**Subject: Science**
CSDE Standard	***The Changing Earth***
Enduring Understanding	**Soils support the growth of many kinds of plants, including those in our food supply.**
Essential Question	***How do materials cycle through the Earth's systems?***
Content Standard:	**2.3 – Earth materials have varied physical properties which make them useful in different ways.**
Performance Expectations (Student outcomes)	**GRADE-LEVEL CONCEPT 2: ◆ Soils support the growth of many kinds of plants, including those in our food supply.** **GRADE-LEVEL EXPECTATIONS:** **1. Many plants need soil to grow. Soil holds water and nutrients that are taken in (absorbed) by plant roots.** **2. Soil is a habitat for many living things. Some organisms live in the soil and others live on the soil. Worms and other underground animals create spaces for air, water and plant roots to move through soil.** **3. Plants we eat ("crops") grow in different soil types. Plant height, root length, number of leaves, and number of flowers can all be affected by how much water, air and organic material the soil holds.** **4. To support the growth of different plants, people can change the properties of soils by adding nutrients (fertilizing), water (irrigating) or air (tilling).**

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Strategies/Modes (examples)	Materials/Resources (examples)	Assessments (examples)
	KEY SCIENCE VOCABULARY: soil, property, classify, mixture, particle, humus, sand, silt, clay, texture, nutrients **2.3.2-2.3.4 (need some additional resources)**	**CMT Expected Performances** **A 21. Sort different soils by properties, such as particle size, color and composition.** **A 22. Relate the properties of different soils to their capacity to retain water and support the growth of certain plants.**

Seymour Public Schools Curriculum

Grade: two	**Subject: Science**
CSDE Standard	***Science and Technology***
Enduring Understanding	**1. The essential components of balanced nutrition can be obtained from plant and animal sources.** **2. People eat different foods in order to satisfy nutritional needs for carbohydrates, proteins and fats.**
Essential Question	***How do science and technology affect the quality of our lives?***
Content Standard:	**2.4 – Human beings, like all other living things, have special nutritional needs for survival.**
Performance Expectations (Student outcomes)	**GRADE-LEVEL CONCEPT 1: ◆ The essential components of balanced nutrition can be obtained from plant and animal sources.** **GRADE-LEVEL EXPECTATIONS:** **1. People need to eat a variety of foods to get the energy and nutrients they need to grow, move and stay healthy. Foods are classified as grains, fruits, vegetables, dairy, meats and beans, and oils.** **2. Some foods people eat come from plants that grow wild or are planted by farmers as crops. A fruit is the ripened ovary of a flower; vegetables are the roots, stems, leaves or flowers of plants.** **3. Some foods people eat come from animals that are wild or are raised on ranches. Meat, fish, dairy products and eggs all come from animals.** **4. The types of crops that can grow in an area depend on the climate and soil. Some foods are grown and sold by local farms, and some foods are grown far away and transported to local grocery stores.**

Seymour Public Schools Curriculum

Strategies/Modes (examples)	Materials/Resources (examples)	Assessments (examples)
	KEY SCIENCE VOCABULARY: nutrient, crop, grain, carbohydrate, protein, dairy, fats, oils, energy	**CMT Expected Performances** **A 23. Identify the sources of common foods and classify them by their basic food groups.** **A 24. Describe how people in different cultures use different food sources to meet their nutritional needs.**
2.4.1-2.4.4 ❖ Students complete a KWL chart for the five major food groups (grain, fruits, vegetables, milk, meats and beans, as well as fats and oils and discretionary and identify foods that will fit in each food category. ❖ Students will survey their classmates on who eats breakfast and what they eat (cereal, waffles, eggs, nothing, other) and graph their answers. (A INQ. 10) ❖ To demonstrate the need to eat every day from all five major foods groups. Students try to perform a task (writing their name) without one of the food groups (they cannot use their thumb, which represents vegetables). Repeat while removing other food groups (and fingers to be used).	**http://www.mypyramid.gov** **http://www.nutritionexplorations.org** **http://www.5aday.com** **http://www.healthyteacher.com** **Grocery store circular/culinary magazines**	**Students will cut out pictures from a grocery store circular or magazines and paste the foods under the correct food group headings (A INQ. 5)** **Students will develop a complete, balanced set of daily meals, including snacks, and draw them on paper plates. (A INQ. 6)**

Seymour Public Schools Curriculum

Grade: two	**Subject: Science**
CSDE Standard	***Science and Technology***
Enduring Understanding	**1. The essential components of balanced nutrition can be obtained from plant and animal sources.** **2. People eat different foods in order to satisfy nutritional needs for carbohydrates, proteins and fats.**
Essential Question	***How do science and technology affect the quality of our lives?***
Content Standard:	**2.4 – Human beings, like all other living things, have special nutritional needs for survival.**
Performance Expectations (Student outcomes)	**GRADE-LEVEL CONCEPT 2: ◆ People eat different foods in order to satisfy nutritional needs for carbohydrates, proteins and fats.** **GRADE-LEVEL EXPECTATIONS:** 1. **All people need the same basic nutrients to grow, move and stay healthy; different cultures satisfy these needs by consuming different foods.** 2. **The level of energy and nutrients individuals need depends on their age, gender and how active they are.** 3. **Most foods contain a combination of nutrients. Labels on food packages describe the nutrients contained in the food and how much energy the food provides (calories).** 4. **Breads, cereals, rice and pasta are sources of carbohydrates, which provide energy.** 5. **Meat, poultry, fish, beans, eggs and nuts are sources of protein, which keeps the body working properly.** 6. **Fruits and vegetables are sources of vitamins and minerals, which keep the body healthy.**

	7. **Nuts, meats and fish are sources of fats and oils, which provide energy.**

Strategies/Modes (examples)	Materials/Resources (examples)	Assessments (examples)
	KEY SCIENCE VOCABULARY: nutrient, crop, grain, carbohydrate, protein, dairy, fats, oils, energy	**CMT Expected Performances** **A 23. Identify the sources of common foods and classify them by their basic food groups.** **A 24. Describe how people in different cultures use different food sources to meet their nutritional needs.**
2.4.1-2.4.7 Students will complete a KWL chart about how they acquire food (grocery store, restaurant). Teacher will ask where do grocery stores get their food. What happens in other countries where there are no grocery stores? How do these families acquire food? Discuss how those communities living near cattle farms eat more meat. Students will list different ethnic foods they know. (Mexican, Italian, American, etc.). Students will identify similarities and differences of these foods and discuss why they think different cultures have different food choices.		**Students will create a menu for a restaurant. Each restaurant will be of a different ethnic origin.**

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APPENDIX

Science CMT Handbook ..\Science\science_cmt_handbook.pdf