ROBBINSVILLE PUBLIC SCHOOLS

OFFICE OF CURRICULUM AND INSTRUCTION

DEPARTMENT
Science

COURSE TITLE
Second Grade Science

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BOARD OF EDUCATION INITIAL ADOPTION DATE:

Course Philosophy

Every individual develops intellectually...

Garamond 12 & Justify

Course Description

Garamond 12 & Justify

Core and Supplemental Instructional Materials

Core Materials	Supplemental Materials
• FOSS science resource books • FOSS material kits • FOSS online videos • FOSS online activities	• BrainPOP Jr. • Discovery Kids • National Geographic Kids

Social Emotional Learning Connections
Below are the five core SEL Competencies as outlined by CASEL, and examples of how each may be addressed within this curriculum
Self-awareness: The ability to accurately recognize one's emotions and thoughts and their influence on behavior. This includes accurately assessing one's strengths and limitations and possessing a well-grounded sense of confidence and optimism. **Example 1:** Establish shared norms, expectations, and routines for classroom behavior. **Example 2:** Self-reflection checklists after completing self-directed learning center activities.
Self-management: The ability to regulate one's emotions, thoughts, and behaviors effectively in different situations. This includes managing stress, controlling impulses, motivating oneself, and setting and working toward achieving personal and academic goals. **Example 1:** Goal setting activities during self-directed learning center activities. **Example 2:** Discussion of Growth Mindset and Fixed Mindset, using videos, read alouds, and chart.
Social awareness: The ability to take the perspective of and empathize with others from diverse backgrounds and cultures, to understand social and ethical norms for behavior, and to recognize family, school, and community resources and supports. **Example 1:** Adding multicultural books into everyday learning.
Relationship skills: The ability to establish and maintain healthy and rewarding relationships with diverse individuals and groups. This includes communicating clearly, listening actively, cooperating, resisting inappropriate social pressure, negotiating conflict constructively, and seeking and offering help when needed. **Example 1:** Morning meeting games to prompt responsive classroom, which will foster positive classroom relationships. **Example 2:** Students will be provided with opportunities to build content knowledge through collaboration and sharing ideas during presentations, projects and group work.
Responsible decision-making: The ability to make constructive and respectful choices about personal behavior and social interactions based on consideration of ethical standards, safety concerns, social norms, the realistic evaluation of consequences of various actions, and the well-being of self and others.

Example 1: Creating classroom rules and revisiting the expectations when needed. Using read alouds to prompt the conversation.
Example 2: Use a lesson to teach students a simple formula for making good decisions (e.g., stop, calm down, identify the choice to be made, consider the options, make a choice and do it, how did it go?). Post the decision-making formula in the classroom.

Integration of 21st Century Themes and Skills

NJSLS-CLKS 9.4: Life Literacies and Key Skills	
Creativity and Innovation	Can be found in unit: 1: Insects and Plants 2: Pebbles, Sand, and Silt 3: Solids and Liquids 9.4.2.CI.1: Demonstrate openness to new ideas and perspectives. 9.4.2.CI.2: Demonstrates originality and inventiveness in work.
Critical Thinking and Problem Solving	Can be found in unit: 1: Insects and Plants 2: Pebbles, Sand, and Silt 3: Solids and Liquids 9.4.2.CT.1: Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem. 9.4.2.CT.2: Identify possible approaches and resources to execute a plan. 9.4.2.CT.3: Uses a variety of types of thinking to solve problems (e.g., inductive, deductive).
Digital Citizenship	Can be found in unit: 1: Insects and Plants 2: Pebbles, Sand, and Silt 3: Solids and Liquids 9.4.2.DC.3: Explain how to be safe online and follow safe practices when using the internet.
Global and Cultural Awareness	Can be found in unit:

	1: Insects and Plants 2: Pebbles, Sand, and Silt 3: Solids and Liquids 9.4.2.GCA:1: Articulate the role of culture in everyday life by describing one's own culture and comparing it to the cultures of other individuals.
Information and Media Literacy	Can be found in unit: 1: Insects and Plants 2: Pebbles, Sand, and Silt 3: Solids and Liquids 9.4.2.IML.1: Identify a simple search term to find information in a search engine or digital resource. 9.4.2.IML.3: Use a variety of sources including multimedia sources to find information about topics such as climate change, with guidance and support from adults. 9.4.2.IML.4: Compare and contrast the way information is shared in a variety of contexts (social, academic, athletic, etc.).
Technology Literacy	Can be found in unit: 1: Insects and Plants 2: Pebbles, Sand, and Silt 3: Solids and Liquids 9.4.2.TL.1: Identify the basic features of a digital tool and explain the purpose of the tool. 9.4.2.TL.2: Create a document using a word processing application. 9.4.2.TL.3: Enter information into a spreadsheet and sort the information. 9.4.2.TL.4: Navigate a virtual space to build context and describe the visual content. 9.4.2.TL.5: Describe the difference between real and virtual experiences.

	9.4.2.TL.6: Illustrate and communicate ideas and stories using multiple digital tools.

Robbinsville Ready 21st Century Skill Integration

The following skills will be embedded throughout the curriculum and instruction of this course.

Collaborative Team Member: Robbinsville students will learn more by working together than in isolation. As educational theorist Lev Vygotsky advocated, learning is a social process. Many workplaces today encourage employees to work in teams to solicit diverse perspectives, brainstorm new ideas and/or products, and solve problems. Further, collaboration fosters interpersonal relationships, self-management skills, cooperation, and a sense of collective responsibility. Collaborative team members are able to work with diverse groups of people who hold a variety of perspectives.

Effective Communicator: Robbinsville students must be able to clearly articulate their ideas orally, in writing, and across various media in order to successfully connect to the world around them. As the world becomes increasingly globalized, communication is more than just sharing one's ideas. Effective communicators are able to communicate their convictions, actively listen and analyze others' work to identify perspective and/or potential bias.

Emotionally Intelligent Learner: Robbinsville students who are emotionally intelligent learn to be empathetic, demonstrate integrity and ethical behavior, are kind, are self-aware, willing to change, and practice self-care. They are better able to cope with the demands of the 21st century digital society and workplace because they are reliable, responsible, form stable and healthy relationships, and seek to grow personally and professionally. Emotionally intelligent people are able to manage their emotions, work effectively on teams and are leaders who can grow and help to develop others.

Informed and Involved Citizen: Robbinsville students need to be digital citizens who are civically and globally aware. The concept of what it means to be "literate" has evolved along with 21st century technological and cultural shifts. Our progressive vision of literacy entails having our students explore real world problems in the classroom. Informed and involved citizens are able to safely and accurately communicate with people all around the world and are financially, environmentally and informationally literate.

Innovative Thinker: Robbinsville students must encompass innovative thinking skills in order to be successful lifelong learners in the 21st century world. As stated by Karl Fisch and Scott McLeod in the short film Shift Happens, "We are currently preparing students for jobs that don't yet exist . . . using technologies that haven't been invented . . . in order to solve problems we don't even know are problems yet." Innovative thinkers are able to think analytically, solve problems critically, creatively engage in curiosity and tinkering, and demonstrate originality.

Resilient and Self-Directed Learner: Robbinsville students need to take risks and ultimately make independent and informed decisions in an ever-changing world. Author of Life, the Truth, and Being Free, Steve Maraboli stated, "Life doesn't get easier or more forgiving, we get stronger and more resilient." Self-directed scholars of the 21st century are able to set goals, initiate resolutions by seeking creative approaches, and adjust their thinking in light of difficult situations. Resilient students are able to take risks without fear of failure and overcome setbacks by utilizing experiences to confront new challenges. Resilient and self directed scholars will consistently embrace opportunities to initiate solutions and overcome obstacles.

Career Awareness and Planning Standards 9.2	
9.2.4.A.2: Identify various life roles and civic and work-related activities in the school, home, and community.	Students make the connection between the scientific processes that they encounter in the world and their community and the corresponding work roles that are related to these concepts. For example, when learning about earth materials, identifying the role of construction workers and engineers in the community and how they utilize this information.

Robbinsville Public Schools
Scope, Sequence, Pacing and Assessment

Second Grade Science

Unit Title	Unit Understandings and Goals	Recommended Duration/ Pacing	Assessments
Insects and Plants	**<u>Investigation 1:</u>** ● Insects need air, food, water, and space. ● The life cycle of the beetle is egg, larva, pupa, and adult, which produces egg. ● Insects have characteristics, structures and behaviors. ● Adult insects have a head, throat, thorax, and abdomen. ● Insects have predictable characteristics at different stages of development. **<u>Investigation 2:</u>** ● Plants need water, air, nutrients, light, and space. ● As plants grow, they develop roots, stems, leaves, bugs, flowers, and seeds in a sequence called a life cycle. Seeds develop into new plants that look like the parent plant. ● Animals disperse seeds, moving them from one location to another where they grow. ● Bees and other insects help some other plants by moving pollen from flower to flower. **<u>Investigation 3:</u>**	30 days	Formative • Notebook entries ○ Investigation 1Part 1: Students will answer: "What do living mealworms need to live?" ○ Investigation 1 Part 2: Students will answer: "How do mealworms grow and change?" ○ Investigation 2 Part 1: Students will answer: "How did we plant the brassica seeds?" ○ Investigation 2 Part 2: Students will answer: "How does a young plant change as it grows?" ○ Investigation 2 Part 3: Students label parts of the brassica plant (notebook sheet 6/7) • Notebook entry share Summative · Performance assessment (observe collaborative group work) Common Benchmark Assessments (mid/end of course) · I-Check Alternative Assessments (projects, etc when appropriate) ·

	• Insects need air, food, water, and appropriate space including shelter; different insects meet these needs in different ways. • The life cycle of some insects is egg, nymph stages, and adult, which produces eggs. • Variations exist within a group of related organisms. • As insects grow, they molt their exoskeleton.		
Pebbles, Sand, and Silt	**<u>Investigation 1:</u>** • Rocks are earth materials and can be described by property of size. • Rock sizes include clay, silt, sand, gravel, pebbles, cobbles, and boulders. • Weathering, caused by wind or water, causes larger rocks to break into smaller rocks. • Some Earth events happen very quickly; others occur very slowly over a long period of time. **<u>Investigation 2:</u>** • Rocks are earth materials and can be described by property of size. • Rock sizes include clay, silt, sand, gravel, pebbles, cobbles, and boulders. • Weathering, caused by wind or water, causes larger rocks to break into smaller rocks. • Some Earth events happen very quickly; others occur very slowly over a long period of time. **<u>Investigation 3:</u>** • Earth materials are natural resources. • The properties of different earth materials make them suitable for specific uses. • Different sizes of sand are used on sandpaper to change the surface of wood	30 days	Formative · Notebook entries ○ Investigation 1 Part 1: Students answer: "What happens when rocks rub together?" ○ Investigation 1 Part 2: Students will answer: "What happens when rocks are placed in water?" ○ Investigation 1 Part 3: Students will answer: "How are river rocks the same?" ○ Investigation 1 Part 4: Students will answer: "What are the properties of schoolyard rocks?" ○ Investigation 2 Part 1: Students will answer: "How can rocks be separated by size?" ○ Investigation 2 Part 2: Students will answer: "How else can rocks be separated by size?" ○ Investigation 2 Part 3: Students will answer: "What are the materials in the vials?" ○ Investigation 3 Part 1: Students will answer: "How do people use earth materials?" ○ Investigation 3 Part 2: Students will answer: "What does sand do for sandpaper?" ○ Investigation 3 Part 3: *See performance assessment ○ Investigation 3 Part 4: Students will answer: "What makes clay the best earth material for making beads?" · Notebook entry share Summative · Performance assessment (observe collaborative group work)

	from rough to smooth. ● Earth materials are commonly used in the construction of buildings and streets. ● Earth materials are used to make sculptures and jewelry.		Common Benchmark Assessments (mid/end of course) · I-Check Alternative Assessments (projects, etc when appropriate) ·
Solids and Liquids	**<u>Investigation 1: Solids</u>** ● Solid is one state or phase of matter ● Objects are defined by their properties ● Objects are made of more than one material ● Natural and human made objects occur outdoors **<u>Investigation 2: Liquids</u>** ● Liquid is one commons state of matter ● Liquids move freely in containers ● Liquids have many properties to help identify them ● Liquids take the shape of their containers ● The surfaces of liquids are flat and level ● Liquids pour and flow **<u>Investigation 3: Bits and Pieces</u>** ● Solid materials can occur as masses of small particles ● A mass of particulate matter can form piles and support a more dense object on its surface ● Masses of particulate can pour ● The surface of mass and of particles is not flat and level ● Particulate solids can be separated by size ● Particulate matter occurs naturally in the outdoors	30 days	Formative · Notebook entries ○ Investigation 1 Part 1: Students will answer: "How can a solid object be described?" ○ Investigation 1 Part 2: Students will name materials from which objects are made ○ Investigation 1 Part 3: Students will answer: "Can two or more objects have the same property?" ○ Investigation 1 Part 4: Students will answer: "What are the properties of a successful tower?" ○ Investigation 2 Part 1: Students will answer: "How are liquids different from each other?" ○ Investigation 2 Part 2: Students will answer: "How can liquids be described?" ○ Investigation 2 Part 3: Liquid Level in a Bottle Sheet/ Falling Bottle Puzzle ○ Investigation 3 Part 1: Students will answer: "Are these materials solids or liquids?" based on particulate materials from investigation. ○ Investigation 3 Part 2: Students will answer: "How can mixtures of particles be separated?" ○ Investigation 3 Part 4: Students describe a rule that could help someone separate mixture of materials of two sizes. · Notebook entry share Summative · Performance assessment (observe collaborative group work) Common Benchmark Assessments (mid/end of course) · I-Check Alternative Assessments (projects, etc when appropriate) ·

Robbinsville Public Schools

Unit #: 1

Enduring Understandings:	**Essential Questions:**
● All living things need food, water, a way to dispose of waste, and an environment in which they can live. ● Reproduction is essential to the continued existence of every kind of organism. Organisms have diverse life cycles. ● Organisms and populations of organisms are dependent on their environmental interactions both with other living things and nonliving factors. ● Biological evolution, the process by which all living things have evolved over many generations from common ancestors, explains both unit and diversity of species.	Investigation 1: Mealworms ● What do mealworms need to live? ● How do mealworms grow and change? ● What are the stages of a beatles life? Investigation 2: Brassica Seeds ● How do you plant brassica seeds? ● How does a young plant change as it grows? ● What will happen to flowers on the brassica plants? ● Where is a good outdoor place for growing young plants? Investigation 3: Milkweed Bugs ● What are the yellow objects and how do they change over time? ● What do milkweed bugs need in their habitat? ● How do milkweed bugs grow and change? ● Where do insects live?

Interdisciplinary Connections

RI1: Ask and answer questions to demonstrate understanding.
RI2: Identify the main topic of a text.
RI5: Know and use text features.
W8: Gather information from provided sources to answer a question.
SL1: Participate in collaborative conversations.
SL2: Recount or describe key ideas.
SL6: Produce complete sentences.
L1: Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
L4: Determine or clarify the meaning of unknown or multiple-meaning words and phrases.
L6: Use acquired words or phrases.

- Have students ask and answer who, what, where, when, why, and how questions about readings in reference books to demonstrate understanding of key details.
- Have students describe the connection between scientific ideas or concepts, or steps in technical procedures in a text.
- Have students use reasons to support specific points the author makes in a text.
- Students will also use the following skills: Reading comprehension, identifying main ideas, using text features, using images to explain text.

- Have students use notebooks to: strengthen writing by revising, recall information from experiences, gather information from provided sources to answer a question.

Guiding / Topical Questions with Specific Standards		Content, Themes, Concepts, and Skills	Teaching Strategies	Instructional Resources and Materials	Assessment Strategies
	Investigation 1: How do organisms live, grow, respond to their environment, and reproduce?	**Content (Vocabulary):** air, bran, food, habitat, insect, living, mealworm, observe, organism, space, structure, water, abdomen, adult, antennae, beetle, dropping, exoskeleton, head, larvae, leg, molt, molting, pupae, segment, stage, thorax	Observe beetles change from larvae to pupae to adults. Communicate observations of the structures, behaviors, and life cycle of insects in words and drawings. Provide for the basic needs of living insects in a classroom habitat.	Content-specific anchor charts, content-specific word wall Student resources book FOSS online activities FOSS online videos	Science notebook entry Performance-based assessment Investigation checks for each investigation
LS1.A: All organisms have external parts. Different animals use their body parts in different ways.		**Concepts:** Insects need air, food, water, and space.			
LS1.B: Reproduction is essential to continued existence of every kind of organisms.		The life cycle of the beetle is egg, larva, pupa, and adult, which produces egg.			
LS1:C: All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow.		Insects have characteristics structures and behaviors.			
		Adult insects have a head, throat, thorax, and abdomen.			
LS2.A: Plants depend on water and light to grow. Plants depend on animals for pollination and to move seeds.		Insects have predictable characteristics at different stages of development.			
LS4.D: There are many different kinds of living things to see in any area, and they exist in different places on land and in water.					

ETS1.A: ETS1.B: ETS1.C:	**<u>Investigation 2:</u>** How do organisms love, grow, and reproduce? How and why do organisms interact with their environment and what are the effects of these interactions? How can there be so many similarities among organisms yet so many different types of plants, animals, and microorganisms? How do engineers solve problems? Defining and delimiting engineering problems. Developing possible solutions. Optimizing the design solution.	**Content (Vocabulary):** bud, flower, germination, leaf, pollen, pollination, seedling, sprout, stem **Concepts:** Plants need water, air, nutrients, light, and space. As plants grow, they develop roots, stems, leaves, bugs, flowers, and seeds in a sequence called a life cycle. Seeds develop into new plants that look like the parent plant. Animals disperse seeds, moving them from one location to another where they grow. Bees and other insects help some other plants by moving pollen from flower to flower.	Plant rapid-cycling brassica seeds in soil and observes changes over time Provide for the needs of plants Record and communicate observation of life cycle using the techniques of drawing, labeling, and captioning with numbers and words. Develop a simple model based on evidence to describe a process in the life cycle of plants.	Content-specific anchor charts, content-specific word wall Student resources book FOSS online activities FOSS online videos	Science notebook entry Performance-based assessment Investigation checks for each investigation
LS1.A:	**<u>Investigation 3:</u>** How do organisms love, grow, and reproduce? How can there be so many similarities among organisms yet so many different types of plants, animals, and microorganisms? How do engineers solve problems? All organisms have external parts. Different animals use	**Content (Vocabulary):** hatch, milkweed bug, nymph, shelter **Concepts:** Insects need air, food, water, and appropriate space including shelter; different insects meet these needs in different ways. The life cycle of some insects is egg, nymph stages, and adult, which produces eggs. Variations exist within a group of related organisms. As insects grow, they molt their exoskeleton.	Compare structures on milkweed bugs to other insects. Communicate observations of the structures, behaviors, and life cycles of insects in words and drawings. Design an insect habitat that meets the basic needs of living insects- air, food, water, space, and shelter.	Content-specific anchor charts, content-specific word wall Student resources book FOSS online activities FOSS online videos	Science notebook entry Performance-based assessment Investigation checks for each investigation

	their body parts in different ways.				
LS1.B:	Reproduction is essential to continued existence of every kind of organisms.				
LS1:C:	All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow.				
LS2.A:	Plants depend on water and light to grow. Plants depend on animals for pollination and to move seeds.				
LS4.D:	There are many different kinds of living things to see in any area, and they exist in different places on land and in water.				

Robbinsville Public Schools

Unit #: 2

Enduring Understandings:	**Essential Questions:**
• Rocks are earth materials and can be described by property of size. • Rock sizes include clay, silt, sand, gravel, pebbles, cobbles, and boulders. • Weathering, caused by wind or water, causes larger rocks to break into smaller rocks. • Some Earth events happen very quickly (volcanic eruptions, floods); others occur very slowly over a long period of time (weathering of rock). • Earth materials are natural resources. • The properties of different earth materials make them suitable for specific uses. • Different sizes of sand are used on sandpaper to change the surface of wood from rough to smooth. • Earth materials are commonly used in the construction of buildings and streets. • Earth materials are used to make sculptures and jewelry.	Investigation 1: • How can rocks be described and categorized? • How do weather and earth events change rocks and the earth's surface? Investigation 2: • How can rocks be described and categorized? • How do weather and earth events change rocks and the earth's surface? Investigation 3: • What are natural resources? • How do the properties of natural resources determine how they can be used? • How can natural resources/earth materials be used to make goods that human beings can use?

Interdisciplinary Connections

RI.2.1 Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.
RI.2.3 Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text.
RI.2.8 Describe how reasons support specific points the author makes in a text.

W.2.1 Write opinion pieces in which they introduce the topic or book they are writing about, state an opinion, supply reasons that support the opinion, use linking words (e.g., because, and, also) to connect opinion and reasons, and provide a concluding statement or section.
W.2.6 With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers.
W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations).
W.2.8 Recall information from experiences or gather information from provided sources to answer a question.
SL.2.2 Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.

- Have students ask and answer who, what, where, when, why, and how questions about readings in reference books to demonstrate understanding of key details.
- Have students describe the connection between scientific ideas or concepts, or steps in technical procedures in a text.
- Have students use reasons to support specific points the author makes in a text.
- Students will also use the following skills: Reading comprehension, identifying main ideas, using text features, using images to explain text.
- Have students use notebooks to: strengthen writing by revising, recall information from experiences, gather information from provided sources to answer a question.

CCSS Math:
MP.2 Reason abstractly and quantitatively.
MP.4 Model with mathematics.
MP.5 Use appropriate tools strategically.
2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.
2.NBT.A Understand place value.

- Have students create tables and graphs, read tables and graphs, reason abstractly and quantitatively, use appropriate tools strategically.

Guiding / Topical Questions with Specific Standards		Content, Themes, Concepts, and Skills	Teaching Strategies	Instructional Resources and Materials	Assessment Strategies
ESS1: ESS1.C: PS1: PS1.A:	**<u>Investigation 1:</u>** What is the universe, and what is Earth's place in it? The history of planet Earth How can one explain the structure, properties, and interactions of matter? Structure and properties of matter	**Content (Vocabulary):** basalt, bubble, color, data, dull, earth material, flat, geologist, granite, group, mineral, pattern, pointed, property, rock, rough, round, sand, scoria, shape, sharp, shiny, size, smooth, sort, texture, tuff, weathering **Concepts:** Rocks are earth materials and can be described by property of size. Rock sizes include clay, silt, sand, gravel, pebbles, cobbles, and boulders. Weathering, caused by wind or water, causes larger rocks to break into smaller rocks. Some Earth events happen very quickly; others occur very slowly over a long period of time.	Use tools to observe and compare physical properties of rocks. Compare and sort rocks in different ways, using two or more physical properties. Rub rocks together and observe that they break into smaller pieces. Observe rocks interacting with water.	Content-specific anchor charts, content-specific word wall Student resources book FOSS online activities FOSS online videos	Science notebook entry Performance-based assessment Investigation checks for each investigation
ESS1: ESS1.C: ESS2: ESS2.A:	**<u>Investigation 2:</u>** What is the universe, and what is Earth's place in it? The history of planet Earth How and why is Earth constantly changing? Earth materials and systems	**Content (Vocabulary):** beach, boulder, butte, canyon, clay, cobble, delta, erosion, gravel, layer, mesa, mixture, model, particle, pebble, plain, plateau, sand, sand dune, screen, separate, settle shake, silt, sink, valley, volcano **Concepts:** Rocks are earth materials and can be described by property of size.	Explore a river-rock mixture containing earth material particles of various sizes and use screens to separate and group river rocks by particle size. Separate sand and silt using water. Explore the properties of dry and wet clay particles.	Content-specific anchor charts, content-specific word wall Student resources book FOSS online activities FOSS online videos	Science notebook entry Performance-based assessment Investigation checks for each investigation

ESS2.C: PS1: PS1.A:	The roles of water in Earth's surface processes How can one explain the structure, properties, and interactions of matter? Structure and properties of matter	Rock sizes include clay, silt, sand, gravel, pebbles, cobbles, and boulders. Weathering, caused by wind or water, causes larger rocks to break into smaller rocks. Some Earth events happen very quickly; others occur very slowly over a long period of time.	Describe a number of landforms.		
PS1: PS1.A: ETS1: ETS1.A: ETS1.B: ETS1.C:	**<u>Investigation 3:</u>** How can one explain the structure, properties, and interactions of matter? Structure and properties of matter How do engineers solve problems? Defining and delimiting engineering problems Developing possible solutions Optimizing the design solution	**Content (Vocabulary):** asphalt, brick, build, coarse, concrete, engineer, fine, harden, matrix, medium, mortar, natural resources, sandpaper, sculpture, sidewalk **Concepts:** Earth materials are natural resources. The properties of different earth materials make them suitable for specific uses. Different sizes of sand are used on sandpaper to change the surface of wood from rough to smooth. Earth materials are commonly used in the construction of buildings and streets. Earth materials are used to make sculptures and jewelry.	Explore places where earth materials are naturally found and ways that earth materials are used. Observe and compare different grades of sandpaper. Use sand to make sculptures and clay to make beads, jewelry, and bricks. Search for earth materials outside the classroom.	Content-specific anchor charts, content-specific word wall Student resources book FOSS online activities FOSS online videos	Science notebook entry Performance-based assessment Investigation checks for each investigation

Robbinsville Public Schools

Unit #: 3

Enduring Understandings:	**Essential Questions:**
• Solids and liquids are states of matter. • Solids and liquids have many properties that describe them and can help identify them. • Solids have their own shape. • Liquids take the shape of their containers and can pour/ flow. • Solids can occur in masses and small particles. Masses of particulate can be poured. • Solids and liquids occur naturally in the outdoors.	Investigation 1: • How can solid objects be described? • What can solid objects be made of? • Can two or more objects have the same property? • What are the properties of a successful structure? • Are there solid objects outdoors? Investigation 2: • How are liquids different from one another? • How can liquids be described? • How do liquids change in containers? • Where are liquids outdoors? Investigation 3: • How are these materials solid and liquid? • How can mixtures of particles be separated? • How do particles move in bottles? • What is a general rule for using screens to separate a mixture of small objects? • Are there little pieces of solid materials outdoors?

Interdisciplinary Connections

RI1: Ask and answer questions to demonstrate understanding.
RI2: Identify the main topic of a text.
RI5: Know and use text features
RI7: Explain how images contribute to and clarify a text.
RI8: Describe how reasons support points the author makes in a text.

W5: Strengthen writing by revising and editing.
W8: Gather information from provided sources to answer a question.

L4: Determine or clarify meaning of unknown or multiple meaning words or phrases.
L5: Demonstrate understanding of word relationships and nuances in word meanings.

SL1: Participate in collaborative conversations.
SL3: Ask and answer questions.

- Have students ask and answer who, what, where, when, why, and how questions about readings in reference books to demonstrate understanding of key details.
- Have students describe the connection between scientific ideas or concepts, or steps in technical procedures in a text.
- Have students use reasons to support specific points the author makes in a text.
- Students will also use the following skills: Reading comprehension, identifying main ideas, using text features, using images to explain text.
- Have students use notebooks to: strengthen writing by revising, recall information from experiences, gather information from provided sources to answer a question.

Guiding / Topical Questions with Specific Standards		**Content, Themes, Concepts, and Skills**	**Teaching Strategies**	**Instructional Resources and Materials**	**Assessment Strategies**
	<u>Investigation 1:</u> How can one explain structure, properties, and interactions of matter? How can engineers solve problems? PSI.1A: Structure and properties of matter ETS1.A: Defining and delimiting engineering problems ETS1.B: Developing possible solutions.	**Content (Vocabulary):** properties, solid, flexible, rigid, color, liquid, matter, object, properties, shape, smooth, rough, texture material, engineers **Concepts:** Solid is one state or phase of matter Objects are defined by their properties Objects are made of more than one material Natural and human made objects occur outdoors	Identify properties of solids. Sort and identify solids based on their properties. Identify naturally occurring solids in nature. Design structures using solid materials based on properties of solids.	Content-specific anchor charts, content-specific word wall Student resources book FOSS online activities FOSS online videos	Science notebook entry Performance-based assessment Investigation checks for each investigation
	<u>Investigation 2:</u> How can one explain structure, properties, and interactions of matter? PSI.1A: Structure and properties of matter ETS1.A: Defining and delimiting engineering problems	**Content (Vocabulary):** liquid, properties, bubble, flow, foam, pour, shake, thick, thin, level, surface, gravity, puddle, prediction **Concepts:** Liquid is one commons state of matter Liquids move freely in containers	Investigate properties and behaviors of liquids. Practice vocabulary associated with liquids. Draw the level of liquids in containers as the container changes positions.	Content-specific anchor charts, content-specific word wall Student resources book FOSS online activities FOSS online videos	Science notebook entry Performance-based assessment Investigation checks for each investigation

ETS1.B:	Developing possible solutions.	Liquids have many properties to help identify them Liquids take the shape of their containers The surfaces of liquids are flat and level Liquids pour and flow	Investigate puddles in naturally occurring settings (i.e. puddles).		
PSI.1A: ETS1.A : ETS1.B:	**<u>Investigation 3:</u>** How can one explain structure, properties, and interactions of matter? Structure and properties of matter Defining and delimiting engineering problems Developing possible solutions.	**Content (Vocabulary):** different, funnel, grain, largest, smallest, particle, pile, powder, scoop, size **Concepts:** Solid materials can occur as masses of small particles A mass of particulate matter can form piles and support a more dense object on its surface Masses of particulate can pour The surface of mass and of particles is not flat and level Particulate solids can be separated by size Particulate matter occurs naturally in the outdoors	Experience solid materials such as pieces, grains, and particles. Observe the behavior of small solids in various settings. Combine and separate solid materials of different particle settings. Compare the behavior of solids and liquids in similar settings.	Content-specific anchor charts, content-specific word wall Student resources book FOSS online activities FOSS online videos	Science notebook entry Performance-based assessment Investigation checks for each investigation

General Differentiated Instruction Strategies	
• Leveled texts • Chunking texts • Choice board • Socratic Seminar • Tiered Instruction • Small group instruction • Guided Reading • Sentence starters/frames • Writing scaffolds • Tangible items/pictures • Adjust length of assignment	• Repeat, reword directions • Brain breaks and movement breaks • Brief and concrete directions • Checklists for tasks • Graphic organizers • Assistive technology (spell check, voice to type) • Study guides • Tiered learning stations • Tiered questioning • Data-driven student partnerships • Extra time

Possible Additional Strategies for Special Education Students, 504 Students, At-Risk Students, and English Language Learners (ELLs)			
Time/General	**Processing**	**Comprehension**	**Recall**
• Extra time for assigned tasks • Adjust length of assignment • Timeline with due dates for reports and projects • Communication system between home and school • Provide lecture notes/outline	• Extra Response time • Have students verbalize steps • Repeat, clarify or reword directions • Mini-breaks between tasks • Provide a warning for transitions • Reading partners	• Precise step-by-step directions • Short manageable tasks • Brief and concrete directions • Provide immediate feedback • Small group instruction • Emphasize multi-sensory learning	• Teacher-made checklist • Use visual graphic organizers • Reference resources to promote independence • Visual and verbal reminders • Graphic organizers

Assistive Technology	Assessments and Grading	Behavior/Attention	Organization
• Computer/whiteboard • Tape recorder • Spell-checker • Audio-taped books	• Extended time • Study guides • Shortened tests • Read directions aloud	• Consistent daily structured routine • Simple and clear classroom rules • Frequent feedback	• Individual daily planner • Display a written agenda • Note-taking assistance • Color code materials

Enrichment

The goal of Enrichment is to provide learners with the opportunity to participate in extension activities that are differentiated and enhance the curriculum. All enrichment decisions will be based upon individual student needs.

- Show a high degree of intellectual, creative and/or artistic ability and demonstrate this ability in multiple ways.
- Pose questions and exhibit sincere curiosity about principles and how things work.
- The ability to grasp concepts and make real world and cross-curricular connections.
- Generate theories and hypotheses and pursue methods of inquiry.
- Produce products that express insight, creativity, and excellence.
- Possess exceptional leadership skills.
- Evaluate vocabulary
- Elevate Text Complexity
- Inquiry based assignments and projects
- Independent student options
- Tiered/Multi-level activities
- Purposeful Learning Center
- Open-ended activities and projects
- Form and build on learning communities
- Providing pupils with experiences outside the 'regular' curriculum
- Altering the pace the student uses to cover regular curriculum in order to explore topics of interest in greater depth/breadth within their own grade level
- A higher quality of work than the norm for the given age group.
- The promotion of a higher level of thinking and making connections.
- The inclusion of additional subject areas and/or activities (cross-curricular).
- Using supplementary materials in addition to the normal range of resources.

English Language Learner (ELL) Resources

- Learning style quiz for students- http://www.educationplanner.org/students/self-assessments/learning-styles-quiz.shtml
- "Word clouds" from text that you provide-http://www.wordle.net/
- Bilingual website for students, parents and educators: http://www.colorincolorado.org/
- Learn a language for FREE-www.Duolingo.com
- Time on task for students-http://www.online-stopwatch.com/
- Differentiation activities for students based on their Lexile-www.Mobymax.com
- WIDA-http://www.wida.us/
- Everything ESL - http://www.everythingESL.net
- ELL Tool Box Suggestion Site http://www.wallwisher.com/wall/elltoolbox
- Hope4Education - http://www.hope4education.com
- Learning the Language http://blogs.edweek.org/edweek/learning-the-language/
- FLENJ (Foreign Language Educators of NJ) 'E-Verse' wiki: http://www.flenj.org/Publications/?page=135
- OELA - http://www.ed.gov/offices/OBEMLA
- New Jersey Department of Education- Bilingual Education information http://www.state.nj.us/education/bilingual/

Special Education Resources

- Animoto -Animoto provides tools for making videos by using animation to pull together a series of images and combining with audio. Animoto videos or presentations are easy to publish and share. https://animoto.com
- Bookbuilder -Use this site to create, share, publish, and read digital books that engage and support diverse learners according to their individual needs, interests, and skills. http://bookbuilder.cast.org/
- CAST -CAST is a non-profit research and development organization dedicated to Universal Design for Learning (UDL). UDL research demonstrates that the challenge of diversity can and must be met by making curriculum flexible and responsive to learner differences. http://www.cast.org
- CoSketch -CoSketch is a multi-user online whiteboard designed to give you the ability to quickly visualize and share your ideas as images. http://www.cosketch.com/
- Crayon -The Crayon.net site offers an electronic template for students to create their own newspapers. The site allows you to bring multiple sources together, thus creating an individualized and customized newspaper. http://crayon.net/ Education Oasis -Education Oasis offers a collection of graphic organizers to help students organize and retain knowledge – cause and effect, character and story, compare and

contrast, and more! http://www.educationoasis.com/printables/graphic-organizers/

- Edutopia -A comprehensive website and online community that increases knowledge, sharing, and adoption of what works in K-12 education. We emphasize core strategies: project-based learning, comprehensive assessment, integrated studies, social and emotional learning, educational leadership and teacher development, and technology integration. http://www.edutopia.org/
- Glogster -Glogster allows you to create "interactive posters" to communicate ideas. Students can embed media links, sound, and video, and then share their posters with friends. http://edu.glogster.com/?ref=personal
- Interactives – Elements of a Story -This interactive breaks down the important elements of a story. Students go through the series of steps for constructing a story including: Setting, Characters, Sequence, Exposition, Conflict, Climax, and Resolution. http://www.learner.org/interactives/story/index.html
- National Writing Project (NWP) -Unique in breadth and scale, the NWP is a network of sites anchored at colleges and universities and serving teachers across disciplines and at all levels, early childhood through university. We provide professional development, develop resources, generate research, and act on knowledge to improve the teaching of writing and learning in schools and communities. http://www.nwp.org
- Pacecar -Vocab Ahead offers videos that give an active demonstration of vocabulary with audio repeating the pronunciation, definition, various uses, and synonyms. Students can also go through flash cards which give a written definition and visual representation of the word. http://pacecar.missingmethod.com/