# **ROBBINSVILLE PUBLIC SCHOOLS**

### OFFICE OF CURRICULUM AND INSTRUCTION

DEPARTMENT Science

# **COURSE TITLE** Kindergarten Science

# **Board of Education**

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BOARD OF EDUCATION INITIAL ADOPTION DATE: October 2021

#### **Course Philosophy**

The Robbinsville educators have designed a science curriculum that meets the needs of all learners, integrates the Robbinsville Ready Skills and allows time for students to practice and experience social emotional learning. Students will experience at least one investigation in earth, life and physical science. Investigations are built to allow for exploration, investigation, recording/interpreting data and collaboration. Students also utilize reading, writing and research skills while the educator embeds interdisciplinary opportunities across the curriculum. New Jersey's emphasis on the Climate Change standards allows opportunities for students to become globally conscious critical thinkers who can make informed decisions about their impacts on the planet.

#### **Course Description**

The focus of Kindergarten Science allows learners to examine, explore and make sense of the world around them. The following course description summarizes the course's three Units: Unit 1 Materials & Motion, Unit 2 Trees and Weather and Unit 3 Animals Two By Two.

In Unit 1, Materials & Motion, provides kindergartners with integrated experiences with physical science, earth science, and engineering core ideas that relate to students' interests and are teachable and learnable. Students investigate the anchor phenomenon that objects are made of materials—wood, paper, and fabric—and how material properties determine their use. Students use those materials to engineer structures, applying physical science ideas of energy transfer. The driving questions for the module are what is made of wood, paper, and fabric, and how are the properties of those materials useful to us? Students come to understand that humans use natural resources for everything they do and that people impact the world around them. After building a repertoire of practices with materials and objects, students investigate the effect of pushes and pulls on objects,

and apply their intuitive notion of the concept of variables to change the speed and direction of rolling balls and balloon rockets to achieve specific outcomes. The driving question is how can we change the motion of an object? Students engage in science and engineering practices by asking questions, participating in collaborative investigations, observing, recording, and interpreting data to build explanations, and designing objects and systems to achieve outcomes. Students gain experiences with crosscutting concepts: patterns; cause and effect; scale, proportion, and quantity; systems and system models; energy and matter; and structure and function.

In the **Second Unit, Animals Two by Two,** provides students with close and personal interaction with some common land and water animals. The animals and their survival needs are the engaging anchor phenomena. Students study the phenomena by observing and describing the structures of fish, birds, snails, earthworms, and isopods. Appropriate classroom habitats are established for some organisms and students find out what the animals need to live and grow. In four investigations, animals are studied in pairs. Students observe and care for one animal over time, and then they are introduced to another animal similar to the first but with differences in structure and behavior.

The driving question for **Unit Two** is how are animal structures similar and different? and what do animals need to live and grow? The firsthand experiences are enriched with close-up photos of animals, some related to animals that students have observed in class and some to animals that are new. This process enhances observation, communication, and comparison. In addition, students engage in science and engineering practices by asking questions, participating in collaborative investigations, observing, recording, and interpreting data to build explanations, and obtaining information from photographs. Students gain experiences that will contribute to an understanding of the crosscutting concepts of patterns; cause and effect; systems and system models; and structure and function.

In the **Third Unit, Trees and Weather** the giant sequoia is the most massive living organism on Earth. It is a tree, magnificent in dimension and awe inspiring in its longevity and durability. To a primary student, the oak on the corner, the pines at the park, and the mulberry tree at school are all giants. Systematic investigation of trees over the seasons will bring students to a better understanding of trees' place at school and in the community. Students will observe day-to-day changes in weather over the year, as well as the impact weather has on living things. The **Trees and Weather Unit** provides students with solid experiences to help them know plants and their place on Earth.

# Core and Supplemental Instructional Materials

Core Materials	Supplemental Materials
<ul> <li>FOSS science resource books</li> <li>FOSS material kits</li> <li>FOSS online videos</li> <li>FOSS online activities</li> </ul>	<ul> <li>BrainPOP Jr.</li> <li>Discovery Kids</li> <li>National Geographic Kids</li> </ul>

# **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, <u>read alouds</u>, 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: <u>Adding multicultural books</u> 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

Γ	NJSLS-CLKS 9.4: Life Literacies and Key Skills
Creativity and Innovation	Can be found in unit: 1: Materials and Motion 2: Animals Two By Two 3: Trees and Weather 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: Materials and Motion 2: Animals Two By Two 3: Trees and Weather 9.4.2.CT.2: Identify possible approaches and resources to execute a plan.
Digital Citizenship	Can be found in unit: 1: Materials and Motion 2: Animals Two By Two 3: Trees and Weather 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: Materials and Motion 2: Animals Two By Two 3: Trees and Weather 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: Materials and Motion 2: Animals Two By Two 3: Trees and Weather 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.
Technology Literacy	Can be found in unit: 1: Materials and Motion 2: Animals Two By Two 3: Trees and Weather 9.4.2.TL.1: Identify the basic features of a digital tool and explain the purpose of the tool. 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.

# 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 tree growth, identifying the role of plant growers such as gardeners, landscapers, and farmers in the community and how they utilize this information.	

### Robbinsville Public Schools Scope, Sequence, Pacing and Assessment

# Kindergarten Science

Unit Title	Unit Understandings and Goals	Recommended Duration/ Pacing	Assessments
Unit 1 Materials and Motion	Fabrics are examples of solid material. Solid objects are made of solid material.	3-4 weeks per investigation	Formative · Class discussions · Teacher observation · Science notebook entries
	Solid objects have properties.		Summative • Teacher checklist (from teacher resource book)
	Fabrics can be changed by coloring. Common materials can be changed into new		Common Benchmark Assessments (mid/end of course) • Teacher checklist (from teacher resource book)
	materials (weaving, knitting).		Alternative Assessments (projects, etc when appropriate)
	Pushes and pulls can have different strengths and directions.		
	Pushing and pulling on an object can change the speed and direction of its motion and can start and stop it.		
	A bigger push or pull makes things go faster.		
	When objects touch or collide, they push on one another and can change motion.		
Unit 2 Animals Two By Two	Animals have identifiable structures and behaviors. Animals have basic needs.	2-3 weeks per investigation	Formative · Class discussions · Teacher observation · Science notebook entries
	Land animals need air, water, food, and space with shelter.		Summative · Teacher checklist (from teacher resource book)

	<ul> <li>Water animals need the appropriate kind of water, oxygen from the water, food, and space with shelter.</li> <li>Adult animals and plants can have offspring.</li> <li>A habitat is a place where animals live and their needs are met. There are many different kinds of habitats.</li> <li>Animals eat plants and other animals.</li> <li>Living things can survive only where their needs are met.</li> </ul>		Common Benchmark Assessments (mid/end of course) Teacher checklist (from teacher resource book) Alternative Assessments (projects, etc when appropriate)
Unit 3 Trees and Weather	<ul> <li>Organisms can change their environment.</li> <li>Trees are living plants and have structures.</li> <li>Plants have basic needs- water, light, nutrients , and space.</li> <li>Trees go through predictable stages through the seasons as the weather changes.</li> <li>Weather is the condition of the air outside; weather changes.</li> <li>Temperature is how hot or cold it is and can be measured with a thermometer.</li> <li>Wind is moving air; windsocks indicate direction and speed.</li> </ul>	Full year	Formative         • Class discussions         • Teacher observation         • Science notebook entries         Summative         • Teacher checklist (from teacher resource book)         Common Benchmark Assessments (mid/end of course)         • Teacher checklist (from teacher resource book)         Alternative Assessments (projects, etc when appropriate)         •

### **Robbinsville Public Schools**

### Unit #: 1

Enduring Understandings:	Essential Questions:
Investigation 1: Fabric (Materials)	Investigation 1:Fabric (Materials)
• Fabrics are examples of solid material.	• How are fabrics different?
• Solid objects are made of solid material.	• What is made of fabric?
<ul> <li>Solid objects have properties.</li> </ul>	• How is fabric made?
• Fabrics can be changed by coloring.	• What happens when water gets on fabric?
• Common materials can be changed into new materials (weaving, knitting).	• How are different kinds of fabric used?
Investigation 2: Getting Things to Move (Motion)	• How can we conserve natural resources?
<ul> <li>Pushes and pulls can have different strengths and directions.</li> </ul>	• What happens to water in sunshine and shade?
• Pushing and pulling on an object can change the speed and direction of its	• How can we design a structure to keep water cool in sunshine?
motion and can start and stop it.	
• A bigger push or pull makes things go faster.	Investigation 2: Getting Things to Move (Motion)
• When objects touch or collide, they push on one another and can change	• What causes objects to move?
motion.	• What happens when objects collide?
	• Where can balls roll on the school yard?
	• How can we change how far a balloon rocket travels?
Interdisciplinary	Connections
SL1: Participate in collaborative conversations.	
SL3: Ask and answer questions to seek help, information, or clarity.	
SL4: Describe with details.	
RF2: Demonstrate understanding of spoken words, syllables, and sounds.	
L5a: Sort common objects into categories.	
W5: Strengthen writing.	
W8: Gather information to answer a question.	
RI1: Ask and answer questions about key details.	
RI2: Identify the main topic and retell key ideas.	
RI3: Describe the connection between two ideas.	
RI7: Describe the relationship between the illustration and text.	
RI8: Identify the reasons an author gives to support points.	

RI10: Actively engage in group reading activities with purpose and understanding.

CC4: Understand the relationship between numbers and quantities

CC5: connect counting to cardinality

OT2: solve addition and subtraction word problems.

MD2: Directly compare two objects with a measurable attribute in common.

MD3: Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.

#### Investigation 1: Fabric (Materials)

Literacy Skills: Teachers will use literary resources such as charts, word webs, vocabulary word wall, labels, big books, interactive journals and class discussions. Math Skills: Teachers will use activities such as sorting, comparing, classifying, graphing, counting, analyzing and interpreting data.

#### Investigation 2: Getting Things to Move (Motion)

Literacy Skills: Teachers will use literary resources such as charts, word webs, vocabulary word wall, labels, big books, interactive journals and class discussions. Math Skills: Teachers will use activities such as sorting, comparing, classifying, graphing, counting, analyzing and interpreting data.

Guidir witl	ng / Topical Questions h Specific Standards	Content, Themes, Concepts, and Skills	Teaching Strategies	Instructional Resources and Materials	Assessment Strategies
	<b>Investigation 1: Fabric</b>	Content (Vocabulary): Burlap, cloth, cold,	Observe the properties of 10 different	Content-specific	Students work in small
	(Materials)	conserve, corduroy, denim, fabric, fleece, hot,	fabrics.	anchor charts,	collaborative groups to
PS1:	How can one explain the	knit, least, magnet, most, natural resources,		content-specific word	observe and discuss
	structure, properties and	nubby, recycle, reuse, ripstop nylon, rough,	Match properties by using feely boxes,	wall	properties of 10 kinds
	interaction of matter?	satin, scratchy, seersucker, shiny, slippery,	hunting for fabric and locating fabric		of fabric, investigate
		smooth, soak, soft, sparkly organza, structure,	in the classroom.	Student resources book	loose/tight fabrics,
K-PS1-2	Analyze data obtained from	temperature, terry cloth, texture, thread, warp,			explore water
	testing different materials to	waterproof, woof, woven	Investigate the structure of woven	FOSS online activities	interaction of fabrics,
	determine which materials		fabrics by disassembling and		think about and graph
	have the properties that are	Concepts:	comparing loose and tight fabrics.	FOSS online videos	different fabrics for
	best suited for an intended	How are fabrics different? Fabrics can look and			clothing
	purpose.	feel different.	Investigate how fabrics interact with		
			water. Observe how water absorbs,		On-going student
PS1.A:	Structure/properties of	What is made of fabric? is made of	transmits and repels water.		interactive notebook
	matter	fabric. (ie clothes are made out of fabric)			documentation
			Think about fabrics for clothing.		
PS3:	How is energy transferred	How is fabric made? Fabric is made from	Graph fabrics that would make the		Assessment checklists
	and conserved?	(ie Fabric is made from woven	best kind of clothing.		(found in teacher
		threads.)			resource book)
PS3.B:	Conservation of energy and		Introduce students to natural		
	energy transfer	What happens when water gets on fabric? On	resources and the need to recycle.		Observation
		fabric, water sometimes repels or absorbs.	Collect and sort materials for recycling.		
ESS3:	How do Earth's surface	-			Conversation
	processes and human	How are different kinds of fabric used?	Compare bins of water in shade and		throughout

	activities affect each other?	fabric is used to make	sun. Design a structure to keep water	lessons/activities
			cool in sunshine.	
K-PS3-1	Make observations to	How can we conserve natural resources? We		
	determine the effect	can recycle to save natural resources.	Plan and carry out investigations	
	sunlight has on earth's			
	surfaces.	What happens to water in sunshine and shade?	Analyze and interpret data	
K-PS3-3		Experiment with basins of water outside in sun		
	Communicate solutions that	and shade; compare which is warm/cool.	Ask questions	
	will reduce the impact of	Discuss and share findings.		
	humans on the land, water,		Develop and use models	
	air and/or living things in	How can we design a structure to keep water		
	the local environment.	cool in sunshine? Students create shades for	Construct explanations and design	
К-2-ЕТ		basins; which work to keep water cool? Which	solutions	
S1-2	Develop a simple sketch,	does nothing?		
	drawing or physical model		Obtain, evaluate and communicate	
	to illustrate the shape of an		information	
	object.			
K-2-ET			Use mathematical computational	
S1-3	Analyze data from tests to		thinking	
	two objects designed to			
	solve the same problem to		Engage in argument/explanation	
	compare strengths and		Define problems	
	weaknesses of each			
ESS3.A	performance.		Centers-based rotations	
ESS3.C	Natural Resources		Partnership/small group explorations	
	Things that people do to			
	live comfortably can affect			
	the world around them. But			
	they can make choices that			
	reduce their impacts on the			
	land, water, air, and other			
ETS1:	living things.			
	How do engineers solve			
ETS1.A	problems?			
	Defining engineering			
ETS1.B	problems			
	Developing possible			
ETS1.C	solutions			

	Optimizing designs solutions				
K-PS2-1	<b>Investigation 2:Getting</b> <b>Things to Move (Motion)</b> Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.	Content (Vocabulary): Cause, collide, collision, direction, distance, effect, fast, gravity, gentle, motion, move, pull push, rocket, roll, rolling, ramp, slope, slowly, speed, strength, stop Concepts: What causes objects to move? causes objects to move.	Observe and describe how a push/pull causes something to move. Roll balls at different speeds. Explore what happens when a ball is rolled at different speeds.	Content-specific anchor charts, content-specific word wall Student resources book FOSS online activities	Students work in small collaborative groups to observe and discuss how objects move, explore schoolyard for places that balls will roll, use knowledge of the motion of rolling
K-PS2-2	Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or pull.	What happens when objects collide? The objects One object the other. Where can balls roll on the school yard? Students explore the movement of balls on the school yard. ( balls roll on slopes/hills, large	Introduce and explore the pull of gravity. Use balls and ramps to achieve different speeds.	FOSS online videos	objects to solve a problem, observe balloon rocket system to find out how it works On-going student
PS2:	How can one explain and predict interactions between objects and within system objects?	balls roll straighter) How can we change how far a balloon rocket travels? To make a balloon rocket travel farthest, we	Explore what happens when a ball hits an object. Use knowledge to make a ball land in a specific place.		interactive notebook documentation Assessment checklists (found in teacher
PS2.A:	Forces and motions		Explore the schoolyard for slopes. Make predictions for the path of a ball		resource book)
P52.B	Types of interactions		on a slope.		Observation
PS3:	How is energy transferred and conserved?		Observe a balloon rocket system to find out how far it goes. Investigate how more air in a balloon changes the		Conversation throughout lessons/activities
PS3.C:	Relationships between energy and forces		speed of the rocket and how far it will travel.		
ETS1:	How do engineers solve problems?		Observe what happens when a system collides with an object in flight.		
ETS1.A:	Defining and eliminating problems		Plan and carry out investigations		
ETS1.B:	Developing possible solutions		Analyze and interpret data Ask questions		
ETS1.C:	Optimizing the design		Develop and use models		

solution	Construct explanations and design solutions	
	Obtain, evaluate and communicate information	
	Use mathematical computational thinking	
	Engage in argument/explanation Define problems	
	Centers-based rotations	
	Partnership/small group explorations	

#### **Robbinsville Public Schools**

#### Unit #: 2

Enduring Understandings:	Essential Questions:		
• Animals have identifiable structures and behaviors.	Investigation 1: Goldfish and Guppies		
• Animals have basic needs.	• What are the parts of a goldfish?		
• Land animals need air, water, food, and space with shelter.	• What do goldfish need to live?		
• Water animals need the appropriate kind of water, oxygen from the water,	• What do goldfish do?		
food, and space with shelter.	<ul> <li>How are guppies and goldfish different?</li> </ul>		
• Adult animals and plants can have offspring.	• How are they the same?		
• A habitat is a place where animals live and their needs are met. There are many different kinds of habitats.	• What birds visit our schoolyard?		
• Animals eat plants and other animals.	Investigation 2: Pill Bugs and Sow Bugs		
• Living things can survive only where their needs are met.	• What are isopods?		
• Organisms can change their environment.	• How are pill bugs and sow bugs different?		
	• How are they the same? How do isopods move?		
	• What do animals need to live?		
Interdisciplinary Connections			

#### RI.1: Ask and answer questions about key details.

- RI.2: Identify main topic and retell key details.
- RI.3: Describe the connection between two ideas.
- RI.4: Ask and answer questions about unknown words.
- RI.5: Identify the front cover, back cover, and title page of a book.
- RI.6: Name and define the role of the author and illustrator.
- RI.7: Describe the relationship between illustrations and the text.
- RI.8: Identify the reasons an author gives to support points.
- RI.9: Identify similarities in and differences between two texts on the same topic.
- RI.10: Actively engage in group reading activities with purpose and understanding.
- W.8: Gather information to answer a question.
- SL.1: Participate in collaborative conversations.
- SL.2: Ask and answer questions about key details and request clarification.
- SL.3: Ask and answer questions to seek help, information, or to clarify.
- SL.4: Describe with details.
- L5a: Sort objects into categories.

#### Math:

CC.4: Understand the relationship between numbers and quantities; connect counting to cardinality

MD.2: Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference.

#### Investigation 1: Goldfish and Guppies

Literacy Skills: Teachers will use literary resources such as charts, word webs, vocabulary word wall, labels, big books, interactive journals and class discussions. Math Skills: Teachers will use activities such as sorting, comparing, classifying, graphing, counting, analyzing and interpreting data.

#### Investigation 2: Pill bugs and Sow Bugs

Literacy Skills: Teachers will use literary resources such as charts, word webs, vocabulary word wall, labels, big books, interactive journals and class discussions. Math Skills: Teachers will use activities such as sorting, comparing, classifying, graphing, counting, analyzing and interpreting data.

Guidi wit	ng / Topical Questions h Specific Standards	Content, Themes, Concepts, and Skills	Teaching Strategies	Instructional Resources and Materials	Assessment Strategies
	Investigation 1:	Content (Vocabulary): animal, aquarium, bill,	Observe goldfish, look for and name	Content-specific	Students will be
LS1:	How do organisms live,	bird, dirty, eye, female, fin, fish, fly, food, fresh	parts of the fish, record observations.	anchor charts,	working in small
	grow, respond to their	water, gill, goldfish, guppy, head, male, mouth,		content-specific word	groups to observe and
	environment, reproduce?	plant, prefer, scale, surface, swim, tail, tunnel,	Care for fish by creating a healthy	wall	discuss the structures
	_	water, wing	environment, sharing responsibilities		and behaviors of fish.
LS1.A:	Structure and function		with groups.	Student resources book	They will collaborate to
		Concepts:			care for their fish.
	All organisms have external	What are the parts of a goldfish?	Describe goldfish behavior.	FOSS online activities	
	parts. Different animals use	Goldfish have 2 eyes, one tail, six fins, one			On-going student
	their body parts in different	mouth, and scales.	Alter the aquarium environment and	FOSS online videos	interactive notebook
	ways to see, hear, grasp		record changes in behavior.		documentation
	objects, protect themselves,	What do goldfish need to live?			
	move from place to place,	Goldfish need food, clean water, and space with	Construct a model aquarium to be		Assessment checklists
	and seek, find, and take in	shelter.	used to demonstrate fish behavior.		(found in teacher
	food, water, and air.				resource book)
		What do goldfish do?	Compare structures and behaviors of		
LS1.C:	Organization for matter and	Goldfish swim all around. They find out about	different kinds of fish.		Observation of group
	energy flow in organisms	things with their mouth, nose, and body.			work and interactions
	All animals need food in		Identify fish by gender		
	order to live and grow. They	How are guppies and goldfish different?			Conversation
	obtain their food from	Size, shape, tail, markings	Observe and compare local birds		throughout
	plants or from other animals.				lessons/activities
	Plants need water and light	How are they the same?	Ask questions		
	to live and grow.	Swim, same needs, same basic body structure			
			Develop and use models		
ESS2:	How and why is Earth	What birds visit our schoolyard?			

	constantly changing?	Identify local birds	Plan and carry out investigations		
ESS2.E:	Biogeology				
	0 0,		Analyze and interpret data		
	Plants and animals can		5 1		
	change their environment.		Construct explanations		
	0		1		
ESS3:	Earth and human activity		Obtain, evaluate, and communicate		
	, ,		information		
ESS3.A:	Natural resources				
			Centers-based rotations		
	Living things need water, air,				
	and resources from the land,		Partnership/small group explorations		
	and they live in places that				
	have the things they need.				
	Humans use natural				
	resources for everything they				
	do.				
ESS3.C	Things that people do to live				
	comfortably can affect the				
	world around them. But they				
	can make choices that reduce				
	their impacts on the land,				
	water, air, and other living				
	things.				
	Investigation 2:	Content (Vocabulary): antennae, ball,	Investigate structures and behaviors of	Content-specific	Students will be
LS1:	How do organisms live,	carapace, flat, isopod, jagged, living, moisture,	isopods.	anchor charts,	working in small
	grow, respond to their	nonliving, pill bug, protect, race, roll up, round,		content-specific word	groups to observe and
	environment, reproduce?	section, sow bug, turn over	Compare and sort isopods.	wall	discuss the structures
					and behaviors of
LS1.A:	Structure and function	Concepts:	Find and observe isopods in their	Student resources book	isopods. They will
		What are isopods?	natural environment.		collaborate to create a
	All organisms have external	Isopods are small animals with antennae, a hard		FOSS online activities	habitat.
	parts. Different animals use	carapace over their body, and 14 legs.	Conduct isopod races as a means to		
	their body parts in different		observe movement.	FOSS online videos	On-going student
	ways to see, hear, grasp	How are pill bugs and sow bugs different?			interactive notebook
	objects, protect themselves,	Round vs. flat, roll up vs. turn over, light vs.	Design and construct a terrarium with		documentation
	move from place to place,	dark, long Vs. short antennae, tail vs. no tail	a group to observe how animals live		
	and seek, find, and take in		together.		Assessment checklists
	food, water, and air.	How are they the same?			(found in teacher
		Hard carapace, 14 legs, need moisture, eat	Ask questions		resource book)

LS1.C:	Organization for matter and	potato or carrot		
	energy flow in organisms	-	Develop and use models	Observation of group
		How do isopods move?		work and interactions
	All animals need food in	Isopods move quickly, in a straight line. They	Pan and carry out investigations	
	order to live and grow. They	frequently stop and hide.		Conversation
	obtain their food from		Analyze and interpret data	throughout
	plants or from other animals.	What do animals need to live?		lessons/activities
	Plants need water and light	Animals need food, water, space, and shelter.	Construct explanations	
	to live and grow.		Obtain evaluate and communicate	
ESS2:	How and why is Earth		information	
1001	constantly changing?			
	2 0 0		Centers-based rotations	
ESS2.E:	Biogeology			
			Partnership/small group explorations	
	Plants and animals can			
	change their environment.			
E66 <b>2</b>				
E883:	Earth and human activity			
ESS3 A·	Natural resources			
1000.111	Living things need water air			
	and resources from the land,			
	and they live in places that			
	have the things they need.			
	Humans use natural			
	resources for everything they			
	do.			
ESS2 C	Things that people do to live			
E333.C	comfortably can affect the			
	world around them. But they			
	can make choices that reduce			
	their impacts on the land,			
	water, air, and other living			
	things.			

#### **Robbinsville Public Schools**

#### Unit #: 3

Enduri	ng Understandings:	Essential Questions:
•	Trees are living plants and have structures.	Investigation 1: Observing Trees
•	Plants have basic needs- water, light, nutrients , and space.	• What did we notice about our schoolyard trees?
•	Trees go through predictable stages through the seasons as the weather	• What are the parts of trees?
	changes.	• What shapes are trees?
•	Weather is the condition of the air outside; weather changes.	• Which trees have similar shapes?
•	Temperature is how hot or cold it is and can be measured with a	• What can we find out about our adopted trees?
	thermometer.	• What do trees need to grow?
•	Wind is moving air; windsocks indicate direction and speed.	
		Investigation 2: Trees through the Seasons
		• What do fall trees look like?
		• What do winter trees look like?
		• What do spring trees look like?
		Investigation 3: Observing Weather
		• What words can we use to describe the weather today?
		• How can we measure the air temperature?
		• What does a wind sock tell us about the wind?

#### Interdisciplinary Connections

#### ELA:

SL1: Participate in collaborative conversations.

SL3: Ask and answer questions to seek help, information, or clarity.

SL4: Describe with details.

RF2: Demonstrate understanding of spoken words, syllables, and sounds.

L5a: Sort common objects into categories.

W8: Gather information to answer a question.

RI1: Ask and answer questions about key details.

RI2: Identify the main topic and retell key ideas.

RI3: Describe the connection between two ideas.

RI7: Describe the relationship between the illustration and text.

RI8: Identify the reasons an author gives to support points.

RI9: Identify similarities in and differences between two texts on the same topic.

RI10: Actively engage in group reading activities with purpose and understanding.

#### Math:

CC4: Understand the relationship between numbers and quantities; connect counting to cardinality.

MD2: Directly compare two objects with a measurable attribute in common.

MD3: Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.

G1: Describe objects in the environment using names of shapes, and describe the relative positions of these objects.

#### Investigation 1:

Literacy Skills: Teachers will use literary resources such as charts, word webs, vocabulary word wall, labels, big books, interactive journals and class discussions. Math Skills: Teachers will use activities such as sorting, comparing, classifying, graphing, counting, analyzing and interpreting data.

#### Investigation 2:

Literacy Skills: Teachers will use literary resources such as charts, word webs, vocabulary word wall, labels, big books, interactive journals, and class discussions. Math Skills: Teachers will use activities such as sorting, comparing, classifying, graphing, counting, analyzing and interpreting data.

#### **Investigation 3:**

Literacy Skills: Teachers will use literary resources such as charts, word webs, vocabulary word wall, labels, big books, interactive journals and class discussions. Math Skills: Teachers will use activities such as sorting, comparing, classifying, graphing, counting, analyzing and interpreting data.

Guidi wi	ing / Topical Questions th Specific Standards	Content, Themes, Concepts, and Skills	Teaching Strategies	Instructional Resources and Materials	Assessment Strategies
	Investigation 1:	Content (Vocabulary): adopt, bark, branch,	Observe schoolyard trees, develop	Content-specific	Collaborative group
LS1:	How do organisms live, grow	circumference, compare, cone, conifer, desert,	general concepts about trees and	anchor charts,	outdoor investigations
	and respond to their	different, flower, hardwood, leaves, living,	discuss how trees are useful to people	content-specific word	
	environment and reproduce?	mountain, observe, ocean, pattern, plant, river,	and wild animals.	wall	Class participates in
		root, rubbing, seed, shape, similar, stem, swamp,			choosing a class tree to
K-LS1-	Use observations to describe	texture, tree, trunk, twig, valley	Identify the main parts of trees.	Student resources book	observe, care for and
1	patterns of what plants and				document seasonal
	animals, including humans,	Concepts:	Compare different shapes of trees.	FOSS online activities	changes through the
	need to survive.	What did we learn about our schoolyard trees?			year
		Trees have branches and leaves. Squirrels, birds,	Document observations.	FOSS online videos	
LS1.A	Structure and function	and other animals use trees for home and food.			Labeling tree parts
			Discover and discuss what plants need		
LS1.C	Organization for matter and	What are the parts of trees? Branches, leaves,	to live and grow.		Identifying trees,
	energy flow of organisms	roots and trunk			sorting and classifying
			Ask questions		types of leaves and
ESS2	How and why is earth	What shapes are trees? Round and short; thin			trees
	constantly changing?	and tall	Plan and carry out investigations		
			_		Student documentation

K-ESS	Use and share observations	Which trees have similar shapes? Some trees	Analyze and interpret data		of tree observations
2-1	of local weather conditions to	have points at top; some trees are round at the			through the the
	describe patterns over time.	top	Engage in argument from evidence		seasons in interactive
<b>E</b> 224 E					notebook
ESS2.E	Biogeology	What can we find out about our adopted trees?	Develop and use models		
E662					Assessment checklists
E883	How do earth's surface	Do the leaves fall off in winter?	Construct explanations		(found in teacher
	processes and human	What happens to the two is a storm?	Obtain graluata agmenunianta		resource book)
	activities affect each other?	what happens to the tree in a storm?	obtain, evaluate, communicate		Croup planned
E883 A	Natural Resources	What do treas paid to grow? Treas paid water	information		observations
13555.11	Ivatural Resources	light space and putrients from soil. The two	Centers based rotations		observations
		most important are water and light	Centers-based rotations		Conversations
		most important are water and ingita	Partnership/small group explorations		throughout
			r areatoring, on an group enplorations		lessons/activities
	Investigation 2:	Content (Vocabulary): blossom, bud,	Collect and chart objects from trees.	Content-specific	Collaborative group
LS1:	How do organisms live, grow	evergreen, fall, flower, food, forcing, fruit,	Search for, observe, and compare	anchor charts,	outdoor investigations
	and respond to their	growth ring, leaf scar, needle, scale, seasons,	seeds.	content-specific word	
	environment and reproduce.	seed, spring, summer swollen, winter		wall	Class participates in
			Observe bark, twigs, leaves, flowers,		observing, caring for
K-LS1-	Use observations to describe	Concepts:	fruit, and seeds.	Student resources book	and documenting
1	patterns of what plants and	What do fall trees look like? Leaves change			changes in class tree
	animals, including humans,	colors. Some trees lose their leaves.	Observe the inside of trees and look	FOSS online activities	through the year
	need to survive.		for growth rings, buds, and leaf scars.		
		What do winter trees look like? Some trees are		FOSS online videos	Student documentation
LS1.A	Structure and function	only branches. Some trees are evergreen.	Observe and document changes		of tree observations
TOLO			through seasons.		through the the
LS1.C	Organization for matter and	What do spring trees look like? Trees have			seasons in an
	energy flow of organisms	flowers and new leaves growing on their twigs	Observe and compare bark.		interactive notebook
ESC2	II	and branches.			A
E352	How and why is earth		Look for evidence of new growth.		Assessment checklists
	constantly changing.		Plan and carry out investigations		(Tourid in teacher
K ESS	Use and share observations		Than and carry out investigations		resource book)
2-1	of local weather conditions to		Analyze and interpret data		Group planned
<b>–</b> 1	describe patterns over time.		Thay be and interpret data		observations
	desense patients sver anter		Obtain, evaluate, communicate		oboot (adono
ESS2.D	Weather and climate		information		Conversations
					throughout
ESS3.A	Natural Resources		Construct explanations		lessons/activities
			Centers-based rotations		

			Partnership/small group explorations		
	Investigation 3:	Content (Vocabulary): air, blowing, calendar,	Record daily weather observations.	Content-specific	Collaborative group
ESS2	How and why is earth	cloud, cold, cool, directions, freezing, hot,		anchor charts,	observation of
	constantly changing?	moving air, overcast, partly cloudy, rainy, snowy,	Measure and record relative	content-specific word	on-going weather and
		streamer, sunny, temperature thermometer,	temperature.	wall	temperature graphs
K-ESS	Use and share observations	warm, weather, weather instrument, wind,	-		throughout the year
2-1	of local weather conditions to	windsock	Construct a windsock and observe	Student resources book	
	describe patterns over time.		how it responds when air moves		Month long
		Concepts:	through it.	FOSS online activities	documentation of
K-ESS	Construct an argument	What is the weather today? Today the weather is			weather and
2-1	supported by evidence for		Plan and carry out investigations	FOSS online videos	temperature in
	how plants and animals,				interactive notebooks
	including humans, can	How can we measure the air temperature? We	Analyze and interpret data		
	change the environment to	use a thermometer to tell how hot/cold the air			Designing, creating,
	meet their needs.	is.	Obtain, evaluate, communicate		experimenting with
			information		and documentation of
K-ESS	Use a model to represent the	What does a wind sock tell us about the wind?			a handmade windsock
3-1	relationship between the	Windsocks show the direction of the wind.	Construct explanations		
	needs of different plants and				Small groups design,
	animals, including humans,		Centers-based rotations		create, experiment with
	and the places they live.				and document
			Partnership/small group explorations		observations of
K-ESS	Ask questions to obtain				handcrafted wind
3-2	information about the				chimes
	purpose of weather				A . 1 11 <sup>1</sup> .
	forecasting to prepare for				Assessment checklists
	and respond to severe				(found in teacher
V DC2	weather.				resource book)
K-P55-	Malia observations to				Croup planned
1	determine the effect of				observations
	suplight on Earth's surface				observations
K-2-E	sumgitt on Dartins surface.				Conversations
TS1-2	Develop a simple sketch				throughout
101 2	drawing or physical model to				lessons/activities
	illustrate how the shape of an				leosonoj dedvideo
	object helps it function as				
	needed to solve a given				
	problem.				
ESS2.D	1				
	Weather and climate				
ESS3					
	How do earth's surface				

	processes and human		
	activities affect each other?		
ESS3.B			
	Natural hazards		
ESS3.C			
	Things that people do to live		
	comfortably can affect the		
	world around them. But they		
	can make choices that reduce		
	their impacts on the land,		
	water, air, and other living		
	things.		
PS3			
	How is energy transferred		
DOAD	and conserved?		
P\$3.B			
	Conservation of energy and		
E/E04	energy transfer		
EISI	TT 1 · 1		
	How do engineers solve		
ETC1 D	problems?		
E121'R	Developing accella		
	Developing possible		
	solutions		

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

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

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

# 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 them 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. <u>http://www.edutopia.org/</u>
- 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, from 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/