Introduction - Kindergarten Science

Content Area: **Science**
Course(s):
Time Period:
Length: **Full Year**
Status: **Published**

Title Page, Table of Contents, Statement of purpose

Statement of Purpose:

This course is designed for students in kindergarten to expose them to the basic foundations of science. Throughout this course of study, students will learn to define weather and the different types of weather common to our area. Students will observe and record local weather conditions in order to describe patterns over time (examples - the temperature changes, more foggy days, more rainy days). Additionally, students will understand why observing and understanding these patterns is helpful in their day to day lives (choosing what to wear, knowing to bring an umbrella), and in problem solving (finding a way to cool/shade a sunny area). Students will explore the difference between living and non-living things. Students will observe and understand that living things need things like energy and safety to survive, and how they make changes in the environment to obtain what they need to stay alive. Students will also explore the outdoors in order to observe living things in action. Students will explore different kinds of severe weather, discuss ways to be prepared in the event of a wild storm. They will also learn to use context clues to determine what the weather is outside based on different factors. Additionally students will begin exploring climate change and how humans can make an impact on the planet. Finally, students will explore different types of "work" in motion, particularly how pushes and pulls can change the motion of objects, and how the force of the pushes and pulls can change how much work is done. They will work to engineer different machines to solve simple problems.

Table of Contents:

Unit 1: Sunny Skies

Content Area: **Science**
Course(s):
Time Period: **1st Trimester**
Length: **3 Weeks**
Status: **Published**

Summary of the Unit

In this unit, students will learn to define weather and the different types of weather common to our area. Students will observe and record local weather conditions in order to describe patterns over time (examples - the temperature changes, more foggy days, more rainy days). Additionally, students will understand why observing and understanding these patterns is helpful in their day to day lives (choosing what to wear, knowing to bring an umbrella), and in problem solving (finding a way to cool/shade a sunny area)

Enduring Understandings

- "Weather" is how we describe the conditions outside.
- We track weather so we know how to plan for our days.
- Sunlight can change the temperature of objects.

Essential Questions

- What is weather?
- What are the different types of weather?
- Why is it important to know what the weather will be?

Summative Assessment and/or Summative Criteria

Students will have mastered this topic if they can:

- Describe the weather each day
- Name appropriate clothing items to wear based on the weather
- Talk about patterns they notice in the weather
- Show how sun and shade affect the temperature of objects (through experimentation)

Resources

- Discovery Education
- BrainPop Jr.
- Clear Cups, Soil, pebbles (for experiment)

Unit Plan

Topic/Selection Timeframe	General Objectives (SWBAT)	Instructional Activities	Benchmarks/Assessments
Weather and its purpose (2 weeks)	• Define weather as the combination of sunlight, wind, snow/rain, and temperature in a region at a specific time. • Use and share observations of local weather conditions to describe patterns over time. • Ask questions to obtain information about the purpose of weather forecasting to prepare for, and	DE Mystery Science Unit: Weather Patterns • Lesson 1: How do you know what to wear for the weather? Read along with the story and discover how Kevin becomes a weather detective to figure out what to wear. • Use slides to learn about different weather conditions (sunny, cloudy, snow, rain, temperature, etc) • Lesson 2: What will the weather be like on your birthday?	• Teacher Observation/Anecdotal Notes • Weather Charts • Weather Sorts

	respond to, severe weather.	Watch the video and lead class discussion about seasons. Activity - have students use context clues to figure out which pictures represent which season. Cross Curricular during Morning Meeting • Create a class chart recording the weather over the course of the unit. Record conditions and temperature. Continue observing the weather throughout the year during calendar time. • Create a bar graph, tally chart or other chart to discover patterns (more hot days? more cloudy days?) • Weather Bear: Introduce calendar time after this topic, and daily for the rest of the	

		year. Have children consider the weather, and choose appropriate clothing for the bear/paper doll. Can be physical or digital.	
Sunlight and Temperature (1 week)	• Make observations to determine the effect of sunlight on Earth's surface • Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area.	Mystery Science Unit: Sunny Skies • Lesson 1: How can you walk barefoot across hot pavement without burning your feet? Read along with the story and problem solve to help Keya get to the ice cream truck. Sunlight Experiment • **Start in AM and finish in PM** Set up experiment: for each group in your class you will need 2 cups each with some water, some soil and some pebbles. Place one set of cups in a sunny area, and the other in the shade. Leave for the day, and check in at the end of the day. Observe	• Teacher Observation/Anecdotal Notes • Experiment results, student reports

		the temperature of the cups in the sunlight vs. the cups in the shade. Discuss and create a chart: How does sunlight affect temperature? • Follow up experiment: cups from previous experiment; various supplies to create shade (paper, glue, pipe cleaners). Have students work to create a device that will create shade over one of their cups (use only one material). Place shaded and unshaded cups in the sun and check in on them at the end of the day. Did the shading devices help? Students will write and draw about what they learned from their experiment.	

MA.K.CC.C.7	Compare two numbers between 1 and 10 presented as written numerals.
MA.K.MD.B.3	Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.
SCI.K.ETS1.B	Developing Possible Solutions
SCI.K-ESS3-2	Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.
SCI.K-ESS3-1	Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.
SCI.K-ESS2-1	Use and share observations of local weather conditions to describe patterns over time.
SCI.K-ESS2-2	Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.
SCI.K-PS3-2	Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area.
SCI.K-PS3-1	Make observations to determine the effect of sunlight on Earth's surface.

Suggested Modifications for Special Education, ELL and Gifted Students

Consistent with individual plans, when appropriate.

Special Education:

- Modifications for any individual student's IEP/504 plan must be met.
- Modify assignment type and length to meet diverse learner needs
- Allow additional wait time during discussions to allow for all students to process information
- Students should be provided with graphic organizers.
- Check for understanding by conferencing with the teacher.
- Students may choose a partner or teacher may choose a partner to work that student is comfortable with.
- Repeat and clarify any directions given.
- Break activities into smaller tasks
- Allow for preferential seating within groups and the whole class.
- Modify amount of vocabulary words used
- Read questions out loud.
- Small group testing

ELL:

- Preview vocabulary
- Provide graphic organizers
- Provide opportunities for collaborative learning
- Modify assessments to simplify language
- Read questions out loud
- Break activities into smaller tasks
- Provide modified reading passages

Gifted Students:

- Modify Content: Vary reading levels in reading materials; Offer open ended questions; Tie content to an area of student interest
- Modify Process: Allow students to work independently or collaboratively; Create a space where students can find independent work; Use project based learning
- Modify product: Allow students to choose a way to demonstrate their understanding; offer leveled projects

Suggested Technological Innovations/Use

- 8.1.8. E.1: Effective use of digital tools assists in gathering and managing information.
- 8.2.8. F.2: Technology is created through the application and appropriate use of technological resources.
- 8.2.8. D.1: Information literacy skills, research, data analysis and prediction are the basis for the effective design of technology systems.
- Peer reviews are to be commented on mini papers through Google Documents
- 8.2.8. D.1: Information literacy skills, research, data analysis and prediction are the basis for the effective design of technology systems.

Cross Curricular/21st Century Connections

- WRK.K-12.P.4: Demonstrate creativity and innovation.
- WRK.K-12.P.5: Utilize critical thinking to make sense of problems and persevere in solving them.

- WRK.K-12.P.8: Use technology to enhance productivity, increase collaboration and communicate effectively.
- WRK.K-12.P.9: Work productively in teams while using cultural/global competence.
- SOC.6.1.2.CivicsPI.5: Describe how communities work to accomplish common tasks, establish responsibilities, and fulfill roles of authority.
- SOC.6.1.2.CivicsPD.1: Engage in discussions effectively by asking questions, considering facts, listening to the ideas of others, and sharing opinions.
- SEL.PK-12.1: Self Awareness: Recognize one's feelings and thoughts; personal traits, strengths, and limitations.
- SEL.PK-12.2.2: Self Management: Recognize the skills needed to establish and achieve personal and educational goals
- SEL.PK-12.5: Relationship Skills: Utilize positive communication and social skills to interact effectively with others; Identify who, when, where, or how to seek help for oneself or others when needed

Unit 2: Plants and Animals

Content Area: **Science**
Course(s):
Time Period: **2nd Trimester**
Length: **3 weeks**
Status: **Published**

Summary of the Unit

In this unit, students will explore the difference between living and non-living things. Students will observe and understand that living things need things like energy and safety to survive, and how they make changes in the environment to obtain what they need to stay alive. Students will also explore the outdoors in order to observe living things in action.

Enduring Understandings

- Living things need energy to survive.
- Living things grow, change, and die.
- Animals need food, water, and air to survive
- Plants need light, water, and air to survive
- Animals and plants make changes in their environment in order to thrive.

Essential Questions

- What is a living thing? What is a non-living thing?
- What do plants need to survive?
- What do animals need to survive?
- How do plants and animals make changes in their environment so that they can survive?

Summative Assessment and/or Summative Criteria

Students will have mastered this topic if they can:

- Define living and non-living things.

- Describe what animals need to survive.
- Describe what plants need to survive.
- Describe how a living thing might make a change to their environment to help them stay alive.

Resources

- BrainPop Jr: Plant Life Cycles
- Clear Cups from previous unit, soil, seeds
- RAZ Kids Books: Animals, Animals (E); The Busy Pond (D); Where Plants Grow (D); Places Plants and Animals Live (E)

Unit Plan

Topic/Selection Timeframe	General Objectives (SWBAT)	Instructional Activities	Benchmarks/Assessments
Plant Life (1 week plus morning meeting time)	• Observe and describe patterns of what plants and animals need to survive. • Compare and contrast the survival needs of plants	• Use BrainPop Jr video Living and Non-Living Things as a unit introduction - hold discussion about how we will explore the needs of plants and animals in this unit. • Use Brain Pop Jr video: Plant Life Cycle to introduce concept; create a chart "What does a plant need to grow?" Plant Experiment: • Prepare a container, soil and seeds in advance. Have a class discussion to review what plants	• Teacher Observation/Anecdotal Notes • Student hypothesis and results writing

		need to grow. Demonstrate planting the seed. Keep it well lit and watered. Over the next few weeks, check in with the plant regularly during morning meeting to track the growth of the plant.	
Animal Life (1 week)	• Observe and describe patterns of what animals need to survive • Compare and contrast the survival needs of different animals	DE Mystery Science Unit: Animal Needs • Lesson 1 - Why do woodpeckers peck wood? Watch video and discuss how animals find food to survive • Lesson 2: Where do animals live? Read the story and discuss with class how animals find safe places to live. • Lesson 3: How can you find animals in the woods? Complete mystery science lesson to explore how animals seek safety • DE Exploration board: All About Animals: Students will independently explore videos about different types of animal behaviors.	• Teacher Observation/Anecdotal Notes
Plants and Animals in their Environment (1 week)	• Connect the relationships between the needs of plants and animals, and the environment where they live.	DE Mystery Science Unit: Animal Needs • Animals and changing the environment - Lesson 4: How do animals make their homes in the forest - Complete mystery science activity. Take	• Teacher Observation/Anecdotal Notes • Student observations writing and drawing

		students for a nature walk around the school to observe plants and animals. Have students record what they noticed by drawing a picture. DE Mystery Science Unit: Plant Secrets • Lesson 3: Why would you want an old log in your backyard? Complete mystery science activity.	
Growing Butterflies (3 weeks intermittently)	• Observe and describe the life cycle of a butterfly from caterpillar to butterfly	• Watch BrainPop Jr video: Butterflies to introduce topic before caterpillars arrive. Have a class discussion about butterfly life cycle. • Watch SciShow Butterfly Life Cycle Video: Create butterfly life cycle craft to review. • Watch SciShow Kids Butterfly or Moth video: create class Venn Diagram to compare/contrast between butterflies and moths. • When caterpillars arrive: Allow students time to observe and complete an observation journal each day (suggested: morning warm up). Take time to observe as a class as butterflies move through stages (caterpillar to chrysalis,	• Teacher Observation/Anecdotal Notes • Student observations writing and drawing

		emerging from chrysalis) • Butterfly release - gather students outside and observe as butterflies are released from the net - have students draw what they see. • Conclude unit: Review butterfly life cycle and different facts that we learned about butterflies. Create class chart. Complete all about butterflies writing project.	

ELA.W.IW.K.2	Use a combination of drawing, dictating, and writing to compose informative/explanatory texts to convey ideas.
ELA.SL.PE.K.1	Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.
SCI.K-ESS3-2	Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.
SCI.K-ESS3-1	Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.
SCI.K-ESS3-3	Communicate solutions that will reduce the impact of climate change and humans on the land, water, air, and/or other living things in the local environment.
SCI.K-LS1-1	Use observations to describe patterns of what plants and animals (including humans) need to survive.

Climate Change Activity

- W.IW.K.2. Use a combination of drawing, dictating, and writing to compose informative/explanatory texts to convey ideas.

  Climate Change Example: Students may draw, dictate, and compose text that explains which plants and animals they see in their local areas, and where and when they see those plants and animals.

- SL.PE.K.1. Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.
  Climate Change Example: Students may use information from texts that they have read and written to discuss their observations of how people impact the local environment.

A. Follow agreed-upon norms for discussions (e.g., listening to others with care and taking turns speaking about the topics and texts under discussion).
B. Continue a conversation through multiple exchanges.

Suggested Modifications for Special Education, ELL and Gifted Students

Consistent with individual plans, when appropriate.

Special Education:

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- Allow additional wait time during discussions to allow for all students to process information
- Students should be provided with graphic organizers.
- Check for understanding by conferencing with the teacher.
- Students may choose a partner or teacher may choose a partner to work that student is comfortable with.
- Repeat and clarify any directions given.
- Break activities into smaller tasks
- Allow for preferential seating within groups and the whole class.
- Modify amount of vocabulary words used
- Read questions out loud.
- Small group testing

ELL:

- Preview vocabulary
- Provide graphic organizers
- Provide opportunities for collaborative learning
- Modify assessments to simplify language
- Read questions out loud

- Break activities into smaller tasks
- Provide modified reading passages

Gifted Students:

- Modify Content: Vary reading levels in reading materials; Offer open ended questions; Tie content to an area of student interest
- Modify Process: Allow students to work independently or collaboratively; Create a space where students can find independent work; Use project based learning
- Modify product: Allow students to choose a way to demonstrate their understanding; offer leveled projects

Suggested Technological Innovations/Use

- 8.1.8. E.1: Effective use of digital tools assists in gathering and managing information.
- 8.2.8. F.2: Technology is created through the application and appropriate use of technological resources.
- 8.2.8. D.1: Information literacy skills, research, data analysis and prediction are the basis for the effective design of technology systems.
- Peer reviews are to be commented on mini papers through Google Documents
- 8.2.8. D.1: Information literacy skills, research, data analysis and prediction are the basis for the effective design of technology systems.

Cross Curricular/21st Century Connections

9.1 21st Century Life and Career Skills: All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.

- 9.1.8.A.1: Develop strategies to reinforce positive attitudes and productive behaviors that impact critical thinking and problem-solving skills.
- 9.1.8.B.2: Assess data gathered to solve a problem for which there are varying perspectives (e.g., cross-cultural, gender-specific, generational), and determine how the data can best be used to design multiple solutions.
- 9.1.8.C.2: Demonstrate the use of compromise, consensus, and community building strategies for carrying out different tasks, assignments, and projects.

- 9.1.8.D3: Use effective communication skills in face-to-face and online interactions with peers and adults from home and from diverse cultures.
- 9.1.8.F.1: Demonstrate how productivity and accountability contribute to realizing individual or group work goals within or outside the classroom.

Unit 3: Wild Weather!

Content Area: **Science**
Course(s):
Time Period: **2nd Trimester**
Length: **2 weeks**
Status: **Published**

Summary of the Unit

In this unit, students will explore different kinds of severe weather, discuss ways to be prepared in the event of a wild storm. They will also learn to use context clues to determine what the weather is outside based on different factors. Additionally students will begin exploring climate change and how humans can make an impact on the planet.

Enduring Understandings

- There are different types of severe weather called storms that can be dangerous.
- There are ways that we can be prepared to stay safe when there is severe weather.
- The environment is impacted by human actions
- We can take steps to help the planet and the environment by being mindful of how we use resources.

Essential Questions

- What are different types of storms?
- How can we prepare to be safe if we are in a storm?
- How do humans impact the environment?
- What can we do to help protect the planet?

Summative Assessment and/or Summative Criteria

Students will have mastered this topic if they can:

- Describe the weather outside.
- Name ways to be safe if they are in a storm.
- Explain why it is important to reduce, reuse, and recycle and name 1-2 specific actions they can take to

help.

Resources

- Discovery Education Mystery Science Units
- Brain Pop Jr
- Get Epic Book:Superstorm Sandy
- Supplemental Resources from Lakeshore Science Kits: Weather Activities box, Weather books

Unit Plan

Topic/Selection Timeframe	General Objectives (SWBAT)	Instructional Activities	Benchmarks/Assessments
Severe Weather (1 week)	• Describe the types of severe weather that are likely to happen in our region. • Describe specific actions they can take to prepare for severe weather they might encounter. • Observe and describe the weather. • Use context clues from pictures to make inferences about what the weather must be like in that picture.	DE Mystery Science Unit: Wild Weather • Mystery Science Lesson 1: How can you get ready for a big storm? Read along with the story to introduce different specific types of severe weather (thunderstorms, blizzards, hurricanes, tornadoes). Follow activity to lead class discussion on how to prepare for each type of weather. • Mystery Science Lesson	• Teacher Observation/Anecdotal Notes • What's the Weather today? drawing

		2: Have you ever watched a storm? Watch the video to introduce the topic. Follow along with the discussion prompts to allow students to notice what the sky looks like as different storms are coming. Activity: Breeze Buddy - follow the instructions to create the breeze buddy • Mystery Science Lesson 3: How many different kinds of weather are there? Watch the video to introduce the topic and then follow along to discuss how you can tell what the weather is by observing the sky, the wind, and what people are wearing. Have students observe the weather today, and draw a picture to describe it. • Optional: Use Get Epic book about Superstorm Sandy to open	

		discussion about the local history of severe weather.	
Reduce, Reuse, Recycle (½-1 week)	• Give a basic definition of climate change. • Communicate solutions that will reduce the impact of climate change and humans on land, water, air, and other living things.	• Use Brain Pop Jr video: Reduce, Reuse, Recycle: to introduce a topic. Make a class chart to brainstorm ideas for things that we can do to help the planet. Have the class draw a picture to show one way they can reduce, reuse, or recycle.	• Teacher Observation/Anecdotal Notes • Student drawings

ELA.RL.MF.K.6	With prompting and support, describe the relationship between illustrations and the story in which they appear (e.g., what moment in a story an illustration depicts).
SCI.K-ESS3-2	Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.
SCI.K-ESS2-1	Use and share observations of local weather conditions to describe patterns over time.
SCI.K-ESS3-3	Communicate solutions that will reduce the impact of climate change and humans on the land, water, air, and/or other living things in the local environment.

Climate Change Activity

- RI.MF.K.6. With prompting and support, describe the relationship between illustrations and the text in which they appear.

  Climate Change Example: In a science unit, students may look at images of the impact(s) humans have on land, water, air, and/or other living things in the local environment and describe the relationship between the illustrations and the text in which they appear.

Suggested Modifications for Special Education, ELL and Gifted Students

Consistent with individual plans, when appropriate.

Special Education:

- Modifications for any individual student's IEP/504 plan must be met.
- Modify assignment type and length to meet diverse learner needs
- Allow additional wait time during discussions to allow for all students to process information
- Students should be provided with graphic organizers.
- Check for understanding by conferencing with the teacher.
- Students may choose a partner or teacher may choose a partner to work that student is comfortable with.
- Repeat and clarify any directions given.
- Break activities into smaller tasks
- Allow for preferential seating within groups and the whole class.
- Modify amount of vocabulary words used
- Read questions out loud.
- Small group testing

ELL:

- Preview vocabulary
- Provide graphic organizers
- Provide opportunities for collaborative learning
- Modify assessments to simplify language
- Read questions out loud
- Break activities into smaller tasks
- Provide modified reading passages

Gifted Students:

- Modify Content: vary reading levels in reading materials; offer open ended questions; tie content to an area of student interest
- Modify Process: Allow students to work independently or collaboratively; create a space where

students can find independent work; use project based learning

- Modify product: allow students to choose a way to demonstrate their understanding; offer leveled projects

Suggested Technological Innovations/Use

- 8.1.8. E.1: Effective use of digital tools assists in gathering and managing information.
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Cross Curricular/21st Century Connections

9.1 21st Century Life and Career Skills: All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.

- 9.1.8.A.1: Develop strategies to reinforce positive attitudes and productive behaviors that impact critical thinking and problem-solving skills.
- 9.1.8.B.2: Assess data gathered to solve a problem for which there are varying perspectives (e.g., cross-cultural, gender-specific, generational), and determine how the data can best be used to design multiple solutions.
- 9.1.8.C.2: Demonstrate the use of compromise, consensus, and community building strategies for carrying out different tasks, assignments, and projects.
- 9.1.8.D3: Use effective communication skills in face-to-face and online interactions with peers and adults from home and from diverse cultures.
- 9.1.8.F.1: Demonstrate how productivity and accountability contribute to realizing individual or group work goals within or outside the classroom.

Unit 4: Pushes and Pulls

Content Area: **Science**
Course(s):
Time Period: **3rd Trimester**
Length: **2 Weeks**
Status: **Published**

Summary of the Unit

In this unit, students will explore different types of "work" in motion, particularly how pushes and pulls can change the motion of objects, and how the force of the pushes and pulls can change how much work is done. They will work to engineer different machines to solve simple problems.

Enduring Understandings

- Forces called push and pull can change the motion or direction of an object.
- We can build machines to make pushes and pulls stronger and do more work.
- Machines are used for big projects.
- We can design systems and machines that can help solve problems.

Essential Questions

- What happens when something is pushed or pulled?
- What happens when we change how hard or softly something is pushed or pulled?
- Why do people use machines?
- How can we design different machines to help us solve problems?

Summative Assessment and/or Summative Criteria

Students will have mastered this topic if they can:

- explain how pushes and pulls can move an object in different ways.
- describe how the hard or softly and object is pushed or pulled can change how it moves.
- explain why people use machines.

- design their own machine to solve a simple problem.

Resources

- Discovery Education Mystery Science Units
- RAZ Kids: Move It! (A)
- Supplemental Resources from Lakeshore Science Kit: Activity Box, Books, Cars and tracks

Unit Plan

Topic/Selection Timeframe	General Objectives (SWBAT)	Instructional Activities	Benchmarks/Assessments
Building and construction (1 week)	• Demonstrate how pushing and pulling change the motion of an object. • Investigate and describe the effects of what happens when the strength or direction of the pushes and pulls are changed. • Investigate and describe the forces and work of big machines. • Explain how machines can help builders. • Create a model wrecking ball and change the force of a paper ball and knock down a wall of cups.	DE Mystery Science Unit: Pushes and Pulls: • Lesson 1: What's the biggest excavator? Watch video to introduce concept - we have machines that help us do things every day, but in the past things were done by hand. Discuss "work words" vocabulary: grind, scrub, push, pull. Activity: Students will pretend to dig a hole for a pool with a shovel, and then as an excavator to see the difference in how much work can be done by hand vs. by a machine. • Lesson 2: Why do builders need so many big machines? Read along with Vivian to learn about different construction machines and how they help builders do their jobs.	• Teacher Observation/Anecdotal Notes • Drawing: Machines in action • Observation of group work in creating wrecking ball.

		Move like different big machines. Have children draw one machine in action. • Lesson 3: How can you knock down a concrete wall? Watch the video and discuss how the wrecking ball works to knock down the wall without damaging other buildings. Activity: Students will work together to create a wrecking ball and experiment with different force strengths in order to knock down a wall of cups without damaging the "houses" behind the wall. • Lesson 4: How can you knock down the most bowling pins? Read along with the story and have a class discussion on how Matteo problem solved to knock down bowling pins. Allow students to share their own experiences with bowling (where applicable). Optional bowling activity.	
Engineering and Problem Solving (1 week)	• Describe how pushing and pulling can change the direction of falling objects. • Design a system to protect their tiny town from a falling object. • Describe how machines can be created to solve problems. • Design a machine to solve a personal problem. • Find solutions to	DE Mystery Science Unit: Pushes and Pulls • Lesson 5: How can we protect a mountain town from falling rocks? Watch the video to explore and discuss how falling rocks can damage buildings, and what happens when objects get in the way of falling rocks. Activity: In groups students will explore ways to protect their tiny mountain town from the falling ping	• Teacher Observation/Anecdotal Notes • Observation of group work during "tiny town" experiment • Student work: Design of the machine to do a chore

	problems that arise when developing a machine.	pong balls. • Lesson 6: How could you invent a trap? Read along with the story to discover how Mimi and Lulu problem solve to create an effective monster trap. Discuss the different steps that they took and what problems they ran into along with way. Activity: Have students design a machine that could help them with a chore? (ex - picking up toys, setting the table)	

SCI.K.ETS1.A	Defining and Delimiting an Engineering Problem
SCI.K.ETS1.B	Developing Possible Solutions
SCI.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 a pull.
SCI.K-PS2-1	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.

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- 8.2.8. F.2: Technology is created through the application and appropriate use of technological resources.
- 8.2.8. D.1: Information literacy skills, research, data analysis and prediction are the basis for the effective design of technology systems.
- Peer reviews are to be commented on mini papers through Google Documents
- 8.2.8. D.1: Information literacy skills, research, data analysis and prediction are the basis for the

effective design of technology systems.

Cross Curricular/21st Century Connections

9.1 21st Century Life and Career Skills: All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.

- 9.1.8.A.1: Develop strategies to reinforce positive attitudes and productive behaviors that impact critical thinking and problem-solving skills.
- 9.1.8.B.2: Assess data gathered to solve a problem for which there are varying perspectives (e.g., cross-cultural, gender-specific, generational), and determine how the data can best be used to design multiple solutions.
- 9.1.8.C.2: Demonstrate the use of compromise, consensus, and community building strategies for carrying out different tasks, assignments, and projects.
- 9.1.8.D3: Use effective communication skills in face-to-face and online interactions with peers and adults from home and from diverse cultures.
- 9.1.8.F.1: Demonstrate how productivity and accountability contribute to realizing individual or group work goals within or outside the classroom.