



Springfield Public Schools
Springfield, New Jersey 07081

**Kindergarten
Science**

Curriculum Guide

2026

This curriculum may be modified through varying materials, techniques, and strategies as per an individual student's IEP.

*Springfield Board of Education
Approved July 27, 2026*

Springfield Public Schools

Cultivating compassionate and extraordinary learners!

EXTRACT OF THE MINUTES OF A MEETING OF
THE BOARD OF EDUCATION OF
THE TOWNSHIP OF SPRINGFIELD
COUNTY OF UNION, NEW JERSEY
AS RECORDED IN THE OFFICIAL MINUTE BOOK

Resolution: 21

Introduced By: Mrs. Gamarekian

Seconded By: Vice President Rinaldi

Adopted: July 27, 2026

Curriculum Adoption

To approve the following new and revised curriculum and courses for the 2026-2027 school year:

1. High School Courses

- a. AP Cybersecurity (new course)
- b. AP Business with Personal Finance (new course)
- c. AP Biology
- d. AP Chemistry
- e. AP Physics 1
- f. PLTW Robotics and Automation
- g. PLTW Introduction to Engineering Design
- h. PLTW Principles of Engineering
- i. Biology
- j. Biology Honors
- k. Chemistry
- l. Chemistry Honors
- m. Conceptual Physics
- n. Physics
- o. Environmental Science
- p. Forensics
- q. Human Anatomy and Physiology
- r. Oceanography
- s. Science 8
- t. Molecular Biology Research Lab (new course)

2. Middle School Courses

- a. Science 6
- b. Science 7

3. Elementary School Courses

- a. Kindergarten Science
- b. Grade 1 Science
- c. Grade 2 Science

Michelle Calas, School Business Administrator/Board Secretary

139 Mountain Avenue, Springfield, NJ 07081 • mcalas@springfieldschools.com • 973.376.1025

(continued)

I, Michelle Calas, School Business Administrator/ Board Secretary of the Springfield Board of Education, hereby certify that the extract from the minutes of a meeting of the Board of Education duly called and held on July 27, 2026 has been compared by me with the original minute book of said Board of Education, and is a true, complete and exact copy thereof, as far as the same relates to the subject matter to on said extract.

In WITNESS THEREOF, I have hereunto set my hand and seal of the Springfield Board of Education, this 28th day of July 2026.

SEAL



Michelle Calas

School Business Administrator/ Board Secretary



**Springfield Public Schools
Springfield, New Jersey**

**Rachel Goldberg
Superintendent of Schools**

**Erica Scudero
Assistant Superintendent**

Curriculum Developed By Kindergarten Teachers:

Susie Felter

Rebecca Perone

Paige Rogers

Kayley Boskovic

Dana Zika

Alison Giuliano

Jess Meagher

Gregory Salmon ~ STEM Supervisor



Unit Overview Template

Content Area: Science **Grade Level:** Kindergarten **Unit Title:** Animal Secrets

Unit Summary: In this unit, Kindergarten students become wildlife detectives to uncover the hidden lives of animals right outside their doors. Through hands-on explorations and interactive read-alouds, students discover the fundamental truth that all living things have predictable patterns of basic needs: food, water, shelter, and safety. Students investigate how animals interact with their surroundings, build physical models to map why living things thrive in specific habitats, and gather evidence to show how animals actively reshape their environments to build homes and stay safe.

Primary Interdisciplinary Connections: Mathematics, ELA

21st Century Themes ☒ Creativity and Innovation ☒ Critical Thinking and Problem Solving ☒ ICT Literacy
☒ Information Literacy ☒ Life and Career Skills ☒ Communication and Collaboration ☒ Media Literacy

Unit Rationale: Understanding that organisms have specific needs and predictable behaviors forms the foundational baseline for all ecological and biological sciences. By centering the unit around observable patterns (e.g., woodpeckers pecking for food or squirrels gathering nesting materials), students transition from simply naming animals to analyzing why those animals behave the way they do. This shifts young learners toward evidence-based scientific argumentation (K-ESS2-2) and foundational system modeling (K-ESS3-1). Furthermore, exploring how animals reshape their environments introduces students to the profound interconnectedness of ecosystems, instilling an early sense of environmental responsibility and civic awareness regarding local habitats.

Career Readiness (Standard 9):

- 9.4.2.DC.3: Explain how to be safe online and follow safe practices when using the internet.
9.4.2.DC.6 : Identify respectful and responsible ways to communicate in digital environments.
9.4.2.TL.1: Identify the basic features of a digital tool and explain the purpose of the tool.

Learning Targets

Standards: K-LS1, K-ESS2, K-ESS3

Content Statements: From Molecules to Organisms: Structures and Processes; Earth Systems; Earth and Human Activity

CPI#:	Cumulative Progress Indicator (CPI):
K-LS1-1	Use observations to describe patterns of what plants and animals (including humans) need to survive.
K-ESS2-2	Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.
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.
W.K.2	Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic.



RI.K.1	With prompting and support, ask and answer questions about key details in a text.
K.G.A.1	Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to.
SEL.PK-12.1.1	Recognize one's feelings and thoughts
SEL.PK-12.2.2	Recognize the skills needed to establish and achieve personal and educational goals
SEL.PK-12.4.1	Develop, implement and model effective problem solving and critical thinking skills
8.2.2.ED.1	Communicate the function of a product or device.
8.2.2.ITH.1	Identify products that are designed to meet human wants or needs.
8.2.2.NT.2	Brainstorm how to build a product, improve a designed product, fix a product that has stopped working, or solve a simple problem.

Science and Engineering Practices

Developing and Using Models

Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, storyboard) that represent concrete events or design solutions.

- Use a model to represent relationships in the natural world. (K-ESS3-1)

Analyzing and Interpreting Data

Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.

- Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (K-LS1-1)

Engaging in Argument from Evidence

Engaging in argument from evidence in K–2 builds on prior experiences and progresses to comparing ideas and representations about the natural and designed world(s).

- Construct an argument with evidence to support a claim. (K-ESS2-2)

Disciplinary Core Ideas (DCIs)

LS1.C: Organization for Matter and Energy Flow in Organisms

- 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. (K-LS1-1)



ESS2.E: Biogeology

- Plants and animals can change their environment. (K-ESS2-2)

ESS3.A: Natural Resources

- 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. (K-ESS3-1)

ESS3.C: Human Impacts on Earth Systems

- 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. (Secondary to K-ESS2-2)

Crosscutting Concepts (CCCs)

Patterns

- Patterns in the natural and human-designed world can be observed, used to describe phenomena, and used as evidence. (K-LS1-1)

Systems and System Models

- Systems in the natural and designed world have parts that work together. (K-ESS2-2, K-ESS3-1)

Connections to Nature of Science (NOS)

Scientific Knowledge is Based on Empirical Evidence

- Scientists look for patterns and order when making observations about the world. (K-LS1-1)

Unit Essential Questions:

- Why do animals need food?
- Why do animals need shelter?
- Why do animals need safety?
- What do animals need to stay healthy, safe, and alive?
- How does an animal's home help it get what it needs?
- In what ways do animals change the world around them to survive?

Unit Enduring Understandings:

- All animals (including humans) share a common pattern of basic needs, requiring food, water, shelter, and safety to survive and remain healthy.
- Living things naturally live in specific places that provide exactly what their unique bodies need.
- Animals are not passive; they actively change their physical environments (like digging holes or weaving nests) to meet their survival requirements.



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Unit Learning Targets:

- Identify and describe patterns in what different animals need to survive using firsthand observations and media clues (K-LS1-1).
- Use a model or drawing to demonstrate the direct relationship between an animal's needs and the specific place it chooses to live (K-ESS3-1).
- Construct an argument supported by evidence explaining how an animal alters its environment to successfully meet its needs for shelter or safety (K-ESS2-2).



Evidence of Learning

Summative Assessment: Unit Assessment

Equipment Needed: Mystery Science Kit

Teacher: Mystery Science Online Program

Resources:

Formative Assessments:

- Draw and write follow up activity for each lesson assessment.
- "Animal Needs" Pattern Sort: Students analyze pictures of diverse animals and match them to their primary food, water, and safety sources to demonstrate an understanding of shared survival patterns.
- Habitat Match Modeling: A drawing or interactive modeling task where students place an animal inside a specific habitat layout and orally explain why that location provides its basic needs.
- "Who Changed the Forest?" Evidence Check: Given an environmental change scenario (e.g., a hollowed-out tree trunk or a pile of twigs), students state a claim about which animal caused the change and explain why that change helped the animal survive.



Lesson Plans

Lesson	Time Frame
Lesson 1 Why do woodpeckers peck wood?	40 mins/1 day
Lesson 2 Where do animals live?	40 mins/1 day
Lesson 3 How can you find animals in the woods?	40 mins/1 day

Teacher Notes:

Students will need space to move around and act out as animals in the lesson presentation.

Kindergarten students excel when they can physically embody the concepts. Lean heavily into the built-in dramatization elements (e.g., mimicking woodpecker movements or acting out a squirrel gathering acorns) to solidify the core idea of behavioral patterns.

When exploring how animals change their environments, explicitly draw a parallel to how humans build homes, plant gardens, and design communities to fulfill our own health and safety needs. This bridges basic biology with global awareness and civic responsibility, prompting students to think about how our human modifications impact the animal neighbors sharing our local ecosystem.

Curriculum Development Resources/Technology Resources:

mysteryscience.com



Lesson Plan 1 Template

Content Area: Science	Lesson Title: Why do woodpeckers peck wood?	Time Frame: 40 mins/1 day
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Lesson Components

21st Century Themes

- ☒ Global Awareness ☐ Financial, Economic, Business and Entrepreneurial Literacy
☒ Civic Literacy ☒ Health Literacy

21st Century Skills

- ☒ Creativity and Innovation ☒ Critical Thinking and Problem Solving ☒ Information Literacy
☒ Life and Career Skills ☒ Communication and Collaboration ☒ Media Literacy ☐ ICT Literacy

Interdisciplinary Connections: ELA

Integration of Technology:

Mystery Science video-based lesson accessed through district online platform. Student responses are recorded through discussion and drawing-based responses.

Equipment Needed:

Mystery Science “Animal Needs” Mystery Pack, including forest animal image cards (quail, raccoon, woodpecker), animal behavior cards (scratching, pecking, digging, eating actions), habitat clue/footprint cards used to support observations, activity direction cards for movement simulation, and student recording sheets. Crayons or colored pencils are also required.

Goals/Objectives	Learning Activities/ Instructional Strategies	Formative Assessment Tasks
Students will: - Students will observe and describe observable animal behaviors in a forest environment. - Students will identify that different animals have similar survival needs, especially the need for food. - Students will compare behaviors across animals and recognize patterns in how animals meet their needs. - Students will use observations from video and activities to support	Lesson Sequence - Phenomenon: - Different animals living in the same forest environment behave in different ways, yet all appear to be performing actions related to survival needs, especially finding and eating food. - Students will be introduced to the anchoring phenomenon by observing a forest environment where	- Students will participate in oral discussion and share observations about animal behavior. - Students will correctly sort animal and behavior cards during group activity. - Students will complete a drawing that shows an animal meeting its need for food. - Students will verbally explain how their chosen animal finds food.



simple claims about animal survival.

- different animals behave in different ways but appear to be doing similar survival-related actions.
3. Students will watch a Mystery Science video showing quail, raccoons, and woodpeckers in their natural habitat.
 4. Students will share initial observations about what each animal is doing during a whole-group discussion.
 5. Students will participate in guided movement activities where they act out animal behaviors such as scratching, pecking, walking, and foraging.
 6. Students will use Mystery Pack materials to match animal cards with behavior cards during a structured sorting activity.
 7. Students will revisit video evidence to identify what each animal is doing to meet its needs, with teacher guidance.
 8. Students will discuss similarities across all animals and identify food as a shared survival need.
 9. Students will complete a drawing showing one animal and how it gets food in its environment.
 10. Students will share their drawings and explanations with the



class in a brief
discussion.

Differentiation:

- Students will respond through drawing, speaking, or labeling depending on developmental readiness.
- Movement-based activities will support kinesthetic learners and increase engagement.
- Visual supports from Mystery Pack materials will support comprehension for emerging readers and language learners.
- Teacher will provide small-group reteaching for students who need additional support identifying animal needs.
- Students will be paired strategically to support collaborative discussion and task completion.
- Sentence frames will be provided for students who need structured language support such as "The ____ is ____ to find food."
- Extension opportunities will allow students to compare animal behaviors in the forest to animals they have observed in their own community.

Resources Provided:

- Mystery Science video lesson (Animal Needs unit).
- Mystery Pack materials (animal cards, behavior cards, habitat clues, and activity direction cards).
- Student recording sheets.
- Drawing materials (crayons or colored pencils).



Lesson Plan 2 Template

Content Area: Science Lesson Title: Where do animals live? Time Frame: 40 mins/1 day

Lesson Components

21st Century Themes

- ☒ Global Awareness ☐ Financial, Economic, Business and Entrepreneurial Literacy
☒ Civic Literacy ☒ Health Literacy

21st Century Skills

- ☒ Creativity and Innovation ☒ Critical Thinking and Problem Solving ☒ Information Literacy
☒ Life and Career Skills ☒ Communication and Collaboration ☒ Media Literacy ☒ ICT Literacy

Interdisciplinary Connections:

ELA

Integration of Technology:

Mystery Science interactive read-along lesson accessed through district online platform. Student responses are recorded through collaborative discussion, movement breaks, and drawing-based responses.

Equipment Needed:

Mystery Science "Animal Needs" Read-Along Pack, including Sofia's Walk Big Book (or digital projection version), "Nature Nuggets" extension video, animal home/shelter clue cards (nest, burrow, hollow log), vocabulary anchor charts (Nest, Shelter, Needs), student observation logs, and drawing materials (crayons or colored pencils).

Goals/Objectives	Learning Activities/ Instructional Strategies	Formative Assessment Tasks
Students will: - Students will listen to an interactive read-along text and look for visual clues to identify where animals live. - Students will define and use the target vocabulary words: nest, shelter, and needs. - Students will identify that animals live in specific locations because those places provide them with shelter and safety. - Students will communicate observations from a	Lesson Sequence - Phenomenon: - Animals live in specific places within the woods (like trees, underground, or bushes) that provide shelter and help them meet their basic survival needs. - Students will be introduced to the lesson by watching an introductory video by Doug, framing the investigation around a	- Students will answer text-dependent and visual clue questions during the interactive read-along. - Students will verbally identify and describe the animals and homes observed in the "Nature Nuggets" video. - Students will complete a drawing that accurately pairs an animal with its appropriate shelter. - Students will use the target vocabulary (shelter or needs) when verbally



nature video to explain how different animal homes meet the animals' needs.	character named Sofia who wants to know where animals live. - Students will participate in an interactive read-along story, following Sofia on her walk through the woods. - Students will respond to embedded active-learning prompts during the story, getting up to model movements, hunting for visual clues on the pages, and discussing ideas with partners. - Students will watch the "Nature Nuggets" one-minute extension video showcasing various wild animals at home in their natural shelters. - Students will participate in a whole-group discussion evaluating what animals were seen and how those specific locations help the animals. - Students will work in pairs to explore vocabulary cards (nest, shelter, needs) and match them to visual examples from Sofia's walk. - Students will complete an illustration in their observation logs depicting an animal inside its specific shelter. - Students will add labels or dictate a sentence explaining why that	explaining their drawings.
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| | shelter is a need for the animal's survival.
10. Students will share their shelter drawings with the class to conclude the lesson. | |
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Differentiation:

- Students will respond through drawing, dictating, speaking, or writing depending on developmental readiness.
- Multi-sensory read-along elements (clue hunting, physical movement breaks) will support kinesthetic learners and maintain engagement.
- Visual anchor charts for *nest*, *shelter*, and *needs* will support language acquisition for emerging readers and English learners.
- Teacher will provide targeted, small-group scaffolding during the independent drawing and labeling portion.
- Sentence frames will be provided for writing/dictation support, such as: "A [animal] lives in a [shelter] because it needs [food/safety/warmth]."
- Extension opportunities will challenge advanced students to identify and draw examples of animal shelters they have observed in their local schoolyard or neighborhood.

Resources Provided:

- Mystery Science interactive read-along lesson ("Where do animals live?").
- "Nature Nuggets" one-minute animal home video clip.
- Vocabulary support cards (*nest*, *shelter*, *needs*).
- Student recording/drawing sheets.
- Classroom drawing supplies.



Lesson Plan 3 Template

Content Area: Science	Lesson Title: How can you find animals in the woods?	Time Frame: 40 mins/1 day
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Lesson Components

21st Century Themes

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|--|---|
| ☒ Global Awareness | ☐ Financial, Economic, Business and Entrepreneurial Literacy |
| ☒ Civic Literacy | ☒ Health Literacy |

21st Century Skills

- | | | |
|---|---|---|
| ☒ Creativity and Innovation | ☒ Critical Thinking and Problem Solving | ☒ Information Literacy |
| ☒ Life and Career Skills | ☒ Communication and Collaboration | ☐ Media Literacy ☐ ICT Literacy |

Interdisciplinary Connections:

Mathematics

Integration of Technology:

Mystery Science video-based lesson accessed through district online platform. Student responses are recorded through whole-group discussion, interactive digital prompts, and drawing-based responses.

Equipment Needed:

Mystery Science "Animal Needs" Mystery Pack, including local habitat image cards, animal behavior matching sheets (snail/shell, mantis/fierce pose, gopher/hole), hidden animal visual clue cards, student recording pages, and drawing tools (crayons or colored pencils).

Goals/Objectives	Learning Activities/ Instructional Strategies	Formative Assessment Tasks
Students will: - Students will identify and describe specific strategies and locations for finding animals in a forest (looking under objects, watching for movement, checking ground holes). - Students will observe and explain how different animals use unique behaviors (hiding, looking fierce, fleeing) to meet their basic survival need for safety. - Students will compare behaviors across different species to discover a	Lesson Sequence - Phenomenon: Different animals use specific hiding places or defense behaviors in their habitat to protect themselves and satisfy their basic need for safety. - Students will be introduced to the lesson by Doug sharing secrets on how to locate hidden animals in nature, focusing on the trick of looking under damp logs or leaves. - Students will observe a snail's physical traits and watch its immediate	- Students will answer observational questions during the video segments regarding animal reactions to humans. - Students will successfully demonstrate the three distinct safety behaviors during the movement activities. - Students will verbally explain the common pattern that connects the actions of a snail, a mantis, and a gopher. - Students will complete an illustration that



common behavioral pattern related to survival. • Students will make observations from videos to predict how a new animal (pill bug) might behave to stay safe.	reaction when a person approaches. 4. Students will participate in a guided movement break where they pretend to be a snail, curling into an imaginary shell and stretching out to explore. 5. Students will watch a video demonstrating the second trick for finding animals: stopping to scan leaves for subtle movements, leading to the discovery of a praying mantis. 6. Students will participate in a physical movement activity where they act like a scared praying mantis, stretching up tall and wide to look big and fierce. 7. Students will explore the third trick of checking the ground for holes, observing a gopher using caution to gather seeds left outside its burrow. 8. Students will play an interactive game in an open space, crouching down in an imaginary gopher hole and practicing surfacing only when it is safe from danger. 9. Students will participate in a whole-group wrap-up discussion to look at the pattern connecting the snail, mantis, and gopher. 10. Students will identify that while the physical actions	accurately depicts an animal performing an action to secure its safety.
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- differ, all three animals are demonstrating behaviors driven by the need for safety.
11. Students will complete an independent drawing showing one of the studied animals using its environment to stay safe from danger.

Differentiation:

- Students will share their understanding through drawing, physical modeling, or verbal dictation depending on individual development.
- Multi-sensory game elements (listening for danger cues, moving from crouched to standing positions) will support kinesthetic learners and maintain focus.
- Visual behavior cards showing the text's animals next to their safe spots will support language development for emerging readers and English learners.
- The teacher will guide a small-group circle during the drawing portion to support students who need help connecting the concept of safety to their pictures.
- Sentence frames will be provided for oral or written support, such as: "The [animal] hides in the [spot] to stay safe."
- Extension opportunities will allow advanced students to apply these tricks to a local schoolyard walk to find and observe the safety behaviors of real-world pill bugs or ants.

Resources Provided:

- Mystery Science video lesson (Animal Needs unit).
- Mystery Pack animal behavior and habitat materials.
- Student recording and illustration logs.
- Classroom drawing materials.



Lesson Reflection

Reflect on the lesson you have developed and rate the degree to which the lesson *Strongly*, *Moderately* or *Weakly* meets the criteria below.

Lesson Activities	Strongly	Moderately	Weakly
Are challenging Strongly and require higher order thinking and problem solving skills	☒	☐	☐
Allow for student choice	☐	☒	☐
Provide scaffolding for acquiring targeted knowledge/skills	☒	☐	☐
Integrate global perspectives	☒	☐	☐
Integrate 21st century skills	☒	☐	☐
Provide opportunities for interdisciplinary connection and transfer of knowledge and skills	☒	☐	☐
Foster student use of technology as a tool to develop critical thinking, creativity and innovation skills	☐	☒	☐
Are varied to address different student learning styles and preferences	☒	☐	☐
Are differentiated based on student needs	☒	☐	☐
Are student-centered with teacher acting as a facilitator and co-learner during the teaching and learning process	☐	☒	☐
Provide means for students to demonstrate knowledge and skills and progress in meeting learning goals and objectives	☒	☐	☐
Provide opportunities for student reflection and self- assessment	☒	☐	☐
Provide data to inform and adjust instruction to better meet the varying needs of learners	☐	☒	☐

Curriculum Design Template

Content Area: Science	Grade Level: Kindergarten	Unit Title: Animal Secrets
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Created: 2026	Board Approved on: Type Here
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Unit Overview Template

Content Area: Science **Grade Level:** Kindergarten **Unit Title:** Plant Secrets

Unit Summary: In this unit, Kindergarten students step into the roles of young botanists and conservationists to unlock the mysteries of how plants grow, move, and interact with the world around them. Through structured time-lapse observations, hands-on planting labs, and collaborative engineering design challenges, students discover that plants are dynamic, living things with strict survival requirements. Students investigate how plants actively respond to their environments by stretching toward light and recovering from dehydration. The unit culminates in an exploration of how living things alter their surroundings and how human choices can directly minimize negative impacts on local land, water, and wildlife, fostering early environmental citizenship and stewardship.

Primary Interdisciplinary Connections: Mathematics, ELA

21st Century Themes ☒ Creativity and Innovation ☒ Critical Thinking and Problem Solving ☒ ICT Literacy

☒ Information Literacy ☒ Life and Career Skills ☒ Communication and Collaboration ☒ Media Literacy

Unit Rationale: Recognizing that plants are living organisms with predictable survival needs forms the bedrock of early biological and environmental literacy. Because plant movements occur slowly, young learners often struggle to perceive them as living things. By utilizing time-lapse media and physical modeling, this unit makes plant responses concrete, allowing students to gather clear visual evidence that plants actively seek water and light to live and grow. Transitioning from basic survival needs to environmental systems helps children understand that living things change their surroundings to meet those needs. By connecting these concepts to real-world solutions, students learn that human choices can actively protect the resources that local plants and animals rely on for survival.

Career Readiness (Standard 9):

9.4.2.DC.3: Explain how to be safe online and follow safe practices when using the internet.

9.4.2.DC.6 : Identify respectful and responsible ways to communicate in digital environments.

9.4.2.TL.1: Identify the basic features of a digital tool and explain the purpose of the tool.

Learning Targets

Standards: K-LS1, K-ESS3

Content Statements: From Molecules to Organisms: Structures and Processes; Earth and Human Activity

CPI#: **Cumulative Progress Indicator (CPI):**

K-LS1-1 Use observations to describe patterns of what plants and animals (including humans) need to survive.

K-ESS3-3 Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.

RI.K.1 With prompting and support, ask and answer questions about key details in a text.



K.CC.B.4	Understand the relationship between numbers and quantities; connect counting to cardinality. - When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object. - Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted. - Understand that each successive number name refers to a quantity that is one larger.
SEL.PK-12.1.1	Recognize one's feelings and thoughts
SEL.PK-12.2.2	Recognize the skills needed to establish and achieve personal and educational goals
SEL.PK-12.4.1	Develop, implement and model effective problem solving and critical thinking skills
8.2.2.ED.1	Communicate the function of a product or device.
8.2.2.ITH.1	Identify products that are designed to meet human wants or needs.
8.2.2.NT.2	Brainstorm how to build a product, improve a designed product, fix a product that has stopped working, or solve a simple problem.

Science and Engineering Practices

Developing and Using Models

Modeling in kindergarten through second grade builds on prior experiences and progresses to include using and developing models—such as diagrams, drawings, physical replicas, dioramas, dramatizations, or storyboards—that represent concrete events or design solutions.

- Use a model to represent relationships in the natural world. (K-LS1-1)

Analyzing and Interpreting Data

Analyzing data in kindergarten through second grade builds on prior experiences and progresses to collecting, recording, and sharing observations.

- Use observations from firsthand environments or media to describe patterns in the natural world in order to answer scientific questions. (K-LS1-1)

Engaging in Argument from Evidence

Engaging in argument from evidence in kindergarten through second grade builds on prior experiences and progresses to comparing ideas and representations about the natural and designed worlds.



- Construct an argument with evidence to support a claim. (K-LS1-1)

Obtaining, Evaluating, and Communicating Information

Obtaining, evaluating, and communicating information in kindergarten through second grade builds on prior experiences and progresses to evaluating the merit and accuracy of ideas and methods.

- Communicate solutions with others in oral and/or written forms using models and/or drawings that provide detail about scientific ideas. (K-ESS3-3)

Disciplinary Core Ideas

Life Science 1.C: Organization for Matter and Energy Flow in Organisms

- 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. (K-LS1-1)

Earth and Space Science 2.E: Biogeology

- Plants and animals can change their environment. (K-ESS3-3)

Earth and Space Science 3.A: Natural Resources

- 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. (K-ESS3-3)

Earth and Space Science 3.C: Human Impacts on Earth Systems

- 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. (K-ESS3-3)

Crosscutting Concepts

Patterns

- Patterns in the natural and human-designed world can be observed, used to describe phenomena, and used as evidence. (K-LS1-1)

Systems and System Models

- Systems in the natural and designed world have parts that work together. (K-LS1-1)

Cause and Effect

- Events have causes that generate observable patterns. (K-ESS3-3)

Connections to Nature of Science



Scientific Knowledge is Based on Empirical Evidence

- Scientists look for patterns and order when making observations about the world. (K-LS1-1)

Unit Essential Questions:

- Are plants alive?
- How do plants and trees grow?
- Why would you want an old log in your backyard?
- How do we know that a plant is a living thing?
- What do plants need from their environment to grow big and healthy?
- How do the choices people make affect the plants and animals living in our neighborhood?

Unit Enduring Understandings:

- Find out if plants are alive.
- Find out how plants and trees grow.
- Discover why an old log is important to animals.
- Plants are living things that grow, move, and have basic survival needs, specifically requiring water and light.
- Plants and animals can change the environment around them to meet their basic survival needs.
- Things that people do to live comfortably can affect local ecosystems, but humans can make proactive choices to reduce their impact on land, water, air, and other living things.

Unit Learning Targets:

Students will...

- Use observations to understand what plants need to survive. Students explore how plants need water and sunlight. They also observe how plants grow from seed to seedling.
- Analyze and use data from direct observations to identify patterns in what living plants need to survive.
- Develop and use physical models to demonstrate how plants move and change direction to capture sunlight.
- Construct an argument supported by evidence to prove that plants are alive by comparing their survival needs to non-living objects.
- Communicate solutions that demonstrate how human choices can reduce negative impacts on local plant and animal habitats.



Evidence of Learning

Summative Assessment: Unit Assessment

Equipment Needed: Mystery Science Kit

Teacher: Mystery Science Online Program

Resources:

Formative Assessments:

- Draw and write follow up activity for each lesson assessment.
- Unit-Level Formative Assessments
- "Living vs. Non-Living" Evidence Sort: Students evaluate a mixed set of pictures featuring plants, animals, and non-living items (like rocks or plastic toys). They must verbally defend why the plants are classified as alive by matching them to their daily survival requirements for water and light.
- Light and Water Predictive Mapping: A drawing or physical modeling task where students are presented with a hypothetical scenario (e.g., moving a lamp to the opposite side of a room, or shifting a water dripping source). Students predict and illustrate the direction a plant's roots or leaves will bend and grow in response to the change.
- "Habitat Protector" Design Presentation: A small-group oral and visual presentation where students design a minor modification to a shared local environment (such as a schoolyard recycling bin system, a small brush pile for birds, or a native flower pot). Teams explain how their human-made choice directly reduces human impact on local land, water, or living resources while supporting the needs of surrounding wildlife.



Lesson Plans

Lesson	Time Frame
Lesson 1 Are plants alive?	40 mins/1 day
Lesson 2 How do plants and trees grow?	40 mins/1 day
Lesson 3 Why would you want an old log in your back yard?	40 mins/1 day

Teacher Notes:

Students will need space to move around and act out as plants in the lesson presentation.

The hands-on radish-planting activity in Lesson 2 requires at least five days to show visible sprout results. It is highly recommended to set up the teacher-led demonstration model (seeds in a clear plastic bag with a wet paper towel) on Day 1 of the entire unit. This gives students a clear, un-obscured preview of white root development before their individual cup seedlings manage to break through the opaque soil line.

Integrating Contextual Targets (K-LS1-1 & K-ESS3-3): To bridge the gap between plant needs and human stewardship, use the movement breaks in Lesson 1 to make an explicit health connection—compare a drooping, thirsty plant to how a human body feels fatigued when dehydrated. From there, expand the concept into community civics during Lesson 3: guide students to understand that just as our families intentionally look out for our health and safety needs, humans have a direct civic responsibility to monitor how our actions affect the public green spaces, neighborhood trees, and soils around our school. Focus student project discussions on the fact that simple choices—like picking up litter, avoiding trampling young sprouts, or constructing small brush piles—are active, real-world solutions that reduce our ecological footprint and protect our shared neighborhood habitat.

Curriculum Development Resources/Technology Resources:

mysteryscience.com



Lesson Plan 1 Template

Content Area: Science Lesson Title: Are plants alive? Time Frame: 40 mins/1 day

Lesson Components

21st Century Themes

- ☒ Global Awareness ☐ Financial, Economic, Business and Entrepreneurial Literacy
☒ Civic Literacy ☒ Health Literacy

21st Century Skills

- ☒ Creativity and Innovation ☒ Critical Thinking and Problem Solving ☒ Information Literacy
☒ Life and Career Skills ☒ Communication and Collaboration ☐ Media Literacy ☐ ICT Literacy

Interdisciplinary Connections:

ELA

Integration of Technology:

Mystery Science video-based lesson accessed through district online platform. Student responses are recorded through collaborative discussion, interactive digital visuals, and observation-based movement responses.

Equipment Needed:

Mystery Science "Plant Secrets" Pack, including image cards comparing healthy and unhealthy plants, photos of plants grown in light versus complete darkness, a physical watering can for teacher demonstration, student observation logs, and basic classroom drawing materials like crayons or colored pencils.

Goals/Objectives	Learning Activities/ Instructional Strategies	Formative Assessment Tasks
Students will: - Students will observe and describe the physical changes that occur when a dehydrated plant receives water. - Students will identify that plants move and grow toward light sources to meet their survival requirements. - Students will compare the characteristics of living plants and animals to non-living objects like rocks to define what makes something alive. - Students will state a claim supported by observational evidence	Lesson Sequence - Phenomenon: Over time, plants exhibit observable movements by tilting their leaves toward light sources and changing from droopy to upright shapes when provided with liquid, whereas objects like rocks show no changes in response to these environmental factors. - Students will begin the lesson by discussing what it takes to care for a family pet (feeding, walking, watering) and identifying that animals	- Students will verbally explain the observable visual differences between a healthy plant and an unhealthy plant. - Students will successfully model plant responses to water and sunlight through physical movement actions. - Students will answer text-dependent and video-dependent questions regarding what happens to plants kept in the dark. - Students will complete a drawing that accurately pairs a living plant with



that plants are living things because they have basic needs for water and light.

- are living things with clear survival needs.
3. Students will watch a video introducing the concept of observation as a primary tool used by scientists to pay close attention to clues in nature.
 4. Students will analyze a set of visual images to classify which potted plants look healthy (vibrant green, reaching up) versus unhealthy (wilted, droopy).
 5. Students will view time-lapse, sped-up video segments showing a dry, droopy plant rapidly absorbing water and lifting its leaves.
 6. Students will participate in a physical movement break where they pretend to be a plant, starting in a crouched, droopy position and slowly stretching upright as they imagine receiving drops of water from a watering can.
 7. Students will watch a second time-lapse video demonstrating how plants bend, twist, and grow toward a window with bright sunlight.
 8. Students will play an interactive game where they stand up and pretend to be growing plants, using their arms as leaves to reach toward the teacher, who moves

its primary survival needs of water and light.



- around the room acting as the traveling sun.
9. Students will compare side-by-side evidence of two plants: one grown in a sunlit room and one kept in total darkness, noting the changes in color and structure.
 10. Students will participate in a structured class discussion comparing a living plant to a non-living pet rock to conclude that non-living things do not grow and do not have basic needs.
 11. Students will complete a drawing in their observation logs illustrating a plant receiving its two primary needs: water and sunlight.

Differentiation:

- Students will share their scientific claims through drawing, physical gestures, or oral dictation based on developmental readiness.
- Kinesthetic learners are supported through the integrated time-lapse imitation games and plant movement breaks.
- Visual supports comparing sun-grown plants to dark-grown plants will assist emerging readers and language learners in making text-to-world connections.
- The teacher will provide small-group guidance during the drawing portion to help students connect the abstract concept of "needs" to concrete items like a sun or a watering can.
- Sentence frames will be provided for student discussions, such as: "The plant is alive because it needs [blank] and [blank]."
- Extension opportunities will allow students to inspect real classroom plants or schoolyard trees to check if they are currently bending toward the nearest light source.

Resources Provided:

- Mystery Science video lesson (Plant Secrets unit).
- Visual image cards for plant comparisons.
- Student log sheets for drawing and recording observations.
- Classroom drawing tools.



Lesson Plan 2 Template

Content Area: Science Lesson Title: How do plants and trees grow? Time Frame: 40 mins/1 day

Lesson Components

21st Century Themes

- ☐ Global Awareness ☐ Financial, Economic, Business and Entrepreneurial Literacy
☐ Civic Literacy ☐ Health Literacy

21st Century Skills

- ☐ Creativity and Innovation ☐ Critical Thinking and Problem Solving ☐ Information Literacy
☐ Life and Career Skills ☐ Communication and Collaboration ☐ Media Literacy ☐ ICT Literacy

Interdisciplinary Connections:

Mathematics

Integration of Technology:

Mystery Science video-based instruction modules paired with a live classroom time-lapse observation experiment utilizing clear materials to expose underground root developments.

Equipment Needed: Clear plastic cups, potting soil, spoons, radish seeds, spray bottles filled with water, small paper plates, adhesive labels, permanent markers, clear resealable plastic bags, and paper towels (provided in the Mystery Pack)

Goals/Objectives	Learning Activities/ Instructional Strategies	Formative Assessment Tasks
Students will: - Students will count out an exact quantity of three radish seeds to practice one-to-one counting alignment during planting. - Students will explain why small trees grow rapidly after an adjacent large tree falls, linking the behavior to a struggle for overhead sunlight. - Students will execute a hands-on planting process to discover how water and sunlight trigger seed germination. - Students will monitor and track daily growth	Lesson Sequence - Phenomenon: When a massive canopy tree falls during a storm, the previously stunted small trees surrounding it suddenly begin to grow rapidly and fill the open space. Additionally, sprouted radish seedlings physically pivot and reorient their leaves to point toward a glass window within an eight-hour window. - Students will watch an introductory video showcasing diverse plant life, including desert cacti, tropical bromeliads,	- Students will demonstrate accurate counting skills by separating exactly three seeds for their project. - Students will articulate that plants absorb water through their root systems rather than a traditional mouth. - Students will evaluate an image of a dried, unwatered seed cup to explain the negative consequences of neglecting a plant's basic needs. - Students will point out and identify the physical



changes, noting the emergence of white roots and green leaves.

- Students will describe how young seedlings move by observing leaves turning toward a light source when their container is physically rotated.

and massive California redwood trees.

3. Students will discuss the concept of a "plant-sitter" to identify what would happen if household plants were left without care during a long vacation.
4. Students will analyze a narrative video detailing a fallen tree in a forest ecosystem and brainstorm hypotheses regarding why the nearby smaller trees suddenly thrived in its absence.
5. Students will pair up with a classroom partner to cooperatively manage and share a tray of planting supplies.
6. Students will write their names on a label and affix it to their individual planting cups to establish ownership of their ongoing experiment.
7. Students will count out exactly three radish seeds from a small plate, reinforcing early math counting principles.
8. Students will use a spoon to scoop a pile of soil, deposit their three seeds into the cup, and gently cover the seeds with an additional layer of dirt.
9. Students will test the moisture level of the soil using their fingertips and apply a fine mist of water using a spray bottle if the soil feels dry.

structures of a sprouted plant, specifically detailing the white root squiggles and emerging green leaves.

- Students will predict which direction a plant's leaves will face after its container is spun around.



- | | | |
|--|---|--|
| | <ol style="list-style-type: none"> 10. Students will transport their completed planting cups to a designated sunny windowsill to ensure the seeds have access to natural light. 11. Students will inspect a secondary teacher-led demonstration model where seeds are placed inside a clear plastic bag with a wet paper towel, allowing students to view root formation without dirt obstruction. 12. Students will observe a time-lapse video tracking sprouted seedlings over an eight-hour window to see the leaves actively pivot toward the window glass after being turned backward. 13. Students will summarize the core lesson findings by explaining that water and sunlight are non-negotiable survival needs that cause living plants to grow and move. | |
|--|---|--|

Differentiation:

- Physical modifications will be provided during the seed handling phase, such as using specialized tweezers or guided teacher assistance for students refining fine motor controls.
- Peer pairs are structured to allow students to support one another with cup-holding and soil-scooping tasks.
- Visual progress charts featuring simple illustrations of roots, stems, and leaves will guide non-verbal students in identifying structural milestones.
- Student pairs can use verbal descriptions or simple physical gestures to demonstrate how a plant bends toward the sun during discussion checks.
- For students requiring an extra challenge, extension logs can be provided to count and graph the exact number of days it takes for leaves to clear the surface of the soil.

Resources Provided:

- Mystery Science multimedia instructional guide.



- Pre-packaged radish seeds and portioned soil containers.
- Planting cups, labels, spray misters, and clear bags.
- Student observation check-sheets.



Lesson Plan 3 Template

Content Area: Science	Lesson Title: Why would you want an old log in your backyard?	Time Frame: 40 mins/1 day
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Lesson Components

21st Century Themes

- | | |
|--|--|
| ☒ Global Awareness | ☒ Financial, Economic, Business and Entrepreneurial Literacy |
| ☒ Civic Literacy | ☒ Health Literacy |

21st Century Skills

- | | | |
|---|---|---|
| ☒ Creativity and Innovation | ☒ Critical Thinking and Problem Solving | ☒ Information Literacy |
| ☒ Life and Career Skills | ☒ Communication and Collaboration | ☒ Media Literacy ☒ ICT Literacy |

Interdisciplinary Connections:

ELA

Integration of Technology:

Mystery Science interactive digital read-along book platform combined with video clips showcasing real-world animal micro-habitats. Students also utilize a simple digital camera or tablet to document nature elements.

Equipment Needed:

"The Old Log" interactive big book (digital or physical), video clips of backyard animal habitats, small plastic magnifying glasses, chart paper, markers, recycled materials (small twigs, dry leaves, clean plastic caps), and student unit assessment sheets.

Goals/Objectives	Learning Activities/ Instructional Strategies	Formative Assessment Tasks
Students will: - Students will analyze a read-along story to determine how a decomposing log satisfies the basic survival needs of local wildlife. - Students will identify and communicate how human actions can positively or negatively impact the living conditions of neighborhood animals. - Students will apply problem-solving and engineering skills to design a miniature	Lesson Sequence - Phenomenon: An old, decaying log sitting in a backyard attracts a diverse community of living animals over time, whereas a pristine, clear patch of grass remains empty. - Introduction & Read-Along: Students watch Doug's introduction video and participate in the interactive read-along story about Sam exploring his	- Students will verbally explain why Sam's grandmother keeps an old log in her backyard. - Students will successfully demonstrate collaboration while engineering their miniature animal welcome stations. - Students will use the core vocabulary word needs accurately during their team presentations. - Students will complete the formal unit paper-based assessment,



animal-friendly backyard feature. • Students will collaborate with peers to discuss and map out the resources required to keep local ecosystems healthy.	grandmother's backyard log. 3. Movement & Clue Hunting: During the read-along, students periodically stand up to mimic wood-boring bugs or use magnifying glasses to hunt for visual clues hidden in the storybook illustrations. 4. Ecosystem Discussion: The teacher guides a group discussion on how a rotting log provides moisture, darkness, shelter, and food for bugs, birds, and small mammals. 5. Global Awareness & Civic Literacy Task: The teacher presents a scenario comparing a completely concrete playground to a green park space. Students discuss why towns must intentionally build and protect green spaces so our animal neighbors can survive. 6. Health Literacy Task: Students compare the basic needs of the log-dwelling animals to human health needs, mapping out how clean water, safe shelter, and proper nutrition keep both animals and children healthy. 7. Creativity & Innovation Task (The Backyard Design): Working in small groups, students	demonstrating mastery of plant and animal survival requirements.
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- use recycled materials, twigs, and leaves to construct a physical, miniature model of a "Welcome Backyard Feature" (like a birdbath, a brush pile, or an insect hotel).
8. Communication & Collaboration Task: Student teams present their completed backyard features to the class, practicing speaking clearly to explain which specific animal needs their creation supports.
9. Life, Career, & Financial Literacy Task: Students take on the role of a "Park Ranger." They prioritize a fictional budget using tokens to decide which resources to purchase for their schoolyard park (e.g., buying a bird feeder vs. buying a decorative bench), learning that resources require careful management.
10. Media & ICT Literacy Task: Students use a classroom tablet to snap a photo of their engineering project and work with the teacher to upload it to a digital class portfolio, explaining their design choices out loud.

Differentiation:

- Students can demonstrate their understanding of animal needs through 3D modeling, drawing, physical acting, or verbal dictation.



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- Kinesthetic learners are highly supported by the hands-on building challenges and story-embedded movement breaks.
- Visual anchor charts displaying common backyard animals next to their corresponding needs will support language learners and emerging readers.
- Small-group coaching is provided by the teacher during the planning and token-spending tasks to guide students who need help with decision-making.
- Sentence frames are provided for presentation support: "We built a [blank] because birds need [blank]."
- Extension opportunities allow students to survey the actual school grounds to locate an existing old log or optimal spot to propose a real schoolyard habitat zone.

Resources Provided:

- Mystery Science interactive read-along video and text modules.
- "Animal Visitors" supplemental video library (Clips 1, 2, and 3).
- Recycled and natural building supplies for engineering tasks.
- Formal lesson and unit assessment worksheets.



Lesson Reflection

Reflect on the lesson you have developed and rate the degree to which the lesson *Strongly, Moderately* or *Weakly* meets the criteria below.

Lesson Activities	Strongly	Moderately	Weakly
Are challenging Strongly and require higher order thinking and problem solving skills	☒	☐	☐
Allow for student choice	☒	☐	☐
Provide scaffolding for acquiring targeted knowledge/skills	☒	☐	☐
Integrate global perspectives	☒	☐	☐
Integrate 21st century skills	☒	☐	☐
Provide opportunities for interdisciplinary connection and transfer of knowledge and skills	☒	☐	☐
Foster student use of technology as a tool to develop critical thinking, creativity and innovation skills	☒	☐	☐
Are varied to address different student learning styles and preferences	☒	☐	☐
Are differentiated based on student needs	☐	☒	☐
Are student-centered with teacher acting as a facilitator and co-learner during the teaching and learning process	☒	☐	☐
Provide means for students to demonstrate knowledge and skills and progress in meeting learning goals and objectives	☒	☐	☐
Provide opportunities for student reflection and self- assessment	☒	☐	☐
Provide data to inform and adjust instruction to better meet the varying needs of learners	☐	☒	☐

Curriculum Design Template

Content Area: Science	Grade Level: Kindergarten	Unit Title: Plant Secrets
Created: 2026	Board Approved on:	Type Here



Unit Overview Template

Content Area: Science **Grade Level:** Kindergarten **Unit Title:** Wild Weather

Unit Summary: In this unit, Kindergarten students step into the roles of professional weather watchers and emergency management assistants to uncover the predictable patterns of our atmosphere. Through sensory storytelling, hands-on tool engineering, and active safety simulations, students discover that weather is a combination of four distinct pieces: sky conditions, temperature, wind, and rain or snow. Students explore how severe weather events like hurricanes, tornadoes, and blizzards impact different regions, and investigate how meteorologists use advanced forecasting technology to broadcast warnings. The unit culminates in students building engineering skills and emergency kits to demonstrate how human preparation directly keeps families and communities safe during major storms.

Primary Interdisciplinary Connections: Mathematics, ELA

21st Century Themes ☒ Creativity and Innovation ☒ Critical Thinking and Problem Solving ☒ ICT Literacy
☒ Information Literacy ☒ Life and Career Skills ☒ Communication and Collaboration ☒ Media Literacy

Unit Rationale: Developing an early understanding of weather patterns and severe weather hazards is critical for establishing foundational Earth science literacy and personal safety habits. Because weather is an abstract, multi-sided concept, young learners frequently struggle to look past basic observations like "it is sunny." By breaking weather down into four distinct, measurable parts and constructing physical tracking tools, students gain the ability to analyze their environment systematically. Connecting these observations to severe weather forecasting teaches children the cause-and-effect relationship between atmospheric changes and community safety, replacing fear of major storms with confidence, preparedness, and proactive problem-solving skills.

Career Readiness (Standard 9):

- 9.4.2.DC.3: Explain how to be safe online and follow safe practices when using the internet.
- 9.4.2.DC.6 : Identify respectful and responsible ways to communicate in digital environments.
- 9.4.2.TL.1: Identify the basic features of a digital tool and explain the purpose of the tool.

Learning Targets

Standards: K-ESS2, K-ESS3

Content Statements: Earth Systems; Earth and Human Activity

CPI#:	Cumulative Progress Indicator (CPI):
K-ESS2-1	Use and share observations of local weather conditions to describe patterns over time.
K-ESS3-2	Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.
RL.K.1	With prompting and support, ask and answer questions about key details in a text (e.g., who, what, where, when, why, how).
RL.K.3	With prompting and support, identify characters, settings, and major events in a story.



K.CC.A.3	Write numbers from 0 to 20. Represent a number of objects with a written numeral 0–20 (with 0 representing a count of no objects).
K.CC.B.5	Count to answer “how many?” questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects.
K.M.A.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. For example, directly compare the heights of two children and describe one child as taller/shorter.
SEL.PK-12.1.1	Recognize one’s feelings and thoughts
SEL.PK-12.2.2	Recognize the skills needed to establish and achieve personal and educational goals
SEL.PK-12.4.1	Develop, implement and model effective problem solving and critical thinking skills
8.2.2.ED.1	Communicate the function of a product or device.
8.2.2.ITH.1	Identify products that are designed to meet human wants or needs.
8.2.2.NT.2	Brainstorm how to build a product, improve a designed product, fix a product that has stopped working, or solve a simple problem.

Science and Engineering Practices

Analyzing and Interpreting Data

Analyzing data in kindergarten through second grade builds on prior experiences and progresses to collecting, recording, and sharing observations.

- Use observations from firsthand environments or media to describe patterns in the natural world in order to answer scientific questions. (K-ESS2-1)

Asking Questions and Defining Problems

Asking questions and defining problems in kindergarten through second grade builds on prior experiences and progresses to simple descriptive questions that can be tested.

- Ask questions based on observations to find more information about the designed and natural world. (K-ESS3-2)

Obtaining, Evaluating, and Communicating Information

Obtaining, evaluating, and communicating information in kindergarten through second grade builds on prior experiences and progresses to evaluating the merit and accuracy of ideas and methods.

- Communicate solutions with others in oral and/or written forms using models and/or drawings that provide detail about scientific ideas. (K-ESS3-2)



Disciplinary Core Ideas

Earth and Space Science 2.D: Weather and Climate

- Weather is the combination of sunlight, wind, snow or rain, and temperature in a particular region at a particular time. People measure these conditions to describe and record the weather and to notice patterns over time. (K-ESS2-1)

Earth and Space Science 3.B: Natural Hazards

- Some kinds of severe weather are more likely than others in a given region. Weather scientists forecast severe weather so that communities can prepare for and respond to these hazards. (K-ESS3-2)

Crosscutting Concepts **Patterns**

- Patterns in the natural and human-designed world can be observed, used to describe phenomena, and used as evidence. (K-ESS2-1)

Cause and Effect

- Events have causes that generate observable patterns. (K-ESS3-2)

Connections to Nature of Science

Science Knowledge is Based on Empirical Evidence

- Scientists look for patterns and order when making observations about the world. (K-ESS2-1)

Unit Essential Questions:

- How can you get ready for a big storm?
- Have you ever watched a storm?
- How many different kinds of weather are there?
- What are the four parts of weather that a weather watcher looks for?
- How can changes in the weather turn into a big storm?
- How does paying attention to weather forecasts help us prepare and stay safe?

Unit Enduring Understandings:

- Find out how to get ready for a big storm.
- Find out the characteristics of a severe storm.
- Discover how many different kinds of weather there are.
- Weather is a combination of multiple parts—including the sky, temperature, wind, and precipitation—that can be observed, measured, and mapped over time.
- Severe weather events like hurricanes, tornadoes, and blizzards follow specific environmental patterns that can be predicted by scientists using forecasting technology.



- People can use weather forecasts and warning signals to take specific safety actions, prepare emergency kits, and protect their homes and bodies before a storm arrives.

Unit Learning Targets:

Students will...

- Explore storms and severe weather. Students obtain information from weather forecasts to prepare for storms and stay safe. Students practice describing the various characteristics of weather in order to make their own predictions about storms.
- Analyze and record data from direct observations to describe local weather patterns across the four core components of weather.
- Use mathematical counting to assemble a specific quantity of critical emergency supplies for a safety kit.
- Evaluate and compare environmental clues to identify different types of severe storms and predict their physical impact on structures.
- Communicate a clear safety solution by identifying appropriate shelter and protective actions to take in response to specific weather warnings and forecasting signals.



Evidence of Learning

Summative Assessment: Unit Assessment

Equipment Needed: Mystery Science Kit

Teacher: Mystery Science Online Program

Resources:

Formative Assessments:

- Draw and write follow up activity for each lesson assessment.
- Severe Weather Signal and Response Sort: Students hear or see a specific weather warning signal (like a tornado siren or a smartphone hurricane alert) and must verbally identify the incoming storm type and pick the correct protective gear card for their family kit.
- Four-Part Weather Data Landscape: A detailed scientific drawing assignment where students observe the current outdoor environment and use specific, accurate symbols to document the state of the sky, temperature, wind direction, and moisture levels.
- Emergency Kit Inventory Check: An individual evaluation where students review a mixed tray of survival and recreational items, successfully counting out exactly five necessary tools for a severe storm while discarding non-essential distractions.



Lesson Plans

Lesson	Time Frame
Lesson 1 How can you get ready for a big storm?	40 minutes/ 1 day
Lesson 2 Have you ever watched a storm?	40 minutes/ 1 day
Lesson 3 How many different kinds of weather are there?	40 minutes/ 1 day

Teacher Notes:

Students will need space to move around and act out as people preparing for storms. Students need a weather journal to draw and record the weather around them.

For the Breeze Buddy activity in Lesson 2, pre-creasing the index cards and taping down the sticker edges for the children ahead of time saves immense frustration and keeps the lesson focused on wind observation rather than fine-motor struggles.

To maximize your target standards, ensure students understand that weather forecasting is a life-saving human solution to natural hazards. Use the tornado and blizzard simulations to connect directly to New Jersey's actual seasonal patterns (Nor'easters in winter, severe summer thunderstorms). Emphasize that while we cannot stop a big storm from coming, our civic and health choices—like listening to weather reports, planning indoor shelter locations, and helping our neighbors prepare their homes—give us control over our own safety and well-being.

Curriculum Development Resources/Technology Resources:

Clever and mysteryscience.com



Lesson Plan 1 Template

Content Area: Science Lesson Title: Severe Weather and Preparation Time Frame: 40 mins/1 day

Lesson Components

21st Century Themes

- ☒ Global Awareness ☐ Financial, Economic, Business and Entrepreneurial Literacy
☒ Civic Literacy ☒ Health Literacy

21st Century Skills

- ☒ Creativity and Innovation ☒ Critical Thinking and Problem Solving ☒ Information Literacy
☒ Life and Career Skills ☒ Communication and Collaboration ☒ Media Literacy ☐ ICT Literacy

Interdisciplinary Connections:

ELA, Math

Integration of Technology:

Mystery Science multimedia read-along digital platform combined with audio sound clips of community emergency warning systems (sirens) and simulated smartphone weather forecasting alerts.

Equipment Needed:

"JJ's Stormy Day" interactive digital or physical storybook, audio speaker for siren simulation, images of emergency supply kit items (flashlights, blankets, water bottles, non-perishable food, warm clothing, and non-examples like swimsuits), and student weather observation logs.

Goals/Objectives	Learning Activities/ Instructional Strategies	Formative Assessment Tasks
Students will: - Students will identify and describe three distinct types of severe weather: hurricanes, tornadoes, and blizzards based on their unique patterns of wind, precipitation, and temperature. - Students will explain how forecasting technology (TV news, smartphone alerts, computer reports) and community signals (sirens) help people prepare for incoming storms.	Lesson Sequence - Phenomenon: Local weather conditions can suddenly change into dangerous storms like spinning winds, heavy coastal rain, or blinding snow, but communities can use technology and signals to predict these events and protect their homes and bodies ahead of time. - Read-Along Introduction: Students engage with Doug's introduction video and read the interactive story about JJ	- Students will look at a picture of a severe storm and correctly name whether it represents a hurricane, a tornado, or a blizzard based on its weather patterns. - Students will verbally explain what a community siren means and what immediate safety action they should take when they hear it. - Students will evaluate an emergency kit layout and point out any incorrect items (such as a swimsuit)



- Students will count out an exact quantity of five physical or simulated items to assemble an emergency preparedness supply kit.
- Students will demonstrate concrete safety actions and shelter choices corresponding to different severe weather warnings.

- observing seasonal rain and thunderstorms in his neighborhood.
3. Hurricane Exploration (Anton's Story): Students meet Anton from coastal Florida and observe media images of a hurricane to identify its defining patterns: heavy rainfall, extreme winds, and giant ocean waves crashing on land.
 4. Shutter Closing Movement Break: Students stand up, space out, and use their arms to mimic closing and latching heavy storm shutters on three separate windows to protect Anton's house from high winds.
 5. Tornado Exploration (Sarah's Story): Students meet Sarah from Texas and identify a tornado as a powerful, swirling funnel of wind. The teacher plays a live audio clip of a community tornado siren.
 6. Emergency Shelter Drill: Students practice a rapid response to the simulated siren by safely curling up into a tight ball beneath a classroom desk or table to model proper tornado safety positioning.
 7. Blizzard Exploration (Russell's Story): Students meet Russell from Minnesota and define a blizzard as a

- or beach towel) that do not support human survival needs during a storm.
- Students will accurately count a set of five shelter supplies during a group check.



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- freezing storm characterized by heavy accumulation of snow and high winds that drop visibility to zero.
8. Supply Kit Item
Evaluation & Counting: Students analyze a mixed collection of items to determine which objects are useful for an emergency winter kit. Students count out exactly five pretend logs of firewood to stack by a fireplace in case the electricity goes out.
9. Regional Weather
Mapping Discussion: The teacher guides a collaborative conversation asking students to reflect on the specific types of storms that occur in their local New Jersey region and how their own families prepare for them.
10. Weather Log
Documentation: Students wrap up the lesson by drawing a picture in their observation logs showing one type of severe weather paired with one corresponding safety tool (e.g., a flashlight, a storm shutter, or an emergency shelter).

Differentiation:

- Students can demonstrate their knowledge of storm safety through direct physical movements (such as ducking under a table or mimicking wood stacking) if they have emerging verbal language skills.
- Visual anchor charts matching a storm icon (snowflake, funnel cloud, ocean wave) to a specific safety action will be displayed to support English language learners and emerging readers.



- For students with auditory sensitivities, the volume of the simulated tornado siren will be lowered, or a visual flashing light cue will be substituted.
- During the supply counting activity, students needing fine motor or cognitive support can use large, tactile blocks to represent the five pieces of firewood.
- Sentence frames are provided for peer discussions: "To get ready for a blizzard, I need [blank] to keep me warm."
- Extension opportunities will allow advanced students to draft a checklist of items to look for in their own home emergency kits tonight.

Resources Provided:

- Mystery Science digital media lesson library.
- Audio files for severe weather warning sirens.
- Illustrated cards for emergency supply kit sorting.
- Classroom observation logs and student drawing sheets.



Lesson Plan 2 Template

Content Area: Science Lesson Title: Have you Ever Watched a Storm? Time Frame: 40 mins/1 day

Lesson Components

21st Century Themes

- ☒ Global Awareness ☐ Financial, Economic, Business and Entrepreneurial Literacy
☒ Civic Literacy ☒ Health Literacy

21st Century Skills

- ☒ Creativity and Innovation ☒ Critical Thinking and Problem Solving ☒ Information Literacy
☒ Life and Career Skills ☒ Communication and Collaboration ☒ Media Literacy ☐ ICT Literacy

Interdisciplinary Connections:

ELA, Math

Integration of Technology:

Mystery Science interactive video player featuring real-time storm footage, integrated digital countdown timers for crafting, and wind simulation modeling.

Equipment Needed:

Large index cards, colored paper streamers, pipe cleaners, stickers, markers/crayons, and a high-velocity classroom fan (to simulate varying wind speeds).

Goals/Objectives	Learning Activities/ Instructional Strategies	Formative Assessment Tasks
Students will: - Students will identify wind as an invisible form of weather that can be observed and measured indirectly through the movement of physical objects. - Students will build a functional wind-tracking tool (Breeze Buddy) by following a precise, multi-step structural sequence. - Students will compare the physical effects of a gentle breeze versus a strong wind wind-current on their tracking tool,	Lesson Sequence - Phenomenon: Wind is a powerful, invisible part of the weather that moves clouds and storms, but we can construct tracking tools with lightweight materials to see and measure how hard it is blowing. - Storm Observation Narrative: Students watch Doug's childhood story about sitting on the porch with his grandfather, identifying the sensory clues that happen before a storm hits (dark clouds, rising	- Students will demonstrate their understanding of wind tracking by showing how their streamers react differently to a gentle breath versus a heavy gust of air. - Students will use positional terms (such as higher or straight out) to describe how a major storm alters the position of a wind-tracking tool compared to a calm day. - Students will verbally list at least two environmental clues (like



using comparative language like "higher," "lower," "more," and "less."

- Students will describe the sequential changes in the environment that signal an approaching storm, including cloud accumulation, increasing wind, and temperature drops.

wind, dropping temperatures).

3. Wind Concept
Introduction: The teacher introduces the role of wind in moving weather systems, discussing how it pushes clouds, carries storms into an area, and blows them away when the storm is over.
4. Material Preparation & Sticker Management:
Students prepare their desk workspace by peeling their assembly stickers and anchoring one edge to the table surface so they are easy to grab during construction.
5. Card and Streamer Folding: Students practice fine-motor alignment by folding their note card cleanly in half like a book, and then looping and leveling two paper streamers so the tails are even.
6. Streamer Attachment: Students align the folded loop of each paper streamer directly with the center crease of their open index card and secure them side-by-side using their prepared stickers.
7. Pipe Cleaner Safety Framing: Students fold over the sharp outer tips of a pipe cleaner to ensure safe handling, lay the pipe cleaner inside

leaves rustling or air getting colder) that tell a weather watcher a storm is coming.

- Students will successfully assemble their tracking tool with structural integrity, ensuring the pipe cleaner loop holds when hung.



- the crease, and fold the index card closed around it.
8. Securing and Looping the Tool: Students wrap stickers around the outer card edges to seal the pocket, cross the pipe cleaner arms into an "X" shape, and twist them together three times to build a hanging loop.
 9. Personalized Decoration: A two-minute digital timer is displayed while students write their names and draw custom weather designs (like wind swirls or storm clouds) on their tools.
 10. Simulated Wind Experimentation: Students test their completed tools by blowing gently to model a mild breeze, then blowing forcefully to simulate a major storm system, observing how the angle of the streamers changes.
 11. Comparative Wind Analysis: The teacher utilizes a classroom fan at low and high settings, prompting students to directly compare the streamer movement and record the data in their weather journals.



Differentiation:

- Pre-cut or creased index cards and pre-looped streamers will be provided to support students developing fine-motor control or bilateral coordination.
- Visual, step-by-step pictorial task cards detailing the pipe cleaner twisting sequence will be placed at work tables for independent tracking.
- Students can demonstrate their understanding of low versus high wind by pointing to corresponding wind speed illustrations on a visual anchor chart rather than using verbal descriptions.
- For students needing behavioral or focus support, the teacher will break the assembly steps down into individual check-ins, delivering one sticker at a time.
- Advanced students can use their tools to test various locations around the classroom or schoolyard, predicting which zones generate the most wind resistance.
- Sentence frames are provided for language support: "When the wind blows harder, my Breeze Buddy's streamers move [higher/lower]."

Resources Provided:

- Mystery Science digital video curriculum and automated pacing timers.
- Mystery Pack (consumable cardstock, custom streamers, safety-shielded pipe cleaners, and adhesive strip stickers).
- Classroom weather observation logs.
- Variable-speed electric fan for controlled environmental testing.



Lesson Plan 3 Template

Content Area: Science Lesson Title: How many different kinds of weather are there? Time Frame: 40 mins/1 day

Lesson Components

21st Century Themes

- ☒ Global Awareness ☐ Financial, Economic, Business and Entrepreneurial Literacy
☒ Civic Literacy ☒ Health Literacy

21st Century Skills

- ☒ Creativity and Innovation ☒ Critical Thinking and Problem Solving ☒ Information Literacy
☒ Life and Career Skills ☒ Communication and Collaboration ☒ Media Literacy ☐ ICT Literacy

Interdisciplinary Connections:

ELA, Math

Integration of Technology:

Mystery Science multimedia video player highlighting historical weather landscape paintings by Luke Howard and visual examples of varying global weather conditions.

Equipment Needed:

Student observation drawing paper, clipboards, pencils, crayons or colored markers, and an outdoor viewing space (or large classroom window access).

Goals/Objectives	Learning Activities/ Instructional Strategies	Formative Assessment Tasks
Students will: - Students will identify and name the four core components of weather: sky conditions, temperature, wind, and precipitation. - Students will analyze clothing choices (such as shorts versus heavy coats) as indirect evidence to determine the current air temperature. - Students will create an accurate, data-driven scientific drawing that illustrates all four	Lesson Sequence - Phenomenon: Weather is not just a single condition but a combination of four distinct parts—sky appearance, temperature, wind speed, and precipitation—that scientists systematically observe and record over time to track environmental shifts. - Cloud Variation Discussion: Students watch Doug's introduction regarding cloud diversity, observing	- Students will point to a weather picture and successfully list all four distinct parts of the weather currently occurring in that scene. - Students will look at an illustration of a person wearing a scarf and gloves and correctly state what that tells a scientist about the temperature. - Students will produce an outdoor weather drawing that contains clear, identifiable symbols for



components of the current local weather. • Students will label their scientific weather records with the current date and a numerical count of observed weather variables.	how clouds differ in structure, ranging from flat sheets to puffy mounds and towering storm mushrooms. 3. Multi-Part Weather Identification: The teacher introduces the concept that weather is made up of multiple simultaneous factors rather than a single attribute. 4. Sky and Temperature Analysis: Students review images of children in various climates, using clothing clues to deduce whether a sunny day is physically warm or freezing cold. 5. Wind and Precipitation Indicators: Students spot environmental clues that reveal wind presence (such as flags flying or grass bending) and precipitation states (rain, snow, or completely dry conditions). 6. Weather Watcher Review: The class plays a collaborative matching game to verbally reinforce all four criteria required to perform a comprehensive weather assessment. 7. Historical Scientist Connection: The teacher introduces the historical work of Luke Howard, a scientist who painted landscape weather conditions over 200 years	all four weather components observed during the lesson. • Students will correctly identify whether the outdoor conditions are currently dry, raining, or snowing during a verbal check-in.
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- ago to record environmental data before modern cameras existed.
8. **Workspace Setup:** Students secure their observation sheets onto clipboards and practice writing their name and the numerical calendar date at the top of their record page.
 9. **Field Observation Session:** Students transition outside or sit directly adjacent to classroom windows to execute a quiet, focused observation of the current environment.
 10. **Scientific Illustration Generation:** Students draw a detailed landscape that represents the current sky (cloud count), temperature (depicting themselves in appropriate clothing), wind (bending trees or straight flags), and moisture levels.
 11. **Data Logging and Storage:** Students file their finished data drawings into a dedicated weather binder, discussing how comparing today's sheet to a future storm sheet will showcase shifting patterns.

Differentiation:



- Pre-printed icons representing the four weather elements (a sun/cloud, a thermometer, a wind swirl, a raindrop) will be provided on drawing sheets to guide students with processing needs.
- Students with emerging fine-motor skills can use pre-cut weather stickers (clouds, rain drops, snow crystals) to build their scientific landscape.
- English language learners will use an illustrated word wall featuring clothing paired with temperature labels (e.g., boots/heavy coat = cold) to complete their data drawings.
- For students who require physical or spatial boundaries, the teacher will utilize defined clipboard zones to separate the drawing space from text labeling lines.
- Advanced students can add a written prediction sentence stating how they think the four weather parts will change by tomorrow morning.
- Sentence frames are provided for collaborative analysis: "I know it is windy outside because the [blank] is moving."

Resources Provided:

- Mystery Science media player and video observation prompts.
- Mystery Pack (heavyweight scientific drawing logs and durable student observation clipboards).
- Classroom weather vocabulary anchor charts.
- Historical gallery prints of Luke Howard's weather paintings.



Lesson Reflection

Reflect on the lesson you have developed and rate the degree to which the lesson *Strongly*, *Moderately* or *Weakly* meets the criteria below.

Lesson Activities	Strongly	Moderately	Weakly
Are challenging Strongly and require higher order thinking and problem solving skills	☒	☐	☐
Allow for student choice	☒	☐	☐
Provide scaffolding for acquiring targeted knowledge/skills	☒	☐	☐
Integrate global perspectives	☒	☐	☐
Integrate 21st century skills	☒	☐	☐
Provide opportunities for interdisciplinary connection and transfer of knowledge and skills	☒	☐	☐
Foster student use of technology as a tool to develop critical thinking, creativity and innovation skills	☒	☐	☐
Are varied to address different student learning styles and preferences	☒	☐	☐
Are differentiated based on student needs	☐	☒	☐
Are student-centered with teacher acting as a facilitator and co-learner during the teaching and learning process	☒	☐	☐
Provide means for students to demonstrate knowledge and skills and progress in meeting learning goals and objectives	☒	☐	☐
Provide opportunities for student reflection and self- assessment	☒	☐	☐
Provide data to inform and adjust instruction to better meet the varying needs of learners	☐	☒	☐

Curriculum Design Template

Content Area: Science	Grade Level: Kindergarten	Unit Title: Wild Weather
Created: 2026	Board Approved on:	Type Here



Unit Overview Template

Content Area: Science **Grade Level:** Kindergarten **Unit Title:** Circle of Seasons

Unit Summary: In this unit, Kindergarten students step into the roles of junior meteorologists and habitat trackers to decode the predictable rhythms of seasonal change. Through interactive narrative mysteries, collaborative graphing labs, and personalized tracking logs, students expand their knowledge of the four core components of weather by monitoring how they shift day-to-day and season-to-season. Students gather long-term data patterns to solve daily human problems, such as clothing selection, while investigating how seasonal shifts prompt local plants and animals to physically modify their immediate environments to survive. The unit wraps up with students analyzing localized data trends to forecast future conditions and map out seasonal environmental changes.

Primary Interdisciplinary Connections: Mathematics, ELA

21st Century Themes ☒ Creativity and Innovation ☒ Critical Thinking and Problem Solving ☒ ICT Literacy
☒ Information Literacy ☒ Life and Career Skills ☒ Communication and Collaboration ☒ Media Literacy

Unit Rationale: Tracking seasonal weather shifts over time introduces young learners to the foundational scientific concept of patterns and predictable natural cycles. While single-day observations are valuable, tracking multi-day trends allows kindergarten students to transition from simple description to active forecasting. By investigating the connection between changing temperatures and the survival actions of living organisms, children discover how plants and animals actively alter their physical surroundings (such as dropping leaves or burrowing into soil) in response to seasonal changes. This dual focus builds essential data-tracking skills while illustrating how interconnected living systems are with their physical environments.

Career Readiness (Standard 9):

- 9.4.2.DC.3: Explain how to be safe online and follow safe practices when using the internet.
 9.4.2.DC.6 : Identify respectful and responsible ways to communicate in digital environments.
 9.4.2.TL.1: Identify the basic features of a digital tool and explain the purpose of the tool.

Learning Targets

Standards: K-ESS2

Content Statements: Earth Systems

CPI#:	Cumulative Progress Indicator (CPI):
K-ESS2-1	Use and share observations of local weather conditions to describe patterns over time.
K-ESS2-2	Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.
RI.K.1	With prompting and support, ask and answer questions about key details in a text.
K.CC.B.4	Understand the relationship between numbers and quantities; connect counting to cardinality.



	- When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object. - Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted. - Understand that each successive number name refers to a quantity that is one larger.
SEL.PK-12.1.1	Recognize one's feelings and thoughts
SEL.PK-12.2.2	Recognize the skills needed to establish and achieve personal and educational goals
SEL.PK-12.4.1	Develop, implement and model effective problem solving and critical thinking skills
8.2.2.ED.1	Communicate the function of a product or device.
8.2.2.ITH.1	Identify products that are designed to meet human wants or needs.
8.2.2.NT.2	Brainstorm how to build a product, improve a designed product, fix a product that has stopped working, or solve a simple problem.

Science and Engineering Practices

Analyzing and Interpreting Data

Analyzing data in kindergarten through second grade builds on prior experiences and progresses to collecting, recording, and sharing observations.

- Use observations from firsthand environments or media to describe patterns in the natural world in order to answer scientific questions. (K-ESS2-1)

Engaging in Argument from Evidence

Engaging in argument from evidence in kindergarten through second grade builds on prior experiences and progresses to comparing ideas and representations about the natural and designed worlds.

- Construct an argument with evidence to support a claim. (K-ESS2-2)

Disciplinary Core Ideas

Earth and Space Science 2.D: Weather and Climate

- Weather is the combination of sunlight, wind, snow or rain, and temperature in a particular region at a particular time. People measure these conditions to describe and record the weather and to notice patterns over time. (K-ESS2-1)



Earth and Space Science 2.E: Biogeology

- Plants and animals can change their environment. (K-ESS2-2)

Crosscutting Concepts

Patterns

- Patterns in the natural and human-designed world can be observed, used to describe phenomena, and used as evidence. (K-ESS2-1)

Systems and System Models

- Systems in the natural and designed world have parts that work together. (K-ESS2-2)

Connections to Nature of Science

Science Knowledge is Based on Empirical Evidence

- Scientists look for patterns and order when making observations about the world. (K-ESS2-1)

Unit Essential Questions:

- How do you know what to wear for the weather?
- What will the weather be like on your birthday?
- Why do birds lay eggs in the spring?
- What are the four parts of weather that a weather tracker looks for?
- How can a weather tracker look at past data to predict what the weather will be like tomorrow?
- How do plants and animals change their surroundings when the seasons change?

Unit Enduring Understandings:

- Find ways to track the weather over four or more days.
- Find observations of the four seasons and their patterns to determine the order of the seasons.
- Discover why spring is the best time for babies to be born.
- Weather follows predictable, cyclical patterns over days, weeks, and seasons that can be tracked, counted, and recorded.
- Looking at collected weather data allows scientists to identify patterns, make predictions about future weather, and prepare for daily life.
- Plants and animals actively change their immediate environment in response to shifting seasonal weather patterns to meet their survival requirements.

Unit Learning Targets:

Students will...

- Gather evidence in order to identify daily and seasonal weather patterns. They use those patterns to explain mysteries like why you might lose your jacket during the day or why birds lay their eggs at certain times of the year.
- Collect and record daily observations over a four-day cycle to map patterns across sky conditions, temperature, and precipitation levels.



- Analyze data-driven patterns to predict future short-term weather changes and determine appropriate human responses.
- Construct an argument supported by evidence detailing how local plants or animals physically change their environment to adapt to seasonal shifts.
- Use mathematical organization to classify, group, and count weather events into a class tracking log.



Evidence of Learning

Summative Assessment: Unit Assessment

Equipment Needed: Mystery Science Kit

Teacher: Mystery Science Online Program

Resources:

Formative Assessments:

- Draw and write follow up activity for each lesson assessment.
- The Four-Day Weather Tracking Log: An ongoing daily recording book where students observe, analyze, and circle symbolic data representing sky, temperature, and moisture conditions, identifying shifts over a four-day sequence.
- "Kevin's Wardrobe" Predictive Solution: A problem-solving task where students look at a multi-day data set and verbally explain how Kevin can use past weather patterns to select the correct clothing items before his clothes disappear.
- Seasonal Environmental Impact Mapping: A guided drawing and classification task where students illustrate how a local animal (like a squirrel digging) or plant (like a tree dropping leaves) alters its surrounding environment as summer shifts into winter.



Lesson Plans

Lesson	Time Frame
Lesson 1 How do you know what to wear for the weather?	40 minutes/ 1 day
Lesson 2 What will the weather be on your birthday?	40 minutes/ 1 day
Lesson 3 Why do birds lay eggs in the spring?	40 minutes/ 1 day

Teacher Notes:

Students will need space to move around and act out as people preparing in different types of weather. Students need a weather journal to draw and record the weather around them.

Lesson 1 kicks off a four-day consecutive weather-tracking cycle. Coordinate this unit to begin on a Monday so students can complete all four data entries within a single school week without a weekend gap disrupting their pattern analysis.

To maximize your target standards, utilize the daily data entry time to emphasize that weather data collection is a practical human solution for daily survival. Connect the changing temperatures directly to New Jersey's dramatic seasonal shifts. As autumn arrives, guide students to observe how local wildlife alters the schoolyard environment—squirrels burying nuts in the soil or worms moving deeper underground. Remind students that just as humans change our environment by heating our homes or putting away summer clothes, plants and animals are active engineers changing their surroundings to match the circle of seasons.

Curriculum Development Resources/Technology Resources:

Clever and mysteryscience.com



Lesson Plan 1 Template

Content Area: Science Lesson Title: How do you know what to wear for the weather? Time Frame: 40 min/ 1 day

Lesson Components

21st Century Themes

- ☒ Global Awareness ☐ Financial, Economic, Business and Entrepreneurial Literacy
☒ Civic Literacy ☒ Health Literacy

21st Century Skills

- ☒ Creativity and Innovation ☒ Critical Thinking and Problem Solving ☒ Information Literacy
☒ Life and Career Skills ☒ Communication and Collaboration ☒ Media Literacy ☐ ICT Literacy

Interdisciplinary Connections:

ELA, Math

Integration of Technology:

Mystery Science digital read-along book module combined with interactive smart-board display screens illustrating multi-variable data fields.

Equipment Needed:

Mystery weather log book handouts, pencils, crayons, scissors, and child-safe glue sticks.

Goals/Objectives	Learning Activities/ Instructional Strategies	Formative Assessment Tasks
Students will: - Students will define weather as an ongoing combination of three distinct variables: sky conditions, air temperature, and precipitation. - Students will analyze historical clothing data to solve a real-world problem regarding changing environmental conditions. - Students will construct a functional four-day tracking booklet using precise folding and alignment strategies.	Lesson Sequence - Phenomenon: A boy named Kevin leaves his home wearing different layers of clothing in the morning, but as the outdoor conditions predictably change over the course of the day, his clothing choices stop matching the environment, creating a daily wardrobe mystery. - Mystery Read-Along Introduction: Students engage with the digital introductory story detailing Kevin's problem with disappearing	- Students will successfully isolate and circle one descriptive icon for each of the three weather variables matching the current day's real outdoor conditions. - Students will explain why a person might need a winter coat even if the sky icon is a bright, clear sun symbol. - Students will articulate a logical prediction for tomorrow's weather based on current local indicators during their



- Students will formulate a short-term weather prediction by recognizing patterns in local environmental changes over time.

- sweatshirts and jackets, tracking clues to deduce why he sheds layers as the day gets warmer.
- Variable Definition Analysis: The teacher introduces the three core observations needed to complete a data track: what is in the sky (sunny, cloudy), what the temperature feels like (hot, mild, cold), and what is falling (rain, snow, dry).
 - Contrasting Climates Exercise: Students evaluate side-by-side images of a beach environment and a sunlit winter field, determining that a sunny sky pattern does not automatically dictate a hot temperature.
 - Handout Distribution & Tracing: Students move to their workspace tables to receive their data sheets, write their names, and trace the structural letters for the word "weather" to reinforce fine motor control and spelling.
 - Booklet Engineering (Window Fold): Students execute a multi-step paper fold, pulling both outer panels inward toward the center line to create a double-door "window book" structure that safely encloses their ongoing log data.

- group turn-and-talk check.
- Students will engineer their weather log booklet with correct symmetry so that the panels open and close like a window display.



7. **Day One Data Collection:**
The teacher guides students through the current calendar day's environmental conditions, prompting them to look out the window and select one symbol within each category box.
8. **Pattern Verification Check:** Students circle their final data set for Day One (e.g., circling the sun icon, the mild jacket icon, and the dry grass icon) to finalize their initial scientific observation.
9. **Turn and Talk**
Forecasting: Students turn to an adjacent peer buddy to share observations and formulate predictions regarding what changes or consistent patterns they anticipate seeing in tomorrow's sky.
10. **Securing the Artifact:**
Students utilize glue sticks to securely attach their new four-day weather books directly into their permanent classroom science portfolios to protect their data collection space.

Differentiation:

- Pre-cut and highlighted folding lines will be provided on the booklets to support students with processing or fine-motor challenges.
- High-contrast icon stampers or adhesive stickers can be substituted for circling tasks for students refining pencil grip control.



- Peer-led verbal checks are supplemented with teacher-facilitated sentence starters during the prediction phase to guide language development.
- For students who benefit from structured task sequences, a visual checklist will be posted showing the: Name -> Fold -> Circle -> Glue process.
- Advanced students can add a small numerical icon to track wind speed changes along with the three required categories in their logs.
- Sentence frames are provided for data support: "Today the sky looks [blank] and the air feels [blank]."

Resources Provided:

- Mystery Science media library and digital timer prompts.
- Mystery Pack (specialized heavy-gauge weather tracking booklets and structural lesson templates).
- Student portfolios, pencils, crayons, and desktop adhesive glue sticks.



Lesson Plan 2 Template

Content Area: Science	Lesson Title: What will the weather be like on your birthday?	Time Frame: 40 min/1 day
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Lesson Components

21st Century Themes

- | | |
|--|---|
| ☒ Global Awareness | ☐ Financial, Economic, Business and Entrepreneurial Literacy |
| ☒ Civic Literacy | ☒ Health Literacy |

21st Century Skills

- | | | |
|---|---|--|
| ☒ Creativity and Innovation | ☒ Critical Thinking and Problem Solving | ☒ Information Literacy |
| ☒ Life and Career Skills | ☒ Communication and Collaboration | ☒ Media Literacy ☐ ICT Literacy |

Interdisciplinary Connections:

ELA, Math

Integration of Technology:

Digital video prompt modeling chronological pattern sequencing paired with a dynamic visual whiteboard display to track environmental clues.

Equipment Needed:

Seasonal backyard clue cards, scissors, coloring crayons, student birthday cake stickers, and child-safe glue sticks.

Goals/Objectives	Learning Activities/ Instructional Strategies	Formative Assessment Tasks
Students will: - Students will identify the four distinct seasons—winter, spring, summer, and autumn—as a repeating cycle of predictable environmental changes. - Students will analyze visual data clues within a natural landscape to categorize specific weather conditions. - Students will execute fine motor cutting skills to divide chronological	Lesson Sequence - Phenomenon: A series of four drawings taken from the exact same backyard vantage point reveal dramatic, cyclical transformations in temperature, clothing choices, and plant life that repeat in a predictable sequence over time. - Birthday Weather Hook: Students watch the introductory media clip of Doug explaining how his summer birthday	- Students will correctly sequence the four visual landscape cards to show the accurate progression from winter through autumn. - Students will isolate and explain at least two environmental clues (such as tree leaves changing or human clothing styles) that justify why a specific card belongs to spring versus summer.



sequence cards along designated paths.

- Students will construct a spatial loop model (a circle) to demonstrate how seasonal patterns continuously repeat without a permanent ending point.

dictates specific hot, sunny swimming weather patterns that are entirely different from winter conditions.

3. The Mixed-Up Card Challenge: The teacher presents a problem—Doug's seasonal drawings of his backyard have dropped and mixed together—and challenges the students to act as science detectives to sort them.
4. Collaborative Partner Assignment: Students pair up with a table buddy and distribute the two separate hand-out cutting sheets evenly between themselves.
5. Precision Card Separation: Students use child-safe scissors to cut cleanly along the dotted indicator lines on their respective handouts, creating a shared pool of four individual landscape cards.
6. Winter Anchor Isolation: The partners look across their cards to hunt for unambiguous winter indicators—such as active snowflakes, heavy snow cover, and a fully formed snowman—to set their baseline starting point.
7. Tree Clue Analysis: The teacher guides students to track a single biological indicator across all four cards:

- Students will describe why the seasons are best represented as a physical circle rather than a straight line with a starting and stopping point.
- Students will accurately apply their personal birthday cake token to the seasonal quadrant that matches their actual birthday month's typical climate conditions.



- observing a bare tree, a tree with budding sprouts, a full canopy of leaves, and a tree actively shedding foliage.
8. Chronological Progression Tracking: Students identify the melting snowman, spring rain showers, and emerging flowers to sequence spring immediately after winter, followed by the shorts, swimming pools, and full leaves of summer.
 9. Name Convergence & Loop Transition: The teacher introduces "autumn" and "fall" as interchangeable terms for the final card, highlighting how the shedding leaves lead directly back into the bare branches of winter.
 10. Circular Layout Engineering: Students arrange their sorted cards into a physical loop formation on their workspaces rather than a straight line to mirror the continuous, repeating nature of the year.
 11. Personalized Birthday Mapping: Each student receives a custom birthday cake emblem or sticker, identifies which seasonal climate zone matches their actual month of birth, and affixes it to the



	corresponding quadrant of the circle model.	
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Differentiation:

- Pre-cut card decks will be distributed to students requiring fine motor tracking adaptations.
- High-contrast borders will be added around key visual clues (like the melting snowman or budding tree leaves) to support visual processing needs.
- Teacher-led verbal checklists are used during the partner sorting phase to guide students who benefit from structured task sequences.
- Visual sequence anchor charts will remain projected on the central media board to provide a continuous reference point for data matching.
- Advanced students can illustrate and add local New Jersey migratory animals (like birds flying south or butterflies on flowers) to the corresponding seasonal quadrants of their circles. (K-ESS2-2)
- Sentence frames are provided for collaborative discussions: "I know this card is spring because I see [blank]."

Resources Provided:

- Mystery Science video chapters and interactive timer assets.
- Mystery Pack (heavy-print seasonal backyard landscape worksheets and birthday cake tracking emblems).
- Safety scissors, pencil sets, color crayons, and classroom display portfolios.



Lesson Plan 3 Template

Content Area: Science Lesson Title: Why do birds lay eggs in the spring? Time Frame: 40 min/1 day

Lesson Components

21st Century Themes

- ☒ Global Awareness ☐ Financial, Economic, Business and Entrepreneurial Literacy
☒ Civic Literacy ☒ Health Literacy

21st Century Skills

- ☒ Creativity and Innovation ☒ Critical Thinking and Problem Solving ☒ Information Literacy
☒ Life and Career Skills ☒ Communication and Collaboration ☒ Media Literacy ☐ ICT Literacy

Interdisciplinary Connections: ELA, Math

Integration of Technology:

Video analysis of avian developmental biology and nesting behavior paired with a digital countdown timer to pace the design workshop.

Equipment Needed: Small paper lunch bags, tissue paper sheets, cotton cotton balls, yarn scraps, drawing paper, pencils, crayons, and child-safe scissors.

Goals/Objectives	Learning Activities/ Instructional Strategies	Formative Assessment Tasks
Students will: - Students will explain why spring provides the optimal temperature, food supply, and duration of time for young organisms to develop before winter returns. - Students will analyze how animals alter their immediate environment by gathering raw materials to construct protective shelters. - Students will manipulate flat materials to engineer a stable, three-dimensional bowl structure that prevents spherical objects from rolling away.	Lesson Sequence: - Phenomenon: Local birds gather twigs, leaves, and mud to build specialized, padded structures in tree branches precisely as winter snow melts and plants begin to bloom. - Nest Discovery Hook: Students observe close-up media clips of yellow warbler and hummingbird nests, discovering how different bird species use local plant fibers and spiderwebs to build protective shelters. - Seasonal Pacing Analysis: The teacher leads an inquiry discussion	- Students will successfully modify a flat paper bag into a rounded, three-dimensional bowl that physically mimics a natural bird nest. - Students will verbally explain why a flat surface is dangerous for a bird's eggs compared to a recessed bowl structure. - Students will identify at least two reasons why spring is a safer season for a baby bird to hatch than winter or autumn. - Students will describe how a real bird changes its physical surroundings



- Students will compare how different animal species utilize unique regional resources to solve the same basic survival challenge.

- contrasting spring with other seasons, guiding students to deduce that summer or autumn births do not leave enough time for chicks to grow into independent fledglings before winter.
4. Developmental Stage Identification: Students analyze the physiological transition from a helpless, featherless chick exhibiting food-begging behaviors to a fully feathered fledgling practicing short flights.
 5. Engineering Challenge Launch: The teacher establishes the design challenge: students must act as bird engineers to transform a flat material into a padded bowl that safely holds an egg.
 6. Collaborative Bag Shaping: Working in pairs, one student holds a flat paper bag upright while their partner uses both hands to squash and roll down the outer edges, forming a sturdy, recessed bowl.
 7. Structural Stability Test: Students observe a video demonstration contrasting what happens to a loose egg placed on a flat sheet versus an egg secured inside the newly engineered bag nest.
 8. Insulation Material Evaluation: Students touch and evaluate an

when it prepares to lay its eggs.



- assortment of soft materials, selecting items like cotton, yarn, or torn paper to mimic the animal fur and moss real birds use for padding.
9. Interior Nest Padding: Students crumble, tear, and distribute their chosen soft materials to line the inside of their paper bag nests, ensuring a cushioned interior that prevents eggs from breaking.
 10. Avian Blueprint Tracing: Students form their hand into a closed fist with an upturned thumb, placing it on drawing paper to trace the silhouette—using the fist for the bird's body and the thumb for its head.
 11. Character Finalization & Cut: Students color their custom bird silhouette, draw an eye and a tail structure, cut a square border around their illustration, and perch their finished bird securely inside the completed nest.
 12. Comparative Zoology Review: The teacher projects images of mud-built flamingo nests, twig-based robin nests, and spiderweb hummingbird nests to highlight how animals must use whatever resources are available in



their immediate
surroundings.

Differentiation:

- Pre-collapsed or partially scored bags will be provided to support students building hand strength or fine-motor coordination.
- Die-cut bird body templates are available to substitute for the hand-tracing step for students refining pencil tracking.
- Peer pairs are intentionally structured to balance tactile engineering tasks and collaborative design discussions.
- Step-by-step visual anchor charts demonstrating the "Squash, Pad, Trace, Cut" sequence will be displayed on the main board.
- Advanced students can sketch and place specific food items (like earthworms or small insects) into their nests based on what real spring parents gather for their chicks.
- Sentence frames are provided for nesting analysis: "The bird uses [blank] to change its tree because it needs to keep the eggs [blank]."

Resources Provided:

- Mystery Science media player and interactive bird tracking clips.
- Mystery Pack (structural paper bags, assorted interior lining fibers, and heavy-gauge drawing paper).
- Classroom scissors, graphite pencils, multi-color crayons, and student science folders.



Lesson Reflection

Reflect on the lesson you have developed and rate the degree to which the lesson *Strongly*, *Moderately* or *Weakly* meets the criteria below.

Lesson Activities	Strongly	Moderately	Weakly
Are challenging Strongly and require higher order thinking and problem solving skills	☒	☐	☐
Allow for student choice	☒	☐	☐
Provide scaffolding for acquiring targeted knowledge/skills	☒	☐	☐
Integrate global perspectives	☒	☐	☐
Integrate 21st century skills	☒	☐	☐
Provide opportunities for interdisciplinary connection and transfer of knowledge and skills	☒	☐	☐
Foster student use of technology as a tool to develop critical thinking, creativity and innovation skills	☒	☐	☐
Are varied to address different student learning styles and preferences	☒	☐	☐
Are differentiated based on student needs	☐	☒	☐
Are student-centered with teacher acting as a facilitator and co-learner during the teaching and learning process	☒	☐	☐
Provide means for students to demonstrate knowledge and skills and progress in meeting learning goals and objectives	☒	☐	☐
Provide opportunities for student reflection and self- assessment	☒	☐	☐
Provide data to inform and adjust instruction to better meet the varying needs of learners	☐	☒	☐

Curriculum Design Template

Content Area: Science	Grade Level: Kindergarten	Unit Title: Circle of Seasons
Created: 2026	Board Approved on:	Type Here



Unit Overview Template

Content Area: Science **Grade Level:** Kindergarten **Unit Title:** Sunny Skies

Unit Summary: In this engineering-focused science unit, Kindergarten students transition into the roles of solar inventors and architectural designers to explore how the sun's light alters the physical conditions of Earth's surfaces. Through a sequence of hands-on structural challenges, localized model testing, and tactile material investigations, students discover that the sun provides continuous light and warmth to our planet. Students investigate the mechanical differences between direct solar exposure and shaded cooling zones to solve immediate biological problems, such as keeping livestock safe from heat stress or bringing localized warmth to a freezing community. The unit culminates in an iterative engineering design cycle where students build, critique, and optimize physical prototypes that manipulate light paths using horizontal barriers and reflective surface boundaries.

Primary Interdisciplinary Connections: Mathematics, ELA

21st Century Themes ☒ Creativity and Innovation ☒ Critical Thinking and Problem Solving ☒ ICT Literacy
☒ Information Literacy ☒ Life and Career Skills ☒ Communication and Collaboration ☒ Media Literacy

Unit Rationale: Understanding how sunlight warms the Earth provides early learners with a concrete foundation for studying energy transfer and structural design. For Kindergarten students, the abstract concept of thermal energy is best internalized through local, tangible phenomena—such as the pain of stepping barefoot on sun-baked pavement or observing materials change state from solid to liquid under direct light. By investigating how simple structural choices can intentionally block, reduce, or redirect solar rays, students learn that human design choices can modify environmental conditions to support living things. This active manipulation of materials allows young students to interact directly with the core engineering loop: defining a human or animal problem, identifying explicit physical constraints, and adjusting a prototype based on evidence.

Career Readiness (Standard 9):

- 9.4.2.DC.3: Explain how to be safe online and follow safe practices when using the internet.
9.4.2.DC.6 : Identify respectful and responsible ways to communicate in digital environments.
9.4.2.TL.1: Identify the basic features of a digital tool and explain the purpose of the tool.

Learning Targets

Standards: K-PS3, K-2-ETS1

Content Statements: Energy; Engineering Design

CPI#: **Cumulative Progress Indicator (CPI):**

K-PS3-1	Make observations to determine the effects of sunlight on Earth's surface.
K-PS3-2	Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area.
K-2-ETS1-1	Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.



K-2-ETS1-3	Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.
RI.K.1	With prompting and support, ask and answer questions about key details in a text.
K.CC.B.4	Understand the relationship between numbers and quantities; connect counting to cardinality. - When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object. - Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted. - Understand that each successive number name refers to a quantity that is one larger.
SEL.PK-12.1.1	Recognize one's feelings and thoughts
SEL.PK-12.2.2	Recognize the skills needed to establish and achieve personal and educational goals
SEL.PK-12.4.1	Develop, implement and model effective problem solving and critical thinking skills
8.2.2.ED.1	Communicate the function of a product or device.
8.2.2.ITH.1	Identify products that are designed to meet human wants or needs.
8.2.2.NT.2	Brainstorm how to build a product, improve a designed product, fix a product that has stopped working, or solve a simple problem.

Science and Engineering Practices

Planning and Carrying Out Investigations

Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.

- Make observations (firsthand or from media) to collect data that can be used to make comparisons. (K-PS3-1)

Designing Solutions

Designing solutions in K–2 builds on prior experiences and progresses to simple design problems that can be solved through developing a new or improved object or tool.

- Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem. (K-PS3-2)

Asking Questions and Defining Problems



Asking questions and defining problems in K–2 builds on prior experiences and progresses to simple descriptive questions that can be tested.

- Ask questions, based on observations, to find more information about the natural and/or designed world(s). (K-2-ETS1-1)
- Define a simple problem that can be solved through the development of a new or improved object or tool. (K-2-ETS1-1)

Developing and Using Models

Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions.

- Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem. (K-2-ETS1-2)

Analyzing and Interpreting Data

Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.

- Analyze data from tests of an object or tool to determine if it works as intended. (K-2-ETS1-3)

Disciplinary Core Ideas

Physical Science 3.B: Conservation of Energy and Energy Transfer

- Sunlight warms Earth's surface. (K-PS3-1),(K-PS3-2)

Engineering Technology and Science 1.A: Defining and Delimiting Engineering Problems

- A situation that people want to change or create can be approached as a problem to be solved through engineering. (K-2-ETS1-1)
- Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1)
- Before beginning to design a solution, it is important to clearly understand the problem. (K-2-ETS1-1)

Engineering Technology and Science 1.B: Developing Possible Solutions

- Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solution to other people. (K-2-ETS1-2)



Engineering Technology and Science 1.C: Optimizing the Design Solution

- Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (K-2-ETS1-3)

Crosscutting Concepts

Cause and Effect

- Events have causes that generate observable patterns. (K-PS3-1),(K-PS3-2)

Structure and Function

- The shape and stability of structures of natural and designed objects are related to their function(s). (K-2-ETS1-2)

Connections to Nature of Science

Scientific Investigations Use a Variety of Methods

- Scientists use different ways to study the world. (K-PS3-1)

Unit Essential Questions:

- How could you walk barefoot across hot pavement without burning your feet?
- How could you warm up on a frozen playground?
- Why does it get cold in winter?
- What does the sun provide to the planet Earth, and how can we feel its power?
- How can a builder use a custom design to block or redirect the sun's rays to change the temperature of a specific area?
- How does changing the shape, height, or surface of a material alter how much sunlight hits a target spot?

Unit Enduring Understandings:

- Students notice that cows (like people) use shade to stay cool. Then, they think through how they would design a shade structure for cows.
- Students think about their experiences with hot and cold weather, and learn about a real city where the sun never shines in winter.
- Students observe the path of the Sun in the summer and in the winter and realize that light from the Sun keeps the Earth warm.
- Sunlight constantly strikes the surface of the Earth, providing light and a predictable warming effect that can be observed and recorded.
- The physical shape, placement, and reflective surface of human-made structures can intentionally reduce or increase solar heating in localized areas.
- Engineering solutions require identifying a problem, working within set physical limitations, and changing a design over time to make it perform better.



Unit Learning Targets:

Students will...

- Make observations to explore how sunlight warms the Earth's surface. Students will observe how the Sun's energy heats up the pavement, keeps us warm, and can even melt marshmallows.
- Observe and describe the thermal effects of sunlight on diverse surface materials to prove that solar exposure increases localized temperature.
- Define an environmental engineering problem threatening living organisms and identify structural size constraints required for a viable solution.
- Construct and test physical prototypes that create targeted cooling zones by blocking overhead light rays with custom horizontal covers.
- Manipulate reflective material boundaries to intentionally redirect light paths into dark areas to maximize localized illumination and warmth.



Evidence of Learning

Summative Assessment: Unit Assessment

Equipment Needed: Mystery Science Kit

Teacher: Mystery Science Online Program

Resources:

Formative Assessments:

- Draw and write follow up activity for each lesson assessment.
- The Dual-Variable Structural Checklist: A guided self-evaluation index where students verify that their engineered shade canopy possesses both the necessary height clearance and wide horizontal roof span required to protect an endangered animal target.
- The Illumination Map Routing Task: A hands-on physical tracking task where students manipulate polished panels to navigate a light beam around an active map grid, successfully hitting specific target zones while completely avoiding protected non-target locations.
- The Solar Arc Diagram Reflection: A comparative sketching assignment where students illustrate a light ray striking a surface directly from overhead versus a low angle, noting the difference in concentrated heat using primary color labels.



Lesson Plans

Lesson	Time Frame
Lesson 1 How could you walk barefoot across hot pavement without burning your feet?	40 min /1 day
Lesson 2 How could you warm up a frozen playground?	40 min /1 day
Lesson 3 Sunlight & Warmth	40 min /1 day

Teacher Notes:

Lesson 2 involves a dark-room simulation using directional desk lamps to represent the sun. Set up the lamps along a central power strip the morning of the lesson to ensure the beams are pre-aligned to cast appropriate mountain shadows without blinding students during map manipulation.

To maximize your target standards, explicitly frame every design challenge as a compassionate human or animal solution. When students design the livestock shade structure, connect it directly to New Jersey's intense summer humidity and the critical need for farmers to protect dairy herds from heat exhaustion. When students guide the mirror arrays for the shaded town, remind them that engineers must work within geographical boundaries—we cannot move mountains or shift the sun, but we can use our knowledge of physical science to alter how natural energy interacts with the built environment. Emphasize that failing an early design test is an essential milestone in the engineering journey.

Curriculum Development Resources/Technology Resources:

mysteryscience.com



Lesson Plan 1 Template

Content Area: Science	Lesson Title: How could you walk barefoot across hot pavement without burning your feet?	Time Frame: 40 min/1 day
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Lesson Components

21st Century Themes

☒ Global Awareness ☐ Financial, Economic, Business and Entrepreneurial Literacy
☒ Civic Literacy ☒ Health Literacy

21st Century Skills

☒ Creativity and Innovation ☒ Critical Thinking and Problem Solving ☒ Information Literacy
☒ Life and Career Skills ☒ Communication and Collaboration ☒ Media Literacy ☐ ICT Literacy

Interdisciplinary Connections: Math, ELA

Integration of Technology:

Interactive digital read-along narrative paired with visual engineering model prompt clips to evaluate spatial shadow coverage.

Equipment Needed:

Large chart paper, thick markers, design prompt printouts of Farmer Josie's pasture, toy cow figures, and geometric block sets to model structural ideas.

Goals/Objectives	Learning Activities/ Instructional Strategies	Formative Assessment Tasks
Students will: - Students will describe the warming effect of direct sunlight on structural surfaces and identify shade as a physical mechanism to reduce heat absorption. - Students will define an engineering problem involving animal welfare and evaluate multiple structural designs based on explicit performance constraints (height and width).	Lesson Sequence - Phenomenon: A dark asphalt surface exposed to direct summertime sunlight becomes painfully hot to the touch, while nearby areas obscured by buildings or umbrellas remain noticeably cooler. - Keya's Hot Pavement Hook: Students engage with an interactive digital story about a girl named Keya who faces a major problem—she wants to run barefoot from the	- Students will verbally explain how the presence of a shade structure changes the temperature of a surface exposed to the summer sun. - Students will evaluate two competing shade designs and identify which one provides a wider, taller shadow area based on the physical dimensions of the structure. - Students will generate an original design sketch



- Students will analyze real-world models (trees and umbrellas) to identify which geometric properties yield optimal protective shadow patterns.
- Students will sketch and refine an original structural prototype that successfully blocks sunlight to create a wide, tall cooling zone.

- pool to the ice cream truck, but the summer sun has made the ground scorchingly hot.
3. Thermal Impact Brainstorm: The teacher facilitates a movement-integrated discussion focusing on how direct sunlight transfers heat to surfaces like concrete and pavement, and asks students to brainstorm how shadows alter that thermal experience.
 4. Farmer Josie's Dilemma Presentation: Students are introduced via media clip to Farmer Josie, whose cows are overheating in a wide-open pasture that contains zero mature trees or native shade structures.
 5. Constraint Identification Session: The teacher establishes the design parameters: planting trees will take too many years to mature, meaning the students must design a functional mechanical structure that creates immediate shade.
 6. Biological Model Analysis: Students examine images of contrasting tree shapes to deduce how structural form impacts performance, noting that narrow trunks create uselessly skinny shadows

- that accurately combines vertical supports and a wide horizontal roof to block overhead light.
- Students will justify how their proposed structure solves Farmer Josie's immediate problem regarding her overheating cows.



- while broad canopies generate wide cooling zones.
7. Vertical Clearance
Evaluation: Pairs compare a short, stunted tree model against a tall, elevated canopy model to determine that a successful structure must be elevated high enough off the ground for large animals to easily gather underneath.
 8. Consumer Model
Comparison: The teacher introduces commercial umbrellas as a human-made parallel, directing students to analyze how scaling up an object's surface area directly influences the geometric size of the shadow it casts.
 9. Iterative Design Review:
Students critique Farmer Josie's early prototypes—including a low blanket tent and a tall but narrow canopy—identifying the exact structural flaws of each iteration.
 10. Roof and Pillar Blueprint Modeling: The teacher demonstrates how separating vertical support pillars from horizontal roofing materials maximizes both structural height and wide shade distribution.
 11. Architectural Sketching & Optimization: Working



independently or in design teams, students sketch their finalized Shade Maker layouts on pasture worksheets, drawing in optimal shadow zones and upgrading their designs to protect multiple cows simultaneously.

Differentiation:

- Pre-drawn grid lines or simple geometric stamps will be provided on drawing sheets to assist students with spatial alignment and scaling.
- 3D plastic blocks and miniature fabric sheets will be available to allow students with fine-motor or spatial tracking challenges to build tangible models instead of sketching blueprints.
- Simplified visual checklists featuring icons for "Tall" and "Wide" are provided to guide self-evaluation during the design process.
- The teacher will utilize targeted prompting during group discussions: "Show me with your hands how high the roof needs to be for a cow to fit."
- Advanced students can design adjustable or angled roofs that can pivot to track and block the sun as its position shifts across the sky from morning to afternoon.
- Sentence frames are provided for engineering analysis: "My shade maker needs to be tall so that [blank] and wide so that [blank]."

Resources Provided:

- Mystery Science read-along interface and video projection segments.
- Mystery Pack (pasture boundary worksheets, structural design templates, and cow placement stickers).
- Drawing pencil sets, coloring crayons, building blocks, and architectural display clips.



Lesson Plan 2 Template

Content Area: Science	Lesson Title: How could you warm up a frozen playground?	Time Frame: 40 min /1 day
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Lesson Components

21st Century Themes

- | | |
|--|---|
| ☒ Global Awareness | ☐ Financial, Economic, Business and Entrepreneurial Literacy |
| ☒ Civic Literacy | ☒ Health Literacy |

21st Century Skills

- | | | |
|---|---|--|
| ☒ Creativity and Innovation | ☒ Critical Thinking and Problem Solving | ☒ Information Literacy |
| ☒ Life and Career Skills | ☒ Communication and Collaboration | ☒ Media Literacy ☐ ICT Literacy |

Interdisciplinary Connections: Science, Math, ELA, Social Studies, Art/Creativity, Technology,

Students explore how sunlight warms objects and then design solutions (engineering) to control heating—like keeping something warm or cool.

Integration of Technology:

Physical incandescent or LED directional table lamps to simulate solar positioning paired with media documentaries highlighting geographic landform shadows.

Equipment Needed: Chill City paper map handouts, 12-inch plastic rulers, table lamps, reflective aluminum foil sheets, clear acetate plastic strips, target zone stickers, and "Draw Chill City" blueprint worksheets.

Goals/Objectives	Learning Activities/ Instructional Strategies	Formative Assessment Tasks
Students will: - Students will demonstrate that light from a source travels in straight paths and can be redirected or reflected by smooth, shiny surfaces to transfer heat to a new location. - Students will construct a three-dimensional paper landform model to observe how tall structures block light waves and cast large structural shadows.	Lesson Sequence - Phenomenon: A deep mountain valley blocks direct winter sunlight from reaching a small town, creating a persistent freezing shadow, while massive glass mirrors tracking the sun high on the ridgeline bounce a beam of light directly down onto the town square to provide localized heat. - Phoenix Heat vs. Valley Shadow Hook: Students watch media clips	- Students will successfully position a piece of reflective foil to bounce a light beam out of a shadow zone and onto a designated target letter. - Students will verbally explain how a smooth, shiny material changes the path of light compared to a flat, dark surface. - Students will identify which shape of foil (flat versus curved) creates a



- Students will manipulate, bend, and position reflective materials to navigate light beams into specific targeted map zones while avoiding preservation areas.
- Students will record their engineering solutions by sketching a structural blueprint of a community light-redirecting system.

illustrating extreme solar heat impacts (like melting car paint and dashboards acting as ovens) before transitioning to the inverse problem—a real valley town in Norway trapped in a freezing mountain shadow all winter.

3. Landform Base
Construction: Students align a plastic ruler with the dotted guideline on their Chill City handout, folding the heavy paper stock cleanly to erect a standing vertical ridge of paper mountains.
4. Solar Positioning
Calibration: Teachers dim the classroom overhead fixtures and activate central desk lamps, instructing students to rotate their paper towns until the paper mountains cast a direct shadow over the settlement.
5. Target Identification:
Partners locate three distinct critical zones printed on their shaded maps: the frozen playground (P), the central town square (S), and the winter ice skating rink (R).
6. Reflective Material
Exploration: Teams unpack their testing kit envelopes containing textured materials,

brighter, more concentrated patch of heat and light.

- Students will document a functional design solution on their blueprint sheets, matching their drawing to their physical model setup.



- discovering that polished, metallic aluminum foil and transparent plastic strips possess the physical capacity to redirect light beams.
7. Playground Target Illumination: Students experiment with flat foil pieces, angling the materials relative to the lamp to capture the light beam and bounce it over the paper mountain peak directly onto the playground target.
 8. Beam Intensity Maximization: The teacher challenges students to physically alter the shape of their foil, demonstrating that curling or bending the reflective surface concentrates the light waves into a brighter, warmer pinpoint.
 9. Dual-Zone Optimization: Students expand their testing parameters to manipulate their reflective panels so that the redirected sunlight illuminates both the frozen playground and the town square simultaneously.
 10. Target Exclusion Simulation: Teams engage in an advanced constraint challenge, adjusting their reflective angles to fully warm the playground and town square while keeping the



- ice skating rink safely in the cold shadow so it does not melt.
11. Architectural Reflection Blueprinting: Students transfer their successful spatial configurations onto a "Draw Chill City" worksheet, drawing lines representing their reflective panels positioned on the grey mountain shadow zones.
 12. Rjukan Mirror Reveal: The lesson closes with real-world footage of the giant hillside heliostat mirrors in Rjukan, Norway, showing how real engineers scaled up this exact reflective strategy to host sunny gatherings in the middle of winter.

Differentiation:

- Pre-folded mountain sheets will be distributed to students developing bilateral coordination or fine motor tracing skills.
- High-contrast neon target rings will replace standard lettering on target zones to support students with visual tracking modifications.
- Desk lamps can be clamped to stable fixtures to prevent tipping and allow students to focus entirely on material manipulation.
- Visual directional arrows demonstrating light bouncing off a surface will be displayed on the interactive board as a processing anchor.
- Advanced students can use two separate pieces of foil simultaneously to bounce light across multiple mountain ridges to reach separate hard-to-reach targets.
- Sentence frames are provided for reflection analysis: "When the lamp light hits the shiny foil, the light bounces to the [blank] and makes it [blank]."

Resources Provided:

- Mystery Science multimedia player and topographic shadow assets.
- Mystery Pack (Chill City structural fold sheets, reflective foil segments, clear testing strips, and design worksheets).
- Heavy desk lamps, extension cords, plastic rulers, and student structural portfolios.



Lesson Plan 3 Template

Content Area: Science Lesson Title: Why does it get cold in winter? Time Frame: 40 min/1 day

Lesson Components

21st Century Themes

- ☒ Global Awareness ☐ Financial, Economic, Business and Entrepreneurial Literacy
☒ Civic Literacy ☒ Health Literacy

21st Century Skills

- ☒ Creativity and Innovation ☒ Critical Thinking and Problem Solving ☒ Information Literacy
☒ Life and Career Skills ☒ Communication and Collaboration ☒ Media Literacy ☐ ICT Literacy

Interdisciplinary Connections: Math, ELA

Integration of Technology: Digital video playback displaying time-lapse recordings of annual solar arc variations paired with thermal color-map data visualizations.

Equipment Needed: Large chart paper, thick markers, student science journals, modeling clay, flashlight pointers, and regional temperature trend charts.

Goals/Objectives	Learning Activities/ Instructional Strategies	Formative Assessment Tasks
Students will: - Students will explain that the sun provides light and warmth to planet Earth, acting as the primary energy source that regulates surface temperatures. - Students will observe and describe the changing arc of the sun, noting that it rises higher in the summer sky and travels a lower path closer to the horizon in the winter. - Students will correlate the angle of incoming solar light rays with temperature intensity, explaining that direct, overhead light causes	Lesson Sequence 1. Phenomenon: A dark asphalt surface exposed to direct summertime sunlight becomes painfully hot to the touch, while nearby areas obscured by buildings or umbrellas remain noticeably cooler. 2. Seasonal Temperature Shift Hook: Students review personal anecdotes regarding seasonal apparel adjustments—contrasting wearing shorts and swimming in the summer with wearing heavy parkas to climb deep snowdrifts in the winter.	- Students will verbally explain why the sun makes a car warmer when it is parked in an open lot compared to a shaded driveway. - Students will use their hands to demonstrate the difference between the high path of the summer sun and the low path of the winter sun. - Students will identify that an object has absorbed heat energy by describing its changing texture during a mechanical compression test. - Students will draw a diagram showing a sun ray shining directly down



greater heating than lower, angled light.

- Students will carry out a physical inquiry ("The Squish Test") to gather empirical evidence demonstrating how thermal energy changes the structural state of soft objects.

3. Solar Path Comparison
Inquiry: The teacher projects a split-screen time-lapse video tracking the movement of the sun over a single location, guiding students to notice that the summer sun traces a giant, high arc while the winter sun stays low and flat.
4. Solar Ray Angle
Simulation: Utilizing a flashlight pointer and a large globe, the teacher demonstrates how light energy shining straight down from above concentrates intense heat on a localized area, while light shining from a low, sideways angle spreads out and feels weaker.
5. The Melty Camping Mystery: Students are introduced to a camping scenario involving two characters, Leo and Noah, who park their vehicles in different locations, resulting in Noah's campfire treats melting into a gooey mess while Leo's treats remain completely solid.
6. Variable Isolation
Analysis: Students compare images of the two vehicles, identifying that Noah's car is exposed to direct, overhead sunlight while Leo's car is protected by a pocket of structural shade.

on a hot object versus a sun ray shining from a low angle on a cold object.



7. Experimental Swap
Discussion: The teacher presents an overview of an experimental trial where the characters trade parking spots, prompting students to predict what will happen to the interior items when the environmental conditions switch.
8. The Squish Test
Evaluation: Students watch a demonstration of the "Squish Test" being performed on identical target objects, noting that an object heated by direct solar exposure collapses flat under pressure, while a shaded object retains its structure and bounces back into shape.
9. Solar Cooking Design
Concept: Students brainstorm alternative uses for concentrated solar heat, sketching imaginary thermal cooking inventions that rely purely on direct sunlight rather than a kitchen stove or fire.
10. Day Length and Energy
Synthesis: The teacher leads a concluding chart-based discussion connecting high solar paths with longer daylight duration, helping students synthesize that more hours of high-angle sunshine directly causes summer warmth.



Differentiation:

- Heavy tactile materials like dense modeling clay will be provided for students to practice squeezing during the compression lesson to reinforce tactile tracking.
- Visual path templates showing high and low dotted lines will be taped to student desks to assist with spatial processing of solar arcs.
- High-contrast yellow and blue markers will be used to clearly differentiate warm sunlit zones from cold shaded areas on all shared graphic organizers.
- Strategic check-ins will utilize targeted hand gestures: "Show me with your arm how the sun moves across the sky when it is cold outside."
- Advanced students can track and chart the changing location of a shadow cast by a classroom window pole throughout the morning to observe the sun's motion in real time.
- Sentence frames are provided for solar analysis: "The summer sun is [blank] in the sky, which makes the ground feel [blank]."

Resources Provided:

- Mystery Science media platform with solar tracking animations.
- Mystery Pack (camping site illustration sheets, car placement tokens, and target state tracking charts).
- Portable flashlights, structural target blocks, modeling materials, and student observation folders.



Lesson Reflection

Reflect on the lesson you have developed and rate the degree to which the lesson *Strongly*, *Moderately* or *Weakly* meets the criteria below.

Lesson Activities	Strongly	Moderately	Weakly
Are challenging Strongly and require higher order thinking and problem solving skills	☒	☐	☐
Allow for student choice	☒	☐	☐
Provide scaffolding for acquiring targeted knowledge/skills	☒	☐	☐
Integrate global perspectives	☒	☐	☐
Integrate 21st century skills	☒	☐	☐
Provide opportunities for interdisciplinary connection and transfer of knowledge and skills	☒	☐	☐
Foster student use of technology as a tool to develop critical thinking, creativity and innovation skills	☒	☐	☐
Are varied to address different student learning styles and preferences	☒	☐	☐
Are differentiated based on student needs	☐	☒	☐
Are student-centered with teacher acting as a facilitator and co-learner during the teaching and learning process	☒	☐	☐
Provide means for students to demonstrate knowledge and skills and progress in meeting learning goals and objectives	☒	☐	☐
Provide opportunities for student reflection and self- assessment	☒	☐	☐
Provide data to inform and adjust instruction to better meet the varying needs of learners	☐	☒	☐

Curriculum Design Template

Content Area: Science	Grade Level: Kindergarten	Unit Title: Sunny Skies
Created: 2026	Board Approved on:	Type Here



Unit Overview Template

Content Area: Science **Grade Level:** Kindergarten **Unit Title:** Force Olympics

Unit Summary: In this high-energy, physically interactive science unit, Kindergarten students step into the stadium as mechanical engineers, demolition experts, and physics athletes. Through an immersive series of hands-on structural challenges, spatial testing grids, and kinetic modeling, students investigate the unseen forces that rule our physical world: pushes and pulls. Students will discover how the strength and direction of a force dictates an object's motion, speed, and structural impact. From operating giant imaginary excavators to calibrating the precise pendulum swing of a tabletop wrecking ball, students will learn how to intentionally apply, redirect, and balance forces. The unit culminates in an iterative design cycle where students define spatial engineering problems, build physical structural prototypes, and test their ideas against strict environmental constraints.

Primary Interdisciplinary Connections: Mathematics, ELA

21st Century Themes ☒ Creativity and Innovation ☒ Critical Thinking and Problem Solving ☒ ICT Literacy
☒ Information Literacy ☒ Life and Career Skills ☒ Communication and Collaboration ☒ Media Literacy

Unit Rationale: For early learners, "force" can feel like an abstract, invisible concept. The best way to make physics real is to anchor it within their immediate, tactile world—the satisfaction of knocking over a towering block stack, the resistance of scooping dirt, or the sight of a rolling toy car crashing into a barrier. By exploring real-world industrial machinery, demolition sites, and hazard-prevention tools, students learn that human engineering is simply the smart control of natural forces. This unit teaches young students that a physical structural failure (like accidentally crushing a paper house or missing a target) isn't a mistake—it is critical data. By actively manipulating variables like pull distance, object mass, and collision angles, Kindergarteners learn to approach problems with the mindset of an engineer: observing carefully, isolating what went wrong, and modifying a design to make it perform better.

Career Readiness (Standard 9):

- 9.4.2.DC.3: Explain how to be safe online and follow safe practices when using the internet.
- 9.4.2.DC.6 : Identify respectful and responsible ways to communicate in digital environments.
- 9.4.2.TL.1: Identify the basic features of a digital tool and explain the purpose of the tool.

Learning Targets

Standards: K-PS2, K-2 -ETS1

Content Statements: Motion and Stability: Forces and Interactions; Engineering Design

CPI#:	Cumulative Progress Indicator (CPI):
K-2-ETS1-1	Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.



K-2 -ETS1-2	Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.
K-2 -ETS1-3	Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.
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.
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.
RI.K.1	With prompting and support, ask and answer questions about key details in a text.
K.CC.B.4	Understand the relationship between numbers and quantities; connect counting to cardinality. - When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object. - Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted. - Understand that each successive number name refers to a quantity that is one larger.
SEL.PK-12.1.1	Recognize one's feelings and thoughts
SEL.PK-12.2.2	Recognize the skills needed to establish and achieve personal and educational goals
SEL.PK-12.4.1	Develop, implement and model effective problem solving and critical thinking skills
8.2.2.ED.1	Communicate the function of a product or device.
8.2.2.ITH.1	Identify products that are designed to meet human wants or needs.
8.2.2.NT.2	Brainstorm how to build a product, improve a designed product, fix a product that has stopped working, or solve a simple problem.

Science and Engineering Practices

Planning and Carrying Out Investigations

Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.

- With guidance, plan and conduct an investigation in collaboration with peers. (K-PS2-1)
- Make observations (firsthand or from media) to collect data that can be used to make comparisons. (K-PS2-1)

Analyzing and Interpreting Data



Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.

- Analyze data from tests of an object or tool to determine if it works as intended. (K-PS2-2), (K-2-ETS1-3)

Asking Questions and Defining Problems

Asking questions and defining problems in K–2 builds on prior experiences and progresses to simple descriptive questions that can be tested.

- Ask questions, based on observations, to find more information about the natural and/or designed world(s). (K-2-ETS1-1)
- Define a simple problem that can be solved through the development of a new or improved object or tool. (K-2-ETS1-1)

Developing and Using Models

Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions.

- Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem. (K-2-ETS1-2)

Disciplinary Core Ideas

Physical Science 2.A: Forces and Motion

- Pushes and pulls can have different strengths and directions. (K-PS2-1),(K-PS2-2)
- Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. (K-PS2-1),(K-PS2-2)

Physical Science 2.B: Types of Interactions

- When objects touch or collide, they push on one another and can change motion. (K-PS2-1)

Physical Science 3.C: Relationship Between Energy and Forces

- A bigger push or pull makes things go faster or farther. (K-PS2-1)

Engineering Technology and Science 1.A: Defining and Delimiting Engineering Problems

- A situation that people want to change or create can be approached as a problem to be solved through engineering. (K-2-ETS1-1)
- Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1)



- Before beginning to design a solution, it is important to clearly understand the problem. (K-2-ETS1-1)

Engineering Technology and Science 1.B: Developing Possible Solutions

- Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solution to other people. (K-2-ETS1-2)

Engineering Technology and Science 1.C: Optimizing the Design Solution

- Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (K-2-ETS1-3)

Crosscutting Concepts

Cause and Effect

- Simple tests can be designed to gather evidence to support or refute student ideas about causes. (K-PS2-1),(K-PS2-2)

Structure and Function

- The shape and stability of structures of natural and designed objects are related to their function(s). (K-2-ETS1-2)

Connections to Nature of Science

Scientific Investigations Use a Variety of Methods

- Scientists use different ways to study the world. (K-PS2-1)

Unit Essential Questions:

- What is the biggest excavator?
- Why do builders need so many big machines?
- How can you knock down a wall made of concrete? What is the difference between a push and a pull, and how do they change how an object moves?
- How does changing the strength or direction of a force alter the final position or shape of a structural target?
- How can engineers design physical barriers to safely block, absorb, or redirect an object's destructive energy?

Unit Enduring Understandings:

- A force is a push or a pull that can make things start moving, speed up, slow down, stop, or completely change direction.
- The physical shape, size, and weight of an object directly dictate how much force is required to move it or stop it.



- Engineering is an iterative puzzle that involves identifying a real-world problem, establishing structural boundaries, and continually testing solutions to see what works best.

Unit Learning Targets:

Students will...

- Understand that pushes and pulls are forces that move, stop, or change the directions of objects. They can experiment with different strengths and directions to solve problems and observe how forces affect motion in their everyday lives.
- Compare and contrast the effects of varied force strengths on stationary targets to prove that bigger forces cause bigger physical movements.
- Map and track the directional path of moving objects before and after a physical collision to analyze cause-and-effect trajectory changes.
- Design and execute a controlled multi-stage engineering trial that clears a target zone while completely protecting neighboring safety perimeters.
- Construct a physical layout of structural barriers to successfully intercept and redirect a rolling projectile into a terminal containment zone.



Evidence of Learning

Summative Assessment: Unit Assessment

Equipment Needed: Mystery Science Kit

Teacher: Mystery Science Online Program

Resources:

Formative Assessments:

- exit tickets, whole group discussions, turn and talk, quick questioning, observation sketching
- The Force Strength Sorting Log: A pictorial recording sheet where students evaluate multiple structural interactions and categorize the applied force vector as either a "Big Push/Pull" or a "Little Push/Pull."
- The Demolition Accuracy Matrix: A spatial layout assessment where students demonstrate their ability to consistently clear a 3-cup wall using a pendulum drop without allowing any structural debris to breach a designated safety buffer.
- The Deflection Vector Mapping Task: A physical check-in where students place arrow stickers onto their cardboard ramps to accurately predict the exit path of a ball after it collides with a stationary boundary peg.



Lesson Plans

Lesson	Time Frame
Lesson 1 What's the biggest excavator?	40 minutes/1 day
Lesson 2 How do you knock down a heavy wall?	40 minutes/1 day
Lesson 3 How can we protect a mountain town from falling rocks?	40 minutes/1 day

Teacher Notes:

This unit relies heavily on physical kinetics and mechanical movement. Ensure your classroom layout features clear, designated "testing rings" or open floor mats where student pairs can launch rolling spheres or swing paperboards without disrupting neighboring teams.

When facilitating these lessons, actively lean into the "Force Olympics" framing! Frame structural design adjustments as technical sports training—if a wrecking ball is "too strong" and crushes a neighboring house, tell the student team that their athlete needs to scale back their muscle control. When introducing the intermediate lessons like How could you invent a trap? or How can you knock down the most bowling pins?, emphasize the role of spatial positioning and material choice. Help students explicitly vocalize why a heavy ball drops faster or why a smooth plastic peg stands firmer than a lightweight paperboard structure. Remind them daily that every adjustment to a design is a step closer to the engineering podium!

Curriculum Development Resources/Technology Resources:

Click the links below to access additional resources used to design this unit:

mysteryscience.com



Lesson Plan 1 Template

Content Area: Science Lesson Title: What's the biggest excavator? Time Frame: 40 minutes/1 day

Lesson Components

21st Century Themes

- ☒ Global Awareness ☐ Financial, Economic, Business and Entrepreneurial Literacy
☒ Civic Literacy ☒ Health Literacy

21st Century Skills

- ☒ Creativity and Innovation ☒ Critical Thinking and Problem Solving ☒ Information Literacy
☒ Life and Career Skills ☒ Communication and Collaboration ☒ Media Literacy ☐ ICT Literacy

Interdisciplinary Connections:

Mathematics, ELA

Integration of Technology:

Digital video analysis demonstrating mechanical internal movements of hidden machine components paired with scaled photographic media to evaluate spatial dimensions.

Equipment Needed:

Large chart paper, primary color markers, imaginary construction zone floor markers, printed scaling comparison sheets (giant excavator versus human worker), and toy shovels.

Goals/Objectives	Learning Activities/ Instructional Strategies	Formative Assessment Tasks
Students will: - Students will identify that pushes and pulls represent the core mechanical forces required to do work and alter the physical location of objects. - Students will compare the mechanical performance of human manual labor against automated machines to explain how technology maximizes force output. - Students will model a sequential multi-step kinetic pattern (stretch, push, lift, turn, dump) to simulate the functional	Lesson Sequence - Phenomenon: A human worker using a hand shovel requires hours of intense physical labor to dig a small trench, whereas a massive mechanical excavator utilizes gigantic steel components to scoop up tons of earth and hollow out a swimming pool basin in less than two minutes. - Future Invention Imagination Hook: Students engage with a guided brainstorming session imagining futuristic automation	- Students will verbally define "push" and "pull" as the essential work words needed to move objects from one location to another. - Students will demonstrate the exact sequential movement path of an excavator arm using a synchronized whole-body physical performance. - Students will evaluate a side-by-side comparison chart and explain why a larger mechanical shovel requires a bigger force input to move a larger payload of dirt.



operation of mechanical joints.

- Students will analyze physical scale differences to deduce how structural volume influences the capacity to move massive quantities of matter.

tools—such as a robotic bedroom organizer or an automated cooking device—to establish the value of labor-saving technology.

3. Historical Work-Word Deconstruction: The teacher introduces the concepts of historical manual labor, guiding students to define foundational action variables—including grinding, scrubbing, sawing, and lifting—as human-powered pushes and pulls.
4. Internal Mechanical X-Ray Analysis: Students analyze a video clip displaying the internal mechanisms of common household appliances like dishwashers and mixing machines, discovering that hidden moving parts carry out the same physical work-word actions previously completed by hand.
5. The Backyard Swimming Pool Dilemma: The teacher presents a spatial problem: calculating the time and physical force constraints necessary to move a massive hill of underground earth out of a backyard to build a swimming pool.
6. Kinetic Hand-Shovel Simulation: Students stand up in designated movement zones to

- Students will describe how utilizing a machine changes the duration of time needed to complete a major physical task.



- execute a choreographed three-part manual labor simulation, physically acting out the words "push down, lift up, move over, and dump out" using a pretend shovel.
7. Kinetic Excavator
Upgrade: Students transition their physical posture to mimic a heavy mechanical excavator, executing an expanded, high-power kinetic sequence: stretching out, pushing down, lifting up, turning the body chassis, and dumping the payload.
 8. Performance Output
Comparison: The teacher displays a digital graphic comparing the tiny hole generated by three imaginary manual shovel scoops against the large crater generated by three high-volume mechanical excavator sweeps.
 9. Giant Scale Hidden Feature Hunt: Students evaluate a high-resolution photograph of the world's largest industrial excavator, participating in a visual investigation to locate a tiny adult human observer standing next to the track assembly for scale comparison.
 10. Tonnage Data Volumetric Synthesis: The teacher leads a counting and



- capacity analysis, demonstrating that the giant scoop handles 100 tons of earth, which translates to excavating 44 complete swimming pools in a single hour.
11. Force Scale Synthesis
 Discussion: The lesson wraps up with a structured group discussion reinforcing that while a machine is vastly larger and faster than a human, it operates using the exact same fundamental pushing and pulling forces.

Differentiation:

- Seated alternative movement variations will be provided for students developing trunk stability or motor planning skills during the kinetic simulation.
- High-contrast color-coded floor mats will mark the specific boundaries for the "stretch, turn, and dump" zones to support spatial processing.
- Tactile toy shovels and kinetic play-sand bins will be available to provide a hands-on, concrete sensory connection to the digging sequence.
- The teacher will use clear vocal cues and rhythmic percussion clapping to anchor the pacing of the multi-step movement pattern.
- Advanced students can draw and label a custom blueprint of a new machine attachment designed to complete a different work word task, such as sweeping or crushing.
- Sentence frames are provided for force analysis: "A big excavator can move more dirt because its scoop makes a bigger [blank]."

Resources Provided:

- Mystery Science multimedia interface and mechanical movement clips.
- Mystery Pack (scale comparison photo prints, work-word anchor posters, and machine output comparison charts).
- Floor positioning markers, classroom demonstration models, and student portfolio sheets.



Lesson Plan 2 Template

Content Area: Science	Lesson Title: How do you knock down a heavy wall?	Time Frame: 40 minutes/1 day
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Lesson Components

21st Century Themes

- | | |
|--|---|
| ☒ Global Awareness | ☐ Financial, Economic, Business and Entrepreneurial Literacy |
| ☒ Civic Literacy | ☒ Health Literacy |

21st Century Skills

- | | | |
|---|---|--|
| ☒ Creativity and Innovation | ☒ Critical Thinking and Problem Solving | ☒ Information Literacy |
| ☒ Life and Career Skills | ☒ Communication and Collaboration | ☒ Media Literacy ☐ ICT Literacy |

Interdisciplinary Connections:

ELA, Mathematics

Integration of Technology:

Digital force-meter animations demonstrating how potential distance correlates to kinetic energy, paired with real-world demolition video slow-motion captures to isolate directional collision vectors.

Equipment Needed:

Game station target maps, three heavy plastic cups per group, two folded paper houses per group, pre-assembled string-and-paperboard desk wrecking balls, and force tracking charts.

Goals/Objectives	Learning Activities/ Instructional Strategies	Formative Assessment Tasks
Students will: - Students will explain that changing the strength of a pull on an object directly changes the strength of its forward push when released. - Students will conduct a controlled spatial engineering trial ("Don't Crush That House") to discover how structural spacing impacts demolition outcomes. - Students will analyze physical evidence to determine whether a force was too strong (crushing the	Lesson Sequence - Phenomenon: A massive iron wrecking ball pulled back high into the air and released crashes into a concrete wall with an explosive collision that shatters the structure completely, while pulling the exact same ball back only a few inches causes it to merely thud against the wall, leaving the bricks entirely intact. - The Block Tower Tea Party Disaster: The teacher shares a narrative detailing a student who accidentally collapsed a	- Students will demonstrate how to increase or decrease the force of a wrecking ball swing by adjusting the physical distance of their pull. - Students will verbally categorize a demolition test result as "too strong," "too weak," or "just right" based on the final positions of the cups and houses. - Students will point to the direction that the cups travel after being hit by



preservation zone) or too weak (failing to dismantle the target). Students will observe and state that mechanical forces have explicit direction and cause predictable physical reactions in the objects they strike.	massive block tower into a neighboring stuffed-animal gathering, introducing the real-world risk of uncontrolled force. - Kinetic Force-Scale Warmup: Students participate in an interactive movement game where they match physical gestures to structural scales—using two-handed pushing thrusts for a heavy shopping cart and single-finger tapping motions for a tiny block pillar. - Industrial Demolition Media Scan: The class analyzes slow-motion documentary footage of an industrial wrecking ball system, observing how professional engineers use massive scale variables to flatten aging municipal structures. - The Neighborhood Safety Dilemma: The teacher presents a spatial problem: a hazardous, crumbling brick partition needs to be cleared, but occupied residential homes are located directly on the street behind it. - Game Station Infrastructure Setup: Working in stable engineering teams, students assemble their	the forward moving wrecking ball. Students will record their team's successful launch angle using a simple three-tier height chart (Low, Medium, High).
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- testing station maps, placing two folded paper houses onto marked preservation graphics and building a three-cup vertical wall on the target zone lines.
7. Baseline Pull Distance Trial: Students conduct an initial trial, pulling their tabletop paper wrecking ball back to a high vertical angle and releasing it to observe the high-velocity impact of a maximum force application.
 8. Collateral Damage Assessment: Teams examine the post-impact testing grid, noting whether the high-power push sent flying cup debris past the safety perimeter lines into the residential housing area.
 9. Iterative Force Adjustment Loop: Students Reset their cups and houses after every swing, systematically reducing the backward distance of their pull to find the exact drop point that creates a moderate, safe forward impact.
 10. Dual-Constraint Optimization Challenge: Teams compete to successfully clear all three target cups from the map grid while ensuring the neighboring paper houses remain



- completely undisturbed and intact.
11. Variable Distance
Predictive Debate: The teacher displays static diagrams of two distinct drop heights, prompting student groups to debate and predict which option will trigger an excessive force failure versus an optimized target clearance.
12. Heliostat & Demolition
Synthesis: The lesson concludes with a review linking the careful alignment of industrial wrecking balls to the precision required by full-scale engineering designs.

Differentiation:

- Weighted stabilizer bases will be attached to the paper houses for groups developing spatial awareness to prevent accidental table-bump resets.
- High-contrast boundary tape will delineate the exact target path from the forbidden housing preservation zones to support visual tracking.
- Textured launch-peg indicators (Green = Safe/Low, Red = High/Danger) can be attached to the swing string to provide concrete tactile release markers.
- The teacher will use rhythmic vocal pacing ("Pull back small, let it fall; pull back high, watch them fly") to anchor energy concepts.
- Advanced students can add a fourth cup to their wall structure or move the paper houses two inches closer to the target line to test precision under tighter spatial boundaries.
- Sentence frames are provided for force analysis: "When I pull the ball way back, it gets a [blank] push and travels [blank]."

Resources Provided:

- Mystery Science media dashboard with demolition video clips.
- Mystery Pack (Chill City structural fold sheets, cup targets, pre-strung pendulum swing arms, and house models).
- Game station alignment guides, desktop mounting brackets, and student performance logs.



Lesson Plan 3 Template

Content Area: Force Olympics	Lesson Title: How can we protect a mountain town from falling rocks?	Time Frame: 40 minutes/1 day
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Lesson Components

21st Century Themes

- | | |
|--|---|
| ☒ Global Awareness | ☐ Financial, Economic, Business and Entrepreneurial Literacy |
| ☒ Civic Literacy | ☒ Health Literacy |

21st Century Skills

- | | | |
|---|---|--|
| ☒ Creativity and Innovation | ☒ Critical Thinking and Problem Solving | ☒ Information Literacy |
| ☒ Life and Career Skills | ☒ Communication and Collaboration | ☒ Media Literacy ☐ ICT Literacy |

Interdisciplinary Connections:

Mathematics, ELA

Integration of Technology:

Digital slow-motion path-tracking software to overlay colorful directional vectors on rolling spheres, paired with live geographic warning map interfaces.

Equipment Needed:

Corrugated cardboard incline ramps, 5 colored plastic pushpins per team, paper "Tiny Town" house templates, a catcher cup (the dump truck), ping-pong balls, and structural grid maps.

Goals/Objectives	Learning Activities/ Instructional Strategies	Formative Assessment Tasks
Students will: - Students will explain that a moving object travels in a predictable path until a physical collision applies an opposing force to alter its course. - Students will demonstrate that the speed and mass of a rolling object dictate the strength of its pushing force upon impact with a stationary barrier. - Students will design, test, and refine a physical pin	Lesson Sequence Phenomenon: A smooth ping-pong ball rolled down an open cardboard slope accelerates in a straight path and smashes directly into a cluster of paper model homes, whereas inserting small plastic peg boundaries along its descent causes the rolling ball to collide and instantly veer sideways into a collection bin.	- Students will point to a diagram to identify the exact spot where a rolling ball changes its direction of motion. - Students will verbally explain how a stationary pushpin can "push back" against a rolling ball to alter its path. - Students will successfully complete two identical test trials where the rolling ball misses the



layout to safely redirect a rolling projectile around a preservation zone and into a designated terminal zone.

- Students will recognize that a stationary post applies a counter-push when struck, functioning as an engineering tool to protect vulnerable structures.

2. Mountain Safety Sign Hook: Students examine real-world roadway photographs featuring bold yellow "Falling Rock" warning signs, discussing how environmental changes like rainfall cause solid materials to detach and slide.
3. Velocity vs. Impact Analysis: The teacher utilizes a video clip demonstrating a slow-moving stone stopping against a tree trunk, contrasting it with a high-velocity stone that snaps the timber, establishing that faster objects exert greater force.
4. The Italian Barn Real-World Case: The class analyzes archival images from an event in Italy where a slow, giant boulder completely demolished a farm building, proving that immense mass generates a massive pushing force even at low speeds.
5. Boulder Bump Simulation Briefing: Students are introduced to the "Tiny Town" model, learning their engineering mission: guide a runaway rolling boulder safely into an "Itty Bitty Builders" dump truck cup using a

paper houses and enters the target cup.

- Students will count and confirm that their functional design solution uses five or fewer physical boundary pins.



- maximum of five pin barriers.
6. Baseline Destruction
Test: Teams set up their cardboard slopes with paper houses clustered at the base, releasing an unobstructed ping-pong ball from a launching cup to observe its natural straight-line path of destruction.
 7. Turn-Based Barrier
Installation: Partners alternate turns on the grid map; Player One inserts a single pushpin into the cardboard slope at a custom angle before initiating a test release.
 8. Path Reproducibility
Verification: Students perform two identical test drops for every single pin modification, confirming that the ball's collision path yields consistent directional changes rather than an accidental fluke.
 9. Multi-Pin Obstacle
Navigation: Player Two analyzes the trajectory, choosing to either reposition the existing pin or insert a second peg to create a multi-stage zigzag path that steers the ball clear of the village.
 10. Target Containment
Triumph: Teams refine their layout over a five-minute trial window, adjusting angles of



- incidence until the ball bounces off the pin array and lands directly inside the terminal collection cup.
11. Industrial Safety Bollard
 Synthesis: The teacher connects the classroom activity to urban infrastructure, displaying media of steel safety poles protecting warehouse shelving and preventing reversing delivery trucks from breaching buildings.

Differentiation:

- Pre-punched grid holes will be provided on the cardboard slopes for students developing fine motor precision or hand strength.
- High-contrast neon alignment guidelines can be drawn on the ramp to visually map out ideal path trajectories for visual processing support.
- Larger, high-mass wooden spheres can be substituted for ping-pong balls to give a more distinct auditory feedback cue upon pin impact.
- The teacher will utilize physical hand-chopping gestures to model "straight line" versus "angled bounce" path concepts.
- Advanced students can lock out two sections of the hill as "landslide zones," forcing them to guide the ball using only three pins through a narrow corridor.
- Sentence frames are provided for collision analysis: "When the ball hits the pin, the pin pushes it in a new [blank]."

Resources Provided:

- Mystery Science interactive unit portal and topographic safety video clips.
- Mystery Pack (cardboard ramps, alignment target mats, paper house nets, and lightweight testing spheres).
- Storage cups, heavy-duty mounting fasteners, safety pins, and student data log clipboards.



Lesson Reflection

Reflect on the lesson you have developed and rate the degree to which the lesson *Strongly, Moderately* or *Weakly* meets the criteria below.

Lesson Activities	Strongly	Moderately	Weakly
Are challenging Strongly and require higher order thinking and problem solving skills	☒	☐	☐
Allow for student choice	☒	☐	☐
Provide scaffolding for acquiring targeted knowledge/skills	☒	☐	☐
Integrate global perspectives	☒	☐	☐
Integrate 21st century skills	☒	☐	☐
Provide opportunities for interdisciplinary connection and transfer of knowledge and skills	☒	☐	☐
Foster student use of technology as a tool to develop critical thinking, creativity and innovation skills	☒	☐	☐
Are varied to address different student learning styles and preferences	☒	☐	☐
Are differentiated based on student needs	☐	☒	☐
Are student-centered with teacher acting as a facilitator and co-learner during the teaching and learning process	☒	☐	☐
Provide means for students to demonstrate knowledge and skills and progress in meeting learning goals and objectives	☒	☐	☐
Provide opportunities for student reflection and self- assessment	☒	☐	☐
Provide data to inform and adjust instruction to better meet the varying needs of learners	☐	☒	☐

Curriculum Design Template

Content Area: Science	Grade Level: Kindergarten	Unit Title: Force Olympics
Created: 2026	Board Approved on:	Type Here



SPRINGFIELD PUBLIC SCHOOLS

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY
GLOBAL SKILLS

IEP AND 504 ACCOMMODATIONS AND MODIFICATIONS FOR EARLY CHILDHOOD AND ELEMENTARY SCHOOL STUDENTS:

Large print textbooks
Textbooks for at-home use
Additional time for assignments
Review of directions
Use of mnemonics
Have student restate information
Concrete examples
Adaptive writing utensils
Support auditory presentations with visuals
Use of a study carrel
Assistance in maintaining uncluttered space
Weekly home-school communication tools (notebook, daily log, phone calls or email messages)
Space for movement or breaks
Study sheets and teacher outlines
Extra visual and verbal cues and prompts
Math sheets with highlighted instructions
Graph paper to assist in organizing or lining up math problems
Use of computers and calculators
Books on tape
Graphic organizers
Quiet corner or room to calm down and relax when anxious
Preferential seating
Alteration of the classroom arrangement
Reduction of distractions
Answers to be dictated
Hands-on activities
Use of manipulatives
No penalty for spelling errors or sloppy handwriting
Follow a routine/schedule
Alternate quiet and active time
Teach time management skills
Rest breaks
Verbal and visual cues regarding directions and staying on task
Agenda book and checklists
Adjusted assignment timelines
Visual daily schedule



SPRINGFIELD PUBLIC SCHOOLS

**ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY
GLOBAL SKILLS**

Varied reinforcement procedures
Immediate feedback
Work-in-progress check
Personalized examples

TESTING AND ASSESSMENT ACCOMMODATIONS AND MODIFICATIONS:

Answers to be dictated
Frequent rest breaks
Additional time
Oral testing
Untimed tests
Choice of test format (multiple-choice, essay, true-false)
Alternate ways to evaluate (projects or oral presentations instead of written tests)
Accept short answers
Open-book tests
Read test and directions to student
Provide study outline prior to tests
Highlight key directions
Test in alternative site
Use of calculator
Extra credit option
Preview test procedures
Simplified test wording; rephrased test questions and/or directions

GENERAL ACCOMMODATIONS AND MODIFICATIONS:

Use of alternative books or materials on the topic being studied
Computerized spell-check support
Word bank of choices for answers to test questions
Provision of calculator and/or number line for math tests
Reworded questions in simpler language
Projects instead of written reports
Highlighting important words or phrases in reading assignments
Modified workload or length of assignments/tests
Modified time demands
Modified grades based on IEP

BEHAVIOR ACCOMMODATIONS MODIFICATIONS:



SPRINGFIELD PUBLIC SCHOOLS

**ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY
GLOBAL SKILLS**

Breaks between tasks
Cue expected behavior
Daily feedback to student
Have contingency plans
Use de-escalating strategies
Use positive reinforcement
Use proximity/touch control
Use peer supports and mentoring
Model expected behavior by adults
Have parent sign homework
Have parent sign behavior chart
Set and post class rules
Chart progress and maintain data



SPRINGFIELD PUBLIC SCHOOLS

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY
GLOBAL SKILLS

IEP AND 504 ACCOMMODATIONS AND MODIFICATIONS FOR MIDDLE AND HIGH SCHOOL STUDENTS:

Large print textbooks
Textbooks for at-home use
Additional time for assignments
A locker with adapted lock
Review of directions
Review sessions
Use of mnemonics
Have student restate information
Provision of notes or outlines
Concrete examples
Adaptive writing utensils
Support auditory presentations with visuals
Weekly or bi-weekly home-school communication
Space for movement or breaks
Study sheets and teacher outlines
Extra visual and verbal cues and prompts
Lab and math sheets with highlighted instructions
Graph paper to assist in organizing or lining up math problems
Use of tape recorder for lectures
Use of Interactive notebook
Use of a scribe
Use of computers and calculators
Books on tape
Graphic organizers
Quiet corner or room to calm down and relax when anxious
Preferential seating
Alteration of the classroom arrangement
Reduction of distractions
Answers to be dictated
Hands-on activities
Ability to type all assignments
Follow a routine/schedule
Teach time management and organizational skills
Rest breaks
Verbal and visual cues regarding directions and staying on task
Agenda book and checklists
Daily check-in with case manager or special education teacher
Adjusted assignment timelines
Visual daily schedule



SPRINGFIELD PUBLIC SCHOOLS

**ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY
GLOBAL SKILLS**

Varied reinforcement procedures
Immediate feedback
Work-in-progress check
Personalized examples

TESTING AND ASSESSMENT ACCOMMODATIONS AND MODIFICATIONS:

Answers to be dictated
Frequent rest breaks
Additional time
Oral testing
Choice of test format (multiple-choice, essay, true-false)
Alternate ways to evaluate (projects or oral presentations instead of written tests)
Accept short answers
Open-book or open-note tests
Read test and directions to student
Provide study guides prior to tests
Highlight key directions
Test in alternative site
Use of calculator
Extra credit option
Pace long-term projects
Preview test procedures
Simplified test wording; rephrased test questions and/or directions

GENERAL ACCOMMODATIONS AND MODIFICATIONS:

Allow outlining, instead of writing for an essay or major project
Use of alternative books or materials on the topic being studied
Computerized spell-check support
Word bank of choices for answers to test questions
Provision of calculator for math tests
Film or video supplements in place of reading text
Reworded questions in simpler language
Projects instead of written reports
Highlighting important words or phrases in reading assignments
Modified workload or length of assignments/tests
Modified time demands



SPRINGFIELD PUBLIC SCHOOLS

**ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY
GLOBAL SKILLS**

Pass/no pass option
Modified grades based on IEP

BEHAVIOR ACCOMMODATIONS FOR STUDENTS:

Breaks between tasks
Cue expected behavior
Daily feedback to student
Have contingency plans
Use de-escalating strategies
Use positive reinforcement
Use proximity/touch control
Use peer supports and mentoring
Model expected behavior by adults
Have parent sign homework
Set and post class rules
Chart progress and maintain data



Accommodations and Modifications for ESL Students

- Give tests orally
- Give instructions/directions in writing and orally
- Assign a peer tutor, same language or English speaking
- Allow use of bilingual/translation dictionary
- Provide summaries of text or study guides of particular chapters
- Allow errors in speaking
- Allow errors in writing
- Accept writing in first language
- Highlight key vocabulary
- Reduce amount of work required
- Assess comprehension through demonstration or other alternative means (gestures, drawings)
- Rephrase questions, directions, and explanations
- Reduce multiple choices on assessments
- Provide study guides and/ or outlines
- Shorten reading assignments
- Allow extended time for test/project completion
- Use of audio books
- Use of graphic organizers
- Use reduced text, so that print is not dense
- Use visuals/pictures throughout lesson/unit/assignment
- Adapt homework to reflect language proficiency/home support
- Adapt homework to reflect home support
- Provide hands-on activities and explanations
- Allow extended time to answer questions, and permit drawing, as an explanation
- Use of translation dictionaries to locate words in the native language
- Use anecdotal records and portfolio of work as forms of assessment
- Use story retellings to assess comprehension

What Does the Gifted and Talented Experience Look Like?
Springfield Public Schools

Mission Statement

The Gifted and Talented Program of the Springfield Public Schools aims to provide a meaningful and rigorous education that instills the value of lifelong learning and empowers all students to reach their full potential and become self-fulfilled creative leaders in accordance with the comprehensive standards of our state. We accomplish this by offering challenging, real-world experiences in a student-centered environment.

We recognize that students come from diverse socioeconomic, cultural, and ethnic backgrounds, and the mission of the gifted and talented program is to provide opportunities for students to explore their intellectual, creative, and artistic gifts and talents within the classroom and with beyond-the-classroom experiences. It is essential to provide diverse, appropriate, and ongoing learning experiences and environments that incorporate students' academic, psychological, and social needs. Our responsibility is to provide students with educational alternatives that teach, challenge, and expand their knowledge, while simultaneously stressing the development of independent and self-directed learners who continuously generate questions, analyze, synthesize, and evaluate information and ideas.

New Jersey Administrative Code 6A:8-3.1 defines students who are gifted and talented as those students who possess or demonstrate high levels of ability in one or more content areas when compared to their chronological peers in the local district and who require modification of their educational program if they are to achieve in accordance with their capabilities.

Goals:

To support our mission, we have established the following goals to guide our work:

- To infuse into the general education program a broad range of activities for high-level learning that will challenge all students to perform at advanced levels, and provide extended opportunities, resources, and support in particular areas where student interest or talent is demonstrated.
- To provide a continuum of gifted education services that will strengthen the total school program, offer enriching and challenging learning opportunities for all students, and provide specialized learning experiences
- To promote achievement of students' best potentials and increased ability.

Through a productive and collaborative relationship among the building principals, classroom teachers, and the Gifted and Talented teacher, our schools can create programming that will enhance the learning experience for every student and serve the unique and specialized needs of students currently demonstrating gifted behaviors.

Elements of the Schoolwide Enrichment Model, W.I.N (What I Need), differentiated instruction, advanced classes, or individual programs into a student's regular instruction program are integral to this overarching framework for gifted education in the Springfield School District.

Reference Board Policy and Regulation 2464 – Gifted and Talented Pupils (M)

Early Childhood Center **Edward V. Walton**

Schoolwide Virtual Enrichment

All first and second grade students have access to the [Gifted and Talented Virtual Classroom](#). This virtual classroom is a space for students to complete various challenges and enrichment opportunities at their own pace. Students can receive feedback and additional adaptable resources to meet their individual learning needs. The virtual classroom design expands accessibility to enrichment resources and allows students to choose learning activities according to their unique interests and abilities. The purpose of the activities is to encourage problem-solving, develop critical thinking

skills, and expand curiosity and imagination. Activities are aligned to the New Jersey Student Learning Standards.

Gifted and Talented Teacher as a Resource

The Gifted and Talented teacher serves as a resource to all teachers within Edward V. Walton School. Teachers seeking resources for their high-ability learners will receive additional support from the Gifted and Talented teacher in various ways. This support may include additional units of study, challenging resources, and student projects.

Elementary Schools

James Caldwell

Thelma L. Sandmeier

The goal is to engage small groups of students in intensive learning experiences through standards-based, rigorous, and relevant units of study that supplement, not supplant, the grade-level curriculum and support students' unique learning needs.

Enrichment Experience Grade 3

Beginning in third grade, the G&T teacher will cycle through all classrooms to work on problem-solving and enrichment tasks with students. Driven by assessment data, academic performance, student interest, and teacher observation, small groups of students will meet with the G&T teacher during W.I.N. (What I Need) periods throughout the week that the teacher is assigned to their classroom teacher. Groupings will be flexible and monitored to best meet each student's needs throughout the school year. Activities will include brain teasers, puzzles, strategic thinking, problem-solving, and STEM challenges.

Targeted Gifted and Talented Programing Grades 4-5

Students may become identified as Gifted and Talented in fourth grade. Students that are identified may receive support from the G&T Teacher for up to five periods (200 minutes) a week during W.I.N. (What I Need) periods. Identified students will meet to explore grade-level content while incorporating depth and complexity in a student-centered, problem-based environment. The Gifted and Talented Program aims to provide students with various advanced and challenging learning experiences across content areas to promote independent thinking skills, refine critical thinking and communication skills, cultivate joy in learning, and expand student interests through problem-solving. The instruction that students receive incorporates 21st Century Skills and advanced content that is challenging, hands-on, and relevant to the real world.

Strategies and Practices that Support Gifted and Talented Students

- Adjusted Pace of Lessons
- Inquiry-Based Instruction
- Higher-Order Thinking Activities
- Interest-Based Content
- Real World Problem Solving/Problem Based Learning
- Independent Study/Passion Projects
- Units of Study with Like-Minded Peers

Schoolwide Virtual Enrichment

All JCS and TLS students have access to grade level-specific [Gifted and Talented Virtual Classrooms](#). These virtual classrooms are a space for students to complete various challenges and enrichment opportunities at their own pace. Students are able to receive feedback and additional opportunities based on their needs. The virtual classrooms have expanded the accessibility of enrichment resources directly to the students and allows for students to choose opportunities according to their interests and abilities. The purpose of the activities is to encourage problem solving, develop critical thinking skills, and expand curiosity and imagination in conjunction with the New Jersey Student Learning Standards.

Gifted and Talented Teacher as a Resource

In addition to classroom support, the Gifted and Talented teacher also serves as a resource to all teachers in the building. Teachers that are seeking resources for their high ability learners will receive additional support from the Gifted and Talented teacher in various ways. This may include additional units of study, challenging resources, student projects, and meeting with the G&T teacher as needed.

Additional Enrichment Opportunities

Across all grade levels 3-5, as recommended by the classroom teacher, students exhibiting a need for additional enrichment may have the opportunity to meet with the G&T teacher as the schedule allows. Groupings will be flexible and monitored to best meet the students' needs throughout the school year. Activities will include, brain teasers, puzzles, strategic thinking activities, problem-solving challenges, and STEM challenges. Students engage in an extended process of asking questions, using resources, and developing answers that lead to thinking about what and how they are learning. Students are held accountable for how they work and use their time by demonstrating their learning through products or presentations.

Students self-select to participate in individual and/or group projects based on interest and commitment. The classroom teacher and/or the enrichment teacher will help guide and monitor student exploration of chosen topics, facilitating their learning with resources and teaching of needed skills.

Secondary Schools
Florence M. Gaudineer Middle School
Jonathan Dayton High School

Grades 6-12: Access to specific content programs with higher levels of academic challenges (i.e. Pre-Algebra, Accelerated Communication Arts, and Advanced Placement Classes)

Dual Credit Courses provide students the opportunity to obtain high school credit, and college credit, simultaneously through partnerships with several institutions.

Project Lead the Way (PLTW) students become builders of technology by engaging in real world activities. Students are empowered as design thinkers collaborating on real world projects.

Gifted and Talented Identification Criteria

The Springfield Schools Gifted and Talented Program recognizes that students require differentiated learning experiences beyond the core curriculum being taught because of their advanced abilities in one or more content areas. These students may also have other cognitive qualities such as curiosity, creativity, motivation, leadership, and passion that require modifications to their academic experience.

Multiple Measures of Eligibility

Kindergarten through grade twelve identification process for gifted and talented students includes multiple measures. Multiple measures may include but are not limited to: achievement test scores; grades; student performance or products; intelligence testing; parent, student, and/or teacher recommendation; and other appropriate measures. The identification methodology is developmentally appropriate, non-discriminatory, and related to the programs and services offered by the Springfield School District. The identification procedures are reviewed annually.

According to N.J.A.C. 6A:8-3.1, all public school districts must have a board-approved gifted and talented identification process and provide services for identified students enrolled in the grades of that school district. The regulations require that identification and services be made available to students in grades K-12.

When students are recommended for the Gifted and Talented Program there are multiple measures that are considered to determine if services are necessary and appropriate. The assessments used are as follows:

- Cognitive Abilities Test (CogAT)
- Classroom Performance/Student Portfolios
- DRA2 Level
- iReady Diagnostic Scores
- Gifted Indicators Checklist
- Start Strong/NJSLA Assessment Data

The N.J.A.C. requires that students be compared to their chronological peers in the local school district. The New Jersey Department of Education has not established state-level criteria for identifying students who are gifted, such as mandated tests or assessments, grade point averages, or IQ scores. Local school districts must use multiple measures to identify students.

Procedures

<https://www.straussesmay.com/seportal/Public/DistrictPolicy.aspx?policyid=2464&id=b8a33a9f505e4998a6db3fb8e1de778b>

Gifted and Talented Program Identification Matrix

Minimum Score Required for Consideration: 14 Points

1 Point	2 Points	3 Points
Cogat Assessment Overall Stanine Score of a 7	Cogat Assessment Overall Stanine Score of an 8	Cogat Assessment Overall Stanine Score of a 9
iReady Math Assessment Just Below Current Grade Level	iReady Math Assessment On Grade Level	iReady Math Assessment ½ Year + Above Current Level
iReady ELA On Grade Level	iReady ELA ½ Year Above Current Level	iReady ELA One Full Grade Level + Above Current Level
NJSLA Math Approaching Expectations	NJSLA Math Met Expectations	NJSLA Math Exceed Expectations
NJSLA ELA Approaching Expectations	NJSLA ELA Met Expectations	NJSLA ELA Exceed Expectations
HOPE Teacher Rating Scale Raw Score: 11 - 29	HOPE Teacher Rating Scale Raw Score: 30 - 49	HOPE Teacher Rating Scale Raw Score: 50-66

Team meetings present the opportunity to review data and assess the educational needs of all students. Teacher provides examples of student work exhibiting above and beyond grade level expectations, creativity, leadership, critical and abstract thinking. Programs for gifted and talented students will be periodically evaluated for their continuing efficacy and adjusted accordingly. The parent of any student identified as gifted or talented shall be consulted regarding any program designed to address the student's particular needs.

Resource Links

https://riversideinsights.com/cognitive_abilities_test

<https://www.curriculumassociates.com/programs/i-ready-learning>

<https://www.nj.gov/education/assessment/resources/>

<https://www.routledge.com/HOPE-Teacher-Rating-Scale-Involving-Teachers-in-Equitable-Identification/Gentry-Pereira-Peters-McIntosh-Fugate/p/book/9781618214522#:~:text=The%20HOPE%20Teacher%20Rating%20Scale,making%20it%20easy%20to%20use.>

Gifted and talented student: The "[*Strengthening Gifted and Talented Education Act*](#)" defines a gifted and talented student as a "student who possesses or demonstrates a high level of ability in one or more content areas when compared to their chronological peers in the school district and who require modifications of their educational program if they are to achieve in accordance with their capabilities."

Twice-exceptional (2E) students: A twice-exceptional (2E) student is defined as "a student who is both gifted and a student with a disability. These students may also be referred to as having dual exceptionalities or as being gifted with learning disabilities (GT/LD). This also applies to students who are gifted with ADHD or gifted with autism" (New Jersey Association for Gifted Children, www.nagc.org).

Instructional adaptation: An adjustment or modification to instruction enabling a student who is gifted and talented to participate in, benefit from, and demonstrate knowledge and application of the New Jersey Student Learning Standards in one or more content areas at the instructional level of the student, not just the student's grade level.

Identifying gifted and talented students: The focus of identification is to provide programming and services in which students' specific learning needs and potential are appropriately addressed and met. In every New Jersey school district, there are students who require modifications to the general education curriculum if they are to achieve in accordance with their abilities. By identifying a student's general intellectual ability, creativity, or specific academic area aptitudes, we are acknowledging that they need programming and services outside of the general education/grade level curriculum to advance their learning.

NJDOE Fast Facts

<https://www.nj.gov/education/standards/gifted/>

<https://www.nj.gov/education/standards/gifted/legislation.shtml>

Supplemental Resources/Programming for Gifted Students

Edward V. Walton

- PETS Program – Primary Education Thinking Skills
- Group Solutions/Group Solutions 2 – Cooperative Logic Activities
- Lollipop Logic
- Beginning Thinking Skills
- AIMS Education Programming

James Caldwell and Thelma L. Sandmeier

Math/ELA

- Project M3: Mentoring Mathematical Minds
- Junior Great Books
- AIMS Education Programming
- Borenson Hands on Equations
- BizWorld
- Perplexors
- Advanced Math Explorations grade 3-5
- Challenging Units for Gifted Learners (ELA and Math)
- Creative Curriculum Extenders
- Differentiated Lessons & Projects
- Challenge Math Grades 4+
- Differentiating Instruction with Menus (All Content Areas)
- Jacob's Ladder
- Genius Hour/Passion Project
- Spatial Reasoning
- Logic Puzzles, Brain Games, Analogies

STEM

- Engineering is Elementary
- Engineer Throughout the Year
- PBS Design Squad
- DefinedSTEM
- Project Lead the Way (PLTW)

Enrichment Events

Experience for all students to be enriched through events related to the curricular or extracurricular activities. Examples include after school clubs, PTA-sponsored events, leadership opportunities, visual and performing arts, and community service opportunities.