Grade 5 Unit 1
Ecosystems: Interactions, Energy, and Dynamics
End of September/October - Mid November/MP 1

Unit Summary:

- The unit on ecology helps students develop the idea that plants, animals, and fungi form a system of interdependent parts, with each part dependent on the other parts for its material nourishment. By the end of the unit, students will be able to conclude that organic matter is cycling through the living world.
- Understandings to include:
  - Food chains, predators, prey, herbivores, carnivores
  - Matter cycle, food chain
  - Matter cycle, decomposition
  - Matter cycle, nutrients
  - Flow of energy necessary to support all life

Concepts	Vocabulary
● Matter is transported into, out of, and within systems. ● Plants acquire their material for growth chiefly from air and water, and the sun. ● An ecosystem can be described in terms of its components and their interactions. ● The food of almost any kind of animal can be traced back to plants. ● Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. ● Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as decomposers. ● Decomposition eventually restores (recycles) some materials back to the soil. ● Organisms can survive only in environments in which their particular needs are met.	plants, plant growth, material / matter (Air and Water), energy (sunlight), plant, animals, predators, prey, herbivores, carnivores, decomposers (fungi and bacteria), environment, matter (e.g. air, soil, water), ecosystem, animals' food, function (e.g. body repair, growth, motion, body warmth)

Stage 1 – Desired Results (Also see Disciplinary Core Ideas Below)

Performance Expectations: (PE) (Established Goals / Content Standards)

- **●5-LS1-1: Support an argument that plants get the materials they need for growth chiefly from air and water.**
- ○ **Clarification Statement:** Emphasis is on the idea that plant matter comes mostly from air and water, not from the soil.
- **● 5-LS1-1: Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.**
- ○ **Clarification Statement:** Emphasis is on the idea that matter that is not food (air, water, decomposed materials in soil) is changed by plants into matter that is food. Examples of systems could include organisms, ecosystems, and the Earth.
- ○ **Assessment Boundary:** Assessment does not include molecular explanations
- **● 5-PS3-1: Use models to describe that energy in animals' food (used for body repair,**

growth, motion, and to maintain body warmth) was once energy from the sun.

- ○ **Clarification Statement:** Examples of models could include diagrams, and flowcharts.

Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Engaging in Argument from Evidence ● Support an argument with evidence, data, or a model. (5-LS1-1) **Developing and Using Models** ● Develop a model to describe phenomena. (5-S2-1) ● Use models to describe phenomena. (5-PS3-1)	**LS1.C: Organization for Matter and Energy Flow in Organisms** ● Plants acquire their material for growth chiefly from air and water. (5-LS1-1) **LS2.A: Interdependent Relationships in Ecosystems** ● The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as "decomposers." Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem. (5-LS2-1)	**Energy and Matter** ● Matter is transported into, out of, and within systems. (5-LS1-1) Grade 5 - Science Curricular Framework Developing and Using Models ● Develop a model to describe phenomena. (5-S2-1) ● Use models to describe phenomena. (5-PS3-1) chiefly from air and water. (5-LS1-1) **LS2.A: Interdependent Relationships in Ecosystems** ● The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as "decomposers." Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem. (5-LS2-1)

	LS2.B: Cycles of Matter and Energy Transfer in Ecosystems ● Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Organisms obtain gases, and water from the environment, and release waste matter (gas, liquid, or solid) back into the environment. (5-LS2-1) **PS3.D: Energy in Chemical Processes and Everyday Life** ● The energy released [from] food was once energy from the sun that was captured by plants in the chemical process that forms plant matter (from air and water). (5-PS3-1) LS1.C: Organization for Matter and Energy Flow in Organisms ● Food provides animals with the materials they need for body repair and growth and the energy they need to maintain body warmth and for motion. (secondary to 5-PS3-1)	**LS2.B: Cycles of Matter and Energy Transfer in Ecosystems** ● Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and ● Energy can be transferred in various ways and between objects. (5-PS3-1) Systems and System Models ● A system can be described in terms of its components and their interactions. (5-LS2-1) - - - - - - - - - - - - - - - - - Connections to the Nature of Science Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena ● Science explanations describe the mechanisms for natural events. (5-LS2-1)

Enduring Understandings (What are the big ideas?)	**Essential Questions**
Students will understand: ● Matter never disappears & energy continues to flow through the ecosystem	● How do organisms live, grow, respond to their environment? ● How and why do organisms interact with their environment and what are the effects of these interactions?

• The interactions of organisms within an ecosystem	

Stage 2 – Model Assessments	
Summative Performance Task(s) • Students will model the relationships that exist in an ecosystem (paper, slideshow, diorama, etc.) to include at least two producers, two consumers, and one decomposer. ○ Students must also explain how energy & matter moves through their models. **Audience:** • Peers/ teacher **Criteria:** • Rubric, observation, self reflection	**Formative Evidence:** Through what other evidence will students demonstrate achievement of the desired results? • (Suggested) 2-4 question comprehension checks • Teacher observation/Assessment of student success in experiment • Class Discussion/ Anecdotal notes • (possible) Mystery Science end-of-mystery assessment • Analyze and construct a food chain or web

Stage 3 – Learning Plan Resources and Activities
Suggested Resources for Planning: • **Mystery Science** • **NJCTL.org** • **Super Science** • **Scholastic** • **Scholastic Study Jams** • **Tower Garden**
Learning Activities: • **Tower Garden lessons**

- Phenomena based learning
- Mystery Science mysteries:
    - **Web of Life (Ecosystems and the Food Web)**
        - **Mystery: Food Chains, Predators, Herbivores & Carnivores**
            - ***Why Would a Hawk Move to NYC (predator/prey)***
        - **Mystery: Matter Cycle, Food Chain**
            - ***What Do Plants Eat?***
        - **Mystery: Decomposers & Matter Cycle**
            - ***Where Do Fallen Leaves Go?***
        - **Mystery: Decomposers, Nutrients, & Matter Cycle**
            - ***Do Worms Really Eat Dirt?***
        - **Mystery: Ecosystems and Matter Cycle**
            - ***Why Do You Have to Clean a Fish Tank but Not a Pond?***
        - **Mystery: Flow of Energy**

          Why Did the Dinosaurs Go Extinct?

- creating food chains and webs
- creating and monitoring mold terrariums
- fish tanks to stimulate pond ecosystem, design an ecosystem
- Scholastic activities:
- Ecosystem Slideshow

Suggested Methods: (The following methods anchor learning with a purpose, mitigating the "why do I need to know this" questions.)

- Phenomena based learning
- Problem Based Learning (PBL)
- Inquiry Based Learning
- Case studies
- Engaging in Argument w/ evidence

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Grade 5 Unit 2
Water on Earth
Mid/End November - Late January/MP 2

Unit Summary:

- The unit on matter helps students develop the idea that the Earth is a complex and dynamic set of interconnected systems (e.g. geosphere, hydrosphere, atmosphere, biosphere) that interact in multiple ways to affect the Earth's surface and processes.
- Understandings to include:
  - The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate.
  - Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather.
  - Most freshwater is in glaciers or underground with the remainder in streams, lakes, wetlands, and atmosphere.
  - Water continually cycles among land, ocean, and atmosphere via transpiration, evaporation, condensation and crystallization, and precipitation as well as downhill flows on land.
  - The Earth's processes affect and are affected by human activities

Concepts	Vocabulary
● Standard units are used to measure and describe physical quantities such as weight and volume. ● Nearly all of Earth's available water is in the ocean. ● Most freshwater is in glaciers or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere	Hydrosphere, organisms, glaciers, transpiration, evaporation, condensation, precipitation, groundwater, well, stomata

Stage 1 – Desired Results (Also see Disciplinary Core Ideas below)

Performance Expectations: (PE) (Established Goals / Content Standards)

- **5-ESS2-1: Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.**
  - **Clarification Statement:** Examples could include the influence of the ocean on ecosystems, landform shape, and climate; the influence of the atmosphere on landforms and ecosystems through weather and climate; and the influence of mountain ranges on winds and clouds in the atmosphere. The geosphere, hydrosphere, atmosphere, and biosphere are each a system.
  - **Assessment Boundary:** Assessment is limited to the interactions of two systems at a time.
- **5-ESS2-2. Describe and graph the amounts of saltwater and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.**
  - **Assessment Boundary:** Assessment is limited to oceans, lakes, rivers, glaciers, ground water, and polar ice caps, and does not include the atmosphere.] The performance expectations above
- **5-ESS3-1: Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment**

Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Developing and Using Models ● Develop a model using an example to describe a scientific principle. (5-ESS2-1) **Obtaining, Evaluating, and Communicating ESS2.A: Earth Materials and Systems** ● Earth's major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things). **Systems and System Models** ● A system can be described in terms of its components and their interactions. (5-ESS2-1),(5-ESS3-1)	**ESS2.C: The Roles of Water in Earth's Surface Processes** ● Nearly all of Earth's available water is in the ocean. Most fresh water is in glaciers or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere. (5-ESS2-2) **ESS3.C: Human Impacts on Earth Systems** ● Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments. (5-ESS3-1)	**Scale, Proportion, and Quantity** ● Standard units are used to measure and describe physical quantities such as weight and volume. (5-ESS2-2) **Systems and System Models** ● A system can be described in terms of its components and their interactions. (5-ESS3-1) **Science Addresses Questions About the Natural and Material World** ● Science findings are limited to questions that can be answered with empirical evidence. (5-ESS3-1)

Enduring Understandings	Essential Questions
● Understandings to include: ○ Earth's major systems are the geosphere, hydrosphere, and biosphere, which interact in multiple ways to affect the Earth's surface materials and processes. ○ Human activities in agriculture, industry, and everyday life have had major effects on land, vegetation, streams, ocean, and air. ○ Natural bodies of water support a variety of ecosystems and organisms, shapes landforms, and influences	● How and why is Earth constantly changing? ● How do Earth's processes and human activities affect each other? ● How and why is Earth constantly changing from the effect of water energy?

Stage 2 – Model Assessments	
Summative Performance Task(s): ● Develop a model to describe the ways the geosphere, hydrosphere, and biosphere interact. (5-ESS2-1) ● Develop a model to describe the ways the	**Formative Evidence:** ● (Suggested) 2-4 question comprehension checks ● Teacher observation ● Class Discussion/ Anecdotal notes

geosphere, hydrosphere, and biosphere interact. This could include the influence of atmosphere on landforms and ecosystems though weather and climate, mountain ranges on winds and clouds, etc. (5-ESS2-1)
 	
• **Audience:**
  • Peers/ teacher
Criteria:
  • Rubric, observation, self reflection
	• (possible) Mystery Science end-of-mystery assessment
	• Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.
	• Using real time data, graph amounts of water in various reservoirs to provide evidence about the distribution of water on earth.

Stage 3 – Learning Plan Resources and Activities

Suggested Resources for Planning:

- **Mystery Science**
- **Super Science**
- **Scholastic**
- **NJCTL.org**
- **Scholastic Study Jams - Water Cycle:**
- **Scholastic Study Jams Weather and Climate:**
- **United States Environmental Protection Agency**
- **The Water Project activities**

Learning Activities:

- Map areas where frozen, fresh, and salter are found and evaluate findings to arrive at conclusions
- Investigate where inland areas get fresh water from
- Create evaporation cycle to simulate rain
- Brainstorm ways to protect areas against water-related disasters
- Mystery Science mysteries
  - **Watery Planet (Water Cycle and Earth's Systems)**
    - **Mystery: Water on Earth's Surface**
      - ***How much water is in the world?***
    - **Mystery: Water as a Natural Resource**
      - ***When you turn on the faucet, where does the water come from?***
    - **Mystery: Water Cycle**
      - ***Can we make it rain?***
    - **Mystery: Natural Disasters and Engineering**
      - ***How can you save a town from a hurricane?***

Suggested Methods: (The following methods anchor learning with a purpose, mitigating the “why do I need to know this” questions.)

- Phenomena based learning
- Problem Based Learning (PBL)
- Inquiry Based Learning
- Case studies
- Engaging in Argument w/ evidence

Grade 5 Unit 3
Earth Systems: Interactions Within the Earth, Sun, and Moon System
Late January - End of March/MP 3

Unit Summary:
This Earth and Space science unit helps students develop the idea that observable phenomena such as time, season, sunrise/sunset, moon phase, gravity, and shooting stars are the results of natural laws governing the movement of bodies through space. Students will also develop an understanding that it is Earth's place in the universe that allows life to exist and flourish on Earth.

- Understandings to include:
  - Sun's daily patterns due to Earth's rotation
  - Sun and Earth's orbit and annual patterns
  - Stars and constellations
  - Moon's orbit and lunar cycle
  - Planets and the solar system
  - Gravity
  - Star brightness (relative brightness)
  - Requirements of a habitable planet

Concepts	Vocabulary
• A system can be described in terms of its components and their interactions • Earth's major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). • The Earth's major systems interact in multiple ways to affect Earth's surface materials and processes. • Natural bodies of water support a variety of ecosystems and organisms, shapes landforms, and influences climate. • Winds and clouds in the atmosphere interact with landforms to determine patterns of weather.	Rotation, orbit, ellipse, hydrosphere, geosphere, atmosphere, interaction, systems, relative distance, brightness, axis, patterns, gravity, asteroid, comet, meteor, meteorite

Stage 1 – Desired Results (Also see Disciplinary Core Ideas below)

Performance Expectations: (PE) (Established Goals / Content Standards)

- **5-PS2-1: Support an argument that the gravitational force exerted by Earth on objects is directed down.**
  - **Clarification Statement:** "Down" is a local description of the direction that points toward the center of the spherical Earth.
  - **Assessment Boundary:** Assessment does not include mathematical representation of gravitational force.
- **5-ESS1-1: Support an argument that the apparent brightness of the sun and stars is due to their**

relative distances from the Earth.
  - **Assessment Boundary:** Assessment is limited to relative distances, not sizes, of stars. Assessment does not include other factors that affect apparent brightness (such as stellar masses, age, stage).
- **5-ESS1-2: Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.**
  - **Clarification Statement:** Examples of patterns could include the position and motion of Earth with respect to the sun and selected stars that are visible only in particular months.
  - **Assessment Boundary:** Assessment does not include causes of seasons.

Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Developing and Using Models ● Develop a model using an example to describe a scientific principle. **Engaging in Argument from Evidence** ● Support an argument with evidence, data, or a model. (5-PS2-1), (5-ESS1-1) **Analyzing and Interpreting Data** ● Represent data in graphical displays (bar graphs, pictographs and/or pie charts) to reveal patterns that indicate relationships.	**PS2.B: Types of Interactions** ● The gravitational force of Earth acting on an object near Earth's surface pulls that object toward the planet's center. (5-PS2-1) **ESS1.A: The Universe and its Stars** ● The sun is a star that appears larger and brighter than other stars because it is closer. Stars range greatly in their distance from Earth. (5-ESS1-1) **ESS1.B: Earth and the Solar System** ● The orbits of Earth around the sun and of the moon around Earth, together with the rotation of Earth about an axis between its North and South poles, cause observable patterns. These include day and night; daily changes in the length and direction of shadows; and different positions of the sun, moon, and stars at different times of the day, month, and year. (5-ESS1-2)	**Cause and Effect** ● Cause and effect relationships are routinely identified and used to explain change. (5-PS2-1) **Scale, Proportion, and Quantity** ● Natural objects exist from the very small to the immensely large. (5-ESS1-1) **Patterns** ● Similarities and differences in patterns can be used to sort, classify, communicate and analyze simple rates of change for natural phenomena. (5-ESS1-2) **Systems and Systems Models** ● A system is an organized group of related objects or components. Models can be used for understanding and predicting the behavior of systems. (Links to unit as a whole)

Enduring Understandings	**Essential Questions**
Students will understand: ● Predictable patterns occur in the universe ● Planets and a variety of other bodies form a system of objects orbiting the sun.	● How do patterns control the universe? ● What is the universe, and what is Earth's place in it?

Stage 2 – Model Assessments	
Summative Performance Task(s): ● Project with Rubric ● Mystery Science Unit Assessment ● **Audience:** ● Peers and teachers	**Formative Evidence:** ● Mystery Science 3 - 4 question comprehension check for each mystery. ● Solar system model using beads ● Student-created assessment (contributions from groups of students or each student)

Stage 3 – Learning Plan Resources and Activities
Suggested Resources for Planning: ● **Mystery Science** ● **Super Science** ● **Scholastic** ● **NJCTL.org** ● **PBS Meet the Planets activity** ● **Study Jams Solar System** ● **Nasa Solar System activities** ● **Inspiration Laboratories activities**

Learning Activities:

- Engineering tasks - teachengineering.org
- **Mystery Science mysteries: Spaceship Earth (Sun, Moon, Stars & Planets)**
  - **Mystery: Day, Night and Earth's Rotations**
    - **How fast does the Earth spin?**
  - **Mystery: Earth's Rotation and Time**
    - **Who set the first clock?**
  - **Mystery: Seasonal Changes and Sun's Path**
    - **How can the sun tell you the season?**
  - **Mystery: Seasons and Earth's Revolution**
    - **Why do the stars change with the seasons?**
  - **Mystery: Moon Phases, Lunar Cycle**
    - **Why does the moon change shape?**
  - **Mystery: Planets and Solar Systems**
    - **What are the wandering stars?**
  - **Mystery: Gravity**
    - **Why is gravity different on other planets?**
  - **Mystery: Star Brightness and Habitable Planets**
    - **Could there be life on other planets?**
- Possible provocative questions:
  - Why does the sun rise and set?
  - Why does the moon change shape?
  - Why do we have seasons?
  - What makes a planet livable?

Suggested Methods: (The following methods anchor learning with a purpose, mitigating the "why do I need to know this" questions.)

- Phenomena based learning
- Problem Based Learning (PBL)
- Inquiry Based Learning
- Case studies
- Engaging in Argument w/ evidence

Grade 5 Unit 4
Properties of Matter
Early April through June/MP 4

Unit Summary

- The unit on matter helps students develop the idea that matter of any type can be subdivided into particles that are too small to see but even then the matter still exists and can be detected by other means. By the end of the unit, students will be able to conclude that matter WILL ALWAYS be present.
- Understandings to include:
  - When two or more different substances are mixed, a new substance with different properties may be formed.
  - Measurements of a variety of properties can be used to identify materials.

Concepts	Vocabulary
• Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume. • Measurements of a variety of properties can be used to identify materials. (At this grade level, mass and weight are not distinguished, and no attempt is made to define the unseen particles or explain the atomic-scale mechanism of evaporation and condensation.)	matter, property, characteristic, physical properties, chemical properties, substance, chemical reaction, transform, solid, liquid, gas, color, hardness, magnetic forces, heat properties, solubility, acid, alkaline, neutral

Stage 1 – Desired Results (Also see Disciplinary Core Ideas below)

Performance Expectations:

- **5-PS1-1. Develop a model to describe that matter is made of particles too small to be seen**
  - **Clarification Statement:** Examples of evidence could include adding air to expand a basketball, compressing air in a syringe, dissolving sugar in water, and evaporating salt water.
  - **Assessment Boundary:** Assessment does not include the atomic-scale mechanism of evaporation and condensation or defining the unseen particles.
- **5-PS1-2. Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.**
  - **Clarification Statement:** Examples of reactions or changes could include phase changes, dissolving, and mixing that forms new substances
  - **Assessment Boundary:** Assessment does not include distinguishing mass and weight.
- **5-PS1-3. Make observations and measurements to identify materials based on their properties.**
  - **Clarification Statement:** Examples of materials to be identified could include baking soda and other powders, metals, minerals, and liquids. Examples of properties could include color, hardness, reflectivity, electrical conductivity, thermal conductivity, response to magnetic forces, and solubility; density is not intended as an identifiable property.
  - **Assessment Boundary:** Assessment does not include density or distinguishing mass and weight.
- **5-PS1-4. Conduct an investigation to determine whether the mixing of two or more substances results in new substances.**

Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Planning and Carrying Out Investigations ● Make observations and measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon. (5-PS1-3) **Developing and Using Models** ● Use models to describe phenomena. (5-PS1-1)	**PS1.A: Structure and Properties of Matter** ● Measurements of a variety of properties can be used to identify materials. (Boundary: At this grade level, mass and weight are not distinguished, and no attempt is made to define the unseen particles or explain the atomic-scale mechanism of evaporation and condensation.) (5-PS1-3) ● Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means. A model showing that gases are made from matter particles that are too small to see and are moving freely around in space can explain many observations, including the inflation and shape of a balloon and the effects of air on larger particles or objects. (5-PS1-1)	**Scale, Proportion, and Quantity** ● Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume. (5-PS1-3) ● Natural objects exist from the very small to the immensely large. (5-PS1-1)

Enduring Understandings (What are the big ideas?)	**Essential Questions**
Students will understand that: ● Matter changes but never disappears ● Properties of matter may change depending on interaction with other substances	● When matter changes what happens? ● How can one explain the form, properties, and interactions of matter?
Stage 2 – Model Assessments	
Summative Performance Task(s): ● Develop a model with specific criteria. ● Conduct an investigation with specific criteria.	**Formative Evidence:** Through what other evidence will students demonstrate achievement of the desired results? ● (Suggested) 2-4 question comprehension checks ● Teacher observation

• **Audience:** • Peers/ teacher **Criteria:** • Rubric, observation, self reflection	• Class Discussion/ Anecdotal notes • (possible) Mystery Science end-of-mystery assessment • Make observations and measurements to identify given materials based on their properties

Stage 3 – Learning Plan Resources and Activities

Suggested Resources for Planning:

- **Mystery Science**
- **Super Science**
- **NJCTL.org**
- **Scholastic Study Jams Properties of Matter:**
- **Chem4kids - States of Matter**
- **The gooey properties of matter (Scholastic)**
- **Properties of Matter Video Experiment**
- **TeachEngineering.org**

Learning Activities:

- Mystery Science mysteries:
  - **Chemical Magic (Chemical Reactions and Properties of Matter)**
    - **Mystery: Introduction to Chemistry**
      - **Are magic potions real?**
    - **Mystery: Particulate Nature of Matter**
      - **Could you transform something worthless into gold?**
    - **Mystery: Acids, Reactions, and Properties of Matter**
      - **What would happen if you drank a glass of acid?**
    - **Mystery: Chemical Reactions**
      - **What do fireworks, rubber, and silly putty have in common?**
    - **Mystery: Gases and Particulate Natures of Matter**
      - **Why do some things explode?**
- Mixing and combining substances
- Observing and measuring materials based on properties
- “What’s the Matter?” web-quest
- Scholastic: Study Jams (matter, solids, liquids, gases)

Suggested Methods: (The following methods anchor learning with a purpose, mitigating the "why do I need to know this" questions.)

- Phenomena based learning
- Problem Based Learning (PBL)
- Inquiry Based Learning
- Case studies
- Engaging in Argument w/ evidence

Fifth Grade Science
Course Compendium

<u>UNITS OF STUDY</u>*

Unit 1- *Ecosystems: Interactions, Energy and Dynamics*
Unit 2- *Water on Earth*
Unit 3- *Earth Systems*
Unit 4- *Properties of Matter*

<u>INTERDISCIPLINARY CONNECTIONS</u>

ELA Standards:

- RI.5.1. Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.
- RI.5.7.Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.
- RI.5.9. Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.
- W.5.1. Write opinion pieces on topics or texts, supporting a point of view with reasons and information.
- SL.5.5 Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.
- W.5.8 Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources.
- W.5.9. Draw evidence from literary or informational texts to support analysis, reflection, and research.

Math Standards

- MP.2 Reason abstractly and quantitatively.
- MP.4. Model with mathematics.
- MP 5. Use appropriate tools strategically.
- 5.NBT.B.5,6
- 5.G.A.2. Repres. Fluently multiply multi-digit whole numbers using the standard algorithm. 6. Find whole-number quotients of whole numbers with up to four-digit dividends and two digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.ent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.
- MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories

**See individual units for Pacing Guide, NJSLS Standards, Transfer Skills, Enduring Understandings, Essential Questions, Learning Objectives, Key Vocabulary, Skills, Resources, & Assessments*

21st Century Life and Careers

- **CRP2.** Apply appropriate academic and technical skills.
- **CRP4.** Communicate clearly and effectively and with reason.
- **CRP6.** Demonstrate creativity and innovation.
- **CRP11.** Use technology to enhance productivity.
- **9.2.4.A.3** Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.
- **9.2.4.A.4** Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.

Technology

- **8.2.2.B.4** Identify how the ways people live and work has changed because of technology.
- **8.2.2.C.1** Brainstorm ideas on how to solve a problem or build a product.

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<tr>
<td rowspan="3">• WIDA Can Do Descriptors for Kindergarten*
• WIDA Essential Actions Handbook
• FABRIC Paradigm
• Wall Township ESL Grading Protocol

*Use WIDA Can Do Descriptors in coordination with Student Language Portraits (SLPs).

Potential Accommodations for ELLs

• Personal glossary
• Text-to-speech
• Extended time
• Simplified / verbal instructions
• Frequent breaks
• Small group/One to one
• Additional time
• Review of directions</td>
<td rowspan="3">• New Jersey Tiered System of Supports
• National Center on Universal Design for Learning - About UDL
• UDL Checklist
• UDL Key Terms

Students within this class receiving Special Education/Section 504 programming have specific goals and objectives, as well as accommodations and modifications outlined within their Individualized Education Plans (IEP)/504 Plans due to an identified disability and/or diagnosis. In addition to exposure to the general education curriculum, instruction is differentiated based upon the student's needs. The IEP/504 Plan acts as a supplemental curriculum guide inclusive of instructional strategies that support each specific learner.

Potential Accommodations for Special Education

Presentation accommodations:
• Listen to audio recordings instead of reading text</td>
<td>• Knowledge and Skill Standards in Gifted Education for All Teachers
• Pre-K-Grade 12 Gifted Programming Standards
• Gifted Programming Glossary of Terms

Potential Accommodations for Advanced Learners

• Use of high level academic vocabulary/texts
• Problem-based learning
• Pre-assess to condense curriculum
• Interest-based research
• Authentic problem-solving
• Homogeneous grouping opportunities</td>
</tr>
<tr><th>Students with 504 Plans</th></tr>
<tr><td></td></tr>
</table>

**See individual units for Pacing Guide, NJSLS Standards, Transfer Skills, Enduring Understandings, Essential Questions, Learning Objectives, Key Vocabulary, Skills, Resources, & Assessments*

• Student restates information • Extra visual and verbal cues and prompts • Preferential seating • Verbal and visual cues regarding directions and staying on task • Checklists • Immediate feedback	• Pre-teach unknown vocabulary through pictures or videos, and relate to prior knowledge • Work with fewer items per page and/or materials in a larger print size • Use a visual blocker • Use visual presentations of verbal material, such as word webs and visual organizers • Be given a written list of instructions/picture cues **Response accommodations**: • Give responses in a form (oral or written) that's easier for him/her • Dictate answers to a scribe • Capture responses on an audio recorder • Use a spelling dictionary or electronic spell-checker • Use a word processor to give responses in class • Use a calculator or table of "math facts" **Setting accommodations**: • Work or take a test in a different setting, such as a quiet room with few distractions • Sit where he/she learns best (for example, near the teacher) • Take a test in small group setting **Timing accommodations**: • Take more time to complete a task or a test • Have extra time to process oral information and directions • Take frequent breaks, such as after completing a task **Assignment modifications**: • Complete fewer or different homework problems than peers • Shorten assignment • Answer fewer or different test questions • Create alternate projects or assignments	Teachers are responsible for implementing designated services and strategies identified on a student's 504 Plan.
At Risk Learners / Differentiation Strategies		
Alternative Assessments Choice Boards Games and Tournaments Group Investigations Guided Reading Learning Contracts Leveled Rubrics	Independent Research & Projects Multiple Intelligence Options Project-Based Learning Varied Supplemental Activities Varied Journal Prompts or RAFT Writing Tiered Activities/Assignments Tiered Products	Jigsaw Think-Tac-Toe Cubing Activities Exploration by Interest Flexible Grouping Goal-Setting with Students Homework Options

**See individual units for Pacing Guide, NJSLS Standards, Transfer Skills, Enduring Understandings, Essential Questions, Learning Objectives, Key Vocabulary, Skills, Resources, & Assessments*

Literature Circles Multiple Texts Personal Agendas	Graphic Organizers Choice of Books/Activities Mini-Workshops to Reteach or Extend Think-Pair-Share by readiness or interest Use of Collaboration of Various Activities	Open-Ended Activities Use of Reading Buddies Varied Product Choices Stations/Centers Work Alone/Together

**See individual units for Pacing Guide, NJSLS Standards, Transfer Skills, Enduring Understandings, Essential Questions, Learning Objectives, Key Vocabulary, Skills, Resources, & Assessments*