6th Grade Unit 1 - Ecosystems

Content Area:	**Science**
Course(s):	**Science Grade 6**
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NJSLS - Science

SCI.MS-LS1-6	Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.
SCI.MS-LS1-7	Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.
SCI.MS-LS2-1	Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
SCI.MS-LS2-2	Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.
SCI.MS-LS2-3	Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.
SCI.MS-LS2-4	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
SCI.MS-LS2-5	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.
SCI.MS-ETS1-1	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
SCI.MS-ETS1-2	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
SCI.MS-ETS1-3	Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

Science and Engineering Practices

Developing and Using Models

Develop a model to describe unobservable mechanisms. (MS-LS1-7)

Develop a model to describe phenomena. (MS-LS2-3)

Constructing Explanations and Designing Solutions

Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (MS-LS1-6)

Construct an explanation that includes qualitative or quantitative relationships between variables that predict phenomena. (MS-LS2-2)

Analyzing and Interpreting Data

Analyze and interpret data to provide evidence for phenomena. (MS-LS2-1)

Analyze and interpret data to determine similarities and differences in findings. (MS-ETS1-3)

Constructing Explanations and Designing Solutions

Construct an explanation that includes qualitative or quantitative relationships between variables that predict phenomena. (MS-LS2-2)

Engaging in Argument from Evidence

Construct an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for phenomenon or a solution to a problem. (MS-LS2-4)

Evaluate competing design solutions based on jointly developed and agreed-upon design criteria. (MS-LS2-5, MS-ETS1-2)

Asking Questions and Defining Problems

Define a design problem that can be solved through the development of an object, tool, process or system and includes multiple criteria and constraints, including scientific knowledge that may limit possible solutions. (MS-ETS1-1)

Disciplinary Core Ideas

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

Plants, algae (including phytoplankton), and many microorganisms use the energy from light to make sugars (food) from carbon dioxide from the atmosphere and water through the process of photosynthesis, which also releases oxygen. These sugars can be used immediately or stored for growth or later use. (MS-LS1-6)

Within individual organisms, food moves through a series of chemical reactions in which it is broken down and rearranged to form new molecules, to support growth, or to release energy. (MS-LS1-7)

LS2.A: Interdependent Relationships in Ecosystems

Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors. (MS-LS2-1)

In any ecosystem, organisms and populations with similar requirements for food, water, oxygen, or other resources may compete with each other for limited resources, access to which consequently constrains their growth and reproduction. (MS-LS2-1)

Growth of organisms and population increases are limited by access to resources. (MS-LS2-1)

Similarly, predatory interactions may reduce the number of organisms or eliminate whole populations of organisms. Mutually beneficial interactions, in contrast, may become so interdependent that each organism requires the other for survival. Although the species involved in these competitive, predatory, and mutually beneficial interactions vary across ecosystems, the patterns of interactions of organisms with their environments, both living and nonliving, are shared. (MS-LS2-2)

LS2.B: Cycle of Matter and Energy Transfer in Ecosystems

Food webs are models that demonstrate how matter and energy is transferred between producers, consumers, and decomposers as the three groups interact within an ecosystem. Transfers of matter into and out of the physical environment occur at every level. Decomposers recycle nutrients from dead plant or animal matter back to the soil in terrestrial environments or to the water in aquatic environments. The atoms that make up the organisms in an ecosystem are cycled repeatedly between the living and nonliving parts of the ecosystem. (MS-LS2-3)

LS2.C: Ecosystem Dynamics, Functioning, and Resilience

Ecosystems are dynamic in nature; their characteristics can vary over time. Disruptions to any physical or biological component of an ecosystem can lead to shifts in all its populations. (MS-LS2-4)

Biodiversity describes the variety of species found in Earth’s terrestrial and oceanic ecosystems.The completeness or integrity of an ecosystem's biodiversity is often used as a measure of its health. (MS-LS2-5)

ETS1.A: Defining and Delimiting Engineering Problems

The more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that are likely to limit possible solutions. (MS-ETS1-1)

ETS1.B: Developing Possible Solutions

There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem. (MS-ETS1-2, MS-ETS1-3)

Sometimes parts of different solutions can be combined to create a solution that is better than any of its predecessors. (MS-ETS1-3)

ETS1.C: Optimizing the Design Solution

Although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process—that is, some of those characteristics may be incorporated into the new design. (MS-ETS1-3)

Crosscutting Concepts

Energy and Matter

Within a natural system, the transfer of energy drives the motion and/or cycling of matter. (MS-LS1-6)

Matter is conserved because atoms are conserved in physical and chemical processes. (MS-LS1-7)

The transfer of energy can be tracked as energy flows through a natural system. (MS-LS2-3)

Cause and Effect

Cause and effect relationships may be used to predict phenomena in natural or designed systems. (MS-LS2-1)

Patterns

Patterns can be used to identify cause and effect relationships. (MS-LS2-2)

Stability and Change

Small changes in one part of a system might cause large changes in another part. (MS-LS2-4, MS-LS2-5)

Scientific Knowledge is Based on Empirical Evidence

Science knowledge is based upon logical connections between evidence and explanations. (MS-LS1-6)

Science disciplines share common rules of obtaining and evaluating empirical evidence. (MS-LS2-4)

Influence of Science, Engineering, and Technology on Society and the Natural World

The use of technologies and any limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions. Thus, technology use varies from region to region and over time. (MS-LS2-5, MS-ETS1-1)

All human activity draws on natural resources and has both short and long-term consequences, positive as well as negative, for the health of people and the natural environment. (MS-ETS1-1)

Scientific Knowledge Assumes an Order and Consistency in Natural Systems

Science assumes that objects and events in natural systems occur in consistent patterns that are understandable through measurement and observation. (MS-LS2-3)

Science Addresses Questions About the Natural and Material World

Scientific knowledge can describe the consequences of actions but does not necessarily prescribe the decisions that society takes. (MS-LS2-5)

Rationale and Transfer Goals

In this unit, students explore the processes of photosynthesis and cellular respiration, and relate these processes to the movement of matter and energy through organisms and the environment. Students explore how organisms interact and change in an ecosystem, and come to understand how populations are affected by the availability of resources in their ecosystem. Students will also understand what biodiversity in an ecosystem is and how it can be protected. They will design a solution and maintain the biodiversity in a coral reef ecosystem. They construct explanations for the interactions in ecosystems and the scientific, economic, political, and social justifications used in making decisions about maintaining biodiversity in ecosystems. The crosscutting concepts of matter and energy, systems and system models, patterns, and cause and effect provide a framework for understanding the disciplinary core ideas. Students demonstrate grade-appropriate proficiency in asking questions, analyzing and interpreting data, developing and using models, constructing arguments, and designing solutions. Students use these science and engineering practices to demonstrate understanding of the disciplinary core ideas.

Enduring Understandings

Photosynthesis has a role in the cycling of matter and flow of energy in and out of organisms.

Organisms and populations of organisms are dependent on their environmental interactions with other living and non living things.

Disruptions to any physical or biological component of an ecosystem can lead to shifts in all the ecosystem's populations.

Biodiversity describes the variety of species found in Earth's terrestrial and oceanic ecosystems.

The completeness, or integrity, of an ecosystem's biodiversity is often used as a measure of its health.

Changes in biodiversity can influence humans' resources, such as food, energy, and medicines.

Essential Questions

What is the role of photosynthesis in the cycling of matter and flow of energy into and out of an organism?

How is food rearranged through chemical reactions to form new molecules that support growth and/or release energy as this matter moves through an organism?

How do changes in the availability of matter and energy affect populations in an ecosystem?

How do relationships among organisms, in an ecosystem, affect populations?

How can you explain the stability of an ecosystem by tracing the flow of matter and energy?

How can a single change to an ecosystem disrupt the whole system?

What limits the number and variety of living things in an ecosystem?

How do matter and energy move through organisms and the environment?

Why is biodiversity important and how can it be protected?

Content - What will students know?

- Photosynthesis has a role in the cycling of matter and flow of energy into and out of organisms.
- The flow of energy and cycling of matter can be traced.
- The chemical reaction by which plants produce complex food molecules (sugars) requires an energy input (i.e., from sunlight) to occur. In this reaction, carbon dioxide and water combine to form carbon based organic molecules and release oxygen.
- Plants, algae (including phytoplankton), and many microorganisms use the energy from light to make sugars (food) from carbon dioxide from the atmosphere and water through the process of

photosynthesis, which also releases oxygen.

- Sugars produced by plants can be used immediately or stored for growth or later use.
- Within a natural system, the transfer of energy drives the motion and/or cycling of matter.
- Food is rearranged through chemical reactions, forming new molecules that support growth.
- Food is rearranged through chemical reactions, forming new molecules that release energy as this matter moves through an organism.
- Molecules are broken apart and put back together to form new substances, and in this process, energy is released.
- Cellular respiration in plants and animals involves chemical reactions with oxygen that release stored energy.
- In cellular respiration, complex molecules containing carbon react with oxygen to produce carbon dioxide and other materials.
- Within individual organisms, food moves through a series of chemical reactions in which it is broken down and rearranged to form new molecules to support growth or to release energy.
- Matter is conserved during cellular respiration because atoms are conserved in physical and chemical processes.
- Organisms and populations of organisms are dependent on their environmental interactions with other living things.
- Organisms and populations of organisms are dependent on their environmental interactions with nonliving factors.
- In any ecosystem, organisms and populations with similar requirements for food, water, oxygen, or other resources may compete with others for limited resources.
- Access to food, water, oxygen, or other resources constrain organisms' growth and reproduction.
- Predatory interactions may reduce the number of organisms or eliminate whole populations of organisms.
- Mutually beneficial interactions may become so interdependent that each organism requires the other for survival.
- The patterns of interactions of organisms with their environment, both its living and nonliving components, are shared.
- Interactions within ecosystems have patterns that can be used to identify cause-and-effect relationships.
- Patterns of interactions among organisms across multiple ecosystems can be predicted.
- Patterns of interactions can be used to make predictions about the relationships among and between organisms and abiotic components of ecosystems.

- Food webs are models that demonstrate how matter and energy are transferred among producers, consumers, and decomposers as the three groups interact within an ecosystem.
- Transfers of matter into and out of the physical environment occur at every level.
- Decomposers recycle nutrients from dead plant or animal matter back to the soil in terrestrial environments.
- Decomposers recycle nutrients from dead plant or animal matter back to the water in aquatic environments.
- The atoms that make up the organisms in an ecosystem are cycled repeatedly between the living and nonliving parts of the ecosystem.
- The transfer of energy can be tracked as energy flows through an ecosystem.
- Science assumes that objects and events in ecosystems occur in consistent patterns that are understandable through measurement and observation.
- Ecosystems are dynamic in nature.
- The characteristics of ecosystems can vary over time.
- Disruptions to any physical or biological component of an ecosystem can lead to shifts in all the ecosystem's populations.
- Small changes in one part of an ecosystem might cause large changes in another part.
- Patterns in data about ecosystems can be recognized and used to make warranted inferences about changes in populations.
- Evaluating empirical evidence can be used to support arguments about changes to ecosystems.
- Biodiversity describes the variety of species found in Earth's terrestrial and oceanic ecosystems.
- The completeness, or integrity, of an ecosystem's biodiversity is often used as a measure of its health.
- Changes in biodiversity can influence humans' resources, such as food, energy, and medicines.
- Changes in biodiversity can influence ecosystem services that humans rely on.
- There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem.
- A solution needs to be tested and then modified on the basis of the test results, in order to improve it.
- Models of all kinds are important for testing solutions.
- The iterative process of testing the most promising solutions and modifying what is proposed on the basis of the test results leads to greater refinement and ultimately to an optimal solution.
- Small changes in one part of a system might cause large changes in another part.

- Scientific knowledge can describe the consequences of actions but does not necessarily prescribe the decisions that society takes.

Skills - What will students be able to do?

- Construct a scientific explanation for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms based on valid and reliable evidence obtained from sources (including the students' own experiments).
- Construct a scientific explanation for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms based on the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.
- Develop and use a model to describe how food is rearranged through chemical reactions.
- Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
- Use cause-and-effect relationships to predict the effect of resource availability on organisms and populations in natural systems.
- Construct an explanation about interactions within ecosystems.
- Include qualitative or quantitative relationships between variables as part of explanations about interactions within ecosystems.
- Make predictions about the impact within and across ecosystems of competitive, predatory, or mutually beneficial relationships as abiotic (e.g., floods, habitat loss) or biotic (e.g., predation) components change.
- Develop a model to describe the cycling of matter among living and nonliving parts of an ecosystem.
- Develop a model to describe the flow of energy among living and nonliving parts of the ecosystem. Track the transfer of energy as energy flows through an ecosystem.
- Observe and measure patterns of objects and events in ecosystems.
- Construct an argument to support or refute an explanation for the changes to populations in an ecosystem caused by disruptions to a physical or biological component of that ecosystem. Empirical evidence and scientific reasoning must support the argument.
- Use scientific rules for obtaining and evaluating empirical evidence.
- Recognize patterns in data and make warranted inferences about changes in populations.
- Evaluate empirical evidence supporting arguments about changes to ecosystems.
- Construct a convincing argument that supports or refutes claims for solutions about the natural and

designed world(s).

- Develop a model to generate data to test ideas about designed systems, including those representing inputs and outputs.
- Create design criteria for design solutions for maintaining biodiversity and ecosystem services.
- Evaluate competing design solutions based on jointly developed and agreed upon design criteria.

Activities - How will we teach the content and skills?

- Inspire Life Science Unit 1 Module 1: Lesson 1 Photosynthesis and Cellular Respiration
- Inspire Life Science Unit 1 Module 1: Lesson 2 Flow of Energy
- Inspire Life Science Unit 1 Module 1: Lesson 3 Cycling of Matter
- Inspire Life Science Unit 1 Module 2: Lesson 1 Resources in Ecosystems
- Inspire Life Science Unit 1 Module 2: Lesson 2 Interactions Within Ecosystems
- Inspire Life Science Unit 1 Module 2: Lesson 3 Changing Ecosystems
- Inspire Life Science Unit 1 Module 3: Lesson 1 Benefits of Biodiversity
- Inspire Life Science Unit 1 Module 2: Lesson 2 Maintaining Biodiversity

Evidence/Assessments - How will we know what students have learned?

- Inspire Science Labs
- Inspire Science STEM Module Projects
- Inspire Life Science Unit 1 Module 1 Assessment
- Inspire Life Science Unit 1 Module 2 Assessment
- Inspire Life Science Unit 1 Module 3 Assessment
- Daily Warm Ups
- Daily Exit Tickets
- Grade 6 Unit 1 Benchmark Assessment

Spiraling for Mastery

Content or Skill for this Unit	Spiral Focus from Previous Unit	Instructional Activity
• The chemical reaction by which plants produce complex food molecules (sugars) requires an energy input (i.e., from sunlight) to occur. In this reaction, carbon dioxide and water combine to form carbon based organic molecules and release oxygen. • Decomposers recycle nutrients from dead plant or animal matter back to the soil in terrestrial environments. • Decomposers recycle nutrients from dead plant or animal matter back to the water in aquatic environments. • Interactions within ecosystems have patterns that can be used to identify cause-and-effect relationships. • Patterns of interactions among organisms across multiple ecosystems can be predicted. • Patterns of interactions can be used to make predictions about the relationships among and between organisms and abiotic components of ecosystems. • Food webs are models that demonstrate how matter and energy are transferred	By the end of Grade 5, students understand that: 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). 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. 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	5-LS2-1 Activities 2-LS2-1 Activities 2-LS2-2 Activities

among producers, consumers, and decomposers as the three groups interact within an ecosystem.	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. 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. Populations live in a variety of habitats, and change in those habitats affects the organisms living there. Adult plants and animals can have young. In many kinds of animals, parents and the offspring themselves engage in behaviors that help the offspring to survive. When the environment changes in	

	ways that affect a place's physical characteristics, temperature, or available resources, some organisms survive and reproduce, some move to new locations, some move into the transformed environment, and some die. Research on a problem should be carried out before work to design a solution begins. Testing a solution involves investigating how well it performs under a range of likely conditions. At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs. Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved. Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints.	

Key Resources

Mcgraw Hill Inspire Science

Explorelearning.com (Gizmos)

Plant Growth and Gas Exchange Unit

Habitable Planet Population Simulator

Modeling Marine Food Webs and Human Impact

Florida's Everglades: The River of Grass

Food Chains, Food Webs, Energy Pyramids

Food Chain Gizmo

Cell Energy Cycle Gizmo

Ecosystems STEM Case Gizmo

Inspire STEM Module Project:

*Sun Block

*The Fox and The Hare

*Good "greef"! The corals are dying!

*This lesson allows students to investigate what would happen to plants and animals if their environment changed

http://www.pbslearningmedia.org/resource/tdc02.sci.life.oate.lp_changeenviron/effects-of-environmental-change/

*This activity provides students with a few videos and an informal assessment to go over ecological relationships.

http://nationalgeographic.org/activity/ecological-relationships/

21st Century Life and Careers

WRK.9.2.8.CAP.8	Compare education and training requirements, income potential, and primary duties of at least two jobs of interest.

Career Readiness, Life Literacies, & Key Skills

TECH.9.4.8.CI.1	Assess data gathered on varying perspectives on causes of climate change (e.g., cross-cultural, gender-specific, generational), and determine how the data can best be used to design multiple potential solutions (e.g., RI.7.9, 6.SP.B.5, 7.1.NH.IPERS.6, 8.2.8.ETW.4).
TECH.9.4.8.CT.1	Evaluate diverse solutions proposed by a variety of individuals, organizations, and/or agencies to a local or global problem, such as climate change, and use critical thinking skills to predict which one(s) are likely to be effective (e.g., MS-ETS1-2).
TECH.9.4.8.CT.2	Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MS-ETS1-4, 6.1.8.CivicsDP.1).
TECH.9.4.8.CT.3	Compare past problem-solving solutions to local, national, or global issues and analyze the factors that led to a positive or negative outcome.
TECH.9.4.8.TL.1	Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data-based decision-making.
TECH.9.4.8.TL.2	Gather data and digitally represent information to communicate a real-world problem (e.g., MS-ESS3-4, 6.1.8.EconET.1, 6.1.8.CivicsPR.4).
TECH.9.4.8.TL.3	Select appropriate tools to organize and present information digitally.
TECH.9.4.8.TL.4	Synthesize and publish information about a local or global issue or event (e.g., MSLS4-5, 6.1.8.CivicsPI.3).
TECH.9.4.8.IML.3	Create a digital visualization that effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping (e.g., 6.SP.B.4, 7.SP.B.8b).
TECH.9.4.8.IML.4	Ask insightful questions to organize different types of data and create meaningful visualizations.
TECH.9.4.8.IML.5	Analyze and interpret local or public data sets to summarize and effectively communicate the data.

Interdisciplinary Connections/Companion Standards

NJSLS ELA

RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts. (MS-LS1-6, MS-LS2-1, MS-LS2-2, MS-LS2-4, MS-ETS1-1, MS-ETS1-2, MS-ETS1-3)

RST.6-8.2 Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions. (MS-LS1-6)

RST.6-8.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table). (MS-LS2-1, MS-ETS1-3)

RST.6-8.8 Distinguish among facts, reasoned judgment based on research findings, and speculation in a text. (MS-LS2-5)

RST.6-8.9 Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic. (MS-ETS1-2, MS-ETS1-3)

RI.8.8 Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims. (MS-LS-4, MS-LS2-5)

WHST.6-8.1 Write arguments focused on discipline-specific content. (MS-LS2-4)

WHST.6-8.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. (MS-LS1-6, MS-LS2-2)

WHST.6-8.7 Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration. (MS-ETS1-2)

WHST.6-8.8 Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation. (MS-ETS1-1)

WHST.6-8.9 Draw evidence from informational texts to support analysis, reflection, and research. (MS-LS1-6, MS-LS2-2, MS-LS2-4, MS-ETS1-2)

SL.8.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others’ ideas and expressing their own clearly. (MS-LS2-2)

SL.8.4 Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation. (MS-LS2-2)

SL.8.5 Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest. (MS-LS1-7, MS-LS2-3)

NJSLS Math

MP.2 Reason abstractly and quantitatively. (MS-ETS1-1, MS-ETS1-2, MS-ETS1-3)

MP.4 Model with mathematics. (MS-LS2-5)

6.RP.A.3 Use ratio and rate reasoning to solve real-world and mathematical problems. (MS-LS2-5)

6.EE.C.9 Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. (MS-LS1-1), (MS-LS1-6, MS-LS2-3)

6.SP.B.5 Summarize numerical data sets in relation to their context. (MS-LS2-2)

7.EE.3 Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. (MS-ETS1-1, MS-ETS1-2, MS-ETS1-3)