Department of Curriculum & Instruction

Science

Curriculum Guide

Grade 6

Montclair Public Schools

Approved by the Montclair Board of Education September 2011/
Revised: September 2013

Introduction

The Montclair Public Schools believes in celebrating the rich history of our magnet school system while ensuring consistent, high quality instruction for all learners. The Grade 6 Science curriculum is built upon this belief by incorporating the Next Generation Science Standards within the framework of the Crosscutting Concepts and the Science & Engineering Practices. This approach provides all students with equitable access to the same learning goals while allowing teachers the flexibility to adapt to the needs of their learners.

The standards below are overarching. While these standards may not appear specifically in any unit, they are the collective goals of all units.

By the end of Grade 6, Science students in the Montclair Public Schools:

MS-PS1-2	Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.
MS-PS1-4	Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.
MS-PS3-4	Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.
MS-LS1-1	Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.
MS-LS1-2	Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.
MS-LS1-3	Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.
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.
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.
MS-LS1-8	Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.
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.
MS-LS2-2	Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.
MS-LS2-3	Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.
MS-LS2-4	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
MS-LS2-5	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.
MS-ESS3-2	Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
MS-ESS3-3	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
MS-ESS3-4	Construct an argument supported by evidence for how increases in human population and per-capital consumption of natural resources impact Earth's systems.

The Science & Engineering Practices:
Standards and performance expectations that are aligned to the framework must take into account that students cannot fully understand scientific and engineering ideas without engaging in the practices of inquiry and the discourses by which such ideas are developed and refined. At the same time, they cannot learn or show competence in practices except in the context of specific content. (NRC Framework, 2012, p. 218)

We use the term "practices" instead of a term such as "skills" to emphasize that engaging in scientific investigation requires not only skill but also knowledge that is specific to each practice. (NRC Framework, 2012, p. 30)

SP1.	Asking questions (for science) and defining problems (for engineering)
SP2.	Developing and using models
SP3.	Planning and carrying out investigations
SP4.	Analyzing and interpreting data
SP5.	Using mathematics and computational thinking
SP6.	Constructing explanations (for science) and designing solutions (for engineering)
SP7.	Engaging in argument from evidence
SP8.	Obtaining, evaluating, and communicating information

The Engineering Design Standards

At the high school level students are expected to engage with major global issues at the interface of science, technology, society and the environment, and to bring to bear the kinds of analytical and strategic thinking that prior training and increased maturity make possible. As in prior levels, these capabilities can be thought of in three stages—defining the problem, developing possible solutions, and improving designs.

HS-ETS1-1	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
HS-ETS1-2	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
HS-ETS1-3	Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.
HS-ETS1-4	Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.

Scope and Sequence

Marking Period	Areas of Focus
1	The Scientific Method and Measurement
2	Matter and Energy
3	Biological Structure & Function
4	Ecology

Montclair Public Schools Instructional Unit

Content:	Science			**Grade:**	6
Unit #:	1	**Unit Title:**	The Scientific Method and Measurement	**Pacing:**	Marking Period 1

OVERVIEW

Students should be able to develop a problem based on an observation they have made, construct a hypothesis related to said problem, design a procedure testing the hypothesis they constructed, collect data by following their procedure, analyze the data they collected, and come to a conclusion based on this data after completing material related to this unit.
ELA Lexile® Levels: 925L - 1070L

BIG IDEAS

- A scientific problem takes the form of a question that you develop based on knowledge you obtain, an observation you make, or an experience you have.
- A hypothesis is a response to a scientific problem that is based on your knowledge base or experience.
- A scientific procedure is a set of instructions that you can follow to test your hypothesis. Multiple trials and a control should be a part of a procedure.
- Data obtained through experimentation should be recorded in a way that is clear and understandable to anyone wishing to review the results of an experiment.
- An analysis of data collected during an experiment should be based on the data that was obtained and should include a scrutiny of possible sources of experimental error or factors that may have influenced the data.
- A conclusion should be based on data collected during an experiment.
- Data related to, but not limited to, time, temperature, dimension, mass, and volume needs to be measured correctly using the appropriate tools.

ESSENTIAL QUESTIONS

- How can I answer a question I have about what I know or have observed?
- How can I measure phenomena?

TARGET STANDARDS

Standard	NGSS	SLO	Student Learning Objectives	Depth of Knowledge
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.**	1	Develop a scientific problem based on an observation or experience that takes the form of a question that can be explored through experimentation.	3
		2	Construct a hypothesis for a scientific problem that is composed of a response to the question posed in the problem and a rationale for this response that is based on prior knowledge or experience.	4

		3	Develop a procedure to test a hypothesis that is realistic, understandable, and well organized.	4
		4	Design a clear and labeled data table that can be used to record all of the data that should be collected according to a procedure.	3
MS-ETS1-2	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.	5	Compare differing hypotheses and procedures between individuals and groups working with the same problem and evaluate which are most relevant and well written.	3
		6	Design and construct devices that all fit a set of similar criteria.	3
		7	Measure the same factor using student-designed devices for the purposes of design analysis and comparison.	2
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.**	8	Analyze the data collected during an experiment with the purpose of answering the question posed in a scientific problem.	4
		9	Determine factors that may have influenced data collected during an experiment and identify possible sources of experimental error.	3
		10	Revise a procedure based on experimental error.	2
		11	Develop a conclusion that relates to an experimental problem that is based on data collected during an experiment and support this conclusion using specific data.	4
MS-ETS1-4	**Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.**	12	Design multiple trials into procedures.	2
		13	Design an experimental control into procedures.	4
RST.6-8.1	Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.	14	**Conduct** research to support inferences made regarding topics in this unit.	3

RST.6-8.3	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.	15	**Follow** a multi-step procedure to collect required data.	1
		16	**Compose** a multi-step procedure to collect data or perform a task.	4
RST.6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.	17	**Interpret** definitions of key vocabulary so they are meaningful in context.	2
		18	**Use** symbols or vocabulary when participating in discussions about or writing about topics related to the unit.	4
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).	19	**Construct** and label diagrams and tables.	4
		20	**Describe** the process used to demonstrate a concept.	3
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.	21	**Analyze** the similarities and differences between information or data from various sources in context.	4
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.	22	**Develop** and **conduct** an experiment or research project that relies on information gathered prior to designed data collection.	4

Assessments

Common labs, or a lab similar to the common lab, should be offered to the students at some point during the marking period. The purpose of these labs is to offer a common experience to all middle school students in the district. You may also use student scores for these labs to evaluate current levels of class and individual comprehension and to generate data for your SGOs.
"**Measuring Matter and Energy Activity Centers" -** You should allot one week of class time towards the start of the unit (marking period) to complete "Measuring Matter and Energy Activity Centers" with your students. Assessment is rubric-based.
"The Scientific Method" lab - You should allot one week of class time near the end of the unit (marking period) to complete "The Scientific Method" with your students. Assessment is rubric-based.

The Assessment of Content Comprehension (ACC) is a topic-specific assessment Composed of multiple choice and open-ended questions. You may choose to offer this assessment to students three times throughout the unit (marking period). You can determine how much time students way have to complete this assessment and when, or if, you will offer this assessment to your students. **This assessment is optional**. You may also use student scores for these assessments to evaluate current levels of class and individual comprehension and to generate data for your SGOs.

Montclair Public Schools Instructional Unit					
Content:	Science			**Grade:**	6
Unit #:	2	**Unit Title:**	Matter and Energy	**Pacing:**	Marking Period 2

OVERVIEW

Students should be able to describe substances according to their physical properties, determine whether a change is physical or chemical, and create models that describe molecular arrangement and motion in a substance based on the amount of thermal energy in a system after completing material related to this unit.
ELA Lexile® Levels: 925L - 1070L

BIG IDEAS

- Each pure substance has characteristic physical and chemical properties (for any bulk quantity under given conditions) that can be used to identify it.
- Gases and liquids are made of molecules or inert atoms that are moving about relative to each other.
- In a liquid, the molecules are constantly in contact with others; in a gas, they are widely spaced except when they happen to collide. In a solid, atoms are closely spaced and may vibrate in position but do not change relative locations.
- The changes of state that occur with variations in temperature or pressure can be described and predicted using these models of matter.

ESSENTIAL QUESTIONS

- How can I identify an unknown substance based on data I can collect through research or process?
- How can I differentiate between solids, liquids, and gasses through what I can observe for myself?
- How does thermal energy affect atoms or molecules in a sample?

TARGET STANDARDS

Standard	NGSS	SLO	Student Learning Objectives	Depth of Knowledge
MS-PS1-2	**Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.**	1	Use mathematics and computational thinking to calculate the volume, mass, and density of various objects.	2
		2	Use the appropriate tools to measure the physical properties of a substance.	4
		3	Analyze and interpret data based on these properties: density, melting point, boiling point, solubility, flammability	4
		4	Design an investigation to identify unknown substances.	4

		5	Describe the differences between chemical and physical changes.	2
		6	Evaluate data to determine if a physical or chemical change or reaction has occurred.	3
MS-PS1-4	**Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.**	7	Describe and model molecular arrangement in a liquid, solid, and a gas.	3
		8	Develop a model that predicts and describes changes in particle motion, temperature, and state when thermal energy is added or removed to various substances.	4
MS-PS3-4	Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.	9	Design an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the resulting change in temperature of the sample.	4
RST.6-8.1	**Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.**	10	**Conduct** research to support inferences made regarding topics in this unit.	3
RST.6-8.3	**Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.**	11	**Follow** a multi-step procedure to collect required data.	2
		12	**Compose** a multi-step procedure to collect data or perform a task.	4
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).**	13	**Construct** and label diagrams and tables.	4
		14	**Describe** the process used to demonstrate a concept.	3
WHST.6-8.1	Write arguments focused on discipline content.	15	**Develop** and present arguments using evidence to support claims.	3
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.**	16	**Develop** and **conduct** an experiment or research project that relies on information gathered prior to designed data collection.	4
WHST.6-8.8	**Gather relevant information from multiple print and digital sources; assess the credibility of each source; and quote or**	17	**Determine** whether or not information from any source is veracious or opinionated.	2

	paraphrase the data and conclusions of others while avoiding plagiarism and providing basic bibliographic information for sources.	18	**Cite** all sources using proper MLA format.	1
SL.8.5	Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.	19	**Present** a summary of the results of research, a thesis, or knowledge-based opinion using graphs, illustrations, videos, or presentation software.	2

Assessments
Common labs, or a lab similar to the common lab, should be offered to the students at some point during the marking period. The purpose of this lab is to offer a common experience to all middle school students in the district. You may also use student scores for these labs to evaluate current levels of class and individual comprehension and to generate data for your SGO's. **"Fusion!...maybe" lab -** You should allot two days of class time at any point during the unit (marking period) to complete "FUSION!...maybe" with your students. Assessment is rubric-based. **"Canned Heat" lab -** You should allot one week of class time at any point during the unit (marking period) to complete "Canned Heat" lab with your students. Assessment is rubric-based. The Assessment of Content Comprehension (ACC) is a topic-specific assessment Composed of multiple choice and open-ended questions. You may choose to offer this assessment to students three times throughout the unit (marking period). You can determine how much time students way have to complete this assessment and when, or if, you will offer this assessment to your students. **This assessment is optional**. You may also use student scores for these assessments to evaluate current levels of class and individual comprehension and to generate data for your SGO's.

Montclair Public Schools Instructional Unit

Content:	Science			**Grade:**	6
Unit #:	3	**Unit Title:**	Biological Structure & Function	**Pacing:**	Marking Period 3

OVERVIEW

Students should be able to describe the relationship between structure and function in unicellular and multicellular organisms, use a microscope to examine specimens, and describe photosynthesis and the cycling of materials in a biological system after completing material related to this unit.

ELA Lexile® Levels: 925L - 1070L

BIG IDEAS

- All living things are made up of cells, which is the smallest unit that can be said to be alive. An organism may consist of one single cell (unicellular) or many different numbers and types of cells (multicellular).
- Within cells, special structures are responsible for particular functions.
- In multicellular organisms, the body is a system of multiple interacting subsystems. These subsystems are groups of cells that work together to form tissues and organs that are specialized for particular body functions.
- 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.

ESSENTIAL QUESTIONS

- What is the fundamental unit of life?
- How do the structures found in uni- and multicellular organisms function?
- What is photosynthesis? Why is photosynthesis important to producers and consumers?

TARGET STANDARDS

Standard	NGSS	SLO	Student Learning Objectives	Depth of Knowledge
MS-LS1-1	**Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.**	1	Investigate cell theory and engage in argument from evidence to show that all living things are made up of cells	3
		2	Differentiate between living and non-living things.	2
		3	Describe the requirements for cells to live.	3

		4	Compare and contrast single-celled and multicellular organisms according to organization, growth and development, response to stimuli, and reproduction.	4
		5	Investigate microorganisms and observe and identify structures using a microscope.	3
MS-LS1-2	Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.	6	Research and compile information about cell structures/organelles, their functions, photosynthesis, and cellular respiration. Create a model comparing the structures to an everyday functioning facility like a school.	4
MS-LS1-3	**Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.**	7	Compare and contrast specialized/differentiated cells and tissues according to their structures and functions and verify that organisms have interacting subsystems made up of specialized structures.	3
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.**	8	Differentiate between plant and animal cells.	2
		9	Explain why cells need energy, summarize how energy is captured and stored, and describe how plants and animals get energy.	3
		10	Design an investigation to prove the recycling of matter and predict the flow of energy in producers.	4
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.	11	Compare and contrast processes of photosynthesis and cellular respiration involving the relevant organelles, organs, and organ systems.	3
MS-LS1-8	Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.	12	Investigate the nervous system and the senses.	2
		13	Verify that organisms have interacting subsystems made up of specialized cells	3
RST.6-8.1	**Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. (MS-LS1-1)**	14	Cite specific experimental data to **support** analysis of science and technical information gathered during an experiment.	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)	15	**Describe** the content of a reading selection according to the main idea and content.	3

RST.6-8.3	**Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.**	16	**Follow** a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks to produce results or collect data that is within the expectations of the teacher.	2
		17	**Construct** a multistep procedure that can be followed by others to replicate a process resulting in the collection of data and measurements or the assembly of a device.	4
RI.6.8	Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not.	18	**Evaluate** the authenticity of information found in text using an existing knowledge base and other text or online resources.	4
WHST.6-8.1	**Write arguments focused on discipline content.**	19	**Construct** an argument based on an existing knowledge base.	3
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.	20	**Compose** informational text after conducting academic research to elucidate that topic.	3
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.**	21	**Conduct** academic research prior to the design of a scientific problem or device with the aim of improving the problem or device.	4
WHST.6-8.8	Gather relevant information from multiple print and digital sources; assess the credibility of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and providing basic bibliographic information for sources. (MS-LS1-8)	22	**Determine** whether or not information from any source is veracious or opinionated.	2
		23	**Cite** all sources using proper MLA format.	1
WHST.6-8.9	Draw evidence from informational texts to support analysis, reflection, and research. (MS-LS1-6)	24	**Support** a thesis pertaining to a relevant topic using informational texts.	4
SL.8.5	Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points. (MS-LS31-2, MS-LS1-7)	25	**Present** a summary of the results of research, a thesis, or knowledge-based opinion using graphs, illustrations, videos, or presentation software.	2

Assessments
Common labs, or a lab similar to the common lab, should be offered to the students at some point during the marking period. The purpose of this lab is to offer a common experience to all middle school students in the district. You may also use student scores for these labs to evaluate current levels of class and individual comprehension and to generate data for your SGOs. **"Cell Comparison" lab -** You should allot two days of class time at any point during the unit (marking period) to complete "Cell Comparison" with your students. Assessment is rubric-based. **"School of Cell" project -** You should allot three days of class time at any point during the unit (marking period) to complete "School of Cell" project with your students. Assessment is rubric-based. The Assessment of Content Comprehension (ACC) is a topic-specific assessment Composed of multiple choice and open-ended questions. You may choose to offer this assessment to students three times throughout the unit (marking period). You can determine how much time students way have to complete this assessment and when, or if, you will offer this assessment to your students. **This assessment is optional**. You may also use student scores for these assessments to evaluate current levels of class and individual comprehension and to generate data for your SGO's.

Montclair Public Schools Instructional Unit

Content:	Science			**Grade:**	6
Unit #:	4	**Unit Title:**	Natural Selection & Ecology	**Pacing:**	Marking Period 4

OVERVIEW

Students will be able to understand how all living and nonliving things are connected in an ecosystem. They will be able to trace the path of energy through the tropic levels in a particular ecosystem, and describe how that energy changes as it moves through the different factors in an environment. Students will have to identify which of these factors restricts and supports a population in a habitat. Students will also investigate the impact of human activities on ecosystems, and identify patterns in data. Students will then use this data to predict future impacts on ecosystems.
ELA Lexile® Levels: 925L - 1070L

BIG IDEAS

- Matter and energy together support life within an environment.
- Living things in a particular ecosystem interact with other organisms and abiotic factors in that ecosystem,
- Humans and human population growth affect the environment

ESSENTIAL QUESTIONS

- What factors limit population growth?
- How do changes in an ecosystem affect the entire ecosystem?
- How does energy flow through an ecosystem?
- What are producers, consumers, and decomposers? What roles do they play within their environment?
- What affect do humans have on the biodiversity of an ecosystem?

TARGET STANDARDS

Standard	NGSS	SLO	Student Learning Objectives	Depth of Knowledge
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.**	1	**Define limiting factors and give examples.**	2
		2	**Prove the importance of competition between species, and how it consequently constrains growth and reproduction.**	**4**
		3	**Analyze and interpret data to determine the impact of limited resources on a population.**	**4**
MS-LS2-2	Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.	4	Compare competitive, predatory, and mutually beneficial interactions between organisms in an ecosystem.	**3**

MS-LS2-3	**Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.**	**5**	**Differentiate abiotic and biotic factors in an ecosystem.**	2
		6	**Design a model illustrating the cycling of matter through biotic and abiotic components of an ecosystem.**	**3**
MS-LS2-4	**Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.**	**7**	**Summarize and interpret differences in ecosystems. Relate them to abiotic factors such as temperature, light, and water sources.**	**4**
		8	**Predict the changes that will occur in a food web when a population of a certain species is removed.**	**4**
		9	Explain how invasive species can affect the biodiversity of a habitat.	2
MS-LS2-5	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.	10	Design a plan to manage uses of the Earth's resources in a way that will maintain the biodiversity of a habitat.	2
MS-ESS3-2	Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.	11	Graph the frequency of natural disasters in a particular region.	3
		12	Analyze the history of natural disasters in a particular region, and design a plan to reduce damage from these events in the future.	4
MS-ESS3-3	**Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.**	13	**List ways in which humans alter the environment, and explain the impact of each.**	3
		14	**Define a problem, then plan and carry out investigations around how human activity impacts an ecosystem.**	4
MS-ESS3-4	Construct an argument supported by evidence for how increases in human population and per-capital consumption of natural resources impact Earth's systems.	**15**	**Define renewable and nonrenewable resources.**	2
		16	**Identify four ways to conserve fossil fuel, minerals, and plants.**	3
		17	**Predict how increases in the human population will impact the availability of natural resources.**	4
RST.6-8.1	**Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.**	18	**Conduct** research to support inferences made regarding topics in this unit.	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.**	19	**Describe** the content of a reading selection according to the main idea and content.	3

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).	20	**Construct** and label diagrams and tables.	4
			Describe the process used to demonstrate a concept.	3
RST.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.**	21	**Collect** information from multiple sources to add to an existing knowledge base, verify a statement, or construct an understanding of a topic.	3
		22	**Assess** information to determine if it is factual, an opinion, or incorrect.	4
		23	**Quote** or **paraphrase** information in the correct way to avoid plagiarism.	2
RI.8.8	Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not.	24	**Identify** the main argument in a test.	2
		25	**Determine** which arguments or claims are supported by data and which arguments or claims are opinion.	4
WHST.6-8.1	Write arguments focused on discipline content.	26	**Develop** and present arguments using evidence to support claims.	3
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.	27	**Compose** informational text after conducting academic research to elucidate that topic.	3
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.**	28	**Develop** and **conduct** an experiment or research project that relies on information gathered prior to designed data collection.	4
WHST.6-8.8	**Gather relevant information from multiple print and digital sources; assess the credibility of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and providing basic bibliographic information for sources.**	29	**Determine** whether or not information from any source is veracious or opinionated.	2
		30	**Cite** all sources using proper MLA format.	1
WHST.6-8.9	Draw evidence from informational texts to support analysis, reflection, and research.	31	**Support** a thesis pertaining to a relevant topic using informational texts.	4

SL.8.5	Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.	32	**Present** a summary of the results of research, a thesis, or knowledge-based opinion using graphs, illustrations, videos, or presentation software.	2

Assessments
Common labs, or a lab similar to the common lab, should be offered to the students at some point during the marking period. The purpose of this lab is to offer a common experience to all middle school students in the district. You may also use student scores for these labs to evaluate current levels of class and individual comprehension and to generate data for your SGO's. **"Soil Lab" lab -** You should allot two days of class time at any point during the unit (marking period) to complete "Soil Lab" with your students. Assessment is rubric-based. **"Populous Yeast" lab -** You should allot one week of class time at any point during the unit (marking period) to complete "Populous Yeast" lab with your students. Assessment is rubric-based. The Assessment of Content Comprehension (ACC) is a topic-specific assessment Composed of multiple choice and open-ended questions. You may choose to offer this assessment to students three times throughout the unit (marking period). You can determine how much time students way have to complete this assessment and when, or if, you will offer this assessment to your students. **This assessment is optional**. You may also use student scores for these assessments to evaluate current levels of class and individual comprehension and to generate data for your SGO's.

Suggested Resources
Text Resource: Glencoe Interactive iScience (McGraw Hill) **Online Resources:** **Glencoe Science Textbook web resources –** http://connected.mcgraw-hill.com **Next Generation Science Standards -** http://www.nextgenscience.org/next-generation-science-standards Select "Arranged by Disciplinary Core Idea" and scroll down to the middle school standards. Select the standard to find detailed information. **The Lexile® Framework for Reading -** http://lexile.com/ This site contains information about an assessment scheme related to text complexity. **WebElements: The Periodic Table on the Web** - http://www.webelements.com/ Find information about the physical and chemical properties of every element here. **Perdue University's "Gases, Liquids, and Solids"** - http://www.chem.purdue.edu/gchelp/liquids/character.html This site provides very general information about solids, liquids, and gasses.

DIFFERENTIATION		
Special Education	**ELL**	**RtI**
• Modifications & accommodations as listed in the student's IEP • Assign a peer to help keep student on task • Modified or reduced assignments • Reduce length of assignment for different mode of delivery • Increase one to one time • Working contract between you and student at risk • Prioritize tasks • Think in concrete terms and provide hands on tasks • Position student near helping peer or have quick access to teacher • Anticipate where needs will be • Break tests down in smaller increments • NJDOE resources	• Strategy groups • Teacher conferences • Graphic organizers • Modification plan • NJDOE resources • Adapt a Strategy-Adjusting strategies for ESL students: http://www.teachersfirst.com/content/esl/adaptstrat.cfm	• Tiered Interventions following RtI framework • NJDOE resources

ALIGNMENT TO 21st CENTURY SKILLS AND TECHNOLOGY	
21st Century/ Interdisciplinary Themes: Bold all that apply	**21st Century Skills: Bold all that apply**
Global Awareness Financial, Economic, Business and Entrepreneurial Literacy Civic Literacy Health Literacy **Environmental Literacy**	**Creativity & Innovation** **Critical Thinking & Problem Solving** **Communication & Collaboration** **Media Literacy** **Information Literacy** **Information, Communication & Technology** **Life & Career Skills**

Technology Infusion
• Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others • Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism. • Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

Evidence of Student Learning			
• Common benchmarks/labs • Evaluation rubrics	• Teacher-student conferences • Running records	• Students' published work • Unit tests	• Quizzes • Laboratory Investigations