

Department of Curriculum & Instruction

Science

Curriculum Guide

Grade 8



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 8 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 8, Science students in the Montclair Public Schools:

MS-PS1-1	Develop models to describe the atomic composition of simple molecules and extended structures, and use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.
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-PS1-5	Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.
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-LS1-6	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-LS1-5	Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.
MS-LS3-1	Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.
MS-LS3-2	Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.
MS-LS4-2	Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.
MS-LS4-3	Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.
MS-LS4-4	Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.
MS-LS4-5	Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.

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	Atoms & the Periodic Table
2	Chemical Interactions
3	Cell Biology
4	Genetics & Evolution



Montclair Public Schools Instructional Unit

Content:	Science	Grade:	8
Unit #:	1	Unit Title:	Atoms & the Periodic Table
		Pacing:	Marking Period 1

OVERVIEW

Students should be able to describe and model atoms, measure and interpret data pertaining to physical and chemical properties of matter, and use the Periodic Table of Elements to obtain information after completing the material in this unit.

ELA Lexile Levels: 1010L - 1185L

BIG IDEAS

- All matter is composed of atoms, which can bond together to form units of compounds or molecules.
- Atoms are composed of sub-atomic particles (protons, neutrons, and electrons) that have distinct charges and locations within the atom.
- Atoms that are identified as a specific element have the same number of protons, but the number of neutrons and electrons can change.
- Each element has characteristic physical and chemical properties (for any bulk quantity under given conditions) that can be used to identify it.
- Information pertaining to elements and atoms can be found on the Periodic Table of Elements.
- The Periodic Table of Elements is organized according to the chemical properties of elements. Elements are grouped into families according to their chemical properties.
- A model of an atom can be constructed using information available on the Periodic Table through electron configurations.

ESSENTIAL QUESTIONS

- How can I model atoms and molecules in a way that makes sense to others and shows what I know about their structure and charges?
- What evidence can I collect to describe a substance according to some of its physical properties? How can I go about collecting this evidence?
- How can I use the Periodic Table to find information about atoms?

TARGET STANDARDS

Standard	NGSS	SLO	Student Learning Objectives	Depth of Knowledge
MS-PS1-1	Develop models to describe the atomic composition of simple molecules and extended structures.	1	Create diagrams or 3-dimensional models of atoms based on information from the Periodic Table of Elements.	3
		2	Provide evidence that substances are made from different types of atoms, which combine with one another in various ways.	3
HS-PS1-1	Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.	3	Use the Periodic Table to determine the number of protons, neutrons, and electrons present in one electrically neutral atom of any element.	3
		4	Describe chemical characteristics of any element using the Periodic Table.	4
		5	Write and quantize electron configurations using the Periodic Table.	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.	6	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.	7	Follow a multi-step procedure to collect required data.	2
		8	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).	9	Construct and label diagrams and tables.	4
		10	Describe the process used to demonstrate a concept.	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.	11	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 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.

"Put it to the Flame" activity - You should allot 2 days of class time toward the end of the unit (marking period) to complete "Put it to the Flame" with your students. Assessment is rubric-based.

The Assessment of Content Comprehension (ACC) is a topic-specific assessment composed of multiple-choice questions. **This assessment is optional.** You may 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:	8
Unit #:	2	Unit Title:	Chemical Interactions
		Pacing:	Marking Period 2

OVERVIEW

Students should be able to describe and model molecules, measure and interpret data pertaining to physical properties of matter, predict atomic ratio in the formation of compounds, identify compounds as ionic, covalent, or metallic through the interpretation of data, and represent chemical reactions in a variety of ways after completing the material in this unit.

ELA Lexile Levels: 1010L - 1185L

BIG IDEAS

- Substances are made from different types of atoms, which combine with one another in various ways. Atoms form molecules that range in size from two to thousands of atoms.
- Each pure substance has characteristic physical and chemical properties (for any bulk quantity under given conditions) that can be used to identify it.
- Solids may be formed from molecules, or they may be extended structures with repeating subunits (e.g., crystals).
- Substances react chemically in characteristic ways. In a chemical process, the atoms that make up the original substances are regrouped into different molecules, and these new substances have different properties from those of the reactants.
- The total number of each type of atom is conserved, and thus the mass does not change.
- Some chemical reactions release energy, others store energy.

ESSENTIAL QUESTIONS

- How can I model atoms and molecules in a way that makes sense to others and shows what I know about their structure and charges?
- What evidence can I collect to describe a substance according to some of its physical properties? How can I go about collecting this evidence?
- What are some indications that a chemical reaction occurred? Why are these indications that a chemical reaction occurred?
- How can I demonstrate that matter is rearranged and mass is conserved when a chemical reaction takes place?

TARGET STANDARDS

Standard	NGSS	SLO	Student Learning Objectives	Depth of Knowledge
MS-PS1-1	Develop models to describe the atomic composition of simple molecules and extended structures.	1	Create diagrams or 3-dimensional models of molecules based on information from the Periodic Table of Elements.	4
		2	Determine the number of atoms of given elements in one molecule of a compound by reading the chemical formula for that compound.	3

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.	3	Measure the following physical properties of substances: density, melting and boiling points, conductivity, and solubility.	4
		4	Prove that an observed change is chemical or physical based on analysis of substances prior to and following an action or interaction.	4
		5	Determine whether a compound is ionic, covalent, or metallic based on its physical and chemical characteristics.	4
MS-PS1-5	Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.	6	Describe matter as being conserved and rearranged during a chemical reaction using diagrams or models of the individual atoms involved in simple reactions.	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-PS1-2)	7	Cite specific experimental data to support analysis of science and technical information gathered during an experiment.	3
RST.6-8.3	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. (MS-PS1-6) (MS-PS3-3)	8	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
		9	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
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-PS1-1) (MS-PS1-2) (MS-PS1-5)	10	Connect visual representations of quantitative data to a constructed written analysis of the same data.	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. (MS-PS3-3)	11	Conduct academic research prior to the design of a scientific problem or device with the aim of improving the problem or device.	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 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.

"Name that Bond" Lab - You should allot one week of class time towards the middle of the unit (marking period) to complete "Name that Bond" with your students. Assessment is rubric-based.

The Assessment of Content Comprehension (ACC) is a topic-specific assessment composed of multiple-choice questions. **This assessment is optional.** You may 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:	8
Unit #:	3	Unit Title:	Cell Biology	Pacing: Marking Period 3

OVERVIEW

Students will be able to observe and identify cells using a microscope, describe and differentiate between prokaryotic and eukaryotic (specifically plant and animal) cells based on structure, describe organelles according to structure and function, describe and test for the presence of important organic molecules, and discuss photosynthesis and cellular respiration in terms of reactants, products, and energy required for and produced during these processes upon completion of the material in this unit.

BIG IDEAS

- Within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell.
- 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.
- 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.
- 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.
- Cellular respiration in plants and animals involve chemical reactions with oxygen that release stored energy. In these processes, complex molecules containing carbon react with oxygen to produce carbon dioxide and other materials.

ESSENTIAL QUESTIONS

- What structures allow cells to survive and carry out life processes? How do these structures function?
- What is photosynthesis? What reactants, products and type of energy is involved in this process?
- What is cellular respiration? What reactants, products and type of energy is involved in this process?
- How are photosynthesis and cellular respiration related?

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	Identify living or dead cells in a specimen that is student-prepared and examined using a microscope.	2
		2	Construct a hypothesis about the number and types of cells composing various living specimens and use a microscope to test this hypothesis.	4

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.	3	List and describe the structures and organelles found in prokaryotic and eukaryotic cells, specifically the nucleus, nucleolus, chloroplasts, mitochondria, cell membrane, cell wall, endoplasmic reticulum, Golgi complex, vacuoles, and ribosomes.	2
		4	Describe the ways structures and organelles in cells work together to keep the cell alive.	3
		5	Predict what would happen to the cell if a specific organelle were absent/non-functioning.	4
		6	Compare and contrast the structure and function of a cell wall and a cell membrane.	3
		7	Describe the molecular composition of a cell in terms of proteins, carbohydrates, lipids, and nucleic acids and describe how each molecule is used by or in a cell.	4
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	Describe photosynthesis in terms of reactants, products, and energy using the equation, diagrams, and written explanation.	3
		9	Observe the process of photosynthesis in living organisms and collect evidence related to conditions necessary to keep an autotroph alive and what autotrophs produce.	4
		10	Prove that the sugars produced through photosynthesis can be used immediately or stored for growth or later use.	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	Describe cellular respiration in terms of reactants, products, and energy using the equation, diagrams, and written explanation.	2
		12	Construct a model that illustrates how energy is used to build new, more complex molecules and how energy is released when molecules are broken.	4
		13	Explain how food is rearranged in living organisms through diagrams, flowcharts, or written explanation.	3
		14	Observe the chemical reaction that occurs when food burns, provide evidence that energy is released, and determine that O ₂ is needed for the reaction.	3



		15	Observe the process of cellular respiration in living organisms and collect evidence related to conditions necessary to keep an animal alive and what animals produce.	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.	16	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.	17	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.	18	Follow a multi-step procedure to collect required data.	2
		19	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).	20	Construct and label diagrams and tables.	3
		22	Describe the process used to demonstrate a concept.	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.	23	Compose informational text after conducting academic research to elucidate that topic.	3
WHST.6-8.9	Draw evidence from informational texts to support analysis, reflection, and research.	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.	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.

"Where's the Energy" lab - You should allot 120 minutes of class time at any point during the unit (marking period 3) to complete "Where's the Energy" with your students. Assessment is rubric-based.

"Wuzzinacell" lab - You should allot one week of class time at any point during the unit (marking period) to complete "Wuzzinacell" with your students. Assessment is rubric-based.

The Assessment of Content Comprehension (ACC) is a topic-specific assessment composed of multiple choice questions. **This assessment is optional.** You may 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:	8
Unit #:	4	Unit Title:	Genetics and Evolution
		Pacing:	Marking Period 4

OVERVIEW

Students will be able to describe the affect that genetic and environmental factors have on a population, model and discuss genes, chromosomes, and the effect of mutation on an individual organism, describe inheritance in asexually reproducing and sexually reproducing populations, use Punnett squares to predict the expression of traits, define and discuss artificial selection, and define and discuss evolution through the completion of all topics in this unit.

ELA Lexile Levels: 1010L - 1185L

BIG IDEAS

- Genetic factors as well as local conditions affect the growth of organisms.
- Genes are located in the chromosomes of cells, with each chromosome pair containing two variants of each of many distinct genes. Each distinct gene chiefly controls the production of specific proteins, which in turn affects the traits of the individual. Changes (mutations) to genes can result in changes to proteins, which can affect the structures and functions of the organism and thereby change traits.
- In addition to variations that arise from sexual reproduction, genetic information can be altered because of mutations. Though rare, mutations may result in changes to the structure and function of proteins. Some changes are beneficial, others harmful, and some neutral to the organism.
- Variations of inherited traits between parent and offspring arise from genetic differences that result from the subset of chromosomes (and therefore genes) inherited.
- In sexually reproducing organisms, each parent contributes half of the genes acquired (at random) by the offspring. Individuals have two of each chromosome and hence two alleles of each gene, one acquired from each parent. These versions may be identical or may differ from each other.
- In *artificial* selection, humans have the capacity to influence certain characteristics of organisms by selective breeding. One can choose desired parental traits determined by genes, which are then passed on to offspring.

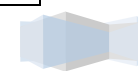
ESSENTIAL QUESTIONS

- What conditions affect an organism as it grows and develops?
- What are genes? How do genes affect the traits of an individual?
- How do genes influence variation between individuals?
- What is mutation? How could mutation benefit and harm a population or individual organism?
- Why don't you look exactly like your biological mother or father?
- Why don't you look exactly like you brothers or sisters (unless you are an identical twin)?
- What is artificial selection? What benefits have humans reaped through artificial selection?



TARGET STANDARDS				
Standard	NGSS	SLO	Student Learning Objectives	Depth of Knowledge
MS-LS1-5	Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.	1	Observe members of a population and describe how their environment has affected them and describe genetic factors that have influenced a population of organisms over time.	3
		2	Predict the outcome of switching members within one geographical population with those of another.	4
MS-LS3-1	Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.	3	Construct props that depict chromosomes as joined groups of genetic information.	3
		4	Utilize those props while explaining the correlation between gene placement, protein, and structure/function within organisms.	4
MS-LS3-2	Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.	5	Apply concepts used in calculating genetic probability in order to compile, arrange, and present evidence that the achievable levels of genetic variance differ between sexual and asexual reproduction.	4
		6	Use Punnett squares to determine the likelihood of phenotype expression in offspring in sexually reproducing populations.	3
MS-LS4-2	Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.	7	After analyzing data-based evidence, describe evolutionary changes, and the factors influencing those changes, in the genetic makeup of a population over time.	4
MS-LS4-3	Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.	8	Construct and/or justify mathematical models, diagrams, or simulations that represent processes of biological evolution.	3
MS-LS4-4	Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.	9	Describe evolution as a function of random mutation resulting in individuals with genotypes that differ from those of the previous generation that may or may not be beneficial to that individual in their current environment.	4
		10	Prove that individuals with beneficial traits are better able to survive and reproduce in the environment in which they live.	4

MS-LS4-5	Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.	11	Identify methods for manipulating the availability of specific genes within individuals, populations, and species.	2
		12	Describe various forms of technology or human activities (such as domestication) that influence the frequency of "desirable" genotypes occurring in a population.	3
		13	Consider and describe the effect of human influence on a modified species and the social, political, an/or moral ramifications of such actions.	4
RST.6-8.1	Cite specific textual evidence to support analysis of science and technical texts.	14	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.	15	Describe the content of a reading selection according to the main idea and content.	3
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.	16	Interpret definitions of key vocabulary so they are meaningful in context.	2
		17	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).	18	Construct and label diagrams and tables.	4
		19	Describe the process used to demonstrate a concept.	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.6-8.8	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.	21	Determine whether or not information from any source is veracious or opinionated.	2
		22	Cite all sources using proper MLA format.	1



WHST.6-8.9	Draw evidence from informational texts to support analysis, reflection, and research.	23	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.	24	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.

"Build a Bug" lab -

The Assessment of Content Comprehension (ACC) is a topic-specific assessment composed of multiple-choice questions. **This assessment is optional.** You may 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.

PhET Interactive Simulations (University of Colorado at Boulder) - <http://phet.colorado.edu/en/simulation/build-a-molecule>

Download an interactive application that allows students to create models of molecules and view 3d versions of their models.

ChemSpider - The free chemical database - <http://www.chemspider.com/>

Find information about almost any chemical here. This is an excellent resource for quick online data collection.

Chem4Kids - <http://www.chem4kids.com.html>

Find easily readable information about general topics here. This is a good site for students to access from home if they need help.

Article: The Genetic Variation in a Population is Caused by Multiple Factors - <http://www.nature.com/scitable/topicpage/the-genetic-variation-in-a-population-is-6526354>

This article clearly discusses genetic variation in populations. Nice animation as well.

Berkeley's "Understanding Evolution" site - <http://evolution.berkeley.edu/evolibrary>

This is a great site to use to expand your current understanding of evolution. It's like an online course.

DIFFERENTIATION			
Special Education	ELL		Rtl
<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 		<ul style="list-style-type: none"> • Tiered Interventions following Rtl framework • NJDOE resources
ALIGNMENT TO 21 st CENTURY SKILLS AND TECHNOLOGY			
21 st Century/ Interdisciplinary Themes: Bold all that apply		21 st 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			
<ul style="list-style-type: none"> • 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			
<ul style="list-style-type: none"> • Common benchmarks/labs • Evaluation rubrics 	<ul style="list-style-type: none"> • Teacher-student conferences • Running records 	<ul style="list-style-type: none"> • Students' published work • Unit tests 	<ul style="list-style-type: none"> • Quizzes • Laboratory Investigations

