Kingsway Regional School District

Committed to Excellence

Course Name: Science 8	**Grade Level(s): 8**
Department: MS Science	**Credits: NA**
BOE Adoption Date: October 2016	**Revision Date(s): October 2019**

ABSTRACT

Students will explore middle school chemistry through a collaborative and lab/inquiry based environment, developing critical thinking and problem solving skills essential to becoming informed productive contributors to society in the 21st Century. Students will engage in engineering and apply crosscutting concepts to deepen their understanding of the Structure and Properties of Matter, Interactions of Matter, Chemical Reactions, and Thermal Energy.

Students will explore academic physics through a collaborative and lab/inquiry based environment, developing critical thinking and problem solving skills essential to becoming informed productive contributors to society in the 21st century. Students who have mastered physics will engage in engineering practices and apply crosscutting concepts to deepen their understanding of how the sum of forces affects an object's motion, relationships among forms of energy, which includes thermal energy, and the idea of the conservation of energy, and the electromagnetic spectrum.

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Mission Statement

The **Kingsway Regional School District** believes that this school district is responsible for developing and maintaining a comprehensive educational program that will foster the academic, social, and personal growth of all students. The Kingsway Regional School District provides a secure, supportive environment. It also provides high quality resources to challenge and empower each individual to pursue his/her potential, to develop a passion for learning in a diverse and challenging world, to encourage active citizenship, and to reach a high standard of achievement at all grade levels as defined by the New Jersey Student Learning Standards (NJ SLS)

Curriculum & Instruction Goals

Goal(s):

1. To ensure students are college and career ready upon graduation
2. To vertically and horizontally align curriculum K-12 to ensure successful transition of students at each grade level
3. To identify individual student strengths and weaknesses utilizing various assessment measures (formative, summative, alternative, etc.) so as to differentiate instruction while meeting the rigor of the applicable content standards
4. To improve student achievement as assessed through multiple measures including, but not limited to, state testing, local assessments, and intermediate benchmarking

Philosophy of the Shared Curriculum Service with South Harrison Township Elementary

The ultimate goal of the newly established shared curriculum service with South Harrison Township Elementary is to provide clearly coherent curriculum for grades K-12 to enhance student growth and achievement and provide learning experiences that assist in providing an inherent love of learning. With true vertical and horizontal curricular alignment all students will be effectively prepared for their arrival onto the campus of Kingsway Regional Middle School. Through this shared vision, both school districts are able to work earlier and more productively with students to ensure they are properly equipped with the knowledge and skills necessary to be successful in college and career upon graduation from high school. The alignment of curriculum K-12 safeguards countless benefits for our children; it is the very foundation for the improved teaching and learning that is our goal as educators, parents, and community members. Most notably, an aligned curriculum K-12 creates a common ownership and understanding of what must be taught and learned at each grade level for each subject area. No matter where a student attends, the curriculum requirements are the same across buildings, grade levels and teachers. Additionally, an aligned curriculum serves to provide valuable information to parents who will know what each child is expected to learn while in the classroom.

How to Read this Document

This curricular document contains both *pacing guides* and *curriculum units*. The pacing guides serve to communicate an estimated timeframe as to *when* skills and topics will be taught throughout the year. The pacing, however, may differ slightly depending upon the unique needs of each learner. The *curriculum units* contain more detailed information as to the content, goals, and objectives of the course well as how students will be assessed. The terms and definitions below will assist the reader to better understand the sections and components of this curriculum document.

Terms to Know

1. **Accommodation(s):** The term "accommodation" may be used to describe an *alteration* of environment, curriculum format, or equipment that allows an individual with a disability to gain access to content and/or complete assigned tasks. They allow students with disabilities to pursue a regular course of study. The term accommodation is often used interchangeable with the term modification. However, it is important to remember that modifications change or modify the intended learning goal while accommodations result in the same learning goal being expected but with added assistance in that achievement. Since accommodations do not alter what is being taught, instructors should be able to implement the same grading scale for students with disabilities as they do for students without disabilities.

2. **Differentiated Instruction:** Differentiation of instruction relies on the idea that instructional approaches should be tailored to each individual student's learning needs. It provides students an array of options during the learning process that allows them make sense of ideas as it relates to them. The integration of differentiated instructional techniques is a curriculum design approach to increase flexibility in teaching and decrease the barriers that frequently limit student access to materials and learning in classrooms.

3. **Enduring Understanding:** Enduring understandings (aka big ideas) are statements of understanding that articulate deep conceptual understandings at the heart of each content area. Enduring understandings are noted in the alongside essential questions within each unit in this document.

4. **Essential Question:** These are questions whose purpose is to stimulate thought, to provoke inquiry, and to spark more questions. They extend beyond a single lesson or unit. Essential questions are noted in the beginning of each unit in this document.

5. **Formative Assessments:** Formative assessments monitor student learning to provide ongoing feedback that can be used by (1) instructors to improve teaching and (2) by students to improve their learning. Formative assessments help identify students' strengths and weaknesses and address problems immediately.

6. **Learning Activity(s):** Learning activities are those activities that take place in the classroom for which the teacher facilitates and the students participate in to ensure active engagement in the learning process. (Robert J. Marzano, *The Art and Science of Teaching*)

7. **Learning Assignment(s):** Learning assignments are those activities that take place independently by the student inside the classroom or outside the classroom (i.e. homework) to extend concepts and skills within a lesson.

8. **Learning Goal(s):** Learning goals are broad statements that note what students "should know" and/or "be able to do" as they progress through a unit. Learning goals correlate specifically to the NJCCCS and CCSS are noted within each unit.

9. **Learning Objective(s):** Learning objectives are more specific skills and concepts that students must achieve as they progress towards the broader learning goal. These are included within each unit and are assessed frequently by the teacher to ensure students are progressing appropriately.

10. **Model Assessment:** Within the model curriculum, model assessments are provided that included assessments that allow for measuring student proficiency of those target skills as the year of instruction progresses.

11. **Model Curriculum:** The model curriculum has been provided by the state of New Jersey to provide a "model" for which districts can properly implement the New Jersey Student Learning Standards and New Jersey Core Curriculum Content Standards by providing an example from which to work and/or a product for implementation.

12. **Modification(s):** The term "modification" may be used to describe a *change* in the curriculum. Modifications are typically made for students with disabilities who are unable to comprehend all of the content an instructor is teaching. The term modification is often used interchangeable with the term accommodations. However, it is important to remember that modifications change or modify the intended learning goal while accommodations result in the same learning goal being expected but with assistance in that achievement.

13. **Performance Assessments: (**aka alternative or authentic assessments) Performance assessments are a form of assessment that requires students to perform tasks that generate a more authentic evaluation of a student's knowledge, skills, and abilities. Performance assessments stress the application of knowledge and extend beyond traditional assessments (i.e. multiple-choice question, matching, true & false, etc.).

14. **Standards:** Academic standards, from which the curriculum is built, are statements that of what students "should know" or "be able to do" upon completion of a grade-level or course of study. Educational standards help teachers ensure their students have the skills and knowledge they need to be successful by providing clear goals for student learning.
    - **State:** The New Jersey Student Learning Standards (NJ SLSs) include Preschool Teaching and Learning Standards as well as K-12 standards for: *Visual and Performing Arts; Comprehensive Health and Physical Education; Science; Social Studies; World Languages; Technology; 21st-Century Life and Careers; Language Arts Literacy; and, Mathematics*
15. **Summative Assessments:** Summative assessments evaluate student learning at the end of an instructional time period by comparing it against some standard or benchmark. Information from summative assessments can be used formatively when students or faculty use it to guide their efforts and activities in subsequent courses.

16. **21st Century Skills:** These skills emphasis the growing need to focus on those skills that prepare students successfully by focusing on core subjects and 21st century themes; learning and innovation skills; information, media and technology skills; and life and career skills. These concepts are embedded in each unit of the curriculum.

Proficiencies and Pacing Guide:

Course Title: Science 8
Prerequisite(s): Science 7

Unit Title:	Duration/ Month(s)	Related Standards:	Learning Goals:	Topics and Skills:
Unit 1: Structure and Properties of Matter Thermal Energy	15 WEEKS SEPT - JAN 13TH	*Primary* NJ SLS.PS-1.A NJ SLS.PS-3.A NJ SLS.PS3.A NJ SLS.PS3.B *Secondary* NJ SLS.ETS1.B NJ SLS.ETS1.C NJ SLS.ETS1.A *NJ Student Learning Standards Connections:* ELA/Literacy NJ SLS.RST.6.8.1 NJ SLS.RST.6.8.3 NJ SLS.RST.6.8.7 NJ SLS.W.6.8.1 NJ SLS.W.6.8.7 NJ SLS.W.6.8.8 *Mathematics* NJ SLS.6.RP.A.1 NJ SLS.6.RP.A.2 NJ SLS.6.RP.A.3 NJ SLS.6.NS.C.5 NJ SLS.8.EE.A.3 NJ SLS.6.SP.B.4 NJ SLS.6.SP.B.5	1. (NJ SLS.MS-PS1-1) Students will understand that 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. 2. (NJ SLS.MS-PS1-2),(NJ SLS.MS-PS1-3) Students will understand that each pure substance has characteristic physical and chemical properties that can be used to identify it. 3. (NJ SLS.MS-PS1-4) Students will understand that Gases and liquids are made of molecules or inert atoms that are moving about relative to each other. 4. (NJ SLS.MS-PS1-4) Students will understand that 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. 5. (NJ SLS.MS-PS1-1) Solids may be formed from molecules, or they may	MS-PS1-1. Develop models to describe the atomic composition of simple molecules and extended structures. MS-PS1-3. Gather and make sense of information to describe that synthetic materials come from natural resources and impact society. 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-PS1-6 Undertake a design project to construct, test, and modify a device that either releases or absorbs energy. MS-PS3-3. Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer. 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.

Unit Title:	Duration/ Month(s)	Related Standards:	Learning Goals:	Topics and Skills:
		NJ SLS.7.RP.A.2 NJ SLS.8.EE.A.1 NJ SLS.8.F.A.3 TECHNOLOGY: NJ SLS.8.1.8.A.2 NJ SLS.8.1.8.A.3 NJNSLS.8.1.8.A.4 NJNSLS.8.1.8.A.5 NJNSLS.8.1.8.D.2 NJNSLS.8.1.8.D.3 NJNSLS.8.2.8.A.1 NJNSLS.8.2.8.A.4 NJNSLS.8.2.8.A.5 NJNSLS.8.2.8.B.1 NJNSLS.8.2.8.C.1 CAREER READY PRACTICES: CRP2. CRP4. CRP5. CRP6. CRP7. CRP8. CRP9. CRP11. FINANCIAL LITERACY: 9.1	be extended structures with repeating subunits (e.g., crystals). 6. (NJ SLS.MS-PS1-4) The changes of state that occur with variations in temperature or pressure can be described and predicted using these models 7. Students will understand that the term “heat” as used in everyday language refers both to thermal energy (the motion of atoms or molecules within a substance) and the transfer of that thermal energy from one object to another. In science, heat is used only for this second meaning; it refers to the energy transferred due to the temperature difference between two objects. (secondary) 8. Students will be able to demonstrate that temperature of a system is proportional to the average internal kinetic energy and potential energy per atom or molecule. 9. Students will understand that temperature is not a direct measure of a system's total thermal energy. The total thermal energy (sometimes called the total internal energy) of a system depends jointly on the temperature, the total number of atoms in the	

Unit Title:	Duration/ Month(s)	Related Standards:	Learning Goals:	Topics and Skills:
		CAREER EXPLORATION: 9.2.8.B.4 9.2.8.B.6 9.2.8.B.7	system, and the state of the material. (secondary) 10. (MS-PS3-3,MS-PS3-4) Students will understand that temperature is a measure of the average kinetic energy of particles of matter. The relationship between the temperature and the total energy of a system depends on the types, states, and amounts of matter present. 11. (NJ SLS.MS-PS3-4) Students will understand that the amount of energy transfer needed to change the temperature of a matter sample by a given amount depends on the nature of the matter, the size of the sample, and the environment. 12. (NJ SLS.MS-PS3-4) Students will understand the amount of energy transfer needed to change the temperature of a matter sample by a given amount depends on the nature of the matter, the size of the sample, and the environment. 13. (secondary to NJ SLS.MS-PS3-3) Students will understand that 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	

Unit Title:	Duration/ Month(s)	Related Standards:	Learning Goals:	Topics and Skills:
			constraints includes consideration of scientific principles and other relevant knowledge that is likely to limit possible solutions. 14. (secondary to NJ SLS.MS-PS3-3) Students will understand that a solution needs to be tested, and then modified on the basis of the test results in order to improve it. There are systematic processes for evaluating solutions with respect to how well they meet criteria and constraints of a problem.	

Unit Title:	Duration/ Month(s)	Related Standards:	Learning Goals:	Topics and Skills:
Unit 2: Chemical Reactions	5 WEEKS JAN.17TH - FEB16TH	*Primary* NJ SLS.PS1.A NJ SLS.PS1.B *Secondary* ETS1.B ETS1.C *NJ Student Learning Standards Connection* *ELA/Literacy* - NJ SLS.RST.6-8.1 NJ SLS.RST.6-8.3 NJ SLS.RST.6-8.7 *Mathematics* - MP.2	1. Students will understand that the total number of each type of atom is conserved, and thus the mass does not change during a chemical reaction. (NJ SLS.MS-PS1-5)	NJ SLS.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. NJ SLS.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. NJ SLS.MS-PS1-6. Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.

Unit Title:	**Duration/ Month(s)**	**Related Standards:**	**Learning Goals:**	Topics and Skills:
		MP.4 NJ SLS.6.RP.A.3 NJ SLS.6.SP.B.4 NJ SLS.6.SP.B.5 TECHNOLOGY: 8.2.8.D.2 8.2.8.D.3 *Career Ready Practices:* CRP2. CRP4. CRP5. CRP6. CRP7. CRP8. CRP9. CRP11. *Financial Literacy:* 9.1 *Career Exploration:* 9.2.8.B.4 9.2.8.B.6 9.2.8.B.7		

Unit Title:	Duration/ Month(s)	Related Standards:	Learning Goals:	Topics and Skills:
Unit 3: Stability and Change on Earth	3 WEEKS FEB 21ST - MAR 9TH	*Primary* NJ SLS.ESS3.A *Interdisciplinary Connections:* *ELA/Literacy* NJ SLS.RST.6-8.1 NJ SLS.WHST.6-8.2 NJ SLS.WHST.6-8.9 *Mathematics –* NJ SLS.6.EE.B.6 NJ SLS.7.EE.B.4 *Technology:* 8.1.8.F.1 8.2.8.A.1 8.2.8.A.2 8.2.8.A.4 8.2.8.A.5 *Career Ready Practices:* CRP2. CRP4. CRP5. CRP6. CRP7. CRP8. CRP9. CRP11.	1. (NJ SLS.MS-ESS3-1) Students will understand that humans depend on Earth's land, ocean, atmosphere, and biosphere for many different resources. Minerals, fresh water, and biosphere resources are limited, and many are not renewable or replaceable over human lifetimes. These resources are distributed unevenly around the planet as a result of past geologic processes. 2. (MS-ESS-3, MS-ESS3-4) Students will understand that typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise. 3. (MS-ESS3-5) Students will understand that human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth's mean surface temperature (global warming). Reducing the level of climate change and reducing human vulnerability to whatever climate changes do occur depend on the understanding of climate science, engineering capabilities, and other kinds of knowledge, such as understanding of human behavior and on applying that knowledge wisely in decisions and activities.	NJ SLS.MS-ESS3-1. Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.

Unit Title:	Duration/ Month(s)	Related Standards:	Learning Goals:	Topics and Skills:
		Financial Literacy: 9.1		

Unit Title:	Duration/ Month(s)	Related Standards:	Learning Goals:	Topics and Skills:
Unit 4: The Electromagnetic Spectrum	4 WEEKS MAR 14TH - APRIL 6TH	*Primary* NJ SLS.PS4.A NJ SLS.PS4.B NJ SLS.PS4.C *ELA/Literacy* - NJ SLS.RST.6-8.1 NJ SLS.RST.6-8.2 NJ SLS.RST.6-8.9 NJ SLS.WHST.6-8.9 NJ SLS.SL.8.5 *Mathematics* - MP.2 MP.4 NJ SLS.6.RP.A.1 NJ SLS.6.RP.A.3 NJ SLS.7.RP.A.2 NJ SLS.8.F.A.3 TECHNOLOGY: 8.1.8.A.1 8.2.8.A.1 *Career Ready Practices:* CRP2. CRP4. CRP5. CRP6. CRP7. CRP8. CRP9. CRP11.	1. (NJ SLS.MS-PS4-1) Students will understand that a simple wave has a repeating pattern with a specific wavelength, frequency, and amplitude. 2. Students will understand that a sound wave needs a medium through which it is transmitted. 3. (NJ SLS.MS-PS4-2) Students will understand that when light shines on an object, it is reflected, absorbed, or transmitted through the object, depending on the object's material and the frequency (color) of the light. 4. (NJ SLS.MS-PS4-2) Students will understand that a wave model of light is useful for explaining brightness, color, and the frequency-dependent bending of light at a surface between media. 5. Students will understand that digitized signals (sent as wave pulses) are a more reliable way to encode and transmit-information. (MS-PS4-3)	NJ SLS.MS-PS4-1 Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave. NJ SLS.MS-PS4-2. Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials. NJ SLS.MS-PS4-3. Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.

Unit Title:	Duration/ Month(s)	Related Standards:	Learning Goals:	Topics and Skills:
		FINANCIAL LITERACY: 9.1 *CAREER EXPLORATION:* 9.2.8.B.4 9.2.8.B.6 9.2.8.B.7		

Unit Title:	Duration/ Month(s)	Related Standards:	Learning Goals:	Topics and Skills:
Unit 5 **Forces for next two years -- see below pg. 41** **Unit 5-6: Relationships Among Forms of Energy**	10 WEEK APRIL 19TH - END OF YEAR	*Primary* NJ SLS.PS3.A NJ SLS.PS3.B NJ SLS.PS3.C NJ SLS.ETS1.A NJ SLS.ETS1.B *ELA/Literacy* – NJ SLS.RST.6-8.1 NJ SLS.RST.6-8.3 NJ SLS.RST.6-8.7 NJ SLS.WHST.6-8.1 NJ SLS.WHST.6-8.7 NJ SLS.SL.8.5 *Mathematics* – MP.2 NJ SLS.6.RP.A.1 NJ SLS.6.RP.A.2 NJ SLS.7.RP.A.2 NJ SLS.8.EE.A.1 NJ SLS.8.EE.A.2 NJ SLS.8.F.A.3	1. (NJ SLS.MS-PS3-1) Students will understand that motion energy is properly called kinetic energy; it is proportional to the mass of the moving object and grows with the square of its speed. 2. (NJ SLS.MS-PS3-2) Students will understand that objects may also contain stored (potential) energy, depending on their relative positions. 3. (NJ SLS.MS-PS3-5) Students will understand that when the motion energy of an object changes, there is inevitably some other change in energy at the same time. (NJ SLS.MS-PS3-2) 4. Students will understand that when two objects interact, each one exerts a force on the other that can cause energy to be transferred to or from the object. (MS-PS2-1)	NJ SLS.MS-PS3-1. Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object. NJ SLS.MS-PS3-2. Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system. NJ SLS.MS-PS3-5. Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.

Unit Title:	Duration/ Month(s)	Related Standards:	Learning Goals:	Topics and Skills:
		NJ SLS.6.SP.B.5 *CAREER READY PRACTICES:* CRP2. CRP4. CRP5. CRP6. CRP7. CRP8. CRP9. CRP11. FINANCIAL LITERACY: 9.1 CAREER EXPLORATION: 9.2.8.B.4 9.2.8.B.6 9.2.8.B.7	5. Students will understand that for any action there is an equal and opposite reaction (Newton's 3rd Law). (MS-PS2-2) 6. Students will understand that the motion of an object is determined by the relationship of the object's force and mass (newton's 2nd law	

Unit Title:	Duration/ Month(s)	Related Standards:	Learning Goals:	Topics and Skills:
Unit: 6 Relationships Among Forms of Energy (Energy)	10 WEEKS APR 19TH - END OF YEAR	*Primary* NJ SLS.PS3-1 (PS3.A) NJ SLS.PS3-2 (PS3.A AND PS3.C) NJ SLS.PS3-5 (PS3.B) *Secondary* *Interdisciplinary Connections: ELA/Literacy* NJ SLS.RST.6-8.1 NJ SLS.WHST.6-8.2 NJ SLS.WHST.6-8.9 *Mathematics –* NJ SLS.6.EE.B.6 NJ SLS.7.EE.B.4 *TECHNOLOGY:* 8.1.8.F.1 8.2.8.A.1 8.2.8.A.2 8.2.8.A.4 8.2.8.A.5 *CAREER READY PRACTICES:* CRP2. CRP4. CRP5. CRP6. CRP7.	1. (MS-PS3-1) Students will understand that motion energy is properly called kinetic energy; it is proportional to the mass of the moving object and grows with the square of its speed. 2. (MS-PS3-2) Students will understand that a system of objects may also contain stored (potential) energy, depending on their relative positions. 3. (MS-PS3-5) Students will understand that when the motion energy of an object changes, there is inevitably some other change in energy at the same time. 4. (MS-PS3-2) Students will understand that when two objects interact, each one exerts a force on the other that can cause energy to be transferred to or from the object.	NJ SLS.MS-PS3-1, Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object NJ SLS.MS-PS3-2, Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system NJ SLS.MS-PS3-5. Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.

Unit Title:	Duration/ Month(s)	Related Standards:	Learning Goals:	Topics and Skills:
		CRP8. CRP9. CRP11. FINANCIAL LITERACY: 9.1		

Unit: 1 - Structure and Properties of Matter/Thermal Energy (Energy)	Recommended Duration: [Weeks– Months] -- 15 WEEKS/ SEPT - JAN.13TH
Unit Description: Students build understandings of what occurs at the atomic and molecular scale. Students apply their understanding that pure substances have characteristic properties and are made from a single type of atom or molecule. They also provide a molecular level accounts to explain states of matter and changes between states. The crosscutting concepts of *cause and effect*, *scale, proportion and quantity*, *structure and function*, *interdependence of science, engineering, and technology*, and *the influence of science, engineering and technology on society and the natural world* provide a framework for understanding the disciplinary core ideas. Students demonstrate grade appropriate proficiency in *developing and using models*, constructing explanations and designing solutions, and *obtaining, evaluating, and communicating information*. Students are also expected to use the scientific and engineering practices to demonstrate understanding of the core ideas.	

Essential Question	Enduring Understanding
● How does structure of matter determine its function and behavior? ● How does the molecular structure and movement of atoms change when energy is added?	● Matter is composed of atoms that have specific physical and chemical properties that determine its function and behavior. ● States of matter are determined by the amount of energy in a substance due to constant movement of atoms. ● Energy is conserved in interactions of matter accounting for no temperature change during a phase change.

Relevant Standards:	Learning Goals:	Learning Objectives:
NJ SLS.MS-PS-1.A Develop models to describe the atomic composition of simple molecules and extended structures. NJ SLS.MS-PS-3.A Gather and make sense of information to describe that synthetic materials come from natural resources and impact society	1. (NJ SLS.MS-PS1-1) Students will understand that 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. 2. (NJ SLS.MS-PS1-2), (NJ SLS.MS-PS1-3) Students will understand that each pure substance has characteristic physical and chemical properties that can be used to identify it. 3. (NJ SLS.MS-PS1-4) Students will understand that Gases and liquids are made of molecules or inert atoms that are	This is where *observable features of student performance* are used to drive activities and assessment. **1.A (1.1 -1.4)** 1. Students will be able to develop and interpret a model of atomic composition of simple molecules and extended structures that vary in complexity. 2. Students will be able to describe the composition of various types of pure substances and understand how composition affect behavior. 3. Students will be able to organize data, identifying relationships, interpreting the data relative to the properties of matter and

Relevant Standards:	Learning Goals:	Learning Objectives:
	moving about relative to each other. 4. (NJ SLS.MS-PS1-4) Students will understand that 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. 5. (NJ SLS.MS-PS1-1) Solids may be formed from molecules, or they may be extended structures with repeating subunits (e.g., crystals). 6. (NJ SLS.MS-PS1-4) The changes of state that occur with variations in temperature or pressure can be described and predicted using these models 7. Students will understand that temperature is not a direct measure of a system's total thermal energy. The total thermal energy (sometimes called the total internal energy) of a system depends jointly on the temperature, the total number of atoms in the system, and the state of the material. 8. (NJ SLS.MS-PS3-1) Students will understand that motion energy is properly called kinetic energy; it is proportional to the mass of the moving object and grows with the square of its speed. 9. (NJ SLS.MS-PS3-2) Students will understand that a system of objects may also contain stored (potential) energy, depending on their relative positions.	changes in state. **3.A (3.1 - 3.5)** 1. Students use graphical displays to organize, identify relationships, and interpret data for the connection between kinetic energy and mass of an object as a linear proportional relationship. 2. Students will be able to make sense of a given phenomenon involving two objects interacting at a distance, develop a model in which they identify and describe* relationships and make connections between the components. 3. Students use the model to provide a causal account for the idea that the amount of potential energy in a system of objects changes when the distance between stationary objects interacting in the system changes. **4.** Students will be able to use scientific knowledge to generate a design solution, to describe criteria and constraints and evaluate potential solutions to a problem that requires either minimizing or maximizing thermal energy transfer. **5.** Students will test the device to determine its ability to maximize or minimize the flow of thermal energy, using the rate of temperature change as a measure of success. 6. Students identify the phenomenon under investigation involving thermal energy transfer by describing the purpose of the investigation, the data to be collected and the evidence to be derived from the data. 7. Students will plan the investigation using the

Relevant Standards:	Learning Goals:	Learning Objectives:
	10. (NJ SLS.MS-PS3-3),(NJ SLS.MS-PS3-4) Students will understand that temperature is a measure of the average kinetic energy of particles of matter. The relationship between the temperature and the total energy of a system depends on the types, states, and amounts of matter present. 11. (NJ SLS.MS-PS3-5) Students will understand that when the motion energy of an object changes, there is inevitably some other change in energy at the same time. 12. (NJ SLS.MS-PS3-4) Students will understand that the amount of energy transfer needed to change the temperature of a matter sample by a given amount depends on the nature of the matter, the size of the sample, and the environment. 13. (NJ SLS.MS-PS3-4) Students will understand the amount of energy transfer needed to change the temperature of a matter sample by a given amount depends on the nature of the matter, the size of the sample, and the environment. 14. (NJ SLS.MS-PS3-2) Students will understand that when two objects interact, each one exerts a force on the other that can cause energy to be transferred to or from the object. 15. (secondary to NJ SLS.MS-PS3-3) Students will understand that the more precisely a design task's criteria and constraints can	Scientific method that will list specific procedures and units to use for measuring temperature and mass. 8. Students make a claim about a given explanation or model for a phenomenon. In their claim, students include idea that when the kinetic energy of an object changes, energy is transferred to or from that object. 9. Students identify and describe* the given evidence that supports the claim, evaluates and critiques the evidence. 10. Students use reasoning to connect the necessary and sufficient evidence and construct the argument. Students describe* a chain of reasoning that describes how a change in kinetic energy of an object changes the energy of the object itself indicating that energy was transferred to or from the object. 11. Students present oral or written arguments to support or refute the given explanation or model for the phenomenon. **ETS1.A** 1. Students will be able to Identify a problem to be solved, identify the system in which the problem is embedded, define criteria that must be taken into account, and define constraints that must be taken into account when deciding on a solution.

Relevant Standards:	Learning Goals:	Learning Objectives:
	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 is likely to limit possible solutions. 16. (secondary to NJ SLS.MS-PS3-3) Students will understand that a solution needs to be tested, and then modified on the basis of the test results in order to improve it. There are systematic processes for evaluating solutions with respect to how well they meet criteria and constraints of a problem.	

Formative Assessments	Summative Assessments:	Performance Assessments:	Major Activities/ Assignments (required):
• White board responses and presentations • Entrance Ticket or Exit Ticket • Drawing/interpretation of models • Quizzes • Questioning/Discussions (Q &A, A &Q) • Status Check (sticks, hands, thumbs up) • Student/Teacher/Peer Conferences • Graphic Organizers (Venn diagram of relationships) • Four Corners • Think/Pair/Share	Test	• Curious Crystals Lab – students have to use properties of substances to identify an unknown substance. • Final Writing Piece— Conclusion writing for labs (explanatory using evidence from lab) • Lab activity using the Scientific method: ~ Curious Crystals ~ Making Sense of Density ~ Drops on a Penny ~ Communicating results of lab writing a Conclusion citing evidence (data	• Student/Teacher/Peer Conferences • Interactive notebook (ISN) • Writing assignment specific to unit (global issues, final lab activity such as designed labs/models. • Choice of writing assignment (Interview with an atom, Diary of water) • Phase Change Lab, construct and interpret graphs,

Formative Assessments	Summative Assessments:	Performance Assessments:	Major Activities/ Assignments (required):
• Gallery Walk • Analyze and interpret data to determine similarities and differences from results of chemical reactions between substances before and after they undergo a chemical process. • Analyze and interpret data on the properties of substances before and after they undergo a chemical process. • Identify and describe possible correlation and causation relationships evidenced in chemical reactions. • Make logical and conceptual connections between evidence that chemical reactions have occurred and explanations of the properties of substances before and after they undergo a chemical process.			

Possible Assessment Modifications /Accommodations/ Differentiation:			
Special Education Students	**English Language Learners**	**At-Risk Learners**	**Advanced Learners**
• Study Guide- Pre-made for Unit Test • Extended time • Allow breaks during testing	• Study Guide- pre-made for Unit Test with pictures • Scaffolding and Simplifying directions: According to	• Study Guide- pre-made for Unit Test • Extended time	• Leveled reading • Increased quantity of choices

Possible Assessment Modifications /Accommodations/ Differentiation:			
Special Education Students	**English Language Learners**	**At-Risk Learners**	**Advanced Learners**
• Administer assessment in several sessions, specifying the duration of each session	language acquisition Tier (1, 2, 3) e.g. Tier 1 single-step directions	• Small group testing in a separate location and/or with minimal distractions • Clarify and repeat directions as needed	• Varied question format (Open Ended instead of Multiple Choice)

Instructional Strategies:
Modeling Scaffolding Direct Instruction Graphic Organizers (States of Matter) (Changes in states of matter) (atom) Homework Note-taking Interactive notebooks Guided/Independent Practice (explanation and citing evidence as to why phenomena happens) Academic Games Investigation (Design and conduct an investigation)

Possible Instructional Modifications /Accommodations/ Differentiation:			
Special Education Students	**English Language Learners**	**At-Risk Learners**	**Advanced Learners**
• Preferential seating • Mini-lessons on photosynthesis, cellular respiration, and energy transfer • Teacher modeling • One-to-one instruction • Direct explanation or instruction	Study guide for unit test with pictures Scaffolding and simplifying directions • All directions should be single step Scaffolding questions for writing with visuals /prompts • Fill in the blank with word	Study guide for unit test Scaffolding directions • Chunking Scaffolding questions for writing with prompts • Fill in the blank with word bank	Topic list overview Varied question format (open ended instead of multiple choice) Optional individual procedure/data for lab report Analysis and Synthesis if articles

Possible Instructional Modifications /Accommodations/ Differentiation:			
Special Education Students	**English Language Learners**	**At-Risk Learners**	**Advanced Learners**
• Cueing, prompting questions • Teacher clarification of assignment objectives • State/ highlight key points for students to focus on	bank • Utilize vocab sheet with English/native language and picture Frequent checks for understanding (1-1)	• Utilize vocab sheet with picture Frequent checks for understanding during labs	

Unit Vocabulary:
Essential: **Ch. 1:** properties of matter (many), matter, chemistry, substance, atom, chemical bond, molecule, chemical formula, heterogeneous, homogeneous, solution, mass, volume, density, energy, temperature, pressure, thermal energy, endothermic change, exothermic change, kinetic energy, potential energy, chemical energy, electromagnetic energy, electrical energy **Ch. 2** solid, liquid, gas, viscosity, amorphous solid, crystalline solid, fluid, surface tension, melting point, melting, sublimation, boiling point, freezing, vaporization, evaporation, boiling, condensation, Boyle's Law, Charles's Law **Ch. 3** nucleus, proton, neutron, electron, atomic number, isotope, mass number, model, atomic mass, period, chemical symbol, group, periodic table **Non-Essential:** Graphing terms - independent variable, dependent variable, direct relationship, inverse relationship (indirect)

Interdisciplinary Connections (Applicable Standards):	**Integration of Technology:**	**21st Century Themes:**	**21st Century Skills:**
ELA: NJ SLS.RST.6-8.3: Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. NJ SLS.WHST.6-8.7: Conduct short research projects to answer a question (including a self-generated question),	Technology: • Quizlet to assess student understanding of content and plan instruction • Blendspace activities offer students an opportunity to interact with content	__x__ Global Awareness Students will compare the physical characteristics of the surrounding neighborhood to other countries	__x__ Critical Thinking and Problem Solving; Use critical thinking to make sense of problems and persevere in solving them. __X__ Communication & Collaboration Articulate thoughts and ideas effectively using oral, written, and non-verbal communication skills in a variety of forms and context

Interdisciplinary Connections (Applicable Standards):	Integration of Technology:	21st Century Themes:	21st Century Skills:
drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration. NJ SLS.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. Mathematics: NJ SLS.8.EE.A.3: Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. Science: PS-1-A: Structure and Properties of Matter • 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. • Solids may be formed from molecules, or they may be extended structures with repeating subunits (e.g., crystals).	digitally to explore it using another medium • Virtual labs • Interactive sites • Powerpoints		

Interdisciplinary Connections (Applicable Standards):	Integration of Technology:	21st Century Themes:	21st Century Skills:
NJ SLS.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. NJ SLS.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			

Resources:
Texts/Materials: Prentice Hall Science Explorer Series - Chemical Building Blocks, Chemical Interactions,

Unit: 2 Chemical Reactions	Recommended Duration: [Weeks– Months] -- 5 WEEKS/ JAN.17TH - FEB. 16TH

Unit Description:
Students provide molecular-level accounts of states of matters and changes between states, of how chemical reactions involve regrouping of atoms to form new substances, and of how atoms rearrange during chemical reactions. Students also apply their understanding of optimization design and process in engineering to chemical reaction systems. The crosscutting concept of *energy and matter* provides a framework for understanding the disciplinary core ideas. Students are expected to demonstrate proficiency in *developing and using models, analyzing and interpreting data, designing solutions*, and *obtaining, evaluating, and communicating information*. Students are also expected to use these science and engineering practices to demonstrate understanding of the disciplinary core ideas.

Essential Question	Enduring Understanding
● How can you predict elements that are likely to combine in nature due to their atomic structure? ● How does a chemical equation demonstrate the law of conservation of matter? ● How can we trace synthetic materials back to natural ingredients?	● The periodic table orders elements horizontally according to the number of protons in the atom's nucleus; it organizes elements with similar chemical properties vertically, in columns. The repeating patterns of this table reflect patterns of outer electron states. ● Matter is conserved in physical and chemical processes. ● All substances are made of different combinations of elements from the periodic table

Relevant Standards:	Learning Goals:	Learning Objectives:
NJ SLS.**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 NJ SLS.**MS-PS1-6** Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.*	1. Students will understand that the total number of each type of atom is conserved, and thus the mass does not change. (NJ SLS.MS-PS1-5) 2. Students will understand that some chemical reactions release energy, others store energy.	PS1-5 (PS1.B) 1. Students will be able to develop a model in which they identify the relevant components for a given chemical reaction. 2. Students will be able to describe the relationships between the components such as the number of atoms in the products are the same number of atoms that make up the reactants. 3. Students will be able to connect the idea of conservation of mass/matter from their model reaction. PS1-6 (PS1.B) 1. Students will be able to solve a problem that

Relevant Standards:	Learning Goals:	Learning Objectives:
		requires either heating or cooling such as the system will either absorb or release thermal energy. ETS1.B 1. Students will be able to develop possible solutions of the criteria and constraints for the device such as amount of cost of materials and safety. 2. Students will be able to test the possible solutions for the release or absorption of thermal energy to or from the system.

Formative Assessments	Summative Assessments:	Performance Assessments:	Major Activities/ Assignments (required):
White board responses and presentations Entrance Ticket or Exit Ticket Drawing/interpretation of models Quizzes Questioning/Discussions (Q &A, A &Q) Status Check (sticks, hands, thumbs up) Student/Teacher/Peer Conferences Graphic Organizers (Venn diagram of relationships) Four Corners Think/Pair/Share Gallery Walk · Analyze and interpret data to determine similarities and differences from results of chemical reactions between substances before	CSA test	Final Writing Piece Lab activity using the Scientific method. Communicating results of lab writing a Conclusion citing evidence (data)	Student/Teacher/Peer Conferences Interactive notebook (ISN) Writing assignment specific to unit (global issues, final lab activity such as designed labs/models. **Major Assignments (required):** demonstrate knowledge of how to use periodic table **Major Activities (required**): use mathematics to model the Law of Conservation of Matter, model/design device either releases or absorbs thermal energy by chemical process

Formative Assessments	Summative Assessments:	Performance Assessments:	Major Activities/ Assignments (required):
and after they undergo a chemical process. · Analyze and interpret data on the properties of substances before and after they undergo a chemical process. · Identify and describe possible correlation and causation relationships evidenced in chemical reactions. Make logical and conceptual connections between evidence that chemical reactions have occurred and explanations of the properties of substances before and after they undergo a chemical process.			

Possible Assessment Modifications /Accommodations/Differentiation:			
Special Education Students	**English Language Learners**	**At-Risk Learners**	**Advanced Learners**
• Clarify and repeat directions as needed • Read aloud sections of the test/directions • Increase spacing between items or reduce items per page	• Clarify and repeat directions as needed • Read aloud sections of the test/directions • Increase spacing between items or reduce items per page	• Allow breaks during testing • Administer assessment in several sessions, specifying the duration of each session	Leveled reading Increased quantity of choices Varied question format (Open Ended instead of Multiple Choice)

Instructional Strategies:
Modeling Scaffolding Direct Instruction Graphic Organizers Homework Note-taking Interactive notebooks Guided/Independent Practice (explanation and citing evidence as to why phenomena happens) Academic Games Investigation (Design and conduct an investigation)

Possible Instructional Modifications /Accommodations/Differentiation:			
Special Education Students	**English Language Learners**	**At-Risk Learners**	**Advanced Learners**
• Graphic organizers • Chunking writing tasks in to more manageable pieces • Cooperative learning • Flexible grouping • Focus on particular techniques of informative writing • Summarizing and Note taking • Mini-lessons on how to write a lab report and how to document observations/results • Leveled text	• Offer alternatives to writing e.g. Checklist • One-to-one conferencing on topics of need for individual students • Immediate feedback	Vocab • Key words/ Picture Graphic organizers • Notes (fill in, copy of teacher notes, additional examples) • Diagrams (organization of chemical reactions) Leveled reading • Organization of chemicals Flexible grouping • Station/lab partner Cueing/prompting • Categorization of chemical compounds	Vocab • Frayer model for key terms Graphic organizers • Student created diagrams Leveled reading • Higher level for current event and class articles Flexible grouping • Homogeneous grouping

Unit Vocabulary:
Essential: Interactions textbook: Chapter 1: Review of key terms from last unit in Ch. 1 from last unit (Building Blocks), chemical bond, Electron Dot Diagram (Bohr's model), Ionic bonds, ions, chemical formula, subscript, Covalent Bonds, Conservation of Matter (mass) Non-Essential: Scientific Method terms, graphing terms

Interdisciplinary Connections (Applicable Standards):	**Integration of Technology:**	**21st Century Themes:**	**21st Century Skills:**
E/LA: NJ SLS.RST.6-8.1: Cite specific textual evidence to support analysis of science and technical texts. NJ SLS.RST.6-8.3: Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. NJ SLS.RST.6-8.7: Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually *Mathematics*: MP.2: Reason abstractly and quantitatively. MP.4: Model with mathematics. Science: NJ SLS.PS3.D: 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	Technology: Quizlet Blendspace activities Virtual labs Interactive sites Powerpoints	__x__ Environmental Literacy: Student will demonstrate knowledge and understanding of the environment and the circumstances and conditions affecting it, particularly as relates to the introduction of chemical elements into air, climate, land, food, energy, water and ecosystems	__X__ Communication & Collaboration Articulate thoughts and ideas effectively using oral, written, and non-verbal communication skills in a variety of forms and context

Interdisciplinary Connections (Applicable Standards):	Integration of Technology:	21st Century Themes:	21st Century Skills:
combine to form carbon-based organic molecules and release oxygen NJ SLS.LS1.C: Plants use the energy from light to make sugars through photosynthesis. Within individual organisms, food is broken down through a series of chemical reactions that rearrange molecules and release energy NJ SLS LS2.B: Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. NJ SLS.ESS2.A : Construct an explanation based on evidence for how geoscience processes have changed Earth's surfaces at varying times and spatial scales			

Resources:
Texts/Materials: Materials should include various levels of texts (Newsela is one example. Provide suggested titles.) **Prentice Hall Science Explorer Series - Chemical Building Blocks, Chemical Interactions**

Unit: 3 Stability and Change on Earth (Earth's Systems)	Recommended Duration: [Weeks– Months] - 3 WEEKS/ FEB. 21ST - MAR.9TH

Unit Description:
Students construct an understanding of the ways that human activities affect Earth's systems. Students use practices to understand the significant and complex issues surrounding human uses of land, energy, mineral, and water resources and the resulting impacts on the development of these resources. Students also understand that the distribution of these resources is uneven due to past and current geosciences processes or removal by humans. The crosscutting concepts of patterns, cause and effect, and stability and change are called out as organizing concepts for these disciplinary core ideas. In this unit of study students are expected to demonstrate proficiency in asking questions, analyzing and interpreting data, constructing explanations, and designing solutions. Students are also expected to use these practices to demonstrate understanding of the core ideas.

Essential Question	Enduring Understanding
1. What are the renewable and nonrenewable resources that humans depend on from the Earth? What are the causes of some of the depleting resources in which we depend?	Humans depend on Earth's land, ocean, atmosphere and biosphere for many resources such as coal, freshwater, greenhouse effect etc. These resources are limited because of the uneven distribution around the planet due to geologic processes but there are renewable resources that we can use to limit our use of nonrenewable sources.

Relevant Standards:	Learning Goals:	Learning Objectives:
NJ SLS.MS-ESS3-1 Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes	1.Students will understand that humans depend on Earth's land, ocean, atmosphere, and biosphere for many different resources. Minerals, fresh water, and biosphere resources are limited, and many are not renewable or replaceable over human lifetimes. These resources are distributed unevenly around the planet as a result of past geologic processes. (NJ SLS.MS-ESS3-1) 2.Students will understand that typically as human populations and per-capita	ESS3-1 (ESS3.A) 1. Students will be able to explain how the past and current geoscience processes have caused the uneven distribution of Earth's resources. 2. Students will be able to identify the scientific evidence and connect this evidence to explain ways in which the extraction of each type of resource by people changes how much and where more of the that resource can be found.

Relevant Standards:	Learning Goals:	Learning Objectives:
	consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise. (MS-ESS-3, MS-ESS3-4) 3. Students will understand that human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth's mean surface temperature (global warming). Reducing the level of climate change and reducing human vulnerability to whatever climate changes do occur depend on the understanding of climate science, engineering capabilities, and other kinds of knowledge, such as understanding of human behavior and on applying that knowledge wisely in decisions and activities.(MS-ESS3-5)	

Formative Assessments	Summative Assessments:	Performance Assessments:	Major Activities/ Assignments (required):
White board responses and presentations Entrance Ticket or Exit Ticket Drawing/interpretation of models Quizzes Questioning/Discussions (Q &A, A &Q) Status Check (sticks, hands, thumbs up) Student/Teacher/Peer Conferences	CSA TEST	Final Writing Piece Lab activity using the Scientific method. Communicating results of lab writing a Conclusion citing evidence (data)	Student/Teacher/Peer Conferences Interactive notebook (ISN) Writing assignment specific to unit (global issues, final lab activity such as designed labs/models. Major Assignments (required): analyze distribution of renewable and nonrenewable resources around the world

Formative Assessments	Summative Assessments:	Performance Assessments:	Major Activities/ Assignments (required):
Graphic Organizers (Venn diagram of relationships) Four Corners Think/Pair/Share Gallery Walk			Major Activities (required): use interactive maps to research locations of renewable and nonrenewable resources

Possible Assessment Modifications /Accommodations/ Differentiation:			
Special Education Students	**English Language Learners**	**At-Risk Learners**	**Advanced Learners**
• Reduce superfluous words within questions and responses • Rephrase test directions/questions • Chunking Information	• Reduce superfluous words within questions and responses • Rephrase test directions/questions • Chunking Information	• Read aloud sections of the test/directions Increase spacing between items or reduce items per page • Rephrase test directions/questions • Highlight key ideas	• Leveled reading • Increased quantity of choices • Varied question format (Open Ended instead of Multiple Choice)

Instructional Strategies:
Modeling Scaffolding Direct Instruction Graphic Organizers Homework Note-taking Interactive notebooks Guided/Independent Practice (explanation and citing evidence as to why phenomena happens) Academic Games Investigation (Design and conduct an investigation)

Possible Instructional Modifications /Accommodations/ Differentiation:			
Special Education Students	**English Language Learners**	**At-Risk Learners**	**Advanced Learners**
• Tiered Assignments • Scaffolding questions • Highlight key ideas • Teacher Notes • Comprehension Check- Monitor and check for understanding • Provide small group and/or individualized instruction when needed • Cueing strategies to promote on task behavior- refocus/redirect • Organization Check- provide organizational support as needed	• Clarify and repeat directions as needed • Use visual cues • Model expectations provided additional examples • Limit number of oral instructions	Oral responses in place of written extended response Limit multiple choice options and provide visuals on assessments Lab format • Chunk directions • Highlight key vocabulary • Modified response rubric • Report template Extended time (quizzes and tests)	• Enrichment Opportunities • Cooperative learning • Flexible grouping • Analysis and Synthesis of articles at advanced reading level

Unit Vocabulary:
Essential: fuel, fossil fuel, energy transformation, hydrocarbon, combustion, solar energy, hydroelectric power, biomass fuel, geothermal energy, nuclear fission **Non-Essential:** refinery, reactor, meltdown, efficiency, energy conservation

Interdisciplinary Connections (Applicable Standards):	**Integration of Technology:**	**21st Century Themes:**	**21st Century Skills:**
E/LA: NJ SLS.RST.6-8.1: Cite specific textual evidence to support analysis of science	Technology: Quizlet	__X__ Environmental Literacy: Students will investigate and analyze environmental issues, and	__X__ Communication & Collaboration Articulate thoughts and ideas effectively using oral, written, and non-verbal

Interdisciplinary Connections (Applicable Standards):	Integration of Technology:	21st Century Themes:	21st Century Skills:
and technical texts. NJ SLS.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. NJ SLS.WHST.6-8.9: Draw evidence from informational texts to support analysis, reflection, and research. Science: • NJ SLS.PS1.A: Structure of properties and matter - Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties. (2-PS1-1) • Different properties are suited to different purposes. (2-PS1-2),(2-PS1-3) • A great variety of objects can be built up from a small set of pieces. (2-PS1-3) • NJ SLS.PS1.B: Chemical Reactions- Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not. (2-PS1-4) • NJ SLS.ESS2.D : Weather and Climate- Scientists record patterns	Blendspace activities Virtual labs Interactive sites Powerpoints	make accurate conclusions about effective solutions	communication skills in a variety of forms and context __x__ Critical Thinking and Problem Solving; Use critical thinking to make sense of problems and persevere in solving them.

Interdisciplinary Connections (Applicable Standards):	Integration of Technology:	21st Century Themes:	21st Century Skills:
of the weather across different times and areas so that they can make predictions about what kind of weather might happen next. (3-ESS2-1) • Climate describes a range of an area's typical weather conditions and the extent to which those conditions vary over years. (3-ESS2-2)			

Resources:
Texts/Materials: Prentice Hall Science Explorer Series - Environmental Science

Unit: 4 The Electromagnetic Spectrum (Waves and Electromagnetic Radiation)	Recommended Duration: [Weeks– Months] -- 4 WEEKS/ MAR. 14TH - APR. 6TH
Unit Description: In this unit of study, students develop and use models, use mathematical thinking, and obtain, evaluate, and communicate information in order to describe and predict characteristic properties and behaviors of waves. Students also apply their understanding of waves as a means of sending digital information. The crosscutting concepts of patterns and structure and function are used as organizing concepts for these disciplinary core ideas. Students develop and use models, use mathematical thinking, and obtain, evaluate, and communicate information. Students are also expected to use these practices to demonstrate understanding of the core ideas.	

Essential Question	Enduring Understanding
1. How can you represent a wave using mathematical equations? 2. Why are waves reflected, absorbed or transmitted differently through different materials?	1. Simple waves have repeating patterns with specific wavelengths, frequencies, and amplitudes. 2. The amplitude of a wave is related to the energy in a wave.

Relevant Standards:	Learning Goals:	Learning Objectives:
NJ SLS.MS-PS4-1 Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave NJ SLS.MS-PS4-2 Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials NJ SLS.MS-PS4-3. Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals	1. Students will understand that a simple wave has a repeating pattern with a specific wavelength, frequency, and amplitude. (NJ SLS.MS-PS4-1) 2. Students will understand that a sound wave needs a medium through which it is transmitted. 3. Students will understand that when light shines on an object, it is reflected, absorbed, or transmitted through the object, depending on the object's material and the frequency (color) of the light. (NJ SLS.MS-PS4-2) 4. Students will understand that a wave	**PS4-1 (PS4.A)** 1. **Students will be able to identify, analyze the** characteristics of a simple mathematical wave model such as frequency, amplitude and wavelength and predict changes in the energy of the wave if one of the parameters of the wave is changed. PS4.-2 (PS4.A - PS4.B) 1. Students will be able to develop and identify relevant components of a wave. 2. Students will be able to describe the relationships between how waves interact with materials. 3. Students will be able to use model to make connections of why materials with certain properties are well suited for particular functions.

Relevant Standards:	Learning Goals:	Learning Objectives:
	model of light is useful for explaining brightness, color, and the frequency-dependent bending of light at a surface between media. (NJ SLS.MS-PS4-2) 5. Students will understand that digitized signals (sent as wave pulses) are a more reliable way to encode and transmit information. (NJ SLS.MS-PS4-3)	PS4-3 (PS4.C) 1. Students will be able to gather and evaluate evidence to support a claim that includes the idea that using waves to carry digital signals is a more reliable way to encode and transmit information than using waves to carry analog signals.

Formative Assessments	Summative Assessments:	Performance Assessments:	Major Activities/ Assignments (required):
White board responses and presentations Entrance Ticket or Exit Ticket Drawing/interpretation of models Quizzes Questioning/Discussions (Q &A, A &Q) Status Check (sticks, hands, thumbs up) Student/Teacher/Peer Conferences Graphic Organizers (Venn diagram of relationships) Four Corners Think/Pair/Share Gallery Walk	CSA TEST	Final Writing Piece Lab activity using the Scientific method. Communicating results of lab writing a Conclusion citing evidence (data)	Student/Teacher/Peer Conferences Interactive notebook (ISN) Writing assignment specific to unit (global issues, final lab activity such as designed labs/models. Major Assignments (required): EMS journal for a week, demonstrate knowledge of how microwaves allow us to communicate Major Activities (required): compare/contrast chart of types of EMS waves

Possible Assessment Modifications /Accommodations/ Differentiation:			
Special Education Students	**English Language Learners**	**At-Risk Learners**	**Advanced Learners**
• Highlight key ideas • Provide visual cues such as arrows Limited multiple choice/shortened assessments • Scaffolding questions	• Highlight key ideas • Provide visual cues such as arrows Limited multiple choice/shortened assessments • Scaffolding questions	• Scaffolding questions • On-task/focusing prompts • Allow typed extended responses	Leveled reading Increased quantity of choices Varied question format (Open Ended instead of Multiple Choice)

Instructional Strategies:
Modeling Scaffolding Direct Instruction Graphic Organizers Homework Note-taking Interactive notebooks Guided/Independent Practice (explanation and citing evidence as to why phenomena happens) Academic Games Investigation (Design and conduct an investigation)

Possible Instructional Modifications /Accommodations/ Differentiation:			
Special Education Students	**English Language Learners**	**At-Risk Learners**	**Advanced Learners**
1. Clarify and repeat directions as needed 2. Use visual cues 3. Activity breaks 4. Increase eye contact 5. Physical proximity	• Tiered Assignments • Scaffolding questions • Highlight key ideas • Comprehension Check-Monitor and check for understanding	Frequent checks for understanding (1-1) Oral responses in place of written extended response	Enrichment Opportunities Cooperative learning Flexible grouping Analysis and Synthesis if articles

Possible Instructional Modifications /Accommodations/ Differentiation:			
Special Education Students	**English Language Learners**	**At-Risk Learners**	**Advanced Learners**
6. Model expectations provided additional examples 7. Limit number of oral instructions 8. Copy of class notes	• Provide small group and/or individualized instruction when needed • Organization/Comprehension Checks- provide organizational support as needed	• Use of diagrams/pictures Limit multiple choice options and provide visuals on assessments • Extended time (quizzes and tests)	

Unit Vocabulary:
Essential: compression waves, transverse waves, frequency, wavelength, radio waves, infrared waves, ultraviolet waves, X-rays, gamma rays, visible light, microwaves, hertz, angstroms **Non-Essential:** data, cell phone, communication

Interdisciplinary Connections (Applicable Standards):	**Integration of Technology:**	**21st Century Themes:**	**21st Century Skills:**
E/LA: NJ SLS.RST.6-8.1: Cite specific textual evidence to support analysis of science and technical texts. NJ SLS.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. NJ SLS.RST.6-8.9: Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained	Technology: Quizlet Blendspace activities Virtual labs Interactive sites Powerpoints	__x__ Environmental Literacy: Students develop and use models, use mathematical thinking, and obtain, evaluate, and communicate information in order to describe and predict characteristic properties and behaviors of waves.	__X__ Communication & Collaboration Articulate thoughts and ideas effectively using oral, written, and non-verbal communication skills in a variety of forms and context __x__ Critical Thinking and Problem Solving; Use critical thinking to make sense of problems and persevere in solving them.

Interdisciplinary Connections (Applicable Standards):	Integration of Technology:	21st Century Themes:	21st Century Skills:
from reading a text on the same topic. NJ SLS.WHST.6-8.9: Draw evidence from informational texts to support analysis, reflection, and research. NJ SLS.SL.8.5: Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest. Mathematics: MP.2: Reason abstractly and quantitatively. MP.4: Model with mathematics. NJ SLS.8.F.A.3: Interpret the equation *y = mx + b* as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. Science: NJ SLS.LS1.D: Information Processing - Different sense receptors are specialized for particular kinds of information, which may be then processed by the animal's brain. Animals are able to use their perceptions and memories to guide their actions. (4-LS1-2)			

Resources:
Texts/Materials: Prentice Hall Science Explorer Series Astronomy page 119, PBS Learning Media, Discovery Education

Unit 5: FORCE AND MOTION	Recommended Duration: [Weeks– Months] -- This unit will be taught in the 8th grade for the next two years as we fade into the new curriculum.
Unit Description: Students use system and system models and stability and change to understanding ideas related to why some objects will keep moving and why objects fall to the ground. Students apply Newton's third law of motion to related forces to explain the motion of objects. Students also apply an engineering practice and concept to solve a problem caused when objects collide. The crosscutting concepts of system and system models and stability and change provide a framework for understanding the disciplinary core ideas. Students demonstrate proficiency in asking questions, planning and carrying out investigations, designing solutions, engaging in argument from evidence, developing and using models, and constructing explanations and designing solutions. Students are also expected to use these practices to demonstrate understanding of the core ideas.	

Essential Question	Enduring Understanding
How can we predict the motion of an object? How does mass of an object affect the motion of an object?	All objects in the universe follow the same laws of motion (Newton's Three laws). The mass of an object will affect the motion of the object and the speed at which it can travel.

Relevant Standards:	Learning Goals:	Learning Objectives:
NJ SLS.MS-PS2-1 Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects. * NJ SLS.MS-PS2-2Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object. [NJ SLS.MS-ETS1-1Define 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. NJ SLS.MS-ETS1-2Evaluate competing design solutions using a systematic process to	Students will be able to understand that for any pair of interacting objects, the force exerted by the first object on the second object is equal in strength to the force that the second object exerts on the first, but in the opposite direction (Newton's third law). Students will be able to understand that the motion of an object is determined by the sum of the forces acting on it; if the total force on the object is not zero, its motion will change. The greater the mass of the object, the greater the force needed to achieve the same change in motion. For any given object, a larger force causes a larger change in motion.	Students will be able to plan an investigation individually and collaboratively which will display the change in motion of an object and in the design: identify independent and dependent variables and controls, what tools are needed to do the gathering, how measurements will be recorded, and how many data are needed to support a claim Students will be able to identify how mass in this system affects the motion of the objects by testing out collisions of two objects by testing several variables in the investigation.

Relevant Standards:	Learning Goals:	Learning Objectives:
determine how well they meet the criteria and constraints of the problem. NJ SLS.MS-ETS1-3Analyze 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. NJ SLS.MS-ETS1-4Develop 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.	Students will be able to understand that all positions of objects and the directions of forces and motions must be described. Students will understand that for any action there is an equal and opposite reaction (Newton's 3rd Law). MS-PS2-1 Students will understand that the motion of an object is determined by the relationship of the object's force and mass (newton's 2nd law) (MS-PS2-2)	

Formative Assessments	Summative Assessments:	Performance Assessments:	Major Activities/ Assignments (required):
White board responses and presentations Entrance Ticket or Exit Ticket Drawing/interpretation of models Quizzes Questioning/Discussions (Q &A, A &Q) Status Check (sticks, hands, thumbs up) Student/Teacher/Peer Conferences Graphic Organizers (Venn diagram of relationships) Four Corners Think/Pair/Share Gallery Walk	CSA TEST	Final Writing Piece Lab activity using the Scientific method. Communicating results of lab writing a Conclusion citing evidence (data)	Student/Teacher/Peer Conferences Interactive notebook (ISN) Writing assignment specific to unit (global issues, final lab activity such as designed labs/models.

Possible Assessment Modifications /Accommodations/ Differentiation:			
Special Education Students	**English Language Learners**	**At-Risk Learners**	**Advanced Learners**
• On-task/focusing prompts • Allow typed extended responses • Allow for retakes/redos	• On-task/focusing prompts • Allow typed extended responses • Allow for retakes/redos	• On-task/focusing prompts • Allow typed extended responses	Leveled reading Increased quantity of choices Varied question format (Open Ended instead of Multiple Choice)

Instructional Strategies:
Modeling Scaffolding Direct Instruction Graphic Organizers Homework Note-taking Interactive notebooks Guided/Independent Practice (explanation and citing evidence as to why phenomena happens) Academic Games Investigation (Design and conduct an investigation)

Possible Instructional Modifications /Accommodations/ Differentiation:			
Special Education Students	**English Language Learners**	**At-Risk Learners**	**Advanced Learners**
• Alternatives to writing Checklist • Multisensory approaches • One-to-one conferencing on topics of need for individual students	• Graphic organizers • Chunking writing tasks in to more manageable pieces • Cooperative learning • Summarizing and Note taking • Mini-lessons on how to write a lab report and how to	Study guide for unit test Scaffolding directions • Chunking Scaffolding questions for writing with prompts • Fill in the blank with word	Enrichment Opportunities Cooperative learning Flexible grouping Analysis and Synthesis if articles

Possible Instructional Modifications /Accommodations/ Differentiation:			
Special Education Students	**English Language Learners**	**At-Risk Learners**	**Advanced Learners**
• Construction of peer review of groups based on flexible grouping • Homework assignments simplify/shorten • Reinforcing effort and providing recognition • Immediate feedback • Learning Contracts	document observations/results	bank • Utilize vocab sheet with picture Frequent checks for understanding during labs Oral responses in place of written extended response	

Unit Vocabulary:
Essential: motion, speed, velocity, acceleration, forces (unbalanced and balanced), inertia, gravity, Newton's laws of motion, mass, momentum **Non-Essential:** measuring terms: mass, grams, meters, centimeters Graphing terms: variables (independent and dependent), x-axis, y-axis,

Interdisciplinary Connections (Applicable Standards):	**Integration of Technology:**	**21st Century Themes:**	**21st Century Skills:**
E/LA: NJ SLS.RST.6-8.1: Cite specific textual evidence to support analysis of science and technical texts. NJ SLS.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. NJ SLS.RST.6-8.3: Follow precisely a multistep procedure when carrying out	Technology: Quizlet Blendspace activities Virtual labs Interactive sites Powerpoints	__X__ Health Literacy: Real world problems related to exercise & caloric intake. Discussions of balancing equations & balancing calories intake and energy expended.	__X__ Communication & Collaboration Articulate thoughts and ideas effectively using oral, written, and non-verbal communication skills in a variety of forms and context __x__ Critical Thinking and Problem Solving; Use critical thinking to make sense of problems and persevere in solving them.

Interdisciplinary Connections (Applicable Standards):	Integration of Technology:	21st Century Themes:	21st Century Skills:
experiments, taking measurements, or performing technical tasks. NJ SLS.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. NJ SLS.WHST.6-8.9: Draw evidence from informational texts to support analysis, reflection, and research. NJ SLS.SL.8.5: Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest Mathematics: MP.2: Reason abstractly and quantitatively. MP.4: Model with mathematics. NJ SLS.8.EE.B.5: Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways NJ SLS.8.EE.B.6: Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.			

Interdisciplinary Connections (Applicable Standards):	Integration of Technology:	21st Century Themes:	21st Century Skills:
NJ SLS.8.F.A.3: Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.			

Resources:
Texts/Materials: Prentice Hall Science Explorer Series

Unit: 6 Relationships Among Forms of Energy (Energy)	Recommended Duration: [Weeks– Months] -- 10 WEEKS/APR. 19TH - END OF YEAR
Unit Description: In this unit, students use the practices of analyzing and interpreting data, developing and using models, and engaging in argument from evidence to make sense of relationship between energy and forces. Students develop their understanding of important qualitative ideas about the conservation of energy. Students understand that objects that are moving have kinetic energy and that objects may also contain stored (potential) energy, depending on their relative positions. Students also understand the difference between energy and temperature, and the relationship between forces and energy. The crosscutting concepts of scale, proportion, and quantity, systems and system models, and energy and matter are called out as organizing concepts for these disciplinary core ideas. Students use the practices of analyzing and interpreting data, developing and using models, and engaging in argument from evidence. Students are also expected to use these practices to demonstrate understanding of the core ideas.	

Essential Question	Enduring Understanding
1. How is Kinetic energy related to the mass and speed of an object? 2. How is Gravitational Potential Energy related to vertical height and mass? 3. Why is energy conserved when the kinetic energy of an object changes?	1. Kinetic energy is proportional to the mass of a moving object and grows with the square of its speed. **K.E. = 1/2 mv^2** 2. Stored potential energy grows as distance between the objects increases. (electric, magnetic and gravitational interactions) 3. Energy is not created or destroyed only transferred to another system, Law of Conservation of Energy.

Relevant Standards:	Learning Goals:	Learning Objectives:
NJ SLS.MS-PS3-1, Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object NJ SLS.MS-PS3-2, Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system NJ SLS.MS-PS3-5. Construct, use, and present arguments to	1. Students will understand that motion energy is properly called kinetic energy; it is proportional to the mass of the moving object and grows with the square of its speed. (MS-PS3-1) 2. Students will understand that a system of objects may also contain stored (potential) energy, depending on their relative positions. (MS-PS3-2) 3. Students will understand that when the motion energy of an object changes, there is inevitably some other change in energy at the same time. (MS-PS3-5) 4. Students will understand that when two	PS3-1 (PS3.A) 1. Students will be able to organize data, identify relationships and interpret data to explain the relationship between kinetic energy and the mass and velocity of the object. PS3-2 (PS3.A AND PS3.C) 1. Students will be able to identify relationships and make connections between potential energy and the types of forces through which the objects interact with distance between the objects as a main cause of change to potential energy. PS3-5 (PS3.B) 1. Students will be able to support the claim that

Relevant Standards:	Learning Goals:	Learning Objectives:
support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.	objects interact, each one exerts a force on the other that can cause energy to be transferred to or from the object. (MS-PS3-2)	energy is conserved in a system when the kinetic energy of the object changes. 2. Students will be able to evaluate, reason and synthesize that with observable features (motion, temperature, etc.), that kinetic energy of the object increases or decreases, the energy of the other objects or surroundings within the system increases or decreases, showing a transfer of energy to or from the object. 3. Students will be able to present oral or written arguments to support or refute the given explanation of this law.

Formative Assessments	Summative Assessments:	Performance Assessments:	Major Activities/ Assignments (required):
White board responses and presentations Entrance Ticket or Exit Ticket Drawing/interpretation of models Quizzes Questioning/Discussions (Q &A, A &Q) Status Check (sticks, hands, thumbs up) Student/Teacher/Peer Conferences Graphic Organizers (Venn diagram of relationships) Four Corners Think/Pair/Share Gallery Walk	CSA TEST	Final Writing Piece Lab activity using the Scientific method. Communicating results of lab writing a Conclusion citing evidence (data)	Student/Teacher/Peer Conferences Interactive notebook (ISN) Writing assignment specific to unit (global issues, final lab activity such as designed labs/models. Major Assignments (required): create data table and graph that analyzes the relationship between kinetic energy, speed, and mass Major Activities (required): plan an investigation that demonstrates how energy changes as it is transferred between objects (Bounce ball lab, Rocket lab)

Possible Assessment Modifications /Accommodations/ Differentiation:			
Special Education Students	**English Language Learners**	**At-Risk Learners**	**Advanced Learners**
• Pace long-term projects • Chunk long-term assignments • Oral Testing • Picture Prompts • No penalty for spelling errors	• Pace long-term projects • Chunk long-term assignments • Oral Testing • Picture Prompts • No penalty for spelling errors • Oral testing	• Allow for retakes/redos • Pace long-term projects • Chunk long-term assignments	Leveled reading Increased quantity of choices Varied question format (Open Ended instead of Multiple Choice)

Instructional Strategies:
Modeling Scaffolding Direct Instruction Graphic Organizers Homework Note-taking Interactive notebooks Guided/Independent Practice (explanation and citing evidence as to why phenomena happens) Academic Games Investigation (Design and conduct an investigation)

Possible Instructional Modifications /Accommodations/ Differentiation:			
Special Education Students	**English Language Learners**	**At-Risk Learners**	**Advanced Learners**
• Jigsaw • Learning Stations • Timer • Extended time • Creating a flexible timetable for deadlines	• Mini-lessons on photosynthesis, cellular respiration, and energy transfer • Teacher modeling	Study guide for unit test Scaffolding directions • Chunking Scaffolding questions for writing with	Enrichment Opportunities Cooperative learning Flexible grouping Analysis and Synthesis if articles

Possible Instructional Modifications /Accommodations/ Differentiation:			
Special Education Students	**English Language Learners**	**At-Risk Learners**	**Advanced Learners**
• Student input into rubrics • Provide additional and follow-up reviews • Additional tutoring time during	• Direct explanation or instruction • Clarification of assignment objectives • State/ highlight key points for student's focus	prompts • Fill in the blank with word bank • Utilize vocab sheet with picture Frequent checks for understanding during labs • kinetic energy, • thermal energy • electrical energy • nuclear energy, • electromagnetic energy transformation • law of conservation of energy Oral responses in place of written extended response	

Unit Vocabulary:
Essential: kinetic energy, potential energy, mass, speed, mechanical energy, thermal energy, electrical energy, nuclear energy, electromagnetic energy, energy transformation, law of conservation of energy, **Non-Essential: Graphing terms,** Newton's Laws, velocity, combustion, fossil fuels, force, unbalanced force, balanced force, inertia

Interdisciplinary Connections (Applicable Standards):	Integration of Technology:	21st Century Themes:	21st Century Skills:
E/LA: NJ SLS.RST.6-8.1: Cite specific textual evidence to support analysis of science and technical texts. NJ SLS.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. NJ SLS.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. NJ SLS.WHST.6-8.9: Draw evidence from informational texts to support analysis, reflection, and research. Mathematics: NJ SLS.6.RP.A.1: Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. NJ SLS.6.RP.A.3: Use ratio and rate reasoning to solve real-world and mathematical problem NJ SLS.7.RP.A.2: Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship.	Technology: Quizlet Blendspace activities Virtual labs Interactive sites Powerpoints	__X__ Financial, Economic, Business, & Entrepreneurial Literacy Establish an understanding that career-ready individuals take regular action to contribute to their personal financial wellbeing, understanding that personal financial security provides the peace of mind required to contribute more fully to their own career success.	__X__ Communication & Collaboration Articulate thoughts and ideas effectively using oral, written, and non-verbal communication skills in a variety of forms and context __x__ Critical Thinking and Problem Solving; Use critical thinking to make sense of problems and persevere in solving them.

Resources:
Texts/Materials: Prentice Hall Science Explorer Series Motion, Forces, and Energy