Science 8 Honors

Curriculum Guide

Dunmore School District

Dunmore, PA

Science 8 Honors

Prerequisite:

- Successful completion of Science 7

The students in Science 8 will be introduced to fundamental concepts in chemistry and physics. Chemistry and physics are math-based sciences therefore, Science 8 Honors students are required to learn formulas and solve basic equations independently. The first half of the year involves studying matter, including elements and compound, and their bonding characteristics. Also, an in depth study of the periodic table. During the second half of the year, the physical world is studied including motion, forces, energy, work, and simple machines. Throughout the year, laboratory activities and demonstrations are used. These allow students to improve their knowledge of the components of experiments, while developing critical thinking and scientific reasoning.

Dunmore School District
Curriculum Guide

Year-at-a-glance

Subject: Science 8	**Grade Level: 8**	**Date Completed: 5/18/2018**

1st Quarter

Topic	Resources	Standards
Science Skills	Approved textbook and workbook *Physical Science: Concepts in Action:* Chapter 1 Worksheets Bell Ringer Review PowerPoint	S8.A.1.1.1 S8.A.1.1.2 S8.A.1.1. S8.A.2.1.3 S8.A.2.2.2 S8.A.3.2.1
Introduction to Chemistry: Properties of Matter	Approved textbook and workbook *Physical Science: Concepts in Action:* Chapter 2 Worksheets Bell Ringer Review PowerPoint	S8.C.1.1.1 S8.C.1.1.2
Introduction to Chemistry: States of Matter	Approved textbook and workbook *Physical Science: Concepts in Action:* Chapter 3 Worksheets Bell Ringer Review PowerPoint	S8.C.1.1.2 S8.C.3.1.2 S11.C.1.1.2

2nd Quarter

Topic	Resources	Standards
Introduction to Chemistry: Atomic Structure	Approved textbook and workbook *Physical Science: Concepts in Action:* Chapter 4 Worksheets Bell Ringer Review PowerPoint	S8.C.1.1.1. S11.C.1.1.1
Introduction to Chemistry: The Periodic Table	Approved textbook and workbook *Physical Science: Concepts in Action:* Chapter 5 Worksheets Bell Ringer Review PowerPoint	S8.C.1.1.1 S11.C.1.1.4
Introduction to Chemistry: Chemical Bonds	Approved textbook and workbook *Physical Science: Concepts in Action:* Chapter 6 Worksheets Bell Ringer Review PowerPoint	S8.C.1.1.1 E S11.C.1.1.3
Introduction to Chemistry: Chemical Reactions	Approved textbook and workbook *Physical Science: Concepts in Action:* Chapter 7 Worksheets Bell Ringer Review PowerPoint	S8.C.1.1.1 S8.C.1.1.2 S8.C.1.1.3 S11.C.1.1.6

3rd Quarter

Topic	Resources	Standards
Introduction to Chemistry: Chemical Reactions (continued)	Approved textbook and workbook *Physical Science: Concepts in Action:* Chapter 7 Worksheets Bell Ringer Review PowerPoint	S8.C.1.1.1 S8.C.1.1.2 S8.C.1.1.3 S11.C.1.1.6
Introduction to Physics: Forces and Motion	Approved textbook and workbook *Physical Science: Concepts in Action:* Chapter 12 Worksheets Bell Ringer Review PowerPoint	S8.C.3.1.1 S8.C.3.1.2
Introduction to Physics: Work, Power, and Machines	Approved textbook and workbook *Physical Science: Concepts in Action:* Chapter 14 Worksheets Bell Ringer Review PowerPoint	S8.A.1.1.1 S8.C.3.1.1 S8.C.3.1.2 S8.C.3.1.3
Introduction to Physics: Energy	Approved textbook and workbook *Physical Science: Concepts in Action:* Chapter 15 Worksheets Bell Ringer Review PowerPoint	S8.C.2.1.1 S8.C.2.1.2 S8.C.2.1. S8.C.2.2.1. S8.C.2.2.2 S8.C.2.2.3

4th Quarter

Topic	Resources	Standards
Introduction to Physics: Thermal Energy and Heat	Approved textbook and workbook *Physical Science: Concepts in Action:* Chapter 16 Worksheets Bell Ringer Review PowerPoint	S8.C.2.1.2
PSSA Review and Testing Window	Approved text *Perfection Learning's How to Get Better Test Scores*	
Introduction to Physics: Electricity	Approved textbook and workbook *Physical Science: Concepts in Action:* Chapter 20 Worksheets Bell Ringer Review PowerPoint	S.6.C.3.2.1 S.6.C.3.2.2 S.6.C.3.2.3. S11.C.2.1.4
Introduction to Physics: Magnetism	Approved textbook and workbook *Physical Science: Concepts in Action:* Chapter 21 Worksheets Bell Ringer Review PowerPoint	S.6.C.3.2.1
Review and Final Exam		

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Science Skills	**Anchor Descriptor:** S8.A.1.1 Explain, interpret, and apply scientific, environmental, or technological knowledge presented in a variety of formats (e.g., visuals, scenarios, graphs). S8.A.2.1 Apply knowledge of scientific investigation or technological design in different contexts to make inferences to solve problems. S8.A.2.2 Apply appropriate instruments for a specific purpose and describe the information the instrument can provide. S8.A.3.2 Apply knowledge of models to make predictions, draw inferences, or explain technological concepts. **PA Academic Standards: Science** 3.2.4 A Identify and use the nature of scientific and technological knowledge. Provide clear explanations that account for observations and	**Eligible Content:** S8.A.1.1.1 Distinguish between a scientific theory and an opinion, explaining how a theory is supported with evidence, or how new data/information may change existing theories and practices. S8.A.1.1.2 Explain how certain questions can be answered through scientific inquiry and/or technological design. S8.A.1.1.3 Use evidence, such as observations or experimental results, to support inferences about a relationship. S8.A.2.1.3 Design a controlled experiment by specifying how the independent variables will be manipulated, how the dependent variable will be measured, and which variables will be held constant.	**Approved textbook and workbook** *Physical Science: Concepts in Action:* Chapter 1 Worksheets Bell Ringer Review PowerPoint	**Teacher prepared tests** **Quizzes** **Worksheets**	**18 days**

	results. Relate how new information can change existing. 3.2.4 C Recognize and use the elements of scientific inquiry to solve problems. Generate questions about objects, organisms and/or events that can be answered through scientific investigations. Design an investigation. Conduct an experiment. State a conclusion that is consistent with the information. 3.1.4 B Know models as useful simplifications of objects or processes. Identify and apply models as tools for prediction and insight. Apply appropriate simple modeling tools and techniques. Identify theories that serve as models. 3.2.4 B Describe objects in the world using the five senses. Recognize observational	S8.A.2.2.2 Apply appropriate measurement systems (e.g., time, mass, distance, volume, temperature) to record and interpret observations under varying conditions. S8.A.3.2.1 Describe how scientists use models to explore relationships in natural systems. **Essential Knowledge/Skills: Explain how science and technology are related.** List the major branches of natural science and describe how they develop. Describe the main ideas of physical science. Describe the steps in scientific method. Identify the relationship between the independent and dependent variable using experimental design. Write a hypothesis to show cause and effect of factors in an experiment. Compare and contrast facts,			

	descriptors from each of the five senses (e.g., see-blue, feel-rough). Use observations to develop a descriptive vocabulary. **PA Core Standards: Reading for Science and Technical Subjects, 6-12** 3.5 Reading Informational Text Students read, understand, and respond to informational text-with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence. **PA Core Standards: Writing for Science and Technical Subjects, 6-12** 3.6 Writing Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content.	scientific theories, and scientific laws. Explain the importance of models in science. Explain the importance of safety in science. Perform calculations involving scientific notation and conversion factors. Identify the metric and SI units used in science and convert between common metric prefixes. Compare and contrast accuracy and precision. Relate the Celsius, Kevin, and Fahrenheit scales. Organize and analyze data using tables and graphs. Explain the importance of communicating accurate data and discuss peer review. **Vocabulary:**			

		Science Technology Chemistry Physics Geology Astronomy Geology scientific method observation Qualitative observation Quantitative observation Hypothesis Independent variable Dependent variable Controlled experiment Scientific theory Scientific law Model Direct relationship Inverse relationship			

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Properties of Matter **Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.**	**Anchor Descriptor:** S8.C.1.1 Explain concepts about the structure and properties (physical and chemical) of matter. S8.A.1.3 Identify and analyze evidence that certain variables may have caused measurable changes in natural or human-made systems. S8.A.2.1 Apply knowledge of scientific investigation or technological design in different contexts to make inferences to solve problems. S8.A.2.2 Apply appropriate instruments for a specific purpose and describe the information the instrument can provide. **PA Academic Standards: Science** 3.2.10.B Apply process knowledge and organize scientific and technological phenomena in varied ways. Describe materials using precise quantitative and qualitative	**Eligible Content:** S8.C.1.1.1 Explain the differences among elements, compounds, and mixtures. S8.C.1.1.2 Use characteristic physical or chemical properties to distinguish one substance from another (e.g., density, thermal expansion/contraction, freezing/melting points, streak test). **Essential Knowledge/Skills:** **Pure substances are made from a single type of atom or compound; each pure substance has characteristic physical and chemical properties that can be used to identify it.** Generate evidence supporting the claim that one pure substance can be distinguished from another based on given characteristic properties.	**Approved textbook and workbook** *Physical Science: Concepts in Action:* Chapter 2 Worksheets Bell Ringer Review PowerPoint	**Teacher prepared tests** **Quizzes** **Worksheets**	**15 days**

	skills based on observations. Develop appropriate scientific experiments: raising questions, formulating hypotheses, testing, controlled experiments, recognizing variables, manipulating variables, interpreting data, and producing solutions. 3.4.7. A Describe concepts about the structure and properties of matter. Identify elements as basic building blocks of matter that cannot be broken down chemically. Distinguish compounds from mixtures. Describe and conduct experiments that identify chemical and physical properties. **PA Core Standards:** **Reading for Science and Technical Subjects, 6-12** 3.5 Reading Informational Text Students read, understand, and respond to informational text-	**Each pure substance has characteristic physical and chemical properties that can be used to identify it.** Select appropriate materials, based on their physical and/or chemical properties, to be used to identify an unknown substance. Classify pure substances as elements or compounds. Describe the characteristics of an element and the symbols used to identify the elements. Describe the characteristics of a compound. Distinguish pure substances from mixtures. Classify mixtures as heterogeneous or homogeneous. Classify mixtures as solutions, suspensions, or colloids.			

	with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence. **PA Core Standards: Writing for Science and Technical Subjects, 6-12** 3.6 Writing Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content.	Describe physical properties of matter. Identify substances based on their physical properties. Describe methods used to separate mixtures. Describe evidence that indicates a physical change is taking place. Describe chemical properties of matter. Describe clues that indicate that a chemical change is taking place. Distinguish chemical changes from physical changes. **Vocabulary:** Pure Substances Element Compound Mixture Heterogeneous Mixture			

		Homogeneous Mixture Solution Solute Solvent Colloid Suspension Physical properties Viscosity Boiling point Conductivity Density Flammability Malleability Melting point Odor Chemical properties Pure Substance Reactivity Solubility Chemical change Physical change			

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
States of Matter **Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.**	**Anchor Descriptor:** S8.A.3.2 Apply knowledge of models to make predictions, draw inferences, or explain technological concepts. S8.C.1.1 Explain concepts about the structure and properties (physical and chemical) of matter. S8.C.3.1 Describe the effect of multiple forces on the movement, speed, or direction of an object. **PA Academic Standards: Science** 3.1.7.B Describe the use of models as an application of scientific or technological concepts. Identify and describe different types of models and their functions. Apply models to predict specific results and observations (e.g., population growth, effects of infectious organisms).	**Eligible Content:** S8.C.1.1.2 Use characteristic physical or chemical properties to distinguish one substance from another (e.g., density, thermal expansion/contraction, freezing/melting points, streak test). S8.C.3.1.2 Distinguish between kinetic and potential energy. S11.C.1.1.2 Explain the relationship between the physical properties of a substance and its molecular or atomic structure. **Essential Knowledge/Skills:** **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.**	**Approved textbook and workbook** *Physical Science: Concepts in Action:* Chapter 3 Worksheets Bell Ringer Review PowerPoint	**Teacher prepared tests** **Quizzes** **Worksheets**	**10 days**

	Explain systems by outlining a system's relevant parts and its purpose and/or designing a model that illustrates its function. 3.4.10.A Predict the behavior of gases through the use of Boyle's, Charles' or the ideal gas law, in everyday situations. Describe phases of matter according to the Kinetic Molecular Theory. **PA Core Standards: Reading for Science and Technical Subjects, 6-12** 3.5 Reading Informational Text Students read, understand, and respond to informational text- with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence. **PA Core Standards: Writing for Science and Technical Subjects, 6-12** 3.6 Writing Students write for different purposes and audiences. Students write clear and focused	Construct models comparing the arrangement and motion of molecules within solids, liquids and gases of the same substance. **The changes of state that occur with variations in temperature or pressure can be described and predicted.** Determine the temperature at which a substance is solid, liquid and/or gas. Describe the five states of matter. Classify materials as solids, liquids, or gases. Explain the behavior of gases, liquids, and solids using kinetic theory. Define pressure and gas pressure. Identify factors that affect gas pressure. Predict changes in gas pressure due to changes in			

	text to convey a well-defined perspective and appropriate content.	temperature, volume, and number of particles. Explain Charles's law, Boyle's law, and the combined gas law. Apply gas laws to solve problems involving gases. Describe phase changes. Explain what happens to the motion, arrangement, and average kinetic energy of water molecules during phase changes. Describe each of the six phase changes and identify as endothermic or exothermic. **Vocabulary:** Solids Liquids Gases Kinetic energy Pressure Absolute zero Charles's Law Boyle's Law Phase change Endothermic			

		Exothermic Vaporization Evaporation Vapor pressure Condensation Sublimation Deposition			

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Atomic Structure **Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.**	**Anchor Descriptor:** S8.A.3.2 Apply knowledge of models to make predictions, draw inferences, or explain technological concepts. S8.C.1.1 Explain concepts about the structure and properties (physical and chemical) of matter. **PA Academic Standards: Science** 3.1.10.B Describe concepts of models as a way to predict and understand science and technology. Distinguish between different types of models and modeling techniques and apply their appropriate use in specific applications (e.g., kinetic gas theory, DNA). 3.4.10.A Explain concepts about the structure and properties of matter. Know that atoms are composed of even smaller sub-atomic structures whose	**Eligible Content:** S8.C.1.1.1 Explain the differences among elements, compounds, and mixtures. S11.C.1.1.1 Explain that matter is made of particles called atoms and that atoms are composed of even smaller particles (e.g., protons, neutrons, electrons). **Essential Knowledge/Skills:** **All substances are made of atoms, which combine with one another in various ways.** Recognize how the atomic model has changed over time. Identify the subatomic particles of an atom based on the periodic table. **Vocabulary:** Protons Electrons	**Approved textbook and workbook** *Physical Science: Concepts in Action:* Chapter 4 Worksheets Bell Ringer Review PowerPoint	**Teacher prepared tests** **Quizzes** **Worksheets**	**12 days**

	properties are measurable. **PA Core Standards: Reading for Science and Technical Subjects, 6-12** 3.5 Reading Informational Text Students read, understand, and respond to informational text- with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence. **PA Core Standards: Writing for Science and Technical Subjects, 6-12** 3.6 Writing Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content.	Neutrons Atomic Number Atomic mass Isotopes Electron Cloud Model Energy levels Atomic orbitals Electron configuration (excited state, ground state)			

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
The Periodic Table **Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.**	**Anchor Descriptor:** S8.C.1.1 Explain concepts about the structure and properties (physical and chemical) of matter. S8.A.3.3 Describe repeated processes or recurring elements in natural, scientific, and technological patterns. **PA Academic Standards: Science** 3.1.10.B Describe concepts of models as a way to predict and understand science and technology. Examine the advantages of using models to demonstrate processes and outcomes (e.g., blue print analysis, structural stability). 3.4.10.A Explain concepts about the structure and properties of matter. Explain the repeating pattern of chemical properties by using the repeating patterns of atomic structure within the	**Eligible Content:** S8.C.1.1.1 Explain the differences among elements, compounds, and mixtures. S11.C.1.1.4 Explain how the relationships of chemical properties of elements are represented in the repeating patterns within the periodic table. **Essential Knowledge/Skills: The relationships of chemical properties of elements are represented in the repeating patterns within the periodic table.** Understand how the elements were organized into groups based on repeating patterns within the periodic table. Describe the periodic table using accurate vocabulary. Using what you know about the repeating pattern of	**Approved textbook and workbook** *Physical Science: Concepts in Action:* Chapter 5 Worksheets Bell Ringer Review PowerPoint	**Teacher prepared tests** **Quizzes** **Worksheets**	**12 days**

	periodic table. **PA Core Standards: Reading for Science and Technical Subjects, 6-12** 3.5 Reading Informational Text Students read, understand, and respond to informational text- with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence. **PA Core Standards: Writing for Science and Technical Subjects, 6-12** 3.6 Writing Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content.	chemical properties and atomic structure within the periodic table, identify key properties of an element based on its location on the periodic table. Identify the name and symbol for the main group elements and common transition metals. **Vocabulary:** Periodic Law Periods Groups Atomic Mass Metals Transition Metals Nonmetals Metalloids Valence electrons Main group elements names and key properties: Alkali Metals, Alkaline Earth Metals, Boron Family, Carbon Family, Nitrogen Family, Oxygen Family, Halogens, Noble Gases)			

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Chemical Bonds **Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.**	**Anchor Descriptor:** S8.A.3.2 Apply knowledge of models to make predictions, draw inferences, or explain technological concepts. S8.C.1.1 Explain concepts about the structure and properties (physical and chemical) of matter. **PA Academic Standards: Science** 3.1.10.B Describe concepts of models as a way to predict and understand science and technology. • Distinguish between different types of models and modeling techniques and apply their appropriate use in specific applications (e.g., kinetic gas theory, DNA). 3.4.10.A Explain concepts about the structure and properties of matter. Know that atoms are composed	**Eligible Content:** S8.C.1.1.1 Explain the differences among elements, compounds, and mixtures. S11.C.1.1.3 Explain the formation of compounds (ionic and covalent) and their resulting properties using bonding theories. **Essential Knowledge/Skills:** **All substances are made of atoms, which combine with one another in various ways.** Represent models of simple molecules based on the type of bond (ionic, covalent) using bond diagrams. Identify characteristics of metallic bonds. Name compounds and write chemical formulas for ionic and molecular formulas. Identify basic differences	**Approved textbook and workbook** *Physical Science: Concepts in Action:* Chapter 6 Worksheets Bell Ringer Review PowerPoint	**Teacher prepared tests** **Quizzes** **Worksheets**	**17 days**

	of even smaller sub-atomic structures whose properties are measurable Recognize formulas for simple inorganic compounds. Understand that carbon can form several types of compounds. 3.4.12 A Apply concepts about the structure and properties of matter. Apply rules of systematic nomenclature and formula writing to chemical substances. **PA Core Standards:** **Reading for Science and Technical Subjects, 6-12** 3.5 Reading Informational Text Students read, understand, and respond to informational text-with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence. **PA Core Standards: Writing for Science and Technical Subjects, 6-12** 3.6 Writing Students write for different	between nonpolar and polar covalent bonds. **Vocabulary:** Chemical Bonds Octet Rule Chemical Formulas Lewis Structures (electron dot diagrams) Ions Cations Anions Ionic Bonds Covalent Bonds Molecules Polar Covalent Bonds Nonpolar Covalent Bonds Metallic Bonds			

	purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content.				

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Chemical Reactions **Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.**	**Anchor Descriptor:** S8.C.1.1 Explain concepts about the structure and properties (physical and chemical) of matter. S8.A.1.3 Identify and analyze evidence that certain variables may have caused measurable changes in natural or human-made systems. S8.A.2.1 Apply knowledge of scientific investigation or technological design in different contexts to make inferences to solve problems. S8.A.2.2 Apply appropriate instruments for a scientific purpose and describe the information the instruments can provide. **PA Academic Standards: Science** 3.4.7. A Describe concepts about the structure and properties of matter. Identify elements as basic building blocks of matter that cannot be broken down	**Eligible Content:** S8.C.1.1.1 Explain the differences among elements, compounds, and mixtures. S8.C.1.1.2 Use characteristic physical or chemical properties to distinguish one substance from another. S8.C.1.1.3 Identify and describe reactants and products of simple chemical reactions. S11.C.1.1.6 Describe factors that influence the frequency of collisions during chemical reactions that might affect the reaction rates (e.g., surface area, concentration, catalyst, temperature). **Essential Knowledge/Skills:** **The amount of matter is conserved regardless of what reaction or change in properties occurs, the total mass of the substances involved does not change.**	**Approved textbook and workbook** *Physical Science: Concepts in Action:* Chapter 7 Worksheets Bell Ringer Review PowerPoint	**Teacher prepared tests** **Quizzes** **Worksheets**	**17 days**

	chemically. Describe reactants and products of simple chemical reactions. 3.4.10.A Explain concepts about the structure and properties of matter. Recognize formulas for simple inorganic compounds. Describe various types of chemical reactions by applying the laws of conservation of mass and energy. 3.2.10.B Describe concepts of models as a way to predict and understand science and technology. Examine the advantages of using models to demonstrate processes and outcomes (e.g., blue print analysis, structural stability). 3.4.12 A Apply concepts about the structure and properties of matter. Apply rules of systematic nomenclature and formula writing to chemical substances. Classify and describe, in equation form, types of	Determine the effect on the total mass of a substance when the substance changes shape, phase, and/or is dissolved. Investigate the interaction of two or more substances to determine whether a new substance is formed when materials are mixed. Interpret chemical equations in terms of reactants, products, and conservation of mass. Based on the law of conservation of mass, balance chemical equations by manipulating coefficients. Convert between moles and mass of a substance using molar mass. Completed using dimensional analysis. Classify chemical reactions as synthesis, decomposition, single-replacement, double-replacement, or combustion reactions.			

	chemical and nuclear reactions. Quantify the properties of matter (e.g., density, solubility coefficients) by applying mathematical formulas. **PA Core Standards: Reading for Science and Technical Subjects, 6-12** 3.5 Reading Informational Text Students read, understand, and respond to informational text- with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence. **PA Core Standards: Writing for Science and Technical Subjects, 6-12** 3.6 Writing Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content.	Describe the energy changes that take place during chemical reactions. Classify chemical reactions as endothermic or exothermic. Explain how energy is conserved during chemical reactions. Explain what a reaction rate is. Describe the factors affecting chemical reaction rates. Identify and describe physical and chemical equilibria. Describe the factors affecting chemical equilibrium. **Vocabulary:** Reactants Products Chemical equation Coefficients Mole (Avogadro's Number) Molar Mass Synthesis Reaction Decomposition Reaction Single-Replacement Reaction Double-Replacement Reaction Combustion Reaction			

		Oxidation-Reduction Reaction Chemical Energy Exothermic Reaction Endothermic Reaction Reaction Rate Catalyst Equilibrium Reversible Reaction			

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Forces and Motion **Interactions between any two objects can cause changes in one or both of them.**	**Anchor Descriptors:** S8.A.1.1 Explain, interpret, and apply scientific, environmental, or technological knowledge presented in a variety of formats (e.g., visuals, scenarios, graphs). S8.A.2.1 Apply knowledge of scientific investigation or technological design in different contexts to make inferences to solve problems. S8.A.2.2 Apply appropriate instruments for a scientific purpose and describe the information the instruments can provide. S8.A.3.2 Apply knowledge of models to make predictions, draw inferences, or explain technological concepts. **PA Academic Standards: Science** 3.1.7.B Describe the use of models as an application of scientific or technological concepts. Identify and describe different types of models and their functions.	**Eligible Content:** S8.C.3.1.1 Describe forces acting on objects (e.g. friction, gravity, balanced versus unbalanced). S8.C.3.1.2 Distinguish between kinetic and potential energy. **Essential Knowledge/Skills:** **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.** **A pair of interacting objects apply equal and opposite forces on one another.** **Gravitational forces are always attractive. There is a gravitational force between all objects. This force is dependent upon mass and distance between the objects.**	**Approved textbook and workbook** *Physical Science: Concepts in Action:* Chapter 12 Worksheets Bell Ringer Review PowerPoint	**Teacher prepared tests** **Quizzes** **Worksheets**	**10 days**

	Apply models to predict specific results and observations (e.g., population growth, effects of infections organisms). Explain systems by outlining a system's relevant parts and its purpose and/or designing a model that illustrates its function. 3.4.7.D Identify gravity as the force that keeps planets in orbit around the sun and governs the rest of the movement of the solar system and universe. 3.1.10.B Apply mathematical models to science and technology 3.4.7.C Identify and explain the principles of force and motion. Describe the motion of an object based on its position, direction and speed. 3.4.12.C Describe inertia, motion, equilibrium, and action/reaction concepts through words, models and mathematical symbols.	Using given data that represents the relationship of gravitational interactions (force, mass, distance) and the motion of objects in space. Represent how an object's relative position, velocity, and direction of motion are affected by forces acting on the object. Design a qualitative solution to a problem involving the motion of colliding objects. Describe examples of force and identify appropriate SI units used to measure force. Explain how the motion of an object is affected when balanced and unbalanced forces act on it. Compare and contrast the four kinds of friction. Describe how Earth's gravity and air resistance affect falling objects.			

	PA Core Standards: Reading for Science and Technical Subjects, 6-12 3.5 Reading Informational Text Students read, understand, and respond to informational text- with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence. **PA Core Standards: Writing for Science and Technical Subjects, 6-12** 3.6 Writing Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content.	Describe the path of a projectile and identify the forces that produce projectile motion. Describe Newton's first law of motion and its relation to inertia. Describe Newton's second law of motion and use it to calculate acceleration, force, and mass values. Relate the mass of an object to its weight. Explain how action and reaction forces are related according to Newton's third law of motion. Calculate the momentum of an object and describe what happens when momentum is conserved during a collision. Identify the forms of electromagnetic force that can both attract and repel. Identify and describe the universal forces acting within the nucleus.			

		Define Newton's law of universal gravitation and describe the factors affecting gravitational force. Describe centripetal force and the type of motion it produces. **Vocabulary:** Force Newton (SI unit) Net Force Friction Static Friction Sliding Friction Rolling Friction Fluid Friction Air Resistance Gravity Terminal Velocity Projectile Motion Inertia Mass Weight Momentum Law of Conservation of Momentum Electromagnetic Force Strong Nuclear Force Weak Nuclear Force Gravitational Force Centripetal Force			

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Work, Power, and Machines **Interactions between any two objects can cause changes in one or both of them.**	**Anchor Descriptor:** S8.A.1.1 Explain, interpret, and apply scientific, environmental, or technological knowledge presented in a variety of formats (e.g., visuals, scenarios, graphs). S8.C.3.1 Describe the effect of multiple forces on the movement, speed, or direction of an object. **PA Academic Standards: Science** 3.4.4.C Recognize forces that attract or repel other objects and demonstrate them. Describe various types of motions. Compare the relative movement of objects and describe types of motion that are evident. Describe the position of an object by locating it relative to another object or the background (e.g., geographic direction, left, up). 3.4.7.C Explain various motions using models.	**Eligible Content:** S8.A.1.1.1 Distinguish between a scientific theory and an opinion, explaining how a theory is supported with evidence, or how new data/information may change existing theories and practices. S8.C.3.1.1 Describe forces acting on objects (e.g., friction, gravity, balanced versus unbalanced). S8.C.3.1.2 Distinguish between kinetic and potential energy. S8.C.3.1.3 Explain that mechanical advantage helps to do work (physics) by either changing a force or changing the direction of the applied force (e.g., simple machines, hydraulic systems). **Essential Knowledge/Skills: Explain that the mechanical advantages produced by simple machines helps to do work (physics) by either overcoming a force or**	**Approved textbook and workbook** *Physical Science: Concepts in Action:* Chapter 14 Worksheets Bell Ringer Review PowerPoint	**Teacher prepared tests** **Quizzes** **Worksheets**	**10 days**

	3.4.10.C Identify elements of simple machines in compound machines. **PA Core Standards: Reading for Science and Technical Subjects, 6-12** 3.5 Reading Informational Text Students read, understand, and respond to informational text-with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence. **PA Core Standards: Writing for Science and Technical Subjects, 6-12** 3.6 Writing Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content.	**changing the direction of the applied force.** Given a scenario involving simple machines, qualitatively compare the mechanical advantage of each. Based on this analysis, argue which machine is best for the task. Describe the conditions that must exist for a force to do work on an object. Calculate the work done on an object. Describe and calculate power. Compare the units of watts and horsepower as they relate to power. Describe what a machine is and how it makes work easier to do. Relate the work input to a machine to the work output of the machine. Compare a machine's actual			

		mechanical advantage to its ideal mechanical advantage. Calculate the ideal and actual mechanical advantages of various machines. Calculate a machine's efficiency and explain why the efficiency is always less than 100%. Name, describe, and give an example of the six types of simple machines. Describe how to determine the ideal mechanical advantage of each type of simply machine. Describe and identify compound machines. **Vocabulary:** Work Joule Power Watt, Horsepower Machine Input Force Input Distance Work Input Output Force			

		Output Distance Work Output Mechanical Advantage Actual Mechanical Advantage Ideal Mechanical Advantage Efficiency Lever Fulcrum Input Arm, Output Arm Wheel and Axle Inclined Plane Wedge Screw Pulley Compound Machine			

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Energy **Interactions of objects or systems of objects can be predicted and explained using the concept of energy transfer and conservation.**	**Anchor Descriptor:** S8.A.2.1 Apply knowledge of scientific investigation or technological design in different contexts to make inferences to solve problems. S8.A.2.2 Apply appropriate instruments for a specific purpose and describe the information the instrument can provide. S8.C.2.1 Describe energy sources, transfer of energy, or conversion of energy. S8.C.2.2 Compare the environmental impact of different energy sources chosen to support human endeavors. **PA Academic Standards: Science** 3.4.7.B Explain the conversion of one form of energy to another by applying knowledge of each form of energy. **PA Core Standards: Reading for Science and Technical Subjects, 6-12** 3.5 Reading Informational Text Students read, understand, and	**Eligible Content:** S8.C.2.1.1 Distinguish among forms of energy (e.g., electrical, mechanical, chemical, light, sound, nuclear) and sources of energy (i.e., renewable and nonrenewable energy) S8.C.2.1.2 Explain how energy is transferred from one place to another through convection, conduction, or radiation. S8.C.2.1.3 Describe how one form of energy (e.g., electrical, mechanical, chemical, light, sound, nuclear) can be converted into a different form of energy. S8.C.2.2.1 Describe the Sun as the major source of energy that impacts the environment. S8.C.2.2.2 Compare the time span of renewability for fossil fuels and the time span of renewability for alternative fuels. S8.C.2.2.3 Describe the waste (i.e., kind and quantity)	**Approved textbook and workbook** *Physical Science: Concepts in Action:* Chapter 15 Worksheets Bell Ringer Review PowerPoint	**Teacher prepared tests** **Quizzes** **Worksheets**	**10 days**

	respond to informational text-with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence. **PA Core Standards: Writing for Science and Technical Subjects, 6-12** 3.6 Writing Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content.	derived from the use of renewable and nonrenewable resources and their potential impact on the environment. **Essential Knowledge/Skills: Whenever a transformation of energy occurs, some of the energy in the system appears as thermal energy.** Compare, evaluate, and design a device that improves thermal energy transfer, and defend the selection of materials chosen to construct the device. Describe the relationship between work and energy. Relate kinetic energy to mass and speed and calculate these quantities. Analyze how potential energy is related to an object's position and give example of gravitational and elastic potential energy.			

		Solve equations that relate an object's gravitational potential energy to its mass and height. Give examples of the major forms of energy and explain how each is produced. Describe conversions of energy from one form to another. State and apply the law of conservation of energy. Analyze how energy is conserved in conversions between kinetic energy and potential energy and solve equations that equate initial energy to final energy. Describe the relationship between energy and mass and calculate how much energy is equivalent to a given mass.			

		Classify energy resources as renewable or nonrenewable. Evaluate benefits and drawbacks of different energy sources. Describe ways to conserve energy resources. **Vocabulary:** Energy Kinetic energy Potential energy Gravitational potential energy Elastic potential energy Mechanical energy Thermal energy Chemical energy Electrical energy Electromagnetic energy Nuclear energy Energy conversion Law of conservation of energy Nonrenewable energy resources Fossil fuels Renewable energy resources Hydroelectric energy Solar energy Geothermal energy			

		Biomass energy Hydrogen fuel cells Energy Conservation			

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Thermal Energy and Heat **Interactions of objects or systems of objects can be predicted and explained using the concept of energy transfer and conservation.**	**Anchor Descriptor:** S8.A.3.2 Apply knowledge of models to make predictions, draw inferences, or explain technological concepts. S8.C.2.1 Describe energy sources, transfer of energy, or conversion of energy **PA Academic Standards: Science** 3.4.4.B Identify energy forms and examples (e.g., sunlight, heat, stored, motion). Know the concept of the flow of energy by measuring flow through an object or system. Classify materials as conductors and nonconductors. 3.2.10.B Apply process knowledge and organize scientific and technological phenomena in varied ways. **PA Core Standards: Reading for Science and Technical Subjects, 6-12** 3.5 Reading Informational Text Students read, understand, and respond to informational text-	**Eligible Content:** S8.C.2.1.2 Explain how energy is transferred from one place to another through convection, conduction, or radiation **Essential Knowledge/Skills:** **Energy is transferred from hotter regions or objects and into colder ones by the processes of conduction, convection, and radiation.** **The term "heat" as used in everyday language refers both to thermal motion (the motion of atoms or molecules within a substance) and electromagnetic radiation (particularly infrared and light).** Communicate the means by which thermal energy is transferred during	**Approved textbook and workbook** *Physical Science: Concepts in Action:* Chapter 16 Worksheets Bell Ringer Review PowerPoint	**Teacher prepared tests** **Quizzes** **Worksheets**	**5 days**

	with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence. **PA Core Standards: Writing for Science and Technical Subjects, 6-12** 3.6 Writing Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content.	conduction, convection, and radiation. Explain how heat and work transfer energy. Relate thermal energy to the motion of particles that make up a material. Relate temperature to thermal energy and to thermal expansion. Calculate thermal energy, temperature change, or mass using the specific heat equation. Describe how a calorimeter operates. Describe conduction, convection, and radiation and identify which of these is occurring in a given situation. Classify materials as thermal conductors or thermal insulators. Apply the second law of thermodynamics in situations where thermal energy moves			

		from cooler to warmer objects. State the third law of thermodynamics. Describe heat engines and how they convert thermal energy into mechanical energy. Describe how different heating and cooling systems operate. **Vocabulary:** Heat Temperature Absolute zero Thermal Expansion Specific heat Calorimeter Conduction Thermal conductor Thermal insulator Convection Convection current Radiation Thermodynamics Heat engine Waste heat External combustion engine Internal combustion engine Central heating system			

		Heat pump Refrigerant			

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
PSSA Review and Testing Window	**Anchor Descriptor:** **All anchors reviewed for PSSA test preparation.** **PA Academic Standards: Science** **PA Core Standards: Reading for Science and Technical Subjects, 6-12** 3.5 Reading Informational Text Students read, understand, and respond to informational text- with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence. **PA Core Standards: Writing for Science and Technical Subjects, 6-12** 3.6 Writing Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content.	**Eligible Content:** **All anchors reviewed for PSSA test preparation.** **Essential Knowledge/Skills:** All skills reviewed for PSSA test preparation. **Vocabulary:** All necessary vocabulary reviewed for PSSA test preparation.	**Perfection Learning's How to Get Better Test Scores**	**Perfection Learning's How to Get Better Test Scores Practice Tests**	**15 days**

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Electricity **Interactions of objects or systems of objects can be predicted and explained using the concept of energy transfer and conservation.**	**Anchor Descriptor:** S.6.C.3.2 Describe how magnets and electricity produce related forces. **PA Academic Standards: Science** 3.4.10 B Analyze energy sources and transfers of heat. Explain resistance, current and electro-motive force (Ohm's Law). 3.4.10 C Distinguish among the principles of force and motion. Identify the relationship of electricity and magnetism as two aspects of a single electromagnetic force. Identify elements of simple machines in compound machines. 3.4.4 B Know basic energy types, sources and conversions. Identify energy forms and examples (e.g., sunlight, heat, stored, motion). Know the concept of the flow of	**Eligible Content:** S.6.C.3.2.1 Describe how moving electric charges produce magnetic forces and moving magnets produce electric forces. S.6.C.3.2.2 Describe the relationships between voltage, current, and resistance (Ohm's Law). S.6.C.3.2.3 Distinguish between gravity and electromagnetism. S11.C.2.1.4 Use Ohm's Law to explain relative resistances, currents, and voltage. **Essential Knowledge/Skills:** Analyze factors that affect the strength and direction of electric forces and fields. Describe how electric forces and fields affect electric charges. Describe how electric charges are transferred and explain	**Approved textbook and workbook** *Physical Science: Concepts in Action:* Chapter 20 Worksheets Bell Ringer Review PowerPoint	**Teacher prepared tests** **Quizzes** **Worksheets**	**14 days**

	energy by measuring flow through an object or system. Describe static electricity in terms of attraction, repulsion and sparks. Apply knowledge of the basic electrical circuits to design and construction simple direct current circuits. Classify materials as conductors and nonconductors. **PA Core Standards: Reading for Science and Technical Subjects, 6-12** 3.5 Reading Informational Text Students read, understand, and respond to informational text- with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence. **PA Core Standards: Writing for Science and Technical Subjects, 6-12** 3.6 Writing Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content.	why electric charges occur. Describe electric current and identify the two types of current. Describe conduction and classify materials as good electrical conductors or good electrical insulators. Describe the facts that affect resistance. Explain how voltage produces electric current. Calculate voltage, current, and resistance using Ohm's law. Analyze and draw circuit diagrams for series and parallel circuits. Solve equations that relate electric power to current, voltage, and electrical energy. Describe devices for maintaining electrical safety. Describe how electronic			

		devices used to control electron flow. Describe how solid-state components are used in electronic devices. **Vocabulary:** Electric charge Electric force Electric field Static electricity Law of conservation of charge Induction Electric current Direct current Alternating current Electrical conductor Electrical insulator Resistance Superconductor Potential difference Voltage Battery Ohm's law Electric circuit Series circuit Parallel circuit Electric power Fuse Circuit breaker Grounding Electronics			

		Electronic signal Analog signal Digital signal Semiconductor Diode Transistor Integrated circuit			

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Magnetism **Interactions of objects or systems of objects can be predicted and explained using the concept of energy transfer and conservation.**	**Anchor Descriptor:** S.6.C.3.2 Describe how magnets and electricity produce related forces. **PA Academic Standards: Science** 3.4.10 C Distinguish among the principles of force and motion. Identify the relationship of electricity and magnetism as two aspects of a single electromagnetic force. **PA Core Standards: Reading for Science and Technical Subjects, 6-12** 3.5 Reading Informational Text Students read, understand, and respond to informational text- with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence. **PA Core Standards: Writing for Science and Technical Subjects, 6-12** 3.6 Writing Students write for different	**Eligible Content:** S.6.C.3.2.1 Describe how moving electric charges produce magnetic forces and moving magnets produce electric forces. **Essential Knowledge/Skills:** Describe the effects of magnetic forces and magnetic fields and explain how magnetic poles determine the direction of magnetic force. Describe Earth's magnetic field. Explain the behavior of ferromagnetic materials in terms of magnetic domains. Describe how moving electric charge creates a magnetic field and determine the direction of the magnetic field based on the type of charge and the direction of its motion.	**Approved textbook and workbook** *Physical Science: Concepts in Action:* Chapter 21 Worksheets Bell Ringer Review PowerPoint	**Teacher prepared tests** **Quizzes** **Worksheets**	**8 days**

	purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content.	Explain how solenoids and electromagnets are constructed and describe factors that affect the field strength of both Describe how electric current is generated by electromagnetic induction. Compare AC and DC generators and how they work. Summarize how electrical energy is produced, transmitted, and converted for use in the home. **Vocabulary:** Magnetic force Magnetic pole Magnetic field Magnetosphere Magnetic domain Ferromagnetic material Electromagnetic force Solenoid Electromagnet Galvanometer Electric motor Electromagnetic induction Generator Transformer Turbine			

General Topic	Anchor Descriptor PA Academic and Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Review and Final Exam					**7 days**

PA Core Standards:
Reading for Science and Technical Subjects, 6-12

3.5 Reading Informational Text
Students read, understand, and respond to informational text-with emphasis on comprehension, making connections among ideas and between texts with focus on textual evidence.

Grades 6-8

CC.3.5.6-8.A.
Cite specific textual evidence to support analysis of science and technical texts.

CC.3.5.6-8.B.
Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

CC.3.5.6-8.C.
Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

CC.3.5.6-8.D.
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.

CC.3.5.6-8.E.
Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.

CC.3.5.6-8.F.
Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.

CC.3.5.6-8.G.
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).

CC.3.5.6-8.H.
Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.

CC.3.5.6-8.I.
Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

CC.3.5.6-8.J.
By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.

PA Core Standards:
Writing for Science and Technical Subjects, 6-12

3.6 Writing
Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content.

Grades 6-8

CC.3.6.6-8.A.
Write arguments focused on discipline-specific content.

- Introduce claim(s) about a topic or issue, acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically.
- Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources.
- Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence.
- Establish and maintain a formal style.
- Provide a concluding statement or section that follows from and supports the argument presented.

CC.3.6.6-8.B. *
Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

- Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories as appropriate to achieving purpose; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.
- Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.
- Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.
- Use precise language and domain-specific vocabulary to inform about or explain the topic.
- Establish and maintain a formal style and objective tone.
- Provide a concluding statement or section that follows from and supports the information or explanation presented.

CC.3.6.6-8.C.
Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

CC.3.6.6-8.D.
With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.

CC.3.6.6-8.E.
Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

CC.3.6.6-8.F.
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.

CC.3.6.6-8.G.
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.

CC.3.6.6-8.H.
Draw evidence from informational texts to support analysis reflection, and research.

CC.3.6.6-8.J.I.
Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.