

BATAAN MILITARY ACADEMY

Grades 9-12 Science Curriculum Alignment with State Standards

NM Statute 22-13-1.6.A. Each school district shall align its curricula to meet the state standards for each grade level and subject area so that students who transfer between public schools within the school district receive the same educational opportunity within the same grade or subject area.

District: Bataan Military Academy

<p>Strand: SCIENTIFIC THINKING AND PRACTICE</p>	<p>Standard I: Understand the processes of scientific investigations and use inquiry and scientific ways of observing, experimenting, predicting, and validating to think critically.</p>	<p>9-12 Benchmark I: Use accepted scientific methods to collect, analyze, and interpret data and observations and to design and conduct scientific investigations and communicate results.</p>
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<p>Grades 9-12 Performance Standards</p>	<p>Course Name, Textbook Name, and Pages</p>	<p>Supplemental Materials</p>	<p>Month(s) when Addressed</p>
<p>1. Describe the essential components of an investigation, including appropriate methodologies, proper equipment, and safety precautions.</p>	<p>Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u>; Chapter 1: pages 2-25.</p> <p>Chemistry I, Prentice Hall Chemistry, Chapter 1, pages 7-35.</p>	<p>Textbook Appendix: Basic Process Skills, pages 656-661 Guided Reading: What is Science? BrainPop video: The Brain and the Thinking Process</p> <p>“Chemical Know-how”, “Toward Success in Chemistry”, Lab Safety Rules, Lab Safety Quiz, Lab Safety Video, Guided Notes, Section Assessments, Section Reviews, Vocabulary Review</p>	<p>August/September</p> <p>August/September</p>
<p>2. Design and conduct scientific investigations that include:</p> <ul style="list-style-type: none"> • testable hypotheses • controls and variables • methods to collect, analyze, and interpret data • results that address hypotheses being investigated • predictions based on results • re-evaluation of hypotheses and additional experimentation as necessary • error analysis. 	<p>Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u>; Chapter 1: pages 7- 13.</p> <p>Chemistry I, Prentice Hall Chemistry, Chapter 1, pages 7-35.</p> <p>Forensics, Forensic Science, Saferstein, Chapter</p>	<p>Textbook Appendix: Experimental Methods: pages 658-659 Guided Reading: Using a Scientific Approach BrainPop videos: Scientific Method and Metric vs. Imperial</p> <p>Lab, Indirect Measurement, Guided Reading and Study Worksheets, Section Assessments, Section Reviews.</p> <p>Lab Manual, Exercise 1, “Locard’s</p>	<p>September</p> <p>August/September</p> <p>September</p>

BATAAN MILITARY ACADEMY

	2, pages 42-63.	Exchange Principle”	
3. Use appropriate technologies to collect, analyze, and communicate scientific data (e.g., computers, calculators, balances, microscopes).	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 1: pages 14-21	Textbook Appendix: Math Skills, pages 664-671; Appendix A & B, pages 674-675. Quick Lab: Comparing Precision, page 18 Lab: How to Use a Balance	September
	Chemistry I, Prentice Hall Chemistry, Chapter 1, pages 7-35.	Lab, “Observing, Questioning”, Section Assessments, Section Reviews.	September
	Forensics, Forensic Science, Saferstein, Chapter 3, pages 80-99.	Lab Manual, Exercise 17-3, “Empirical Measurement of Sex Differences”, Exercise 17-4, “Human Dentition.	October

BATAAN MILITARY ACADEMY

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Grades 9-12 Performance Standards	Course Name, Textbook Name, and Pages	Supplemental Materials	Month(s) when Addressed
<p>4. Convey results of investigations using scientific concepts, methodologies, and expressions, including:</p> <ul style="list-style-type: none"> • scientific language and symbols • diagrams, charts, and other data displays • mathematical expressions and processes (e.g., mean, median, slope, proportionality) • clear, logical, and concise communication • reasoned arguments. 	<p>Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u>; Chapter 1: pages 22-27</p> <p>Chemistry I, Prentice Hall Chemistry, Chapter 2, pages 38-59.</p> <p>Forensics, Forensic Science, Saferstein, Chapter 4, pages 114-131.</p>	<p>Textbook Appendix: Math Skills, pages 664-671 Consumer Lab: Determining the Thickness of Aluminum Foil, pages 26-27.</p> <p>Lab, "Density Determination", Section Assessments, Section Reviews.</p> <p>Lab, SI Measurements and Conversions</p>	<p>September</p> <p>October</p> <p>October</p>
<p>5. Understand how scientific theories are used to explain and predict natural phenomena (e.g., plate tectonics, ocean currents, structure of atom).</p>	<p>Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u>; Chapter 1: pages 9-11</p> <p>Chemistry I, Prentice Hall Chemistry, Chapter 4, pages 101-125, Chapter 5, pages 127-153.</p>	<p>Go Online: Science News, The Nature of Science articles</p> <p>Reteaching Worksheets, Reading Selection, "Nuclear Structure", "Bohr Models of Atoms" activity, Teaching Diagrams on Electron Configurations, Lab, "Flame Tests", Section Assessments, Section Reviews.</p>	<p>September</p> <p>October November</p>

BATAAN MILITARY ACADEMY

Grades 9-12 Science Curriculum Alignment with State Standards

District: Bataan Military Academy

<p>Strand: SCIENTIFIC THINKING AND PRACTICE</p>	<p>Standard I: Understand the processes of scientific investigations and use inquiry and scientific ways of observing, experimenting, predicting, and validating to think critically.</p>	<p>9-12 Benchmark II: Understand that scientific processes produce scientific knowledge that is continually evaluated, validated, revised, or rejected.</p>
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<p>Grades 9-12 Performance Standards</p>	<p>Course Name, Textbook Name, and Pages</p>	<p>Supplemental Materials</p>	<p>Month(s) when Addressed</p>
<p>1. Understand how scientific processes produce valid, reliable results, including:</p> <ul style="list-style-type: none"> • consistency of explanations with data and observations • openness to peer review • full disclosure and examination of assumptions • testability of hypotheses • repeatability of experiments and reproducibility of results. 	<p>Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u>; Chapter 1: page 25</p> <p>Chemistry I, Prentice Hall Chemistry, Chapter 1, pages 7-35.</p>	<p>Chapter 1 Review and Assessment, pages 28-31</p> <p>Handouts, Sample Lab Notebook Record”, “Sample Lab Report”</p>	<p>September</p> <p>September</p>
<p>2. Use scientific reasoning and valid logic to recognize:</p> <ul style="list-style-type: none"> • faulty logic • cause and effect • the difference between observation and unsubstantiated inferences and conclusions • potential bias. 	<p>Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u>; Chapter 1: pages 7-9</p> <p>Chemistry I, Prentice Hall Chemistry, Chapter 4, pages 101-125,</p>	<p>Scientific Laws: Build Science Skills, page 9</p> <p>edHelper.com: Developing Critical Thinking Skills: Cause and Effect activity</p> <p>“Development of Atomic Theory”, Lab, “Investigating the Law of Conservation of Mass-Energy”, Section Assessments, Section Reviews.</p>	<p>September</p> <p>October</p>
<p>3. Understand how new data and observations can result in new scientific knowledge.</p>	<p>Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u>; Chapter 1: pages 2-3</p>	<p>Science and Technology: Using Visuals</p>	<p>September</p>

BATAAN MILITARY ACADEMY

	Chemistry I, Prentice Hall Chemistry, Chapter 4, pages 101-125,	“Development of Atomic Theory”, Section Assessments, Section Reviews.	October
4. Critically analyze an accepted explanation by reviewing current scientific knowledge.	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 1: page 9		September
	Chemistry I, Prentice Hall Chemistry, Chapter 4, pages 101-125,	“Development of Atomic Theory”, Section Assessments, Section Reviews.	October

Grades 9-12 Science Curriculum Alignment with State Standards

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Strand: SCIENTIFIC THINKING AND PRACTICE	Standard I: Understand the processes of scientific investigations and use inquiry and scientific ways of observing, experimenting, predicting, and validating to think critically.	9-12 Benchmark II: Understand that scientific processes produce scientific knowledge that is continually evaluated, validated, revised, or rejected.
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Grades 9-12 Performance Standards	Course Name, Textbook Name, and Pages	Supplemental Materials	Month(s) when Addressed
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BATAAN MILITARY ACADEMY

<p>5. Examine investigations of current interest in science (e.g., superconductivity, molecular machines, age of the universe).</p>	<p>Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u>; Chapter 1: page 5</p> <p>Forensics, Forensic Science, Saferstein, Chapter 9, pages 306-347.</p>	<p>DNA videos, Website, "Introduction to DNA Structure", DNA molecular models</p>	<p>September</p> <p>February</p>
<p>6. Examine the scientific processes and logic used in investigations of past events (e.g., using data from crime scenes, fossils), investigations that can be planned in advance but are only done once (e.g., expensive or time-consuming experiments such as medical clinical trials), and investigations of phenomena that can be repeated easily and frequently.</p>	<p>Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u>; Chapter 1: pages 12-13</p> <p>Forensics, Forensic Science, Saferstein, 8, pages 266-304.</p>	<p>Forensic Science: Analyzing Data activity</p> <p>"Blood Drop Analysis", Lab, "Blood Spatter Evidence", Lab, "Bloodstain Analysis"</p>	<p>September</p> <p>January</p>

BATAAN MILITARY ACADEMY

Grades 9-12 Science Curriculum Alignment with State Standards

District: Bataan Military Academy

<p>Strand: SCIENTIFIC THINKING AND PRACTICE</p>	<p>Standard I: Understand the processes of scientific investigations and use inquiry and scientific ways of observing, experimenting, predicting, and validating to think critically.</p>	<p>9-12 Benchmark III: Use mathematical concepts, principles, and expressions to analyze data, develop models, understand patterns and relationships, evaluate findings, and draw conclusions.</p>
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<p>Grades 9-12 Performance Standards</p>	<p>Course Name, Textbook Name, and Pages</p>	<p>Supplemental Materials</p>	<p>Month(s) when Addressed</p>
<p>1. Create multiple displays of data to analyze and explain the relationships in scientific investigations.</p>	<p>Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u>; Chapter 1: Teacher demos and quick labs, pages 3, 10, 15, 18, 24, and 26-27</p> <p>Chemistry I, Prentice Hall Chemistry, Chapter 14, pages 412-443.</p>	<p>The Penny Lab</p> <p>Graphs of Boyle's Law Data and Charles's Law Data, Lab, "Charles's Law - The Effect of Temperature on Volume", Section Assessments, Section Reviews.</p>	<p>September/ October</p> <p>April</p>
<p>2. Use mathematical models to describe, explain, and predict natural phenomena.</p>	<p>Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u>; Chapter 1: page10</p> <p>Chemistry I, Prentice Hall Chemistry, Chapter 14, pages 412-443.</p> <p>Chemistry I</p>	<p>Teacher Demo: Scientific Models, page 10</p> <p>"Seven Gas Laws", use gas law relationships to solve many problems on worksheets, Section Assessments, Section Reviews</p> <p>Lab, "Specific Heat of a Metal"</p>	<p>September</p> <p>April</p> <p>December</p>
<p>3. Use technologies to quantify relationships in scientific hypotheses (e.g., calculators, computer spreadsheets and databases, graphing software, simulations, modeling).</p>	<p>Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u>; Chapter 1: pages 10-11</p> <p>Chemistry I, Prentice Hall Chemistry, Chapter 10, pages 286-319.</p>	<p>Computer graphing, worksheets, etc.</p> <p>"Gram-Equivalent Masses", "Mole-Mass Conversions", "Percentage Composition", Section Assessments, Section Reviews.</p>	<p>September</p> <p>February</p>

BATAAN MILITARY ACADEMY

<p>4. Identify and apply measurement techniques and consider possible effects of measurement errors.</p>	<p>Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u>; Chapter 1 pages 14-21</p> <p>Chemistry I, Prentice Hall Chemistry, Chapter 3, pages 62-97.</p>	<p>Measurements and Length Lab Activity</p> <p>Worksheet, "Percent Error and Significant Digits", Lab, "Density Determination", Section Assessments, Section Reviews.</p>	<p>September</p> <p>October</p>
<p>5. Use mathematics to express and establish scientific relationships (e.g., scientific notation, vectors, dimensional analysis).</p>	<p>Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u>; Chapter 1, pages 14-15; Appendix: pages 666-667.</p> <p>Chemistry I, Prentice Hall Chemistry, Chapter 3, pages 62-97, Chapter 10, pages 286-319</p> <p>Forensics, Forensic Science, Saferstein, Chapter 8, pages 266-304.</p>	<p>Guided Reading: Measurement Scientific Notation Worksheet</p> <p>"Energy Changes in Reactions", Problem Solving in Chemistry, Lab, "Empirical Formula Determination", Section Assessments, Section Reviews.</p> <p>Lab, "Impact Angle of Bloodstains"</p>	<p>September</p> <p>September, October, November, December, February</p> <p>January</p>

BATAAN MILITARY ACADEMY

Grades 9-12 Science Curriculum Alignment with State Standards

District: Bataan Military Academy

Strand: CONTENT OF SCIENCE	Standard I (Physical Science): Understand the structure and properties of matter, the characteristics of energy, and the interactions between matter and energy.	9-12 Benchmark I: Understand the properties, underlying structure, and reactions of matter.
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Grades 9-12 Performance Standards	Course Name, Textbook Name, and Pages	Supplemental Materials	Month(s) when Addressed
1. Classify matter in a variety of ways (e.g., element, compound, mixture; solid, liquid, gas; acidic, basic, neutral).	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 2, pages 38-44.	Guided Reading: Classifying Matter What is Matter? United Streaming video BrainPop video: Acids and Bases	October
	Chemistry I, Prentice Hall Chemistry, Chapter 2, pages 38-60, Chapter 19, pages 586-627.	Use a classification scheme to classify materials, Demonstrations of Electrolytes, Section Assessments, Section Reviews	September April
	Forensics, Forensic Science, Saferstein, Chapter 4, pages 112-147.	Demonstration, "States of Matter"	October
2. Identify, measure, and use a variety of physical and chemical properties (e.g., electrical conductivity, density, viscosity, chemical reactivity, pH, melting point).	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 2, pages 45-59.	Guided Reading: Physical Properties edHelper.com: Density, Sink or Swim lesson with activities; Physical vs. Chemical Properties with activities BrainPop videos: Buoyancy, Sink or Swim; Physical or Chemical properties	October
	Chemistry I, Prentice Hall Chemistry-, Chapter 2, pages 38-60, Chapter 3, pages 62-97, Chapter 19, pages 586-627.	Lab, "Physical and Chemical Change Lab, "Density Determination" Demonstration of Electrolytes Lab, "Indicators and pH", Section Assessments, Section Reviews.	September October April

BATAAN MILITARY ACADEMY

<p>3. Know how to use properties to separate mixtures into pure substances (e.g., distillation, chromatography, solubility).</p>	<p><u>Integrated Science, Prentice Hall Physical Science with Earth and Space Science</u>; Chapter 2, page 50</p> <p>Chemistry I, Prentice Hall Chemistry, Chapter 2, pages 38-60.</p> <p>Forensics, Forensic Science, Saferstein, Chapter 4, pages 148-195.</p>	<p>Using Properties to Separate Mixtures, page 50 Forensics Lab: Using Properties to Identify Materials, pages 60-61.</p> <p>Demonstrations of Separating Mixtures, Section Assessments, Section Reviews.</p> <p>Lab, "Paper Chromatography of Ink", Lab, "Thin Layer Chromatography of Liquid Lip Color".</p>	<p>October</p> <p>September</p> <p>November</p>
<p>4. Describe trends in properties (e.g., ionization energy or reactivity as a function of location on the periodic table, boiling point of organic liquids as a function of molecular weight).</p>	<p><u>Integrated Science, Prentice Hall Physical Science with Earth and Space Science</u>; Chapter 2, pages 54-59.</p> <p>Chemistry I, Prentice Hall Chemistry-, Chapter 6, pages 154-184.</p>	<p>Guided Reading: Chemical Properties Quick Lab: Identifying a Chemical Change, page 56</p> <p>Dry Lab, "The Periodic Law", Section Assessments, Section Reviews.</p>	<p>October</p> <p>January</p>
<p>5. Understand that matter is made of atoms and that atoms are made of subatomic particles.</p>	<p><u>Integrated Science, Prentice Hall Physical Science with Earth and Space Science</u>; Chapter 4, pages 100-112.</p> <p>Chemistry I, Prentice Hall Chemistry, Chapter 4, pages 100-124.</p>	<p>Guided reading: Studying Atoms Inquiry Activity, How Can you study Objects that are not Visible?, page 99</p> <p>Reteaching Worksheets, Lab, "Investigating the Law of Conservation of Mass-Energy". Section Assessments, Section Reviews.</p>	<p>November</p> <p>October</p>

BATAAN MILITARY ACADEMY

Strand: CONTENT OF SCIENCE	Standard I (Physical Science): Understand the structure and properties of matter, the characteristics of energy, and the interactions between matter and energy.	9-12 Benchmark I: Understand the properties, underlying structure, and reactions of matter.
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Grades 9-12 Performance Standards	Course Name, Textbook Name, and Pages	Supplemental Materials	Month(s) when Addressed
<p>6. Understand atomic structure, including:</p> <ul style="list-style-type: none"> • most space occupied by electrons • nucleus made of protons and neutrons • isotopes of an element • masses of proton and neutron 2000 times greater than mass of electron • atom held together by proton-electron electrical forces. 	<p>Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u>; Chapter 4, pages 108-118.</p>	<p>Guided Reading: The Structure of an Atom BrainPop video: Atoms with activities Problem-solving activity, Determining an Atomic Exhibit, page 109</p>	November
	<p>Chemistry I, Prentice Hall Chemistry, Chapter 4, pages 100-124.</p>	<p>Bohr Models of Atoms activity, Section Assessments, Section Reviews.</p>	October
<p>7. Explain how electrons determine the properties of substances by:</p> <ul style="list-style-type: none"> • interactions between atoms through transferring or sharing valence electrons • ionic and covalent bonds • the ability of carbon to form a diverse array of organic structures. 	<p>Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u>; Chapter 4, pages 116-117.</p>	<p>Guided Reading: Modern Atomic Structure Quick Lab: Comparing Excited States, page 117</p>	November
	<p>Chemistry I, Prentice Hall Chemistry, Chapter 9, pages 252-284.</p>	<p>Periodic Table, Table of Oxidation Numbers, Dry Lab, "Formulas and Oxidation Numbers", Section Assessments, Section Reviews.</p>	January
<p>8. Make predictions about elements using the periodic table (e.g., number of valence electrons, metallic character, reactivity, conductivity, type of bond between elements).</p>	<p>Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u>; Chapter 5, pages 139-145.</p>	<p>Guided Reading: Organizing the Elements Quick Lab: Making a Model of a Periodic Table, page 128 BrainPop video: The Periodic Table Quia, Naming the Elements game</p>	November
	<p>Chemistry I, Prentice Hall Chemistry, Chapter 6, pages 154-184.</p>	<p>Periodic Table, Periodic Law Worksheet, Section Assessments, Section Reviews.</p>	January

BATAAN MILITARY ACADEMY

9. Understand how the type and arrangement of atoms and their bonds determine macroscopic properties (e.g., boiling point, electrical conductivity, hardness of minerals).	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 5, pages 130-138.	Guided Reading: The Modern Periodic Table Teacher Demo: Period 3 Properties, page 138	November

BATAAN MILITARY ACADEMY

Strand: CONTENT OF SCIENCE	Standard I (Physical Science): Understand the structure and properties of matter, the characteristics of energy, and the interactions between matter and energy.	9-12 Benchmark I: Understand the properties, underlying structure, and reactions of matter.
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Grades 9-12 Performance Standards	Course Name, Textbook Name, and Pages	Supplemental Materials	Month(s) when Addressed
10. Know that states of matter (i.e., solid, liquid, gas) depend on the arrangement of atoms and molecules and on their freedom of motion.	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 3, pages 68-74.	Guided reading: Solids, Liquids and Gases United Streaming video: Matter and Energy	October
	Chemistry I, Prentice Hall Chemistry, Chapter 14, pages 412-442.	Problems involving seven ideal gas laws, Section Assessments, Section Reviews.	March/April
11. Know that some atomic nuclei can change, including: <ul style="list-style-type: none"> • spontaneous decay • half-life of isotopes • fission • fusion (e.g., the sun) • alpha, beta, and gamma radiation 	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 3, pages 84-91.	Guided Reading: Phase Changes United Streaming video: Phase Changes of Matter	October
12. Know that chemical reactions involve the rearrangement of atoms, and that they occur on many timescales (e.g., picoseconds to millennia).	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 7, pages 192-198. Chemistry I, Prentice Hall Chemistry, Chapter 11, pages 320-350.	Guided Reading: Describing Reactions Quick Lab: Modeling a Mole, page 196 Handout, "Predicting Products", Section Assessments, Section Reviews.	December
13. Understand types of chemical reactions (e.g., synthesis, decomposition, combustion, redox, neutralization) and identify them as exothermic or endothermic.	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 7, pages 199-205.	Guided Reading: Types of reactions Quick Lab: Identifying a Type of Change, page 203 Teacher Demo: Exothermic Reaction, page 200	December
	Chemistry I, Prentice Hall Chemistry, Chapter 11, pages 320-350.	Lab, "Chemical Changes and Equations"	March

BATAAN MILITARY ACADEMY

<p>14. Know how to express chemical reactions with balanced equations that show:</p> <ul style="list-style-type: none"> • conservation of mass • products of common reactions. 	<p>Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u>; Chapter 7, pages 192-198.</p> <p>Chemistry I, Prentice Hall Chemistry-, Chapter 11, pages 320-350.</p>	<p>Guided Reading: Energy Changes in Reactions BrainPop video: Chemical Equations with activity BrainPop video: Law of Conservation of Mass</p> <p>Section Assessments, Section Reviews.</p>	<p>December</p> <p>March</p>
<p>15. Describe how the rate of chemical reactions depends on many factors that include temperature, concentration, and the presence of catalysts.</p>	<p>Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u>; Chapter 7, pages 206-209.</p>	<p>Guided Reading: Reaction Rates Activity: Exothermic and Endothermic Reactions, page 208</p>	<p>December</p>

BATAAN MILITARY ACADEMY

Grades 9-12 Science Curriculum Alignment with State Standards

District: Bataan Military Academy

Strand: CONTENT OF SCIENCE	Standard I (Physical Science): Understand the structure and properties of matter, the characteristics of energy, and the interactions between matter and energy.	9-12 Benchmark II: Understand the transformation and transmission of energy and how energy and matter interact.
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Grades 9-12 Performance Standards	Course Name, Textbook Name, and Pages	Supplemental Materials	Month(s) when Addressed
1. Identify different forms of energy, including kinetic, gravitational (potential), chemical, thermal, nuclear, and electromagnetic.	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 15, pages 446-452.	Guided Reading: Energy and its Forms. Inquiry Activity: How Can Energy Change Form?, page 445 United Streaming video: Energy	January
2. Explain how thermal energy (heat) consists of the random motion and vibrations of atoms and molecules and is measured by temperature.	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 16, pages 474-478.	Guided Reading: Thermal Energy and Matter Quick Lab: Cooling Air, page 476	January
	Chemistry I, Prentice Hall Chemistry, Chapter 14, pages 412-442.	Lab, "Charles's Law – The Effect of Temperature on Volume.	April
3. Understand that energy can change from one form to another (e.g., changes in kinetic and potential energy in a gravitational field, heats of reaction, hydroelectric dams) and know that energy is conserved in these changes.	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 16, pages 479-483.	Guided Reading: Heat and Thermodynamics Build Science Skills: Applying Concepts, page 482	January
4. Understand how heat can be transferred by conduction, convection, and radiation, and how heat conduction differs in conductors and insulators.	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 16, pages 479-483.	Quick Lab: Observing Convection, page 481 BrainPop video: Heat	January
5. Explain how heat flows in terms of the transfer of vibrational motion of atoms and molecules from hotter to colder regions.	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 16, pages 486-492.	Guided Reading: Using Heat Teacher Demo: Cooling by Evaporation, page 490	January
	Chemistry I	Lab, "Specific Heat of a Metal"	December

BATAAN MILITARY ACADEMY

6. Understand that the ability of energy to do something useful (work) tends to decrease (and never increases) as energy is converted from one form to another.	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 16, pages 486-492.	Vocabulary Review Chapter 16 Assessment	January
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BATAAN MILITARY ACADEMY

Strand: CONTENT OF SCIENCE	Standard I (Physical Science): Understand the structure and properties of matter, the characteristics of energy, and the interactions between matter and energy.	9-12 Benchmark II: Understand the transformation and transmission of energy and how energy and matter interact.
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Grades 9-12 Performance Standards	Course Name, Textbook Name, and Pages	Supplemental Materials	Month(s) when Addressed
7. Understand that electromagnetic waves carry energy that can be transferred when they interact with matter.	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 18, pages 532-538. Chemistry I, Prentice Hall Chemistry, Chapter 5, pages 126-152.	Guided Reading: Electromagnetic Waves Teacher Demo: Photoelectric Effect, page 537 Handout, "Electromagnetic Spectrum"	February November
8. Describe the characteristics of electromagnetic waves (e.g., visible light, radio, microwave, X-ray, ultraviolet, gamma) and other waves (e.g., sound, seismic waves, water waves), including: <ul style="list-style-type: none"> • origin and potential hazards of various forms of electromagnetic radiation • energy of electromagnetic waves carried in discrete energy packets (photons) whose energy is inversely proportional to wavelength. 	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 18, pages 539-545. Chemistry I, Prentice Hall Chemistry, Chapter 5, pages 126-152.	Guided Reading: Electromagnetic Spectrum Quick Lab: Evaluating Sunscreen, page 544 BrainPop video: Electromagnetic Spectrum Handout, "Electromagnetic Spectrum". Section Assessments, Section Reviews.	February November
9. Know that each kind of atom or molecule can gain or lose energy only in discrete amounts.	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 18, pages 546-549. Chemistry I, Prentice Hall Chemistry, Chapter 5, pages 126-152.	Guided Reading: The Behavior of Light Teacher Demo: Reflected Light and Vision, page 547 Section Assessments, Section Reviews.	February November
10. Explain how wavelengths of electromagnetic radiation can be used to identify atoms, molecules, and the composition of stars.	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 18, pages 550-557.	Guided Reading: Color Exploration Lab: Mixing Colored Lights, page 563	February

BATAAN MILITARY ACADEMY

	Chemistry I, Prentice Hall Chemistry, Chapter 5, pages 126-152.	Section Assessments, Section Reviews.	November
11. Understand the concept of equilibrium (i.e., thermal, mechanical, and chemical).	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 7, pages 216-219.	Guided Reading: Equilibrium Design your own Lab: Manipulating Chemical Equilibrium, page 220-221	February

BATAAN MILITARY ACADEMY

Grades 9-12 Science Curriculum Alignment with State Standards

District: Bataan Military Academy

Strand: CONTENT OF SCIENCE	Standard I (Physical Science): Understand the structure and properties of matter, the characteristics of energy, and the interactions between matter and energy.	9-12 Benchmark III: Understand the motion of objects and waves, and the forces that cause them.
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Grade 9-12 Performance Standards	Course Name, Textbook Name, and Pages	Supplemental Materials	Month(s) when Addressed
1. Know that there are four fundamental forces in nature: gravitation, electromagnetism, weak nuclear force, and strong nuclear force.	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 12, pages 356-362.	Guided Reading: Forces Inquiry Activity: What starts an Object Moving?, page 355	March
2. Know that every object exerts gravitational force on every other object, and how this force depends on the masses of the objects and the distance between them.	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 12, pages 363-369.	Guided Reading: Newton's 1 st and 2 nd Law of Motion Teacher Demo: Force and Acceleration, page 365 United Streaming video: The Laws of Motion	March
3. Know that materials containing equal amounts of positive and negative charges are electrically neutral, but that a small excess or deficit of negative charges produces significant electrical forces.	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 12, pages 378-382. Chemistry I, Prentice Hall Chemistry, Chapter 9, pages 252-284.	Guided Reading: Universal Forces Quick Lab: Investigating Force and Distance, page 380 Section Assessments, Section Reviews.	March January
4. Understand the relationship between force and pressure, and how the pressure of a volume of gas depends on the temperature and the amount of gas.	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 13, pages 394-397. Chemistry I, Prentice Hall Chemistry, Chapter 14, pages 412-442	Guided Reading: Forces and Pressure in Fluids Teacher Demo: Pascal's Principle, page 394 Gas Law Problems worksheets, Section Assessments, Section Reviews.	March

BATAAN MILITARY ACADEMY

<p>5. Explain how electric currents cause magnetism and how changing magnetic fields produce electricity (e.g., electric motors, generators).</p>	<p>Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u>; Chapter 20, pages 609-613.</p>	<p>Forensics Lab: Evaluating Electrical Safety, page 623 BrainPop video: Electric Currents</p>	<p>March</p>
<p>6. Represent the magnitude and direction of forces by vector diagrams.</p>	<p>Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u>; Chapter 11, pages 328-331.</p>	<p>Guided Reading: Distance and Displacement Teacher Demo: Frames of Reference, page 329</p>	<p>March</p>

BATAAN MILITARY ACADEMY

Strand: CONTENT OF SCIENCE	Standard I (Physical Science): Understand the structure and properties of matter, the characteristics of energy, and the interactions between matter and energy.	9-12 Benchmark III: Understand the motion of objects and waves, and the forces that cause them.
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Grade 9-12 Performance Standards	Course Name, Textbook Name, and Pages	Supplemental Materials	Month(s) when Addressed
7. Know that when one object exerts a force on a second object, the second object exerts a force of equal magnitude and in the opposite direction on the first object (i.e., Newton's Third Law).	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 12, pages 372-377.	Guided Reading: Newton's Third Law of Motion BrainPop video: Newton's Laws of Motion Exploration Lab: Exploring a Balloon Jet, page 383	March
8. Apply Newton's Laws to describe and analyze the behavior of moving objects, including: <ul style="list-style-type: none"> displacement, velocity, and acceleration of a moving object Newton's Second Law, $F = ma$ (e.g., momentum and its conservation, the motion of an object falling under gravity, the independence of a falling object's motion on mass) circular motion and centripetal force. 	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 12, pages 363-377.	Quick Lab: Investigating Inertia, page 365 Building Science Skills: Predicting, page 373 Teacher Demo: Momentum, page 374	March
9. Describe relative motion using frames of reference.	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 11, pages 328-331.	Inquiry Activity: How does a ramp affect a rolling marble?, page 327	March
10. Describe wave propagation using amplitude, wavelength, frequency, and speed.	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 17, pages 504-507.	Quick Lab: Comparing Frequency and Wave Speed, page 505	February
11. Explain how the interactions of waves can result in interference, reflection, and refraction.	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 17, pages 508-512.	Teacher Demo: Water-Wave Reflections, page 508 Teacher Demo: Standing Waves, page	February

BATAAN MILITARY ACADEMY

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12. Describe how waves are used for practical purposes (e.g., seismic data, acoustic effects, Doppler effect).	<u>Integrated Science, Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 17, pages 514-521.	Guided Reading: Sound and Hearing Exploration Lab: Investigating Sound Waves, pages 524-525	February

BATAAN MILITARY ACADEMY

Grades 9-12 Science Curriculum Alignment with State Standards

District: Bataan Military Academy

Strand: CONTENT OF SCIENCE	Standard II (Life Science): Understand the properties, structures, and processes of living things and the interdependence of living things and their environments.	9-12 Benchmark I: Understand how the survival of species depends on biodiversity and on complex interactions, including the cycling of matter and the flow of energy.
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Grades 9-12 Performance Standards	Course Name, Textbook Name, and Pages	Supplemental Materials	Month(s) when Addressed
1. Know that an ecosystem is complex and may exhibit fluctuations around a steady state or may evolve over time.	Biology 1, <u>Prentice Hall Biology</u> ; Chapter 3, pages 63-66.	Inquiry activity: How do Organisms affect one another's survival? Page 62 United Streaming Video: Ecosystems Technology and Society: Exploring Science from Space, page 66	April
2. Describe how organisms cooperate and compete in ecosystems (e.g., producers, decomposers, herbivores, carnivores, omnivores, predator-prey, symbiosis, and mutualism).	Biology 1, <u>Prentice Hall Biology</u> ; Chapter 3, pages 67-73	Quick Lab: How is a food chain organized? Page 70 Basic Science Skills, pages 67 and 71	April
3. Understand and describe how available resources limit the amount of life an ecosystem can support (e.g., energy, water, oxygen, nutrients).	Biology 1, <u>Prentice Hall Biology</u> ; Chapter 3, pages 74-80	Identifying a Limiting Nutrient, page 81 Demonstrating decomposition Lab: "Bags of Bananas"	April
4. Critically analyze how humans modify and change ecosystems (e.g., harvesting, pollution, population growth, technology)	Biology 1, <u>Prentice Hall Biology</u> ; Chapter 6, pages 139-143	Inquiry Activity: What happens to household trash? Page 138 Discovery Video: "The Human Influence of Ecology" Adapted Reading: Chapter 6.4, <i>Charting a Course for the Future</i> .	April

BATAAN MILITARY ACADEMY

<p>5. Explain how matter and energy flow through biological systems (e.g., organisms, communities, ecosystems), and how the total amount of matter and energy is conserved but some energy is always released as heat to the environment.</p>	<p>Biology 1, <u>Prentice Hall Biology</u>; Chapter 4, pages 67-73</p>	<p>The Science of Life Video: “The Flow on Energy and Matter” Adapted Reading: Chapter 3.2, <i>Energy Flow in Food Chains</i></p>	<p>April</p>
<p>6. Describe how energy flows from the sun through plants to herbivores to carnivores and decomposers.</p>	<p>Biology 1, <u>Prentice Hall Biology</u>; Chapter 3, pages 87-89</p>	<p>Inquiry Activity: What Relationships exist in an Ecosystem? Page 86</p>	<p>April</p>

BATAAN MILITARY ACADEMY

Strand: CONTENT OF SCIENCE	Standard II (Life Science): Understand the properties, structures, and processes of living things and the interdependence of living things and their environments.	9-12 Benchmark I: Understand how the survival of species depends on biodiversity and on complex interactions, including the cycling of matter and the flow of energy.
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Grades 9-12 Performance Standards	Course Name, Textbook Name, and Pages	Supplemental Materials	Month(s) when Addressed
7. Understand and explain the principles of photosynthesis (i.e., chloroplasts in plants convert light energy, carbon dioxide, and water into chemical energy).	Biology 1, <u>Prentice Hall Biology</u> ; Chapter 3, pages 67-73	Video: "Photosynthesis, The Process"	April
8. Understand and explain the hierarchical classification scheme (i.e., domain, kingdom, phylum, class, order, family, genus, species), including: <ul style="list-style-type: none"> • classification of an organism into a category • similarity inferred from molecular structure (DNA) closely matching classification based on anatomical similarities • similarities of organisms reflecting evolutionary relationships. 	Biology 1, <u>Prentice Hall Biology</u> ; Chapter 18, pages 447-450	Adapted Reading: <i>Finding Order in Diversity</i> SciLinks Online Activity: Classification student worksheet Discovery Video: "Biologically Speaking: Classification"	April
9. Understand variation within and among species, including: <ul style="list-style-type: none"> • mutations and genetic drift • factors affecting the survival of an organism • natural selection. 	Biology 1, <u>Prentice Hall Biology</u> ; Chapter 16, pages 397-402	Quick Lab: Can the Environment Affect Survival? Page 401 BrainPop Video: "Human Evolution"	April

BATAAN MILITARY ACADEMY

Grades 9-12 Science Curriculum Alignment with State Standards

District: Bataan Military Academy

Strand: CONTENT OF SCIENCE	Standard II (Life Science): Understand the properties, structures, and processes of living things and the interdependence of living things and their environments.	9-12 Benchmark II: Understand the genetic basis for inheritance and the basic concepts of biological evolution.
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Grades 9-12 Performance Standards	Course Name, Textbook Name, and Pages	Supplemental Materials	Month(s) when Addressed
1. Know how DNA carries all genetic information in the units of heredity called genes, including: <ul style="list-style-type: none"> • the structure of DNA (e.g., subunits A, G, C, T) • information-preserving replication of DNA • alteration of genes by inserting, deleting, or substituting parts of DNA. 	Biology 1, <u>Prentice Hall Biology</u> ; Chapter 12, pages 287-294	Inquiry Activity: How do Codes work? Page 286 Teacher Demonstration, page 291 Modeling DNA Replication, page 313	April
	Forensics, Forensic Science, Saferstein, Chapter 9, pages 306-347.	DNA Molecular Model, DNA videos	February
2. Use appropriate vocabulary to describe inheritable traits (i.e., genotype, phenotype).	Biology 1, <u>Prentice Hall Biology</u> ; Chapter 11, pages 263-266	Adapted Reading 11.1 – The Work of Gregor Mendel Chapter 11 Activity: Vocabulary Review	April
3. Explain the concepts of segregation, independent assortment, and dominant/recessive alleles.	Biology 1, <u>Prentice Hall Biology</u> ; Chapter 11, pages 267- 269	Adapted reading 11.2 – Probability and Punnett Squares	April
4. Identify traits that can and cannot be inherited.	Biology 1, <u>Prentice Hall Biology</u> ; Chapter 11, pages 270-274	Adapted reading 11.3 – Exploring Mendelian Genetics Lab: Investigating Inherited Traits Discovery Video: <i>Genetics and Behavior</i>	April

BATAAN MILITARY ACADEMY

<p>5. Know how genetic variability results from the recombination and mutation of genes, including:</p> <ul style="list-style-type: none">• sorting and recombination of genes in sexual reproduction result in a change in DNA that is passed on to offspring• radiation or chemical substances can cause mutations in cells, resulting in a permanent change in DNA.	<p>Biology 1, <u>Prentice Hall Biology</u>; Chapter 13, pages 322-326</p>	<p>Discovery Video: <i>Genetics, Cloning</i></p> <p>Video: <i>Investigating Cells and Genetics: Genetic Disease</i></p> <p>Lab: Analyzing DNA Fingerprints</p>	<p>April</p>
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BATAAN MILITARY ACADEMY

Strand: CONTENT OF SCIENCE	Standard II (Life Science): Understand the properties, structures, and processes of living things and the interdependence of living things and their environments.	9-12 Benchmark II: Understand the genetic basis for inheritance and the basic concepts of biological evolution.
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Grades 9-12 Performance Standards	Course Name, Textbook Name, and Pages	Supplemental Materials	Month(s) when Addressed
6. Understand the principles of sexual and asexual reproduction, including meiosis and mitosis.	Biology 1, <u>Prentice Hall Biology</u> ; Chapter 11, pages 270-274	Discovery Video: Sexual and Asexual Reproduction Adapted Reading: Chapter 11.3 - Exploring Mendelian Genetics	April
7. Know that most cells in the human body contain 23 pairs of chromosomes including one pair that determines sex, and that human females have two X chromosomes and human males have an X and a Y chromosome.	Biology 1, <u>Prentice Hall Biology</u> ; Chapter 11, pages 275-278	Teacher Demonstration, page 278 Chapter 11 Exploration: Modeling Meiosis	April
8. Describe the evidence for the first appearance of life on Earth as one-celled organisms, over 3.5 billion years ago, and for the later appearance of a diversity of multicellular organisms over millions of years.	Biology 1, <u>Prentice Hall Biology</u> ; Chapter 7, pages 169-173	Inquiry Activity: What is a Cell? Page 168 United Streaming Video: <i>The Living Cell</i>	April
9. Critically analyze the data and observations supporting the conclusion that the species living on Earth today are related by descent from the ancestral one-celled organisms.	Biology 1, <u>Prentice Hall Biology</u> ; Chapter 7, pages 169-173	Discovery Video: <i>The Big Bang Theory</i>	April
10. Understand the data, observations, and logic supporting the conclusion that species today evolved from earlier, distinctly different species, originating from the ancestral one-celled organisms.	Biology 1, <u>Prentice Hall Biology</u> ; Chapter 15, pages 369-372	Adapted Reading: Chapter 15.1: Understanding Life's Diversity Inquiry Activity: Do Lima Beans show Variation? Discovery Video: <i>The Origin of Species: Comprehending Human Evolution</i>	April

BATAAN MILITARY ACADEMY

11. Understand that evolution is a consequence of many factors, including the ability of organisms to reproduce, genetic variability, the effect of limited resources, and natural selection.	Biology 1, <u>Prentice Hall Biology</u> ; Chapter 15, pages 378-386	Quick Lab: New Vegetables from Old Adapted Reading: Darwin presents his Case BrainPop Video: <i>Natural Selection</i>	April
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BATAAN MILITARY ACADEMY

Strand: CONTENT OF SCIENCE	Standard II (Life Science): Understand the properties, structures, and processes of living things and the interdependence of living things and their environments.	9-12 Benchmark II: Understand the genetic basis for inheritance and the basic concepts of biological evolution.
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Grades 9-12 Performance Standards	Course Name, Textbook Name, and Pages	Supplemental Materials	Month(s) when Addressed
12. Explain how natural selection favors individuals who are better able to survive, reproduce, and leave offspring	Biology 1, <u>Prentice Hall Biology</u> ; Chapter 15, pages 378-386	Exploration Lab: Modeling Adaptation, page 386	April
13. Analyze how evolution by natural selection and other mechanisms explains many phenomena including the fossil record of ancient life forms and similarities (both physical and molecular) among different species.	Biology 1, <u>Prentice Hall Biology</u> ; Chapter 15, pages 378-386	Discovery Video: Neanderthal: The Evolution of Homo-sapiens	April

BATAAN MILITARY ACADEMY

Grades 9-12 Science Curriculum Alignment with State Standards

District: Bataan Military Academy

Strand: CONTENT OF SCIENCE	Standard II (Life Science): Understand the properties, structures, and processes of living things and the interdependence of living things and their environments.	9-12 Benchmark III: Understand the characteristics, structures, and functions of cells.
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Grades 9-12 Performance Standards	Course Name, Textbook Name, and Pages	Supplemental Materials	Month(s) when Addressed
1. Know that cells are made of proteins composed of combinations of amino acids.	Biology 1, <u>Prentice Hall Biology</u> ; Chapter 2, pages 44-48	Adapted Reading: Chapter 2.3, Carbon Compounds	April
2. Know that specialized structures inside cells in most organisms carry out different functions, including: <ul style="list-style-type: none"> • parts of a cell and their functions (e.g., nucleus, chromosomes, plasma, and mitochondria) • storage of genetic material in DNA • similarities and differences between plant and animal cells • prokaryotic and eukaryotic cells. 	Biology 1, <u>Prentice Hall Biology</u> ; Chapter 7, pages 174-181	Adapted Reading: Chapter 7.2, Eukaryotic Cell Structure United Streaming Video: <i>The Cell</i> Quick Lab: How can you make a model of the cell? Page 180	April
3. Describe the mechanisms for cellular processes (e.g., energy production and storage, transport of molecules, waste disposal, synthesis of new molecules).	Biology 1, <u>Prentice Hall Biology</u> ; Chapter 7, pages 182-189	Adapted Reading: Chapter 7.3, Cell Boundaries Analyzing Data: Crossing Cell Membranes, page 188 BrainPop Video: <i>Cell Structures</i>	April
4. Know how the cell membrane controls which ions and molecules enter and leave the cell based on	Biology 1, <u>Prentice Hall Biology</u> ; Chapter 7, pages 182-189	Exploration Lab: Investigating Cell Structures and Processes, pages 194-195	April

BATAAN MILITARY ACADEMY

membrane permeability and transport (i.e., osmosis, diffusion, active transport, passive transport).			
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BATAAN MILITARY ACADEMY

Strand: CONTENT OF SCIENCE	Standard II (Life Science): Understand the properties, structures, and processes of living things and the interdependence of living things and their environments.	9-12 Benchmark III: Understand the characteristics, structures, and functions of cells.
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Grades 9-12 Performance Standards	Course Name, Textbook Name, and Pages	Supplemental Materials	Month(s) when Addressed
5. Explain how cells differentiate and specialize during the growth of an organism, including: <ul style="list-style-type: none"> • differentiation, regulated through the selected expression of different genes • specialized cells, response to stimuli (e.g., nerve cells, sense organs). 	Biology 1, <u>Prentice Hall Biology</u> ; Chapter 7, pages 190-193	Adapted Reading: Chapter 7.4, The Diversity of Cellular Life Lab: Investigating Cells, Tissues and Organs BrainPop Video: <i>Cell Specialization</i>	April
6. Know that DNA directs protein building (e.g., role of RNA).	Biology 1, <u>Prentice Hall Biology</u> ; Chapter 12, pages 300-306	Adapted Reading: Chapter 12.3, RNA and Protein Synthesis Quick Lab: How Does a Cell Interpret DNA? Page 303	April
7. Describe how most cell functions involve chemical reactions, including: <ul style="list-style-type: none"> • promotion or inhibition of biochemical reactions by enzymes • processes of respiration (e.g., energy production, ATP) • communication from cell to cell by secretion of a variety of chemicals (e.g., hormones). 	Biology 1, <u>Prentice Hall Biology</u> ; Chapter 7, pages 174-181	Adapted Reading: Chapter 7.2, Eukaryotic Cell Structure Discovery Video: <i>The Cell – Cytoplasm of Eukaryotic Cells</i>	April

BATAAN MILITARY ACADEMY

Grades 9-12 Science Curriculum Alignment with State Standards

District: Bataan Military Academy

Strand: CONTENT OF SCIENCE	Standard III (Earth and Space Science): Understand the structure of Earth, the solar system, and the universe, the interconnections among them, and the processes and interactions of Earth's systems.	9-12 Benchmark I: Examine the scientific theories of the origin, structure, contents, and evolution of the solar system and the universe, and their interconnections.
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Grades 9-12 Performance Standards	Course Name, Textbook Name, and Pages	Supplemental Materials	Month(s) when Addressed
1. Understand the scale and contents of the universe, including: <ul style="list-style-type: none"> • range of structures from atoms through astronomical objects to the universe • objects in the universe such as planets, stars, galaxies, and nebulae. 	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 25, pages 790-820.	Inquiry Activity: Why does the Sun Seem to Move, page789 Discovery Video: <i>Solar System</i>	May
2. Predict changes in the positions and appearances of objects in the sky (e.g., moon, sun) based on knowledge of current positions and patterns of movements (e.g., lunar cycles, seasons).	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 25, pages 796-801.	Using Models, page 796 Guided reading: Chapter 25.2, "The Earth-Moon System" BrainPop Video: <i>Solar System</i>	May
3. Understand how knowledge about the universe comes from evidence collected from advanced technology (e.g., telescopes, satellites, images, computer models).	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 26, pages 790-795.	Guided Reading: Chapter 25.4, Exploring the Solar System Investigation 25B: Investigating Eccentric Orbits	May
4. Describe the key observations that led to the acceptance of the Big Bang theory and that the age of the universe is over 10 billion years.	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 26, pages 852-855.	Guided Reading: Chapter 26.5, The Expanding Universe BrainPop Video: <i>Galaxies</i>	May
5. Explain how objects in the universe emit different electromagnetic radiation and how	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 26, pages	Quick Lab: Calculating the Sun's Power, page 832	May

BATAAN MILITARY ACADEMY

this information is used.	828-833.	Discovery Video: <i>The Sun's Magnetic Rays</i>	
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BATAAN MILITARY ACADEMY

Strand: CONTENT OF SCIENCE	Standard III (Earth and Space Science): Understand the structure of Earth, the solar system, and the universe, the interconnections among them, and the processes and interactions of Earth's systems.	9-12 Benchmark I: Examine the scientific theories of the origin, structure, contents, and evolution of the solar system and the universe, and their interconnections.
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Grades 9-12 Performance Standards	Course Name, Textbook Name, and Pages	Supplemental Materials	Month(s) when Addressed
6. Describe how stars are powered by nuclear fusion, how luminosity and temperature indicate their age, and how stellar processes create heavier and stable elements that are found throughout the universe.	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 26, pages 840-844.	Guided Reading: Chapter 26.3, Life Cycles of Stars Investigation 26B: Investigating a Neutron Star NASA Video: <i>Chandra – Neutron Star</i>	May
7. Examine the role that New Mexico research facilities play in current space exploration (e.g., Very Large Array, Goddard Space Center).	New Mexico Department of Science and Technology – Aerospace website	http://www.nmsciencetech.com/index.php/partners/more/los_alamos_national_laboratory/	May

BATAAN MILITARY ACADEMY

Grades 9-12 Science Curriculum Alignment with State Standards

District: Bataan Military Academy

Strand: CONTENT OF SCIENCE	Standard III (Earth and Space Science): Understand the structure of Earth, the solar system, and the universe, the interconnections among them, and the processes and interactions of Earth's systems.	9-12 Benchmark II: Examine the scientific theories of the origin, structure, energy, and evolution of Earth and its atmosphere, and their interconnections.
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Grades 9-12 Performance Standards	Course Name, Textbook Name, and Pages	Supplemental Materials	Month(s) when Addressed
1. Describe the characteristics and the evolution of Earth in terms of the geosphere, the hydrosphere, the atmosphere, and the biosphere.	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 22, pages 660-663.	Guided Reading: Chapter 22.1, Earth's Structure Discovery Video: <i>Earth Science – Rocks and Minerals</i>	May
2. Recognize that radiometric data indicate that Earth is at least 4 billion years old and that Earth has changed during that period.	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 23, pages 732-738.	Guided Reading: Chapter 23.6, The Earth's History Discovery Video: <i>Earth Science – History of the Earth</i>	May
3. Describe the internal structure of Earth (e.g., core, mantle, crust) and the structure of Earth's plates.	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 22, pages 676-683.	Guided reading: Chapter 22.4, Plate Tectonics Discovery Video: <i>What's Inside the Earth – Plate Tectonics</i>	May
4. Understand the changes in Earth's past and the investigative methods used to determine geologic time, including: <ul style="list-style-type: none"> • rock sequences, relative dating, fossil correlation, and radiometric dating • geologic time scales, historic changes in life forms, and the evidence for absolute ages (e.g., 	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 23, pages 732-738.	Guided Reading: Chapter 23.6, The Earth's History Discovery Video: <i>Earth Science – History of the Earth</i>	May

BATAAN MILITARY ACADEMY

radiometric methods, tree rings, paleomagnetism).			
5. Explain plate tectonic theory and understand the evidence that supports it.	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 22, pages 676-683.	Guided reading: Chapter 22.4, Plate Tectonics Discovery Video: <i>What's Inside the Earth – Plate Tectonics</i>	May

BATAAN MILITARY ACADEMY

Strand: CONTENT OF SCIENCE	Standard III (Earth and Space Science): Understand the structure of Earth, the solar system, and the universe, the interconnections among them, and the processes and interactions of Earth's systems.	9-12 Benchmark II: Examine the scientific theories of the origin, structure, energy, and evolution of Earth and its atmosphere, and their interconnections.
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Grades 9-12 Performance Standards	Course Name, Textbook Name, and Pages	Supplemental Materials	Month(s) when Addressed
6. Know that Earth's systems are driven by internal (i.e., radioactive decay and gravitational energy) and external (i.e., the sun) sources of energy.	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 24, pages 746-751.	Teacher Demo, Air Pressure, page 748 Guided Reading, Chapter 24.1, The Atmosphere Quick Lab: Demonstrating the Affect of Air Pressure, page 749	May
7. Describe convection as the mechanism for moving heat energy from deep within Earth to the surface and discuss how this process results in plate tectonics, including: <ul style="list-style-type: none"> • geological manifestations (e.g., earthquakes, volcanoes, mountain building) that occur at plate boundaries • impact of plate motions on societies and the environment (e.g., earthquakes, volcanoes). 	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 22, pages 684-696	Teacher Demo, Faults and Folds, page 685 Guided Reading, Chapter 22.5, Earthquakes Guided Reading: Chapter 22.6, Volcanoes Quick Lab: Modeling a Seismograph, page 687	May
8. Describe the patterns and relationships in the circulation of air and water driven by the sun's radiant energy, including: <ul style="list-style-type: none"> • patterns in weather systems related to the transfer of energy • differences between climate and weather 	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 24, pages 778-782.	Guided Reading: Chapter 24.7, Climate Discovery Video: <i>Extreme Climate: The Climate Crisis</i> Investigation 24B: Modeling Global Warming	May

BATAAN MILITARY ACADEMY

<ul style="list-style-type: none">• global climate, global warming, and the greenhouse effect• El Niño, La Niña, and other climatic trends.			
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BATAAN MILITARY ACADEMY

Strand: CONTENT OF SCIENCE	Standard III (Earth and Space Science): Understand the structure of Earth, the solar system, and the universe, the interconnections among them, and the processes and interactions of Earth's systems.	9-12 Benchmark II: Examine the scientific theories of the origin, structure, energy, and evolution of Earth and its atmosphere, and their interconnections.
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Grades 9-12 Performance Standards	Course Name, Textbook Name, and Pages	Supplemental Materials	Month(s) when Addressed
9. Know that Earth's system contains a fixed amount of natural resources that cycle among land, water, the atmosphere, and living things (e.g., carbon and nitrogen cycles, rock cycle, water cycle, ground water, aquifers).	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 22, pages 670-675 and Chapter 23, pages 704-708.	Quick Lab: Observing the Size of Crystals, page 671 Guided Reading: Chapter 22.3, Rocks and the Rock Cycle Quick Lab: Modeling the Water Cycle, page 705	May
10. Describe the composition and structure of Earth's materials, including: <ul style="list-style-type: none"> • the major rock types (i.e., sedimentary, igneous, metamorphic) and their formation • natural resources (e.g., minerals, petroleum) and their formation. 	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 22, pages 670-675.	Guided Reading: Chapter 22.3, Rocks and The Rock Cycle Investigation 22A: Identifying Rocks Discovery Video: <i>Earth Science – Rocks and Minerals</i>	May
11. Explain how layers of the atmosphere (e.g., ozone, ionosphere) change naturally and artificially.	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 24, pages 746-751.	Guided Reading: Chapter 24.1, The Atmosphere Inquiry Activity: Why do Cold Surfaces become Wet? Page 745	May
12. Explain how the availability of ground water through aquifers can fluctuate based on multiple factors (i.e., rate of use, rate of replenishment, surface changes, and changes in temperature).	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 23, pages 713-717.	Guided Reading: Chapter 23.1, Water Shapes the Land Quick Lab: Forming Sedimentary Layers, page 714	May

BATAAN MILITARY ACADEMY

Grades 9-12 Science Curriculum Alignment with State Standards

District: Bataan Military Academy

Strand: SCIENCE AND SOCIETY	Standard I: Understand how scientific discoveries, inventions, practices, and knowledge influence, and are influenced by, individuals and societies.	9-12 Benchmark I: Examine and analyze how scientific discoveries and their applications affect the world, and explain how societies influence scientific investigations and applications.
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Grades 9-12 Performance Standards	Course Name, Textbook Name, and Pages	Supplemental Materials	Month(s) when Addressed
1. Know how science enables technology but also constrains it, and recognize the difference between real technology and science fiction (e.g., rockets vs. antigravity machines; nuclear reactors vs. perpetual-motion machines; medical X-rays vs. Star-Trek tricorders).	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 1, pages 2-6.	Concepts in Action, Scale of the Universe, pages 850-851 Science and History, Exploring the Solar System, pages 806-807 How it Works: Automobile Safety: Air Bags, page 201	May
	Forensics, Forensic Science, Saferstein, Chapter 1, pages 2-36.	Review and Supplementary Questions.	August
2. Understand how advances in technology enable further advances in science (e.g., microscopes and cellular structure; telescopes and understanding of the universe).	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 1, pages 10-11.	Concepts in Action, Forensic Science, pages 12-13	May
	Forensics, Forensic Science, Saferstein, Chapter 7, pages 236-256.	Lab, "Use of the Compound Microscope, and the Stereomicroscope", Web Extras, "Matching Bullets and Casings", Review and Supplementary Questions.	January
3. Evaluate the influences of technology on society (e.g., communications, petroleum, transportation, nuclear energy, computers, medicine, genetic engineering) including both desired and undesired effects, and including some historical examples (e.g., the wheel, the plow, the printing press,	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 20, page 622.	How it Works: Digital Camera, page 620 Concepts in Action, Chipping In, pages 182-183	May

BATAAN MILITARY ACADEMY

the lightning rod).			
4. Understand the scientific foundations of common technologies (e.g., kitchen appliances, radio, television, aircraft, rockets, computers, medical X-rays, selective breeding, fertilizers and pesticides, agricultural equipment).	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 16, pages 486-492.	Guided Reading: Chapter 16.3, Using Heat Concepts in Action, Solar Home, pages 484-485 How it Works: Hybrid Automobile, pages 488-489	May

BATAAN MILITARY ACADEMY

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5. Understand that applications of genetics can meet human needs and can create new problems (e.g., agriculture, medicine, cloning)	Biology 1, <u>Prentice Hall Biology</u> ; Chapter 14, pages 355-360.	Adapted Reading: Chapter 14.3, Human Molecular Genetics Discovery Video: <i>The Clone Age: Part One</i>	May
6. Analyze the impact of digital technologies on the availability, creation, and dissemination of information.	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 20, pages 618-622.	Concepts in Action: Getting Personal with Computers, pages 614-615 Science and History: Photography, pages 582-583	May
	Forensics, Forensic Science, Saferstein, Chapter 14, pages 470-504.	Lab, "Balloon Prints", Lab, "Lifting and Developing Latent Prints",	April
7. Describe how human activities have affected ozone in the upper atmosphere and how it affects health and the environment.	Biology 1, <u>Prentice Hall Physical Biology</u> ; Chapter 6, pages 157-160.	Adapted Reading: Chapter 6.4, Charting a Course for the Future Article: Green Science: <i>Avoiding and Reducing the Ozone</i>	May
8. Describe uses of radioactivity (e.g., nuclear power, nuclear medicine, radiometric dating).	Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u> ; Chapter 10, pages 292-297.	Guided Reading: Chapter 10.1, Radioactivity Discovery Video: <i>Atomic Structure: The Uses of Radioactivity</i>	May
9. Describe how scientific knowledge helps decision makers with local, national, and global challenges (e.g., Waste Isolation Pilot Project [WIPP], mining, drought, population growth, alternative energy, climate change).	Biology 1, <u>Prentice Hall Physical Biology</u> ; Chapter 6, pages 144-156.	Adapted Reading: Chapter 6.2, Renewable and Non-renewable Resources Adapted Reading: Chapter 6.3, Biodiversity	May

BATAAN MILITARY ACADEMY

<p>10. Describe major historical changes in scientific perspectives (e.g., atomic theory, germs, cosmology, relativity, plate tectonics, and evolution) and the experimental observations that triggered them.</p>	<p>Integrated Science, <u>Prentice Hall Physical Science with Earth and Space Science</u>; Chapter 4, pages 100-105.</p>	<p>Assignment Discovery - Video: <i>Origin of the Atom Theory</i></p> <p>Guided Reading: Chapter 4.1, Studying Atoms</p> <p>Article: “The Copernican Crisis: Scientific Revolution and the Church”</p>	<p>May</p>
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<p>Grades 9-12 Performance Standards</p>	<p>Course Name, Textbook Name, and Pages</p>	<p>Supplemental Materials</p>	<p>Month(s) when Addressed</p>
<p>11. Know that societal factors can promote or constrain scientific discovery (e.g., government funding, laws and regulations about human cloning and genetically modified organisms, gender and ethnic bias, AIDS research, alternative-energy research).</p>	<p>Biology 1, <u>Prentice Hall Physical Biology</u>; Chapter 14, pages 355-360.</p>	<p>BBC Documentary/Video: <i>A War on Science</i></p>	<p>May</p>
<p>12. Explain how societies can change ecosystems and how these changes can be reversible or irreversible.</p>	<p>Biology 1, <u>Prentice Hall Biology</u>; Chapter 5, pages 129-132.</p>	<p>Adapted Reading: Chapter 5.3, Human Population Growth</p>	<p>May</p>
<p>13. Describe how environmental, economic, and political interests impact resource management and use in New Mexico.</p>	<p>Water is a big issue in New Mexico as you can see from the websites listed.</p>	<p>Rio Grande Water Rights Association - http://www.rgwaterrights.org/about.html</p> <p>Rio Grande Silvery Minnow - http://www.defenders.org/programs_and_policy/in_the_courts/legal_docket/rio_grande_silvery_minnow.php</p>	<p>May</p>
<p>14. Describe New Mexico’s role in nuclear science (e.g., Manhattan Project, WIPP, national laboratories).</p>	<p>Los Alamos National Laboratory</p>	<p>http://www.lanl.gov/</p>	<p>May</p>

BATAAN MILITARY ACADEMY

<p>15. Identify how science has produced knowledge that is relevant to individual health and material prosperity.</p>	<p>Discovery Video: Life Science – Health: This program encourages teenagers to develop good health habits at an early stage in life, including eating well, exercising and protecting the skin.</p> <p>Forensics, Forensic Science, Saferstein, Chapter 6, pages 200-234.</p>	<p>Other examples of how science has produced knowledge that is relevant to individual health include: Fluoride toothpaste for stronger teeth; Food preservation methods such as refrigerators, freezers and zip-lock bags; hand sanitizer and soap.</p> <p>www.howstuffworks.com/breathalyzer.htm, Review and Supplementary Questions.</p>	<p>May</p> <p>December</p>
<p>16. Understand that reasonable people may disagree about some issues that are of interest to both science and religion (e.g., the origin of life on Earth, the cause of the Big Bang, the future of Earth).</p>	<p>BBC Documentary/Video: <i>A War on Science</i></p>	<p>Additional disagreements include: Articles – <i>Cloning the Best: Arguments Against Gene Banks and Controversy – Creationism in Disguise?</i></p>	<p>May</p>

BATAAN MILITARY ACADEMY

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17. Identify important questions that science cannot answer (e.g., questions that are beyond today's science, decisions that science can only help to make, questions that are inherently outside of the realm of science).	<p>Some things Science cannot do:</p> <ol style="list-style-type: none"> 1. Science doesn't make moral judgments 2. Science doesn't make aesthetic judgments 3. Science doesn't tell you how to use scientific knowledge 4. Science doesn't draw conclusions about supernatural explanations 	<p>Some Things Science cannot do: (Website)</p> <p>http://undsci.berkeley.edu/article/0_0_0/whatisscience_12</p>	May
18. Understand that scientists have characteristics in common with other individuals (e.g., employment and career needs, curiosity, desire to perform public service, greed, preconceptions and biases, temptation to be unethical, core values including honesty and openness).	<p>How Stuff Works Podcast: Are Humans Wired to Survive?</p> <p>http://videos.howstuffworks.com/sysk/23024-are-humans-wired-to-survive-video.htm</p> <p>Are humans born with survival instincts? This video will show more about human instincts and survival.</p>	Discovery Video: "Human Body: Built for Survival"	May
19. Know that science plays a role in many different kinds of careers and activities (e.g., public service, volunteers, public office holders, researchers, teachers, doctors, nurses, technicians, farmers, ranchers).	<p>The Role of Science in various careers:</p> <p>Career and Technical Education's Role in Science, Technology, Engineering and Math</p> <p>http://hub.mspnet.org/index.cfm/18109</p>	<p>The Role for Science in Regulatory Policy</p> <p>http://blogs.sciencemag.org/scienceinsider/2009/08/the-role-for-sc.html</p>	May