

Argenta-Oreana High School
Physical Science
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Date Semester	IL Learning Standards	Unit and/or Essential Question Content and/or Skills	Assessments and/or Products
August Week 1	13.A.4a	<u>Lab Safety Protocols</u> <ul style="list-style-type: none"> • Creating a safe lab environment • Understanding clean up procedures • Handling instruments/chemicals • Working with fire 	Lab Safety Quiz
August Week 2-?	11.A.4a 11.A.4c 11.A.4d	<u>Ch. 1: The Nature of Science</u> <ul style="list-style-type: none"> • Section 1.1-Science is Everywhere • Section 1.2-Finding Out • Section 1.4-Exploring Science 	Homework <ul style="list-style-type: none"> • Section 1.1 • Section 1.2 • Section 1.4 • Chapter 1 Review Chapter 1 Notes Chapter 1 Test
September Weeks 1 & 2	11.A.4b 11.A.4c 11.A.4f 13.B.4a	<u>Ch. 2: Physical Science Methods</u> <ul style="list-style-type: none"> • Section 2.1-Standards and Measurements • Section 2.2-Using SI Units • Section 2.3-Graphing Skills <ul style="list-style-type: none"> • Understanding and applying the metric staircase (prefixes) • Converting between metric units • Understanding the concept of a standard and how it applies to the scientific community • Calculating Mass, Density • Understand the various temperature scales used in science (Celsius and Kelvin) and how these scales compare to the Fahrenheit scale 	Homework <ul style="list-style-type: none"> • Section 2.1 • Section 2.2 • Section 2.3 • Chapter 2 Review Construction of a bar, pie, and line graph using Microsoft Excel Chapter 2 Notes Chapter 2 Test

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September Weeks 3 & 4	11.A.4a 11.A.4b 11.A.4c 11.A.4d 11.B.3e 12.D.4a	<u>Ch 3: Exploring Motion and Forces</u> <ul style="list-style-type: none"> • Section 3.1-Motion and Speed • Section 3.2-Velocity and Acceleration • Section 3.4-Connecting Motion with Forces • Section 3.5-Gravity-A Familiar Force Skills: <ul style="list-style-type: none"> • Calculate Speed, Velocity, and Acceleration • Understand Newton’s 1st Law of Motion • Distinguish between balanced and unbalanced forces • Understand how inertia and mass are related • Distinguish between weight and mass 	Homework <ul style="list-style-type: none"> • Section 3.1 • Section 3.2 • Section 3.4 • Section 3.5 • Ch. 3 Review Acceleration Lab Unit Labeling Quiz I Chapter 3 Notes Chapter 3 Test
October Weeks 1 & 2	11.A.4a 12.D.4a 12.D.5a 12.D.5b 12.F.4a 12.F.4b	<u>Ch. 4: Acceleration and Momentum</u> <ul style="list-style-type: none"> • Section 4.1-Accelerated Motion • Section 4.2-Projectile and Circular Motion • Section 4.3-Technology: Sending Up Satellites • Section 4.4-Momentum—Mass on the Move Skills: <ul style="list-style-type: none"> • Understand Newton’s 2nd Law • Calculate Force using-- $F = ma$ • Understand why projectiles follow a curved path on Earth • Explain how a satellite is placed into Earth orbit • Understand Newton’s 3rd Law • Calculate momentum using-- $p = mv$ • Understand the concept of Conservation of Momentum 	Homework <ul style="list-style-type: none"> • Section 4.1 • Section 4.2 • Section 4.3 • Section 4.4 Unit Labeling Quiz 2 Chapter 4 Notes Chapter 4 Test

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October Weeks 3 & 4	11.A.4a 11.A.4b 11.A.4c 12.C.4a 12.E.4a	<u>Ch. 5: Energy</u> <ul style="list-style-type: none"> • Section 5.1-Energy and Work • Section 5.2-Temperature and Heat • Section 5.3-Thermal Pollution: Waste You Can't See Skills <ul style="list-style-type: none"> • Calculating work using-- $W = Fd$ • Differentiate between potential and kinetic energy • Understand the concept of pendulum motion using a swing or clock pendulum as an example • Understand that all particles are in motion when being heated • Distinguish between temperature and heat • Calculate the change in thermal energy using-- $Q = mC?T$ 	Homework <ul style="list-style-type: none"> • Section 5.1 • Section 5.2 • Section 5.3 • Chapter 5 Review Pendulum Motion Lab Unit Labeling Quiz 3 Chapter 5 Notes Chapter 5 Review
November Weeks 1&2	11.A.4a 11.A.4c 12.B.4a 12.D.4b	<u>Ch. 8: Solids, Liquids, and Gases</u> <ul style="list-style-type: none"> • Section 8.1-Matter and Temperature • Section 8.2-Fresh Water—Will there be enough? • Section 8.3-Changes in State • Section 8.4-Behavior of Gases • Section 8.5-Uses of Fluids Skills <ul style="list-style-type: none"> • Understand the difference in solids, liquids, and gases in terms of the motion of the particles and the volume (if any) of each • Use Boyle's Law and Charles's Law to make calculations • Use Bernoulli's Principle to understand how airplanes fly • Use Pascal's Principle to explain how hydraulic lifts work 	Homework <ul style="list-style-type: none"> • Section 8.1 • Section 8.2 • Section 8.3 • Section 8.4 • Section 8.5 • Chapter 8 Review Unit Labeling Quiz 4 Construct a line graph of P vs. V and V vs. T Chapter 8 Notes Chapter 8 Test

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November Weeks 3 & 4	12.C.4a 12.C.5b	<u>Ch. 9: Classification of Matter</u> <ul style="list-style-type: none"> • Section 9.1-Composition of Matter • Section 9.2-Technology: The Colloid Connection • Section 9.3-Describing Matter Skills <ul style="list-style-type: none"> • Understand the difference (atomically) between elements, compounds, and mixtures • Understand how colloids are used to purify drinking water and the air we breathe • Distinguish between chemical and physical properties • Distinguish between chemical and physical changes 	Homework: <ul style="list-style-type: none"> • Section 9.1 • Section 9.2 • Section 9.3 • Chapter 9 Review Unit Labeling Quiz 5 Chapter 9 Notes Chapter 9 Test
December Weeks 1&2 January Weeks 1&2	11.A.4a 11.A.4b 11.A.4c 11.B.4c 12.D.4b	<u>Ch. 10: Atomic Structure and the Periodic Table</u> <ul style="list-style-type: none"> • Section 10.1-Structure of the Atom • Section 10.2-Quarks • Section 10.3-Masses of Atoms • Section 10.4-The Periodic Table Skills <ul style="list-style-type: none"> • List, describe, and label the 3 subatomic particles (protons, electrons, neutrons) • Describe the present model of the atom and how it has changed over time • Understand that protons and neutrons are made of smaller particles known as quarks • Calculate the number of neutrons in a given atom using the atomic mass and atomic number • Define what is meant by the term isotope • Understand the history behind the periodic table from 	Homework: <ul style="list-style-type: none"> • Section 10.1 • Section 10.2 • Section 10.3 • Section 10.4 Atomic Model Project Ch. 10 Jeopardy Game Secret Agent Lab Chapter 10 Notes Chapter 10 Test

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		Mendeleev to Mosely <ul style="list-style-type: none"> • Distinguish between a period and a group • Understand critical trends in groups which include alkali metals, alkaline earth metals, transition metals, metalloids, halogens, and noble gases 	
January Weeks 3&4	12.C.4b 12.D.4b 13.A.4a	<u>Ch. 11 Chemical Bonds</u> <ul style="list-style-type: none"> • Section 11.1-Why Atoms combine • Section 11.2-Kinds of Chemical Bonds • Section 11.3-Chemical Hazards at Home • Section 11.4-Formulas and Names of Compounds Skills <ul style="list-style-type: none"> • Describe how the properties of an element differ when that element is combined with another element or elements • Understand what a chemical formula represents/means • Describe the difference in ionic and covalent bonding from the standpoint of the valance electron behavior in each • Differentiate between a polar covalent bond and a nonpolar covalent bond • Understand how a person's life can be impacted by the use of everyday (hazardous) chemicals • Explain how to determine oxidation numbers • Be able to write formulas for compounds given their names • Be able to name compounds given their formulas • Understand the difference in naming of ionic compounds and molecular compounds. 	Homework: <ul style="list-style-type: none"> • Section 11.1 • Section 11.2 • Section 11.3 • Section 11.4 A • Section 11.5 A • Section 11.6 A • Ch. 11 Review Chapter 11 Notes Chapter 11 Test

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February Weeks 1&2	12.B.4a 12.C.4a 12.C.4b 12.D.4b	<p><u>Chapter 13: Organic and Biological Compounds</u></p> <ul style="list-style-type: none"> • Section 13.1-Simple Organic Compounds • Section 13.2-Other Organic Compounds • Section 13.3-Growing Energy on the Farm • Section 13.4-Biological Compounds <p>Skills</p> <ul style="list-style-type: none"> • Describe structures of organic compounds and why carbon can create so many compounds. • Draw common organic compounds using the IUPAC system • Differentiate between saturated and unsaturated hydrocarbons • Understand what is meant by the term “isomer” and how to identify carbon containing isomers • List and describe the characteristics of aromatic compounds • Understand what is meant by the term “substituted hydrocarbon” and be able to classify groups of hydrocarbons • Describe the role of biomass and biogas in increasing our energy supply • Describe how polymers form and their importance • Compare and contrast lipids, carbohydrates, proteins, nucleic acids 	Homework: <ul style="list-style-type: none"> • Section 13.1 • Section 13.1 A • Section 13.2 • Section 13.3 • Section 13.4 • Chapter 13 Review Chapter 13 Notes Chapter 13 Test

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February Weeks 3&4	11.B.4a 12.C.4b 12.D.4a	<u>Chapter 14: Useful Materials</u> <ul style="list-style-type: none"> • Section 14.1-Materials with a Past • Section 14.2-New Materials • Section 14.3-Record Breaking with Sports Technology Skills <ul style="list-style-type: none"> • Identify the names and composition of common alloys • Compare and contrast ceramics and alloys including a historical perspective on each • Compare and contrast plastics and synthetic polymers • Understand the history behind plastics and the role that plastics play in everyday living • Describe a composite • Understand how sports have benefit from alloys, composites, plastics, and synthetic polymers 	Homework <ul style="list-style-type: none"> • Chapter 14.1 • Chapter 14.2 • Chapter 14.3 • Chapter 14 Review Chapter 14 Notes Chapter 14 Test
March Weeks 1, 2, and 3	11.A.4a 11.A.4b 11.A.4e 12.C.4a 12.C.4b 12.D.4b 13.A.4a	<u>Chapter 15: Solutions</u> <ul style="list-style-type: none"> • 15.1-How Solutions Form • 15.3-Solubility and Concentration • 15.4-Particles in Solution Skills <ul style="list-style-type: none"> • Understand the difference in solution, solute, and solvent • Explain how substances dissolve • Explain what factors effect the rates at which a solid dissolves as it pertains to solids and gases. • Understand the role that temperature plays in rate of dissolving of solids • Demonstrate an understanding of the term concentration • Compare and contrast the behavior of polar and nonpolar 	Homework <ul style="list-style-type: none"> • Chapter 15.1 • Chapter 15.3 • Chapter 15.4 • Chapter 15 Review Chapter 15 Notes Sugar Cube Solubility Lab Chapter 15 Test

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		substances in forming solutions.	
March Week 4 April Weeks 1 & 2	11.B.4c 12.C.4a 12.C.4b 12.D.4b	<u>Chapter 16: Chemical Reactions</u> <ul style="list-style-type: none"> • 16.1-Chemical Changes in Matter • 16.3-Chemical Equations • 16.4-Types of Chemical Reactions • 16.5-Energy and Chemical Reactions Skills <ul style="list-style-type: none"> • Understand and apply the Law of Conservation of Mass • Recognize, given a chemical equation, the reactants, products, and any special notations used to describe the reaction • Explain the difference between coefficients and subscripts • Understand and apply the concept of balancing equations. • Explain how using coefficients to balance a chemical reaction is satisfying the Law of Conservation of Mass • Given the chemical equation, recognize the type of reaction taking place • Explain the difference in energy in an exothermic reaction and an endothermic reaction • Given the reactants, be able to predict the type of reaction and the products of that reaction 	Homework: <ul style="list-style-type: none"> • Chapter 16.1 • Chapter 16.3 • *Extensive reinforcement of balancing equations • Chapter 16.4 • *Extensive reinforcement of types of reactions • Chapter 16.5 • Chapter 16 Review Chapter 16 Notes Chapter 16 Test
April Weeks 3 & 4	11.A.4a 11.A.4b 11.A.4c 12.C.4a 12.C.4b 12.D.4b	<u>Chapter 17: Acids, Bases, and Salts</u> <ul style="list-style-type: none"> • 17.1-Acids and Bases • 17.2-Strength of Acids and Bases • 17.3-Acid Rain • 17.4-Acids, Bases, and Salts 	Homework: <ul style="list-style-type: none"> • Chapter 17.1 • Chapter 17.2 • Chapter 17.3 • Chapter 17.4

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	12.E.4a 13.a.4a	Skills <ul style="list-style-type: none"> • Define an acid and a base • Define what is meant by ionization and what is meant by dissociation. • Explain what determines the strength of an acid or a base • Define pH and uses indicators to determine the relative pH of a substance • Use pH units to define acid rain • Be able to recognize and acid/base (neutralization) reaction • Define a salt and explain how a salt forms 	<ul style="list-style-type: none"> • Chapter 17 Review Cabbage Juice Indicator Lab Chapter 17 Notes Chapter 17 Test
May Weeks 1 & 2	11.A.4a 11.A.4b 11.A.4c 12.A.4b 13.A.4a	<u>Water Chemistry Unit</u> <ul style="list-style-type: none"> • Freshwater Pollution Testing • Testing Pollution in Water • Bacterial Pollution • Ground Water Pollution Testing Skills <ul style="list-style-type: none"> • Understand some different forms and sources of pollution • Explain how contaminated group water can effect animal and plant life in the effected areas • Understand possible reasons for variation in pH in municipal water samples • Test for various chlorine levels present tap water and suggest a reason for different chlorine levels between various cities • Understand how Coliform bacteria contaminates water sources 	<ul style="list-style-type: none"> • Freshwater Pollution Lab and post lab analysis questions • Post Lab Quiz (freshwater pollution lab) • Pollution in Tap Water Lab and post lab analysis questions • Post lab Quiz (Pollution in Tap Water) • Bacterial Pollution Lab and post lab questions

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<p style="text-align: center;">May Weeks 3&4</p>	<p>12.C.4a 12.C.4b 12.D.5b</p>	<p><u>Chapter 24: Radioactivity and Nuclear Reactions</u></p> <ul style="list-style-type: none"> • Section 24.1-Radioactivity • Section 24.2-Nuclear Decay • Section 24.3-Detecting Radioactivity • Section 24.4-Nuclear Reactions • Section 24.5-Nuclear Reactions in Medicine <p>Skills</p> <ul style="list-style-type: none"> • Explain how radioactivity was discovered • Contrast properties of radioactive materials versus stable nuclides • Distinguish between alpha, beta, and gamma radiation • Calculate the amount of a radioactive substance remaining after a time based on its half-life • Describe how radioactivity can be detected • Explain how a Geiger counter functions and what it measures. 	<p>Homework:</p> <ul style="list-style-type: none"> • Chapter 24.1 • Chapter 24.2 • Chapter 24.3 • Chapter 24.4 • Chapter 24 Review <p>Chapter 24.1-24.2 Quiz Chapter 24 Notes Chapter 24 Test</p>