8th Grade Science Curriculum Bundle #4

Title	Suggested Dates
Matter: Interactions and Reactions	10/26-11/13 (12 days)

Big Idea/Enduring Understanding	Guiding Questions
The physical and chemical properties of substances are determined by their atomic and molecular structures.	How are chemical and physical properties of matter related to the structure of matter? Why do chemists use chemical symbols, formulas and equations? What causes chemical reactions that affect our daily lives?

The resources included here provide teaching examples and/or meaningful learning experiences to address the District Curriculum. In order to address the TEKS to the proper depth and complexity, teachers are encouraged to use resources to the degree that they are congruent with the TEKS and research-based best practices. Teaching using only the suggested resources does not guarantee student mastery of all standards. Teachers must use professional judgment to select among these and/or other resources to teach the district curriculum.

Knowledge & Skills with Student Expectations	Specificity & Examples	Suggested Resources (Read the note above)
8.9 The student knows that substances have chemical and physical properties. 8.9A Demonstrate that substances may react chemically to form new substances.	Including: --- Recognize that formulas and equations express what happens in a chemical reaction --- Observe and recognize signs of chemical change: • Color change • Energy change (including exothermic & endothermic reactions) • Odor • Precipitate formation • Release of a gas --- Differentiate between • Elements • Compounds • Molecules • Atoms Teacher Note: Use rusting as an example of a sign of chemical change. This student expectation should formalize the examples used in 6.7A & 7.7A with chemical equations.	**VOCABULARY**: element, compound, molecule, endothermic reaction, exothermic reaction, catalyst, inhibitor, subscript, coefficient, yield, product, reactant, precipitate, chemical equations, feedback mechanism, balanced equation , chemical change, physical change, Law of Conservation of Mass, and equilibrium. AVID Activity- Writing in Science pages 22-23 "Pre-write and Quickwrite" **CORE ACTIVITY:** Balanced Budget Chemistry Fast Rusting (Demo) Chemical or Physical Change **Uncovering Student Ideas in Science**, Keeley. Vol. 1, #12, The Rusty Nails

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8.9 The student knows that substances have chemical and physical properties. 8.9C Recognize the importance of formulas and equations to express what happens in a chemical reaction.	Including: --- Use formulas to represent a chemical reaction • Subscript • Coefficient • Yields • Product • Reactant --- Classify substances as • Elements • Compounds --- Law of conservation of mass --- Count atoms to determine if chemical equation is balanced or not. At this grade level, items that include chemical equations will focus on identifying rearrangement of atoms. Teacher Note: Students will not be required to balance chemical equations. Pre-AP extension may include balancing equations and differentiating between chemical reactions such as single and double replacement, decomposition and synthesis.	**CORE ACTIVITY:** Holt Math Skills for Science #50 Balancing Chemical Equations PREAP: Bond with a Class Mate @ www.Sciencespot.net PREAP: Bonding Basics PREAP Only: o Covalent o Ionic PREAP Only: Balancing Equations Problems like Balancing Act
8.6 The student knows that interdependence occurs among living systems. 8.6B Identify feedback mechanisms that maintain equilibrium of systems such as body temperature, turgor pressure, and chemical reactions.	Such as: --- Chemical reactions	
8.10 The student knows that complex interactions occur between matter and energy. 8.10C Identify and demonstrate that loss or gain of heat energy occurs during exothermic and endothermic chemical reactions	Including: --- Endothermic reactions & Exothermic reactions in chemical equations and lab investigations --- Interpretation of endo- and exothermic graphs --- Energy changes accompany chemical reactions Teacher Note: Use everyday examples: heat packs & cold packs	**CORE ACTIVITY**: Bagful of Chemicals Station Lab http://www.flinnsci.com/documents/demopdfs/chemistry/cf0398.00.pdf Exothermic Reactions Used in Hot Packs Endo/Exothermic Lab or Exo or Endo Part I or Part II

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8.1 The student conducts field and laboratory investigations using safe environmentally appropriate, and ethical practices. 8.1A Demonstrate safe practices during field and laboratory investigations.	Including: --- Lab Cleanup Procedures --- Chemical and waste disposal --- Equipment cleaning and storage ---Safety contract In accordance with the Texas Safety Standards: Pflugerville ISD :: Online Curriculum :: Science Teacher Note: Safety skills and process TEKS should be embedded and reinforced throughout the year.	Texas Safety Standards
8.1 The student conducts field and laboratory investigations using safe environmentally appropriate, and ethical practices. 8.1B Make wise choices in the use and conservation of resources and the disposal and recycling of materials.	Including: --- Lab material disposal/hazardous materials (MSDS listing)	
8.2 The student uses scientific inquiry methods during fields and laboratory investigations. 8.2A Plan and implement investigative procedures including asking questions, formulating testable hypotheses, and selecting and using equipment and technology.	Such as: --- Design their own experiments --- Emphasis should be on scientific methods and should build understanding of the variety of methods and their suitability for various tasks. Teacher Note: It is recommended that students create and design at least 2 labs/experiments.	AVID Activity- Writing in Science pages 55-94 "Experimental Design Lab Report Activities"
8.2 The student uses scientific inquiry methods during fields and laboratory investigations. 8.2B Collect information by observing and measuring.	Such as: --- Measuring temperature with thermometer --- Pre-AP: Emphasis on using probeware in a variety of situations Teacher Note: Measurement exercises should progress across the middle school grade levels and begin by developing conceptual understanding. In 8th grade, students can begin to convert from one unit to another.	AVID Activity- Writing in Science pages 26-28 " Observation Narrative"
8.2 The student uses scientific inquiry methods during fields and laboratory investigations. 8.2C Organize, analyze, evaluate, make inferences, and predict trends from direct and indirect evidence.	Including: --- graph interpretation and extrapolation --- predicting outcomes based on data tables	AVID Activity- Writing in Science pages 29-30 "Comparative Analysis"

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8.2 The student uses scientific inquiry methods during fields and laboratory investigations. 8.2D Communicate valid conclusions.	Including: --- Experimental conclusions --- Supporting conclusions with data --- Analyze error sources and fix experiment to reduce outside variables --- Graph/Chart/Table extrapolation for conclusion --- Analysis of graphs	AVID Activity- Reading in Science pages 111-132 " Additional Active Reading Graphic Organizers"
8.2 The student uses scientific inquiry methods during fields and laboratory investigations. 8.2E Construct simple graphs, tables, maps, and charts using tools including computers to organize, examine and evaluate data.	Such as: --- Bar graphs, line graphs, pie charts, data tables, and determine which is best for each set of data.	
8.3 The student uses critical thinking and scientific problem solving to make informed decisions. 8.3A Analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information.	Including: --- Critique a conclusion of a modeled experiment. Teacher Note: Current event analysis that critiques a scientific explanation. Relate to labs throughout the year. Should emphasize the nature of scientific explanations: testability, repeatability, evidence, and predictive nature.	
8.3 The student uses critical thinking and scientific problem solving to make informed decisions. 8.3B Draw inferences based on data related to promotional materials for products and services.	Such as: --- interpreting product labels such as MSDS labels.	
8.4 The student knows how to use a variety of tools and methods to conduct science inquiry. 8.4A Collect, record, and analyze information using tools including beakers, petri dishes, meter sticks, graduated cylinders, weather instruments, hot plates, dissecting equipment, test tubes, safety goggles, spring scales, balances, microscopes, telescopes, thermometers, calculators, field equipment, computers, computer probes, water test kits, and timing devices.	Such as: --- The TAKS formulated Periodic Table and Formula Chart	
8.4 The student knows how to use a variety of tools and methods to conduct science inquiry. 8.4B Extrapolate from collected information to make predictions.	Such as: --- extrapolating using graph and data tables to predict expected results.	