LAB-AIDS CORRELATIONS FOR

OKLAHOMA ACADEMIC STANDARDS FOR SCIENCE (OAS-S)

HIGH SCHOOL CHEMISTRY

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This document shows how the *NATURAL APPROACH TO CHEMISTRY* materials align with the *Oklahoma Academic Standards for Science*[1].

ABOUT US

Lab-Aids has maintained its home offices and operations in Ronkonkoma, NY, since 1963. We publish over 200 kits and core curriculum programs to support science teaching and learning, grades 6-12. All core curricula support an inquiry-driven pedagogy, with support for literacy skill development and with robust support for assessment. All programs have extensive support for technology and feature comprehensive teacher support. For more information please visit www.lab-aids.com and navigate to the program of interest.

ABOUT A NATURAL APPROACH TO CHEMISTRY

A Natural Approach to Chemistry (NAC) is written by Hsu, Chaniotakis, Carlisle, and Damelin, and is published by, and available exclusively from, LAB-AIDS, Ronkonkoma NY. A short summary of the program is provided below; for more information visit https://store.lab-aids.com/catalog/high-school/chemistry/.

A Natural Approach to Chemistry
THEMES
• Energy is a unifying theme that explains why chemistry occurs
• The atomic model of matter is consistently woven through every chapter
• Understanding of 'why' chemistry occurs is emphasized
• Principles are illustrated with examples from the human body and the environment

[1] https://sde.ok.gov/sites/default/files/Oklahoma%20Academic%20Standards%20for%20Science.pdf

ORGANIZATION OF CONTENT		
Fundamentals	Chapters 1 -4	Present comprehensive overview of all main ideas in chemistry such as the atomic nature of matter, systems, temperature, and energy. *"Big Picture"*
Core Concepts	Chapters 5 -14	Present in-depth coverage of all major topic areas. They developed usable understanding of the big ideas laid out in the first four chapters. The treatment includes strong conceptual development as well as algebra-based quantitative problem solving. *All academic content and instruction standards for chemistry have been met by the end of Chapter 14.*
Applications	Chapter 15 - 21	Provide deeper exploration of significant areas of interest in chemistry. *Examples include rechargeable batteries, materials science, planetary atmospheres, etc.*
COMPLETE LEARNING SYSTEM – SUPPORTS DISTANCE LEARNING		
• Coordinated student textbook		
• Integrated laboratory investigations manual containing 58 labs to choose from		
• New laboratory control, data collection and **probe system** (The LAB-MASTER)		
• Evaluation elements throughout the curriculum (student book and lab investigation manual) through which student knowledge or skills are assessed or applied		
• Full powerpoints and lab pre videos for teachers – supports distance learning		
• Includes student podcasts for most student book chapters and sections and lab prep videos that support distance learning		

ABOUT THE LAB-AIDS CITATIONS

The following tables are presented in an OAS-S format. Locations in EDC Earth Science that support the OAS-S are identified, in the Student Book, Lab Investigations Manual, or Teacher's Edition.

The following citation…

Student Book Ch. 2, 5 – 7
Laboratory Investigations 2B, 5A, 6A – C, 7A

…means the standard is addressed in chapters 2, 5-7 of the Student Book, and labs 2B, 5A, 6A-C and 7A.

MATTER AND ITS INTERACTIONS (PS1)

OKLAHOMA ACADEMIC STANDARD FOR SCIENCE	LOCATION IN NAC PROGRAM
CH.PS1.1 Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.	SB: 5.2, 6.3 LIM: 2B, 5A, 6A – C, 7A
CH.PS1.2 Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, knowledge of the patterns of chemical properties, and formation of compounds.	SB: 4.2, 5.2, 6.2, 6.3 4, 10.3, 10.4, 13.1 LIM: 4B – C, 10A – C, 11A – B, 12A – B, 13B – D
CH.PS1.3 Plan and conduct an investigation to compare the structure of substances at the bulk scale level to infer the strength of electrical forces between particles.	SB: 7.1 8.1, 8.2 LIM: 3D, 4A, 8A, 14A, 16A
CH.PS1.4 Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.	SB: 4.2, 10.4 LIM: 4B, 10B, 10C
CH.PS1.5 Apply scientific principles and evidence to provide an explanation about the effects of changing the conditions of the reacting particles on the rate at which a reaction occurs.	SB 12.1, 12.2 LIM 12A – 12C
CH.PS1.6 Refine the design of a chemical system by specifying a change in conditions that would produce a change in the amounts of products at equilibrium.*	SB 12.1 -12.4 LIM 12B, 12C
CH.PS1.7 Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.	SB 4.2, 10.2, 11.1-11.4 LIM 4C, 11A – B, 13C – D, 14A
CH.PS1.8 Develop models to illustrate the changes in composition of the nucleus of the atom and the energy released during the processes of fission, fusion, and radioactive decay.	SB 20.2-20.4 LIM 20A – B

FORCES AND INTERACTIONS (PS2)

OKLAHOMA ACADEMIC STANDARD FOR SCIENCE	LOCATION IN NAC PROGRAM
CH.PS2.6 Communicate scientific and technical information about why the molecular level structure of designed materials determines how the material functions.*	SB, 12.3, 12.4, 15.4, 17.1, 17.2, 18.3 LIM 15D, 17B, 18B, 18C

ENERGY (PS3)

OKLAHOMA ACADEMIC STANDARD FOR SCIENCE	LOCATION IN NAC PROGRAM
CH.PS3.3 Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.*	SB 10.4, 15.1, 15.2 LIM 10C, 15A, 15B
CH.PS3.4 Plan and conduct an investigation to provide evidence that the transfer of thermal energy between components in a closed system involves changes in energy dispersal and heat content and results in a more uniform energy distribution among the components in the system (second law of thermodynamics).	SB 3.2 LIM 3A – D

WAVES AND THEIR APPLICATION FOR INFORMATION TRANSFER (PS4)

OKLAHOMA ACADEMIC STANDARD FOR SCIENCE	LOCATION IN NAC PROGRAM
CH.PS4.1 Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.	SB 5.2
CH.PS4.3 Develop an argument for how scientific evidence supports the explanation that electromagnetic radiation can be described either by the wave model or the particle model, and in some situations one model is more useful than the other.	SB 5.2 LIM 5A (particle nature), 5B (wave nature) [LAB-AIDS clarification statement: Discussed but not evaluation of Claims; some description of quantum theory but no mathematical modeling]