

FOLSOM CORDOVA UNIFIED SCHOOL DISTRICT



Chemistry of the Earth System

Board Approval Date: 6/20/24	Course Length: 2 Semesters
Grading: A-F	Credits: 5 Credits per Semester
Proposed Grade Level(s): 10, 11, 12	Subject Area: Physical Science Elective Area (if applicable):
Prerequisite(s): IM3 concurrent or completed Highly Recommended: Chemistry or Honors Chemistry	Corequisite(s):
CTE Sector/Pathway:	
Intent to Pursue ‘A-G’ College Prep Status: Yes	
A-G Course Identifier: (d) Laboratory Science	
Graduation Requirement: No	
Course Intent: Site Specific Program (if applicable):	
<p>The Folsom Cordova Unified School District prohibits discrimination, intimidation, harassment (including sexual harassment) or bullying based on a person’s actual or perceived ancestry, color, disability, race or ethnicity, religion, gender, gender identity or gender expression, immigration status, national origin, sex, sexual orientation, or association with a person or group with one or more of these actual or perceived characteristics. For concerns/questions or complaints, contact the Title IX Coordinator(s), Equity Compliance Officer(s) and Section 504 Coordinator(s) :</p> <p>Donald Ogden, Associate Superintendent – Human Resources, Title IX Coordinator (Employees) & Equity Compliance Officer dogden@fcusd.org 916-294-9000 Ext 104410</p> <p>Jim Huber Ed. D., Assistant Superintendent – Educational Services, Title IX Coordinator (Students), Section 504 Coordinator & Equity Compliance Officer jhuber@fcusd.org 916-294-9000 Ext 104625</p>	

COURSE DESCRIPTION (Online Course at Innovations Academy):

This comprehensive course gives students a solid basis to move on to future studies. The course provides an in-depth survey of all key areas, including chemistry of earth systems, biogeochemical cycles, atomic structure, chemical bonding and reactions, solutions, thermochemistry, energy, and electricity. The course includes direct online instruction, virtual laboratories, and related assessments, used with a reference guide and problem-solving book.

DETAILED UNITS OF INSTRUCTION:

Unit Number/Title	Unit Essential Questions	Examples of Formative Assessments	Examples of Summative Assessment
1. Energy in the Earth System	What is energy, how is it measured, and how does it flow within a system? What mechanisms allow us to utilize the energy of our foods and fuels? What is the particle model? How is energy transferred and conserved? How can energy be harnessed to perform useful tasks? What is energy, how is it measured, and how does it flow within a system? What mechanisms allow us to utilize the energy of our foods and fuels? What is the particle model? How is energy transferred and conserved? How can energy be harnessed to perform useful tasks?	*Online or paper-based worksheets and practice sets *Quizzes *Threaded discussions *Labs and lab reports *Simulations *Exit tickets	*Unit Test *Essays, research papers, and other writing assignments *Presentations *Project
2. Bonds	How does the configuration of electrons form different kinds of bonds? What types of bonds form? How do they form? How do bonds relate to the periodic table of elements?	*Online or paper-based worksheets and practice sets *Quizzes *Threaded discussions *Labs and lab reports *Simulations *Exit tickets	*Unit Test *Essays, research papers, and other writing assignments *Presentations *Project

3. Patterns of the Periodic Table	What are inside atoms and how does this affect how they interact? What models can we use to predict the outcomes of chemical reactions? What are the patterns and trends of the periodic table? How do I read the periodic table?	*Online or paper-based worksheets and practice sets *Quizzes *Threaded discussions *Labs and lab reports *Simulations *Exit tickets	*Unit Test *Essays, research papers, and other writing assignments *Presentations *Project
4. Chemical Reactions	What holds atoms together in molecules? How do chemical reactions absorb and release energy? What are the types of chemical reactions? How can I balance chemical equations? What is the Law of Conservation of Matter?	*Online or paper-based worksheets and practice sets *Quizzes *Threaded discussions *Labs and lab reports *Simulations *Exit tickets	*Unit Test *Essays, research papers, and other writing assignments *Presentations *Project
5. Reaction Rates & Equilibrium	How can you alter chemical equilibrium and reaction rates? How can you predict the relative quantities of products in a chemical reaction? How does Ocean Acidification relate to reaction rates and equilibrium?	*Online or paper-based worksheets and practice sets *Quizzes *Threaded discussions *Labs and lab reports *Simulations *Exit tickets	*Unit Test *Essays, research papers, and other writing assignments *Presentations *Project
6. Chemistry of Climate Change	What regulates weather and climate? What effects are humans having on the climate?	*Online or paper-based worksheets and practice sets *Quizzes *Threaded discussions *Labs and lab reports *Simulations *Exit tickets	*Unit Test *Essays, research papers, and other writing assignments *Presentations *Project

ESSENTIAL STANDARDS:

HS-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. (ELA/Literacy CCSS: RST.9-10.7)

HS-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, and knowledge of the patterns of chemical properties. (ELA/Literacy CCSS: RST.11-12.2, RST.11-12.5 and Math CCSS: HSN-Q.A.1, HSN-Q.A.3)

HS-PS1-5 Apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs. (ELA/Literacy CCSS: RST.11-12.1, RST.11-12.2 and Math CCSS: MP.2, HSN-Q.A.1, HSN-Q.A.3)

HS-PS1-6: Refine the design of a chemical system by specifying a change in conditions that would produce increased amounts of products at equilibrium.* (ELA/Literacy CCSS: RST.11-12.7)

HS-PS1-7: Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction. (Math CCSS: MP.2, HSN-Q.A.1, HSN-Q.A.2, HSN-Q.A.3)

HS-ESS3-4: Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.(ELA/Literacy CCSS - RST.11-12.1, RST.11-12.8 and Math CCSS HSN.Q.A.1, HSN.Q.A.2, HSN.Q.A.3)

HS-ESS3-6: Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity. (Math CCSS HSN.Q.A.1, HSN.Q.A.2, HSN.Q.A.3)

RELEVANT STANDARDS AND FRAMEWORKS, CONTENT/PROGRAM SPECIFIC STANDARDS:

Link to Common Core Standards (if applicable):

Educational standards describe what students should know and be able to do in each subject in each grade. In California, the State Board of Education decides on the standards for all students, from kindergarten through high school.

<https://www.cde.ca.gov/be/st/ss/documents/sciencestnd.pdfs/wlstandards.pdfstandards.pdf>

Link to Framework (if applicable):

Curriculum frameworks provide guidance for implementing the content standards adopted by the State Board of Education (SBE). Frameworks are developed by the Instructional Quality Commission, formerly known as the Curriculum Development and Supplemental Materials Commission, which also reviews and recommends textbooks and other instructional materials to be adopted by the SBE.

<https://www.cde.ca.gov/ci/sc/cf/cascienceframework2016.aspchapter18.pdf.pdfpter16.pdfdfework.pdf>

Link to Subject Area Content Standards (if applicable):

Content standards were designed to encourage the highest achievement of every student, by defining the knowledge, concepts, and skills that students should acquire at each grade level.

<https://docs.google.com/spreadsheets/d/18FDVrzVXON14QEjvCxeGVFIVicXhmWG5/edit?usp=sharing&ouid=104956413096596664509&rtfpof=true&sd=true>

Link to Program Content Area Standards (if applicable):

Program Content Area Standards apply to programs such as International Baccalaureate, Advanced Placement, Career and Technical Education, etc.

TEXTBOOKS AND RESOURCE MATERIALS:

Textbooks

Board Approved	Pilot Completion Date (If applicable)	Textbook Title	Author(s)	Publisher	Edition	Date
<i>Yes</i>		<i>Online Curriculum</i>	K12 Stride	12 Stride		
<i>Yes</i>		<i>Chemistry: A Laboratory Guide</i>	K12 Stride	K12 Stride		<i>1/1/2008</i>