

WARREN COUNTY SCHOOL DISTRICT

PLANNED INSTRUCTION

COURSE DESCRIPTION

Course Title: Chemistry CP
Course Number: 00331
Course Prerequisites: Successful completion of Algebra 1 CP or Algebra 1B

Course Description: Chemistry courses involve studying the composition, properties, and reactions of substances. These courses typically explore such concepts as the behaviors of solids, liquids, and gases; acid/base and oxidation/reduction reactions; and atomic structure. Chemical formulas and equations and nuclear reactions are also studied. College Preparatory (CP) Chemistry describes matter using both words and numbers. Students will be required to utilize higher math skills frequency. Current enrollment in or completion of CP Algebra II is strongly recommended for success in CP Chemistry. The course will meet 6 periods per week with one of those periods designated for laboratory exploration.

Suggested Grade Level: Grades 10-12
Length of Course: Two Semesters
Units of Credit: 1

PDE Certification and Staffing Policies and Guidelines (CSPG) Required Teacher Certifications:

CSPG 34 Chemistry

To find the CSPG information, go to [CSPG](#)

Certification verified by the WCSD Human Resources Department: ☒ Yes ☐ No

WCSD STUDENT DATA SYSTEM INFORMATION

Course Level: Academic
Mark Types: Check all that apply.
☒ F – Final Average ☒ MP – Marking Period ☒ EXM – Final Exam

GPA Type: ☐ GPAEL-GPA Elementary ☐ GPAML-GPA for Middle Level ☒ NHS-National Honor Society
☒ UGPA-Non-Weighted Grade Point Average ☒ GPA-Weighted Grade Point Average

State Course Code: 03101

To find the State Course Code, go to [State Course Code](#), download the Excel file for SCED, click on SCED 6.0 tab, and choose the correct code that corresponds with the course.

WARREN COUNTY SCHOOL DISTRICT

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TEXTBOOKS AND SUPPLEMENTAL MATERIALS

Board Approved Textbooks, Software, and Materials:

Title: OpenSciEd
Publisher: OpenSciEd
ISBN #: N/A
Copyright Date: N/A
WCSD Board Approval Date: 12/16/2024

Supplemental Materials: OpenSciEd content including kits and digital platform, content specific videos/video clips from OpenSciEd, Swank, YouTube, PBS, or other WCSD approved sources.

Curriculum Document

WCSD Board Approval:

Date Finalized: 12/6/2024
Date Approved: 12/16/2024
Implementation Year: 2025-2026

SPECIAL EDUCATION, 504, and GIFTED REQUIREMENTS

The teacher shall make appropriate modifications to instruction and assessment based on a student's Individual Education Plan (IEP), Chapter 15 Section 504 Plan (504), and/or Gifted Individual Education Plan (GIEP).

SCOPE AND SEQUENCE OF CONTENT AND CONCEPTS

Marking Period 1

- Thermodynamics in Earth's Systems
- Structures and Properties of Matter

Marking Period 2

- Structures and Properties of Matter continued
- Molecular Processes in Earth Systems

Marking Period 3

- Chemical Reactions in Our World

Marking Period 4

- Energy from Chemical and Nuclear Reactions

WARREN COUNTY SCHOOL DISTRICT

PLANNED INSTRUCTION

Standards/Eligible Content and Skills

Performance Indicator	PA Core Standard and/or Eligible Content	Marking Period Taught
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.	3.2.9-12.A	MP2
Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.	3.2.9-12.B	MP2
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.	3.2.9-12.C	MP2
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.	3.2.9-12.D	MP4
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.	3.2.9-12.E	MP3
Refine the design of a chemical system by specifying a change in conditions that would produce increased amounts of products at equilibrium.	3.2.9-12.F	MP3
Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.	3.2.9-12.G	MP3
Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes of fission, fusion, and radioactive decay.	3.2.9-12.H	MP3
Use mathematical representations of Newton's Law of Gravitation and Coulomb's Law to describe and predict the gravitational and electrostatic forces between objects.	3.2.9-12.L	MP2
Communicate scientific and technical information about why the molecular level structure is important in the functioning of designed materials.	3.2.9-12.N	MP2
Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known.	3.2.9-12.O	MP1, MP4
Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated	3.2.9-12.P	MP4

WARREN COUNTY SCHOOL DISTRICT

PLANNED INSTRUCTION

Performance Indicator	PA Core Standard and/or Eligible Content	Marking Period Taught
with the motions of particles (objects) and energy associated with the relative positions of particles (objects).		
Develop and use a model of two objects interacting through electric or magnetic fields to illustrate the forces between objects and the changes in energy of the objects due to the interaction.	3.2.9-12.S	MP4
Construct an explanation of the Big Bang theory based on astronomical evidence of light spectra, the motion of distant galaxies, and the composition of matter in the universe.	3.3.9-12.B	MP2
Develop a model to illustrate how Earth's internal and surface processes operate at different spatial and temporal scales to form continental and ocean-floor features.	3.3.9-12.J	MP2
Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes.	3.3.9-12.K	MP2
Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.	3.3.9-12.L	MP3
Construct an argument based on evidence about the simultaneous coevolution of Earth's systems and life on Earth.	3.3.9-12.N	MP1, MP2
Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.	3.3.9-12.O	MP1
Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.	3.3.9-12.P	MP1, MP4
Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.	3.3.9-12.Q	MP2, MP4
Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems.	3.3.9-12.S	MP3
Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.	3.5.9-12.T(ETS)	MP3, MP4
Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.	3.5.9-12.Y(ETS)	MP3
The many dynamic and delicate feedback between the biosphere and other Earth systems cause a continual co-evolution of Earth's surface and the life that exists on it.	ESS2.E	MP1
Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.	CC.3.5.11-12.A	MP1, MP2, MP3, MP4

WARREN COUNTY SCHOOL DISTRICT

PLANNED INSTRUCTION

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Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.	CC.3.5.11-12.B	MP1, MP3, MP4
Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.	CC.3.5.11-12.G	MP1, MP2, MP3, MP4
Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.	CC.3.5.11-12.H	MP1, MP3, MP4
Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible .	CC.3.5.11-12.I	MP3, MP4
Write arguments focused on discipline-specific content.	CC.3.6.11-12.A	MP1
Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.	CC.3.6.11-12.A.1	MP1
Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.	CC.3.6.11-12.A.2	MP1
Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.	CC.3.6.11-12.A.3	MP1
Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.	CC.3.6.11-12.A.4	MP1
Provide a concluding statement or section that follows from or supports the argument presented.	CC.3.6.11-12.A.5	MP1
Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.	CC.3.6.11-12.B	MP1, MP2, MP3
Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.	CC.3.6.11-12.B.1	MP1, MP2, MP3
Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or	CC.3.6.11-12.B.2	MP1, MP2, MP3

WARREN COUNTY SCHOOL DISTRICT

PLANNED INSTRUCTION

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other information and examples appropriate to the audience's knowledge of the topic.		
Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.	CC.3.6.11-12.B.3	MP1, MP2, MP3
Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.	CC.3.6.11-12.B.4	MP1, MP2, MP3
Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).	CC.3.6.11-12.B.5	MP1, MP2, MP3
Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.	CC.3.6.11-12.D	MP1
Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.	CC.3.6.11-12.F	MP2, MP3, MP4
Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.	CC.3.6.11-12.G	MP1, MP3, MP4
Draw evidence from informational texts to support analysis, reflection, and research.	CC.3.6.11-12.H	MP1, MP2, MP4

ASSESSMENTS

PDE Academic Standards, Assessment Anchors, and Eligible Content: The teacher must be knowledgeable of the PDE STEELS Standards as well as the Reading and Writing in Science and Technical Subjects Standards and incorporate them regularly into planned instruction.

Formative Assessments: The teacher will utilize a variety of assessment methods to conduct in-process evaluations of student learning.

Effective formative assessments for this course include: Bell ringers, exit tickets, notice and wonderings, progress checks, quizzes, lab assignments, teacher questioning, class discussions, peer assessments, model trackers, and teacher observations.

Summative Assessments: The teacher will utilize a variety of assessment methods to evaluate student learning at the end of an instructional task, lesson, and/or unit.

Effective summative assessments for this course include: Lab reports, CER responses, chapter tests, district marking period assessments, culminating tasks, and projects.