WARREN COUNTY SCHOOL DISTRICT

PLANNED INSTRUCTION

COURSE DESCRIPTION

Course Title: Physical Science
Course Number: 00332
Course Prerequisites: Successful completion of Algebra 1CP or Algebra 1B

Course Description: Physical Science courses involve study of the structures and states of matter. Typically (but not always) offered as introductory survey courses, they may include such topics as forms of energy, wave phenomenon, electromagnetism, and physical and chemical interactions.

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; CSPG 40 Earth and Space Science; CSPG 56 Physics
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: 03159
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.

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

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

Marking Period 2

- Molecular Processes in Earth Systems continued
- Energy from Chemical and Nuclear Reactions

Marking Period 3

- Energy Flow from Earth's Systems
- Collisions and Momentum

Marking Period 4

- Collisions and Momentum continued
- Electromagnetic Radiation

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	MP1, 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	MP1, 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	MP1, 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	MP2
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	MP2
Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.	3.2.9-12.I	MP3
Use mathematical representations to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system.	3.2.9-12.J	MP3
Apply scientific and engineering ideas to design, evaluate and refine a device that minimizes the force on a macroscopic object during a collision.	3.2.9-12.K	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	MP1
Plan and conduct an investigation to provide evidence that an electric current can produce a magnetic field and that a changing magnetic field can produce an electric current.	3.2.9-12.M	MP3, MP4
Communicate scientific and technical information about why the molecular level structure is important in the functioning of designed materials.	3.2.9-12.N	MP1, 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	MP2, MP3
Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motions of particles (objects) and energy associated with the relative positions of particles (objects).	3.2.9-12.P	MP2, MP3

Performance Indicator	**PA Core Standard and/or Eligible Content**	**Marking Period Taught**
Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.	3.2.9-12.Q	MP3
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	MP2, MP3
Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.	3.2.9-12.T	MP4
Evaluate questions about the advantages of using digital transmission and storage of information.	3.2.9-12.U	MP4
Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter.	3.2.9-12.W	MP4
Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.	3.2.9-12.X	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	MP1, MP2
Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.	3.3.9-12.B	MP4
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	MP1, 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	MP1, MP2
Construct an argument based on evidence about the simultaneous coevolution of Earth's systems and life on Earth.	3.3.9-12.N	MP1
Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.	3.3.9-12.P	MP2
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	MP1, MP2, MP3
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	MP2
Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.	3.5.9-12.I(ETS)	MP3
Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria	3.5.9-12.K(ETS)	MP3

Performance Indicator	**PA Core Standard and/or Eligible Content**	**Marking Period Taught**
and constraints on interactions within and between systems relevant to the problem.		
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)	MP2
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
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	MP2
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	MP2, 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	MP2, MP3
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, MP4
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, MP4
Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.	CC.3.6.11-12.B.2	MP1, MP2, MP3, MP4
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, MP4
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, MP4
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, MP4

Performance Indicator	PA Core Standard and/or Eligible Content	Marking Period Taught
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, MP2
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	MP1, 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	MP2, MP3, MP4
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.	CC.3.6.11-12.H	MP1, MP2, MP3, MP4

ASSESSMENTS

PDE Academic Standards, Assessment Anchors, and Eligible Content: The teacher must be knowledgeable of the PDE Academic Standards, Assessment Anchors, and Eligible Content 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.