

WARREN COUNTY SCHOOL DISTRICT

PLANNED INSTRUCTION

COURSE DESCRIPTION

Course Title: Science 8
Course Number: 00307
Course Prerequisites: None

Course Description: In this eighth-grade general science course, students will learn the fundamental principles of the natural world. Through engaging experiments, hands-on activities, and interactive discussions students will explore a diverse range of topics. These include contact forces, sound waves, forces at a distance, Earth in space, genetics, and the concepts of natural selection and common ancestry. The six units in Science 8 blend core ideas with science and engineering practices, incorporating crosscutting concepts. This approach supports students in developing usable knowledge across various science disciplines. Standards from multiple branches of science and areas of the STEELS standards are integrated to ensure a cohesive and integrated science experience, aligning with the three-dimensional design of the standards. District assessments are required.

Suggested Grade Level: Grade 8

Length of Course: Two Semesters

Units of Credit: 1

PDE Certification and Staffing Policies and Guidelines (CSPG) Required Teacher Certifications: CSPG 32 Biology, CSPG 34 Chemistry, CSPG 40 Earth and Space Science, CSPG 45 Environmental Science, CSPG 46 General Science, CSPG 54 Middle Level Science, CSPG 56 Physics, CSPG 70 Grades 4 – 8

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: 03238

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.

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TEXTBOOKS AND SUPPLEMENTAL MATERIALS

Board Approved Textbooks, Software, and Materials:

Title: OpenSciEd
Publisher: OpenSciEd
ISBN #: NA
Copyright Date: NA
WCSD Board Approval Date: 5/8/2023

Supplemental Materials: OpenSciEd Kits and Digital Platform through Carolina Biological, Content specific videos/video clips from OpenSciEd, Carolina Biological, Swank, YouTube, PBS or other WCSD approved source.

Curriculum Document

WCSD Board Approval:

Date Finalized: 12/18/2023
Date Approved: 6/10/2024
Implementation Year: 2024-2025

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

- Contact Forces
 - Forces and Motion
 - Definitions of Energy
 - Developing Possible Solutions
 - Optimizing the Design Solution
 - Information Processing
 - Conservation of Energy and Energy Transfer
 - Relationship Between Energy and Forces
- Sound Waves
 - Wave Properties

Marking Period 2

- Sound Waves
 - Wave Properties
- Forces at a Distance
 - Types of Interactions
 - Definitions of Energy

Marking Period 3

- Earth in Space
 - The Universe and Its Stars
 - Earth and the Solar System
 - Gravitational Force
 - Electromagnetic Radiation
- Genetics
 - Structure and Function
 - Growth and Development of Organisms
 - Inheritance of Traits
 - Variation of Traits

Marking Period 4

- Genetics
 - Structure and Function
 - Growth and Development of Organisms
 - Inheritance of Traits
 - Variation of Traits

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- Natural Selection and Common Ancestry
 - o Growth and Development of Organisms
 - o Evidence of Common Ancestry and Diversity
 - o Natural Selection
 - o Adaptation
- Rocketry (If time and **building funds** permit)
 - o History and Principles
 - o Rocket Parts/Assembly
 - o Newton’s Laws of Motion
 - o Launch Procedures and Safety
 - o Rocket Day

Standards/Eligible Content and Skills

Performance Indicator	PA Core Standard and/or Eligible Content	Marking Period Taught
Apply Newton’s third law to design a solution to a problem involving the motion of two colliding objects.	3.2.6-8.G	MP 1
Plan an investigation to provide evidence that the change in an object’s motion depends on the sum of the forces on the object and the mass of the object.	3.2.6-8.H	MP 1
Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass and speed of an object.	3.2.6-8.L	MP 1
Gather and synthesize information about how sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.	3.1.6-8.H	MP 1
Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.	3.5.6-8.N (ETS)	MP 1
Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.	3.5.6-8.P (ETS)	MP 1
Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.	3.2.6-8.Q	MP1 MP2
Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.	3.2.6-8.R	MP1 MP2
Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.	3.1.6-8.H	MP1 MP2

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Performance Indicator	PA Core Standard and/or Eligible Content	Marking Period Taught
Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.	3.2.6-8.I	MP2
Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.	3.2.6-8.K	MP2
Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.	3.2.6-8.P	MP2
Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.	3.2.6-8.J	MP3
Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.	3.2.6-8.R	MP3
Develop and use a model of the Earth–Sun–Moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.	3.3.6-8.A	MP3
Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.	3.3.6-8.B	MP3
Analyze and interpret data to determine scale properties of objects in the solar system.	3.3.6-8.C	MP3
Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.	3.1.6-8.B	MP3 MP4
Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.	3.1.6-8.E	MP3 MP4
Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.	3.1.6-8.M	MP3 MP4
Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.	3.1.6-8.N	MP3 MP4
Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.	3.1.6-8.R	MP3 MP4
Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.	3.1.6-8.D	MP3 MP4
Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.	3.1.6-8.O	MP4

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Performance Indicator	PA Core Standard and/or Eligible Content	Marking Period Taught
Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.	3.1.6-8.P	MP4
Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.	3.1.6-8.Q	MP4
Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.	3.1.6-8.S	MP4
Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.	3.1.6-8.T	MP4
Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects	3.2.6-8.G	MP4
Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.	3.2.6-8.H	MP4
Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.	3.2.6-8.J	MP4
Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.	3.5.6-8.M (ETS)	MP4
Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.	3.5.6-8.N (ETS)	MP4
Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.	3.5.6-8.P (ETS)	MP4
Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.	3.5.6-8.W (ETS)	MP4
Cite specific textual evidence to support analysis of science and technical texts.	CC.3.5.6-8.A	MP1 MP2 MP3 MP4
Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.	CC.3.5.6-8.B	MP1 MP2 MP3 MP4

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Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.	CC.3.5.6-8.C	MP1 MP2 MP3 MP4
Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.	CC.3.5.6-8.D	MP1 MP2 MP3 MP4
Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.	CC.3.5.6-8.E	MP1 MP2 MP3 MP4
Analyze the author’s purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.	CC.3.5.6-8.F	MP1 MP2 MP3 MP4
Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).	CC.3.5.6-8.G	MP1 MP2 MP3 MP4
Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.	CC.3.5.6-8.H	MP1 MP2 MP3 MP4
Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.	CC.3.5.6-8.I	MP1 MP2 MP3 MP4
By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.	CC.3.5.6-8.J	MP1 MP2 MP3 MP4
Write arguments focused on discipline-specific content. • Introduce claim(s) about a topic or issue, acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically. • Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources. • Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence. • Establish and maintain a formal style. • Provide a concluding statement or section that follows from and supports the argument presented.	CC.3.6.6-8.A	MP1 MP2 MP3 MP4

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Performance Indicator	PA Core Standard and/or Eligible Content	Marking Period Taught
<p>Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. • Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories as appropriate to achieving purpose; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension. • Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples. • Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts. • Use precise language and domain-specific vocabulary to inform about or explain the topic. • Establish and maintain a formal style and objective tone. • Provide a concluding statement or section that follows from and supports the information or explanation presented.</p>	CC.3.6.6-8.B	MP1 MP2 MP3 MP4
<p>Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>	CC.3.6.6-8.C	MP1 MP2 MP3 MP4
<p>With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.</p>	CC.3.6.6-8.D	MP1 MP2 MP3 MP4
<p>Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.</p>	CC.3.6.6-8.E	MP1 MP2 MP3 MP4
<p>Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.</p>	CC.3.6.6-8.F	MP1 MP2 MP3 MP4
<p>Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.</p>	CC.3.6.6-8.G	MP1 MP2 MP3 MP4
<p>Draw evidence from informational texts to support analysis reflection, and research.</p>	CC.3.6.6-8.H	MP1 MP2 MP3 MP4
<p>Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.</p>	CC.3.6.6-8.I	MP1 MP2 MP3 MP4

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ASSESSMENTS

PDE Academic Standards: The teacher must be knowledgeable of the PDE STEELS Standards as well as the Reading and Writing in Science and Technology 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, initial models, driving question boards, progress checkers, quizzes, lab assignments, practice tests, writing prompts, teacher questioning, class discussions, individual and team-based projects.

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, tests, district marking period assessments, CER Responses, consensus models.