WARREN COUNTY SCHOOL DISTRICT

PLANNED INSTRUCTION

COURSE DESCRIPTION

Course Title: Science 7
Course Number: 00305
Course Prerequisites: None

Course Description: Students in Science 7 continue to develop an understanding of key concepts to help them make sense of the world around them. These ideas build upon students' science understanding from earlier grades and from the disciplinary core ideas, science and engineering practices, and crosscutting concepts of previous experiences with science. Although there is an emphasis on life science and environmental science content in the six Science 7 units, standards are incorporated from all three branches of science and all areas of the STEELS standards to ensure a well-rounded science experience in accordance with the three-dimensional design of these new standards.

Suggested Grade Level: Grade 7
Length of Course: Two Semesters
Units of Credit: 1
PDE Certification and Staffing Policies and Guidelines (CSPG) Required Teacher Certifications:
CSPG 32 Biology, CSPG 46 General Science, CSPG 54 Middle Level Science, CSPG 70 Grades 4 – 8 (3100-05)

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: 03237
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 #:	NA
Copyright Date:	NA
WCSD Board Approval Date:	5/8/2023

Supplemental Materials: OpenSciEd kits and digital platform through Carolina Biological

Curriculum Document

WCSD Board Approval:

Date Finalized:	6/26/2023
Date Approved:	6/26/2023
Implementation Year:	2023-2024

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

- Cells & Systems
    - Structure and Function
    - Information Processing
- Metabolic Reactions
    - Structure and Function
    - Growth and Development
    - Organization of Matter and Energy Flow in Organisms
    - Energy in Processes and Everyday Life

Marking Period 2

- Metabolic Reactions
    - Structure and Function
    - Growth and Development
    - Organization of Matter and Energy Flow in Organisms
    - Energy in Processes and Everyday Life
- Matter Cycling and Photosynthesis
    - Organization for Matter and Energy Flow in Organisms
    - Cycle of Matter and Energy Transfer in Ecosystems
    - Structure and Properties of Matter
    - Chemical Reactions
    - Energy in Chemical Processes and Everyday Life

Marking Period 3

- Ecosystem Dynamics
    - Interdependent Relationships in Ecosystems
    - Cycles of Matter and Energy Transfer in Ecosystems
    - Ecosystem Dynamics, Functioning, and Resilience
    - Biodiversity and Humans
    - Developing Possible Solutions
    - Human Impacts on Earth Systems
- 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
- Natural Selection and Common Ancestry
    - Growth and Development of Organisms
    - Evidence of Common Ancestry and Diversity
    - Natural Selection
    - Adaptation

Standards/Eligible Content and Skills

Performance Indicator	PA Core Standard and/or Eligible Content	Marking Period Taught
Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.	3.1.6-8.A	MP1
Conduct an investigation to produce data supporting the concept that living things may be made of one cell or many and varied cells.	3.1.6-8.A	MP1
Distinguish between living and nonliving things.	3.1.6-8.A	MP1
Observe different types of cells that can be found in the makeup of living things.	3.1.6-8.A	MP1
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	MP1
Develop and use models to describe the relationship between the structure and function of the cell wall and cell membrane.	3.1.6-8.B	MP1
Identify parts of the cell, specifically the nucleus, chloroplasts, mitochondria, cell membrane, and cell wall.	3.1.6-8.B	MP1
Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.	3.1.6-8.C	MP1
Use an oral and written argument supported by evidence to support or refute an explanation or a model of how the body is a system of interacting subsystems composed of groups of cells	3.1.6-8.C	MP1
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
Gather, read, and synthesize information from multiple appropriate sources about sensory receptors' response to stimuli.	3.1.6-8.H	MP1
Assess the credibility, accuracy, and possible bias of each publication and methods used.	3.1.6-8.H	MP1
Describe how publications and methods used are supported or not supported by evidence.	3.1.6-8.H	MP1
Use an oral and written argument supported by evidence to support or refute an explanation or a model of how the body is a system of interacting subsystems composed of groups of cells.	3.1.6-8.C	MP1 MP2
Conduct experiments, collect evidence, and analyze empirical data.	3.1.6-8.E	MP1 MP2
Use evidence from experiments and other scientific reasoning to support oral and written explanations of how environmental and genetic factors influence the growth of organisms.	3.1.6-8.E	MP1 MP2

Performance Indicator	**PA Core Standard and/or Eligible Content**	**Marking Period Taught**
Identify and describe possible causes and effects of local environmental conditions on the growth of organisms.	3.1.6-8.E	MP1 MP2
Identify and describe possible causes and effects of genetic conditions on the growth of organisms.	3.1.6-8.E	MP1 MP2
Develop and use a model to describe how food is rearranged through chemical reactions.	3.1.6-8.G	MP1 MP2
Develop a model of a simple molecule.	3.2.6-8.A	MP1 MP2
Use the model of the simple molecule to describe its atomic composition.	3.2.6-8.A	MP1 MP2
Develop a model of an extended structure.	3.2.6-8.A	MP1 MP2
Use the model of the extended structure to describe its repeating subunits. *[Boundary: The substructure of atoms and the periodic table are learned in high school chemistry.]*.	3.2.6-8.A	MP1 MP2
Analyze and interpret data to determine similarities and differences from results of chemical reactions between substances before and after they undergo a chemical process.	3.2.6-8.D	MP1 MP2
Analyze and interpret data on the properties of substances before and after they undergo a chemical process.	3.2.6-8.D	MP1 MP2
Identify and describe possible correlation and causation relationships evidenced in chemical reactions.	3.2.6-8.D	MP1 MP2
Make logical and conceptual connections between evidence that chemical reactions have occurred and explanations of the properties of substances before and after they undergo a chemical process.	3.2.6-8.D	MP1 MP2
Construct a scientific explanation for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms based on valid and reliable evidence obtained from sources (including the students' own experiments).	3.1.6-8.F	MP2
Construct a scientific explanation for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms based on the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.	3.1.6-8.F	MP2
Develop a model to describe the cycling of matter among living and nonliving parts of an ecosystem.	3.1.6-8.K	MP2
Develop a model to describe the flow of energy among living and nonliving parts of ecosystem. Track the transfer of energy as energy flows through an ecosystem.	3.1.6-8.K	MP2
Observe and measure patterns of objects and events in ecosystems.	3.1.6-8.K	MP2

Performance Indicator	**PA Core Standard and/or Eligible Content**	**Marking Period Taught**
Develop a model that predicts and describes changes in particle motion that could include molecules or inert atoms or pure substances.	3.2.6-8.C	MP2
Use cause-and-effect relationships to predict changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed in natural or designed systems.	3.2.6-8.C	MP2
Develop and use a model to describe the function of a cell as a whole and ways the parts of cells contribute to the function. (Specifically, chloroplasts and mitochondria)	3.1.6-8.B	MP2
Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.	3.1.6-8.I	MP3
Use cause-and-effect relationships to predict the effect of resource availability on organisms and populations in natural systems.	3.1.6-8.I	MP3
Construct an explanation about interactions within ecosystems.	3.1.6-8.J	MP3
Include qualitative or quantitative relationships between variables as part of explanations about interactions within ecosystems.	3.1.6-8.J	MP3
Make predictions about the impact within and across ecosystems of competitive, predatory, or mutually beneficial relationships as abiotic (e.g., floods, habitat loss) or biotic (e.g., predation) components change.	3.1.6-8.J	MP3
Construct an argument to support or refute an explanation for the changes to populations in an ecosystem caused by disruptions to a physical or biological component of that ecosystem. Empirical evidence and scientific reasoning must support the argument.	3.1.6-8.L	MP3
Use scientific rules for obtaining and evaluating empirical evidence.	3.1.6-8.L	MP3
Recognize patterns in data and make warranted inferences about changes in populations.	3.1.6-8.L	MP3
Evaluate empirical evidence supporting arguments about changes to ecosystems.	3.1.6-8.L	MP3
Construct a convincing argument that supports or refutes claims for solutions about the natural and designed world(s).	3.1.6-8.M	MP3
Develop a model to generate data to test ideas about designed systems, including those representing inputs and outputs.	3.1.6-8.M	MP3
Create design criteria for design solutions for maintaining biodiversity and ecosystem services.	3.1.6-8.M	MP3
Define the criteria and constraints of a design problem with 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 with a particular attention to what land-use strategies work for different stakeholders and the limits of their application.	3.5.6-8.W (ETS)	MP3
Apply scientific principles to design a method for monitoring and minimizing human impact on the environment.	3.3.6-8.M	MP3

Performance Indicator	**PA Core Standard and/or Eligible Content**	**Marking Period Taught**
Construct an argument supported by evidence for how increases in human population and per capita consumption of natural resources impact Earth's systems.	3.3.6-8.N	MP3
Develop a model to describe how agricultural and food systems function, including the sustainable use of natural resources and the production, processing, and management of food, fiber, and energy.	3.4.6-8.A	MP3
Analyze and interpret data about how different societies (economic and social systems) and cultures use and manage natural resources differently.	3.4.6-8.B	MP3
Collect, analyze, and interpret environmental data to describe a local environment.	3.4.6-8.E	MP3
Obtain and communicate information on how integrated pest management could improve indoor and outdoor environments.	3.4.6-8.F	MP 3
Obtain and communicate information to describe how best resource management practices and environmental laws are designed to achieve environmental sustainability.	3.4.6-8.G	MP3
Design a solution to an environmental issue in which individuals and societies can engage as stewards of the environment.	3.4.6-8.H	MP3
Construct an explanation that describes regional environmental conditions and their implications on environmental justice and social equity.	3.4.6-8.I	MP3
Conduct experiments, collect evidence, and analyze empirical data.	3.1.6-8.E	MP3 MP4
Use evidence from experiments and other scientific reasoning to support oral and written explanations of how environmental and genetic factors influence the growth of organisms.	3.1.6-8.E	MP3 MP4
Identify and describe possible causes and effects of local environmental conditions on the growth of organisms.	3.1.6-8.E	MP3 MP4
Identify and describe possible causes and effects of genetic conditions on 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.	3.1.6-8.N	MP3 MP4
Develop and use a model to describe why sexual reproduction results in offspring with genetic variation.	3.1.6-8.N	MP3 MP4
Use models such as Punnett squares, diagrams, and simulations to describe the cause-and effect-relationship of gene transmission from parent(s) to offspring and resulting genetic variation.	3.1.6-8.N	MP3 MP4
Explain some causes of natural selection and the effect it has on the increase or decrease of specific traits in populations over time.	3.1.6-8.R	MP3 MP4

Performance Indicator	**PA Core Standard and/or Eligible Content**	**Marking Period Taught**
Use mathematical representations to support conclusions about how natural selection may lead to increases and decreases of genetic traits in populations over time.	3.1.6-8.R	MP3 MP4
Develop and use a model to describe the function of a cell as a whole.	3.1.6-8.B	MP3 MP4
Develop and use a model to describe how parts of cells contribute to the cell's function.	3.1.6-8.B	MP3 MP4
Develop and use models to describe the relationship between the structure and function of the cell wall and cell membrane.	3.1.6-8.B	MP3 MP4
Within cells, the cell membrane forms the boundary that controls what enters and leaves the cell.	3.1.6-8.B	MP3 MP4
Collect empirical evidence about animal behaviors that affect the animals' probability of successful reproduction and also affect the probability of plant reproduction.	3.1.6-8.D	MP3 MP4
Collect empirical evidence about plant structures that are specialized for reproductive success.	3.1.6-8.D	MP3 MP4
Use empirical evidence from experiments and other scientific reasoning to support oral and written arguments that explain the relationship among plant structure, animal behavior, and the reproductive success of plants.	3.1.6-8.D	MP3 MP4
Identify and describe possible cause-and effect relationships affecting the reproductive success of plants and animals using probability.	3.1.6-8.D	MP3 MP4
Support or refute an explanation of how characteristic animal behaviors and specialized plant structures affect the probability of successful plant reproduction using oral and written arguments.	3.1.6-8.D	MP3 MP4
Use graphs, charts, and images to identify patterns within the fossil record.	3.1.6-8.O	MP4
Analyze and interpret data within the fossil record to determine similarities and differences in findings.	3.1.6-8.O	MP4
Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of past plate motions.	3.3.6-8.G	MP4
Make logical and conceptual connections between evidence in the fossil record and explanations about the existence, diversity, extinction, and change in many life forms throughout the history of life on Earth.	3.1.6-8.P	MP4
Apply scientific ideas to construct explanations for evolutionary relationships.	3.1.6-8.P	MP4
Apply the patterns in gross anatomical structures among modern organisms and between modern organisms and fossil organisms to construct explanations of evolutionary relationships.	3.1.6-8.P	MP4
Apply scientific ideas about evolutionary history to construct an explanation for evolutionary relationships evidenced by similarities or differences in the gross appearance of anatomical structures.	3.1.6-8.P	MP4
Use diagrams or pictures to identify patterns in embryological development across multiple species.	3.1.6-8.Q	MP4
Analyze displays of pictorial data to identify where the embryological development is related linearly and where that linear nature ends.	3.1.6-8.Q	MP4

Performance Indicator	**PA Core Standard and/or Eligible Content**	**Marking Period Taught**
Infer general patterns of relatedness among embryos of different organisms by comparing the macroscopic appearance of diagrams or pictures.	3.1.6-8.Q	MP4
Construct an explanation that includes probability statements regarding variables and proportional reasoning of how genetic variations of traits in a population increase some individuals' probability surviving and reproducing in a specific environment.	3.1.6-8.S	MP4
Use probability to describe some cause-and-effect relationships that can be used to explain why some individuals survive and reproduce in a specific environment.	3.1.6-8.S	MP4
Gather, read, and synthesize information about technologies that have changed the way humans influence the inheritance of desired traits in organisms (artificial selection) from multiple appropriate sources.	3.1.6-8.T	MP4
Describe how information from publications about technologies and methods that have changed the way humans influence the inheritance of desired traits in organisms (artificial selection) used are supported or not supported by evidence.	3.1.6-8.T	MP4
Assess the credibility, accuracy, and possible bias of publications and the methods they used when gathering information about technologies that have changed the way humans influence the inheritance of desired traits in organisms (artificial selection).	3.1.6-8.T	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
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

Performance Indicator	**PA Core Standard and/or Eligible Content**	**Marking Period Taught**
		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
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.	CC.3.6.6-8.B.	MP1 MP2 MP3 MP4
Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.	CC.3.6.6-8.C	MP1 MP2 MP3 MP4
With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting,	CC.3.6.6-8.D	MP1 MP2 MP3

Performance Indicator	PA Core Standard and/or Eligible Content	Marking Period Taught
or trying a new approach, focusing on how well purpose and audience have been addressed.		MP4
Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.	CC.3.6.6-8.E.	MP1 MP2 MP3 MP4
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.	CC.3.6.6-8.F.	MP1 MP2 MP3 MP4
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.	CC.3.6.6-8.G.	MP1 MP2 MP3 MP4
Draw evidence from informational texts to support analysis reflection, and research.	CC.3.6.6-8.H	MP1 MP2 MP3 MP4
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.	CC.3.6.6-8.I	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, worksheets, 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