

WARREN COUNTY SCHOOL DISTRICT

PLANNED INSTRUCTION

COURSE DESCRIPTION

Course Title: Advanced Biology Honors
Course Number: 00317
Course Prerequisites: Appropriate algebra-based coursework

Course Description: Advanced Biology Honors is highly recommended for students who desire to attend college and/or pursue a career in a biological field. The main approach to the course is at the molecular level with an emphasis on biodiversity, systematics, and ecology. Additional focus is placed on biochemistry, cells, genetics, and evolution. The viruses and major phyla of living things are studied in depth. Final assessment required.

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 32 Biology

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: Choose an item.

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: 03052

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: Campbell Biology Concepts & Connections 9th edition
Publisher: Pearson
ISBN #: 978-0-13-465340-2
Copyright Date: 2018
WCSD Board Approval Date: May 14, 2018

Supplemental Materials: [Click or tap here to enter text.](#)

Curriculum Document

WCSD Board Approval:

Date Finalized: 2/19/2025
Date Approved: 3/10/2025
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

- Exploring Life
- Microbial Life
- The Evolution of Plants and Fungi

Marking Period 2

- Animal Evolution and Diversity
- Ecology Introduction and Climate Change
- Ecology Populations, Community, Ecosystems, and Conservation

Marking Period 3

- Molecules of Life
- The Working Cell
- The Cell
- Photosynthesis
- Cellular Respiration
- Cell Reproduction

Marking Period 4

- Cell Reproduction continued
- Patterns of Inheritance
- Molecular Biology on the Gene
- Gene Control and Cancer
- Biotechnology
- Introduction to Evolution

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Standards/Eligible Content and Skills

| Performance Indicator | PA Core Standard and/or Eligible Content | Marking Period Taught |
|---|---|------------------------------|
| Describe the common characteristics of life. | SCT.9-12.3.1.B.A1.i | MP1 |
| Compare and contrast the cellular structures and degrees of complexity of prokaryotic and eukaryotic organisms. | SCT.9-12.3.1.B.A1.ii | MP1 |
| Explain that some structures in eukaryotic cells developed from early prokaryotic cells (e.g., mitochondria, chloroplasts). | SCT.9-12.3.1.B.A1.iii | MP1 |
| Recognize that systems within cells and multicellular organisms interact to maintain homeostasis. | SCT.9-12.3.1.B.A8.i | 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. | LA.CC.3.5.11-12.A | MP1, MP3, MP4 |
| Demonstrate 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. | LA.CC.3.5.11-12.B | MP2, MP3, MP4 |
| Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. | LA.CC.3.5.11-12.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 to grades 11-12 text and topics. | LA.CC.3.5.11-12.D | MP1, MP3, MP4 |
| Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas. | LA.CC.3.5.11-12.E | MP2, MP3, MP4 |
| Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved. | LA.CC.3.5.11-12.F | MP2, MP3, MP4 |
| Evaluate the hypotheses, data, analyses, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information. | LA.CC.3.5.11-12.H | MP1, MP2, MP3, MP4 |
| Provide a concluding statement or section that follows from or supports the argument presented. | LA.CC.3.6.11-12A.5 | MP3 |
| Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes. | LA.CC.3.6.11-12.B | MP2, MP3 |
| Draw evidence from informational texts to support analysis, reflection, and research. | LA.CC.3.6.11-12.H | MP4 |
| Explain the characteristics common to all organisms. | SCI.9-12.BIO.A.1.1 | MP2 |
| Describe the characteristics of life shared by all prokaryotic and eukaryotic organisms. | SCI.9-12.BIO.A.1.1.1 | MP2 |
| Describe and interpret relationships between structure and function at various levels of biochemical organization (i.e., atoms, molecules, and macromolecules). | SCI.9-12.BIO.A.2.2 | MP3 |

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| Performance Indicator | PA Core Standard and/or Eligible Content | Marking Period Taught |
|--|---|------------------------------|
| Explain how carbon is uniquely suited to form biological macromolecules. | SCI.9-12.BIO.A.2.2.1 | MP3 |
| Describe how macromolecules form monomers. | SCI.9-12.BIO.A.2.2.2 | MP3 |
| Compare the structure and function of carbohydrates, lipids, proteins, and nucleic acids in organisms. | SCI.9-12.BIO.A.2.2.3 | MP3 |
| Explain how enzymes regulate biochemical reactions within a cell. | SCI.9-12.BIO.A.2.3 | MP3 |
| Describe the role of an enzyme as a catalyst in regulating a specific biochemical reaction. | SCI.9-12.BIO.A.2.3.1 | MP3 |
| Explain how factors such as pH, temperature, and concentration levels can affect enzyme function. | SCI.9-12.BIO.A.2.3.2 | MP3 |
| Identify and describe the cell structures involved in processing energy. | SCI.9-12.BIO.A.3.1 | MP3 |
| Describe the fundamental roles of plastids (e.g., chloroplasts) and mitochondria in energy transformations. | SCI.9-12.BIO.A.3.1.1 | MP3 |
| Identify and describe how organisms obtain and transform energy for their life processes. | SCI.9-12.BIO.A.3.2 | MP3 |
| Compare the basic transformation of energy during photosynthesis and cellular respiration. | SCI.9-12.BIO.A.3.2.1 | MP3 |
| Describe the role of ATP in biochemical reactions. | SCI.9-12.BIO.A.3.2.2 | MP3 |
| Explain mechanisms that permit organisms to maintain biological balance between their internal and external environments. | SCI.9-12.BIO.A.4.2 | MP2 |
| Explain how organisms maintain homeostasis (e.g. thermoregulation, water regulation, oxygen regulation). | SCI.9-12.BIO.A.4.2.1 | MP2 |
| Describe the three stages of the cell cycle: interphase, nuclear division, cytokinesis. | SCI.9-12.BIO.B.1.1 | MP3 |
| Describe the events that occur during the cell cycle: interphase, nuclear division (i.e., mitosis or meiosis), cytokinesis. | SCI.9-12.BIO.B.1.1.1 | MP3 |
| Compare the processes or outcomes of mitotic and meiotic nuclear divisions. | SCI.9-12.BIO.B.1.1.2 | MP3 |
| Explain how genetic information is inherited. | SCI.9-12.BIO.B.1.2 | MP4 |
| Explain the functional relationships between DNA, genes, alleles, and chromosomes and their roles in inheritance. | SCI.9-12.BIO.B.1.2.2 | MP4 |
| Compare Mendelian and non-Mendelian patterns of inheritance. | SCI.9-12.BIO.B.2.1 | MP4 |
| Describe and/or predict observed patterns of inheritance (i.e., dominant, recessive, co-dominance, sex-linked, polygenic, and multiple alleles). | SCI.9-12.BIO.B.2.1.1 | MP4 |
| Describe processes that can alter composition or number of chromosomes (i.e., crossing-over, nondisjunction, translocation, deletion, insertion, and inversion). | SCI.9-12.BIO.B.2.1.2 | MP3 |
| Explain the process of protein synthesis (i.e., transcription, translation, and protein modification). | SCI.9-12.BIO.B.2.2 | MP4 |
| Describe how the processes of transcription and translation are similar in all organisms. | SCI.9-12.BIO.B.2.2.1 | MP4 |

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| Performance Indicator | PA Core Standard and/or Eligible Content | Marking Period Taught |
|---|--|-----------------------|
| Describe the role of ribosomes, endoplasmic reticulum, Golgi apparatus, and the nucleus in the production of specific types of proteins. | SCI.9-12.BIO.B.2.2.2 | MP4 |
| Explain how genetic information is expressed. | SCI.9-12.BIO.B.2.3 | MP4 |
| Describe how genetic mutations alter the DNA sequence and may or may not affect phenotype (e.g., silent, nonsense, frame-shift). | SCI.9-12.BIO.B.2.3.1 | MP4 |
| Apply scientific thinking, processes, tools, and technologies in the study of genetics. | SCI.9-12.BIO.B.2.4 | MP4 |
| Explain how genetic engineering has impacted the fields of medicine, forensics, and agriculture (e.g., selective breeding, gene splicing, cloning, genetically modified organisms, gene therapy). | SCI.9-12.BIO.B.2.4.1 | MP4 |
| Describe ecological levels of organization in the biosphere. | SCI.9-12.BIO.B.4.1 | MP2 |
| Describe the levels of ecological organization (i.e., organism, population, community, ecosystem, biome, and biosphere). | SCI.9-12.BIO.B.4.1.1 | MP2 |
| Describe characteristic biotic and abiotic components of aquatic and terrestrial ecosystems. | SCI.9-12.BIO.B.4.1.2 | MP2 |

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, posters

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, projects, teacher created tests and quizzes