

WARREN COUNTY SCHOOL DISTRICT

PLANNED INSTRUCTION

COURSE DESCRIPTION

Course Title: Biology
Course Number: 00311
Course Prerequisites: None

Course Description: Biology is recommended for tenth grade students who have successfully completed Introduction to Environmental Science. The course focuses on the study of biochemistry, cells, genetics, and evolution. Appropriate lab activities will be used including elements of scientific inquiry, concepts of models and the use of technological devices.

Suggested Grade Level: Grade 10
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 <https://www.education.pa.gov/Educators/Certification/Staffing%20Guidelines/Pages/default.aspx>

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: 03051

To find the State Course Code, go to <https://nces.ed.gov/forum/sced.asp>, download the Excel file for SCED, click on SCED 6.0 tab, and chose the correct code that corresponds with the course.

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TEXTBOOKS AND SUPPLEMENTAL MATERIALS

Board Approved Textbooks, Software, and Materials:

Title: Miller & Levine Biology
Publisher: Pearson
ISBN #: 10: 0-32-892512-8
Copyright Date: 2019
WCSD Board Approval Date: 5/14/2018

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

Curriculum Document

WCSD Board Approval:

Date Finalized: 2/28/2018
Date Approved: 5/14/2018
Implementation Year: 2018-2019

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).

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SCOPE AND SEQUENCE OF CONTENT, CONCEPTS, AND SKILLS

Performance Indicator	PA Core Standard and/or Eligible Content	Month Taught and Assessed for Mastery
Apply the scientific method to solve a problem.	RST.9.3 WHST.9-10.1.a	August September
Explain how scientific theories are developed.	RST.9.3 WHST.9-10.1.a	August September
Explain how scientific attitudes develop new ideas.	RST.9.3 WHST.9-10.1.a	August September
Describe how the structure of water is responsible for its unique properties.	RST.9.5	September Choose an item.
Relate carbon's bonding versatility to its ability to form biological macromolecules.	BIO.A.2.2.1 BIO.A.2.2.2 BIO.A.2.2.3	September Choose an item.
Describe the process of dehydration synthesis and hydrolysis.	BIO.A.2.2.2	September Choose an item.
Differentiate between the structures and functions of carbohydrates, lipids, nucleic acids, and proteins.	BIO.A.2.2.3	September Choose an item.
Investigate the presence of specific molecules in food and the effects of environmental factors on enzyme activities.	BIO.A.2.3 BIO.A.2.3.1	September Choose an item.
Describe the role of catalysts in chemical reactions and identify the enzymes as biological catalysts.	BIO.A.2.3 BIO.A.2.3.1	September Choose an item.
Explain the induced fit model of enzymes.	BIO.A.2.3 BIO.A.2.3.1	September Choose an item.

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Observe cells under a microscope.	BIO.A.3.1 BIO.A.4.1	October November
Build a mosaic of a typical prokaryotic cell.	BIO.A.3.1 BIO.A.4.1	October November
Describe the function of each structure in a prokaryotic cell.	BIO.A.3.1 BIO.A.4.1	October November
Compare and contrast a prokaryotic cell with a eukaryotic cell.	BIO.A.3.1 BIO.A.4.1	October November
Compare and contrast a typical plant cell with a typical animal cell.	BIO.A.3.1.1 BIO.A.3.2 BIO.A.3.2.1	October November
Write an analogy for the function of each of the organelles found in a eukaryotic cell.	BIO.A.3.1 BIO.A.4.1 BIO.A.4.1.1	October November
Describe how the biological levels of organization are arranged in increasing order.	BIO.A.3.1 BIO.A.4.2	October November
Relate the structure of membrane-bound organelles to their functions in energy and transportation of materials.	BIO.A.3.1.1 BIO.A.3.2 BIO.A.3.2.1	October November
Describe the role of the plasma membrane in regulating cell activities and protecting the cell.	BIO.A.4.1.1 BIO.A.4.1.2 BIO.A.4.1.3	October November
Describe the role of ATP in photosynthesis, cell respiration, and active transport.	BIO.A.3.2.1 BIO.A.3.2.2	October November
Compare energy transfer during photosynthesis and cell respiration.	BIO.A.3.2.1 BIO.A.3.2.2	October November
Compare the various mechanisms of passive and active transport.	BIO.A.4.1.2	October November
Identify and describe the three main stages in the cell cycle.	BIO B.1.1 BIO B.1.1.1 BIO B 1.1.2	December Choose an item.
Identify the changes and events that occur in cells before and during mitosis.	BIO B.1.1 BIO B.1.1.1 BIO B 1.1.2	December Choose an item.

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Identify the changes and events that occur in cells before and during meiosis	BIO B.1.1 BIO B.1.1.1 BIO B 1.1.2	December Choose an item.
Differentiate between mitosis and meiosis.	BIO B.1.1 BIO B.1.1.1 BIO B 1.1.2 BIO 1.2 BIO 1.2.2 RST.9.1 RST.9.2	December Choose an item.
Create a model to demonstrate the process of mitosis or meiosis.	BIO B.1.1 BIO B.1.1.1 BIO B 1.1.2	December Choose an item.
Calculate surface area to volume ratio and explain how it limits cell size.	BIO B.1.1 BIO B.1.1.1 BIO B 1.1.2	December Choose an item.
Explain how cancer cells differ from normal cells.	BIO B.1.1 BIO B.1.1.1 BIO B 1.1.2 BIO 1.2 BIO 1.2.2 RST.9.1 RST.9.2 WHST.9.10.2c	January January
Determine the relationship between alleles and genes.	BIO.B.2.1 BIO B.2.1.1 BIO.B.2.2. BIO.B.2.2.1 BIO.B.2.2.2.BIO.B.2.3 BIO.B.2.3.1 RST.9.1 RST.9.2 RST.9.3 RST.9.4 RST.9.5 RST.9.7 RST.9.10.1.c WHST.9-10.2	January February

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Describe and predict various patterns of inheritance.	BIO.B.2.1 BIO B.2.1.1 BIO.B.2.2. BIO.B.2.2.1 BIO.B.2.2.2.BIO.B.2.3 BIO.B.2.3.1 RST.9.1 RST.9.2 RST.9.3 RST.9.4 RST.9.5 RST.9.7 RST.9.10.1.c WHST.9-10.2	January February
Summarize the events of DNA replication and explain the result of replication.	BIO.B.2.1 BIO B.2.1.1 BIO.B.2.2. BIO.B.2.2.1 BIO.B.2.2.2.BIO.B.2.3 BIO.B.2.3.1 RST.9.1 RST.9.2 RST.9.3 RST.9.4 RST.9.5 RST.9.7 RST.9.10.1.c WHST.9-10.2	January February
Explain the roles of DNA, genes, alleles, and chromosomes in inheritance.	BIO.B.2.1 BIO B.2.1.1 BIO.B.2.2. BIO.B.2.2.1 BIO.B.2.2.2.BIO.B.2.3 BIO.B.2.3.1 RST.9.1 RST.9.2 RST.9.3 RST.9.4 RST.9.5 RST.9.7 RST.9.10.1.c WHST.9-10.2	January February
Compare and contrast Mendelian and non-Mendelian patterns of inheritance.	BIO.B.2.1 BIO B.2.1.1 BIO.B.2.2. BIO.B.2.2.1 BIO.B.2.2.2.BIO.B.2.3 BIO.B.2.3.1 RST.9.1 RST.9.2 RST.9.3 RST.9.4 RST.9.5 RST.9.7 RST.9.10.1.c WHST.9-10.2	January February

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<p>Explain the process of transcription, translation, and protein modification</p>	<p>BIO.B.2.1 BIO B.2.1.1 BIO.B.2.2. BIO.B.2.2.1 BIO.B.2.2.2.BIO.B.2.3 BIO.B.2.3.1 RST.9.1 RST.9.2 RST.9.3 RST.9.4 RST.9.5 RST.9.7 RST.9.10.1.c WHST.9-10.2</p>	<p>February March</p>
<p>Identify and explain how genetic information is expressed.</p>	<p>BIO.B.2.1 BIO B.2.1.1 BIO.B.2.2. BIO.B.2.2.1 BIO.B.2.2.2.BIO.B.2.3 BIO.B.2.3.1 RST.9.1 RST.9.2 RST.9.3 RST.9.4 RST.9.5 RST.9.7 RST.9.10.1.c WHST.9-10.2</p>	<p>February March</p>
<p>Explore the relationships between advancements in technology and innovative biological studies.</p>	<p>BIO.B.2.1 BIO B.2.1.1 BIO.B.2.2. BIO.B.2.2.1 BIO.B.2.2.2.BIO.B.2.3 BIO.B.2.3.1 RST.9.1 RST.9.2 RST.9.3 RST.9.4 RST.9.5 RST.9.7 RST.9.10.1.c WHST.9-10.2</p>	<p>February March</p>
<p>Conduct a laboratory investigation on how natural selection can affect allele frequencies of a population.</p>	<p>BIO.B.3.1 BIO.B.3.1.1 BIO.B.3.1.2 BIO.B.3.1.3 BIO.B.3.2 BIO.B.3.2.1 BIO.B.3.3. RST.9.2 RST.9.3 RST.9.4 RST.9.5 RST.9.6,8,8 WHST.9-10.4</p>	<p>April Choose an item.</p>
<p>Describe the mechanisms that lead to the development of new species.</p>	<p>BIO 3.1.B.C3</p>	<p>April Choose an item.</p>
<p>Explain how genetic mutations can result in changes in a population's genotypes and phenotypes.</p>	<p>BIO.B.3.1.3</p>	<p>April Choose an item.</p>

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Describe how living organisms affect the survival of one another.	BIO.B.4.1 BIO.B.4.2 RST.9.1 RST.9.2 RST.9.3 RST.9.4 RST.9.5 RST.9.7 WHST.9-10.1.c WHST.9-10.1-10.6	May Choose an item.
Explain the biotic and abiotic parts of an ecosystem and their interactions.	BIO.B.4.1 BIO.B.4.2 RST.9.1 RST.9.2 RST.9.3 RST.9.4 RST.9.5 RST.9.7 WHST.9-10.1.c WHST.9-10.1-10.6	May Choose an item.
Predict how limiting factors such as physical, biological, chemical factors, etc. can affect organisms.	BIO.B.4.1 BIO.B.4.2 RST.9.1 RST.9.2 RST.9.3 RST.9.4 RST.9.5 RST.9.7 WHST.9-10.1.c WHST.9-10.1-10.6	May Choose an item.
Use evidence to explain how patterns in populations affect natural systems.	BIO.B.4.1 BIO.B.4.2 RST.9.1 RST.9.2 RST.9.3 RST.9.4 RST.9.5 RST.9.7 WHST.9-10.1.c WHST.9-10.1-10.6	May Choose an item.
Explain how energy moves through trophic levels in ecosystems	BIO.B.4.1 BIO.B.4.2 RST.9.1 RST.9.2 RST.9.3 RST.9.4 RST.9.5 RST.9.7 WHST.9-10.1.c WHST.9-10.1-10.6	May Choose an item.

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Describe predator-prey relationships in ecosystems.	BIO.B.4.1 BIO.B.4.2 RST.9.1 RST.9.2 RST.9.3 RST.9.4 RST.9.5 RST.9.7 WHST.9-10.1.c WHST.9-10.1-10.6	May Choose an item.
Investigate how limiting factors affect populations.	BIO.B.4.1 BIO.B.4.2 RST.9.1 RST.9.2 RST.9.3 RST.9.4 RST.9.5 RST.9.7 WHST.9-10.1.c WHST.9-10.1-10.6	May Choose an item.
Compare cycles of matter with conservation of energy in ecosystems.	BIO.B.4.1 BIO.B.4.2 RST.9.1 RST.9.2 RST.9.3 RST.9.4 RST.9.5 RST.9.7 WHST.9-10.1.c WHST.9-10.1-10.6	May Choose an item.

ASSESSMENTS

PSSA 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: Exit tickets, project, labs, etc.

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: Teacher created tests, quizzes, etc.