

Rumson-Fair Haven Regional High School

Course: *Advanced Placement Biology*

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Section I: Course Description

AP Biology is an introductory college-level biology course. Students cultivate their understanding of biology through inquiry-based investigations as they explore the following topics: evolution, cellular processes, energy and communication, genetics, information transfer, ecology, and interactions. The *AP Biology* course is equivalent to a two-semester college introductory biology course for biology majors. Students should have successfully completed high school courses in biology and chemistry. This course requires that 25 percent of the instructional time be spent in hands-on laboratory work, with an emphasis on inquiry-based investigations that provide students with opportunities to apply the science practices. Students enrolled in *AP Biology* are expected to take the *AP Biology* exam in May to demonstrate their proficiency.

Section II: NJSLs: New Jersey Student Learning Standards/Learning Objectives:

1. [2020 New Jersey Student Learning Standards – Science:](#)
 - “Scientific and technological advances have proliferated and now permeate most aspects of life in the 21st century. It is increasingly important that all members of our society develop an understanding of scientific and engineering concepts and processes. Learning how to construct scientific explanations and how to design evidence-based solutions provides students with tools to think critically about personal and societal issues and needs. Students can then contribute meaningfully to decision-making processes, such as discussions about climate change, new approaches to health care, and innovative solutions to local and global problems.”
2. [2023 New Jersey Student Learning Standards – Mathematics:](#)
 - “A New Jersey education in Mathematics builds quantitatively and analytically literate citizens prepared to meet the demands of college and career, and to engage productively in an information-driven society; ...A high-quality mathematics education fosters a population that...leverages data in decision-making and as a lens for discussing, analyzing, and responding to practical questions, persists to make sense of and model problems arising in everyday life, society, and the workplace, thinks critically and strategically to assess quantitative relationships and to solutions to complex problems, employs precise reasoning and constructs viable arguments to deduce conclusions, recognize false statements and assess peers’ reasoning, interprets, evaluates and critiques the mathematics embedded in social, scientific and commercial systems, as well as the claims made in the private and public sectors, communicates precisely when conveying, representing, and justifying both qualitative and quantitative perspectives.”
3. [2023 New Jersey Student Learning Standards English Language Arts:](#)
 - A New Jersey education in English Language Arts builds readers, writers, and communicators prepared to meet the demands of college and career and to engage as productive American citizens with global responsibilities. Students will develop the necessary skills in reading, writing, speaking, and listening that are the foundations for creative and purposeful expression in language; read rich, challenging texts that build their knowledge of the world, grow their confidence and identities as readers, and develop critical thinking skills and vocabulary necessary for long-term success engage in regular, meaningful, writing authentic tasks, exploring valued topics, writing for impact and expression, and sharing their work with others (including authentic audiences) leverage complex texts and digital media to develop comprehension, active listening, and discussion skills ground daily writing and discussion in evidence, fostering an ability to read critically, build arguments, cite evidence, and communicate ideas to contribute meaningfully as productive citizens; evaluate the reliability, credibility, and perspective of authors and speakers across all forms of media; express ideas and knowledge through a variety of modalities and media, and serve as effective communicators who purposefully read, write, and speak across multiple disciplines and learn to persist in reading complex texts, establishing lifelong habits to read voluntarily for pleasure, for further education, for information on public policy, and for advancement in the workplace.
4. [Standard 8.1 \(Computer Science\) and 8.2 \(Design Thinking\) of the 2020 NJSLs:](#)
 - “The ‘Intent and Spirit of the Computer Science and Design Thinking Standards’ is to focus on deep understanding of concepts that enable students to think critically and systematically about leveraging technology to solve local and global issues. Authentic learning experiences that enable students to apply content knowledge, integrate concepts across disciplines, develop computational thinking skills, acquire and incorporate varied perspectives, and communicate with diverse audiences about the use and effects of computing prepares New Jersey students for college and careers.”
5. [Standard 9.4 \(Life Literacies and Key Skills\) of the 2020 NJSLs:](#)
 - “This standard outlines key literacies and technical skills such as critical thinking, global and cultural awareness, and technology literacy that are critical for students to develop to live and work in an interconnected global economy.”

***Climate Change:** The state of New Jersey has mandated instruction in, “Climate Change across all content areas, leveraging the passion students have shown for this critical issue and providing them opportunities to develop a deep understanding of the science behind the changes and to explore the solutions our world desperately needs.”

6. ***Amistad Law: N.J.S.A. 18A 52:16A-88:**
 - o The inclusion of lessons and resources/texts dealing with the African slave trade, slavery in America, the vestiges of slavery in this country and the contributions of African-Americans to our society will be implemented in English and Social Studies courses in accordance with state law: “Every board of education shall incorporate the information regarding the contributions of African-Americans to our country in an appropriate place in the curriculum of elementary and secondary school students.”
7. ***Holocaust Law: N.J.S.A. 18A 35-28:**
 - o The inclusion of lessons and resources/texts that enable pupils to identify and analyze applicable theories concerning human nature and behavior; to understand that genocide is a consequence of prejudice and discrimination; and to understand that issues of moral dilemma and conscience have a profound impact on life will be implemented in English and Social Studies courses in accordance with state law: “Every board of education shall include instruction on the Holocaust and genocides in an appropriate place in the curriculum of all elementary and secondary school pupils. The instruction shall further emphasize the personal responsibility that each citizen bears to fight racism and hatred whenever and wherever it happens.”
8. ***LGBT and Disabilities Law: N.J.S.A. 18A:35-4.35:**
 - o A transformative approach to the inclusion of lessons and resources/texts on the contributions and issues concerning the LGBTQ+ population and people with disabilities will be implemented across all core subjects in accordance with state law: “A board of education shall include instruction on the political, economic, and social contributions of persons with disabilities and lesbian, gay, bisexual, and transgender people, in an appropriate place in the curriculum of middle school and high school students as part of the district’s implementation of the New Jersey Student Learning Standards (N.J.S.A.18A:35-4.36). A board of education shall have policies and procedures in place pertaining to the selection of instructional materials to implement the requirements of N.J.S.A. 18A:35-4.35.”
9. ***Asian American and Pacific Islanders Legislation: N.J.S.A 4021/A6100:**
 - o The inclusion of lessons and resources/texts on the history and contributions of Asian Americans and Pacific Islanders, will enable New Jersey’s schools to provide a curriculum that reflects the diversity of our state. In accordance with state law: “A board of education shall include instruction on the history and contributions of Asian Americans and Pacific Islanders in an appropriate place in the curriculum of students in grades kindergarten through as part of the school district’s implementation of the New Jersey Student Learning Standards in Social Studies.”
10. Acquisition/development/refinement of the higher-order critical thinking skills aligned with the *Revised Bloom’s Taxonomy of Cognitive Objectives*

Section III: Curriculum Modifications

The *AP Biology* curriculum is subject to case-by-case modifications to support/advance the needs of all students, including special education students, English language learners, gifted students, and those at risk of school failure. These modifications are based on Individualized Learning Programs (IEPs), recommendations made by the district’s Multilingual Learners (ML) coordinator, feedback from members of the Intervention & Referral Services Team (*I&RS*) for at-risk students, and 504 Plans.

Coursework and assessments will be modified on an individual basis for students when necessary. Modifications may include, but are not limited to, those outlined on the [Modifications/Accommodations for Science Courses](#) chart.

Section IV: Preparation for Standardized Testing

Instruction in *AP Biology* is aligned with the requirements of state and national standardized assessments, including the *NJGPA*, *NJSLA*, the *ACT*, the *PSAT*, and the *SAT*.

Section V: Curriculum Pacing Guide

Curriculum Pacing Guide	
Course Title: <i>Advanced Placement Biology</i>	Grade Level: 11 and 12

Unit I: Ecology (Summer Unit)	Weeks 0-4
Unit II: Chemistry of Life	Weeks 5-9
Unit III: Cellular Structure and Function	Weeks 10-16
Unit IV: Cellular Energetics	Weeks 17-20
Unit V: Cell Communication and Cell Cycle	Weeks 21-24
Unit VI: Heredity	Weeks 25-28
Unit VII: Gene Expression and Regulation	Weeks 29-33
Unit VIII: Natural Selection	Weeks 34-37
Unit IX: Final Project	Weeks 38-40

Section VI: Primary Texts and Year-Long Instructional Resources

The following texts and instructional resources are employed for all students in *AP Biology*:

- Google Classroom
- *Common Sense Education* (www.commonsense.org)
- Urry, Lisa A., Cain, Michael L. [et.al]. *Campbell Biology In Focus*, 3rd edition. Boston: Pearson Education, Inc., 2019.
- Suggested websites and electronic media:
 - AP Classroom
 - Mastering by Pearson
 - PIVOT Interactives
 - The Biology Project - University of Arizona
 - San Diego Zoo Institute for Conservation Research Educator Resources
 - Data Nuggets
 - YouTube
 - EdPuzzle
 - Quizizz
 - HHMI Biointeractive
 - Pearson+ - General Biology
 - DNAFTB.ORG
 - TALKORIGINS.ORG
 - LEARN.GENETICS.UTAH.EDU
 - Cells Alive
 - Pbs.org
 - RFH Science LibGuide

- <https://apcentral.collegeboard.org/courses/ap-biology>
- <https://www.nsta.org/case-studies>
- <http://www.bozemanscience.com/>
- <http://www.hhmi.org/>
- <http://www.plosgenetics.org/home.action>
- <http://www.ted.com/talks>
- <https://phet.colorado.edu/>
- <https://apbiopenguins.weebly.com/>

Section VII: Grading Formula and Assessment Modes

Marking period grades in *AP Biology* are determined via a percentage weighting model. The specific grading categories and weightings of each will be determined before the start of each academic year and will be published in the posted/distributed course syllabi.

Assessments in *AP Biology* vary greatly in format, scope/content/skills assessed, and alternative assessments; differentiation in assessments and choice will be incorporated as appropriate. Preliminary assessments of each format will be used as benchmarks, and summative assessments will be created/revised collaboratively each year and planned by members of the *AP Biology* instructional team to inform future learning and to measure student growth.

Section VIII: Unit Templates

The following unit templates have been established for the *AP Biology* curriculum by the *AP Biology* instructional team:

Unit I: Ecology	
Unit Summary	
<p>This unit shows how a system's interactions are directly related to the system's available energy and its ability to evolve and respond to changes in its environment. When highly complex living systems interact, communities and ecosystems will change based on those interactions. The more biodiversity present in a system, the more likely that system is to maintain its health and success in the face of disruption. Energy flows through systems; the rate of flow determines the success of the species within the systems. By this point in the curriculum, a student should be able to accurately determine what happens within biological systems when disruptions occur. Students will also review experimental design, graphing, biostatistics, including standard deviation, standard error, and chi-square. These skills will be utilized throughout the course.</p>	
Standards/Core Ideas/Performance Expectations/Progress Indicators	
<p>The state standards outlined below, and established by the New Jersey Department of Education, will guide instruction throughout this unit in <i>Advanced Placement Biology</i>:</p> <ul style="list-style-type: none"> ● <i>2020 New Jersey Student Learning Standards: Science</i> <ul style="list-style-type: none"> ○ HS-LS1.3, HS-LS2.1-8, HS-LS4.6, HS-ESS2.4-6, HS-ESS2.1, 4, & 6, HS-ETS1.4 ● <i>2023 New Jersey Student Learning Standards: Mathematics</i> <ul style="list-style-type: none"> ○ N.Q.A.1, S.ID.1, S.ID.9, S.IC.6 ● <i>2023 New Jersey Student Learning Standards: English Language Arts 11-12</i> <ul style="list-style-type: none"> ○ RI.CR.11–12.1., RI.CI.11–12.2., W.WR.11-12.5, W.WP.11–12.4, W.SE.11–12.6, SL.PI.11-12.4 ● <i>2020 New Jersey Student Learning Standards: Computer Science and Design Thinking</i> <ul style="list-style-type: none"> ○ 8.1.12.DA.5, 8.2.12.ED.1, 8.2.12.ITH.1 ● <i>2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills</i> <ul style="list-style-type: none"> ○ 9.4.12.CI.1-2, 9.4.12.CT.2, 9.4.12.TL.2, 9.4.12.IML.2 	
Unit Essential Questions	Unit Enduring Understandings
<ul style="list-style-type: none"> ● How does the availability and flow of energy directly influence the interactions within a biological system and its capacity to evolve and respond to environmental changes? ● In what ways do the interactions among highly complex living systems lead to dynamic changes within communities and ecosystems? ● How does the level of biodiversity within a system contribute to its resilience, health, and ability to persist in the face of environmental disruptions? 	<ul style="list-style-type: none"> ● The availability, transformation, and transfer of energy are fundamental drivers that dictate the nature and intensity of interactions among organisms within a biological system, directly shaping its evolutionary trajectory and its ability to adapt and respond to environmental fluctuations. ● The interactions among highly complex living systems create dynamic feedback loops that continuously drive changes in population sizes, species composition, and overall structure and function within communities and ecosystems. ● A higher level of biodiversity provides a broader range of functional roles and adaptive capacities within a system, enhancing its resilience, promoting overall health, and increasing its ability to withstand, recover from, and persist through environmental disruptions.

<ul style="list-style-type: none"> • What is the relationship between the rate of energy flow through a system and the success or stability of the species within that system? • How can one predict and analyze the consequences of various disruptions on the structure and function of biological systems? 	<ul style="list-style-type: none"> • The rate and efficiency of energy flow through an ecosystem's trophic levels are critical determinants of the biomass, population sizes, and long-term stability of the species within that system. • By understanding the interconnectedness of components and the principles of energy flow and feedback mechanisms within biological systems, the cascading consequences of various disruptions can be predicted and analyzed.
Evidence of Learning	
Formative & Alternative Assessments: <ul style="list-style-type: none"> • Ecology Study Guide • Graphing and Statistics Practice • Mastering Biology Assignments • Animal Behavior Lab • AP Classroom Practice Questions • Unit 8 (AP) Progress Check • Unit 8 AP Classroom videos • Individual student check ins with teacher 	Benchmark & Summative Assessments: <ul style="list-style-type: none"> • Summer Assignment Quiz (Benchmark) • Ecology Unit Test (Benchmark) • Animal Behavior Lab Assessment (Benchmark)
Resources Needed: <ul style="list-style-type: none"> • Pearson Mastering Biology • Bozeman Science videos 	

Unit II: Chemistry of Life	
Unit Summary	
<p>This first unit sets the foundation for students to understand the chemical basis of life, which is needed for mastery of future areas of focus, and provides students with a survey of the elements necessary for carbon-based systems to function. In Unit II, students learn that water and the properties of water play a vital role in the survival of individuals and biological systems. They also learn that living systems exist in a highly complex organization that requires the input of energy and the exchange of macromolecules. This unit also addresses in detail how and in what conformations molecules called monomers bond together to form polymers. The structure of monomers and polymers determines their function. In the units that follow, students will need to understand and explain the interaction and bonding of atoms to form molecules.</p>	
Standards/Core Ideas/Performance Expectations/Progress Indicators	
<p>The state standards outlined below, and established by the New Jersey Department of Education, will guide instruction throughout this unit in <i>Advanced Placement Biology</i>:</p> <ul style="list-style-type: none"> • <i>2020 New Jersey Student Learning Standards: Science</i> <ul style="list-style-type: none"> ◦ HS-PS1.1-3, HS-LS1.1, 2, & 6-7, HS-ESS2.5, HS-ETS1.4 • <i>2023 New Jersey Student Learning Standards: Mathematics</i> <ul style="list-style-type: none"> ◦ N.Q.A.1, S.ID.1, S.ID.9, S.IC.6 • <i>2023 New Jersey Student Learning Standards: English Language Arts 11-12</i> <ul style="list-style-type: none"> ◦ RI.CR.11–12.1., RI.CI.11–12.2., W.WR.11-12.5, W.WP.11–12.4, W.SE.11–12.6, SL.PI.11-12.4 • <i>2020 New Jersey Student Learning Standards: Computer Science and Design Thinking</i> <ul style="list-style-type: none"> ◦ 8.1.12.DA.5, 8.2.12.ED.1, 8.2.12.ITH.1 • <i>2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills</i> <ul style="list-style-type: none"> ◦ 9.4.12.CI.1-2, 9.4.12.CT.2, 9.4.12.TL.2, 9.4.12.IML.2 	
Unit Essential Questions	Unit Enduring Understandings
<ul style="list-style-type: none"> • How do the unique properties of water contribute to the survival of living organisms and the functioning of biological systems? • What fundamental elements are necessary for the formation and function of carbon-based biological molecules? • How does the intricate organization of living systems necessitate a continuous input of energy and the exchange of macromolecules? • What are the processes by which monomers bond together to form complex polymers, and how do their 	<ul style="list-style-type: none"> • The unique emergent properties of water, such as its polarity, high specific heat, cohesive and adhesive forces, and solvent capabilities, are indispensable for maintaining cellular structure, regulating temperature, facilitating transport, and enabling biochemical reactions crucial for life. • Carbon, hydrogen, oxygen, nitrogen, phosphorus, and sulfur (CHNOPS) are the fundamental elements that form the backbone and functional groups of all essential carbon-based biological macromolecules, enabling the diverse structures and functions required for life. • Living systems maintain their highly ordered and complex organization, grow, and carry out life processes through a constant input of energy and the continuous synthesis, breakdown, and exchange of macromolecules, adhering to the laws of thermodynamics.

<p>specific conformations determine their biological functions?</p> <ul style="list-style-type: none"> How does the interaction and bonding of atoms at the molecular level provide the foundation for all biological processes? 	<ul style="list-style-type: none"> Monomers bond together to form complex polymers through dehydration synthesis (condensation) reactions, and the specific sequence, arrangement, and conformation of these polymers are critical determinants of their unique biological functions. The specific types of chemical bonds between atoms and molecules dictate their structure, reactivity, and interactions.
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Evidence of Learning

<p>Formative & Alternative Assessments:</p> <ul style="list-style-type: none"> Chemistry of Life Study Guide Mastering Biology Assignments Properties of Water Lab Pattern Matching Activity Reproductive Endocrinology Lab AP Classroom Practice Questions Unit 1(AP) Progress Check Unit 1 AP Classroom videos Individual student check ins with teacher 	<p>Benchmark & Summative Assessments:</p> <ul style="list-style-type: none"> Topic Quizzes Chemistry of Life Unit Test 	<p>Resources Needed:</p> <ul style="list-style-type: none"> RFH Science LibGuide Pearson Mastering Biology San Diego Zoo Institute for Conservation Research Educator Resources
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Unit III: Cellular Structure and Function

Unit Summary

Unit III focuses on the cell, the basic unit of life. Cells contribute to the organization of life and provide the environment in which organelles function. Organelles, in turn, provide compartmentalization and organize cellular products for dispersal and waste for disposal. Cells have membranes that allow them to establish and maintain an internal environment. These membranes also control the exchange of material with the cell's external environment—an important, foundational concept. The maintenance of the internal and external conditions of a cell is called homeostasis. Student understanding of these concepts will be necessary in later units when the focus of instruction shifts to cellular products and by-products and when students learn why cellular exchange of energy and materials matters.

Standards/Core Ideas/Performance Expectations/Progress Indicators

The state standards outlined below, and established by the New Jersey Department of Education, will guide instruction throughout this unit in *Advanced Placement Biology*:

- 2020 New Jersey Student Learning Standards: Science*
 - HS-LS1.1-3, HS-ETS1.4
- 2023 New Jersey Student Learning Standards: Mathematics*
 - N.Q.A.1, S.ID.1, S.ID.9, S.IC.6
- 2023 New Jersey Student Learning Standards: English Language Arts 11-12*
 - RI.CR.11–12.1., RI.CI.11–12.2., W.WR.11–12.5, W.WP.11–12.4, W.SE.11–12.6, SL.PI.11–12.4
- 2020 New Jersey Student Learning Standards: Computer Science and Design Thinking*
 - 8.1.12.DA.5, 8.2.12.ED.1, 8.2.12.ITH.1
- 2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills*
 - 9.4.12.CI.1-2, 9.4.12.CT.2, 9.4.12.TL.2, 9.4.12.IML.2

Unit Essential Questions

- How does the cell serve as the fundamental unit of life, and what is the significance of its internal organization?
- How do organelles within a cell provide compartmentalization and organize cellular products for dispersal and waste for disposal?
- How do cellular membranes enable cells to establish and maintain a distinct internal environment?
- In what ways do cellular membranes control the selective exchange of materials with the

Unit Enduring Understandings

- The cell is the most basic structural and functional unit of all known living organisms, and its highly organized internal structure, including specialized organelles, is essential for carrying out the complex processes necessary for life.
- Organelles create distinct compartments within the cell, allowing for the efficient segregation of biochemical reactions, the organized synthesis and packaging of cellular products for specific destinations, and the controlled processing and disposal of cellular waste.
- Cellular membranes, primarily composed of a selectively permeable phospholipid bilayer with embedded proteins, act as crucial barriers that regulate the passage of substances, thereby enabling cells to establish and maintain a stable and distinct internal environment separate from their surroundings.
- Cellular membranes control the selective exchange of materials through various transport mechanisms that allow cells to acquire necessary

<p>cell's external environment?</p> <ul style="list-style-type: none"> How does a cell maintain homeostasis, and why is this internal balance crucial for its survival and function? 	<p>nutrients, eliminate waste, and communicate with their external environment, all while maintaining internal equilibrium.</p> <ul style="list-style-type: none"> A cell maintains homeostasis by actively regulating its internal conditions through feedback mechanisms and membrane transport, a crucial internal balance that ensures optimal enzyme activity, metabolic processes, and overall cellular survival and proper function.
Evidence of Learning	
<p>Formative & Alternative Assessments:</p> <ul style="list-style-type: none"> Cellular Structure and Function Study Guide Mastering Biology Assignments Organelle Speed Dating Activity Cell Size and Diffusion Lab Osmosis and Water Potential Lab AP Classroom Practice Questions Unit 2 (AP) Progress Check Unit 2 AP Classroom videos Individual student check ins with teacher 	<p>Benchmark & Summative Assessments:</p> <ul style="list-style-type: none"> Topic Quizzes Cellular Structure and Function Unit Test Cell Organelle Disease Presentation Osmosis and Water Potential Lab Digital Poster Summative Assessment #1 <p>Resources Needed:</p> <ul style="list-style-type: none"> RFH Science LibGuide Pearson Mastering Biology Bozeman Science videos EdPuzzle Pivot Interactives

Unit IV: Cellular Energetics	
Unit Summary	
<p>In this unit, students build on knowledge gained in Unit III about the structure and function of cells, focusing on cellular energetics. Living systems are complex in their organization and require a constant input of energy. This unit will provide students with the knowledge necessary to master the concepts of energy capture and use. Students work through enzyme structure and function, learning how the environment plays a role in how enzymes perform their function(s). Students gain a deeper understanding of the processes of photosynthesis and cellular respiration, knowledge they will use in Unit VI while studying how cells use energy to fuel life processes.</p>	
Standards/Core Ideas/Performance Expectations/Progress Indicators	
<p>The state standards outlined below, and established by the New Jersey Department of Education, will guide instruction throughout this unit in <i>Advanced Placement Biology</i>:</p> <ul style="list-style-type: none"> <i>2020 New Jersey Student Learning Standards: Science</i> <ul style="list-style-type: none"> HS-PS1.4 & 5, HS-LS1-1, 5-7, HS-LS2-3-5, HS-ETS1.4 <i>2023 New Jersey Student Learning Standards: Mathematics</i> <ul style="list-style-type: none"> N.Q.A.1, S.ID.1, S.ID.9, S.IC.6 <i>2023 New Jersey Student Learning Standards: English Language Arts 11-12</i> <ul style="list-style-type: none"> RI.CR.11–12.1., RI.CI.11–12.2., W.WR.11-12.5, W.WP.11–12.4, W.SE.11–12.6, SL.PI.11-12.4 <i>2020 New Jersey Student Learning Standards: Computer Science and Design Thinking</i> <ul style="list-style-type: none"> 8.1.12.DA.5, 8.2.12.ED.1, 8.2.12.ITH.1 <i>2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills</i> <ul style="list-style-type: none"> 9.4.12.CI.1-2, 9.4.12.CT.2, 9.4.12.TL.2, 9.4.12.IML.2 	
Unit Essential Questions	Unit Enduring Understandings
<ul style="list-style-type: none"> How do living systems acquire and utilize energy to maintain their complex organization and carry out life processes? What is the relationship between enzyme structure and its specific function in biological reactions? How do environmental factors influence the performance and efficiency of enzyme function? How do the processes of photosynthesis and cellular 	<ul style="list-style-type: none"> Living systems continuously acquire and transform energy from their environment (e.g., light, chemical bonds) and utilize it through metabolic pathways to power cellular work, maintain highly ordered structures, and perform all essential life processes in accordance with thermodynamic principles. The highly specific three-dimensional structure of an enzyme, particularly its active site, is precisely complementary to its substrate(s), enabling it to catalyze specific biochemical reactions by lowering activation energy without being consumed. Environmental factors such as temperature, pH, and substrate concentration directly impact the rate and efficiency of enzyme function by altering the enzyme's three-dimensional structure

<p>respiration capture and transform energy to fuel life processes?</p> <ul style="list-style-type: none"> Why is a constant input of energy necessary for the survival and function of living systems? 	<p>(denaturation) or affecting the frequency of enzyme-substrate collisions.</p> <ul style="list-style-type: none"> Photosynthesis captures light energy to synthesize organic molecules, while cellular respiration breaks down these organic molecules to release chemical energy (ATP), and these interconnected processes are fundamental for capturing and transforming energy to fuel all life processes in living organisms. A constant input of energy is essential for living systems to counteract the natural tendency towards increasing entropy (disorder), enabling them to maintain their complex organization, carry out metabolic reactions, grow, reproduce, and respond to their environment, thereby ensuring their survival.
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Evidence of Learning

<p>Formative & Alternative Assessments:</p> <ul style="list-style-type: none"> Cellular Energetics Study Guide Mastering Biology Assignments Fermented Foods Research ATP Activity Cell Respiration Lab Transpiration Lab Plant Pigments Activity Photosynthesis Lab AP Classroom Practice Questions Unit 3 (AP) Progress Check Unit 3 AP Classroom videos Individual student check ins 	<p>Benchmark & Summative Assessments:</p> <ul style="list-style-type: none"> Topic Quizzes Cellular Energetics Unit Test Cellular Energetics Lab Report 	<p>Resources Needed:</p> <ul style="list-style-type: none"> RFH Science LibGuide Pearson Mastering Biology Bozeman Science videos EdPuzzle Pivot Interactives
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Unit V: Cell Communication and Cell Cycle

Unit Summary

In this unit, students continue to learn about the role of cells, focusing on how cells use energy and information transmission to communicate and replicate. Through systems of complex transduction pathways, cells can communicate with one another. Cells can also generate and receive signals, coordinate mechanisms for growth, and respond to environmental cues. To maintain homeostasis, cells respond to their environment. They can also replicate and regulate replication as part of the cell cycle, which provides for the continuity of life. In Unit VI, students will move on to learn about heredity.

Standards/Core Ideas/Performance Expectations/Progress Indicators

The state standards outlined below, and established by the New Jersey Department of Education, will guide instruction throughout this unit in *Advanced Placement Biology*:

- 2020 New Jersey Student Learning Standards: Science
 - HS-LS1-3-4, HS-LS3-1, HS-ETS1.4
- 2023 New Jersey Student Learning Standards: Mathematics
 - N.Q.A.1, S.ID.1, S.ID.9, S.IC.6
- 2023 New Jersey Student Learning Standards: English Language Arts 11-12
 - RI.CR.11–12.1., RI.CI.11–12.2., W.WR.11-12.5, W.WP.11–12.4, W.SE.11–12.6, SL.PI.11-12.4
- 2020 New Jersey Student Learning Standards: Computer Science and Design Thinking
 - 8.1.12.DA.5, 8.2.12.ED.1, 8.2.12.ITH.1
- 2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills
 - 9.4.12.CI.1-2, 9.4.12.CT.2, 9.4.12.TL.2, 9.4.12.IML.2

Unit Essential Questions

- How do cells utilize energy and transmit information to communicate with one another?
- What are the mechanisms by which complex signal transduction pathways enable cells to generate, receive, and respond to signals?
- How do cells coordinate mechanisms for growth and respond to

Unit Enduring Understandings

- Cells utilize energy-dependent processes to transmit and receive information through various signaling molecules and receptors, enabling complex communication networks that coordinate cellular activities and responses.
- Complex signal transduction pathways involve a series of molecular events, including receptor binding, phosphorylation cascades, and secondary messengers, that amplify and relay external signals into specific intracellular responses, allowing cells to generate, receive, and precisely respond to a diverse array of cues.

<p>environmental cues to maintain homeostasis?</p> <ul style="list-style-type: none"> • What are the key stages and regulatory mechanisms of the cell cycle, and how does it ensure the continuity of life? • How do cells precisely replicate, and why is this process crucial for maintaining life and transmitting genetic information? 	<ul style="list-style-type: none"> • Cells coordinate growth and respond to environmental cues through intricate regulatory networks and feedback loops, ensuring that internal conditions remain stable (homeostasis) despite external fluctuations, which is vital for their survival and proper function. • The cell cycle consists of distinct stages (G1, S, G2, M) tightly regulated by checkpoints and molecular controls, ensuring accurate DNA replication and cell division, which is fundamental for growth, repair, and the continuity of life across generations. • Cells precisely replicate their genetic material through DNA replication and then divide through processes like mitosis, ensuring that accurate copies of genetic information are passed to daughter cells, a process crucial for growth, tissue repair, and the faithful transmission of heredity.
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Evidence of Learning

<p>Formative & Alternative Assessments:</p> <ul style="list-style-type: none"> • Cell Communication and Cell Cycle Study Guide • Mastering Biology Assignments • Cell Signaling Activity • Taste Lab • Mitosis Review • Mitosis and Cancer Lab Activity • AP Classroom Practice Questions • Unit 4 (AP) Progress Check • Unit 4 AP Classroom videos • Individual student check ins with teacher 	<p>Benchmark & Summative Assessments:</p> <ul style="list-style-type: none"> • Topic Quizzes • Cell Communication and Cell Cycle Unit Test • Infectious Disease Project • Summative Assessment #2 	<p>Resources Needed:</p> <ul style="list-style-type: none"> • RFH Science LibGuide • Pearson Mastering Biology • Bozeman Science videos • EdPuzzle • Pivot Interactives • Learn.Genetics
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Unit VI: Heredity

Unit Summary

Unit VI focuses on heredity and the biological concepts and processes involved in ensuring the continuity of life. Students learn that the storage and transmission of genetic information via chromosomes from one generation to the next occurs through meiosis. Meiotic division ensures genetic diversity, which is crucial to the survival of a species. In this unit, students gain a deeper understanding of Mendelian genetics and learn how non-Mendelian genetics describes those patterns of inheritance that seem to violate Mendel's laws. This unit also teaches the role played by chromosomal inheritance, environmental factors, and nondisjunction on an individual's phenotype. In Unit 6, students move on to learn about gene expression and regulation.

Standards/Core Ideas/Performance Expectations/Progress Indicators

The state standards outlined below, and established by the New Jersey Department of Education, will guide instruction throughout this unit in *Advanced Placement Biology*:

- 2020 New Jersey Student Learning Standards: Science
 - HS-LS1-4, HS-LS3-1-3, HS-ETS1.4
- 2023 New Jersey Student Learning Standards: Mathematics
 - N.Q.A.1, S.ID.1, S.ID.9, S.IC.6
- 2023 New Jersey Student Learning Standards: English Language Arts 11-12
 - RI.CR.11–12.1., RI.CI.11–12.2., W.WR.11-12.5, W.WP.11–12.4, W.SE.11–12.6, SL.PI.11-12.4
- 2020 New Jersey Student Learning Standards: Computer Science and Design Thinking
 - [8.1.12.DA.5](#), 8.2.12.ED.1, 8.2.12.ITH.1
- 2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills
 - 9.4.12.CI.1-2, 9.4.12.CT.2, 9.4.12.TL.2, 9.4.12.IML.2

Unit Essential Questions

- How is genetic information stored and transmitted from one generation to the next through chromosomes?
- What are the processes of meiosis, and how does meiotic division ensure genetic diversity, which is crucial for species survival?

Unit Enduring Understandings

- Genetic information is faithfully stored in the sequence of DNA within chromosomes and is transmitted from one generation to the next through the precise processes of DNA replication and cell division (mitosis and meiosis).
- Meiosis is a two-stage cell division process that reduces the chromosome number by half and generates genetic diversity through crossing over and independent assortment, which are crucial mechanisms for the adaptation and long-term survival of a species.

Unit VI: Heredity		
Unit Summary		
<ul style="list-style-type: none"> How do Mendelian genetics explain patterns of inheritance, and in what ways do non-Mendelian genetics describe variations from these patterns? What role do chromosomal inheritance, environmental factors, and nondisjunction play in determining an individual's phenotype? How does the continuity of life depend on the accurate storage and transmission of genetic information? 	<ul style="list-style-type: none"> Mendelian genetics describes fundamental patterns of inheritance based on dominant and recessive alleles, while non-Mendelian genetics encompasses more complex patterns (e.g., incomplete dominance, codominance, polygenic inheritance) that illustrate variations from these basic rules and the diverse ways traits are expressed. An individual's phenotype is determined by a complex interplay of inherited genetic information on chromosomes, the influence of environmental factors, and potential chromosomal abnormalities like nondisjunction, which can lead to significant variations in traits. The continuity of life fundamentally relies on the accurate storage of genetic information in DNA and its precise transmission through replication and inheritance, ensuring that offspring inherit the necessary instructions for development, function, and perpetuation of the species. 	
Evidence of Learning		
Formative & Alternative Assessments: <ul style="list-style-type: none"> Heredity Study Guide Mastering Biology Assignments Genetics Practice Problems Meiosis Activity Corn Genetics Activity Fruit Fly Genetics Lab Pearson Practice Questions AP Classroom Practice Questions Unit 5 (AP) Progress Check Unit 5 AP Classroom videos Individual student check ins with teacher 	Benchmark & Summative Assessments: <ul style="list-style-type: none"> Topic Quizzes Heredity Unit Test Fruit Fly Genetics Lab CER 	Resources Needed: <ul style="list-style-type: none"> RFH Science LibGuide Pearson Mastering Biology Bozeman Science videos MiniPCR Lab EdPuzzle Pivot Interactives Pearson+

Unit VII: Gene Expression and Regulation	
Unit Summary	
<p>Progressing from the continuity of life to gene expression, in Unit VII, students gain in-depth knowledge about nucleic acids and their role in gene expression. Students receive a finer focus on the comparison between the structures of DNA and RNA. This unit highlights how an individual's genotype is physically expressed through that individual's phenotype. Understanding protein synthesis (transcription and translation) is vital to answering essential questions about gene expression. Regulation of gene expression and cell specialization is instrumental in ensuring survival within an individual and across populations.</p>	
Standards/Core Ideas/Performance Expectations/Progress Indicators	
<p>The state standards outlined below, and established by the New Jersey Department of Education, will guide instruction throughout this unit in <i>Advanced Placement Biology</i>:</p> <ul style="list-style-type: none"> <i>2020 New Jersey Student Learning Standards: Science</i> <ul style="list-style-type: none"> HS-LS1-1 & 4, HS-LS3-1-3, HS-ETS1.4 <i>2023 New Jersey Student Learning Standards: Mathematics</i> <ul style="list-style-type: none"> N.Q.A.1, S.ID.1, S.ID.9, S.IC.6 <i>2023 New Jersey Student Learning Standards: English Language Arts 11-12</i> <ul style="list-style-type: none"> RI.CR.11–12.1., RI.CI.11–12.2., W.WR.11-12.5, W.WP.11–12.4, W.SE.11–12.6, SL.PI.11-12.4 <i>2020 New Jersey Student Learning Standards: Computer Science and Design Thinking</i> <ul style="list-style-type: none"> 8.1.12.DA.5, 8.2.12.ED.1, 8.2.12.ITH.1 <i>2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills</i> <ul style="list-style-type: none"> 9.4.12.CI.1-2, 9.4.12.CT.2, 9.4.12.TL.2, 9.4.12.IML.2 	
Unit Essential Questions	Unit Enduring Understandings
<ul style="list-style-type: none"> How do the structures of DNA and RNA compare, and how does this 	<ul style="list-style-type: none"> DNA and RNA possess distinct structural differences (e.g., double vs. single strand, deoxyribose vs. ribose sugar, thymine vs. uracil) that are directly related to their specialized roles in gene expression:

<p>comparison relate to their distinct roles in gene expression?</p> <ul style="list-style-type: none"> • What are the processes of protein synthesis (transcription and translation), and how do they enable the physical expression of an individual's genotype as a phenotype? • How is gene expression regulated within cells, and why is this regulation crucial for cell specialization? • In what ways do the processes of gene expression and its regulation contribute to the survival of an individual and the adaptation of populations? • How does the flow of information from nucleic acids to proteins underpin all biological functions and the continuity of life? 	<p>DNA stores genetic information, while various types of RNA facilitate its transcription and translation into proteins.</p> <ul style="list-style-type: none"> • Protein synthesis, involving transcription (DNA to RNA) and translation (RNA to protein), is the fundamental process by which the genetic information encoded in an individual's genotype is physically expressed as functional proteins, ultimately determining their observable phenotype. • Gene expression is precisely regulated at multiple stages (e.g., transcription, translation, and post-translational modification) within cells, a crucial control mechanism that allows for differential gene activation, leading to cell specialization and the formation of diverse tissues and organs. • The dynamic processes of gene expression and its regulation enable individuals to respond to changing internal and external conditions, while variations in gene expression patterns across populations contribute to genetic diversity, which is essential for adaptation and survival in evolving environments. • The central dogma of molecular biology, describing the flow of genetic information from nucleic acids (DNA and RNA) to proteins, is the fundamental principle that underpins all biological functions, cellular processes, and the continuity of life through the inheritance and expression of genetic traits. 	
Evidence of Learning		
<p>Formative & Alternative Assessments:</p> <ul style="list-style-type: none"> • Gene Expression and Regulation Study Guide • Mastering Biology Assignments • Double Helix Activity • Describing the Structure of DNA Activity • Protein Synthesis Activity • DNA to Disease Activity • Prokaryotic Gene Regulation Activity • Eukaryotic Gene Regulation Activity • Restriction Enzyme and Gel Electrophoresis Lab • Bacterial Transformation Lab • AP Classroom Practice Questions • Unit 6 (AP) Progress Check • Unit 6 AP Classroom videos • Individual student check ins with teacher 	<p>Benchmark & Summative Assessments:</p> <ul style="list-style-type: none"> • Topic Quizzes • Gene Expression and Regulation Unit Test • Biotechnology Lab Assessment • Summative Assessment #3 	<p>Resources Needed:</p> <ul style="list-style-type: none"> • RFH Science LibGuide • Pearson Mastering Biology • Bozeman Science videos • HHMI Biointeractive • Phet Simulation • MiniPCR Lab • EdPuzzle • Pivot Interactives • YouTube

Unit VIII: Natural Selection
Unit Summary
<p>The concepts in Unit VIII build on foundational content from previous units as students discover natural selection, a mechanism of evolution—the theory that populations that are better adapted to their environment will survive and reproduce. Thus, the evolution of a species involves a change in its genetic makeup over time. In this unit, students study the evidence for and mechanisms of evolutionary change. Students also learn what happens when a species does not adapt to a changing or volatile environment and about the Hardy-Weinberg equilibrium as a model for describing and predicting allele frequencies in non-evolving populations. Students will learn to calculate and draw conclusions about the evolution, or lack thereof, of a population from data related to allele frequencies. Biological principles studied here and in previous units will culminate in Unit IX, which covers ecology.</p>
Standards/Core Ideas/Performance Expectations/Progress Indicators
<p>The state standards outlined below, and established by the New Jersey Department of Education, will guide instruction throughout this unit in <i>Advanced Placement Biology</i>:</p> <ul style="list-style-type: none"> • <i>2020 New Jersey Student Learning Standards: Science</i>

- HS-LS4-1-5, HS-LS3-2 & 3
- HS-ETS1-2 & 3
- *2023 New Jersey Student Learning Standards: Mathematics*
 - N.Q.A.1, S.ID.1, S.ID.9, S.IC.6
- *2023 New Jersey Student Learning Standards: English Language Arts 11-12*
 - RI.CR.11–12.1., RI.CI.11–12.2., W.WR.11-12.5, W.WP.11–12.4, W.SE.11–12.6, SL.PI.11-12.4
- *2020 New Jersey Student Learning Standards: Computer Science and Design Thinking*
 - 8.1.12.D, A.5, 8.2.12.ED.1, 8.2.12.ITH.1
- *2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills*
 - 9.4.12.CI.1-2, 9.4.12.CT.2, 9.4.12.TL.2, 9.4.12.IML.2

Unit Essential Questions		Unit Enduring Understandings	
<ul style="list-style-type: none"> ● How does natural selection, as a mechanism of evolution, lead to populations becoming better adapted to their environment? ● What evidence supports the theory of evolutionary change, and what are the key mechanisms driving this change? ● How does the evolution of a species involve a change in its genetic makeup over time? ● What are the consequences for a species that fails to adapt to a changing or volatile environment? ● How does the Hardy-Weinberg equilibrium serve as a model for describing and predicting allele frequencies in non-evolving populations? ● How can data related to allele frequencies be used to calculate and draw conclusions about the evolution of a population? 		<ul style="list-style-type: none"> ● Natural selection drives evolution by favoring individuals with heritable traits that enhance their survival and reproduction in a specific environment, leading to an increase in the frequency of those advantageous traits in subsequent generations and thus better-adapted populations. ● The theory of evolutionary change is supported by diverse evidence from fossil records, comparative anatomy and embryology, molecular biology, and biogeography, with natural selection, genetic drift, gene flow, and mutation serving as the key mechanisms driving this change. ● The evolution of a species is fundamentally a change in the allele frequencies within its population's gene pool over successive generations, driven by evolutionary mechanisms that alter the genetic makeup of the population. ● A species that fails to adapt to a changing or volatile environment faces severe consequences, including reduced fitness, declining population size, and ultimately, an increased risk of extinction. ● The Hardy-Weinberg equilibrium provides a null model that describes and predicts constant allele and genotype frequencies in a population that is not evolving, serving as a baseline against which real populations can be compared to detect evolutionary change. ● By comparing observed allele frequencies in a population to those predicted by the Hardy-Weinberg equilibrium, scientists can quantitatively calculate and draw conclusions about whether a population is evolving, and infer which evolutionary mechanisms might be at play. 	
Evidence of Learning			
Formative & Alternative Assessments: <ul style="list-style-type: none"> ● Natural Selection Study Guide ● Mastering Biology Assignments ● Natural Selection Activity ● Phylogenetics Activity ● Hardy-Weinberg Lab ● AP Classroom Practice Questions ● Unit 5 (AP) Progress Check ● Unit 5 AP Classroom videos ● Individual student check ins with teacher 	Benchmark & Summative Assessments: <ul style="list-style-type: none"> ● Topic Quizzes ● Natural Selection Unit Test ● Organism Evolution Research 	Resources Needed: <ul style="list-style-type: none"> ● RFH Science LibGuide ● Pearson Mastering Biology ● Bozeman Science videos ● HHMI Biointeractive ● Phet Simulation ● MiniPCR Lab ● EdPuzzle ● Pivot Interactives ● YouTube 	

Unit IX: Final Project

Unit Summary

For the Final Project unit, which is designed around the Children's Book assignment, the overarching goal is for students to achieve a deep understanding of a science concept by effectively teaching it to an audience unfamiliar with the topic. This teaching process requires students to closely examine their chosen subject, distill it down to its important concepts, and then develop simple ways to explain those concepts, often utilizing metaphors, analogies, or simple models. Students are to choose one specific science concept or topic and develop a children's book targeting a kindergarten to third-grade audience. The book must include both words and illustrations, and students are encouraged to use humor and make their

topic interesting to kids. A variety of media can be employed for illustrations, such as drawings, photos, cartoons, paint, or crayons. Students are advised to review successful children's science books from local libraries for inspiration on how to interweave science into a good story.

Standards/Core Ideas/Performance Expectations/Progress Indicators

The state standards outlined below, and established by the New Jersey Department of Education, will guide instruction throughout this unit in *Advanced Placement Biology*:

- *2023 New Jersey Student Learning Standards: Mathematics*
 - N.Q.A.1, S.ID.1, S.ID.9, S.IC.6
- *2023 New Jersey Student Learning Standards: English Language Arts 11-12*
 - RI.CR.11–12.1, RI.CI.11–12.2, W.WR.11-12.5, W.WP.11–12.4, W.SE.11–12.6, SL.PI.11-12.4
- *2020 New Jersey Student Learning Standards: Computer Science and Design Thinking*
 - 8.1.12.DA.5, 8.2.12.ED.1, 8.2.12.ITH.1
- *2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills*
 - 9.4.12.CI.1-2, 9.4.12.CT.2, 9.4.12.TL.2, 9.4.12.IML.2

Unit Essential Questions

- How does the process of teaching a scientific concept deepen one's own understanding of that concept?
- What strategies are most effective for simplifying and communicating complex scientific ideas to a young, non-expert audience (Kindergarten to third grade)?
- How can scientific knowledge be presented in an engaging and accessible manner through various forms of media and activities?
- How does the design process for educational materials reflect and enhance critical thinking, problem-solving, and creative skills?
- How can lessons about scientific topics, such as climate change, be tailored to address societal issues and foster informed decision-making in young learners?

Unit Enduring Understandings

- Teaching a scientific concept to others necessitates a profound personal understanding, as it forces one to distill the subject down to its important concepts, closely examine them, and then develop simple, clear ways to explain them through methods like metaphors, analogies, or simple models.
- Effective communication of complex scientific ideas to a young, non-expert audience (K-3) relies on the strategic simplification of language, the use of relatable analogies, metaphors, or simple models, and engaging storytelling.
- Scientific knowledge becomes most engaging and accessible when presented through diverse and interactive media and activities, such as colorful illustrations, drawings, photos, or cartoons in a children's book, and hands-on activities, crafts, or games as part of a lesson plan. This multi-modal approach transforms passive reception of information into an active, immersive experience that caters to different learning styles and enhances comprehension and interest.
- The design process for creating educational materials, such as a children's book and lesson plan, inherently promotes and enhances critical thinking by requiring students to analyze a chosen scientific concept and distill it for a specific audience. It develops problem-solving skills as students face constraints and challenges in simplifying complex ideas and creating engaging activities. Furthermore, it cultivates creative skills through the imaginative development of metaphors, illustrations, stories, activities, crafts, or games, demonstrating that design is a powerful vehicle for applying and expanding these higher-order cognitive abilities.
- Lessons on scientific topics, particularly those with global implications like climate change, can be tailored to address societal issues and foster informed decision-making in young learners by connecting the scientific understanding directly to real-world problems and potential solutions. By exploring the "science behind the changes" and investigating "solutions our world desperately needs," students learn to analyze impacts, develop evidence-based arguments, and collaborate on solutions to complex issues, thereby equipping them to contribute meaningfully to societal decision-making for a sustainable future.

Evidence of Learning

Formative & Alternative Assessments:

- Check-in assignments
- Book topic proposal
- Email correspondence
- Individual student check ins with teacher

Benchmark & Summative Assessments:

- Children's Book
- Lesson Plan
- Classroom Visit

Resources Needed:

- RFH Science LibGuide
- YouTube
- Children's books

Section IX: Unit Reflection

The *AP Biology* instructional team must confer upon the completion of each instructional unit in the *AP Biology* curriculum and rate the degree to which the instructional units meet performance criteria established by the New Jersey Department of Education using the Unit Reflection Form. Completed unit reflection forms must be submitted to the Department Supervisor for approval upon completion of curriculum implementation with a complementing list of suggested modifications to the *AP Biology* curriculum.

Unit Reflection Form: <i>AP Biology</i>			
Lesson Activities:	Strongly	Moderately	Weakly
Foster student use of technology as a tool to develop critical thinking, creativity, and innovation skills;			
Are challenging and require higher-order thinking and problem-solving skills;			
Allow for student choice;			
Provide scaffolding for acquiring targeted knowledge/skills;			
Integrate modern, global perspectives, especially those regarding diversity, genocide, global issues, and historical ones regarding racial relations;			
Integrate 21 st century skills;			
Provide opportunities for interdisciplinary connection and transfer of knowledge and skills;			
Are varied to address different student learning styles and preferences;			
Are differentiated based on student needs;			
Are student-centered, with the teacher acting as a facilitator and co-learner during the teaching and learning process;			
Provide means for students to demonstrate knowledge and skills and progress in meeting learning goals and objectives;			
Provide opportunities for student reflection and self-assessment;			
Provide data to inform and adjust instruction to better meet the varying needs of learners.			

Appendix
Writing Instruction and the RFH Community

Writing instruction should happen across the RFH Community. Writing across the curriculum is a philosophy that advances the belief that writing is a method of learning. Since all departments are committed to helping students learn, writing must be used as a methodology to advance student learning.

Each academic discipline has its own unique conventions, formats and structures. It is the responsibility of each department to agree upon domain-specific writing praxes, model them for students, and require them to utilize them on a consistent basis.

Students must understand that acceptable writing in one domain may not be acceptable writing in another area. The development of domain-specific writing skills supports the overall development of the student writer because all writing is grounded in the writing situation: audience, context, purpose, subject, and writer. Representatives from the academic disciplines must share their domain-specific writing praxes with each other, identify intersections, and determine how to address perceived gaps that limit student learning.

Students must experience writing situations that help them learn how to think creatively and critically and communicate effectively in the academic disciplines. Writing instruction, regardless of the academic discipline, must always reinforce student understanding of the writing situation. When students experience writing situations, they must study examples of domain-specific writing in order to understand how writers communicate in discipline-related contexts. This does not mean information embedded in textbooks. Domain-specific writing is writing that is used to inform and influence readers as it draws them into an established circle of discourse. Students must use these non-fiction texts to develop the close reading skills that will shape their own writing. Focused engagement with domain-specific writing should not be limited to basic reading comprehension and topical understanding. It must also include the analysis of the writing situation that is represented in the text: audience, context, purpose, subject, and writer. The close reading of well-written texts—regardless of the domain—will show students the importance of writing mechanics, diction, and syntax. The development of close reading skills will also help the students grow in terms of their ability to construct and advance independent and original claims that are well-supported by evidence. Domain-specific writing is grounded in positioning of claims and the effective use of evidence.

The final written product is important; nevertheless, the learning that results in this production must not be devalued. The writing process is not limited to the basic steps of planning, drafting, revising, and editing/proofreading. It is a complex sequence of critical and creative thinking and writing that leads to the production of a text that provides evidence of learning and understanding. Students must ultimately develop the ability to self-assess the effectiveness of their writing as a representation of the writing situation. Without the use of models that evidence learning and understanding, students will not develop the ability to self-assess their own work—the true outcome of the writing process.

What types of writing situations should RFH students engage in?

RFH students should engage in writing situations across the curriculum that require them to:

- write to improve mechanical proficiency, diction usage, and syntactical sophistication
- write to narrate, describe, and reflect
- write to summarize and report
- write to classify and define
- write to explain how process leads to an outcome
- write to compare, contrast and evaluate
- write to speculate on cause and effect
- write to propose solutions and solve problems
- write to analyze

These writing situations should be positioned in a coordinated, developmental sequence that extends across the academic disciplines.

Upon Completion of Grade 12, RFH students must be ready to transition to the following writing situations:

- write to analyze
- write to persuade (argument)

The core foci of first-year college writing courses are analysis and argument. These courses orient the students to the demands and expectations of writing for the academic culture of college. At colleges/universities with carefully coordinated writing programs, students must demonstrate proficiency in analysis and argument before they transition to upper level courses that require them to engage in the following writing situation:

- write to investigate (research)