

**COURSE TITLE**

Biology

**LENGTH**

Full Year

**DEPARTMENT**

STEM Department

**SCHOOL**

Rutherford High School

**DATE**

September 10, 2018

# Biology

## I. Introduction/Overview/Philosophy

Students in this course will develop an understanding of key concepts that help them make sense of life science. The ideas are building upon students' science understanding of disciplinary core ideas, science and engineering practices, and crosscutting concepts from earlier grades. There are five life science topics that will be addressed through this course: 1) Structure and Function, 2) Inheritance and Variation of Traits, 3) Matter and Energy in Organisms and Ecosystems, 4) Interdependent Relationships in Ecosystems, and 5) Natural Selection and Evolution.

The performance expectations for high school life science blend core ideas with scientific and engineering practices and crosscutting concepts to support students in developing useable knowledge that can be applied across the science disciplines. While the performance expectations in high school life science couple particular practices with specific disciplinary core ideas, instructional decisions should include use of many practices underlying the performance expectations. Through a variety of laboratory and hands-on activities, students will investigate areas of biological science. The goal of the course is to instill in students the belief that biology is an exciting, relevant, and human activity based discipline.

## II. Objectives

### *Course Outline:*

1. Ecology-Interdependent relationships in ecosystems
  - a. Mathematical support to carrying capacity
  - b. Factors affecting biodiversity
2. Ecology-Matter and Energy Transformations in an Ecosystem
  - a. Cycling of matter
  - b. Photosynthesis and Cell Respiration
3. Ecology-Human Activity and Climate
  - a. Climate Change as it relates to resource utilization and exploitation
  - b. Earth's Systems
  - c. Evidence for climate change
  - d. Solving Climate Change
4. Human Activity and Biodiversity
  - a. The relationship between sustainability and species survivorship
  - b. Urbanization and its effects
  - c. Endangered Species
5. Cell Specialization and Homeostasis
  - a. DNA
  - b. Homeostasis
6. DNA and Inheritance
  - a. Mitosis/Meiosis
  - b. Genetics and Generalized Recombination
  - c. Mutations
7. Natural Selection
  - a. Biotic and Abiotic factors affecting natural selection

- b. Numerical and Statistical support
  - c. Group Behavior
8. Evolution
- a. Evidence for Darwinian Evolution
  - b. Factors that affect evolution

### ***Student Outcomes:***

After successfully completing this course, the student will:

- construct explanations for the role of energy in the cycling of matter in organisms and ecosystems.
- apply mathematical concepts to develop evidence to support explanations of the interactions of photosynthesis and cellular respiration and develop models to communicate these explanations.
- understand organisms' interactions with each other and their physical environment and how organisms obtain resources.
- formulate answers to the question "how and why do organisms interact with each other (biotic factors) and their environment (abiotic factors), and what affects these interactions?"
- examine factors that have influenced the distribution and development of human society; these factors include climate, natural resource availability, and natural disasters.
- use computational representations to analyze how earth systems and their relationships are being modified by human activity.
- develop an understanding of how human activities affect natural resources and of the interdependence between humans and Earth's systems, which affect the availability of natural resources.
- create or revise a simulation to test solutions for mitigating adverse impacts of human activity on biodiversity.
- formulate an answer to the question "How do the structures of organisms enable life's functions?"
- investigate explanations for the structure and functions of cells as the basic unit of life, of hierarchical organization of interacting organ systems, and of the role of specialized cells for maintenance and growth.
- analyze data develop models to make sense of the relationship between DNA and chromosomes in the process of cellular division, which passes traits from one generation to the next.
- determine why individuals of the same species vary in how they look, function, and behave.
- develop conceptual models of the role of DNA in the unity of life on Earth and use statistical models to explain the importance of variation within populations for the survival and evolution of species.
- develop an understanding of the factors causing natural selection of species over time.
- demonstrate and understandings of how multiple lines of evidence contribute to the strength of scientific theories of natural selection.
- construct explanations for the processes of natural selection and evolution and then communicate how multiple lines of evidence support these explanations.
- evaluate evidence of the conditions that may result in new species and understand the role of genetic variation in natural selection.

### ***New Jersey Student Learning Standards***

#### ***CAREER READY PRACTICES***

##### ***CRP1 Act as a responsible and contributing citizen and employee.***

Career-ready individuals understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good.

***CRP2 Apply appropriate academic and technical skills.***

Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation

***CRP4 Communicate clearly and effectively and with reason.***

Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. They communicate in the workplace with clarity and purpose to make maximum use of their own and others' time. They are excellent writers; they master conventions, word choice, and organization, and use effective tone and presentation skills to articulate ideas. They are skilled at interacting with others; they are active listeners and speak clearly and with purpose. Career-ready individuals think about the audience for their communication and prepare accordingly to ensure the desired outcome.

***CRP5. Consider the environmental, social and economic impacts of decisions.***

Career-ready individuals understand the interrelated nature of their actions and regularly make decisions that positively impact and/or mitigate negative impact on other people, organization, and the environment. They are aware of and utilize new technologies, understandings, procedures, materials, and regulations affecting the nature of their work as it relates to the impact on the social condition, the environment and the profitability of the organization.

***CRP6. Demonstrate creativity and innovation.***

Career-ready individuals regularly think of ideas that solve problems in new and different ways, and they contribute those ideas in a useful and productive manner to improve their organization. They can consider unconventional ideas and suggestions as solutions to issues, tasks or problems, and they discern which ideas and suggestions will add greatest value. They seek new methods, practices, and ideas from a variety of sources and seek to apply those ideas to their own workplace. They take action on their ideas and understand how to bring innovation to an organization.

***CRP7. Employ valid and reliable research strategies.***

Career-ready individuals are discerning in accepting and using new information to make decisions, change practices or inform strategies. They use reliable research process to search for new information. They evaluate the validity of sources when considering the use and adoption of external information or practices in their workplace situation.

***CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.***

Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others.

***CRP9. Model integrity, ethical leadership and effective management.***

Career-ready individuals consistently act in ways that align personal and community-held ideals and principles while employing strategies to positively influence others in the workplace. They have a clear understanding of integrity and act on this understanding in every decision. They use a variety of means to positively impact the directions and actions of a team or organization, and they apply insights into human behavior to change others'

action, attitudes and/or beliefs. They recognize the near-term and long-term effects that management's actions and attitudes can have on productivity, morals and organizational culture.

***CRP10. Plan education and career paths aligned to personal goals.***

Career-ready individuals take personal ownership of their own education and career goals, and they regularly act on a plan to attain these goals. They understand their own career interests, preferences, goals, and requirements. They have perspective regarding the pathways available to them and the time, effort, experience and other requirements to pursue each, including a path of entrepreneurship. They recognize the value of each step in the education and experiential process, and they recognize that nearly all career paths require ongoing education and experience. They seek counselors, mentors, and other experts to assist in the planning and execution of career and personal goals.

***CRP11. Use technology to enhance productivity.***

Career-ready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks.

***CRP12. Work productively in teams while using cultural global competence.***

Career-ready individuals positively contribute to every team, whether formal or informal. They apply an awareness of cultural difference to avoid barriers to productive and positive interaction. They find ways to increase the engagement and contribution of all team members. They plan and facilitate effective team meetings.

## ***TECHNOLOGY STANDARDS***

**Standard 8.1 Educational Technology:** All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

***Strand E: Research and Information Fluency:*** Students apply digital tools to gather, evaluate, and use information.

8.1.12.E.1- Produce a position statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources.

**Standard 8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming:**

All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

***Strand B. Technology and Society:*** Knowledge and understanding of human, cultural and societal values are fundamental when designing technological systems and products in the global society.

8.2.12.B.2- Evaluate ethical considerations regarding the sustainability of environmental resources that are used for the design, creation and maintenance of a chosen product.

***Strand C. Design:*** The design process is a systematic approach to solving problems.

8.2.12.C.4- Explain and identify interdependent systems and their functions.

## ***21ST CENTURY LIFE AND CAREERS***

### ***9.1 Personal Financial Literacy***

#### ***Strand F: Civic Financial Responsibility***

9.1.12.F.3 Analyze how citizen decisions and actions can influence the use of economic resources to achieve societal goals and provide individual services.

## **9.2 Career Awareness, Exploration, and Preparation**

### **Strand C: Career Preparation**

9.2.12.C.1 Review career goals and determine steps necessary for attainment.

### **COMPANION STANDARDS FOR SCIENCE AND TECHNICAL SUBJECTS**

RST.9-10.1. Accurately cite strong and thorough evidence from the text to support analysis of science and technical texts, attending to precise details for explanations or descriptions.

RST.9-10.3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.

WHST.9-10.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

WHST.9-10.5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

WHST.9-10.6. Use technology, including the Internet, to produce, share, and update writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.

WHST.9-10.7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

WHST.9-10.8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.

### **NEW JERSEY STUDENT LEARNING STANDARDS- SCIENCE**

HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins, which carry out the essential functions of life through systems of specialized cells.

HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

HS-LS1-4. Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.

HS-LS2-1. Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.

HS-LS2-2. Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.

HS-LS2-3. Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions.

HS-LS2-4. Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem.

HS-LS2-5. Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere.

HS-LS2-6. Evaluate claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.

HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

HS-LS2-8. Evaluate evidence for the role of group behavior on individual and species' chances to survive and reproduce.

HS-LS3-1. Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.

HS-LS3-2. Make and defend a claim based on evidence that inheritable genetic variations may result from (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.

HS-LS4-1. Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.

HS-LS4-2. Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment.

HS-LS4-3. Apply concepts of statistics and probability to support explanations that organisms with an advantageous heritable trait tend to increase in proportion to organisms lacking this trait.

HS-LS4-6. Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.

HS-ESS1-3. Communicate scientific ideas about the way stars, over their life cycle, produce elements.

HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

HS-ESS3-4. Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.

HS-ESS3-5. Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth's systems.

HS-ESS3-6. Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

HS-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

HS-ETS1-4. Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.

### III. Proficiency Levels

Biology is appropriate for all students in grade 9.

## IV. Methods of Assessment

### Student Assessment

The teacher will provide a variety of assessments during the course of the year. The assessment may include but is not limited to: chapter and unit tests and quizzes, simulations, lab reports, application problems, homework, and projects.

### Curriculum/Teacher Assessment

The teacher will provide the subject area supervisor with suggestions for changes on an ongoing basis.

## V. Grouping

There are no prerequisites for this course.

## VI. Articulation/Scope & Sequence/Time Frame

Course length is one year.

## VII. Resources

### *Texts/Supplemental Reading/References*

Resources include but are not limited to:

1. Text
  - a. Modern Biology, Holt McDougal, 2009
2. Workbook
  - a. Biology for NGSS - Student Workbook, Biozone, 2014
  - b. POGIL
3. Web-based Resources
  - a. <https://www.teachengineering.org/>
  - b. [http://betterlesson.com/next\\_gen\\_science](http://betterlesson.com/next_gen_science)
  - c. <http://www.ck12.org/>
  - d. <http://www.ngsslifescience.com>
  - e. Crash Course: <http://www.pbslearningmedia.org/collection/crash-course/>
  - f. Discovery News: <http://news.discovery.com/>
  - g. SciShow

## VIII. Suggested Activities

Appropriate activities are listed below in the curriculum map.

## IX. Methodologies

The following methods of instruction are suggested: lecture, group projects, demonstration, hands-on applications, and class presentations.



## **X. Interdisciplinary Connections**

Connections will regularly be made to mathematics, history, and language arts through various means.

## **XI. Differentiating Instruction for Students with Special Needs: Students with Disabilities, Students at Risk, English Language Learners, and Gifted & Talented Students**

Differentiating instruction is a flexible process that includes the planning and design of instruction, how that instruction is delivered, and how student progress is measured. Teachers recognize that students can learn in multiple ways as they celebrate students' prior knowledge. By providing appropriately challenging learning, teachers can maximize success for all students.

Differentiating in this course includes but is not limited to:

### *Differentiation for Support (ELL, Special Education, Students at Risk)*

- Peer mentoring on problems
- Differentiated teacher feedback on assignments
- Modeling out problems on whiteboard
- Visual aids as we project problems on whiteboard
- Study guides
- Tiered assignments
- Scaffolding of materials and assignments
- Re-teaching and review
- Guided note taking
- Exemplars of varied performance levels
- Multi-media approach to accommodating various learning styles

### *Differentiation for Enrichment*

- Supplemental reading material for independent study
- Flexible grouping
- Tiered assignments
- Topic selection by interest
- Enhanced expectations for independent study
- Elevated questioning techniques using Webb's Depth of Knowledge matrix

## **XII. Professional Development**

The teacher will continue to improve expertise through participation in a variety of professional development opportunities.

**XII. Curriculum Map/Pacing Guide**

| Unit Topic   | Time Allocated | Differentiating Instruction for Students with Disabilities, Students at Risk, English Language Learners, & Gifted & Talented Students   | Standards  | Assessments  |
|--|----------------|---|--|--|
| <p><b>Ecology-Interdependent relationships in ecosystems</b></p> <ul style="list-style-type: none"> <li>• Mathematical support to carrying capacity</li> <li>• Factors affecting biodiversity</li> </ul> | 4 weeks        | <p><i>For Support:</i></p> <ul style="list-style-type: none"> <li>• Guided notes</li> <li>• Modified homework assignments</li> <li>• Modified assessments</li> </ul> <p><i>For Enhancement:</i></p> <ul style="list-style-type: none"> <li>• Khan Academy</li> <li>• Critical/Analytical thinking tasks</li> <li>• Inquiry-based instruction</li> </ul> | <p>HS-LS2-1<br/>           HS-LS2-2<br/>           HS-LS2-6<br/>           CRP1,2,4,6,7,8,9,11,12<br/>           RST.9-10.1,3<br/>           WHST.9-10.4,5,6,7,8<br/>           8.2.12.C.4<br/>           9.2.12.C.1</p> | <p><i>Formative Assessment:</i></p> <ul style="list-style-type: none"> <li>• Population/Carrying Capacity Virtual Lab</li> <li>• Carbon Transfer Through Snails and Elodea</li> <li>• Predator Prey Virtual Stimulation/Hare &amp; Lynx Activity</li> <li>• Biodiversity case Studies (American Buffalo/Honey Bees)</li> <li>• Rabbits and Wolves-Virtual Stimulation</li> </ul> <p><i>Summative Assessment</i></p> <ul style="list-style-type: none"> <li>• Population/Carry Capacity/ Ecosystems Test</li> <li>• Ecosystem in a Jar</li> </ul> |

| Unit Topic  | Time Allocated | Differentiating Instruction for Students with Disabilities, Students at Risk, English Language Learners, & Gifted & Talented Students  | Standards  | Assessments   |
|---|----------------|--|--|---|
| <b>Ecology-Matter and Energy Transformations in an Ecosystem</b> <ul style="list-style-type: none"> <li>• Cycling of matter</li> <li>• Photosynthesis and Cell Respiration</li> </ul>   | 6 weeks        | <i>For Support:</i> <ul style="list-style-type: none"> <li>• Modified homework assignments</li> <li>• Modified assessments</li> <li>• Rephrase questions, directions, and explanations</li> </ul><br><i>For Enhancement:</i> <ul style="list-style-type: none"> <li>• Provide extension activities</li> <li>• Student-driven projects</li> <li>• Critical/Analytical thinking tasks</li> </ul> | HS-LS2-4<br>HS-LS2-5<br>CRP1,2,4,6,7,8,9,11,12<br>RST.9-10.1,3<br>WHST.9-10.4,5,6,7,8  | <i>Formative Assessment:</i> <ul style="list-style-type: none"> <li>• Photosynthesis Foldable</li> <li>• Cellular Respiration Lab</li> <li>• ATP Building Lab</li> </ul><br><i>Summative Assessment</i> <ul style="list-style-type: none"> <li>• Photosynthesis and Cellular Respiration Test</li> <li>• Biome in a Bottle</li> </ul> |
| <b>Ecology-Human Activity and Climate</b> <ul style="list-style-type: none"> <li>• Climate Change as it relates to resource utilization and exploitation</li> <li>• Earth's Systems</li> <li>• Evidence for climate change</li> </ul> | 4 weeks        | <i>For Support:</i> <ul style="list-style-type: none"> <li>• Pre-teaching of vocabulary and concepts</li> <li>• Rephrase questions, directions, and explanations</li> <li>• Modification of content and student products</li> </ul>  | HS-ESS3-1<br>HS-ESS3-6<br>HS-ESS3-5<br>HS-ESS3-4<br>HS-ETS1-3<br>CRP1,2,4,6,7,8,9,11,12<br>RST.9-10.1,3<br>WHST.9-10.4,5,6,7,8<br>8.1.12.E.1<br>8.2.12.B.2 | <i>Formative Assessment:</i> <ul style="list-style-type: none"> <li>• Smog City-Virtual Stimulation</li> <li>• Film Investigations (Inconvenient Truth vs. PIP vs. Cool It)</li> <li>• Virtual Plate Boundaries</li> </ul><br><i>Summative Assessment</i>   |

| Unit Topic  | Time Allocated | Differentiating Instruction for Students with Disabilities, Students at Risk, English Language Learners, & Gifted & Talented Students  | Standards  | Assessments  |
|---|----------------|--|--|--|
| <ul style="list-style-type: none"> <li>Solving Climate Change</li> </ul>  |                | <i>For Enhancement:</i> <ul style="list-style-type: none"> <li>Inquiry-based instruction</li> <li>Independent study</li> <li>Higher-order thinking skills</li> </ul>   | 9.1.12.F.3   | <ul style="list-style-type: none"> <li>Edible Tectonics</li> <li>Window Water Cycle</li> <li>Ecology Test</li> </ul>   |
| <b>Human Activity and Biodiversity</b> <ul style="list-style-type: none"> <li>The relationship between sustainability and species survivorship</li> <li>Urbanization and its effects</li> <li>Endangered Species</li> </ul> | 3 Weeks        | <i>For Support:</i> <ul style="list-style-type: none"> <li>Guided notes</li> <li>Modified homework assignments</li> <li>Modified assessments</li> </ul> <i>For Enhancement:</i> <ul style="list-style-type: none"> <li>Adjusting the pace of lessons</li> <li>Inquiry-based instruction</li> <li>Higher-order thinking skills</li> </ul> | HS-ESS3-3<br>HS-LS2-7<br>HS-LS4-6<br>HS-ETS1-1<br>HS-ETS1-2<br>HS-ETS1-3<br>HS-ETS1-4<br>CRP1,2,4,6,7,8,9,11,12<br>RST.9-10.1,3<br>WHST.9-10.4,5,6,7,8 | <i>Formative Assessment:</i> <ul style="list-style-type: none"> <li>Tragedy of the Commons Lab</li> <li>R &amp; D Research on Future Renewable Innovations</li> </ul> <i>Summative Assessment:</i> <ul style="list-style-type: none"> <li>Biodiversity T-Shirts</li> <li>Human Activity and Biodiversity Test</li> </ul> |
| <b>Cell Specialization and Homeostasis</b> <ul style="list-style-type: none"> <li>DNA</li> </ul>  | 7 Weeks        | <i>For Support:</i> <ul style="list-style-type: none"> <li>Allow errors</li> <li>Use of visual and</li> </ul>  | HS-LS1-1<br>HS-LS1-2<br>HS-LS1-3   | <i>Formative Assessment:</i> <ul style="list-style-type: none"> <li>DNA Extraction Lab</li> <li>DNA Interactive</li> </ul>   |

| Unit Topic   | Time Allocated | Differentiating Instruction for Students with Disabilities, Students at Risk, English Language Learners, & Gifted & Talented Students  | Standards   | Assessments  |
|--|----------------|--|---|--|
| <ul style="list-style-type: none"> <li>Homeostasis</li> </ul>  |                | <p>multi-sensory formats</p> <ul style="list-style-type: none"> <li>Use of assisted technology</li> </ul> <p><i>For Enhancement:</i></p> <ul style="list-style-type: none"> <li>Real-world problems and scenarios</li> <li>Khan Academy</li> <li>Critical/Analytical thinking tasks</li> </ul>   | HS-LS1-4<br>CRP1,2,4,6,7,8,9,11,12<br>RST.9-10.1,3<br>WHST.9-10.4,5,6,7,8                                       | <p>Manipulatives</p> <ul style="list-style-type: none"> <li>Respiration in Peas</li> <li>Homeostasis Exercise Lab (Jumping Jacks Lab)</li> </ul> <p><i>Summative Assessment</i></p> <ul style="list-style-type: none"> <li>Keeping a Balance: Homeostasis and Negative Feedback</li> <li>Homeostasis Test</li> <li>DNA Test</li> </ul>   |
| <p><b>DNA and Inheritance</b></p> <ul style="list-style-type: none"> <li>Mitosis/Meiosis</li> <li>Genetics and Generalized Recombination</li> <li>Mutations</li> </ul> | 6 Weeks        | <p><i>For Support:</i></p> <ul style="list-style-type: none"> <li>Guided Notes</li> <li>Pre-teaching of vocabulary and concepts</li> <li>Visual learning, including graphic organizers</li> <li>Teacher modeling</li> </ul> <p><i>For Enhancement:</i></p> <ul style="list-style-type: none"> <li>Khan Academy</li> <li>Critical/Analytical Thinking Tasks</li> <li>Real-world problems and scenarios</li> </ul> | HS-LS1-4<br>HS-LS3-1<br>HS-LS3-2<br>CRP1,2,4,6,7,8,9,11,12<br>RST.9-10.1,3<br>WHST.9-10.4,5,6,7,8<br>8.1.12.E.1 | <p><i>Formative Assessment:</i></p> <ul style="list-style-type: none"> <li>Harry Potter Pedigree</li> <li>Karyotyping Lab (Disorders)</li> <li>Sex Linked Inheritance Lab (Coin Lab)</li> </ul> <p><i>Summative Assessment</i></p> <ul style="list-style-type: none"> <li>Modeling Mitosis/Meiosis by Students</li> <li>Around the World Mitosis/Meiosis</li> <li>Make a Baby Lab</li> <li>Mitosis/Meiosis Test</li> </ul> |

| Unit Topic  | Time Allocated | Differentiating Instruction for Students with Disabilities, Students at Risk, English Language Learners, & Gifted & Talented Students  | Standards   | Assessments   |
|---|----------------|--|---|---|
| <p><b>Natural Selection</b></p> <ul style="list-style-type: none"> <li>• Biotic and Abiotic factors affecting natural selection</li> <li>• Numerical and Statistical support</li> <li>• Group Behavior</li> </ul> | 5 Weeks        | <p><i>For Support:</i></p> <ul style="list-style-type: none"> <li>• Use of prompts</li> <li>• Pre-teaching of vocabulary and concepts</li> <li>• Modified assessments</li> </ul> <p><i>For Enhancement:</i></p> <ul style="list-style-type: none"> <li>• Higher-order thinking skills</li> <li>• Interest-based content</li> <li>• Student-driven projects</li> </ul>              | HS-LS4-3<br>HS-LS4-4<br>HS-LS4-5<br>HS-LS2-8<br>CRP1,2,4,6,7,8,9,11,12<br>RST.9-10.1,3<br>WHST.9-10.4,5,6,7,8 | <p><i>Formative Assessment:</i></p> <ul style="list-style-type: none"> <li>• Using a Dichotomous Key Lab (Monsters)</li> <li>• Glencoe Virtual Lab- How Do Organisms React to Changes in Abiotic Factors?</li> </ul> <p><i>Summative Assessment</i></p> <ul style="list-style-type: none"> <li>• Natural Selection M &amp; M Lab</li> <li>• Natural Selection Test</li> </ul> |
| <p><b>Evolution</b></p> <ul style="list-style-type: none"> <li>• Evidence for Darwinian Evolution</li> <li>• Factors that affect evolution</li> </ul>   | 5 Weeks        | <p><i>For Support:</i></p> <ul style="list-style-type: none"> <li>• Use of visual and multi-sensory formats</li> <li>• Guided notes</li> <li>• Modified homework assignments</li> </ul> <p><i>For Enhancement:</i></p> <ul style="list-style-type: none"> <li>• Real-world problems and scenarios</li> <li>• Khan Academy</li> <li>• Critical/Analytical thinking tasks</li> </ul> | HS-LS4-1<br>HS-LS4-2<br>CRP1,2,4,6,7,8,9,11,12<br>RST.9-10.1,3<br>WHST.9-10.4,5,6,7,8                         | <p><i>Formative Assessment:</i></p> <ul style="list-style-type: none"> <li>• Darwin's Finches Bird Beak Lab</li> <li>• HHMI Lizard Evolution Virtual Lab</li> <li>• PhET Virtual Lab- Natural Selection (Bunnies)</li> </ul> <p><i>Summative Assessment</i></p> <ul style="list-style-type: none"> <li>• The Great Fossil Find</li> <li>• Evolution Test</li> </ul>           |