

Stanberry High School Biology Syllabus

2020-2021

Roxanne Hoover, Instructor, rhoover@stanberryschools.org

Welcome to Biology!

I. Course Description

Biology at Stanberry High School is an introductory laboratory course in the life sciences. Topics of study include chemistry of life, cellular energy reactions, cell cycle, heredity, ecology and evolution. The state required End of Course (EOC) exam is administered upon completion of this course.

II. Course Curricular Objectives

The Biology course at Stanberry High School is vitally important in helping students experience the richness and excitement of knowing about and understanding the natural world.

- Students will gain a basic understanding of the characteristics and interactions of living organisms.
- Students will gain a basic understanding of changes in ecosystems.
- Students will gain a basic understanding of the interactions of organisms with their environments.
- Students will gain a basic understanding of the process of scientific inquiry.
- Students will gain a basic understanding of the impact of science, technology, and human activity.

III. Course Materials

Students will be using their chromebooks nearly every day in Biology and need to bring them to class everyday fully charged. We will use Google Classroom as our learning platform on which some assignments will be posted and turned in. Other assignments are still paper based. We will be using the book *Biology* (2012) published by Holt McDougal. The students will also be provided with other materials that review or enrich the content presented in class.

IV. Course Policies

A. Behavior:

Students will respect the rights of others in the classroom, and the school's equipment and facilities. All students will be required to pass a safety quiz and return a signed safety contract (student and guardian) in order to participate in labs. It is a privilege to do labs. They help to make learning meaningful, fun and exciting. For safety reasons, a student who behaves inappropriately during labs will not be allowed to finish the lab. If horseplay is involved, the student potentially endangers other students in class and will be referred to the office. Electronic devices will be used for academic purposes only. Students will be using chromebooks on a regular basis and will be expected to use all technology appropriately and responsibly. The cell phone policy will be strictly enforced in Biology.

B. Absences:

Daily attendance is strongly recommended in this course (and all other courses). Makeup privileges will be as follows:

- If you are absent due to a school function (extracurricular activities, field trips, etc.), you are expected to get your assignments PRIOR to your leave and complete them by the due date. It will be your responsibility to come in for any additional help as needed before/after school to get the work done on time.
- If you have an excused absence, (not due to a school function), you are expected to see me before or afterschool on the day you return to pick up all makeup work. Do not expect assignments to be given to you during valuable class time. Students must have makeup work completed by the time they take the associated unit test. No makeup work will be accepted after the unit test.
- All makeup tests will be given before or after school and may not be the same tests as given to other Students.

C. Testing:

Biology is a challenging class and students need to learn how to effectively study and take tests. Students often do not know the difference between “recognizing” a concept and “knowing” it. Students are usually well trained to recognize answers when given test banks or sets of possible answers, but are sometimes unable to generate complete answers in writing, which requires that they know the material. To help students make this transition, students will be allowed to retake written sections of a unit test (by learning target) if they receive less than a 70% on that learning target section. The student must meet two criteria to be eligible for a retake: 1.) the student must have all assignments turned in on time 2.) the student must come in to go over their previous test prior to taking the retake. The maximum score the student can receive is a 70% on the retake. This privilege is used at the teacher’s discretion.

D. Lab Policy:

Students are expected to do all lab activities. If a student is absent or does not complete the work in class he/she must come in before or after school to complete the assignment. Even if lab work is done in pairs or small groups, each individual is expected to turn in his/her own work unless told otherwise. Data is shared, not the interpretation of the data. Plagiarism will not earn credit.

E. Academic Dishonesty:

Cheating on tests or homework will result in:

- A zero grade for the entire test or assignment.
- Parental notification if caught cheating on a test or assignment
- Notification to the principal if caught cheating on a test.

V. Grading Policy/Assessment

A. Grading Scale

The grading scale for the course is:

96-100	A	73-76	C
90-95	A-	70-72	C-
87-89	B+	67-69	D+
84-86	B	63-66	D
80-83	B-	60-62	D-
77-79	C+	Below 60	F

VI. Course Procedures

- Students need to be in their seats when the bell rings and begin working on the daily opener question.
- Biology class is to be used for the study of biology. You will not be allowed to work on homework from any other class unless your biology work is complete. Any homework from other classes that is out when you should be working on biology will be confiscated.
- Labs need to be cleaned up appropriately before the end of class bell rings. There should be no used paper towels or lab materials left on the floor or counters, the sinks and strainer should be clean, and lab equipment returned to the proper place.
- Students must be in their seats at the end of class in order to be dismissed. The teacher will dismiss the students, not the bell.

VII. Additional Information

My intent is to help all students be successful and to facilitate a positive learning environment. I am easy to get along with, but I have high expectations for all of my students. I will not accept anything less than

your best and you shouldn't either. I am at school by 7:30 a.m. and stay until at least 4:30 p.m. I am willing to stay later if a student needs help. Don't hesitate to ask for help or to discuss grades! Communication is key.

I provide students with printed and highlighted grade reports per unit, indicating progress and missing work. Lumens is updated weekly. Please feel free to contact me by email anytime or by phone before or after school.

The course code for Google Classroom is _____. Please refer to daily announcements for practice, notes, classwork and homework.

VIII. Units of Study (Time is approximate and can be adjusted by the instructor)

Unit Overview	Learning Targets	Time
Welcome to Biology/ What is life?		3 days
Chemistry of Life	<p>Learning Target 9: I can explain how atoms of carbon, hydrogen, and oxygen can combine to form molecules that are essential for life.</p> <p>This includes:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Differentiating between the major classes of organic molecules (carbohydrates, lipids, proteins, and nucleic acids) <input type="checkbox"/> Chemistry of Water 	2 weeks
Cellular Processes	<p>Learning Target 7: I can model the hierarchical organization of interacting systems and describe how organisms maintain homeostasis.</p> <p>This includes:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Comparing and contrasting different cell types <input type="checkbox"/> Cell membrane structure and function <input type="checkbox"/> Determining how substances move in and out of the cell <input type="checkbox"/> Determining how cells will respond to their environment <input type="checkbox"/> Homeostasis 	2 weeks
Cell Structure and Function	<p>Learning target : I can recognize the relationship between structure and function in a cell.</p> <p>This includes:</p> <ul style="list-style-type: none"> <input type="checkbox"/> explaining how cells are the basic unit of life (cell theory). <input type="checkbox"/> describing how structure informs functions <input type="checkbox"/> differentiating between cell organelles and their functions 	2 weeks
Cellular Energy	<p>Learning Target 11: I can model how the process of photosynthesis turns light energy into stored food energy in plants.</p> <p>This includes:</p> <ul style="list-style-type: none"> <input type="checkbox"/> describing where photosynthesis occurs in cells <input type="checkbox"/> describing the role of pigments in photosynthesis <input type="checkbox"/> evaluate factors that affect the rate of photosynthesis <p>Learning Target 10: I can demonstrate or model how organisms turn stored energy in food into cellular energy to power life processes.</p> <p>This includes:</p> <ul style="list-style-type: none"> <input type="checkbox"/> describing where cellular respiration occurs in cells <input type="checkbox"/> describing the importance of oxygen <input type="checkbox"/> describing the role of ATP in the cell <p>Learning Target 9: I can explain how atoms of carbon, hydrogen, and oxygen can combine to form molecules that are essential for life.</p>	3 weeks

	<p>This includes:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Differentiating between the major classes of organic molecules (carbohydrates, lipids, proteins, and nucleic acids) <input type="checkbox"/> Chemistry of Water <p>Learning Target 12: I can describe the transfer of energy and matter within living systems and their environment.</p> <p>This includes:</p> <ul style="list-style-type: none"> <input type="checkbox"/> explain the 10% Rule of energy transfer between trophic levels <input type="checkbox"/> Food webs, food chains, and trophic pyramids <input type="checkbox"/> contrast the flow of energy with the cycling of nutrients in an ecosystem <p>Target 1: I can design and perform an experiment.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Differentiate among hypothesis, theory, and law <input type="checkbox"/> Identify independent and dependent variables <input type="checkbox"/> Define and identify constants and controls <input type="checkbox"/> Use the metric system to make quantitative measurements and convert between units <input type="checkbox"/> Make qualitative observations and inferences <input type="checkbox"/> Make and analyze graphs and data tables <input type="checkbox"/> Draw logical conclusions based on data 	
Cell Cycle	<p>Learning Target 8: I can model the roles of cell division (mitosis) and cell differentiation in producing and maintaining complex organisms.</p> <p>This includes defining the following terms:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Cell cycle <input type="checkbox"/> Mitosis (including the 4 phases) <input type="checkbox"/> DNA Replication <input type="checkbox"/> Chromatin <input type="checkbox"/> Chromosome 	2 week
Heredity	<p>Learning Target 13: I can model how DNA codes for traits that could potentially be passed from parents to offspring.</p> <p>This includes defining the following terms:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Autosome <input type="checkbox"/> Sex Chromosome <input type="checkbox"/> Homologous Chromosome <p>This also includes:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Predicting the traits of offspring using NonMendelian patterns of inheritance (sexlinked traits, incomplete dominance, codominance, and polygenic traits) <p>Learning Target 14: I can make and defend claims based on evidence that variations in offspring result from (1) two parents combining unique sex cells, and (2) mutations occurring during meiosis.</p> <p>This includes defining the following terms:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Aneuploidy <input type="checkbox"/> Nondisjunction <input type="checkbox"/> Mutation <input type="checkbox"/> Independent Assortment <input type="checkbox"/> CrossingOver <p>Learning Target 15: I can apply Mendel's Laws of Inheritance to predict the variation and distribution of traits in a population.</p> <p>This includes defining the following terms:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Homozygous (purebred) <input type="checkbox"/> Heterozygous (hybrid) <input type="checkbox"/> Dominant allele 	3 weeks

	<ul style="list-style-type: none"> <input type="checkbox"/> Recessive allele <input type="checkbox"/> Genotype <input type="checkbox"/> Phenotype <input type="checkbox"/> Gene <input type="checkbox"/> Trait <p>This also includes:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Recognizing Mendel's Laws <input type="checkbox"/> Using Punnett Squares to predict probability of traits in offspring 	
DNA & Protein Synthesis	<p>Learning Target 6: I can model how the structure of DNA codes for specific proteins that have essential functions in living things.</p> <p>This includes:</p> <ul style="list-style-type: none"> <input type="checkbox"/> DNA Structure <input type="checkbox"/> Compare and contrast RNA and DNA <input type="checkbox"/> Protein Synthesis (Transcription and Translation) <input type="checkbox"/> Nonheritable mutations and mutagens <p>Learning Target 9: I can explain how atoms of carbon, hydrogen, and oxygen can combine to form molecules that are essential for life.</p> <p>This includes:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Differentiating between the major classes of organic molecules (carbohydrates, lipids, proteins, and nucleic acids) <input type="checkbox"/> Chemistry of Water 	3 weeks
Evolution	<p>Target 2: I can communicate the scientific evidence that supports that modern living things have evolved from a common ancestor.</p> <p>This includes:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Artificial Selection <input type="checkbox"/> Direct Observation <input type="checkbox"/> Fossil Record <input type="checkbox"/> Geographic Distribution of Living Species <input type="checkbox"/> Comparative Anatomy (Homologous Structures, Analogous Structures, and Vestigial Structures) <input type="checkbox"/> Similarities in Embryology <input type="checkbox"/> Biological Molecules (DNA, Proteins) <p>Target 3: I can explain using evidence that the process of evolution is based on four factors</p> <ul style="list-style-type: none"> <input type="checkbox"/> Overproduction (the potential for a species to increase in number) <input type="checkbox"/> Genetic Variations (due to mutations and sexual reproduction) <input type="checkbox"/> Competition (for limited resources) <input type="checkbox"/> Survival of the fittest (individuals better suited to survive and reproduce in the environment pass on those favored traits to more offspring than others without favored traits) <p>Target 4: I can use statistics and probability to analyze changes in characteristics of a population over time.</p> <p>This includes:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Stabilizing Selection <input type="checkbox"/> Disruptive Selection <input type="checkbox"/> Directional Selection <p>Target 5: I can explain how the sources of variation in a population (including adaptations, mutations, sexual reproduction, and changes in a gene pool) lead to speciation.</p>	2 weeks
Ecology	<p>Learning Target 12: I can describe the transfer of energy and matter</p>	3 weeks

	<p>within living systems and their environment.</p> <p>This includes:</p> <ul style="list-style-type: none">□ explain the 10% Rule of energy transfer between trophic levels□ Food webs, food chains, and trophic pyramids□ contrast the flow of energy with the cycling of nutrients in an ecosystem <p>Target 16: I can make and analyze a graph to explain how limiting factors affect carrying capacity and predict changes in biodiversity and population size.</p> <p>This includes:</p> <ul style="list-style-type: none">□ Exponential and logistic growth□ Density independent and density dependent limiting factors <p>Target 17: I can describe the interactions in ecosystems during relatively stable conditions.</p> <p>This includes:</p> <ul style="list-style-type: none">□ Ecosystem structure (biotic versus abiotic features, habitat versus niche)□ Competition and predator/prey relations□ Symbiotic relationships (mutualism, commensalism, parasitism) <p>Target 18: I can identify and discuss potential and significant disruptions to an ecosystem.</p> <p>This includes:</p> <ul style="list-style-type: none">□ The removal or addition of organisms to an ecosystem□ The relative danger of biological magnification□ Modes of ecological succession□ Humans impact on the environment□ Renewable and nonrenewable resources	
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Biology

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Student and Parent
Signature Form:

I _____ (student
name),

have read and understand the course expectations, prerequisites, recommendations

and policies outlined in this syllabus. My signature indicates that I will use classroom
resources

with respect and understand and will comply with course policies as I put forth my best efforts to

be successful in this
class.

I _____ (parent
or

guardian), have read and understand the course expectations, prerequisites,
recommendations

and policies outlined in this syllabus.