Jefferson City High School Biology Syllabus
2016-2017
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Welcome to Biology!

I. Course Description

Biology at Jefferson City 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 Jefferson City 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 iPads every day in Biology. We will use Google Classroom as our learning platform on which assignments will be posted and turned in. We will be using the book *Biology* (2006) published by Holt, Rhinehart and Winston. Biology books may be checked out if requested, but all students will have online access to the text book as well. 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 iPads on a regular basis and will be expected use all technology appropriately and responsibly. Cell phones will not be needed for class and are expected to be put away for the entirety of the class period.

B. Absences:

Daily attendance is **strongly recommended** in this course (and all other courses). Make-up 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 after school on the day you return** to pick up all make-up work. Do not expect assignments to be given to you during valuable class time. Students must have make-up work completed by the time they take the associated unit test. No make-up work will be accepted after the unit test.
- All make-up 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 difficult 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, we allow them to retake sections of a unit test (by learningn target) if they receive less than an 80% 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. 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.

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 appropriate principal if caught cheating on a test.

V. Grading Policy/Assessment

A. Grading Scale

The grading scale for all courses at Jefferson City High School is:

A	93-100	B-	80-82	D+	67-69
A-	90-92	C+	77-79	D	63-66
B+	87-89	C	73-76	D-	60-62
B	83-86	C-	70-72	F	59 & below

B. Weighting System of Grade Calculation

The term grade will be determined as follows:

- Tests and quizzes are worth 60% of the course grade.
- Labs are worth 20% of the course grade.
- Homework and daily work are worth 10% of the course grade.
- Comprehensive Exams are worth 10% of the course grade.
- No extra credit assignments are offered in this course.

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. No late passes will be written. 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

I'm at school every day before and after school, and am always willing to work with students during these times to answer questions and go over course material. Let me know in advance if you plan on coming in; the best way to reach me during the day is by email at nicole.mcmorris@jcschools.us.

If you have any questions or concerns, please let me know.

VIII. Units of Study

Unit Overview	Learning Targets	Time
1. Welcome to Bio/What is Life?		3 days
2. Chemistry of Life	Learning Target 7: I can model the hierarchical organization of interacting systems and describe how organisms maintain homeostasis. This includes: □ Comparing and contrasting different cell types □ Cell membrane structure and function □ Determining how substances move in and out of the cell □ Determining how cells will respond to their environment □ Homeostasis Learning Target 9: I can explain how atoms of carbon, hydrogen, and oxygen can combine to form molecules that are essential for life. This includes: □ Differentiating between the major classes of organic molecules (carbohydrates, lipids, proteins, and nucleic acids) □ Chemistry of Water	
3. Cellular Energy	Learning Target 11: I can model how the process of photosynthesis turns light energy into stored food energy in plants. This includes: □ describing where photosynthesis occurs in cells □ describing the role of pigments in photosynthesis □ evaluate factors that affect the rate of photosynthesis Learning Target 10: I can demonstrate or model how organisms turn stored energy in food into cellular energy to power life processes. This includes: □ describing where cellular respiration occurs in cells □ describing the importance of oxygen □ describing the role of ATP in the cell Learning Target 9: I can explain how atoms of carbon, hydrogen, and oxygen can combine to form molecules that are essential for life. This includes: □ Differentiating between the major classes of organic molecules (carbohydrates, lipids, proteins, and nucleic acids) □ Chemistry of Water Learning Target 12: I can describe the transfer of energy and matter within living systems and their environment. This includes: □ 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 Target 1: I can design and perform an experiment. □ Differentiate among hypothesis, theory, and law □ Identify independent and dependent variables □ Define and identify constants and controls □ Use the metric system to make quantitative measurements and convert between units □ Make qualitative observations and inferences □ Make and analyze graphs and data tables □ Draw logical conclusions based on data	11 days
4. DNA and Protein Synthesis	Learning Target 6: I can model how the structure of DNA codes for specific proteins that have essential functions in living things.	

	This includes: □ DNA Structure □ Compare and contrast RNA and DNA □ Protein Synthesis (Transcription and Translation) □ Non-heritable mutations and mutagens Learning Target 9: I can explain how atoms of carbon, hydrogen, and oxygen can combine to form molecules that are essential for life. This includes: □ Differentiating between the major classes of organic molecules (carbohydrates, lipids, proteins, and nucleic acids) □ Chemistry of Water	
5. Cell Cycle	Learning Target 8: I can model the roles of cell division (mitosis) and cell differentiation in producing and maintaining complex organisms. This includes defining the following terms: □ Cell cycle □ Mitosis (including the 4 phases) □ DNA Replication □ Chromatin □ Chromosome	6 days
6. Heredity	Learning Target 13: I can model how DNA codes for traits that could potentially be passed from parents to offspring. This includes defining the following terms: □ Autosome □ Sex Chromosome □ Homologous Chromosome This also includes: □ Predicting the traits of offspring using Non-Mendelian patterns of inheritance (sex-linked traits, incomplete dominance, codominance, and polygenic traits) 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. This includes defining the following terms: □ Aneuploidy □ Nondisjunction □ Mutation □ Independent Assortment □ Crossing-Over Learning Target 15: I can apply Mendel's Laws of Inheritance to predict the variation and distribution of traits in a population. This includes defining the following terms: □ Homozygous (purebred) □ Heterozygous (hybrid) □ Dominant allele □ Recessive allele □ Genotype □ Phenotype □ Gene □ Trait This also includes: □ Recognizing Mendel's Laws □ Using Punnett Squares to predict probability of traits in offspring	10 days
7. Ecology	Learning Target 12: I can describe the transfer of energy and matter within living systems and their environment. This includes: □ explain the 10% Rule of energy transfer between trophic levels	19 days

	□ Food webs, food chains, and trophic pyramids □ contrast the flow of energy with the cycling of nutrients in an ecosystem 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. This includes: □ Exponential and logistic growth □ Density-independent and density-dependent limiting factors Target 17: I can describe the interactions in ecosystems during relatively stable conditions. This includes: □ Ecosystem structure (biotic versus abiotic features, habitat versus niche) □ Competition and predator/prey relations □ Symbiotic relationships (mutualism, commensalism, parasitism) Target 18: I can identify and discuss potential and significant disruptions to an ecosystem. This includes: □ 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	
8. Evolution	Target 2: I can communicate the scientific evidence that supports that modern living things have evolved from a common ancestor. This includes: □ Artificial Selection □ Direct Observation □ Fossil Record □ Geographic Distribution of Living Species □ Comparative Anatomy (Homologous Structures, Analogous Structures, and Vestigial Structures) □ Similarities in Embryology □ Biological Molecules (DNA, Proteins) Target 3: I can explain using evidence that the process of evolution is based on four factors: □ Overproduction (the potential for a species to increase in number) □ Genetic Variations (due to mutations and sexual reproduction) □ Competition (for limited resources) □ 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) Target 4: I can use statistics and probability to analyze changes in characteristics of a population over time. This includes: □ Stabilizing Selection □ Disruptive Selection □ Directional Selection 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.	11 days