NGSS 1 Biology

Welcome to the amazing world of Biology. Together we will explore the energy and matter, animals and plants, microorganisms and macromolecules, native species and invasive species, omnivores and oogenesis, decomposition and deoxyribonucleic acid, and succession. To do this we will need to be scientific: curious, cleaver, critical and considerate. Here are our ground rules as a team:

- Be Present mentally.
- Be ready, this really just means seated, materials out quietly watching the teacher, waiting to see what he/she says first.
- An electronic agenda/warm ups will be created daily for this class and made available to all students through their **Blackboard Account**.
- **Complete homework every night** and turn in all class work. If you struggle with work, send the teacher an email.
- Missing assignments will appear red in the gradebook **however you must complete it to make the red box disappear. Assignments turned in one day late earn a 2 or 3 out of five and more than one day late will receive 1 point up to the Unit Assessment. The day of the unit test is the final day to turn in late work for that unit.**
- Avoid being absent; it's hard to catch up once you get behind.
- **Have confidence in your ability to change your behavior for the better.**
- Pay attention to daily notes (all notes are posted on Blackboard; they will help you on your homework.
- Keep an eye on your grade using Homelink! This is online for you (and family) to check often. Ask politely if something doesn't look right in the gradebook.
- If you make a mistake, miss an assignment or deadline, own up to it and find out what can be done!
- **Come to the Pack period at the first sign of trouble!!**
- **No eating in class.**
- **Phones will be on silent or airplane mode and placed in the phone holder on the wall until dismissed by your teacher.**
- **No Air Pods/headphones unless directed by the teacher.**
- **No hoods will be worn during class time.**
- **Masks must cover both your mouth AND nose.**

Technology Expectations

- **Students are expected to use district provided Google login credentials, not personal gmail accounts.**
- **Students are expected to use chromebooks for class/homework assignments and labs. No games or chat/Google Hangouts.**

Grading Framework

Grades may be checked online.
They may also be posted in class.

- A 90% and above
- B 80% – 89%
- C 70% - 79%
- D 60%-69%
- F Below 60%

Categories

- 40% Formative: (Classwork/homework, Quizzes)
- 60% Summative Assessments (Tests, Labs)

Academic Honesty & Plagiarism

Cheating is the unauthorized use of another person's work with the intent to deceive or subvert a clearly defined set of instructions. Unless stated, all assignments in this class are individual assignments. All parties involved will receive zero credit on the assignment, an academic referral will be sent to the office and student(s) may still be required to complete the work. **Googling answers and pasting them into assignments and warm ups is plagiarism.**

Science Supplies

Required Every Day:

Pen/Pencil and paper
Colored Pencils
Chromebook (charged)
Science Notebook/Binder

2021-2022 NGSS Biology Course Outline & Details

Quarter 1

Ecosystems and Sustainability
Unit 1: Exp. Design, Energy and Flow in Ecosystems
Unit 2: Molecules of Life/Biomolecules
Unit 3: Cycling of Matter in Ecosystems
Unit 4: Human Impacts on Ecosystems

⟶Department Midterm Exam

Quarter 2

Universality of All Life
Unit 5: DNA and the Code of Life
Unit 6: DNA to Protein
Unit 7: Inheritance and Variation in Life
Unit 8: Natural Selection and Evolution

⟶Cumulative District Final Exam

Unit 1: Exp. Design, Energy and Flow of Ecosystems

HS-LS 2-1	Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales
HS-LS 2-2	Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.

HS-LS 2-3	Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions
HS-LS 2-4	Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem.

Unit 2/3: Biomolecules/Cycling of matter in Ecosystems

HS-LS1 -5	Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.
HS-LS1 -6	Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.
HS-LS1 -7	Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy.
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-ESS 2-6	Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.

Unit 4: Human impacts on Ecosystems

HS-ESS 2-6	Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.
HS-ESS 3-1	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-ESS 3-2	Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
HS-ESS 3-3	Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.
HS-ESS 3-4	Evaluate or refine a technological solution that reduces impacts of human activities on natural systems
HS-ESS 3-5	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 systems.
HS-ESS 3-6	Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.
HS-LS2 -7	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

Unit 5/6: DNA and the Code of Life/Protein Synthesis

HS-LS 1-1	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-LS 1-2	Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
HS-LS 1-3	Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.
HS-LS 1-4	Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.

Unit 7: Inheritance and variation in Life

HS-LS 3-1	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-LS 3-2	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-LS 3-3	Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.

Unit 8: Natural Selection and Evolution

PE: HS-LS4-1	Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence
PE: 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.
PE: 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.
PE: HS-LS4-4	Construct an explanation based on evidence for how natural selection leads to adaptation of populations.
PE: HS-LS4-5	Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species
PE: HS-LS4-6	Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity

HS-ESS 1-6	Apply scientific reasoning and evidence from ancient Earth materials, meteorites, and other planetary surfaces to construct an account of Earth's formation and early history.

HS-LS2-6	Evaluate the 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-ESS2-7	Construct an argument based on evidence about the simultaneous coevolution of Earth's systems and life on Earth.