Biology A Syllabus

INSTRUCTOR INFORMATION
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CONTACT INFORMATION
I am available by email. Please feel free to contact me if you have any questions regarding your assignments. Every effort will be made to reply to you immediately. I make a point to respond to emails within 24 hours on weekdays and 48 hours on weekends.

COURSE REQUIREMENTS
All learners must have computer and internet access. Participants in online classes must be comfortable with the basic functions of word-processing software, including GOOGLE DOCS, Kami extension (to write on PDF) and Adobe Scan (to take pictures of printed work). Information about Kami and Adobe Scan can be found in the course orientation assignment.

This is an online course. In each unit, students will be expected to participate in discussions and proceed through the Weekly Agenda which may include videos, PowerPoints, virtual labs, research, data gathering and analysis, assignments, or projects. Online simulations will be included in this exploration and may require tech support. Learners will be encouraged to show understanding in creative projects.

COURSE DESCRIPTION
The main purpose of Biology is to develop an understanding of life in the natural world. Major themes include cell structure and specialization, energy and chemistry of life, genetics and evolution, and ecology. You will also investigate how humans impact the biosphere and Earth's natural cycles.

Content knowledge will be gained through readings, case studies, lab activities, simulations, and a variety of multimedia and technology-based applications. You will also see many real-world connections to health and medicine.

COURSE GOALS
The main goal of this program is to provide a solid foundation in the study of the Life Sciences and processes surrounding living things. Through many activities, students will demonstrate how concepts are applicable in laboratory situations. All students will develop good methods of problem-solving and will have many opportunities to demonstrate their understanding in creative ways. The goal of this course is to acquire the critical thinking tools needed to understand the world from a scientifically literate viewpoint.

NEXT GENERATION STANDARDS (NGSS) COVERED IN BIOLOGY A:
- LS1: From Molecules to Organisms: Structures and Processes
- LS3: Heredity: Inheritance and Variation of Traits

REQUIRED TEXTS
All reading materials are available online, but will also be provided as links through the course website.

COURSE OUTLINE:
Unit 1: The Nature of Science
    Block 1: The Scientific Method
- ☐ Scientific Method Practice
- ☐ Discussion - What's Your Experiment?

☐ Lab Report
☐ Optional: House MD episode

Block 2: Making Medical Measurements
☐ Metric Measurements Practice
☐ Metrics Reading Guide Questions
☐ Lab: Medical Biology Measurements - 3 stations

Unit 2: Biochemistry
Block 3: Atoms, Molecules, and the Properties of Water
☐ Element Builder Gizmo Lab
☐ Discussion: Properties of Water
☐ Optional: Water Home Lab

Block 4: The Macromolecules of Life (and Fad Diets)
☐ Macromolecule Activity
☐ Macromolecule Reading Questions
☐ Discussion: Fad Diets

Block 5: Enzymes and Metabolism (and Lactose Intolerance)
☐ Enzyme Review Sheet
☐ Enzyme Lab
☐ Discussion: Lactose Intolerance and the Lactase Enzyme

Unit 3: Cell and Body Homeostasis
Block 6: Cell Structure and Function (and Disease)
☐ Cell Gizmo Lab
☐ Cell Specialization and Organ Systems Reading Questions
☐ Discussion: Cells and Disease

Block 7: Homeostasis (and Diabetes)
☐ Diffusion and Osmosis Lab (Part 1 - 2 is optional)
☐ Homeostasis Feedback Loops Notes
☐ Diabetes Notes and Case Studies
☐ Discussion: Your Risk Factors for Diabetes

Block 8: Cell Division (and Cancer)
☐ DLCE Cell Cycle Diagram
☐ Cell Cycle Gizmo Lab
☐ Discussion: Cancer

Unit 4: DNA and Genetics
Block 9: DNA and Protein Synthesis (and Genetic Disease)
☐ DNA and Protein Synthesis Slideshow Notes
☐ RNA and Protein Synthesis Gizmo Lab
☐ Discussion: Genetic Diseases

Block 10: Meiosis (and Chromosome Disorders)
☐ Human Karyotype Gizmo Lab
☐ Meiosis Gizmo Lab
☐ Discussion: Identical Twins

Block 11: Mendelian Genetics
- ☐ Mouse Genetics Gizmo Lab
- ☐ Genetics Slideshow Notes
- ☐ Punnett Square Practice

Block 12: Non-Mendelian Genetics
- ☐ Chicken Genetics Gizmo
- ☐ Non-Mendelian Traits Practice
- ☐ Optional: Hemophilia - The Royal Disease

Block 13: Bioethics and Genetic Engineering
- ☐ Genetic Engineering Gizmo Lab
- ☐ Gene Editing and CRISPR Notes
- ☐ Discussion: Bioethics Question (from above notes)

Block 14: Genes & the Environment
- ☐ Lab: Genes & the Environment
- ☐ Discussion: Nutrition and Epigenetics

Final Project
- ☐ Final Project (choose one from many options)
- ☐ Final Discussion and Course Survey

RESOURCES/MATERIALS USED IN THIS COURSE

Blocks 1-5: YouTube videos on the scientific method, metric measurements, elements, macromolecules, enzymes, and metabolism; HASPI activities on metric measurements, macromolecules, and digestion; GIZMO lab on Elements,

Block 6-8: YouTube videos on cells, homeostasis, diabetes, and Mitosis; GIZMO labs on Cells and Cell Division; HASPI

Block 9-13: YouTube videos on protein synthesis, meiosis, genetics, and genetic engineering; GIZMO labs on Protein Synthesis, Karyotyping, Meiosis, Genetics, and Genetic Engineering.

Block 14: YouTube videos on COVID, NY Times articles on COVID, Washington Post article on COVID.

Final Project: Many options from HASPI.

METHODS OF INSTRUCTION

This is an online course, and while there is flexibility in how and when you do assignments, it is best to log in and complete work each day according to the posted pacing schedule. Each BLOCK in a course is worth about 1 week of work during the regular semester. You can find our suggested pacing guide at ileadonline.org under 'CALENDARS'. It is highly recommended that learners follow the pacing schedule posted. Please be sure to check in with your teacher of record (coach/EF/Guide/ES) for guidance with scheduling.

 This course uses project-based learning to encourage an authentic, developed appreciation of the topics covered. That means that while it may include quizzes and some traditional assessments, the bulk of the coursework focuses on projects that require learners to display their learning in a thorough and creative manner. If you are struggling to complete your work or you need some assistance with an alternate

schedule or workload, please contact me as soon as possible. I am more than happy to help support your success in the class!

<u>LEARNER EXPECTATIONS</u>

The learner is expected to participate in the course via e-mail, discussion boards (or other communication) with the facilitator, by reading the assigned readings, submitting assignments, and completing and submitting original work.

Learners are expected to check their course and email accounts every day and complete work on time as assigned with designated dates and times.

Learners are expected to communicate with their instructor and each other in a respectful manner. Please follow the guidelines below:

1. **Make sure identification is clear in all communications**. If you are emailing or messaging your instructor or each other, please be sure they know who you are and what class you're in. That really helps with clear communication.
2. **Review what you wrote and try to interpret it objectively.** When we speak face to face and are misunderstood, we have an on-the-spot opportunity to rephrase our words. In writing, we must strive twice as hard to be understood, as we do not have the benefit of modifying or elaborating in real-time. All caps ("I'M SHOUTING") and exclamation points ("Give me a break!!!") can be misinterpreted as intense anger or humor without the appropriate context.
3. **If you wouldn't say it face to face, don't say it online.** When you're working online, you're safe behind a screen, but that's no excuse to be ill-mannered or say things you would never say in public.
4. **Use emoticons when appropriate.** In casual chatroom settings, emoticons can help convey feelings that may otherwise get lost in translation, including humor, exasperation, exhaustion, and even confusion. These aren't the best choices for formal assignments or projects though.
5. **Respect others' voices and be kind.** We all come from different backgrounds and have our own stories. Assume the best of each other and always be kind in your communication.
6. **Remember, if it's on the internet, it's everywhere.** Don't share personal information about yourself in a public online forum, especially something that could put your safety or security at risk.
7. **Practice Patience:** All your facilitators are doing their best to grade work in a timely manner. We also want to give you meaningful feedback, which takes some time. If you feel like there has been an error or an assignment was missed, please reach out with your name and class and we will do our best to sort it out.

<u>GRADING</u>
Each assignment is given a specific number of points. The number of points earned by the student is determined and a percentage is calculated. The raw score is recorded in the grade book.

An overall grade in the course will be determined according to your school's grading scale.

<u>SUBMITTING ASSIGNMENTS</u>
All work must be submitted to Brightspace, our learning management system. This is very important for record-keeping and compliance. You have access to directions on how to do this in the 'Course Resources' folder of this class and in your Orientation class. If you need any help submitting work please reach out to your instructor and we will make time to ensure that you're able to turn in work to

Brightspace.

<u>HONESTY AND PLAGIARISM</u>
 Plagiarism of any sort is prohibited.

According to the Merriam-Webster online dictionary, to "plagiarize" means:
- to steal and pass off (the ideas or words of another) as one's own
- to use (another's production) without crediting the source
- to commit literary theft
- to present a new and original idea or product derived from an existing source

Please review THIS RESOURCE for more information on plagiarism.
Any plagiarized work will be given a zero and referred to your EF/COACH/GUIDE for review. From there we will work with you to support you as best we can.

<u>PRIVACY POLICY</u>
All work submitted is the property of the author and is not available to anyone not in the class. If work is to be submitted or viewed outside of this website, I will obtain permission from the author. FERPA Info