

IB Biology I 2019-2020

SUMMER ASSIGNMENT

Dear Future IB Biology 1 Students and Parents:

We are very pleased to have you as a member of what promises to be an excellent class. The purpose of this course is to provide students with an opportunity to participate in a college-level experience in high school, with the possibility of credit as they enter college. IB Biology is open to any student who has taken Biology I and Chemistry I and is interested in a challenging class.

To provide you with the experience of a first-year college course, we stress the concepts inherent to biology such as science as a process; energy transfers; continuity and change; and structure and function. All lab concepts in the IB Course Description are dealt with in the laboratory with a few additions as time permits.

Each student and parent should not be surprised by course requirements that are in excess of what you would expect from an honors level course. It is not unusual for a student to be responsible for several assignments at the same time. For example, there will be regular reading assignments, labs to write, Marshall Science Fair, and occasional articles to read and summarize. You are taking a college level course with standards that are higher than usual so students accustomed to making all A's may make C's on tests. Students do not have to make A's on every summative assessment to do well in the course.

The greatest challenge is the requirement that students remain consistent throughout the year. Practices such as "cramming" or "end of year slump" will threaten a student's chances of passing. Success in the course will depend on a student's motivation and maturity, ability to read for comprehension, communication skills, and organizational. Self-discipline and regular attendance are vital.

A valuable resource includes **IB Biology Study Guide: 2014 edition: Oxford IB Diploma Program**. We **strongly** recommend that you purchase this book over the summer and review material covering concepts such as basic chemistry and cell structure and function. Additionally, this resource will be useful during your senior year in IB Biology II.

We look forward to a rewarding and productive year. If you have any questions or concerns, please do not hesitate to see one of the IB Biology teachers.

Sincerely,

Summer Assignment: Science Fair Topics

You are required to complete a high-quality science fair project for IB Biology I. One of the hardest parts of this requirement is finding an appropriate topic in which to conduct an experiment. You may choose a topic in one of the following areas: *Zoology, Microbiology, Medicine and Health, Physics, Chemistry, Botany or Engineering*. Final topics will be decided upon during the first month of school. To facilitate this process, we would like you to **choose three possible topics you might be interested in working on and write a description of the possible experiments you may conduct using the project information sheet format (see attached). You should also write a 1-page research paper for each topic.** You may **NOT** do experiments in the following areas unless you are working in a research institution and have my prior approval before summer vacation: *recombinant DNA, vertebrate animals, controlled substances, projectiles, pathogenic agents (to exclude E. coli ordered and then cultured through the school), human subjects (ex:surveys) and human/nonhuman animal tissue (blood, saliva etc).*

If you have any questions, please email us. We cannot guarantee an immediate response, but we will do our best.

Enjoy your summer. We look forward to a great year in IB Biology I.

Overview:

The county requires IB Biology students to complete an independent science project outside of class. To do this, you will follow these steps:

1. choose a topic
2. develop an EDD
3. research that topic
4. perform an experiment
5. present your results

Specific Requirements

- Below is a list of possible topics.
- Highlight the ones that interest you. You should also look in books, magazines, and on the internet.
- Read about the ones that interest you and generate one page of research for each of your top 3 choices.
- This is an independent research project and therefore you may not work with a partner.

Google classroom:

- **Just for the summer** please join our google classroom with the following code : **nqse3e** so that you can see electronic versions of these documents and any announcements we post.

This assignment is worth 50 points total, which will be included in your 1st quarter grade and is due the second class meeting of the first week of school.

- 6 potential experiments = 30pts
- 1 page research per topic = 15pts
- Bibliography = 5pts

Topic List

****NO EXPERIMENTS DEALING WITH THE FOLLOWING TOPICS: molds, bacteria (other than E.coli), disease causing substances, human projects or surveys, animals with a backbone (ex. frogs, mice, or snakes), explosives or projectiles, human/nonhuman tissue(blood, saliva) OR controlled substances (illegal drugs, cigarettes, alcohol, prescription drugs).***

1. Hydroponics
2. Nutrient differences in soils
3. Thermodynamics
4. Insulators
5. Corrosion
6. Protista
7. Pendulums
8. Amplitude and Frequency
9. Magnetism
10. Electricity
11. Optics
12. Lasers
13. Aerodynamics
14. Friction
15. Sound
16. Solar energy
17. Water Quality
18. Weathering of rocks
19. Seismology
20. Erosion
21. Hydrodynamics
22. Robotics
23. Fiber optics
24. Bridges
25. Boats
26. Bacteria (E.coli)
27. Yeast
28. Bioluminescence
29. Asexual reproduction/Regeneration
30. Direction of growth in roots, stems and leaves
31. Stomata: gas exchange regulators
32. Photosynthesis and Respiration
33. Responses of Annelids
34. Conditions of bacterial growth(E.coli)
35. Food preservatives
36. Interactions in an ecosystem
37. Effectiveness of sunscreen (no humans)
38. Function of digestive enzymes (no humans)
39. Operant conditioning (invertebrates)
40. Effect of stimuli on reaction times
41. Acid and Bases
42. Vitamin C content: Analysis of food by titration
43. Parachutes
44. Electromagnets
45. Proteins: Change by denaturing
46. Phase changes effects of solutes
47. Colloids: Dispersed particles
48. Electrolytes
49. Viscosity
50. Floating: Surface tension, density, buoyancy
51. Hard water

No experiments on humans or other vertebrates!

Project Information Sheet

Your name: _____

Class period _____

List your top 3 topic choices and include 2 experiments you could perform on each as well as 1 page of background research for each topic. **We require that this be typed.**

Topic 1: _____

Experiment 1: _____

Experiment 2: _____

Topic 2: _____

Experiment 1: _____

Experiment 2: _____

Topic 3: _____

Experiment 1: _____

Experiment 2: _____

- **Format for this assignment**

- **12pt font**
- **1" margins**
- **Times New Roman Font**
- **Single spaced**
- **Citations within the text**

****Attach at least 1 page of research for EACH topic choice.**