## WELCOME TO OPEN HOUSE AT EPHS!

Dear Parent or Guardian,

Welcome to Honors Biology! Shakespeare once quipped, "Brevity is the soul of wit." So, I'll try to keep this short and sweet. Your child is about to embark on an exciting journey, one with many challenges and many rewards. Your child will learn about the intricacies of the natural world, weaving a beautiful tapestry with the threads of knowledge gleaned through the mastery of the Georgia Biology Standards of Excellence.

The curriculum and instructional strategies for this course are differentiated in content, pacing, process skills emphasis, and expectation of student outcomes from a typical 9<sup>th</sup>- grade Biology course. Curriculum content has been designed for mastery and extension of state standards set by the Georgia Department of Education and the Paulding County School District. <u>This course is appropriate for students who have</u> <u>demonstrated high achievement and interest in Science and Math in middle school.</u> The district has established criteria and guidelines to identify students who will be successful with the advanced curriculum offered in an Honors Biology course. Students are placed in this class according to specified indicators of demonstrated exceptional ability and motivation. Students must meet continuation criteria to remain in the class.

A list of the GA Biology Standards of Excellence students are expected to master can be found on the reverse of this document.

### About the Class and the Instructor:

### **Instructor: Matt Curtis**

Class Website: https://www.paulding.k12.ga.us/Page/6561

#### Mr. Curtis' Contact Information:

Email (quickest and preferred method): <u>mcurtis@paulding.k12.ga.us</u> Phone: 770-445-5100 **\*\*If you have any questions, please do not hesitate to contact me.\*\*** 

#### There was no summer assignment for this course.

This is a lab-based course, with a minimum of 25% of instructional time spent in lab (pending COVID-19 precautions); masks are highly recommended for all students if the can wear one.

#### Is there a State-level test (EOC) in this class?

-<u>MAYBE(?)</u> In a normal year, in order to earn a credit in Biology, students will take the GA Milestone Assessment in December. It is a cumulative test designed to measure student growth and mastery of the GA Biology Standards of Excellence. This assessment <u>cannot</u> be exempted, per GA Department of Education regulations. The GA DOE <u>has</u> applied for a federal waiver for the Milestones for the 2020-2021 school year. However, as of the writing of this document, the waiver has not yet been approved by the U.S. Department of Education. More information will be shared once we hear the result of that waiver application.

Your child will be bringing home the following things on the first day of school to be reviewed and/or signed. Items 2, 3, & 4 should be filled out and submitted via Canvas. We will work on that in class during the 1<sup>st</sup> week:

- 1.) Honors Biology Syllabus to be reviewed and kept in student's binder
- 2.) Flinn Science Safety Form (Students must have a signed form turned in to participate in labs).
- 3.) Classroom Non-negotiables/Policies Form
- 4.) Confidential Science Student Questionnaire a "getting to know you" form

### GA Biology Standard of Excellence – "What you are expected to know/understand/be able

### to do by the end of the course:

## SB1. Obtain, evaluate, and communicate information to analyze the nature of the relationships between structures and functions in living cells.

a. Construct an explanation of how cell structures and organelles (including nucleus, cytoplasm, cell membrane, cell wall, chloroplasts, lysosome, Golgi, endoplasmic reticulum, vacuoles, ribosomes, and mitochondria) interact as a system to maintain homeostasis.

b. Develop and use models to explain the role of cellular reproduction (including binary fission, mitosis, and meiosis) in maintaining genetic continuity.

c. Construct arguments supported by evidence to relate the structure of macromolecules (carbohydrates, proteins, lipids, and nucleic acids) to their interactions in carrying out cellular processes.

d. Plan and carry out investigations to determine the role of cellular transport (e.g., active, passive, and osmosis) in maintaining homeostasis.

e. Ask questions to investigate and provide explanations about the roles of photosynthesis and respiration in the cycling of matter and flow of energy within the cell (e.g., single-celled alga).

# SB2. Obtain, evaluate, and communicate information to analyze how genetic information is expressed in cells.

a. Construct an explanation of how the structures of DNA and RNA lead to the expression of information within the cell via the processes of replication, transcription, and translation.

b. Construct an argument based on evidence to support the claim that inheritable genetic variations may result from:

• new genetic combinations through meiosis (crossing over, nondisjunction);

- non-lethal errors occurring during replication (insertions, deletions, substitutions); and/or
- heritable mutations caused by environmental factors (radiation, chemicals, and viruses).

c. Ask questions to gather and communicate information about the use and ethical considerations of biotechnology in forensics, medicine, and agriculture.

# SB3. Obtain, evaluate, and communicate information to analyze how biological traits are passed on to successive generations.

a. Use Mendel's laws (segregation and independent assortment) to ask questions and define problems that explain the role of meiosis in reproductive variability.

b. Use mathematical models to predict and explain patterns of inheritance.

c. Construct an argument to support a claim about the relative advantages and disadvantages of sexual and asexual reproduction.

## SB4. Obtain, evaluate, and communicate information to illustrate the organization of interacting systems within single-celled and multi-celled organisms.

- a) Construct an argument supported by scientific information to explain patterns in structures and function among clades of organisms, including the origin of eukaryotes by endosymbiosis. Clades should include:
  - archaea

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- bacteria
- eukaryotes
  - fungi
  - plants
  - animals

b. Analyze and interpret data to develop models (i.e., cladograms and phylogenetic trees) based on patterns of common ancestry and the theory of evolution to determine relationships among major groups of organisms.

c. Construct an argument supported by empirical evidence to compare and contrast the characteristics of viruses and organisms.

# SB5. Obtain, evaluate, and communicate information to assess the interdependence of all organisms on one another and their environment.

a. Plan and carry out investigations and analyze data to support explanations about factors affecting biodiversity and populations in ecosystems.

b. Develop and use models to analyze the cycling of matter and flow of energy within ecosystems through the processes of photosynthesis and respiration.

- Arranging components of a food web according to energy flow.
- Comparing the quantity of energy in the steps of an energy pyramid.
- Explaining the need for cycling of major biochemical elements (C, O, N, P, and H).
- c. Construct an argument to predict the impact of environmental change on the stability of an ecosystem.

d. Design a solution to reduce the impact of a human activity on the environment.

e. Construct explanations that predict an organism's ability to survive within changing environmental limits (e.g., temperature, pH, drought, fire).

### SB6. Obtain, evaluate, and communicate information to assess the theory of evolution.

a. Construct an explanation of how new understandings of Earth's history, the emergence of new species from pre-existing species, and our understanding of genetics have influenced our understanding of biology.

b. Analyze and interpret data to explain patterns in biodiversity that result from speciation.

c. Construct an argument using valid and reliable sources to support the claim that evidence from comparative morphology (analogous vs. homologous structures), embryology, biochemistry (protein sequence) and genetics support the theory that all living organisms are related by way of common descent.

d. Develop and use mathematical models to support explanations of how undirected genetic changes in natural selection and genetic drift have led to changes in populations of organisms.

e. Develop a model to explain the role natural selection plays in causing biological resistance (e.g., pesticides, antibiotic resistance, and influenza vaccines).