AP Biology – Fall 2019 Edward R. Murrow High School
Exam 1 Review Sheet Mr. Sprague

Format:

Section I 22 multiple choice questions
Section II 1 essay question and 2 short free response questions

Reading: Hillis chapters 1 and 41

The exam will NOT test memorization of facts or definitions**; instead, questions will assess how deeply you understand and can connect the concepts, as well as how they apply to experimental situations. All questions will emphasize one or more of the six course objectives listed in the syllabus.

(1) Explain biological concepts, processes, and models presented in written format.
(2) Analyze visual representations of biological concepts and processes.
(3) Determine scientific questions and methods.
(4) Represent and describe data.
(5) Perform statistical tests and mathematical calculations to analyze and interpret data.
(6) Develop and justify scientific arguments using evidence.

Concepts to Review:

- Evolution and Ethology
  - Be able to define the terms *evolution*, *differential survival*, *natural selection*, and *sexual selection*.
  - Be able to describe the key features of an evolutionary model.
  - Be able to distinguish between *proximate causes* and *ultimate causes* of behaviors.
  - Be able to describe the following behaviors: *fixed-action patterns*, *associative learning*, *habituation*, *imprinting*.
  - Be able to explain why evolutionary biologists are skeptical of theories involving *altruistic behavior*, as well as some reasons why natural selection may favor altruism in some cases.
  - Be able to describe the proximate and ultimate causes of *circadian rhythms*.

- Labs
  - Understand the term *model*.
  - Be able to write a hypothesis and identify the *independent variable*, *dependent variable*, *control group*, *experimental group*, and *constants* (see Elements to Consider when Designing a Controlled Experiment handout).
  - Be able to distinguish *negative control treatments* from *positive control treatments*.
  - Understand why large sample sizes, multiple trials, and statistical analyzes are used to verify results.
  - Be able to graph data appropriately and add 95% confidence intervals to a graph.
  - Be able to write a null hypothesis and use a chi-square test to reject or fail to reject the null hypothesis.
  - Understand the meaning of the *standard deviation* or *standard error of the mean (SEM or* $SE_{\bar{X}}$*)* and be able to interpret confidence intervals on a graph.

Overarching Questions to Consider:

Suggestion: Answer all of these questions in writing, then compare answers with a classmate. I promise that taking the time to do so will be well worth it and much more useful then memorizing facts and definitions.

1. How are scientific models used to communicate biological concepts? Why are models needed?
2. How is a negative control treatment different from a positive control treatment? In what kind of situations would a negative control be more appropriate and in what kind of situations would a positive control be more appropriate?
3. Why are statistics needed when analyzing biological data? What does the SEM tell us?
4. When is it most appropriate to use a line graph? When is it most appropriate to use a bar graph?
5. Why do observations of altruistic behaviors puzzle evolutionary biologists? How can these seemingly selfless behaviors sometimes increase the fitness of the selfless individual?
6. How do animal behaviors give us clues about the evolutionary history of a species?

Practice Exam Questions:

Visit the course website and click on the "Multiple Choice Practice" link. Complete all practice questions for the relevant chapters and check your work against the answer key. Note: these items are password protected.

Exam Question Sneak Peak:

The essay question for the first exam, as well as selected multiple choice questions (with the answer choices removed), are posted the "Exam Review Sheets" page of the course website. Note: this file is password protected.