

## AP Biology Summer Assignment (Due the first day of class)

Welcome to AP Biology! I am very excited to begin this adventure with you. This is a college-level course which will move at a fast pace. Your active participation in class is crucial. Please try to schedule appointments at a time that will not interfere with your AP classes. The more we can accomplish in class, the less homework we will have. You are expected to take the AP exam in May. Your successful completion of this exam will earn you an additional quality point and could earn you college credit! With hard work and determination, I have no doubt that you will succeed. I am looking forward to a great year!

### Part I: Gather your class materials

Three-ring binder	Post-it notes	Notecards
Loose-leaf paper	Ink pens – blue or black ink	Clorox wipes
File folders	Pencils	Paper towels
Graphing paper	Colored pencils	Hand sanitizer
Dry erase markers	Ruler	Kleenex
Highlighters	Scientific calculator	AP exam fee – cost TBA

### Part II: Required Readings

You will complete a reading guide, summary, essay, and/or quiz on each of the books listed below throughout the school year. These assignments should focus on the environmental and biological concepts discussed in these books and their implications to humans and/or environmental health. The due dates for each are listed below.

These books are considered a valuable resource for AP science courses by the College Board. Please be advised that some of these books contain graphic content, including language and physiological descriptions, some of you might find offensive. If that is the case, please find a substitution from the AP College Board website. On the website, search for AP Science book list. I have several copies you are welcome to check out. You are responsible for replacing any book that you damage or lose. Some of you may want to go ahead and read more than one book this summer, especially if you expect a busy school year.

*The Hot Zone* by Richard Preston – Due the first day of school. Please see below for the assignment for this book.

*Survival of the Sickest* by Dr. Sharon Moalem – Due Monday after Christmas Break

Choose one of the books listed below for your third assignment. Due Monday after Spring Break.

*Toxin* by Robin Cook

*The Cobra Event* by Richard Preston

*Chromosome 6* by Robin Cook

## ***The Hot Zone* by Richard Preston – Novel Review Questions**

1. Preston compares HIV to Ebola throughout the book. Find examples of this comparison in the text and then compare and contrast the two diseases in the following three areas: methods of transmission; how they developed and emerged from the rain forest; their fatality and infection rates. Make sure you explain the similarities and differences of each one, and explain how epidemiologists worked to contain to spread, determined the cause, and searched for a treatment.
2. What did nurse Mayinga do before she was finally checked into the hospital that concerned individuals around the globe? Why exactly did everyone panic?
3. When Johnson took his crew to Kitum cave, they placed many “sentinel animals” around the opening of the cave and in various parts of the cave. What was the purpose of these animals? Why did they pose some problems for Johnson at the end of his investigation?
4. Describe how infectious agents are classified. What do the classifications indicate? What safeguards must be followed when working with the various classes of infectious agents? Give examples of the different classes.
5. When infectious agents are determined to be of low risk in terms of spreading among humans, some people let their guard down. The Ebola-Reston virus is still classified as a Level 4 agent even though scientists think it is not spread from human to human. Should we still be concerned about this virus? Explain.
6. An outbreak of a virus in local hospital threatens to spread throughout the nation. The media finds out and begins broadcasting to the public. People begin to panic. The leaders of the country must address the growing hysteria. Create a detailed plan that could be used to prevent the spreading of the virus. Be sure to include what the plan would be in dealing with those already affected and those who are caring for the sick.
7. Do you think USAMRIID and the CDC handled the Reston outbreak efficiently? If not, what do you think could have been done differently?
8. How do you feel about Tom Geisbert and Peter Jarhling’s decision not to tell their superiors of “the whiffing incident?” Does it differ from what Nurse Mayinga did when she left the hospital? Why do you think each of them tried to hide or deny exposure?
9. Discuss how you think the story would change if news crews had shown up and filmed the bio containment operation.
10. What is the allure of working with hot agents? Why do these people do it? Would you do it?

### Part III: Graphing Practice

Complete the graphing exercises and questions attached. Remember your rules for graphing. Select the most appropriate graph for the data provided. Graphs should cover the entire space on your graph paper. Be sure to title all graphs and label all axes. Add color when appropriate and include a legend.

#### Graphing Practice – Problem 1

Age of the tree in years	Average thickness of the annual rings in cm. Forest A	Average thickness of the annual rings in cm. Forest B
10	2.0	2.2
20	2.2	2.5
30	3.5	3.6
40	3.0	3.8
50	4.5	4.0
60	4.3	4.5

- The thickness of the annual rings indicates what type of environment was occurring at the time of its development. A thin ring usually indicates a lack of water, forest fires, or a major insect infestation. A thick ring indicates just the opposite.
- Make a line graph of the data.
- What is the dependent variable?
- What is the independent variable?
- What was the average thickness of the annual rings of 40 year old trees in Forest A? in Forest B?
- Based on this data, what can you conclude about Forest A and Forest B?

#### Graphing Practice - Problem 2

pH of water	Number of tadpoles
8.0	45
7.5	69
7.0	78
6.5	88
6.0	43
5.5	23

- Make a line graph of the data.
- What is the dependent variable?
- What is the independent variable?
- What is the average number of tadpoles collected per sample?
- What is the optimum water pH for tadpole development?
- Between what two pH readings is there the greatest change in tadpole number?
- How many tadpoles would we expect to find in water with a pH reading of 5.0?

### Graphing Practice - Problem 3

Amount of ethylene in ml/m <sup>2</sup>	Wine sap Apples: Days to Maturity	Golden Apples: Days to Maturity	Gala Apples: Days to Maturity
10	14	14	15
15	12	12	13
20	11	9	10
25	10	7	9
30	8	7	8
35	8	7	7

- Ethylene is a plant hormone that causes fruit to mature. The data above concerns the amount of time it takes for fruit to mature from the time of the first application of ethylene by spraying a field of trees.
- Make a line graph of the data.
- Make a key for the different kinds of apples being graphed.
- What is the dependent variable?
- What is the independent variable?

### Graphing Practice - Problem 4

Water Temperature in °C	Number of developing clams
15	75
20	90
25	120
30	140
35	75
40	40
45	15
50	0

- A clam farmer has been keeping records of the water temperature and the number of clams developing from fertilized eggs. The data is recorded above.
- Make a line graph of the data.
- What is the dependent variable?
- What is the independent variable?
- What is the optimum temperature for clam development?

## Graphing Practice – Problem 5

Time ( seconds )	Distance ( meters )
0	0
1	2
2	8
3	18
4	32
5	50
6	72
7	98
8	128
9	162
10	200

- Graph the data.
- Identify the independent variable.
- Identify the dependent variable.
- By what percent did distance change between 4 and 6 seconds?

## Graphing Practice – Problem 6

The volume of a gas decreases as the temperature of the gas decreases. A sample of gas was collected at 100 degrees Celsius and then cooled. The changes in the volume of the sample are shown below.

TEMPERATURE ( °C )	VOLUME ( ml )
100	317
80	297
60	288
40	278
30	252
20	243
10	236
0	233
-10	227
-30	202

- Graph the data.
- Identify the independent variable.
- Identify the dependent variable.
- Calculate the percent change in volume as temperature decreased from 100 to -30° C.

## Graphing Practice – Problem 7

Graph the following data using the most appropriate type of graph.

### Number of Dwarf Wedge Mussels Observed

Site	# Observed
1	11
2a	28
2b	8
3	2
4	9
5	6
6	6
7	3
8	1
9	2
10	1
11	0
12	0

A. If the sites were positioned from upstream to downstream:

1. what conclusion can you definitely make from the data?
2. what conclusions can be implied by the data?
3. what hypotheses would you make concerning the mussels?
4. design an experiment to test one of your hypothesis. Be sure you have a control.

## Graphing Practice – Problem 8

Create the best graph needed to represent the data below:

### World CO<sub>2</sub> Emissions

Country/Countries	Emissions
USA, Canada, Western Europe	41%
Former USSR Block	26%
China	10%
Japan	5%
Developing Nations	18%

A. Which type of chart/graph is best to use for this information? Explain.