

# AP Biology Summer Assignment

AP Biology builds on the fundamentals that you learned in standard biology. In order to ensure that you are ready to go when we begin in September, this assignment is a review of content that you should know prior to beginning our AP journey ☺

**Please write out your answers- do NOT type your answers!**

**Additionally, there is a letter of introduction that you will need to send to me via email ([cdoubek@aacps.org](mailto:cdoubek@aacps.org)) by August 1- the instructions are on the last page of this assignment.**

1) Describe these properties of water: polarity, hydrogen bonds, surface tension and inorganic.

2) Describe how the density of water changes as its temperature drops from 100°C to 0°C.

3) What makes a molecule organic?

Macromolecule Category	Building blocks	Function(s) within the cell	Example(s)
Carbohydrates	4)	5)	6)
Lipids	7)	8)	9)
Proteins	10)	11)	12)
Nucleic Acids	13)	14)	15)

16) What is an enzyme?

- What group of macromolecules are enzymes in?
- What is the job of an enzyme?
- List 2 ways to increase an enzyme's activity.
- What two things can cause enzymes to malfunction?

17) An acid is a substance with a pH of \_\_\_\_\_, a base is a substance with a pH of \_\_\_\_\_, and a neutral solution has a pH of \_\_\_\_\_.

18) Compare and contrast diffusion and osmosis.

19) Describe what would happen to a red blood cell in each of the following situations:

a) It is placed in a solution with a high concentration of salt.

b) It is placed in distilled water without any solutes.

20) What is homeostasis? How is osmosis related to homeostasis?

21) Active transport uses \_\_\_\_\_, passive transport uses no \_\_\_\_\_.

22) Cell organelles:

<b>Organelle</b>	<b>Function(s)</b>	<b>Type of cell(s) they are in: (animal, plant, and/or, prokaryote OR all)</b>
Plasma membrane	23)	24)
Ribosome	25)	26)
Vacuole	27)	28)
Cell wall	29)	30)
Chloroplast	31)	32)
Cytoplasm	33)	34)
Mitochondria	35)	36)
Nucleus	37)	38)

39) Write the photosynthesis equation. State the purpose of photosynthesis.

a) What is the difference between photosynthesis and chemosynthesis?

40) Write the cellular respiration equation. State the purpose of cellular respiration.

a) What is the difference between aerobic and anaerobic respiration?

41) What are the functions of the nervous system? How does it control reflexes?

42) Name five functions of the circulatory system.

43) Name the two types of vascular tissue found in plants, as well as what they transport.

44) What is the major function of the endocrine system?

a) Describe negative feedback.

45) Describe how wastes get from each cell of the body to the excretory system.

46) Multicellular organisms move with the use of these two systems:

47) Name the three major types of protists and the structures they use for movement:

48) Cell division:

- a) DNA must \_\_\_\_\_ before mitosis begins.
- b) List four differences between mitosis and meiosis.
- c) Summarize how sexual reproduction, which includes meiosis and fertilization, affects genetic variation within an offspring.

49) Describe cloning.

50) What is gene splicing? What is recombinant DNA?

51) Name three uses for DNA fingerprinting.

52) RNA/ DNA Comparison

<b>Characteristic</b>	<b>DNA</b>	<b>RNA</b>
Sugar	53)	54)
# of strands	55)	56)
Length	57)	58)
Nucleotides	59)	60)

61) Briefly describe what a mutation is and name two factors that can cause them.

a) What affect do mutations have on proteins?

62) Protein Synthesis Vocabulary

<b>Vocab</b>	<b>Definition</b>
63) Transcription	
64) mRNA	
65) Codon	
66) Translation	
67) rRNA	
68) tRNA	
69) Anticodon	

70) Genetics Vocabulary:

<b>Vocab</b>	<b>Definition</b>
71) Allele	
72) Autosome	
73) Dominant	
74) Gene	
75) Genotype	
76) Heterozygous	
77) Homozygous	
78) Phenotype	
79) Recessive	
80) Sex-chromosome	

81) Complete the following Punnett squares. Give the genotypic and phenotypic ratio for each.

a) Cross a heterozygous right handed person (dominant) with a left-handed person.

b) Cross a female who is a carrier for hemophilia with a hemophiliac male (hemophilia is sex-linked!).

c) What does it mean for a trait to be sex-linked?

d) Name three examples of sex-linked traits.

## LETTER OF INTRODUCTION

We are going to spend a lot of time together next year, so it's best if I get a head start on learning a bit about you. We will be working online and submitting various assignments via email next year, so let's get you used to communicating via e-mail.

Your first digital assignment is to successfully send an e-mail to your AP Biology teacher.

**Due date: AUGUST 1, 2017**

**Please write an e-mail to me following these rules:**

a. Use clearly written, **full sentences**. Do not abbreviate words like you are texting with a friend. Use **spell check**! This is a professional communication like you would have with a college professor, so let's practice for your rapidly nearing future!

b. Address it to the appropriate teacher:

[cdoubek@aacps.org](mailto:cdoubek@aacps.org)

c. Make the **Subject**: "**AP Bio: Introduction to <Insert Your Name Here>**"  
(Do not include the quote marks or the brackets, just the words)

d. Begin the e-mail with a **formal salutation**, like "Dear Ms. Doubek"

e. Now introduce yourself (your name) and tell me a little bit about yourself, like:

- What do you like to do (hobbies, sports, music, interests, etc.)?
- Do you have a job?
- Tell me a little bit about your family (Mom? Dad? Guardian? Siblings? Pets?) What do your parents do for a living?
- What were your favorite topics from biology?
- What other topics/areas are most interesting to you?
- What was the last book you read for fun?
- What are you looking forward to the most in AP Biology?
- What are you most anxious about in AP Biology?
- Do you have a career path in mind as you begin this next school year?

f. End the e-mail with a **formal closing**: "Cordially", "Sincerely", "Warm regards", etc. and add your name as if you signed a letter.

**Thanks for taking the time to introduce yourself and I look forward to learning more about you throughout the school year!**