AP Biology 2022-2023 Summer Assignment

Welcome to AP Biology! I'm your instructor, Dr. Amanda Helip-Wooley.

The summer assignment has three parts:

I. ***Brain Rules*** **-** Read the book *Brain Rules* by John Medina (available in print, electronic and audiobook formats). The goal is to learn about how the human brain works and use this to develop effective study strategies for this class.

II. **Chemistry Review** - Maybe it's been a while. Maybe you never really loved chemistry. It's OK. Watch the videos, take notes, define the terms, and answer the questions in the assignment below to get ready for our first unit.

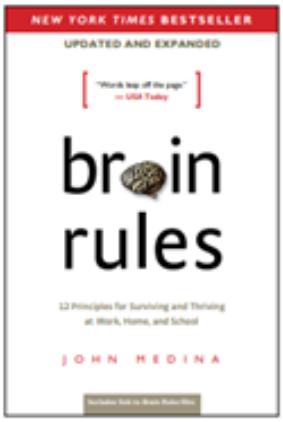
III. **Root words** - Biology can be challenging because it's like learning a foreign language. Instead of learning hundreds of new words, get to know some of their Greek/Latin roots. Complete the worksheet below to find the meaning of the root words and practice using them.

You must email your work for parts II and III to me at ahelipwooley@tampaprep.org before the first day of classes. This assignment will count as the first quiz of the year.

I hope you have a wonderful summer and I look forward to a fantastic year!

Questions? Contact me at ahelipwooley@tampaprep.org.

I. *Brain Rules*



Read each chapter and think about the questions below. If you prefer, you can watch the author's video summaries. You don't need to write down or hand in your answers - but do think about them - we'll discuss them in class.

Rule 1 – Survival
Rule 2 – Exercise
Rule 3 – Sleep

a. Are you a "lark," "owl," or "hummingbird?" Based on that, and what you learned about the circadian rhythm, how would you structure your study schedule?
b. How does sleep loss impact our ability to learn and perform?

Rule 4 – Stress

c. What are some negative effects of long term stress?
d. What are some ways that we can manage stress?

Rule 5 – Wiring
Rule 6 – Attention

e. What does the author have to say about multitasking?
f. How can you use the "10-minute" attention rule?

Rule 7 – Memory

g. The author talks about “elaborative rehearsal,” and how thinking or talking about an event right after it happens is important for memory. How can this relate to how you study?

Rule 8 – Sensory Integration

h. If we learn best when we stimulate several senses at once, what does that mean for how you learn, take notes, and study?

Rule 9 – Vision

i. The author asserts that “vision is king.” What does he mean by this?

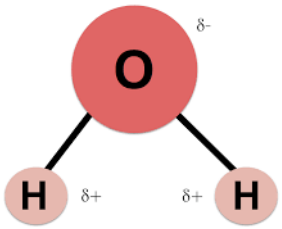
j. For an interesting application of visual memory watch this video to learn how memory champions take advantage of visual imagery to create a memory palace. How can you apply the information from this video and the chapter you read as you study?

Rule 10 – Music

Rule 11 – Gender

Rule 12 – Exploration

II. Chemistry Review for AP Biology



Watch *the following videos. Please do NOT just google the definition. Take notes, define the terms, and answer the questions below.*

Ionic Bonds (4:09 min)

1. ion -
2. ionic bond -
3. electron -
4. valence electron -
5. cation -
6. anion -

Covalent Bonds (5:42 min)

7. covalent bond -
8. How do you indicate a partial positive charge?
9. How do you indicate a partial negative charge?
10. What does polarity mean?

Chemical Bonds: Covalent vs Ionic (8:56 min)

11. octet rule -
12. electronegativity -
13. polar covalent bond -
14. nonpolar covalent bond -
15. What is NH3 - non-polar covalent, polar covalent, or ionic?

Hydrogen Bonding (6:38 min) -

16. hydrogen bonds -
17. Why are hydrogen bonds important in biology? Give two examples.

Making Sense of Chemical Structures (8:58 min) -

18. What are the Bonding Rules for:
    a. Hydrogen:
    b. Carbon:
    c. Nitrogen:
    d. Oxygen:

Chemistry Review Questions

1. Which type of bond exemplifies a weak chemical bond?

A. Covalent bond
B. Hydrogen bond
C. Ionic bond
D. Nonpolar covalent bond

2. Which of the following statements is false?

A. Electrons are unequally shared in polar covalent bonds.
B. Electrons are equally shared in nonpolar covalent bonds.
C. Hydrogen bonds are weak bonds based on electrostatic forces.
D. Ionic bonds are generally stronger than covalent bonds.

3. What forms ionic bonds?

A. atoms that share electrons equally
B. atoms that share electrons unequally
C. ions with similar charges
D. ions with opposite charges

4.

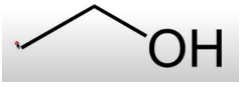
Element	Electronegativity
N	3.04
H	2.20
Cl	3.16
O	3.44
Li	0.98
F	3.98

Based on the information provided, which of the following statements is correct?

A. In NH_2, the nitrogen atom acquires a partial positive charge and the hydrogen atoms acquire a partial negative charge.
B. In H_2O, the hydrogen atoms acquire a partial negative charge, and the oxygen atom acquires a partial positive charge.
C. In aqueous HCl, the hydrogen atom acquires a partial positive charge, and the chlorine atom acquires a partial negative charge.
D. In LiF, the lithium atom acquires a positive charge, and the fluorine atom acquires a negative charge.

5. Why do hydrogen and oxygen form polar covalent bonds within water molecules?

A. Hydrogen is more electronegative than oxygen, generating a partial negative charge near the hydrogen atom.
B. Hydrogen is more electronegative than oxygen, generating a partial positive charge near the hydrogen atom.
C. Oxygen is more electronegative than hydrogen, generating a partial negative charge near the oxygen atoms.
D. Oxygen is more electronegative than hydrogen, generating a partial positive charge near the oxygen atoms.

6. What is the chemical formula of this molecule? 

Part III – Root Words

Find the meaning of the following Greek/Latin root words (Google is fine). I've done a few for you.

Root	Meaning	Root	Meaning
-ase	*suffix indicates an enzyme*	-ology	
a- / an-		-lysis	
aero-		macro-	
amphi-		meta -	
aqua- / hydro-		micro-	
auto-		mono-	
bi- / di-		multi- / poly-	
bio-		-ose	*suffix indicates a simple sugar*
cyto-		-ped /-pod	
de-		-philia	
derm-		-phobia	
ecto- / exo-		photo-	
endo-		primi- / archea-	
epi-		pro- /proto-	
glyco-		pseudo-	
haplo-		sacchar-	
hetero-		-sis	*process*
homo-		sym- / -syn	
hyper-		-therm	
hypo-		-troph	
intra-		uni-	
-itis		zoo-, -zoa	
kary-		zyg- / -zygous	

Using Root words to define unknown words

Break apart each word below into its smaller root word components. Then use ONLY the completed root word table (above) to develop a SIMPLE definition for each of the following terms **in your own words.** If some parts are missing, just give it your best shot using what you know (NO Google). I've done the first one for you.

1. Hydrolysis - *water breaking or breaking with water*

2. Glycolysis -

3. Protozoa -

4. Epidermis -

5. Anaerobic -

6. Symbiosis -

7. Hypertrophic -

8. Dehydrogenase -

9. Endocytosis -

10. Prokaryote -

11. Monosaccharide -

12. Homozygous -

13. Photoautotroph -

14. Thermophilic archaebacteria -

15. Dehydration synthesis -