

Science Skills Review Packet

This is a review of basic science skills in chemistry and biology— we will not spend much class time on all these concepts, as they should have been learned already. Please make sure that you know them and if not, be sure to study through them. *Please hand write in pencil or pen. FYI: We will cover graphing during the AP bootcamp, please make sure you attend.*

Chemistry Review:

1. Compare and contrast the term element with compound.

2. Know the symbols of the following elements and their charge:

a. Carbon:

b. Hydrogen:

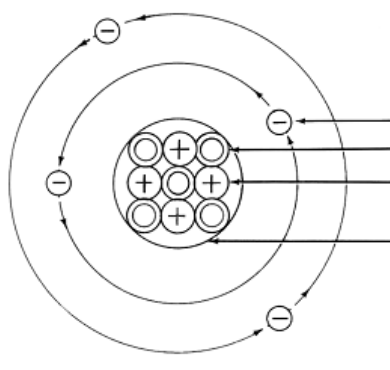
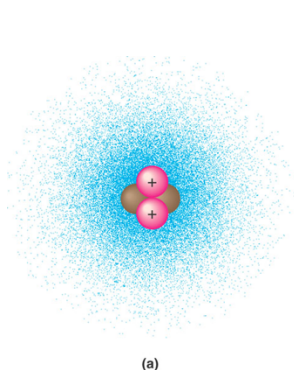
c. Oxygen:

d. Nitrogen:

e. Phosphorus:

f. Sulfur:

3. Label the diagrams below and define the terms that you label. What atom is a? _____ b?



4. Contrast the terms atomic mass and atomic number.

5. What determines interactions between atoms? Why are valence electrons important?

6. Define the following terms:

a. Chemical bond

b. Covalent bond

c. Nonpolar covalent bond

d. Polar covalent bond

7. Know both the molecular formula for the following compounds.
 - a. Oxygen gas
 - b. Carbon dioxide
 - c. Glucose
 - d. Nitrogen gas
 - e. Ammonia
 - f. Water (you would be surprised at how many people missed this!!!)
8. How do ionic bonds compare with covalent bonds?
9. What are hydrogen bonds
10. Define the following terms:
 - a. Solute
 - b. Solvent
 - c. Aqueous solution
 - d. Hydrophilic
 - e. Hydrophobic
 - f. Molarity
11. What defines an acid and a base?
12. What is special about carbon that makes it the central atom in the chemistry of life?

Biology Review:

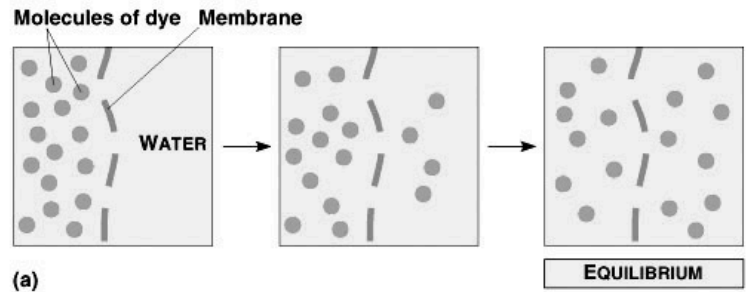
13. Define the following:
 - a. Biology:
 - b. Hypothesis:
 - c. Observation:
 - d. Homeostasis:
14. What are the main characteristics of life (minimum of 5)?

15. Scientists are testing a new pain reducing drug in a trial with 50 patients. Group A gets the drug while group B gets a placebo pill. Level of pain is being recorded for each patient.
- What is the control group:
 - Experimental group:
 - Independent variable:
 - Dependent variable:

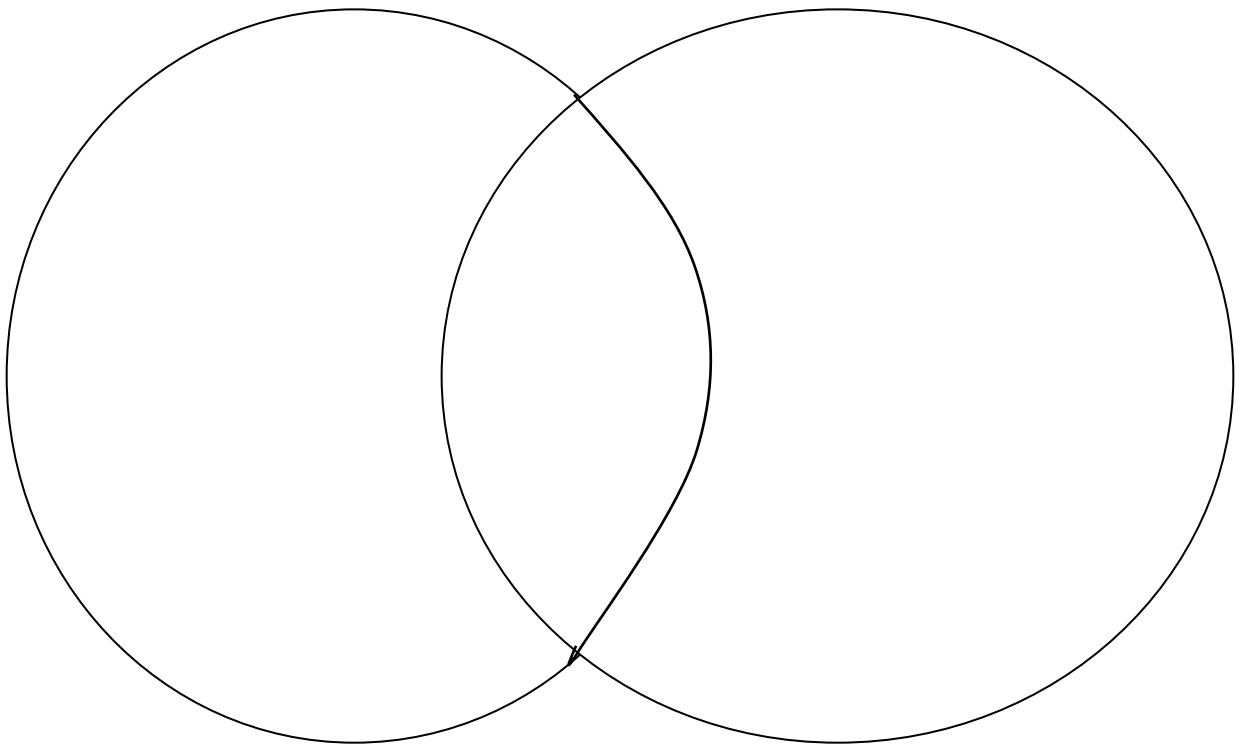
16. Using the picture to the right:

a. Explain *equilibrium*:

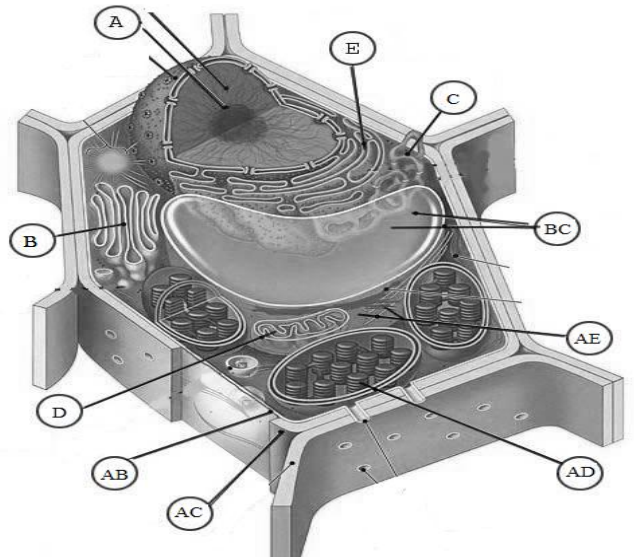
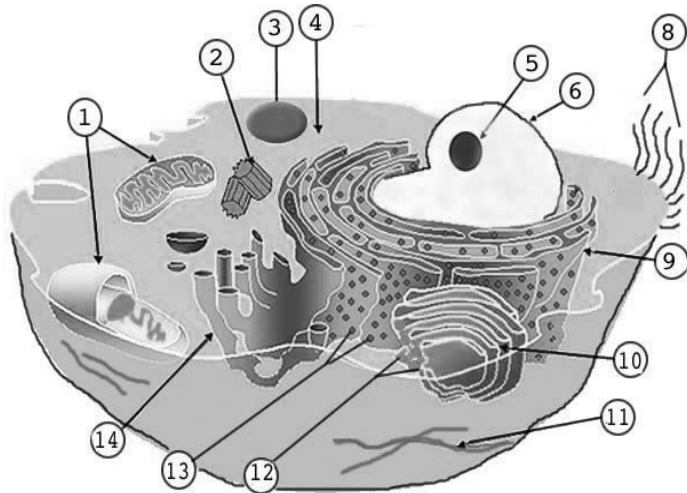
b. Label the most concentrated side of the membrane in the first picture.



17. Complete the diagram comparing DNA and RNA:



18. Label each number on the following



pictures:

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7. NA

- 8.
- 9.
- 10.
- 11.
- 12.
- 13.
- 14.

- A.
- B.
- C.
- D.
- E.

- AB.
- AC.
- AD.
- AE.
- BC.

19. The tall allele, *T*, is dominant to the short allele, *t*, in Mendel's pea plants. You examine a pea plant that has a *phenotype* of short. What is its *genotype*? _____
20. If two plants with the genes *Tt* and *Tt* breed, what are the possible genes of their children? (Hint: create a punnett square)

Biology Prefixes and Suffixes-The Language of Science

The main reason students find it difficult to understand science is because of all the hard to write, spell and read words. Actually, scientific vocabulary is a mix of small words that are linked together to have different meanings. If you learn the meanings of the little words, you'll find scientific vocabulary much easier to understand. Find the mean to the following Greek/Latin root words.

Word	Meaning
a / an	
meso	
leuco	

Word	Meaning
hemo	
hyper	
hypo	

aero	
anti	
amphi	
aqua / hydro	
arthro	
auto	
bi / di	
bio	
cephal	
chloro	
chromo	
cide	
cyto	
derm	
haplo	
ecto (exo)	
endo	
epi	
gastro	
genesis	
herba	
hetero	
homo	
ov	
kary	
neuro	
soma	
saccharo	
primi / archea	
phyl	

intra	
-itis	
lateral	
-logy	
-lysis	
-meter	
mono	
morph	
micro	
macro	
multi / poly	
pod	
-phobia	
-philia	
proto	
photo	
psuedo	
synthesis	
sub	
troph	
therm	
tri	
zoo, zoa	
-tropism	
-taxis	
-stasis	
zyg / zygyous	
phago	
path / pathy	
sym / syn	

Once you have completed the above table, use it to develop a simple, shrot definition, in your own words, for each of the following terms.

1. Hydrology _____

2. Cytolysis _____

3. Protozoa _____

4. Epidermis _____
5. Spermatogenesis _____
6. exoskeleton _____
7. Abiotic _____
8. Pathogen _____
9. psuedopod _____
10. Hemophilia _____
11. Endocytosis _____
12. herbicide _____
13. Anaerobic _____
14. Bilateral _____
15. autotroph _____
16. Monosaccharide _____
17. Arthropod _____
18. polymorphic _____
19. Hypothermia _____
20. Biogenesis _____
21. Heterotroph _____
22. Homozygous _____
23. Phototropism _____
24. Chlorophyll _____
25. Polymorphism _____