Learning Objectives for midterm 1

1) Be able to describe the scientific method.
2) What are multiple hypotheses?
3) What is spontaneous generation and what experiments proved that it does not occur?
4) Describe Redi's experiment. What did it prove and how?
5) What did the Pasteur experiment prove and how did it prove it?
6) Can you eat or drink in the lab?
7) Be able to name the six things that all life has in common.
8) Be able to draw an atom and to identify the parts of the atom. Atomic orbitals.
9) What is an isotope
10) Be able to use the periodic table.
11) What is the difference between a polar and a non-polar bond. How are the similar? Be able to describe them in detail.
12) What is an ion?
13) Describe ionic bonds. Also how do ionic bonds react in water?
14) Hydrogen bonds, how do they work and why are they important? How do they change the property of water?
15) What is the difference between a solvent and a solute?
16) Describe acids and bases?
17) What is an organic compound?
18) What is a dehydration reaction? Hydrolysis?
19) What are functional groups?
20) What are carbohydrates?
21) What does a fat look like?
22) What type of molecule is cholesterol?
23) What are the special properties of phospholipids? What are lipids?
24) What is the basic structure of an amino acid?
25) What is a side group?
26) What are the four levels of protein folding and what bonds are involved?
27) What is the difference between monomers and polymers?
28) What is the role of nucleic acids in the body?
29) What are the bases used in nucleic acids.
30) Why is shape important for a biological molecule?
31) What are the differences between prokaryotes and eukaryotes?
32) Be able to identify all the parts of a prokaryote.
33) Be able to name all the organelles in the animal cell in the lecture and what the function of each of the organelles is.
34) Be able to follow the path of a secreted protein from the mRNA leaving the nucleus to the protein exiting the plasma membrane.
35) What is in cytoplasm?
36) Describe the role of the different filaments in the cell.
37) Be able to name all the organelles in the plant cell from lecture and what the function of each of the organelles is.
38) What are the differences between plant and animal cells? Also, how are they alike?

39) Be able to define diffusion and osmosis.
40) Know the terms hypotonic, isotonic, and hypertonic.
41) Be able to describe the role of the phospholipids in the plasma membrane.
42) What is the difference between active and passive transport?
43) Be able to describe how the sodium potassium pump works.
44) Describe exocytosis.
45) How do the three different versions of endocytosis work?
46) Be able to describe survival of the fittest.
47) Who was Charles Darwin and what did he do? Who was Alfred Russel Wallace?
48) What was Plato's contribution to evolution?
49) What did William Smith do? George Cuvier? James Hutton and Charles Lyle?
50) What was Lamarck's theory?
51) Know the meaning of the following terms: convergent and divergent evolution, analogous and homologous structures.
52) How does DNA show evolutionary similarities? How does embryonic development show evolutionary simitarities?
53) Define the terms: species, allopatric speciation, extrinsic isolation mechanism and intrinsic mechanism.
54) What are the five different intrinsic isolation mechanisms and how do they work?
55) What is the difference between a generalist and a specialist as far as evolution is concerned?
56) What is adaptive radiation?
57) Be able to identify the differences between gradualism and punctuated equilibria.
58) Be able to describe the Linnaean system of classification.
59) What do cladograms show? How is it different from the classical view?
60) Be able to draw and describe the stages of binary fission.
61) Describe what is occurring at each stage of the cell cycle. Also be able to draw the cell cycle.
62) What is a chromosome and what is a chromatid?
63) Be able to define the following terms: spindle fiber, centromere, kinetochore, sister chromatids, cytokinesis, karyokinesis, centrioles, homologous chromosomes, crossing over, tetrad.
64) Be able to draw and describe what is happening in all of the stages of mitosis.
65) What are the differences between animal and plant mitosis?
66) Be able to draw and describe what is happening in all of the stages of meiosis.
67) Differentiate between spermatogenesis and oogenesis. How does meiosis differ?
68) Define morulla, blastula, and zygote.
69) Define non-disjunction.