1. Make sure you print your last name in the upper right-hand corner of every page.

2. Take off your hat, or turn the bill around backwards.

3. Do **not** use red lead or red ink to complete this exam.

4. Keep your eyes on your own exam. Do not cheat in any way OR appear to be cheating. Cheaters will be prosecuted, and your transcript may be marked with a label indicating academic misconduct.

5. Read each question carefully before you begin to answer.

6. Check all your answers before you turn in your exam.

7. Yes, there is lab this week!

Good luck!
3 pts. For what two reasons are plants **essential** to your life?

a)  
b)  

4 pts. What environmental problem did you choose to investigate (from the handout in class)? What is the current status of the problem, and from what specific '07 or '08 resources did you get your information?

Problem—  
Status—  

Two Sources--

3 pts. In the article, “Was confusion over global warming a con job?” According to the article, who was conning who?

4 pts. Please review the graph on the next page. Do you think that the title of the article is appropriate or not, based on the evidence provided in the graph? Say yes or no, and then explain your answer.

6 pts. Here is a code strand of a gene. It is only 6 nucleotides long. First, show what the messenger RNA molecule would look like that is produced from this gene.

Next, draw the inactive strand of DNA of the same gene.

How can you tell the difference between the inactive strand of the gene and the messenger RNA molecule?

3 pts. Things are made from smaller things. What is (are) the main part(s) of each of the following?

a) what is cellulose made of?
b) what are the parts (subunits) of a protein?
c) what are the two main components of a membrane?

4 pts. Does an annual plant put more energy into its roots or its reproductive parts? Explain why this might be important to the plant.
4 pts. Suppose you have a plant and take a cell from its root and a cell from one of its leaves. Do you think that the two cells have the same genes? Say yes or no, and then explain your answer.

3 pts. Suppose you have a cell with 36 chromosomes in it. At the end of mitosis, how many cells do you have, and how many chromosomes are in each cell?

4 pts. Here is a drawing from your book. Label the parts that have arrows pointing to them.

3 pts. From your chemistry worksheet: how does an atom differ from a molecule?

3 pts. From one of your articles…“The number of esophageal cancer cases clearly followed the rise in intake of carbonated soft drinks, the researchers found.” In terms of the process of science, is this statement a cause-and-effect relationship or a correlation? Choose one, and then explain your answer.

3 pts. Do you think that a plant with whorled leaves is more likely to be a monocot or a dicot? Choose one and explain your answer (hint: think about the leaves).

5 pts. Draw one plant with all of the following characteristics: opposite simple leaves with plantlets, contractile roots, adventitious roots, and stem spines.

4 pts. What are the main functions of each of the following plant parts:
   a) root
b) cotyledon  

c) mitochondrion  

d) xylem  

3 pts. What three cell parts are found in both prokaryotes and eukaryotes? For each part, give its function.  
a)  
b)  
c)  

3 pts. We talked about plants having both open growth and cheap growth. What is the difference?  

4 pts. Each chromosome has hundreds or thousands of genes on it. Each gene makes different messenger RNA molecules. One gene can make multiple copies of the same messenger RNA, and one messenger RNA can make multiple copies of the same enzyme. What does this tell you about the number of chemical reactions that occur inside a cell each day?  

4 pts. Arrange the following terms into two groups. What heading would you use for each group?  
Blade, sheath, leaflet, petiole, tendril, spine, plantlets  

3 pts. Explain how mitosis is similar to vegetative reproduction.  

3 pts. Explain how the function of the endodermis depends on the function of the cell membrane.
3 pts. How does the transfer RNA molecule “know” where to place its amino acid on the messenger RNA molecule? (Explain WITHOUT using the words codon, anticodon, or translation.)

3 pts. Use all of the following words in ONE SENTENCE to describe how a nucleus controls the cell’s activities. mRNA, gene, cell function, enzyme, chemical reaction

2 pts. What part of the plant are you eating when you eat an celery? What part of the plant are you eating when you eat a white potato?

4 pts. There are tradeoffs wherever you look in biology. What are the tradeoffs involved in the following examples in the leaf of a plant?
   a) What is the tradeoff between having stomata in the upper epidermis of a leaf and not having stomata there?
   b) What is the tradeoff between having palisade parenchyma throughout a leaf versus having some spongy parenchyma?

5 pts. Name the tissues of the trunk of a tree, starting from the outside and working toward the center of the tree.
   outermost tissue--
   next tissue--
   next tissue--
   next tissue--
   innermost tissue--

Which of the following tissues are closer to the center of a tree?
   a) the sapwood or the heartwood?
   b) the spring wood or summer wood of an annual ring?

2 pts. Rank the following in order or how many you would find in one typical plant cell: (1 is highest number, 4 is lowest). _____nucleotides, _____genes, _____chromosomes, _____nuclei (plural of nucleus)

3 pts. For each of the following characteristics or requirements of living organisms, name the cell part that is involved with that characteristic.
Living things must take in and use energy. Name one organelle involved with energy activities in a plant cell.
Living things must get rid of their waste. What plant cell part helps with this?
Living things must maintain their integrity. What part of the plant cell helps with this?