### **Biological Sciences 101**

### Portfolio



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Instructors: John Janovy, Jr., 424 Manter Hall; jjanovy1@unl.edu; http://bsweb.unl.edu/labs/janovy

#### Krista Major, administrative assistant, kmmajor@aol.com Text: Campbell, Reece, Taylor, Simon, and Dickey, *BIOLOGY: Concepts and Connections*, 6<sup>th</sup> Ed. (Pearson/Benjamin Cummings)

#### Additional Reading: Janovy, Outwitting College Professors, 2<sup>nd</sup> Ed. (Pearson Custom Publishing)

Welcome to the University of Nebraska. I hope your time here is well spent and that the university experience turns out to be a positive one. BioSci 101 is intended for first year students who are not majoring in Biological Sciences. Consequently, this course enrolls people from a wide variety of backgrounds and with an equal diversity of goals and interests. In addition, biology is an exceedingly broad subject; therefore, although lecture content will refer primarily to materials from the text, you should expect to occasionally hear, or participate in, discussion of current scientific issues that affect your daily life.

#### What to expect in this class:

- (1) I usually have three lectures a week, mostly explaining material in the book and expanding on that material when appropriate. Facts, vocabulary, and diagrams usually come from the book, but the meaning, significance, and interpretations will come mainly from material presented in class.
- (2) You will have weekly writing exercises done in class and you will be asked to pick up your papers and do some additional work on them within a week. All papers will be in a plastic box outside my office door.
- (3) You may be asked to write short papers in addition to, and sometimes instead of, coming to class one or two times during the semester. These paper assignments are likely to seem strange and challenging.
- (4) We will use the electronic classroom response system, also known as "clicker technology," every day in class beginning after Labor Day. Plan to bring your "clicker" (officially known as a "response pad") to class every day, with a good battery in it, and do not lose it. This technology makes it easy for me to include attendance and participation as part of the grading criteria. <u>PLEASE REGISTER YOUR CLICKER CORRECTLY</u> (see Blackboard).
- (5) Some student(s) will earn extra points by asking excellent questions, or demonstrating other kinds of intellectual leadership. I may also turn the microphone over to students periodically.
- (6) <u>The material will be integrated from the beginning</u>, in the sense that both lecture and readings are likely to include information from sub-cellular to ecosystem levels, from several places in your book, and from the campus and the media. I suggest considering the index to be the rough equivalent of Google, in the sense that you can search for terms in the index and come up with information about those terms. I will try to tie these subjects together, and you are expected to try to do the same.
- (7) You will be treated as if you have come to a major university (which you have) and will be expected to behave accordingly in this auditorium. If you are being disruptive, talking excessively, reading

the newspaper, talking on your cell phone, lost in a dream with your iPod plugged into your ears, etc., you probably will be asked to leave, maybe even asked to drop the course. <u>Please turn off your cell phone and put your laptop away when class starts</u>.

- (8) You will have to take notes, lots of notes, paying particular attention to interpretations of material from the text and to our attempts to integrate the various aspects of biology into a single big picture.
- (9) I will try to learn as many of your names as possible; I greatly appreciate your help and cooperation in this effort.
- (10) Expect a few unusual class periods when we do something different yet still quite appropriate for a university biology course.

#### Learning Outcomes for this class:

As a result of taking this class, you should be able to <u>clearly explain</u> the following to your friends and relatives, including your present and future children, who have not taken a university-level biology course:

- (1) The fundamental nature of science and of biology.
- (2) The biological roles and functions of the major ingredients indicated on labels of processed food.
- (3) The design of a typical experiment and analysis of the results.
- (4) The structure of a cell and the functions of all the cell organelles typically illustrated in an introductory biology text.
- (5) Mendelian inheritance of dominant and recessive traits and the calculations used to predict probabilities of genotype.
- (6) The evidence for evolution and why evolution is the central unifying theme in biology.
- (7) The evolutionary principles as outlined in an introductory college biology text.
- (8) The flow of energy, chemical elements, and molecules through an ecosystem.
- (9) The diversity of living organisms on Earth.
- (10) The role(s) that humans play, and have played, in modification of the Earth's biota and life support systems.

#### **COURSE ELECTRONICS, OR WELCOME TO THE INFORMATION AGE:**

This class uses two forms of information technology. These technological features include a classroom response system and Blackboard (a Course Management Software system). Please get up to speed on these systems as quickly as you can; they're not particularly difficult, but you will need access to the Internet in order to use them.

#### Classroom Response System (CRS):

In addition to a textbook, you will need a classroom response pad, or "clicker" for this section. The pads are sold separately in the bookstores. *Each pad has a serial number, and you must get online and register it in order to participate in this class*. Instructions for registering online are provided on Blackboard. <u>PLEASE REGISTER YOUR CLICKER CORRECTLY</u>.

#### **Course Management Software (CMS):**

UNL has web-based CMS called Blackboard available for use by students and faculty members. I will use that software to post grades, announcements, and possibly outside readings (or links to them), as well as to provide opportunities for you to earn extra credit and/or have discussions on certain topics. You get into this software through the web site http://my.unl.edu. If you are registered for this class you can get into Blackboard for this section.

#### Attendance:

Attendance is required and accounts for about 15% of your final grade. The quickest way to get into grade trouble in a large university class is to quit coming to school. You are responsible for all of the material presented in lecture and assigned from the text. However, I will try to put all lectures up on Blackboard both as \*.wma and as \*.m4a files and all the PowerPoint shows up as both \*.ppt and \*.pdf files. Beginning after Labor Day, I will take attendance daily through use of the CRS or written exercises.

#### **Questions**:

Questions are expected. Although I have a lecture schedule, it is not so rigid that we can't spend an entire period on class discussion or in answering questions. Someone please raise his or her hand and tell me to slow down, spell words, or repeat if I am going too rapidly.

#### Grading:

Your grades are calculated on the following basis:

(1) Hour exams – three @ 100 points each	= 300 points
(2) Final exam – one @ 160 points	= 160 points
(3) Written assignments 14 @ 10 points	= 140 points
(4) Attendance	= 100 points
TOTAL	= 700 points
PORTFOLIO BONUS POINTS	= 50 points

<u>Hour exams:</u> The tests may include multiple choice and matching questions, diagrams to label or interpret, and short essays. You should also expect a "critical and higher order thinking" section on each exam, consisting of 5 questions that explore a subject in depth. **There is a test question bank on Blackboard**.

<u>Exam questions:</u> I will take as many of the exam questions as I can from the question bank posted on the Blackboard web site for this course, although I may modify them slightly to account for differences in presentation and textbook from semester to semester. I am likely to ask you to write some of your own exam questions and provide not only the answers but also the rationale for the answers (on Blackboard).

- <u>Pop quizzes</u>: If given, pop quizzes will range from 4-10 points, and those points will be subtracted from the ones available on regular tests.
- <u>Writing exercises</u>: Every Friday during the semester I will give small, extemporaneous, writing assignments. You will get 1-3 points (awarded subjectively on the basis of grammar, information content, etc.) for actually doing these assignments in class, and another 4-7 points (awarded subjectively on the basis of grammar, spelling, originality and insight) if you pick them up on time, do the follow-up writing, and return them on time. Follow-up writing will consist of typing the paper (double-spaced) exactly as you wrote it in class, correcting the typed version in red ink, and then evaluating your own performance with a single page of double-spaced typing that addresses matters of grammar, style, and the extent to which you were successful in doing the assignment. These writing exercise follow-ups are due the day the next one is given.
- <u>Portfolio Bonus Points</u>: If, some time during the last week of the semester, you show me your complete set of work for this class, assembled according to instructions on Blackboard, and you have received at least 120 of the 140 points available through writing assignments during the semester, I will add 50 points to your total for the semester. Detailed instructions for preparing your course portfolio will be provided on Blackboard.
- <u>Grading scale</u>: If the class average is 75%, that average is middle C. I reserve the right to scale grades up if the class average falls below 75%. If the class average is 75% or higher, then an approximate standard scale applies (90% = A, 80% = B, etc.). If you end up with 630 points I will give you an "A;" with 560 points you are guaranteed at least a "B;" etc.
- <u>Makeup exams</u>: I give no makeup exams. If you miss a test because of illness or personal emergency, I will not count that test if you have either a physician's note indicating you were ill, or have some other documentation of a real emergency. If you miss class because of athletic competition, I need to have the letter from your coach and I need to be reminded of that letter frequently and as the semester nears its end. If possible, I will arrange for you to take an exam with you on any university-sponsored trip and have it administered by a university official.
- <u>Extra credit</u>: I reserve the right to provide opportunities for extra credit, which will appear as points simply added to your total. These opportunities may include writing some of your own test questions, contributing to exam preparation via Blackboard, exhibiting intellectual leadership in class, sustaining class discussion (see below), etc. If by Thanksgiving break I am able to recognize you on the street, outside of class, by name and face, then I will add 10 extra credit points to your total.

Please decide this afternoon that you are going to come to class every day, take notes seriously, ask questions, participate in class discussions, take all the exams, take advantage of extra credit opportunities, make sure I can recognize you outside of class, and get help early if you need it.

#### **Class discussion:**

If a group of three or more students initiates a serious class discussion of current events, conducted within the context of material we are covering, and if ten or more additional students actually participate

in this discussion, I will add 5 bonus points to the grade of everyone who is in class that day. In order to get these points it will be necessary for you all to be quiet and attentive and to treat your fellow students with respect (but I don't care how lively the discussion gets).

#### Lab:

BioSci 101L is a separate course from BioSci 101 and I have no responsibility for, or control over, your lab grade. I will try to cover certain topics, e.g. cell biology and genetics, before they are covered in lab. Dr. Jon Sandridge is the General Biology Laboratory Coordinator. His office and the Bios 101 lab office are located in room 101A Manter Hall; his telephone number is (402) 472-0620; and, his e-mail is jsandridge2@unlnotes.unl.edu.

#### **Office hours:**

My office hours are MW afternoons after class and Th afternoon 1:30-3:30. You can call me at 472-2754 (office), or leave a message at 472-2720 (BioSci office) or 489-4369 (home). If you leave a message on my home or office phone, please speak slowly and clearly, and leave your name and phone number. I also have a mailbox in 348 Manter Hall (BioSci office, campus mail zip is 0118). My e-mail is jjanovy1@unl.edu. I am available by appointment about any day, including late in the afternoons (except on Friday). If you see me out on campus and I don't seem to be doing anything important, feel free to introduce yourself and ask any questions you may have about biology.

#### Study hints:

- (1) Make a vocabulary list. Someone ask me about how to make and use such a list.
- (2) Find a study partner, or several, and use the vocabulary in your daily conversation.
- (3) Seek individual help early if you feel completely lost.
- (4) DON'T feel embarrassed if you are not doing as well as you think you should be; seek help.
- (5) Use all the resources available, including those that may be on Blackboard.
- (6) Use the old exams as study guides.

#### About your instructor:

John Janovy, Jr.

Paula and D. B. Varner Distinguished Professor of Biological Sciences BS in Math (1959), MS in Zoology (1962), and PhD in Zoology (1965); University of Oklahoma; postdoctoral research, Rutgers (1965-66).

<u>Research interests</u>: parasitology, especially ecology of parasitism and evolution of parasite life cycles, with focus on the protistan parasites of insects and the helminth parasites of small fish. There are usually 2-3 graduate students and 1-3 undergraduates doing research in my lab.

<u>Other courses taught</u>: Parasitology (BIOS 385, spring semesters), Invertebrate Zoology (BioSci 381, fall semesters), Field Parasitology (BioSci 487/887, Cedar Point Biological Station, Lake McConaughy, NE).

Web site: http://bsweb.unl.edu/labs/janovy

#### <u>General advice on how to maximize the value of the education you receive at the University of</u> <u>Nebraska (these suggestions will cost you absolutely nothing except a little time):</u>

- (1) Make sure every instructor you have knows your name, and make sure that instructor knows you and your work well enough so that he/she can write a letter of recommendation for you if necessary.
- (2) Simply decide today that you are not afraid of, or intimidated by, faculty members, no matter how obnoxious or wacko they seem, and regardless of whether their "values" are consistent with yours.
- (3) Pay attention to world events, especially those with a cultural component. Try to understand why these events take place, even though your courses may not deal with anything other than specific subject matter having nothing to do with global politics or economics.
- (4) Visit the museums on campus about once a week (free with student ID). Talk to your friends about what you see in those buildings. Visit the Sheldon Gallery regularly and be able to talk intelligently about the works there, as well as the sculptures on campus.
- (5) Pay attention to the campus landscaping; read the labels on the trees and plants. Talk about campus landscaping and vegetation with your friends.
- (6) Read some high quality magazine fairly regularly. I suggest *The New Yorker, Harpers*, or *Atlantic Monthly*. Ask your instructors for a reading list of non-fiction books and read some of the items on such lists.
- (7) Talk to your parents or guardians about the ideas you are encountering at UNL.
- (8) Do something original and creative (poetry, music, sketches, etc.) on a fairly regular basis.
- (9) Go to free lectures and recitals when you have the opportunity. Once you get there, be a quiet and attentive audience member and stay through the whole performance.
- (10) Talk to your fellow students. Find out who are the most challenging faculty members in the arts, humanities and social sciences, and enroll in those teachers' courses. *Always choose instructors instead of course numbers whenever possible*.

#### GENERAL BIOLOGY LABORATORY ANNOUNCEMENT (Bios 101L)

The laboratory is an integral part of the General Biology course. It is designed to provide you with a series of experiments and observations which illustrated many of the basic biological principles discussed in lecture. Efforts have been made to coordinate the sequence in which lecture and lab materials are presented. In general, the basic background information necessary to carry out each week's lab exercise will be covered in lecture prior to the lab exercise. *The General Biology Laboratory is a 1 credit hour course (Bios 101L) which must be taken concurrently with lecture (Bios 101).* Your lab grade will NOT be averaged into your lecture grade.

Please note the following policies:

1. If you drop or withdraw from Bios 101 lecture you must also drop or withdraw from Bios 101L lab. Conversely, if you drop or withdraw from the Bios 101L lab you must also drop or withdraw from Bios 101 lecture.

2. Attendance will be taken at each lab meeting. If you miss more than 2 lab sections, you will automatically receive a grade of F for the laboratory (Bios 101L).

The General Biology Laboratory Coordinator is Jon Sandridge. His office and the Bios 101 lab office are located in room 101A Manter Hall; his telephone number is (402) 472-0620; and, his e-mail is jsandridge2@unlnotes.unl.edu. All questions concerning the laboratory should be addressed to Dr. Sandridge.

**LECTURE SCHEDULE**. In the following schedule, biology is presented in a sequence that is intended to build upon itself, the earlier lectures providing background information, ideas, and concepts necessary to understand the topics presented later in the semester. Biology is a highly integrated field of study; for this reason I may select readings from several places in the book so that you will have both facts and context relevant to the topic. In the Reading column, the entries are the textbook sections. The sequence of topics also is somewhat dictated by the laboratory.

Week of	Торі	cs; page and cl	hapter refs in text
Week	Торіс	Pages	Question, Topic, or Issue
	What is		
1	science?	8-12, 120 1-7, 307-	Science literacy in the general public.
	What is	309, 763-	
1	biology?	765 8-9, 258-	How scientists approach the study of living organisms.
	What is	259, 299,	
1	evolution?	300-301	Why is "it's only a theory" the wrong phrase to use when trying to deny that the process of evolution shapes life on Earth?
		Chapters 2	
2	Cell chemistry	& 3	What's in junk food?
		Chapters 2	·
2	Cell chemistry	& 3	What's in junk food?
2	Cell chemistry	60-62	What do cells do with the materials in junk food?
	Eukaryotic		
3	Cells	Chapter 4	What is meant by the term "cell"?
	Eukaryotic		
3	Cells	Chapter 4	What is meant by the term "cell"? (cont'd)
_	Eukaryotic		
3	Cells	Chapter 4	Why are cells of potential use in medicine? In agriculture?
		Ch. 5, 6, &	
4	Cell Activities	7 (parts of	How you and every other living organism process the environment
4	Cell Activities	those	Food, feces, parasites, decay, recycling, worms, etc.
4	Cell Activities	Chapters)	A biologist reading labels (more junk food).
		400 400	
-	Constine	128-132,	
5	Genetics	134	How do living organisms grow?
5 5	Genetics	130-143	Nhat should an educated cilizen know about sex?
Э	Genetics	200-207	Population miniking.
6	Genetics	Ch. 9 - 14 (We'll	Why is phenotype so important?
6	Genetics	select parts of these	Why is phenotype so important? (cont'd)
6	Genetics	chapters.)	What is genetic information and how might it be used for profit?

7 7	Genetics Genetics	Ch. 9 – 14 312-313 263, 307- 312, 332,	Some information on human genetics. Molecular genetics and evolutionary biology.
7	Genetics	344, 369, 385	Tree-thinking.
		Chanters	
8	Evolution	13-15	What is evolution?
0	E se la dia a	Chapters	What is the evidence used to support scientists' interpretation of
8	Evolution	13-15 Chapters	life's history?
8	Evolution	13-15	Why do biologists consider evolution to be a fact?
		Chapters	
9	Evolution	13-15 Chapters	Population genetics and mutation.
9	Evolution	13-15	Co-evolution and co-speciation.
U	Evenation	Chapters	
9	Evolution	13-15	The cladistic methodology and underlying ideas.
10	Evolution	400-408, 734-737	Are humans evolving?
10	Evolution	Chapter 16	to people?
10	Evolution	Blackboard	Who is actually hurt by the teaching of evolution?
11	Ecology	Chapter 34	What is meant by the term "environment"?
11	Ecology	Chapter 37	The flow of materials.
11	Ecology	Chapter 38	Are numans destroying the Earth?
12	Ecology	Blackboard	What is the relationship between the Earth's history and current
12	LCOIOgy	Diackboard	To what extent do natural phenomena override government
12	Ecology	Blackboard	actions?
12	Ecology	Blackboard	What power do individuals have to direct their own future and tha of their children?
	Orraniamia	Chantara	
13	Biology	16-19	Who shares this planet with us?
10	Organismic	Chapters	
13	Biology	16-19	Who shares this planet with us?
10	Organismic	Chapters	
13	Biology	16-19	Who shares this planet with us?
	Organismic	Chapters	
14	Biology	16-19 Chaptora	Who shares this planet with us?
14	Biology	16-19	Who shares this planet with us?

#### EXAM DATES:

Wednesday, September 17, 2008. Bring two sharpened No. 2 pencils.

Wednesday, October 15, 2008. Bring two sharpened No. 2 pencils.

Wednesday, November 19, 2008. Bring two sharpened No. 2 pencils.

FINAL EXAM: Wednesday, December 17, 1:00 – 3:00 PM. Bring two sharpened No. 2 pencils.

#### Information sheet (please print legibly, thanks!):

Name		_BIOS ID number	-
Home town	High school a	attended	_
What year are you? (fresh	nan, sophomore, etc.)	Major	_
e-mail address (Please print this	s address very carefully, exa	actly as you would send a message to yourself.)	
Other UNL activities you a in	re involved		
Do you read any magazine they?	s? If so, what are		
What are the last two book course?	s you read that were not req	quired as part of a	
What museum did you last visit?	visit, and when was that		
Have you taken at least six than English, and if so, wh	semesters of a foreign lang at is it?	guage, or do you speak and read a language other	
Foreign countries you have visited	<u>}</u>		
Reason you are taking this course			
Might you be at all interest	ed, ever, in undergraduate r	research?	
Do you have a scholarship	? If so, what kind?_		

# EXAMS AND QUIZZES

Bios 101 Janovy I-08-09 FIRST EXAM

Choose the BEST answer. Put your name and the words "BS101 First Exam" on your answer sheet, and fill in the mark/sense dots for name (last name first) and UNL student ID number. If you wish to comment on a question, answer it then write on the back of your answer sheet "I answered question #\_\_\_\_\_ with choice\_\_\_\_\_ because . . ." Answer sheets are due at 2:20. Choose the BEST answer.

- 1. A scientific hypothesis is (a) a false statement that scientists try to prove true. (b) a true statement that scientists try to prove false. (c) a prediction that can be demonstrated to be false. (d) a true statement about nature. (e) a prediction that scientists must demonstrate is true.
- 2. What is a null hypothesis? (a) a prediction that there will be a difference between the control and experimental groups (b) a prediction of no difference between experimental and control groups (c) an untestable prediction (d) a prediction that scientists fail to reject (e) a non-scientific hypothesis.
- 3. Which of the following questions are typical of those asked by biologists designing experiments?(a) Were all my original group members identical? (b) How do I measure the qualities present in both the experimental and control groups? (c) Are there some alternative hypotheses to explain my results? (d) All of these questions should be asked.
- 4. If you measured the height of all the people in this room, then made a frequency distribution from the data, what would be the dependent variable? (a) height (b) numbers of people of a particular height (c) number of people in the room (d) mean height (e) any of these.
- 5. In order to do experiments in biology, you will need (a) cooperative organisms that you can acquire.(b) a design that includes a testable hypothesis. (c) a design that should include an alternative testable hypothesis. (d) a means of quantifying your results. (e) All of these.
- 6. In biology, organisms are sometimes considered uncooperative if (a) they evolve. (b) they cannot be easily cultured in large numbers. (c) they quickly multiply if provided with minimal food and water. (d) they exhibit genetic variations. (e) they exhibit superfecundity.
- 7. Superfectundity refers to the observed fact that (a) species have variable traits that can be inherited.
  (b) more individuals are produced than survive to reproduce. (c) environmental conditions tend to determine which genetic variants are most successful at reproducing. (d) environmental conditions produce genetic variants. (e) All of these answers are correct.
- 8. The Darwinian principles most well supported by observations include the following: (a) Species have variable traits that can be inherited. (b) More individuals are produced than survive to reproduce. (c) Environmental conditions tend to determine which genetic variants are most successful at reproducing. (d) All of these answers are correct.
- 9. The statement "If you put a million tons of CFC's into the atmosphere every year for 65 years, the ozone layer will not be changed" can be considered (a) an hypothesis for an experiment with a control group. (b) an experiment involving cooperative organisms. (c) a prediction that cannot be falsified. (d) a testable null hypothesis. (e) All of these.
- 10. The statement "If we burn tropical forests at the rate of 50 acres/minute for fifty years, this act will have no effect on human welfare or global economics" can be considered (a) an hypothesis for an

experiment with a control group. (b) an experiment involving cooperative organisms. (c) a prediction that cannot be falsified. (d) a testable null hypothesis. (e) None of these.

- Paradigms are (a) views about nature that tend to determine acceptable lines of research and acceptable results of that research. (b) predictions that cannot be falsified. (c) predictions of no difference between control and experimental groups. (d) views about nature that lead to untestable predictions. (e) None of these answers is correct.
- 12. A good example of life's uniformity can be seen in the (a) general manner in which nucleic acids are assembled. (b) sequence of DNA nucleotides in various campus plant species. (c) primary structures of enzymes in campus plants. (d) characteristics that distinguish one campus plant species from another (e) None of these answers is correct.
- 13. A good example of life's enormous diversity superimposed on uniformity can be seen (a) in use of DNA nucleotide sequences to construct a phylogeny. (b) in genetic differences between roses and oak trees. (c) in the numbers of different enzymes found in a cell. (d) among students at UNL. (e) All of these.
- 14. Which of the following BIOS101 vocabulary words are you likely to find in the ingredients list of junk food from a campus vending machine? (a) protein (b) lipid or monoglycerides (c) sugar (d) polyunsaturated (e) All of these.
- 15. Which of the following items listed on junk food from a campus vending machine were probably built by cells carrying out dehydration synthesis reactions? (a) saturated fat (b) protein from soy beans (c) starch (d) triglycerides (e) All of these.
- 16. Glycogen and cellulose (a) contain many amino acids. (b) differ in the way their glucose units are linked together. (c) perform similar functions for humans. (d) are polymers whose units are linked by peptide bonds. (e) All of these.
- 17. In order to be an amino acid, a molecule must have (a) a hydroxyl group. (b) both an amine and a carboxyl group. (c) glycerol as one of its parts. (d) numerous peptide bonds. (e) a glycogen subunit.
- 18. In order to be a nucleotide, a molecule must have (a) at least one peptide bond. (b) a nitrogenous base, a five carbon sugar, and a phosphate group. (c) glycerol and a fatty acid. (d) both an amine and a carboxyl group. (e) All of these.
- 19. In order to be a nucleic acid, a molecule must have (a) glycerol and fatty acids. (b) both an amine and a carboxyl group. (c) numerous peptide bonds. (d) nucleotides joined together by their phosphate and sugar groups. (e) None of these answers is correct.
- 20. In order to be a polysaccharide, a molecule must have (a) at least one fatty acid. (b) at least one peptide bond between its monosaccharides. (c) a nitrogenous base and a phosphate group. (d) several sugars linked together in a chain. (e) sugars linked together by peptide bonds.
- In order to be a lipid, a molecule must have (a) at least one monosaccharide. (b) at least one fatty acid attached to glycerol. (c) a phosphate group attached to its alpha carbon. (d) both an amine group and a carboxyl group attached to its glycerol. (e) None of these answers is correct.

- 22. Your campus plants should be using (a) hydrolysis reactions to build nucleic acids. (b) hydrolysis reactions to build polypeptides. (c) dehydration synthesis reactions to break apart polysaccharides. (d) dehydration synthesis reactions to build polysaccharides. (e) dehydration synthesis reactions to break apart lipids.
- 23. If you ate a leaf from your campus plant and digested some of it, what compounds would likely be found in your intestine? (b) amino acids (b) glycerol (c) fatty acids (d) nucleotides (e) all of these.
- 24. A peptide bond occurs between (a) glycerol and a fatty acid. (b) nucleotides in DNA. (c) amino acids in a polypeptide. (d) nucleotides in nucleic acids. (e) All of these.
- 25. The primary structure of a protein would be (a) the sequence of its amino acids. (b) the sequence of its nucleotides. (c) the folding of its polypeptides. (d) the manner in which its nucleotides are joined to glycerol. (e) the number of fatty acids attached to its glycerol.
- 26. The tertiary structure of a protein would be (a) the sequence of its amino acids. (b) the sequence of its nucleotides. (c) the folding of its polypeptides. (d) the manner in which its nucleotides are joined to glycerol. (e) the number of fatty acids attached to its glycerol.
- 27. Which of the following items listed on junk food from a campus vending machine would be broken down by enzymes carrying out hydrolysis? (a) saturated fat (b) enzymes (c) starch (d) tri-glycerides (e) All of these.
- 28. Which of the following items listed on junk food from a campus vending machine would be broken down by enzymes carrying out dehydration synthesis reactions? (a) saturated fat (b) enzymes (c) starch (d) triglycerides (e) None of these.
- 29. What do you know about the cells of your favorite campus plants? (a) They contain numerous membrane-bound organelles. (b) They carry out hydrolysis reactions. (c) They carry out dehydration synthesis. (d) They are eukaryotic. (e) All of these.
- 30. If you did an electron microscope study of the cells in your favorite campus plant, what would you expect to observe? (a) hydrolytic reactions (b) dehydration synthesis reactions (c) nuclear envelope (d) paradigms (e) None of these.
- 31. If you did an electron microscope study of the cells in some squirrel climbing your favorite campus oak tree, what would you expect to observe? (a) smooth endoplasmic reticulum (b) membrane-bound vesicles (c) Golgi body (d) nuclear envelope (e) All of these.
- 32. What do you know about the insects on the leaves of your two favorite campus plants? (a) They form peptide bonds. (b) They carry out dehydration synthesis reactions. (c) They contain nucleotides with the nitrogenous base adenine. (d) Their membranes have lipids. (e) All of these.
- 33. In an electron microscope picture of a eukaryotic cell, in order to identify a mitochondrion, you would look for (a) a sausage-shaped body with internal folded membranes. (b) a stack of flattened sacs. (c) lines of double membranes with dark particles attached to them. (d) a group of circular vesicles. (e) membrane-bound vesicles.

- 34. In an electron microscope picture of a eukaryotic cell, in order to identify a Golgi organelle, you would look for (a) a sausage-shaped body with internal folded membranes. (b) a stack of flattened sacs. (c) lines of double membranes with dark particles attached to them. (d) a group of circular vesicles. (e) membrane-bound vesicles.
- 35. In an electron microscope picture of a eukaryotic cell, in order to identify rough endoplasmic reticulum, you would look for (a) a sausage-shaped body with internal folded membranes. (b) a stack of flattened sacs. (c) lines of double membranes with dark particles attached to them. (d) a group of circular vesicles. (e) membrane-bound vesicles.
- 36. If mitochondrial membranes have the same components as other cell membranes, which of the following groups or molecules would expect to find in mitochondria? (a) phosphate groups and fatty acids (b) proteins (c) carboxyl groups and glycerol (d) All of these.
- 37. What do you know about the nucleotides within the nuclei of two different species of campus plants?(a) At least some of them contain adenine. (b) Their sequences within nucleic acids differ in the order of their nitrogenous bases. (c) They all contain nitrogen and carbon. (d) All of these answers are correct. (e) None of these answers is correct.
- 38. What do you know about the species of campus plants other than the ones you chose as your study plants for the semester? (a) They all have scientific names. (b) They all have sets of environment conditions under which they reproduce. (c) They all have evolutionary histories. (d) They all have related species and native geographical distributions. (e) All of these answers are correct.
- 39. According to the Big Picture in Biology document, which of the following are likely the result of several billion years of Earth's geological and biological history? (a) current location of North America (b) present day distribution of petroleum supplies (c) agricultural economies of certain nations (d) distribution of certain species (e) All of these answers are correct.
- 40. According to the Big Picture in Biology document, which of the following current "hot button" social issues have a major biological component? (a) racism (b) sexism (c) sexual orientation (d) unwanted pregnancy (e) All of these answers are correct.

**<u>NOTE</u>**: Usually I am able to get grades posted on Blackboard by Thursday evening, provided you have filled in the mark sense dots for your name and UNL student ID, and provided the grading center actually sends me a file of the results. If you wrote on the back of your answer sheet, then I will look at those papers on Sunday and change your grade if necessary. Krista and I will begin handing back papers before class on Monday.

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Bios 101 Janovy I-08-09 SECOND EXAM

Choose the BEST answer. Put your name, pad number, and the words "BS101 Second Exam" on your answer sheet, and fill in the mark/sense dots for name and 8-digit UNL student ID. If you wish to comment on a question, answer it, then write on the back of your answer sheet "I answered question #\_\_\_\_\_\_with choice\_\_\_\_\_ because . . ." Answer sheets are due at 2:20. Choose the BEST answer.

- 1. What happens during endocytosis? (a) A cell's environment is taken into the cell. (b) The plasma membrane gets turned inside out. (c) A cellular compartment is formed. (e) Molecules from the environment end up in the cytoplasm. (e) All of these.
- 2. What happens during exocytosis? (a) A cell's environment is taken into the cell. (b) The plasma membrane gets turned inside out. (c) Molecules from the environment end up in the cytoplasm. (d) Fluids are taken into the cell. (e) All of these.
- 3. What happens when a lysosome fuses with an endocytotic vesicle? (a) A cell's environment is taken into the cell. (b) The plasma membrane gets turned inside out. (c) A food vacuole is formed. (d) Anabolic reactions are carried out inside the lysosome. (e) All of these.
- 4. What kind of functions might be performed by a membrane protein? (a) active transport (b) cell-to-cell recognition (c) facilitated diffusion (d) Any of these answers could be correct.
- What happens during active transport? (a) Osmosis occurs. (b) Molecules are moved across a membrane against a concentration gradient. (c) Molecules diffuse quickly from areas of high concentration to areas of low concentration. (d) Catabolic reactions occur. (e) All of these.
- 6. A metabolic pathway (a) consists of several linked enzyme reactions. (b) produces carbon skeletons.(c) may consume ATP. (d) may produce a usable form of energy. (e) All of these.
- 7. When enzyme reactions are linked (a) the substrate of one enzyme is also the substrate for another.(b) both enzymes produce the same product. (c) the product of one reaction is a substrate for the next.(d) one enzyme carries out two different reactions. (e) All of these.
- 8. Assuming your textbook metabolic pathway diagrams are applicable to humans, which of the following could you, personally, make from the ingredients in vending machine junk food? (a) polypeptides (b) DNA (c) cell membrane (d) mitochondria (e) All of these.
- 9. Assuming your textbook metabolic pathway diagrams are applicable to humans, which of the following ingredients in vending machine junk food could you, personally, convert into ATP by way of catabolic reactions? (a) starch (b) cheese (c) citric acid (d) oats (e) All of these.
- 10. If the diagrams in your textbook are correct, a carbon atom that is now part of polysaccharide in a grass seed could easily end up in (a) a McDonald's hamburger. (b) the lipid bilayer of your campus plant. (c) a campus squirrel gene. (d) atmospheric CO<sub>2</sub>. (e) Any of these.

11. According to the anabolic and catabolic summary diagrams in your textbook, which of the following statements is true:

- (a) Carbon from carbohydrates could end up in amino acids.
- (b) Carbon from amino acids could end up in lipids.
- (c) Carbon from amino acids could end up as CO<sub>2.</sub>
- (d) Carbon from amino acids could end up in carbohydrates.
- (e) All of these.
- 12. During which of the following cell cycle phases would a homologous pair of chromosomes be replicated? (a) M (b) G1 (c) S (d) G2 (e) Any of these phases.
- 13. During which of the following cell cycle phases would each member of a homologous pair be visible under the microscope as sister chromatids in a cell that had been stained properly? (a) M (b) G1 (c) S (d) G2 (e) Any of these phases.
- 14. CATTGCGCAAT is a piece of genetic information. Which of the following would be the complementary strand of DNA that satisfies the base pairing rules? (a) CATTGCGCAAT (b) GTAACGCGTTA (c) CTTAGCGCAAT (d) TTACAAGTTGC (e) Any of these.
- 15. If a mutation is a mistake in DNA synthesis that can be passed on to future generations, during which cell cycle phase must that mistake occur? (a) M (b) G1 (c) S (d) G2 (e) any of these phases.
- 16. What eventually happens to the genetic information in sister chromatids of dividing somatic cells in a campus squirrel? (a) It dies. (b) It could end up in baby squirrels. (c) It is replicated during G1 by catabolic reactions. (d) It is replicated during G2 by anabolic reactions. (e) Any of these.
- 17. What eventually happens to the genetic information in sister chromatids of dividing germinal cells in a campus squirrel? (a) It dies. (b) It could end up in baby squirrels. (c) It is replicated during G2 by catabolic reactions. (d) It is replicated during G1 by anabolic reactions. (e) Any of these.
- During prophase (a) chromosomes separate. (b) chromosomes line up across the middle of the cell.
   (c) chromosomes become visible as distinct bodies. (d) the cell actually divides into two. (e) DNA is replicated.
- 19. During metaphase of a somatic cell (a) chromosomes separate. (b) chromosomes line up across the middle of the cell. (c) chromosomes become visible as distinct bodies. (d) DNA is replicated. (e) the cell actually divides into two.
- 20. During anaphase of a somatic cell (a) chromosomes separate. (b) DNA is replicated. (c) the cell actually divides into two genetically identical daughter cells. (d) chromosomes line up across the middle of the cell. (e) chromosomes become visible as distinct bodies.
- During cytokinesis of a somatic cell (a) chromosomes line up across the middle of the cell. (b) the cell actually divides into two. (c) chromosomes become visible as distinct bodies (d) chromosomes separate. (e) None of these processes occur in somatic cells.
- 22. Daughter cells resulting from mitosis (a) are genetically equal (b) have half as many chromosomes as the parent cell (c) have twice as many chromosomes as the parent cell (d) have only one member of each homologous pair. (e) have twice as many sister chromatids as the parent cell.

- 23. Daughter cells resulting from meiosis (a) have only one member of each homologous pair (b) have only one member of each pair of alleles (c) have half as many chromosomes as the parent cell (d) can have linked loci. (e) All of these.
- 24. What happens during meiosis anaphase I that does not happen during mitosis anaphase? (a) synapsis(b) separation of members of homologous pairs (c) cytokinesis (d) DNA synthesis (e) sister chromatids separate.
- 25. What happens during meiosis anaphase II that also happens during mitosis anaphase? (a) synapsis(b) separation of members of homologous pairs (c) cytokinesis (d) DNA synthesis (e) sister chromatids separate.
- 26. The Central Dogma states that in a cell, information "flows" from (a) DNA to protein to RNA (b) RNA to protein to DNA (c) protein to RNA to DNA (d) DNA to RNA to protein (e) none of these answers are correct.

#### NOTE: In the following four questions, "kinds" means different combinations of alleles.

- 27. How many different kinds of gametes would AaBbrr be able to make? (a) 2 (b) 4 (c) 8 (d) 16 (e) 32.
- 28. Which of the following would be one of the gametes made by the individual in question #27?(a) aabbrr (c) Aab (c) abr (d) aRr (e) none of these.
- 29. How many different kinds of gametes would <u>AaDdGg</u> be able to make? (a) 2 (b) 4 (c) 8 (d) 16 (e) 32.
- 30. Which of the following could be a gamete made by the individual in question #29? (a) adg(b) ADG (c) adG (d) AdG (e) any of these.
- 31. What do you know about the loci given in question #29? (a) They are on different homologous pairs of chromosomes. (b) The alleles at those loci probably assort independently. (c) They are on the same homologous pair of chromosomes. (d) Their alleles are replicated during G2 in somatic cells but during G1 in germinal cells. (e) Gametes made by this individual contain both members of alleles at a given locus.
- 32. If the individual referred to in both question #27 and question #29 is actually the same individual organism, then what do you know about the species to which this individual belongs? (a) It has at least 4 different homologous pairs of chromosomes. (b) It can make at least 32 different kinds of gametes. (c) the A and G loci are linked. (d) All of these. (e) None of these.

# For the following questions, let us consider the traits Mendel used in studying his pea plants. Plant #1 is on the left; plant #2 is on the right. The traits are:

Tall stem = $\mathbf{T}$ ; dwarf stem = $\mathbf{t}$	Axial flower = $\mathbf{A}$ ; terminal flower = $\mathbf{a}$
Purple flower = $\mathbf{P}$ ; white flower = $\mathbf{p}$	Inflated pod = $\mathbf{I}$ ; constricted pod = $\mathbf{i}$
Green pod = $\mathbf{G}$ ; yellow pod = $\mathbf{g}$	Round seed = $\mathbf{R}$ ; wrinkled seed = $\mathbf{r}$
Yellow seed = $\mathbf{Y}$ ; green seed = $\mathbf{y}$	

#### The next six questions concern this cross: TtAaPpIiGgRrYy x ttAappIiGgRrYy

- 33. How many kinds of gametes can Plant #2 make? (a) 8 (b) 16 (c) 32 (d) 64 (e) 128.
- 34. Which of the following plants would you use in a breeding experiment to check your answer to question #33? (a) TtAaPpIiGgRrYy (b) ttAaPpIiggRryy (c) TTAAPpIiggrrYy (d) TTAaPPIiGGRrYy (e) ttaappiiggrryy.
- 35. Why did you choose the right answer to #34? (a) Alleles at all the loci assort independently. (b) The offspring phenotypes occur in the same proportions as the kinds of gametes made by plant #2.(c) The genotype you chose has a number of linked loci. (d) Alleles at the loci of the genotype you chose assort independently. (e) None of these answers is correct.
- 36. What fraction of the purple-flowered plants resulting from this cross also will have wrinkled green seeds? (a) 1/2 (b) 1/4 (c) 1/16 (d) 1/64 (e) You can't determine the answer from the information given.
- 37. What fraction of the white-flowered plants resulting from this cross also will have green inflated pods? (a) 1/32 (b) 3/16 (c) 9/16 (d) 1/8 (e) You cannot determine the answer from the information given.
- 38. What do you know about the parents of plant #2? (a) At least one of them had green pods. (b) Both of them could have been tall. (c) Both of them could have been dwarf stemmed plants. (d) Answers (a), (b), and (c) are all correct. (e) You cannot determine the answer from the information given.
- 39. A scientific "fact" is best defined as (a) observations or data. (b) an assertion by scientists. (c) the conclusions resulting from test of a hypothesis. (d) ideas that support a theory. (e) Any of these things could be considered facts for a person writing a freshman biology textbook.
- 40. Which of the following issues requires an understanding of how science actually operates? (a) the consequences of climate change (b) the global supply and use of fossil fuel (c) the economic impact of technological innovations (d) the social and economic costs of illness (e) all of these.

**REMINDER:** Remember that on Friday, October 17, 2008, we will meet in Morrill Hall instead of Henzlik Auditorium. Come in the main north door and meet in Elephant Hall, the large main gallery with mammoth and mastodon fossils. Krista and I will distribute the prompt and you will need to spend the entire class period working on it. We will accept the papers at 2:20. Bring your follow-up writing from the previous week and leave it with us as you come in the building.

# SCRATCH PAPER

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Bios 101 Janovy I-08-09 THIRD EXAM

Choose the BEST answer. Put your name and the words "BS101 Third Exam 08" on your answer sheet, and fill in the mark/sense dots for name and 8-digit UNL student ID number. If you wish to comment on a question, answer it, then write on the back of your answer sheet "I answered question #\_\_\_\_ with choice\_\_\_\_ because . . ." Answer sheets are due at 2:20. Choose the BEST answer.

- The Darwinian principles state that (a) all individuals that are produced actually survive. (b) no individuals of a
  particular phenotype survive. (c) more individuals are produced than can survive in nature. (d) all phenotypes
  are equally successful. (e) selection is mainly against homozygous recessives.
- The Darwinian principles state that (a) natural populations consist of identical individuals. (b) gene pools consist of identical individuals. (c) allele frequencies remain stable for long periods in natural populations. (d) natural populations of a species exhibit phenotypic variation (e) all phenotypes are equally successful.
- The Darwinian principles state that (a) in nature some variants within a species are more likely than others to reproduce successfully. (b) in nature, all variants within a species are equally likely to reproduce. (c) all phenotypic variants are equally likely to survive in nature. (d) all genotypes are equally likely to survive. (e) gene pools are split by selection against homozygous recessives.
- 4. Microevolution is considered to be (a) slight changes in the gene frequencies in a population. (b) slight changes in the phenotype frequencies in a population. (c) a result of selection. (d) a phenomenon that is similar to plant breeding in agricultural research. (e) all of these.
- In a natural population of squirrels, you would expect (a) phenotypic variation. (b) more offspring to be produced than actually survive. (c) the Hardy-Weinberg equilibrium to apply to all loci unless demonstrated otherwise. (d) some selection to be occurring. (e) all of these.
- 6. If you were conducting a research project on the evolutionary biology of squirrels in Lincoln, NE, what would you expect to observe? (a) superfecundity (b) macroevolution (c) evidence for continental drift (d) a reduction in the number of squirrels' toes over time (e) all of these.
- 7. In general, what should the average person know about the Galapagos (Darwin's) finches? (a) They became extinct at the end of the Permian. (b) They exhibit diverse and variable bill structures related to food sources and availability. (c) Most are brightly colored. (d) Darwin found them throughout many parts of the world. (e) all of these.
- Scientists (including Darwin) generally consider that Galapagos (Darwin's) finches best illustrate which of the following phenomena? (a) genetic drift (b) adaptive radiation (c) the Permian extinction (d) the Hardy-Weinberg equilibrium (e) the Central Dogma.
- 9. If you went to the grocery store to study evolution, which of the following would you consider produced by artificial selection using a single original species? (a) cabbage (b) Brussels sprouts (c) cauliflower (d) broccoli (e) all of these.
- 10. Which of the following can be considered the results of an experiment in which humans actually tested a hypothesis regarding microevolution (whether they intended to or not)? (a) drug resistant bacteria (b) pesticide resistant insects (c) broccoli (d) corn (e) all of these.

- Based on your trip to Morrill Hall, what can you conclude about the fossil record? (a) It can reveal behavior of extinct species. (b) It contains information about species that lived as long as a hundred million years ago.
   (c) It reveals diversity of related forms. (d) It shows diversity of homologous structures. (e) all of these.
- If you studied a large series of dinosaur footprints, what might you expect to infer? (a) The number of individuals involved. (b) That natural selection had occurred. (c) The Hardy-Weinberg equilibrium applied to their population. (d) The frequencies of several alleles. (e) all of these.
- Homologous structures presumably (a) have the same evolutionary origin. (b) have the same function. (c) have different evolutionary origins. (d) have different functions. (e) Any of these answers could be true depending on the organisms involved.
- 14. Evidence used to establish homology of vertebrate appendages is derived primarily from (a) radioisotope dating of Permian-age rocks. (b) comparative studies of embryological development. (c) use of the appendages as indicated by Cretaceous and Tertiary fossils. (d) phylogenies based on amino acid sequences of certain proteins. (e) studies of gene frequency changes in populations undergoing selection.
- 15. According to the fossil record, the Cambrian period (a) ended with the extinction of the dinosaurs. (b) began with the extinction of the dinosaurs. (c) was the time most modern animal phyla appeared on Earth. (d) was the time mammals first appeared on Earth. (e) was the time when the first land vertebrates appeared on Earth.
- 16. According to the fossil record, what evidently happened at the end of the Permian? (a) Most of the modern animal phyla first appeared. (b) The dinosaurs became extinct. (c) Vast numbers of species became extinct. (d) Flowering plants appeared. (e) There was a great increase in the diversity of mammals, birds, and pollinating insects.
- 17. The phrase "the Cambrian explosion" refers to (a) the extinction of the dinosaurs. (b) the appearance, in the fossil record, of most of the modern animal phyla. (c) a great increase in the diversity of angiosperms. (d) a great increase in the diversity of mammals. (e) all of these.
- 18. Which of the following pairs of structures would be considered analogous but not homologous? (a) bird wings and insect wings (b) bird wings and bat wings (c) bat wings and horse front legs (d) bird wings and horse front legs (e) all of these.
- 19. Which of the following pairs of structures would be considered homologous but not analogous? (a) bird wings and insect wings (b) bat wings and horse front legs (c) insect wings and horse front legs (d) bird wings and bat wings (e) horse front legs and horse hind legs.
- 20. Evidence from developmental studies indicates that plant leaves can evolve into (a) spines. (b) jaw-like structures that catch insects. (c) structures that mimic flowers. (d) all of these.
- 21. If the frequency of a recessive phenotype in a population is 0.04, what is the expected frequency of the dominant allele for that same trait? (a) zero (b) 0.96 (c) 0.8 (d) 0.64 (e) 0.32.
- 22. If the frequency of the dominant phenotype in a population is 0.64, what is the expected frequency of the recessive allele for that same trait? (a) 0.2 (b) 0.6 (c) 0.36 (d) zero (e) you can't determine the answer from the information given.
- 23. If you know that the frequency of the recessive allele in a population is 0.4, what is the expected frequency of the dominant phenotype for that same trait? (a) 0.32 (b) 0.6 (c) 0.16 (d) 0.84 (e) you can't determine the answer from the information given.

- 24. In a breeding population where you know for certain that only 1% of the individuals are homozygous dominant genotypes, what would you predict is the frequency of the recessive allele for that same trait? (a) 0.99 (b) 0.9 (c) 0.18 (d) 0.1 (e) you can't determine the answer from the information given.
- 25. What do you know about members of the animal family Sciuridae? (a) They are all in the same genus.(b) They are all in different genera. (c) They are all in the same order. (d) They are all in different orders.(e) Some, but not all, are in the same order.
- 26. Two species in the same order (a) must also be in the same family. (b) can be in the same genus. (c) can be in different classes. (d) must also have the same genus name. (e) none of these.
- 27. Which of the following pairs of species do you know are in the same family and the same order? (a) *Poa alpina* and *Tenebrio molitor* (b) *Agropyron desertorum* and *Agropyron yukonense* (c) *Mimus polyglottis* and *Corvus brachyrhynchos* (d) *Asio otis* and *Otis asio* (e) none of these.
- 28. If you used the terms *Hymenolepis nana* and *Hymenolepis dimnuta*, you would be communicating information about (a) a presumed relationship. (b) synapomorphic character states. (c) a presumed monophyletic group. (d) the literary history of names. (e) All of these.
- 29. Two species that are in the same subphylum must also be (a) in the same domain. (b) in the same class. (c) in the same order. (d) in different phyla. (e) all of these.
- 30. Two species that are in different orders can also be (a) in the same domain. (b) in different families. (c) in different subphyla. (d) in the same subphylum. (e) all of these.
- 31. Which of the following structures would you expect to find inside a prokaryote but not inside a member of the domain Eukarya? (a) ribosomes (b) DNA (c) mitochondria (d) all of these (e) none of these.
- 32. According to scientists' best estimates, approximately how old is the Earth? (a) 6000 years (b) 250 billion years (c) 4-5 billion years (d) 500 million years (e) 20 million years.
- 33. According to scientists' best estimates, approximately when did the dinosaurs become extinct? (a) 250 million years ago (b) 65 million years ago (c) 4.6 billion years ago (d) 250 billion years ago (e) within the last 10,000 years.
- 34. If scientists are correct in their interpretation of the fossil record, what event of major evolutionary significance happened during the Cenozoic? (a) the breakup of Pangaea (b) the origin of land plants (c) the origin of most modern animal groups (d) the adaptive radiation of mammals (e) all of these.
- 35. If scientists are correct in their interpretation of the evidence regarding Earth's history, what event of major evolutionary significance happened during the Mesozoic? (a) the breakup of Pangaea (b) the Permian extinction (c) the origin of land plants (d) extinction of wooly mammoths (e) all of these.
- 36. Which of the following would scientists consider the results of macroevolution? (a) new types of garden vegetables (b) different orders of mammals (c) shifts in gene frequencies due to genetic drift (d) phenotype frequencies not predicted by the Hardy-Weinberg equilibrium (e) all of these.
- 37. Which of the following would scientists consider the results of microevolution? (a) new types of garden vegetables (b) drug resistant bacteria (c) insecticide resistant mosquitoes (d) phenotype frequencies not predicted by the Hardy-Weinberg equilibrium (e) all of these.
- 38. How could you test a phylogenetic hypothesis regarding members of a plant family? (a) Use their DNA to construct a cladogram. (b) Use some homologous protein to construct a phylogenetic hypothesis. (c) Dissect

all the species and discover some more structural characters used in a new cladogram. (d) Find some new species of the family to include in the analysis. (e) all of these.

- 39. If *Salsuginus yutanensis* is a described species, then (a) you should be able to find its type locality in the literature. (b) you should be able to find a specimen in some museum designated a type specimen. (c) you should be able to determine why it was given its specific epithet. (d) you should be able to find the published original description. (e) all of these.
- 40. If you were a scientist studying the evolution of Archaea, which of the following would you expect to observe in your research? (a) ribosomal nucleotide sequences (b) radius and ulna (c) cell walls with peptidoglycan (d) sensitivity to antibiotics (e) all of these.
- 41. If an organism had a gene with the sequence ATTGCGTAT, but one of its offspring had the same gene with the homologous sequence ATGCGTATG, what might have happened? (a) selection (b) frame shift mutation (c) inversion (d) non-random interbreeding (e) any of these.
- 42. If an organism had a gene with the sequence ATTGCGTAT, but one of its offspring had the same gene with the sequence ATGGCGTAT, what might be the result? (a) an enzyme would not function properly (b) nothing (c) selection against the offspring (d) an altered phenotype (e) any of these.
- 43. What is the product of the process known as transcription? (a) DNA (b) RNA (c) protein (d) mutation (e) any of these.
- 44. What is the product of the process known as translation? (a) DNA (b) RNA (c) protein (d) mutation (e) any of these.
- 45. If, in an experimental population, you selected against the recessive allele, you would expect the frequency of the dominant phenotype to (a) increase (b) decrease (c) stay the same (d) you can't test your expectations with the information given.
- 46. If, in an experimental population, you selected against the recessive allele in order to test for the effects of selection, your null hypothesis states that after several generations of selection, the frequency of the dominant allele would be (a) higher (b) lower (c) the same as when you started (d) the same as that of the recessive allele.
- 47. Which of the following is most likely to be an effective tool for studying microevolution? (a) the Hardy-Weinberg equilibrium (b) The Central Dogma (c) cladistics (d) paleontology (e) they are all about equally effective.
- 48. Which of the following is most likely to be an effective tool for studying macroevolution? (a) mol-ecular biology (b) cladistics (c) paleontology (d) comparative anatomy (e) all of these.
- 49. Among various phenotypes in a population of a single species, those that are the most fit are (a) the largest (b) the strongest (c) the meanest and most aggressive (d) those that reproduce the most (e) the fastest.
- 50. The biological species concept states that members of a single species (a) can successfully interbreed (b) are reproductively isolated from other species (c) are structurally similar (d) all of these.

#### Exam Self Assessment

For the first exam, I feel that I started the year off very well. Although I missed a few problems, I was able to do a fairly decent job on the exam as a whole. I only missed three problems on the exam, and was very happy about that.

For this exam, I spent most of my time studying the powerpoint lectures on Blackboard. Although I did well on this particular exam, I do not feel that I studied as proficiently as I should have. One thing that helped me do so well on this section of the course was the fact that I was taking Agricultural Sciences and Natural Resources 103 during this semester also. The reason why this helped me so much was because we had been studying almost the same material in both classes up until a point shortly after this first exam.

The two courses were so similar for that stretch of time that I remember reading something in one of the books and looking a picture, and then reading something either the same as or very similar to what I read in the other book. Most of the pictures would be the same as well so I would sometimes wonder if I had already read the section even though I knew that I hadn't. Studying the same material in two classes helped to reinforce the knowledge that I was gaining, and it was able to stick with me longer.

The second exam did not go as well as the first exam had. On this test I missed five problems and was very disappointed in myself. After taking the test I was also surprised when I didn't miss more problems because I did not feel very confident about it when I had finished.

On this test I used the same study habits that I had for the first exam. I went to the study session on Sunday night, and then read over all of the power points on Blackboard. For this exam, I also reviewed the discussion board questions, printed off the questions from the test bank on Blackboard and studied them quite often. However, I did not study for this test as much as I should have because I had already studied more than I had for the last test and I had done well on that one. The problem with this theory was that the material from my Agricultural Sciences and Natural Resources class had helped me prepare for that exam much more than I knew. So although I studied expressly for the exam longer, I did not know the material as well as I should have before taking a test.

Although I missed the same number of questions on the third exam than I did on the second one, and I received a higher grade because there were more questions, I was very disappointed in my results on the third exam. After upsetting myself with my poor job on the second exam, I studied much harder for the third exam than I had for any of the others. When I studied the power points on Blackboard this time, I also listened to most of the lectures. On the Sunday before the test I went to the review session to learn more about what to study for this test, and used my notes as a reference for the rest of the week. I also printed off the practice questions from the test bank and spent much time studying the questions people were asking on the discussion board, and how Dr. Janovy answered them.

Overall, I feel that the tests were decent. I wish that I had started out the semester studying as hard as I did for the third exam. This would have helped me out immensely and I would have received better exam scores. I would also have developed better study habits throughout the semester just as I did, and would have been even better at studying by now than I am already. However, the tests still went pretty well and now I have developed skills and knowledge about how to better prepare for exams in the future.

# FRIDAY EXTEMPORANEOUS WRITINGS

5+1-10

#### Extemporaneous writing – 082908

Name

What are the best things you can do with your two plants to help you achieve science literacy in the next 15 weeks?

The assignment to study two perennials for fiftheen weeks provides a great poppourtunity to become literate of scientific terms. To fully live up to that oppourtunity, I must challenge myself in Many ways.

These challenges will probably begin by the human instinct of Curiosity kicking in. I chose my plants, not knowing without "Perovisikia atriplicifulia" means, or I only knew that it was the scientific name for a Russian Sage plant. Now my curiosity has made me want to look for that information, as well as "information concerning my plants, such as "Does it only grow in Nebraska?" I know that the more my curiosity gets the better of me, the more I will learn about not only my prennials, but also the scientific terms that are used to describe them.

When speaking of curiosity, some people say, "curiosity killed the cat." This popular phrase may be true in some context, but when it comes to understanding more about nature, and our surrounding, I do not feel there could be too much curiosity. Without this Curiousness, there will be no tearning. I know that I will really have to study small details about my plants everyday to keep this curiosity. My gal would to be to ask myself a guestion about my plants each day, and then looking for, the answer. Through the reasearch this will take, I know I will tearn many terms that will help me not only in Biology class, but also in my Science literacy in general.

33

#### Biology 101 082908

The assignment to study two perennials for fifteen weeks provides a great oppourtunity to become literate of scientific terms. To fully live up to that oppourtunity, I must challenge myself in many ways.

These challenges will probably begin by the human instinct of curiosity kicking in. I chose my plants, not knowing what "Perovskia atriplicifolia" means, I only knew that it was the scientific name for a Russian Sage plant. Now my curiosity has made me want to look for that information , as well as other information concerning my plants, such as, "Does it only grow in Nebraska?" I know that the more my curiosity gets the better of me, the more I will learn about not only my perennials, but also the scientific terms that are used to describe them.

When speaking of curiosity, some people say, "Curiosity killed the cat." This popular phrase may be true in some context, but when it comes to understanding more about nature, and our surrounding, I do not feel there could be too much curiosity. Without this curiousness, there will be no learning. I know that I will really have to study small details about my plants everyday to keep this curiosity. My goal would to be to ask myself a question about my plants each day, and then looking for the answer. Through the reasearch this will take, I know I will learn many terms that will help me not only in Biology class, but also in my science literacy in general.

#### Self Assessment for 082908

After reviewing my first in class writing assignment, I feel that I preformed a decent job, but had definite room for improvement. The introduction sets up the rest of the paper by first stating the where potential for understanding lies, and then follows that statement up by responding how I am going to become literate of scientific terms. The opening paragraph could be improved by expanding on my plan to learn about scientific terminology, and possibly stating another option to do this in a way other than challenging myself.

The next paragraph played upon an instinct that every reader can relate to. It was designed to draw the reader in by making them remember something they felt curious about. That task could have worked better if I had added in an antidote about the questions my brain came up with when I started becoming curious about my Russian Sage plant. That antidote would have set up my next point of having learned terms about my plant already. I follow this by adding in a question about my plant to which I want to find the answer. I really like how this paragraph ended, I stated my tool of learning, my curiosity, and finally tied in learning about my plants with the goal of learning scientific terms.

The final paragraph keeps the reader's attention very well as it begins by giving a rebuttal to my argument with a popular saying. I feel that I follow this up with a strong claim that, "when it comes to understanding more about nature, and our surrounding, I do not feel there could be too much curiosity." This statement fits well with the topic because it is essentially the essence of biology, as I have learned in my Biology 101 class that biologists are always asking themselves questions. After this statement however, the paper starts to become a little bit detached, and I really struggle to pull all of my points together into one final sentence.

5+81111 Name

BIOS 101 Writing for 090508

Pick one of your <u>individual plants</u> and tell how it illustrates one of the Big Picture in Biology items. Then tell why the other <u>individual plant</u> is not as good a model for that same Big Picture item as the first one was. It should be obvious from your writing that you are talking about INDIVIDUAL plants.

IF I were to pick one of my plants that shows me are Surrounded by biology, I would say that the <u>Russian Sage</u> plant that is <u>east of the UNL</u> Dariy store on East campus best exemplifies that. This plant always keeps me thinking in biological terms, because of the activity that goes on around it. The Russian sage blooms in the Fall, so right now lavender buds are all over the tendrils of the plant, and thy blue Flowers are emerging. This plant is providing energy for the ecosystem because bees have been thying around the plant for the post two weeks collecting rectar. This reminds me of a <u>food web</u> with my Russian sage goining energy from the sun, bees-getting their energy from the nuctor, and bids entry the bees and so on. All of those things are major components of the biology in the world.

On the other hand, while so much activity surrounds My Russian Sage plant, a few meters to the northeast of this spot lies a Morning Light Japanese Silver Brass plant that seems to have no activity around it. Although I know that this grass is part of biology too. I do not seem to recognize the theme of the workly being surrounded by biology in this plant as I do in My other one. When I look at the Grass, I only see an ornamental plant, and the of This does not spark any instruction in on Food webs cosystems, or how the grass helps the community. This is why I feel that the Russian sage plant better exemplifies a Big Picture theme of biology than my Morning Light Spanese silver grass does.
If I were to pick one of my plants that shows we are surrounded by biology, I would say that the Russian Sage plant that is east of the UNL Dariy Store on East Campus best exemplifies that. This plant always keeps me thinking in biological terms, because of the activity that goes on around it. The Russian Sage blooms in the fall, so right now lavender buds are all over the tendrils of the plant, and tiny blue flowers are emerging. This plant is providing energy for the ecosystem because bees have been flying around the plant for the past two weeks collecting nectar. This reminds me of a food web, with my Russian Sage gaining energy from the sun, bees getting their energy from the nectar, and birds eating the bees and so on. All of these things are major components of the biology in the world.

On the other hand, while so much activity surrounds my Russian Sage plant, a few meters to the northeast of this spot lies a Morning Light Japanese Silver Grass plant that seems to have no activity around it. Although I know that this grass is part of biology too, I do not seem to recognize the theme of the world being surrounded by biology in this plant as I do in my other one. When I look at the grass, I only see and ornamental plant. This does not spark and insight in on food webs, ecosystems, or how the grass helps the community. This is why I feel that the Russian Sage plant better exemplifies a Big Picture theme of biology than my Morning Light Japanese Silver grass does.

#### Self Assessment for 090508

In this writing assignment, I feel that I expressed which of my campus plants best exemplifies a Big Picture in Biology them fairly well, but I could have gone into more detail about how my other plant does not. I really like how my first paragraph states what my campus plant is, a "Russian Sage", and exactly where it is located, "...east of the UNL Dariy Store on East Campus." This enables the reader to find the precise plant that I am speaking of. I go on to jump right into my topic of how the Russian Sage reminds me that I am surrounded by biology. In this paragraph I feel that I do a good job describing the parts of the plant that enable this biological thinking. I also feel that it was nice to include the food web that my plant is in, and how I have seen firsthand this food web in action. I end this paragraph a little lamely by just stating that this is important to biology, but I could have improved this paper by explaining my reasoning on this.

The second paragraph starts out well by setting up the contrast between the biological example to my other campus plant. I also state where this plant is located, and tie back to the activity of life around the two plants. I really love my statement, "Although I know that this grass is part of biology too, I do not seep to recognize the theme of the world being surrounded by biology in this plant as I do in my other one." I follow this by saying how I have not personally seen the grass' food web, or how it helps its' community. I could have gone on to say more about why this plant does not spark biological interest as much as my other plant does. Some things that I could have mentioned are that many grasses are planted around my other plants, and that the grass does not add variety. I can also see why that could be an argument that it shows biology by thinking about how the grasses could have shared a common ancestor in the past. Finally, I tie the whole paper together in a final thesis statement that reviews the paper. BIOS 101 Writing for 091208

Name

Interpret the picture on the screen in terms of the material from your textbook as presented in lecture this week.

The picture shown on the screen depicts a forest of many different trees and bushes. The trees have different colors of leaves, and some are taller than others, while some name fuller leaves.

When I look at this picture, and compare it with the things we covered in class this week, I see that the different trees look different from each other because of the way their DNA is sequenced together. This is what creates difference between all organisms on the planet, just like how the letters of my name create a picture of me in other people's minds. In the picture, moss is growing on the trees, but some of the Moss is green, and some of it is pink. I find this interesting as the pink moss seems to absorb green light as well, and only deflects the redand white light. I wonder what genetic sequence has caused this, and whether it is an adaptation that will help it survive in the long run. I see no animals in the picture, so this means that the way all of the macro molecules in all of the trees should be held together in the Same way. This is wooderful to think about, and more than a little Mind blowing to think that all of the trees in the picture are the exact same in some ways, yet in others they are complete individuals. The A's and T's are I med up in each of those trees, but the way that they are ined up differs in each of them. However, some of the trees are of the same species, so some of their double helixes will be the same, because that is what makes them the same species, but they are still individual tless, and different in many ways.

The picture shown on the screen depicts a forest of many different trees and bushes. The trees have different colors of leaves, and some are taller than others, while some have fuller leaves.

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I see no animals in the picture, so this means that the way all of the macro molecules in all of the trees should be held together in the same way. This is wonderful to think about, and more than a little mind blowing to think that al of the trees in the picture are the exact same in some ways, yet in others they are complete individuals. The A's and T's are lined up in each of those trees, but the way that they are lined up differs in each of them. However, some of the trees are of the same species, so some of their double helixes will be the same, because that is what makes them the same species, but they are still individual trees, and different in many ways.

# Self Assessment for 091208

I found the writing assignment for this week extremely challenging, but also interesting. The part that was challenging was trying to incorporate the concepts from our lectures into the scene presented on the screen. I had trouble doing this because while the picture had many organisms, they were all plants and some of the things I remembered most were not about plants, but animals. The project was interesting in the fact that it got me to look at plants in the terms of atoms, molecules, and polypeptide bonds when I usually see plants as a whole, not just pieces.

I start the interpretation of the picture by stating why the trees look different from one another. I like the inference I made about the sequencing of DNA, and how it is like the ordering of the letters in my name because this example helped me learn about the importance of how things are synthesized. I should have gone on to say that this sequencing is also why they look very similar as well.

Next, I write about the different colors of the moss on the trees, and how, "...pink moss seems to absorb green light as well, and only deflects the red and white light." This is a very good paragraph, but I should have started my paper with this train of thought since the pink moss was the first thing that caught my eye in the picture. I continue on about the pink moss by wondering what sequence caused it, and if it will be beneficial. If I had originated with this idea, I would have been able to expand on these thoughts and base my entire paper on the subject of pink moss rather than skipping around to other subjects in no particular order.

My final paragraph was very weak in that I wrote about many things that I did not quite understand at the time. For instance, not all of the macro molecules will be held together in the same way because some are starch and some are cellulose, which are both found in plants. I finally ended by saying that some of the trees will have the same DNA because they are the same species, which contradicts what I said about individuals having different DNA earlier in my paper.

7-1D

BIOS 101 091908 Writing

Name

Please answer the following question with a full page of writing: What does this film teach me about how I should view my two campus plants?

This film teaches me to view my plants in many different ways. The first of these ways being that my plant has had as many years developing and <u>creating the genes for</u> my plant as the earth is old. The second way I have learned to view my plants is to look at what this tiny plant's role is in the ecosystem, and what it's <u>niche is</u>.

The next, and most prominent thing this movie teaches me is that the plant is part of a huge world. This largeness reminds me to look at my plants an see what Makes them different from all of the other plants on this planet, and also what makes them the Same. It makes me look at my plants and wonder what makes them best suited for this environment, and not the desert, Badlands of South Dakota, or the Andes mountains that are shown on the video. I should look at my plants on the internet, and see where else this species grows, and if I can use this information in tracking the history of how my plant Came to be on the UNL campus.

The Final thing that this movie teaches me is all of mankinds inventions, construction, and technology does more and more to destroy the natural beauty of the world. Even common things like putting in a freeway or a powerplant change the landscape, and destroy all of the plants that were once there. This reminds me to view my plants as if there may now be another plant like this on earth if for some reason all of its habitat is destroyed by the the construction of buildings or other things for human use.

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#### Self-Assessment for 091908

This week's writing assignment forced me to view not only my plants, but the world in a different way. This begins in my first paragraph when I mention how long the genes that form my plant have been mixed and matched to produce the product that I see every day. With this new intellect, I have begun contemplating how long the earth has been in existence, and how a small change in a gene sequence in my campus plant may alter the genetic makeup of future plants. At the end of this paragraph I wonder how my plants fit into their niche, and what each of their niches is. After thinking about this for a week, I feel

that I can say that the niche of both of my plants is to provide energy for the ecosystem, but in different ways. For instance, my Russian Sage plant creates pollen which is collected by bees for food, while grasshoppers are the most common insect on my Morning Light Japanese Grass.

In my second paragraph, I started out very repetitive of the things I have already said in other Friday writing assignments. I was commenting about how the movie shows me that my plant is different than all others in some ways, and different in others. I feel that I should have found something more original to place here instead of making the same comments that always come up. I do however like the topic in the second half of the paragraph about what makes my plants suited for Nebraska and not other parts of the globe. I find the idea of tracking all of the places in which my plants live to be interesting, and could have replaced the redundant comments at the beginning with more information about how different factors of the zone we live in help my plants grow.

In my final paragraph, I find it very ironic that I mention some of the basic arguments of the war about cumulative environmental assessments, the topic I have just started studying in another class of mine. Looking back on this paragraph a week later and a week wiser about the topic, I find it very fascinating to read my own opinion on the matter of destroying the world's ecosystems for a gain in technology or development that was written before I was educated on the issue. Furthermore, I am very glad to see that although I have heard both sides of this issue, I continue to support my opinion that the world's ecosystems are one of beauty, and that we need to do all that we can to protect them while we develop. A+8:12

BIOS 101 I-08-09 092608 Writing

Name

Make an analogy between communications networks and metabolic pathways and describe the conditions under which each of them could evolve, but without referring to the three main Darwinian principles.

Communication networks and metabolic perthusays are similar to each other in that both of them need to have the correct numbers, or shape to work properly. By this I mean that for a communication to occur between two people, in the technological world at least, one must know the correct Sequence of didgets to punch into their phone, or e-mail to speak to another person. Similarly, for one molecule to enter into a metabolic Pathway, it must be the correct shape to fit through.

Another way that communications networks and metabolic pathways are similar is that they are working to accomplish a goal. In the technological world, this goal could be anywhere from asking a friend to go to lunch to Making sure all of a person's employees know what is going on. For the metabolic pathways, the goal is to move molecules accross a membrane to preform different acts. These acts cominge between moving from areas of low concentration to high, to moving food who the cell.

These two networks could evolve in the future, and I believe that it is mevitable that they will. One way that they could evolve is that the specific sequences it takes to preform a connection or transfer could become obsolete. In technology, it would be possible to look up any name and automatically have then telephone number on your phone Without them giving it to you. In the pathways, this may mean that enzyme receptors to would be able to transport any kind of molecule accross a membrane. and change it into the molecule that it needs to be.

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These two networks could evolve in the future, and I believe that it is inevitable that they will. One way that they could evolve is that the specific sequences it takes to perform a connection or transfer could become obsolete. In technology, it would be possible to look up any name and automatically have their telephone number on your phone without them giving it to you. In the pathways, this may mean that enzyme receptors would be able to transport any kind of molecule across a membrane and change it into the molecule that it needs to be. Overall I feel that this paper could have been worded better and that I could have found more ways in which the two things were similar.

# Self-Assessment for 092608

This week's Friday writing assignment was not an easy one. I personally had a difficult time trying to compare communication networks and metabolic pathways because I could not find very many similarities in the two. I also feel that it was hard for me to transform what I actually meant into coherent sentences that made sense in my paper. My first paragraph displays this as I am continually adding in more words to convey my meaning. I feel that I could have stated my meaning in fewer words if I had

said something such as, "Communication networks and metabolic pathways are similar to each other in that both of them need to have specific requirements in order to work properly. For example, a communication can occur in the technological world by entering the correct sequence of digits into their phone or computer." If I had been able to gather my thoughts together, I could have cut those two sentences down by a total of eighteen words and improve my paper at the same time.

My second paragraph is very comparable to the first in that I still could not organize my thoughts together in a logical way. Instead of writing about what goals these networks have, I should have spoke about how they work to accomplish their tasks.

Finally, the third paragraph starts to get straight to the point. I like the ideas I thought of on how technology could evolve, but I should have also added how I feel this would be a very invasive evolution. I also could have added in how most new technology seems to take away one's privacy and that this idea is not very far off of other technological advancements. As for the last sentence concerning the evolution of metabolic pathways, I feel that I should have added another sentence on to state that the receptors would not be for only one type of enzyme such as they are now.

3+7-10

#### BIOS 101 Writing for 100308

Based on your knowledge and experience in biology so far, answer the question: Do any of the current candidates for president or vice president understand the importance of scientific research? Answer the question "yes" and defend your answer, then answer the question "no" and defend that answer.

I feel that to an extent, president and vice presidental anididates do understand the importance of environmental research. I think that the canidates do know how important research is because that the canidates do know how important research is because that the canidates do know how important research is because that the canidates do know how important research is because that the canidates do know how important research is because that the canidates do know that this, new technology and products would not Surface. I know that they are conserved with technology because one of the main issues that is being debated in this election is a universal healthcore plan. If people are not doing research then new medicines, or ways to make old medicines cheaper will not be brought forward, and healthcare will be a burden on the tax payers and the government.

At the same time, I also do not think our canidates know enough about the importance of environmental research. One way to prove this is by looking at the Endangered Species Act. (ESA) Residential anidates McCain and Obama have both been in the sende, Where they could have pushed to reinstate the ESA or make a stronger One. However, the ESA has not been in effect since 1994, and Congress has only looked at the issue once since then. This shows me that not only how presidential canidates not realize how important biological diversity is, but that our Congress is completly oblivious as well. If these people knew that for more research to accur, and for the best possible understanding of our world, we should be working hard to protect all of the species on our planet for this to trappen. This is using I feel that the Presidential and vice presidential canidates do not show enough knowlede of the importance of scientific research.

I feel that to an extent, president and vice presidential candidates do understand the importance of environmental research. I think that the candidates do know how important research is because they know that without this, new technology and products would not surface. I know that they are conserned with technology because one of the main issues that is being debated in this election is a universal healthcare plan. If people are not doing research then new medicines, or ways to make old medicines cheaper will not be brought forward, and healthcare will be a burden on the tax payers and the government.

At the same time, I also do not think our candidates know enough about the importance of environmental research. One way to prove this is by looking at the Endangered Species Act. (ESA) Presidential candidates McCain and Obama have both been in the Senate, where they could have pushed to reinstate the ESA or make a stronger one. However, the ESA has not been in effect since 1994, and Congress has only looked at the issue once since then. This shows me that not only do our presidential candidates not realize how important biological diversity is, but that our Congress is compleatly oblivious as well. If these people knew that for more research to occur, and for the best possible understanding of our world, we should be working hard to protect all of the species on our planet for this to happen. This is why I feel that the Presidential and vice presidential candidates do not show enough knowledge of the importance of scientific research.

#### Self-Assessment for 100308

I found this week's writing assignment to be an important topic to discuss since the presidential election will be taking place in a month. I feel that I did a good job addressing both sides to this issue, but also believe that with changes this paper could have been better.

I like the first paragraph because I state one of the reasons presidential candidates do understand the importance of scientific research. However, I know that this is probably one of the only reasons why our candidates find research important. I should have added into my paper that this is upsetting because the only reason the candidates look into research is for their own gain in government. I could have also stated that the presidential candidates seem to care about scientific research only to earn votes from the scientific community, but do not always have the best interests of scientific investigations at heart.

The second paragraph is excellent in that I use a specific example to explain my beliefs, but is a little off topic as I go off on a tangent. I feel that using the knowledge about the Endangered Species Act that I learned in another one of my classes, I made a good case against the candidates' knowledge of the importance of scientific research. However, I should have also added in the fact that Senator Obama has not been in the Senate for very long, and that the last time the issue was voted upon was in 2005 so he would not have had the chance to make his voice heard. On the other hand, he could have brought the issue before Congress again, but he did not. To make this point not only about one issue, I should have also mentioned how the candidates stand on other issues that involve scientific research instead of just the one. Finally, I feel that I did a poor job summing the paper up as my last sentence only applies to my last paragraph, and not the paper as a whole.

BIOS 101 Writing 101008

3 Jame\_ 1-, 10

Finish the following letter without once mentioning health, agriculture, money, politics, sex, sports, or religion (okay to write on the back; in fact it's advised to write enough on this one):

Dear Mom and Dad,

I know you are thrilled that after spending all that money on tuition, I have just been admitted to Harvard Medical School. However, I'm writing to tell you that instead of going to med school, I've decided to spend my life studying frogs, toads, and snakes because... I find their Study Very interesting. To me, it would be more fun to discover New knowledge about these species than it would be to study to be a doctor. The part of these thosen carrier path that initially drew me in was learning about how reptiles are more closely related to mammals than they are to amphibians. I know! This is shocking information, and definatly not common knowledge. You may be wondering why this would make me want to study these two different classes. The reason is that I find this facinating, and know that with studying both reptiles and amphibians. I would be more knowledgeable about the characteristics, and genetic timelines of many more species than if I only studied humans.

The next reason this carrier path looks appealing to me is because I love the outdoors. You know as well as I do that I would much happier if I worked out in nature than if I were in a hospital all day. I will find much more peace having "patients" be can only look, (and makey bite) me than ones that are angery, pesimistic, and all around rude. I know you may be discopointed that in this desision, but I also know you will be proud of me m anything I do. This path will alow me to achieve the excellence I strive for everyday, and I will be able to research parts of science that are interesting to me at the same time. This will be perfect for me as I will have ample opportunities to make important discoveries for biology in general, and will be able to start working right now. It doesn't even matter that I am inexperienced, I can even begin my proffessional carles this summer by studying, and compleating research at ceader Point in Nabraska. I know that offer you think about

Mom and Dad,

I know you are thrilled that after spending all that money on tuition, I have just been admitted to Harvard Medical School. However, I'm writing to tell you that instead of going to med school, I've decided to spend my life studying frogs, toads, and snakes because I find their study very interesting. To me, it would be more fun to discover new knowledge about these species than it would be to study to be a doctor. The part of this chosen carrer path that initially drew me in was learning about how reptiles are more closely related to mammals than they are to amphibians. I know! This is shocking information, and definatly not common knowledge. You may be wondering why this would make me want to study these two different classes. The reason is that I find this fascination, and know that with studying both reptiles and amphibians, I would be more knowledgeable about the characteristics, and genetic timelines of many more species than if I only studied humans.

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Love Always,

# Self-Assessment for 101008

Besides from the fact that I made several spelling and grammar errors in this week's writing assignment, I felt that I accomplished my goal to a large degree. This assignment was difficult because we were asked to do informal writing for a class. Even though it was hard for me to transition from formal writing to the informal style one would find in a letter, I feel that I did a decent job by thinking of my parents as the only readers of this letter.

In my first paragraph, I like how I still used technical terms to describe why I chose this path for my life. I feel that this shows the knowledge I have already gained about this field, and my enthusiasm to learn more interesting facts. I also wrote with emotion to show that I have strong feelings toward this subject, and that it actually interests me. The final sentence is very helpful because I state an exact reason of why I want to study reptiles and amphibians rather than to just have more fun.

The next paragraph starts out good because I give my parents a more personal reason to except this career choice by telling them something they already know. I also touch on how I do not feel that I would be able to control unfriendly patients at a hospital. Another point that could have been added here is that I do not feel very comfortable in hospitals, and that life would be completely horrible to be in such an inhospitable environment every day.

The last half of the final paragraph is not very well thought out. I do not like these sentences because they all say about the same thing with a few extra facts thrown in here and there. Despite this redundancy, I feel that this letter went well as a whole, and believe that if my parents actually read this, they would fully support my decision.

4-17=11

## BIOS 101 Writing for 101708 Name

Use at least three different exhibits on three different floors to do the writing. Fill both sides of this sheet of paper with an answer to the following question: What are the major lessons that natural history museums are able to teach and why are these lessons essential for a civilized society?

The first exhibit that I chose to exemplify the major lessons notual history musems teach and why those lessons are essentiat for a civilized society. Is the Nomads of the plains exhibit on level two. This exhibit consisted of many artifacts from Notive American tribes such as beaded bags, coarly tools, and clothing. This exhibit teaches people about other cultures that used to live on the ground use walk on everyday. This is an important lesson for people to learn because it allows people to open their eyes exp about cultural diversity in ways that many do not initially think of. The lesson that should fone from this exhibit is that Americans as we think of ourselves toolay, were not the first culture to inhabit this area. It also reminds us that many of us are from immigrant families ourselves. This exhibit should teach us to learn from our mistakes of the past, and not suppress other cultures or beliefs because they are different.

The fact that this ochibit is titled, Nomades of the Plains, begins to show the wrong that imnigrants have done to these native people. The native Americans were not a settled culture, and when we came in and began to push them into secluded areas, we took away not only their land, but their entire lively hood as they used the areas they roamed for everything from finding food to enhancing their spiritual beliefs. This was a major mistake as much cultural diversity was lost when white men began to convert notive Americans to their ways. To tearn from this mistake we must be willing to accept other cultures and beliefs and have that interference is not always the best answer.

I feel that the Mesosoic Gallery on the main level also teaches a lesson to civilized society. One display in this exhibit that I love is a map of the region of the globe where North America now sits, but it is from 90 million years ago. On this map, Nebroska is completely under Water. The other displays in this room are fossils of many different creachers that aburously are not found on our planet today. This exhibit is awsome because it teaches many different lessons.

The First lesson to be gained from this exhibit is that the earth's plotles and land masses ve. The world does not look anywhere close to the same as it did 90 million years ago. and will not look the same as it does now in another 90 million years. Some news articles you hear about are shocked by researcher's findings that North America drifts two inches to the west every year. This should not be such shocking news to people if they had Seen an exhibit Similar to this. If one had seen this type of exhibit, they would Probably attribute this Finding to the shifting of the Earth's plates, and the notion that aur planet is constantly reamanging itself, even if it takes admillion years for it to hoppen,

The second lesson to begained by the mesosoic gelleny is that not only is the dibiotic factors of our planet changing, but the biotic factors are as well. The many fastils of different species of organisms show us now life has evolved over time. These fassils prove that different environmental conditions, like Nebaska being a sea, swill select for creachers that have adaptertions that will best allow them to survive in the worter. Whether these adaptations were firs for swimming, or the sharp jaws of the Plesiosaur. Many things about evolution and adaptations can be learned by our society by seeing exhibits like this, and then be later applied to the science about adaptations that of today's animals that sciendists are uncovering everyday.

The third exhibit that teaches our society a valuable lesson is the African Mammal exhibit in the lower level of the muser. This exhibit details different animals such as Zebra, Lions, cheetah, lepoids, and rhinosources. One may wonder what this exhibit could possibly teach us since these animals are still living in Africa today. However, this display is probably the closest some people will ever get to being next to these animals. Not all of saiety is able to travel to Africa in order to bottor understand the wildlife of different areas. Musem exhibits tike such as this allow people to not only see one animal, or just look at it in a picture in a book, but to see several of the animals from one geographic area lined up together in atual Form.

The lesson society can learn by looking at these enimels is that life on earth is very diverse, but also the same as well. Advally, this exhibit exemptifies the big picture theme of boology that life on earth is great diversity super imposed on uniformity. Anyone can see that the animals in this exhibit are not unes that are found on this continent. The world is Full of diversity, and these creatures alle diverse, towever, it is not hard to see now the zebra resembles a horse, the cheetab a booked. (only bigger and with a tail) The lepoid a partitur that may be found in other states, and the lions the mentain lions that are found in some counties of Nebroska. I really love how this Shows how diverse our world is that it can hold so many species, but many of the species are uniform, they are still very similar in make up to their clusions here on our continent. Although I have outlined there exhibits in this paper, and how they teacheds many lessons, I know that there are rearing in our basens

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The first lesson to be gained from this exhibit is that the earth's plates and land masses move. The world does not look anywhere close to the same as it did 90 million years ago, and will not look the same as it does now in another 90 million years. Some news articles you hear about are shocked by researcher's

findings that North America drifts two inches to the west every year. This should not be such shocking news to people if they had seen an exhibit similar to this. If one had seen this type of exhibit, they would probably attribute this finding to the shifting of the Earth's plates, and the notion that our planet is constantly rearranging itself, even if it takes 90 million years for it to happen.

The second lesson to be gained by the mesosoic gallery is that not only is the abiotic factors of our planet changing, but the biotic factors are as well. The many fossils of different species of organisms show us how life has evolved over time. These fossils prove that different environmental conditions, like Nebraska being a sea, will select for creachers that have adaptations that will best allow them to survive in the water. Whether these adaptations were fins for swimming, or the sharp jaws of the Plesiosaur, many things about evolution and adaptations can be learned by our society by seeing exhibits like this, and then be later applied to the science about adaptations that of today's animals that scientists are uncovering everyday.

The third exhibit that teaches our society a valuable lesson is the African Mammal exhibit in the lower level of the museum. This exhibit details different animals such as zebra, lions, cheetah, leopards, and rhinosourous. One may wonder what this exhibit could possibly teach us since these animals are still living in Africa today. However, this display is probably the closest some people will ever get to being next to these animals. Not all of society is able to travel to Africa in order to better understand the wildlife of different areas. Museum exhibits such as this allow people to not only see one animal, or just look at it in a picture in a book, but to see several of the animals from one geographic area lined up together in actual form.

The lesson society can learn by looking at these animals is that life on earth is very diverse, but also the same as well. Actually, this exhibit exemplifies the big picture theme of biology that life on earth is great diversity super imposed on uniformity. Anyone can see that the animals in this exhibit are not ones that are found on this continent. The world is full of diversity, and these creatures are diverse. However, it is not hard to see how the zebra resembles a horse, the cheetah a bobcat, (only bigger and

with a tail) The leopard a panther that may be found in other states, and the lions the mountain lions that are found in some counties in Nebraska. I really love how this shows how diverse our world is that it can hold so many species, but many of the species are uniform, they are still very similar in make up to their cousins here on our continent. Although I have outlined three exhibits in this paper, and how they teach us many lessons, I know that there are many more lessons to be learned in museums such as these.

## Self-Assessment for 101708

The Friday writing done in Morrill Hall was different because it forced me to look at the exhibits in a museum in ways that I had not before. The outcome of this new way of thinking was very good in some areas of my writing and thought process, but shows no expansion in others. One trend that I noticed is that the more that I wrote, the more the displays opened up new ideas to me and the deeper my understanding of them became.

In my explanation of the first exhibit I can tell from my writing that I was not completely sure of the assignment and how to best answer the question. This appears the most when I list some of the artifacts on display in the exhibit. I feel that this listing was unnecessary for my argument because I go on to say how today's culture and the culture of the Native Americans are so different and how we should embrace all cultural diversity instead of suppressing it. I should have mentioned the displays in that exhibit that showed cultural diversity, such as the one of the Ghost Dance, to emphasize my point more than just recording different items on display. I do feel however, that my second paragraph on this topic shows a better connection with how the display can help society in the future.

My second exhibit discussion starts out almost the same as my first one. Both explanations begin by stating the name of the exhibit, where it is located, and then states a few of the displays in the exhibit. However, I do not mind listing some of the displays during this discussion because I only mentioned two displays, and these were the two on which I based my writing. In the first lesson this exhibit teaches us I like how I was able to relate the information I read about Nebraska once being an ocean to documentaries I remember watching that were disturbed by the drifting of the continents. The second lesson was good because it incorporated the facts that I have learned about evolution and adaptations into how adaptations were tied to aboiotic and biotic factors in the past, and that they probably will be tied to them in the future.

The third discussion was interesting because it provided an outlook of why animals that are still in existence are an important exhibit in a natural history museum. I especially like my second paragraph about this display when I am speaking of how one can learn one of the big picture themes of biology. I feel that I did a good job describing the similarities in African mammals and American mammals, but I also could have went on to describe other features they had that made them different and how these differences help them survive in their specific environments.

I feel that the last sentence should be a separate paragraph than the one I left it in because it is about all of the displays instead of just the last one. I also should have written more to sum up my ideas and tie all of the paragraphs together.

#### BIOS 101 I-08-09 Writing for 102408

Transplant the largest of your chosen plants to a new location on campus. Tell (1) where you are moving this plant, (2) at least three things that you hope to accomplish by this move, and (3) what biological effect this move will have on the community where your plant was formerly located. Number your paragraphs for easy grading.

3+8--11

If I were to move my Russian sage plant to a new location on campus, I would move it to the small garden that is east of both kimbal Hall and Westbrooks. This would be a good move for my plant in terms of landscape design Decause it would add a complementary color of lavender to the monochromatic fushia flowers found there. This would also bring an earthy element into the setting as the Russian Sage is a more native looking plant than the plants found in this garden.

The goals that I hope to action plish by this move are to first expose the people who walk by this site every day to a different type of Faunal Since my plant was originally on east campus, I'm sure that not many people who walk by this section of campus have ever seen this Russian sage plant. I teel that it would be beneficial to everyone to be exposed to both what I call "commercial landscaping" and also the more "natural landscaping" that is characterized by softer tones and native plants and grasses. My second goal would be to Study bow well My plants can fair on a new section of campus. Since I know that honey bees pollinate the Russian Sage, I would be carious to see if there were not any. Finally, my third the city as well, and what would happen if there were not any. Finally, my third goal would be to add color to this area of campus since the flowers that are currently in this garden are dying, and the flowers that are on my Russian Sage are still going strong and producing beautiful Florals.

Florals. (3) The Diological effect this more would have on the community on east campus where my plant used to live would begin by bearing an enormored hole in the Flower bed where it resided. This is because thy plant has spread to take up quite a large area. The second effect would be to hurt the bee population as their main source of food would now be gome. They Would not have my Flowers to continue collecting a nectar for making honey. The other plants around this plant would also be hurt because the Russian sage plant provides shade for lather plants in the flower bed. This shade is essential because these plants cannot be indirect sunlight or else they will wilt. The biological effects would also be a loss of nutrients in the soil next spring as the old growth would not be able to add nutrients to the soil when it deteriorates.

If I were to move my Russian Sage plant to a new location on campus, I would move it to the small garden that is east of both Kimbal Hall and Westbrook. This would be a good move for my plant in terms of landscape design because it would add a complementary color of lavender to the monochromatic fushia flowers found there. This would also bring an earthy element into the setting as the Russian Sage is a more native looking plant than the plants found in this garden.

The goals that I hope to accomplish by this move are to first expose the people who walk by this site every day to a different type of fauna. Since my plant was originally on east campus, I'm sure that not many people who walk by this section of campus have ever seen this Russian Sage plant. I feel that it would be beneficial to everyone to be exposed to both what I call "commercial landscaping" and also the more "natural landscaping" that is characterized by softer tones and native plants and grasses. My second goal would be to study how well my plants can fair on a new section of campus. Since I know that honey bees pollinate the Russian Sage, I would be curious to see if there were bees in this area of the city as well, and what would happen if there were not any. Finally, my third goal would be to add color to this area of campus since the flowers that are currently in this garden are dying, and the flowers that are on my Russian Sage are still going strong and producing beautiful florals.

The biological effect this move would have on the community on east campus where my plant used to live would begin by leaving an enormous hole in the flower bed where it resided. This is because my plant has spread to take up quite a large area. The second effect would be to hurt the bee population as their main source of food would now be gone. They would not have my flowers to continue collecting nectar for making honey. The other plants around this plant would also be hurt because the Russian Sage plant provides shade for other plants in the flower bed. This shade is essential because these plants cannot be in direct sunlight or else they will wilt. The biological effects would also be a loss of nutrients in the soil next spring as the old growth would not be able to add nutrients to the soil when it deteriorates.

#### Self-Assessment for 102408

My performance on this week's writing assignment was probably my worst performance yet. In my first paragraph, I talk about where I would move my plant, and I say I would move it to a small garden east of Kimbal Hall and Westbrook. This for one is not a very detailed description of where I would move my plant. I would have done better to say that I would place it on the south side of the sidewalk; across from the trees and benches so that my plant could have optimum sunlight like it did in its home on east campus. Next I go on to say how this will be beneficial for landscape design, and this is where the paper goes all wrong. Here I drone on about how the current flowers are monochromatic and not native looking. However, this entire point doesn't make any sense because the monochromatic flowers add a sense of order to the landscape, especially with the fall colors of the trees. Furthermore, a plant like the Russian Sage would look out of place in this part of campus because this plant is too natural and not modern like the art in this area.

The beginning of my second paragraph has more or less the same problem as the first. Here, I continue to base my scientific paper on elements of landscape design, something that the prompt is not calling for. However, the next goal in this paragraph finally has some scientific basis. I feel that studying how moving this plant will not only affect the pollination process of the flowers, but also studying how this would disrupt the bees' food source would be something worth noticing, and being curious about. Unfortunately, I move off of this strong point into another weak one dealing with landscape design.

The final paragraph could have been much better if I had placed my thoughts in a logical order. When I talk about the gap transplanting my Russian Sage would bring, it would have helped the paper flow if I had followed this by the point that I make about other plants needing the shade that my plant provides. The next point that I make is redundant because I am talking about the bee population again, however, I feel that this fits in with the topic of this paragraph, and is essential to the discussion. To sum up this paper, I would have to say that I did a very poor job answering the prompt in scientific terms, and would have done better to have thought out a plan of attack before I began writing.

3+1-10

Recently, a major political figure made the following comments during a policy speech:

"the most valuable thing of all is information" and that "early identification of a cognitive or other disorder, especially autism, can make a life-changing difference." However, minutes later, the political figure also criticized certain "pet projects, such as **fruit-fly research**", which are funded through earmarks, and according to this politician are **utterly pointless**.

Given your knowledge of genetics and evolution, explain the fundamental flaw in this statement. In other words, why is fruit fly research important to our understanding of biology? Why do researchers use fruit flies? And why is fruit fly research applicable to human health?

Fruit Fly research is an important element in widening our understanding OF biology because we have been able to learn many things from them, and Will continue to learn much more. Studing fruit flys helps us understand biology because we can preformmany experiements on them to help answer humans of different guestions. Some of these guestions include learning about how traits are passed on to offspring. This is expectedly important information to be gained for medical conditions such as autisim. By learning how genetic material is passed on, we will be better able to see it conditions like autism of something that came from a parent's gene, or a mutation that occurs when two genes are paired.

Researchers use Fruit Flys because they are a very comperative organism This coroperation makes them very rare as most other organisms are not. The Fruit Fly is considered coroperative because they can be easily bred, and can be forced to do almost anything researchers want them to do. This comes in very trandy because one would be capable of studying many different generations of the Fly in a realitively short period of time is the time to be of aread bone for any the fly in a realitively short period of time

All of these things add up to be of great benefit to understanding human health. Researchers could use the information they discover from Fruit Fly research to make medical discoveries in humans. This is because they can learn ideas from their experiments and then apply these ideas to medicine. This helps improve human health because it allows experts to Create vaccines and test them with out risking human lives. This study c. Fruit Flys is a valuable resource to better understand human biology, and biology in general. It is rediculous to think that Someone who is intelligent enough to know the value of knowledge would not understand the importance of the study of Fruit Flys.

Fruit fly research is an important element in widening our understanding of biology because we have been able to learn many things form them, and will continue to learn much more. Studying fruit flys helps us understand biology because we can perform many experiments on them to help answer hundreds of different questions. Some of these questions include learning about how traits are passed on to offspring. This is expescially important information to be gained for medical conditions such as autism. By learning how genetic material is passed on, we will be better able to see if conditions like autism is something that came from a parent's gene, or a mutation that occurs when two genes are paired.

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All of these things add up to be of great benefit to understanding human health. Researchers could use the information they discover form fruit fly research to make medical discoveries in humans. This is because they can learn ideas from their experiments and then apply these ideas to medicine. This helps improve human health because it allows experts to create vaccines and test them with out risking human lives. This study of fruit flys is a valuable resource to better understand human biology, and biology in general. It is ridiculous to think that someone who is intelligent enough to know the value of knowledge would not understand the importance of the study of fruit flys.

#### Self-Assessment for 103108

Besides my many spelling errors, I feel that this week's writing assignment went fairly well. It should be noted that flies is not pluralized by adding an "s" and that cooperative is not spelled coroperative. In my first paragraph, I liked how I mentioned that trait heritage could be learned from

studying fruit flies and how I tied this into the topic of autism. I could have extended that paragraph by listing a few more experiments that could be performed on fruit flies since I mentioned that there are many possible experiments to help learn about biology.

In my second paragraph I talk about how fruit flies are cooperative organisms. I like this point because it is true that very few other organisms can be bred so easily in such a short period of time. However, I should have mentioned also that fruit flies are studied because they, like humans, carry their female genes on the "X" chromosome and their male genes on the "Y" chromosome. I could have gone on to say that it would be possible for researchers to make parallels between fly sex linked characteristics and human sex linked characteristics.

My third and final paragraph is good because I revisit the subject of research benefiting medicine. I feel that this was an important point to make because our politicians are always promising better healthcare, but not promoting the research that would make that healthcare feasible for this country. I feel that I should have also added in the fact that without fruit fly research, much of the information we now have concerning autism would not be present. Leaving this information out was my biggest mistake for this paper because the prompt ties directly to the necessity to learn more about autism that this politician promotes, and the importance of studying fruit flies which the politician so ignorantly dismisses. Finally, I like how I summed up the theme of my paper into the last sentence.

5/1

BIOS 101 Writing for 110708

Name

Pick one of your campus plants. Fill in the scientific name (in the correct format), then list nine (9) different changes in that plant that YOU PERSONALLY HAVE OBSERVED since the beginning of the semester.

Scientific name Perovskia atriplicifolia

1. <u>T</u>	e flo	wers	00	the	stems	have	opened	Fully	snee
the	First	wee	≥K.				•	-1	

- 2. Honey bees have stopped pollingting my plant now that it has grown cold.
- 3. After the first frost my plant had a withered look; almost burnt.
- 4. The Flowers have stopped blooming and are falling off of my plant.
- s. The leaves of the Russian Sage are turning brown and falling off.
- 6. the stems are dranging from a grun color to a grey color,

My plant had grown taller from the first week of the semoster.

8. The Russian sage has stopped growing both and Fuller.

9. Now my plant looks a little shabby and is not held together as well as it was before.

Scientific name Perovskia atriplicifolia

1. The flowers on the stems have opened fully since the first week.

2. Honey bees have stopped pollinating my plant now that it has grown cold.

3. After the first frost my plant had a withered look; almost burnt.

4. The flowers have stopped blooming and are falling off of my plant.

5. The leaves of the Russian Sage are turning brown and falling off.

6. The stems are changing from a green color to a grey color.

7. My plant had grown taller form the first week of the semester.

8. The Russian Sage has stopped growing both taller and fuller.

9. Now my plant looks a little shabby and is not held together as well as it was before.

#### Self-Assessment for 110708

This writing assignment was very interesting because it made me review all of the observations I have made about my plant over the past two and a half months. On the first line where I was asked to write my plant's scientific name, I looked through my notebook for the name that had looked up for my

plant the week I started observing it. This alone helped me complete the writing because it caused me to look at other notes I had made about my plant at that time, and I was then able to compare how my plant looks now to that.

The hard part of this assignment was thinking of what changes had occurred in my plant. I would compare this to watching a little kid grow up. If you see the child every day, you do not notice the little changes in that child making them taller or stronger and so on. However, when one has been away from the child for a long time, the growth that has occurred during their absence is apparent. This is why it was hard for me to really notice the changes in my plant until I actually thought about what my plant looked like the first time that I saw it and several other times throughout the semester. By seeing it every day I was unable to notice the small changes that had been occurring the same way parents sometimes wonder how their children grew up so fast.

Finally, looking back at how my Friday writing looks on a typed page I wish that I had written more about the changes my plant has gone through. None of my points take up an entire line, and they are all only one sentence long. This writing would have been more beneficial to me if I had gone into greater detail about the changes in my plant because that would have made me think harder about my plant. I also would have benefited from that detail later in the semester when I look back through all of my writings about my Russian Sage plant and try to view an overall picture of my plant's life cycle for five months of the year.

3+8-11

Name

#### BIOS 101 Writing for 111408

Based on your experience of finding a scientific name for one species of arthropod (insects, crustacean, spiders, etc.), as suggested in the e-mail sent November 13, explain to the proverbial "Joe Sixpac" and "Hockey Mom" or "Soccer Mom" why it is important for their kids to know and use real scientific names of local plants and animals.

It is important, Soccer Mon, to teach your children to use the real scientific mames of the plants and animals in their local Community. Not only will this help your children grow intellectually, but it will allow them to be more understanding of science and bidgy in general. The first way for your children to begin this task of using scientific names on a day to day basis is to start asing these names yourself.

The use of Scientific names will help botts you and your kids learn how species are inter-related. By knowing the species genus and Specific epithet, they will be able to tell if two of the insects they see every day are related or not. This is important so that you and your Children can learn that just because things look similar to each other, they are not nessisarily as closly related as they may think, and this will help them determine relationships.

It is also key to use scientific names while having intelligent dissensions because it will also for everyone to know what species one is talking about. For example, a butterfly has many different species, and many of those species have different common names. However, if one were talking about a Danaus <u>plexippus</u> to a group of people, they would know that the person was talking about a Monarch butterfly. or whatever common name they use. They would then understand why you were talking about migrations when speaking about this species because it is common knowledge that this species does migrate thousands of mixes all over the globbe every year.

All of these reason bourley touch base with all of the advantages inv children yourld receive from using scientific names of species, There is a whole world of knowlege out there to be rearned and it is important that you start them young. This is why I unge you to encourge your children to more use scientific names of species of both Plants and animals.
### Biology 101 111408

It is important, Soccer Mom, to teach your children to use the real scientific names of the plants and animals in their local community. Not only will this help your children grow intellectually, but it will allow them to be more understanding of science and biology in general. The first way for your children to begin this task of using scientific names on a day to day basis is to start using these names yourself.

The use of scientific names will help both you and your kids learn how species are inter-related. By knowing the species' genus and every specific epithet, they will be able to tell if two of the insects they see every day are related or not. This is important so that you and your children can learn that just because things look similar to each other, they are not nessisarily as closely related as they may think, and this will help them determine relationships.

It is also key to use scientific names while having intelligent discussions because it will allow for everyone to know what species one is talking about. For example, a butterfly has many different species, and many of these species have different common names. However, if one were talking about a <u>Danaus</u> <u>plexippus</u> to a group of people, they would know that the person was talking about a Monarch butterfly or whatever common name they use. They would then understand why you were talking about migration when speaking about this species

#### Self-Assessment for 111408

In my first paragraph of this week's writing assignment, I really like how I told the Soccer Mom that I was conversing with that the best way to encourage her children to use the scientific names of species is by using them herself. I feel that this was a very good point to make because parents are a child's first teacher, and children learn many habits from their parents because they mimic everything that they do. I should have expanded more on this subject and gave the Soccer Mom these reasons. I also like how I was not only encouraging the mom to help her children learn, but also encouraging her to learn as well. The next paragraph makes a good point about how two animals that look the same or similar are not necessarily the same species, or even related very closely. In this section, I should have brought up the example of the *Limentis archippus*, or the Viceroy butterfly, and how it mimics the *Danaus plexippus*. This is one example where the two species look very identical, but as one can see by looking at their genera, they are not even in the same genus. That would have been a great example to help convince this Soccer Mom to use the scientific names of both plants and animals, because it would prompt her to look for information about how one can tell the difference between the two species of butterfly.

Using that example would also have helped me to incorporate information about my insect, which was the *Danaus pleippus* into my paper because I found this to be the most challenging task. If I had more time to think about how I could use my species as a reference for every point I made about using scientific names, I would have done a much better job on this assignment, however I still should have been able to add a few more details about my insect into the paper regardless.

# BIOS 101 – Friday writing assignment for 112108 and 120508:

In contrast to the Friday writings you have done so far, your next two weeks' writing will be done outside of class and turned in on Monday, December 8. Here is the assignment, along with the specifications:

- (1) Spend at least one hour in the Sheldon Museum of Art collecting the information and observations needed to write this paper. Use at least four different pieces for your essay, and choose pieces from at least four of the upstairs galleries or the downstairs Charles Rain Gallery and/or print study room. *You will be allowed to take only a pencil and a notebook into the galleries.*
- (2) Answer the following questions, using your original observations:
  - a. What kinds of biological materials and images do artists use in their work?
  - b. What narrative role(s) do these images play in the works of art?
  - c. Given the narrative roles you gave in (b), could your campus plants have served in this capacity just as well as the biological materials used?
  - d. What have you learned about the perception we have of nature from doing this exercise?
- (3) You may do this paper with one other individual from our class. If you do it with a partner, then you need to turn in only one paper, but with both names on it.
- (4) The paper itself must be at least three pages of double-spaced typing with one inch margins, but no more than five pages. Provide a list of the works and artists on a separate reference page, using the format (a fake example, but in the right format):

Smith, J. C. 1900. American dream. Watercolor, 12 x 16 inches.

- (5) Make this essay a particularly spectacular one, with great conceptual and intellectual insights, and apply all of the lessons you have learned so far this semester from self-assessment to make the preparation absolutely perfect, both grammatically and stylistically.
- (6) Your paper will not be graded unless I get the form below, filled in, from the Sheldon security staff. Fill it in on your visit and leave it with the security desk.

BIOS 101 writing exercise 112108 and 120508:			
Name(s)			
Date visited the Sheldon	Time arrived	Time left	

Sheldon security: please give this form to the Curator of Education. Thanks! John Janovy, Jr.; Biological Sciences

#### Biology 101 120508

The Sheldon Museum of Art has many artistic displays that have shown me that biology is all around us. Not only was this a unifying idea in many of the works that I saw there, but it was shown through the mediums the artists used to create art.

The first way in which this was shown was not only the biological images used in the artists' works, but also the materials that they used as well. The first piece that caught my eye was *Flowers on the Wall* by James Surls. This piece consisted of ten large flowers that were hanging together on the wall. These flowers were made out of wood, and held together by steel. This was an interesting concept because the focus of the piece was the beauty of flowers, but they were made out of a tree that in its self would have been beautiful.

*Floral Still Life (Zinnias)* by Martha McKelvie was another piece that featured flowers as its main subject. This painting was different than the other piece though because it was not made from any biological materials. Another painting, *Seacoast, Cape Cod* by Ernest Lawson, was of a seacoast and used the land to tell its story. In this painting, the biological materials seem sparse. The land has only prairie grasses and a few short trees and shrubs.

Another piece used biological materials as well, but unlike the art mentioned before, this one was a person's face sewn into a big piece of fabric. *Greed* by Tania Candiani is different because it uses human biology rather than plant biology. It did, however, used a plant to create the work because the stitching was made from cotton thread.

The narrative roles that these previously mentioned artistic works play are numerous, and very different. For example, the piece of the face sewn into the canvas seems to say that much can be said about emotion through facial expressions. This work only shows the person from the tip of their nose to their neck and their mouth is open. The reason the work narrates how much facial expression is used to determine emotion to me is because immediately after viewing the piece for the first time I started trying to figure out what emotion the person was undergoing. Was he laughing, shouting, singing, or talking? I

realized that humans used facial expressions to understand emotion, but that emotion cannot be entirely understood if one doesn't know the context of the emotion.

While the two pieces featuring flowers are different, they both offer similar narratives. To me, both of them say that nature is beautiful, and that we need nature in our lives to feel at peace. In *Flowers on the Wall*, the artwork reminds me of something that would be found in the living room of a fancy house. It seems to say that everyone needs to see flowers every once in awhile because they make people feel better. The piece is very cheery and would be great for someone who is a little depressed to come home to. In *Floral Still Life (Zinnias)*, the vase full of cut Zinnias in the painting could be a vase sitting on anyone's kitchen table. This tells me that as humans we want to bring the beauty of nature indoors to enjoy it as much as we can.

*Seacoast, Cape Cod*, also seems to tell a story. To me, the painting says that this seemingly quiet little place is actually teeming with life. Although the only life actually seen in the picture is a few bushes and prairie grasses, I see the ecosystem that this picture provides. The coast offers a perfect place for seagulls and other birds to hunt and the prairie grass would not be only grass, but also many different animals and insects. Finally, the last thing that tells me there is life in this little place is the fence that surrounds areas in the picture. This fencing tells me that cattle or some other domestic animal is being raised on this land.

Given these narrative roles, I do not think my Russian Sage plant or my Morning Light Japanese Silver Grass could have served in this capacity as well as the biological materials used in the pieces. First, the piece that says to me that it is human nature to use facial expressions to figure out emotion would not be able to be expressed with either of my plants because they are plants not animals.

The still life painting would not serve its purpose as well as it does now if either of my campus plants were cut and placed in the vase. This is because my plants are not plants that one would think of as indoor decoration. Similarly, they would not be able to show how much people draw on nature to make them feel tranquil in the piece that was made out of wood and steel because it would not be as easy for people to recognize what my plants are if they were as sculpture like that of the flowers. However, it works well with the daisy type flowers because it is an easily recognizable shape.

The exception to my plants not being able to play the narrative roles would be the seacoast painting. In this painting the vegetation on the land is very similar to that of my campus plants. Therefore, if my campus plants were substituted in for some of the plants in this picture, the viewer would still be able to understand the meaning of the painting just as well as they could before.

From completing this exercise, I have learned that everyone perceives nature in different ways. Not only the pieces of art that I focused on in this assignment but also other artwork at the gallery have shown me that some people look at nature in many different ways. Some people view nature as a part of life, one that they live with everyday, and sometimes they take the beauty of it for granted. Yet others only look at the beautiful side of nature and do not see how it can be beneficial to us beyond just beauty.

This exercise has also taught me that many people view nature in art differently. So much of one's perception of art comes from their emotions. The first time that I looked at these pieces I thought one thing about them and interpreted them one way. Then the next time that I went back to review what point the pieces were trying to make I was surprised to find that I was thinking about these artworks differently than I originally did. Not only did I change my perspective on the artwork from the first time that I looked at them to the second, but my observations of them were ever changing.

# References

- Candiani, T. 2002. Greed. Acrylic, graphite, fabric sewn with cotton thread.
- Lawson, E. 1915. Seacoast, Cape Cod. Oil on canvas.
- McKelvie, M. 1947. Floral Still-Life (Zinnias). Oil on canvas.
- Surls, J. 2006. Flowers on the Wall. Steel, cherry wood, base wood.

### **Overall Writing Self-Assessment**

Looking back on all of my Friday writing assignments as a whole, I would say that I did a very good job on them. Of course, some of my writings were not what I would call great, but the important part of that fact was that I learned a little bit each time I re-read what I had written. Even though the assignments usually took me the entire time given during class and quite a bit of out of class time, I enjoyed them.

At the beginning of the semester, I was not very good at these writings, and really did not have a clue about how I should go about assessing my writing. As the semester progressed, however, I became much better at this and able to assess the writings deeper than I would have thought possible. As a result of this, I then became better at doing the writings satisfactorily when I wrote them. If one were to look back through my writings in the order that I wrote them, they could see this change progress by just looking at how much I wrote and the size of my writing.

As the semester progressed, I was better able to talk my way through what I actually meant to say while I was writing and was then able to delve into different ways of thinking about many of the prompts than I actually started out writing about. This was very cool because it made the writing more interesting because it was basically my first thoughts about a new way to look at some issue. It was also very hard for me to assess because many times the beginning of my paper set the path the paper would take differently than what I actually ended up writing about. Then when one read the paper, it appeared to be disjointed.

One thing that would have helped me on these assignments that I wish I would have learned was how to work faster. Every week I would spend precious time sitting to think for a minute about how to best answer the prompt. Then I would carefully choose the words to my opening paragraph to make sure that it introduced what I would be writing about. Next, I would continue on at that pace writing about the prompt and mentally preparing ways to support my viewpoints in the following paragraphs. Then once I was about halfway down the page I would look up at the clock to see that I only had about five minutes left to finish the writing. In a frenzy to make sure that I finished the assignment on time and get

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everything said that wanted to make a point on I would begin writing very fast. One can see where this begins on my papers because it is where my penmanship becomes sloppy and larger due to the speed at which I am writing.

Learning to work quickly would have enable me to write better because I would then have been able to make every supporting point appear in my papers instead of just the ones I had time to write about. Although it is true that I wish I would have learned this skill, I did acquire many others through these writing assignments. One of these skills is the ability to look at different things beyond the way many people view them and look at them in terms of biology. I definitely think that Dr. Janovy was right in saying that it would be impossible to look at art, plants, animals, or things in a museum without thinking about them in terms of biology again. This skill has become a very interesting one to have acquired because I now see many different things when I look at the world around me. This has also allowed me to make the connections with things that we have learned in class and things that I see every day. This is one thing that has shown in a few of my writings as I have associated concepts such as evolution to things such as the plants on campus.

Overall, I feel that the writing assignments in this class went very well and that I was able to grow and progress in my writing and way of thinking very much in this short time frame. Although I originally disliked this assignment, I now feel that it was a very worthwhile endeavor.

# **BIOS 101 Feedback #2:**

Now that I've read several hundred pages of your writing, it's time to pass along some general comments that may be of help not only during the rest of the semester, but also in other classes as well as in your employment beyond graduation.

### Word usage:

Below are some words that often are used incorrectly in student papers. Use these words correctly and you will get better grades than if you use them incorrectly.

*it's* = it is, not the possessive pronoun (e.g., It's a red car).

*its* = the possessive pronoun (e.g., The red car had its oil changed.)

*their* = the possessive pronoun; *there* refers to a place (e.g., They took their cars there to get the oil changed).

*a lot* – Alot is not a word; a lot is two words (e.g., "I like my red car alot." is not a sentence; "I like my red car a lot." is a sentence but not a very literate one.)

*your* = the possessive pronoun (e.g., I like your red car.)

*you're* = you are (e.g., You're going somewhere in your red car.)

- *amount* = a word that refers to quantities that you measure with weight and volume (e.g. Your red car saves a small amount of gasoline compared to my old truck.)
- *number* = a word that refers to discrete quantities that you count (e.g. Your red car has a low number of miles on it, even though it has a large amount of space in the trunk.)
- *went* = the simple past (preterite) tense of *to go*. (e.g., The red car went around the block three times before the driver realized it had a flat tire.)
- *have gone* = the present perfect tense of *to go*. (e.g., I have gone to the grocery store in your red car. See http://en.wikipedia.org/wiki/Grammatical\_tense#English\_tenses for examples of

usage. The use of "have went" either in spoken or written English is a glaring mistake.)

*wrote* and *have written* = See the same comments as for went and have gone above.

*since* = a reference to time. (e.g., It has been a year since I had the oil changed in my red car.)

- *because* = a word to refer to a reason or cause. (e.g., Because it had been so long since the oil was changed in my red car, the engine exploded.)
- *while* = a reference to time (e.g., I had to wait two hours while the guy tried to change the oil in my red car.)
- *although* = a word to indicate an alternative or comparative situation (e.g., Although I had to wait two hours while the guy tried to change the oil in my red car, he did a pretty good job of telling me about Husker football while he worked.)
- *whereas* = a word that can be used in many of the same contexts as *although*; i.e., as a replacement for *while*.
- *research* = a word that is best used as a noun (e.g., I'm going to do some research on why red cars are more popular than blue cars.)
- *study* = a word that can be used as either a noun or a verb (e.g., I'm going to study that Department of Transportation study about the safety of red cars.)

Remember that this weekly writing activity has four pedagogical goals: (1) To teach you to see and use biological materials and information in contexts outside the classroom, i.e., in your everyday life; (2) To provide an opportunity for earning points toward a letter grade in ways other than multiple-choice

exams; (3) To develop scholarly habits that will pay off throughout your academic career and beyond; and (4) To encourage you to start placing serious value on your own creative work. For Krista Major and I, who end up reading this writing, there is the additional goal of trying to extract something original and interesting from a generation that is, or at least seems to be, increasingly homogenized by a number of powerful social/cultural forces. Thus the process is far more important than the product, even though the subject remains biology (as it should for a class such as ours).

Some of you are able to find quite a bit to say about the prompts, others struggle just a little bit. If you are one of those people who are struggling to find enough words to fill up a page, I strongly suggest thinking about biology, about the implications of what you are seeing and learning in class, and noticing such biological materials as campus vegetation. Finding words is one of those individual and free activities; anyone can do it, but we all have to devote some time and intellectual energy to the task if we are to be successful. This technique of simply thinking about the subject matter, asking about the meanings of whatever you have been reading or studying, and imagining yourself writing on some strange prompt, works for all classes, not just BIOS 101.

From your instructors' perspective, the follow-up writing seems to be working like it's supposed to in a large number of cases. The idea behind this follow up is to teach you to see your own writing in a way that gives you the power to modify it, make it accomplish whatever you want to with it, and to empower you a little bit. Remember that in the United States, formal English is the language of commerce, and skill with this language will greatly enhance your ultimate chances of success in life, at least if you remain in this country.

A large number of you (especially the guys) have absolutely abominable handwriting. I really do encourage you to work on your penmanship, regardless of what you see up on the document camera when I write during class. That penmanship will make a major difference in your grades in any course where you have essay exams actually taken in class. Remember that there may be several kinds of marks on your pages. Anything that is underlined (by me or Krista), set off in brackets, checked, or starred is interesting and probably worthy of expansion. Anything that is circled is probably something you need to correct, usually grammar.

You may have discovered that I've started giving a few extra points now and then for particularly well-done papers. These extra points, usually an 8 instead of 7 on the follow-up, are typically for the self-assessment and always indicate that the student has provided some depth and insight well beyond that of the other students. I have asked some students if they are willing to have their work posted on Blackboard, and if they agree, then I strongly recommend reading the posted examples. If you have been asked to provide such papers, and have agreed to do so (anonymously or otherwise) then I greatly appreciate the contribution. I don't always get them up on Blackboard as quickly as you might want, but eventually there will be examples for much of the writing we have done this semester.

--JJJr

# BIOS 101 – Writing feedback, 092308

Here are some comments about your Friday extemporaneous writings and follow-ups to date:

- (1) As indicated on Monday, your writing has improved considerably from the first week, and I am very impressed with your insights and your willingness to engage in this "contract work." Many of these papers are very well done and I have asked a few students for permission to post their work, anonymously, on Blackboard. I am particularly impressed with your follow-up self assessments; you are focusing on both the strong and weak points in your own writing, and in particular you are trying to anticipate the Friday prompts by acquiring biological vocabulary and concepts that might be useful. The challenge for me, of course, also as said on Monday, is to keep the prompts at least somewhat applicable to the subject, but not to make them so strictly scientific that your papers are boring to read. I haven't read the KOYAANISQATSI follow-ups yet, of course, but the GOTHIC FOREST ones were great.
- (2) Please pay particular attention to any marks or notes on your papers. Krista and I tend to read these papers very quickly, but we also try to make some kind of marks on all of them. Remember that underlines, brackets, checks, and stars are "good" in the sense that they represent phrases, observations, or insights that catch a reader's attention, so it's probably worth while to ask yourself why those marked sections stood out on a typed page. Circled words, phrases, or sentences are ones that would need to be corrected if you were doing the papers again.
- (3) The vast majority of you are giving us the follow-up papers in correct format and arrangement: your original Friday hand-written page, your double-spaced typed version, and your double-spaced self assessment, all stapled at the upper left corner. We greatly appreciate your doing this fairly simple task. On the plus side, this format also ensures that two people will look over your extemporaneous writing, although so far Krista has been grading the hand-written pages and I've done the rest.
- (4) Regarding common grammatical and stylistic errors, in your last set of papers many of you failed to use the possessive "week's" when referring to your own writing, using instead the plural "weeks." Also, remember that the words "number" and "fewer" refer to items you count, whereas "amount" and "less" refer to stuff that you measure or weigh. Similarly, "since" and "while" refer to time; "because" refers to causality; and, "whereas" and "although" refer to alternate situations or insights. Remember that grammar and style provide great opportunities for outwitting college professors.
- (5) As of 092308, the maximum number of points available for extemporaneous writing is 33, although in a few cases I've given an extra point or two for exceptional insight, judged subjectively, of course, but those papers were really interesting to read and displayed a lot of depth in thinking and analysis. The frequency distribution of writing grades is: 136 students have 30 or more points, 43 have between 20 and 29 points, and 20 have 19 or fewer points.
- (6) <u>PLEASE pick up your papers</u>. You will need all these papers for your portfolio at the end of the semester.

Again, thanks for your efforts. - JJJr

#### Feedback on your 092608 writing:

This prompt was the one in which you were asked to draw an analogy between communications networks and metabolic pathways, then present some ideas about how each could evolve, but without invoking the Darwinian principles. The Darwinian principles are (1) superfecundity, (2) genetic diversity, and (3) variable reproductive success based on inherited traits. In order to write easily about this prompt you needed to remember something about the metabolic pathways we discussed in lecture the previous two days, especially the fact that such pathways involved linked reactions, and you needed to be able to define or describe a communication network. I thought the prompt was a reasonably challenging one, rather like something you'd see on a doctoral written comprehensive exam (although in such an exam the student would probably get half a day instead of 15 minutes).

Most of you actually did a pretty good job with this prompt, although you were highly critical of yourselves and often stated that you didn't have any idea what to write about. Then, having stated that, you went ahead and gave me a valid example of both a pathway and a network. So I found myself thinking, paper after paper of your self-assessments, "this student is really doing pretty well, given the difficult nature of this prompt, and he/she should perhaps be a little more forgiving or his/her own work." And a few of these papers were extremely well done, with serious and mature thinking.

I was a little surprised that some of you indicated you didn't know what a communication network was, or had trouble defining one. Remember that you are living in a world that is characterized, at least in the human aspects, by rapid and multi-faceted communication. I would probably define a communication network as a set of linked mechanisms for transmitting information, step by step, with a particular step being dependent on the one immediately preceding it. Imagine an event happening, being recorded by a video camera, relayed to a station, edited for the evening news, then imagine yourself telling a friend about that event as you saw it on a television news program. This sequence involves step by step transformation of information, in a manner similar to the step by step transformation of carbon skeletons in a metabolic pathway, with each step dependent on the prior one; thus we can draw the analogy. A number of you used cell phones and the Internet to develop a similar scenario.

The evolution part of the prompt seemed to be a little more challenging, but a few of you came up with excellent ideas. In essence, before evolution can occur, something has to happen that alters the way the network and/or pathway functions. That "something" can be new technology, a permanent change in the direction that information flows, permanently altered ability of some enzymes or news sources to "capture" their respective substrates, and products that are derived from ancestors but perhaps function differently from those ancestors either in the realm of human communications or in the realm of nature. I asked for you to avoid the Darwinian principles for a variety of reasons, but mainly because I hoped you'd focus on mechanisms of change at the lowest level: altered polypeptide primary structure due to mistakes in DNA replication during gametogenesis, and new technology (for the networks).

Admittedly, the prompt was a little bit of a stretch, but remember that it's the process I'm working on, not the product. For fourteen weeks this semester you will be asked to *use* your biological knowledge in unanticipated ways, just like you will be asked to do long after you graduate from UNL.

I noticed that there were not very many marks on your hand-written papers this time, and some of you commented on that observation. It is very satisfying to a teacher to actually see some evidence that students are paying attention to grading marks, so thanks for those comments! Krista grades the 3-point Friday writings and I look at the typed versions and your self-assessment; she simply may have been really pushed for time last weekend but she did tell me last Monday that those papers were very good and

I'd be pleasantly surprised to read them. You won't see any marks on either your 3-point writing from 100308 or your follow-up writing on the prompt for that date simply because we didn't want those marks to be considered subtle political comments from your instructors.

Thanks for the efforts and the willingness to go through this exercise week after week!

-- JJJr

### BIOS 101 Feedback on your writing—100308

<u>The prompt</u>: Based on your knowledge and experience in biology so far, answer the question: Do any of the current candidates for president or vice president understand the importance of scientific research? Answer the question "yes" and defend your answer, then answer the question "no" and defend that answer.

Because there will be no marks on your papers (except for an occasional word), I thought it might be a good idea to give you some collective feedback on your writings about the presidential and vicepresidential candidates. Remember that the lack of marks results from the potential for political statements, subtle as they might be, by me or Krista. We simply cannot use class time, class assignments, or course activities in any way that might be deemed an effort to wield political influence, although to be brutally honest, I'd be pretty surprised to actually discover that university faculty members anywhere, regardless of the subject, have that kind of power over students. Considered collectively, however, your extemporaneous and follow-up writings were interesting enough that I felt you might appreciate some comments.

First, your follow-up writings in general, especially the self-assessments, are improving greatly, week by week, in terms of sentence and paragraph structure, style, insight, and perceptiveness. There are still those ongoing word usage problems, most notably the use of "research" as a verb and "amount" when you actually mean "number," but at least half of you are starting to write increasingly mature papers. Furthermore, a large number of you are very aware of what you are trying to accomplish in terms of both science literacy and written communication skills. For the rest of you, remember that these Friday writings and follow-ups are probably the cheapest points available anywhere in the university and that they represent a real opportunity to develop techniques for effective written communication (a transferable skill). Note that there is a Blackboard Discussion Forum on Friday writing set up for you to ask questions about anything pertaining to these assignments; as of today, there are no posts to that forum.

Second, the trick of asking students to take both sides of an issue is one of the oldest in a teacher's books. This particular trick can be used in virtually any subject and it is a highly effective one for helping students learn to view situations or phenomena in an objective way. The intent is to separate observations from pre-existing biases, opinions, etc. Not everyone is successful at taking both sides of an issue, although if you have had formal debate training and experience in high school you're probably familiar with the practice. In the case of science issues, the exercise of taking both sides tends to involve evaluation of evidence or observations, thus critical thinking, and so is assumed to enhance science literacy. When faced with a science-related issue, the scientifically literate person asks, of course, whether observations support assertions. Such questioning is characteristic of the scientific mindset, and it is a practice that students are supposed to be exposed to in courses such as non-majors' biology (BIOS 101). Most of you struggled a little bit with the yes/no aspects of this prompt, mainly because you did not have enough time or information to evaluate candidates' assertions in terms of facts (=observations = data).

Third, I was quite surprised to discover how many of you had little interest in politics, had done absolutely no investigation of the candidates' positions on much of anything (except stem cell research; more on that below), had no intention of voting, or were outright disgusted at the current political rhetoric. It is a fact that the vast majority of you (indeed, I only know of one student in our class under the age of 18) are old enough to join the military, be issued a weapon, and ordered to kill people, get married legally, sign contracts, drive a 3000 pound vehicle 75 MPH on I-80 while drinking pop and talking on a cell phone, and, of course, vote. I do understand the sadness of having to grow up; part of that sadness drives people like biology profs to become biology profs where they can go play in the mud, catch fish and frogs, spend

hours looking through a microscope, and hang around with people like Gabe Langford. I think he made the point in one of his guest lectures that scientists are typically kids who never grow up, at least in terms of their curiosity, and find a way to pursue their kid interests for the rest of their lives. But part of the burden of growing up is recognizing that society depends on an educated and assertive citizenry, and that burden involves investigation into the behavior, ideals, ideologies, ethics, qualifications, etc., of those seeking positions of power (see also p. 145 of OUTWITTING COLLEGE PROFESSORS). So if this assignment did anything to stimulate your desire to investigate candidates more fully, then it succeeded beyond my expectations.

Fourth, although a few of you seemed to be highly educated relative to ongoing science-related issues (energy policy, water management, weapons development, preventive medicine, pollutants, DNA information security, information technology and privacy), by far the majority of you who mentioned a specific issue focused on stem cell research. I interpreted this equating of stem cell research with science policy to be a hold-over from other courses or derived from religious views, especially those involving abortion (remember the Big Picture PowerPoint and that list of issues with a biological component). Without downplaying either stem cell research or abortion as important issues with a biological component, I would suggest that these issues tend to be very important ones to Americans primarily because of their use, by various individuals and organizations, as political weapons. From the perspective of a scientist, I suspect that energy policy and preventive medicine are the key issues affecting quality of life for you and your children.

Finally, thanks for your patience with these Friday writings and follow-ups. I learned a long time ago that out of 200-300 people selected more or less at random (e.g., a typical BIOS 101 class), anything you do or try as an instructor will make some people very happy and excited, and others disgusted and angry, with most students falling somewhere in the middle, and switching categories depending on the assignment. That expectation has certainly been true of this class in that some of you are always happy and excited about the Friday prompt and others can't find much to say or consider the prompt outside the realm of biology, but then the next week the reactions are reversed. It's probably a good idea to remember that the Friday writings, follow-ups, portfolio, and attendance points are all mechanisms for diluting the influence of standardized multiple-choice tests on your grades. Students learn in various ways, so faculty members need to provide different ways to earn credit, thus the writing. The one positive thing I'm getting from your follow-ups is the sense that many of you are starting to see biological, and scientific, connections that you'd never thought of before.

--JJJr

# Feedback on your BIOS 101 extemporaneous writing – 101008-101708:

# (1) Statistics:

Below is a summary of writing points as of 102108. A few of you arranged for the 101708 museum visit in advance, and if you did, but still have not turned in your paper (in accordance with the agreement in advance), then there will be grades entered for you when I get those papers and follow-up writings. To date, there have been 73 writing points accumulated; we have 67 writing points left, which means you must have at least 53 points to date in order to qualify for portfolio points. Here, below, is a writing grade distribution for this class as of 102108:

74+ points = 6 students 70-73 points = 101 students 60-69 points = 54 students 53-59 points = 19 students < 53 points = 36 students

If I have these points calculated correctly, then at least 180 of you will qualify for portfolio points. Of the remaining 36, I know that there are several who have dropped the class but are still being carried on my official spreadsheet because it's too much trouble to re-design the sheet. As a class you are doing this writing in a much more disciplined and responsible way than last year's BIOS 101 (although some of you are still not happy with some of the prompts). Note also that there are a few students who seem to write in a way that I feel justifies an extra point, thus the 74+ points to date for those individuals.

# (2) Stylistic issues:

The writing prompt for 101008 (the letter home) allowed for some informality and the vast majority of you indicated in the follow-up that you enjoyed this particular assignment, regardless of your interest in frogs, toads, or snakes (or animals of any kind, or biology, for that matter). But you nevertheless went along with the exercise, which really asked you to justify a decision based on scientific exploration alone (a legitimate exercise for a non-majors science requirement class). In the follow-up self-assessment, I was truly surprised at how many of you took this exercise very personally and seriously, even literally, and talked about decisions and indecision regarding career choices. I try to make all these Friday writings involve role-playing, and this one seemed to have worked more effectively than I anticipated in that regard. In the spirit of outwitting your future professors, however, I suggest the following stylistic suggestions, for both writing and speaking:

- "you guys" Delete this phrase from your vocabulary whenever you are dealing with strangers, people with whom you are doing any kind of financial transactions, faculty members, groups of children or fellow students (although in locker room meetings with all-male athletic teams it's probably okay unless you really want results, then use the phrase "you men.")
- "defiantly" This word is an adjective that describes behavior in response to some situation, usually one in which you are actively resisting a command or somebody's efforts to make you behave in a certain way (my dictionary uses the phrase "contempt of opposition," appropriate, perhaps, for a year with a hotly contested election). I frequently see this word used when you actually mean "definitely."
- "definitely" This word means "for certain," or at least that's the common use and it's okay to use the word in this sense in both written and spoken English.

- "since" This word refers to time; it is not the same word as "sense."
- "sense" This word means "a meaning conveyed, a context, sound mental capacity, etc."
- "have wrote" This phrase is simply incorrect. The past tense of the verb "to write" is either simply "wrote" or "have written."

"research" – This word is a noun, not a verb.

"outside the box" – This metaphorical phrase usually refers to unconventional thinking. Your papers will improve greatly, as will your command of the language, if you'll find another way to express the same idea.

As for run-on sentences, contractions, starting sentences with "and" or "but," and other stylistic conventions, I don't mind them, but some profs do. The important thing to remember is that your writing, and speaking, should conform to the situation, context, and audience. You recognized that rule in the letter home. Biological information comes to you from television, newspapers, movies, classes, the visual arts, and the outside environment. It's important to recognize that these different sources can also have quite different narrative strategies, some of which allow observations to be exaggerated, misrepresented, or stripped of all-important context. The latter is a special problem in the electronic age committed to simplification of everything from major ecological issues to positions and intents expressed by political candidates.

# (3) Content and perception issues:

Many if not most of you seemed to get quite a bit out of Gabe's talk on 101008, and your letters home contained many facts about reptiles and amphibians. Both of his Friday presentations were intended to help prepare you for the last part of the semester, in which we begin dealing with an area of biology quite different from cell structure and function. It is our responsibility to cover biological diversity and its origins because evolution is the central unifying theme of the discipline. There are so many ways to present this material, however, that it's always a challenge to do it in a way that expands your understanding of what science has to teach us about the universe, including the one planet that is known to support life. I have found that one of the most effective ways to start this last part of the semester is to introduce, and humanize, the idea of research as an essential component of any attempt to explain nature (thus Gabe's first talk). It also is important to show real organisms (or at least their pictures) and talk about the lives they lead (Gabe's second talk), simply because one cannot truly understand evolution (the central unifying theme of biology) unless one also appreciates diversity in all its various forms. We could have started with protistans, fungi, birds, orchids, cacti, in fact any particular group; I just happened to have a herp expert in the lab (Gabe) who was willing to introduce the concept of diversity, including diversity of life histories, and had good material to use for the purpose.

# (4) The State Museum (Morrill Hall) "field trip":

In general, these papers were well done, although I'll withhold judgment until I see the follow-up writing. The vast majority of you wrote very standard responses to the question of what one learns in such a museum, and very few of you actually addressed the second part of the prompt, namely, why those lessons are important for a civilized society. As a consequence, those papers were a little boring to read, but that was my fault for not designing a more challenging prompt and one that would combine some creativity with conceptual analysis. The fact that you did not adequately address the second part of the 101708 prompt is consistent with your performance on the yes/no question about candidates and your

follow-up writing about the 100308 prompt (see the last feedback on your writing, as well as the Big Talk/Small Talk chapter of OUTWITTING). Nevertheless, it was obvious from your 101708 writing that many, if not most, of you encountered areas of biology, including human biology, that you would not have found otherwise.

Morrill Hall is one of four major museums within a couple of blocks of the city campus union, and all of them are great places to spend an hour or two (think cheap dates). Morrill Hall is open seven days a week and free with your student ID. The Sheldon Museum of Art also is free, but is closed on Mondays. Depending on what is up in mid-November, we could have the last Friday writing over at the Sheldon, although we'd have to modify the visit somewhat because the place will not hold 200 students and their backpacks safely. If we use the Sheldon, then it will be an exercise in looking for biological content in places you'd never otherwise think to look and using that content in a way you'd never do without some encouragement. The Center for Great Plains Studies, across the street south from the Lied Center, often has exhibitions with considerable biological content. Finally, the State Historical Society Museum on 15<sup>th</sup> and Q Streets has mostly social and cultural material, but some of it has biological content that would support an extemporaneous writing exercise.

# (5) Final Comments:

Again, thanks for your patience with this Friday writing endeavor. Krista and I do spend hours reading your papers and I should publicly thank her for that help. Please remember that this Friday writing is intended to teach things that I cannot teach with PowerPoint shows about cell structure and function or genetics. My job is to send you out into the world in December with a greatly increased awareness of biological content in your daily lives and the mental tools to interpret that content. These writings are one attempt to accomplish that task, and from reading thousands of pages of your writing so far, I'm reasonably convinced the attempt is working, at least for some of you.

--JJJr

### BIOS 101 Feedback - 120808

Your writings for the past three weeks are graded, and I've also had a chance to look over the 3 x 5 cards that Gabe used for responses and attendance, so it's time to provide some writing feedback. As always, I encourage you to read through these comments then look back over your own work to see how well they apply to that writing. As of December 8, there are 195 people still officially enrolled this class (out of 210 originally registered). Thus my impressions of your work are based on reading about 600 3 x 5 card responses and at least a thousand pages of your writing since the last feedback was provided.

# (1) Age of the Earth – 3 x 5 card responses:

Responses to this question (How old is the planet Earth?) ranged from 6,000 years and "We don't know how old the Earth is," to 250 billion years. Gabe tells me he had given the figure of approximately 4.6 billion years in lecture that day, as well as in a previous lecture. That figure of 4.6 billion is brought to you by the same people who bring you gasoline (geologists) and nuclear weapons (nuclear physicists and chemists) and probably should be taken as a fairly close approximation. Nobody is doing you any favors by telling you the Earth was created 6,000 years ago. Cave art, done by modern human beings, in Lascaux (France) and Altimira (Spain), including magnificent paintings of horses, is at least twice that old (10,000-15,000 years old); ginkgo trees (*Ginkgo biloba*) planted on the UNL campus have been on Earth as a species at least 100 million years, and scouring rushes of genus *Equisetum*, seen in many Nebraska roadside ditches, have been here maybe twice that long. The entire petroleum industry rests on knowledge of the planet's history as summarized in the geological time scale table in your text. So let's agree that this time scale and its described events are in general true; to act otherwise is to be purposefully, and knowingly, scientifically illiterate.

### (2) The Simpsons video clip on evolution:

Gabe asked you to tell what was accurate and what was inaccurate about this video. Many if not most of you indicated that the acquisition of limbs by fish was accurate. The fossil evidence in this case is very convincing, with crossopterygian fishes possessing the basic pentadactyl appendage design as far back as the Paleozoic Era. There are also a number of well-known fossils of transition stages (Devonian lungfish, labyrinthodont amphibians, *Seymouria*, etc.) and information about those forms is readily available in UNL libraries, especially the Geology library in Bessey Hall. The devolution of Homer Simpson into a rat, of course, is not at all accurate, and virtually all of you noted that was the case. Rats, and rodents in general, are fairly modern mammals regardless of your opinion of them, and make up a large fraction of all mammal species (rodents, bats, and antelopes make up the vast majority of all mammalian species). More importantly, however, evolutionary theory does not allow organisms to evolve into contemporary forms; instead, organisms evolve into new forms that may superficially resemble contemporary ones, although evidence for the history is always present either as embryonic and vestigial structures or, more currently, DNA nucleotide sequences. In my opinion, however, Homer's devolution into a rat can be considered a valid literary device and metaphor.

### (3) Move your plant writing prompt:

The prompt for 102408 was: Transplant the largest of your chosen plants to a new location on campus. Tell (1) where you are moving this plant, (2) at least three things that you hope to accomplish by this move, and (3) what biological effect this move will have on the community where your plant was formerly located. Number your paragraphs for easy grading. You got an extra point for drawing a map on the back of your page. The results of this exercise were a little bit surprising in that so many of you took it dead seriously, including (at least one student indicated) having an argument with a significant

other over whether a tree should be moved. In general, you all had excellent reasons for making the move and most of you assessed the effects accurately, especially in terms of squirrels (the most obvious form of wildlife on campus). Again, I strongly encourage you to develop some writing habits that make your work appear more professional than at present, for example, using "research" as a noun instead of a verb, using the proper possessive forms of nouns (e.g., "this week's writing" instead of "this weeks writing"), and assessing your ideas as well as your grammar.

This prompt was intended to help you see campus landscaping as a community (although obviously a contrived one), to engage you in a decision to alter a plant community, and to require a rationale for making the alteration. As is the case with all of our Friday writings, in this one there is a built-in effort to develop a habit that helps you see the world in biological terms, not as a replacement for your existing world views, but as an addition to them, an option to be used when needed. In this particular assignment, the different areas of campus vegetation tend to have different visual properties, different roles that they play with respect to the sidewalks and/or buildings, and different contributions to UNL's urban forest. So you were really being asked to alter not only a plant community per se, but also a highly contrived one, and a few of you recognized this dual aspect of the prompt.

# (4) Fruit fly research writing prompt:

This prompt was Gabe's:

Recently, a major political figure made the following comments during a policy speech:

"The most valuable thing of all is information" and "early identification of a cognitive or other disorder, especially autism, can make a life-changing difference." However, minutes later, the political figure also criticized certain "pet projects, such as fruit-fly research," which were believed to be funded by earmarks, and according to this politician are "utterly pointless." Given your knowledge of genetics and evolution, explain the fundamental flaw in this statement. In other words, why is fruit fly research important to our understanding of biology? Why do researchers use fruit flies? And why is fruit fly research applicable to human health?"

Most of you nailed this one, and more than a few of you actually traced down not only the political figure who made the statement, but also the project involving fruit fly genes that are potentially homologous to, or function in a manner similar, to those that might influence autism. A large number of you also made the point in your extemporaneous writing, and elaborated upon it in the follow-up, that research in one area of biology has the potential for contributing to other, perhaps unpredicted, areas. A very large number of you also talked about fruit flies as cooperative organisms, using phraseology out of the first few lectures in this course. You should remember, however, that supplies of *Drosophila melanogaster* (fruit flies) for research usually are reared, not captured, or, if they are of species other than *D. melanogaster* and being used in research on evolutionary mechanisms (as in the Morrill Hall exhibit), then they are often captured and subsequently reared. It's not very difficult to catch fruit flies. About all you have to do is put out some bananas in a little cone trap and here they come. The wine industry in California also has a major problem with various types of fruit flies. And, of course, remember that "fruit fly" is a common name that could easily apply to a whole lot of different species.

# (5) Joe Sixpac writing prompt:

The writing for 111408 was: Based on your experience of finding a scientific name for one species of arthropod (insects, crustaceans, spiders, etc.), as suggested in the e-mail sent November 13, explain to

the proverbial "Joe Sixpac" and "Hockey Mom" or "Soccer Mom" why it is important for their kids to know and use real scientific names of local plants and animals.

As a class, you did a superb job on this one, even though in your follow-ups you didn't believe it. I tend to rate you on your ideas, insights, and perceptions first, especially those that might be derived from this semester's course in some way, and on your grammar, spelling, style, and sentence structure second. In general, although students tend to fall a little short of perfection on matters of grammar, spelling, style, and sentence structure, they usually do better in these areas than in terms of ideas, insights, and perceptions. This comment gets back to mine in class the other day in which I noted that as a group you seemed to be highly concerned with what I'm calling compliance, i.e., doing things "correctly," or in a way that you believe some authority wants you to do them. I rated you "superb" on Joe Sixpac and Hockey Mom because so many of you stated, even in your extemporaneous writing on Friday, that scientific names were a vehicle for increasing language skills (or something to that effect). In other words, you accepted the idea that organisms should be known by names that everyone agrees apply to particular species, but many of you also made the connection between learning a foreign language (e.g. scientific names) and the development of skills in your own language. In my own experience, from having taken at least two years (or the equivalent) of French, German, and Spanish, the last as a senior citizen, those foreign language lessons make one highly aware of grammar and sentence structure. That awareness tends to pay off when you return to your native language, especially in writing.

### (6) The last two weeks' daily writings:

I was very surprised at the extent to which most of you were able to recall information from a PowerPoint show, especially one as arcane as that of December 1, and use it to generate a page of writing. That performance was a fairly encouraging one, and was the basis for my comments about our particular class being a very good one. You also did a truly spectacular job on the prompt about biological images in advertising. I was particularly amazed at the diversity of images you wrote about and the equally diverse interpretations of some advertising as having biological content, or what the term "biological content" actually meant. I'd like to believe that all these thousands of pages you have generated this semester, and that Krista and I have read, have indeed functioned to make you increasingly aware of biological materials and images in your environment. These advertising papers you did last Wednesday seemed to indicate that was the case.

### (7) Sheldon papers:

I have read only a few of these papers, but they were the basis for my e-mail, the announcement on Blackboard, and my comments in lecture about being sure to answer the questions *you* were asked, not the ones asked in 2007 or the ones you thought you were asked, or would like to have been asked. I try to avoid using Blackboard's Safe Assignment by giving you prompts and assignments that are either unique or extemporaneous, believing, as I do, that it is the teacher's responsibility to get originality out of students insofar as possible. Profs also read so many papers that they quickly recognize ones that simply don't sound like student work typical of the class involved. As stated in class, this assignment, like all the writing this semester, involves questions that can be answered correctly in as many ways as there are students in the class, and probably in as many ways as there are people in the world. Thus you are being asked to *make* an answer, at least one of many legitimate answers, instead of *find* or *repeat* an answer.

### (8) Thanks!

I do greatly appreciate your willingness to engage in this pedagogical experiment with extemporaneous writing in large introductory classes. My classes have been doing serious writing for at

least 35 years, but it's only been in the last few that I've started looking for ways to avoid the Internet and stimulate originality. Back in the good ole days, when we had only real books and journals that you had to actually handle in the library, it was very easy to stimulate originality, but now, with the advent of the electronic age, it's almost impossible. Last year, the first time I used the 15-20 minute weekly Friday writing, many students made the comment at semester's end that they wanted to know in advance what the prompt or the subject would be for that week. Early returns indicate your [this] class feels exactly the same way. Please note, however, that nobody this semester has received a zero for not writing what I wanted to read, i.e., for not finding a "correct" answer, regardless of the fact that some of you have received reduced credit for not generating enough of an answer. Please note also that a number of you have received an extra point or two for particularly insightful, perceptive, and original writing.

--JJJr

#### **Overall Self-Assessment for BIOS 101**

My assessment for Biological Sciences 101 would be that I did fairly well in this course. If one were to look at the contract for the course and compare it to what I did, they would be able to go down the list and say that I accomplished everything on the contract. This is because I never missed class, completed all of my writing assignments, and took the exams.

This is not to say that the course was not a difficult one. On the contrary, I found that perceiving the content of the exams based on what was emphasized in class to be extremely difficult. I think the main reason for this difficulty was that while the lecture was taking place, one concept or statement would grab my attention and I would begin thinking about that. Even if it was not a very important aspect that would need to be known for the test I would mistakenly start to lose my focus on the rest of the lecture to think about this one concept.

While this was not an activity that I tried to partake in, sometimes this would happen and I would then be very upset that I missed so much material. This then made it hard to decide what was really emphasized in class when it came to exam time because I could never be sure how important what I missed was or if the topic that I had begun to think about had actually been emphasized as much as I thought.

That aside I still think that this class was a success. Although it is true that I wish I would have done better on my exams, life is not about how well one does on tests. I would measure my success in a class based on whether or not I learned something. For this class, my answer would be yes, I did learn many things about biology. This class was also successful because not only did I learn things that one would expect to learn in a biology class, but I also learned new ways of thinking about things that will help me throughout the rest of my life.

#### **Biology 101 End of Semester Questions**

(1) To what extent have the weekly writing exercises helped, or not helped, increase your overall understanding of biology as presented this semester?

The weekly writing exercises have greatly helped me understand biology this semester because they have challenged me to look at different viewpoints of normal things and see them in a different way. This has allowed me to be able to incorporate ideas of biology into everyday life.

(2) If regular writings are used in the future, what changes should be made in the way this part of the course is conducted?

The only way that I would change the weekly writing exercises part of the course would be to allow for a little bit of extra time for the writing because sometimes it was hard to fit everything into twenty minutes.

(3) Please comment on the value of resources such as campus landscaping and the museums as instructional resources in biology.

This semester, resources such as Morrill Hall, the Sheldon Museum of Art, and the campus plants have been an invaluable tool that has aided in my better understanding of biology. Without these, I would not have been able to make connections between concepts and how they are important in life.

(4) What additions would you make to the next edition of OUTWITTING COLLEGE

### PROFESSORS?

For the next addition of OUTWITTING COLLEGE PROFESSORS I would add some ideas to help students be able to come up with a way to begin thinking of the right questions to ask in class.

# BIOS 101 Janovy Fall, 2008 General Comments from the instructor

I try to give each of my classes a set of comments about the course from the perspective of an instructor. These comments are provided for a couple of reasons: (1) students, especially those in their first semester, tend to view their academic experiences quite differently than do their teachers; and, (2) this information may be of help in other courses, and if so, then it has contributed in a general way to the institution's overall quality.

**Statistics:** As of 121508 there were 187 people officially enrolled in this course. The class average as of 121508 was 77.5, although there were still 26 people (out of 158) eligible for portfolio points but who had not had their portfolios examined yet, so if a number of those people get portfolio points then the class average will go up. As of 121508, the final average distribution is:

Final average:	Number of students:
90-100+	51
85-89	19
80-84	19
75-79	22
70-74	20
65-69	14
60-64	13
50-59	17
< 50	12

**Exams:** Averages on the three exams were 72.4, 65.0, and 63.6. Those averages are somewhat lower than in my previous classes, but the test questions themselves were far more similar to the test bank questions than in most of my previous classes. In addition, especially for the second and third exam, there were a great many questions asked, then answered and explained, on the Blackboard Discussion Board. As always, I go through the item analysis provided by Examinations Services and if the analysis or student comments indicate that there is a mistake on the key, I go back and correct those scores by hand. This situation occurred with one of the exams. Quite a few of you wrote comments on the back of your bubble sheets. If you are given that opportunity in other classes, please be sure to make the comments fulfill the instructions, e.g., in this case: I answered question #\_\_\_\_\_ with \_\_\_\_\_ because . . . The "because" part is always very important. In the vast majority of cases, on those questions you wrote about, you either got them correct anyway or were clearly wrong. In the class as a whole I gave quite a few extra points for those comments, however, including some half credits.

**Writing:** Writing this semester was particularly well done. As of 121508, 149 of you had 140 points, 160 had at least 120 points, and 145 of you received extra credit on one or more of the weekly writings or the Sheldon assignment. <u>An extra point on one of these assignments or follow-ups means that either</u> <u>Krista or I (or both of us) saw something especially original or insightful in your writing.</u> I strongly encourage all who received an extra point to go back through your papers, try to discover the cause, and try to replicate that originality in other work for other classes. As of 121508 Krista and I had examined 132 portfolios. Thus 80% of you did all the required writing and follow-up for full credit (14 weeks' worth, including the major Sheldon paper on use of natural materials and subjects in art), and 71% of you completed all the writing and portfolio preparation prior to the final exam. Good work, folks! You may have considered this Friday writing as trivial make-work, and preferred that I lecture for an additional 15-20 minutes each week; however, if you'd read the ~8500 pages of your writing this semester, as Krista and I have done, then you would see beyond your own reaction and realize that yes, indeed, as a group, because of these Friday exercises you have acquired skills, perceptions, and awareness that may be of

value to you in later life. I honestly believe that this weekly writing has contributed far more to your science literacy than either my lecture or those three multiple-choice exams.

**Attendance:** In general, your attendance was excellent, averaging about 83% for the 31 days I took attendance. That attendance rate is far above that of many other large classes, and I personally thank you for obeying the first rule of success in life: Get up and go to work every day.

**Textbooks:** I chose Campbell's 6<sup>th</sup> Edition because of its evolution and organismic biology sections. The chemistry, cell biology, and genetics sections of most introductory texts are very similar, so those other sections, especially the evolution (the central unifying theme of biology) tends to be the one that makes or breaks a textbook. I felt that material was adequate and presented in a way that could easily be used in large classes, so I'll use that same book again if I end up in BIOS 101 next fall. As for OUTWITTING COLLEGE PROFESSORS, there were so many helpful comments, and so much encouragement, from the student group that read it prior to publication that I thought it was time to put it in students' hands. Thanks for your semester-end suggestions; if I use some of those in the third edition, I'll e-mail you to make sure it's okay. If I make any significant amount of money from OCP, those earnings will not be from our class but from other places listed on the Pearson publication page (Hong Kong, London, etc.), and money is never the issue on books except for ones like Campbell. OUTWITTING was generated out of idealism and observations of student behavior, especially with respect to large classes, that I could see was leading to a lower level of success than desired by both me and the students.

**Clicker technology:** After rather lengthy and heated discussions by the faculty, the decision to purchase PRS Interwrite technology was made three years ago by an administrator who is no longer in a position of responsibility. Those of us who used the competing system argued strongly against PRS and we were correct in the belief that the PRS system would not be very functional. Modifications to software in the last two years have made this system virtually unworkable, especially in Henzlik Hall, at least as I felt it needed to be used. I'd be happy to expand on the reasons if you're interested, but instead I would like to apologize for the expenditure of money to buy that clicker. Next year I'll ask for a pack of 3 x 5 cards instead. I hope your clicker works in a rapid and spectacular way in other courses and other settings; if so, then its purchase will be justified, especially if other faculty members figure out how to use classroom response technology in a pedagogically significant way. Asking a multiple choice question on the screen then spending 7-10 minutes of class time dealing with it is not a very pedagogically significant practice, especially given the other options (such as Blackboard) for doing this kind of review.

**Blackboard use:** Personally, I find Blackboard to be one of the most wonderful developments in instructional technology that I have seen over my entire career. Granted, it contributes to the depersonalization of higher education, but I've never been convinced, especially in the last 3-5 years, that it's the major factor. I used Blackboard to provide you with massive amounts of information, post PowerPoints and audio files of lecture, send e-mails, explain test bank questions, etc. I never use it for giving quizzes, keeping records, or designing exercises that you do online (it's not trustworthy and takes way too much time to use it for those functions). You used it primarily for one purpose: asking about exam questions and grades. The few of you that tried to initiate serious online discussions with your fellow students were not very successful. You also generated ~8500 of writing without asking one question on Blackboard about science writing, even though there was a forum set up explicitly for this purpose (knowing in advance how much writing you'd be doing). This lack of online discussion is why you got so much written feedback about those 8500 pages.

**Faculty-student interactions:** I ended up feeling confident that by Thanksgiving I could introduce 45 of you to someone should we meet away from campus or outside of class in a social setting. That number is about half of what it was in my 2007 BIOS 101 class, and the 2007 class was well below those of most

previous years in this regard. These kinds of numbers catch one's attention, perhaps as subjective indicators of something (information technology?) that is working to depersonalize the institution. I have also had only two lengthy conversations this semester (out of an estimated 9000 student days = 14 weeks x 5 days/week x 200 students) about something other than 1 - 7 points either on an exam or writing. I have averaged about ten e-mails a day from students (about a thousand total for the semester), the overwhelming majority of which have involved points or absences. I don't know who is giving you advice about student-faculty interactions, but if they're telling you faculty members are too busy to interact with you *in person* in some intellectually meaningful way, then they are lying. I strongly suggest, in the future, finding some excuse to go talk to your teachers early in the semester, and perhaps more than once, about subjects of mutual interest; both of you will have your experience at UNL enriched.

**Final comments:** I greatly appreciate your efforts on both attendance and Friday writings and follow-ups. I was a little surprised, however, at how willing you were in your self-assessments, including those in the portfolio, to trash your own efforts. This class also seemed like one that collectively was almost obsessive about compliance, wanting to do things correctly, and wanting strong guidelines as opposed to opportunities, although by the end (as indicated in your portfolio assessments) most of you ended up seeing the value of some open-ended opportunities for earning credit toward the grade. As indicated in lecture, originality tends to leap off the page; don't be afraid of your own originality, especially in situations where there is a premium on it, or it helps you stand out from the crowd in a positive way. Once you get out into the real world, you're more likely to advance by making answers rather than finding answers, so I encourage you to start practicing soon.

Thanks for a challenging and interesting semester and I wish you the best of success in the future.

JJJr