Syllabus for Evolution
BIO 571 sec. 01, Fall 2007

Instructor: Dr. Patrick J. Lewis
Office: LDB 103B
Phone: 4-3397

Class: LDB 115, T/Th 11-12:20 pm
Office Hours: M/W 1-3pm; T/Th 2-4pm
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Course Description: This course will examine the mechanisms and processes of evolution using the primate/human lineage as our model. Human evolution will be examined at a variety of scales, from molecular to ecological, and from changes in populations over a few generations to large-scale patterns that emerge over millennia. Controversies and methods of study will be covered, particularly those aspects related to primate and human evolution. Current debates, such as evolution and creationism, out-of-Africa vs. multi-regionalism, the origin of anthropoid primates, and those surrounding recent fossil hominid discoveries will all be covered. A text will be used to provide a review, but the class will be focused on the current literature. It will be a reading and discussion based course with little structured lecture. A firm understanding of basic evolutionary principles and a general knowledge of the human skeleton are desired.

Course Objectives:

- Gain an understanding of the major elements of, and current debates surrounding, macroevolution
- Become familiar with key taxa, innovations, and patterns of primate and human evolution
- Develop a basic knowledge of the morphology of key fossil human and primate taxa

Recommended Textbooks:

Carroll, R.L. *Patterns and Processes of Vertebrate Evolution*. Cambridge University Press, 1997.

Larsen C.S. et al. *Human origins: the fossil record*. Ed. 3. Waveland Press, 1998.

Johanson, D., et al., *Lucy to Language: Revised, Updated and Expanded*. Simon & Schuster, 2006.

Emerson, J., and Emerson, B. *Middle Eocene Claiborne Invertebrate Fossils*. The Houston Gem & Mineral Society Paleontology Publication, (can be purchased at http://www.hgms.org/publications/MECGIF.html)

*Additional readings will be provided on Blackboard or handed out during class.

Attendance Policy: In accordance with University policy, I expect regular and punctual attendance and will record it at each meeting. The course is participation based and missed classes will ultimately lead to a lower grade. Any unexcused absences will result in a 1% reduction in the final grade. An excused absence must be discussed with me prior to the absence. If you are unable to contact me prior to missing class for some reason, proper documentation will be required.

Participation: Students should read all material thoroughly before each meeting and be ready to discuss each topic. The course is reading intensive, with book chapters and multiple readings assigned for most meetings. What you will take away from the course depends greatly on your dedication to this reading, as does your ability to intelligently participate in the discussions. For this reason, your participation in daily discussions will count as 20% of your final course grade. See the addendum for what I expect of students to receive full participation points. There will be two excursions, one to collect fossils and a second to visit a museum, that are mandatory. Check the schedule to make sure you can participate.

Article Summaries: You will find 3 articles from the primary literature on a set list of topics (see schedule) and write a 1-page summary of each. You should be prepared to lead a 15-minute discussion of your paper on the day it is scheduled to be discussed. The primary literature is composed of peer-reviewed journals (*Nature*, *Science*, *Journal of Vertebrate Paleontology*, *Journal of Human Evolution*, etc.) rather than the popular press (*Discover*

Magazine, *National Geographic*, *Scientific American*, newspapers, websites, etc.). **A copy of the article and your summary of that article must be uploaded to Blackboard one week prior to the discussion date**. All students can then go to Blackboard and download the papers to read prior to the class meeting. A hard copy of the paper is to be turned in to me with its summary the class before the topic is to be discussed (immediately after the preceding class). Pick papers carefully and thoughtfully, and check to make sure the paper you have picked hasn't already been posted. Do not wait until the last minute as many excellent articles may require the use of the interlibrary loan system. Reading the book chapter relevant to the topic prior to choosing your article is also important to insure that your article is relevant to the day's subject. These articles, discussions and summaries are worth 20% of your final grade. The grade will be based on how appropriate your article is, your summary of the article, and your ability to lead a discussion on the article. See below for summary preparation and my expectations.

Fossil Project: Each student will complete a study of an Eocene fossil assemblage and write up this study in a 15-page paper. Directions are appended below. The project is worth 25% of your final grade.

Research Project: A comprehensive research project resulting in a 15-20-page paper (directions below) will be worth 25% of the final grade. A 20-minute presentation of this paper will account for another 10% of the course grade. Specific details on this assignment will be provided in the first 2 weeks of the course to allow students time to prepare. General directions are appended below.

Final Grade Determination:	
Participation	20%
Article summaries	20%
Research Project	25%
Final Project	25%
Presentation	10%
TOTAL	100%

Course grades will be assigned on a standard 10-percentage point scale (90% and above = A, 80%-89% = B, etc.).

There will be no extra credit under any circumstances.

	Topic	Ch	Assignments	Articles
17-Jan	Introduction		time scale	
22-Jan	**Current Problems**	1		
24-Jan	ID/Evolution			
29-Jan	Brazos		Collect	
31-Jan	**Theories of Evolution**	2		
5-Feb	Punc/eq vs. gradualism		*Debate*	a
7-Feb	**Evo in modern Pops**	3		
12-Feb	Vicariance			b
14-Feb	**Fossil Record**	4		c
19-Feb	**Cenozoic Mammals**	5		
21-Feb	Species selection		Research Topic	d
26-Feb	**Cenozoic nonmammals**	6		
28-Feb	Extinction			a
4-Mar	**Classification**	7		
6-Mar	Naming clades		**Brazos paper due**	b
18-Mar	**Evolutionary Constraints**	8		
20-Mar	Material constraints			c
25-Mar	**Evolutionary Genetics**	9		
27-Mar	Quantitative traits			d
1-Apr	Lucy		Museum Trip	
3-Apr	**Development**	10		
8-Apr	Human growth			a
10-Apr	**Physical Constraints**	11		
15-Apr	Hominid constraints			b
17-Apr	**Major Transitions**	12		
22-Apr	Genus Homo			c
24-Apr	**Radiations**	13		
29-Apr	Anthropoids Asia vs. Africa		*Debate*	d
1-May	**Forces of Evolution**	14		
6-May	Turnover-pulse			
8-May	**Conclusions**	15	**Research paper due**	
FINAL	**Presentations**		**Present**	

Brazos Groups

Tim	Sophia	
Timos	Anna	
Anne	Julie	
Stephanie	Mona	Scarlett

Articles

Sophia	b
Mona	a
Anna	a
Tim	d
Timos	c
Anne	a
Scarlett	c
Stephanie	d
Julie	b

Ways To Get Help: Students may meet with the instructor during office hours or by special appointment. Questions or comments can also be emailed, or you may call me at the number provided above. Other help may be found at the learning center.

Keys to Excelling in Evolution: Attendance is a critical element to success in any course, particularly a discussion based class. You must show up, you must be prepared (e.g., have read the days readings) and actively participate in all discussions and activities to do well.

Academic Dishonesty: All students are expected to engage in all academic pursuits in a manner that is above reproach. Students are expected to maintain complete honesty and integrity in the academic experiences both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action. The University and its official representatives may initiate disciplinary proceedings against a student accused of any form of academic dishonesty including, but not limited to, cheating on an examination or other academic work which is to be submitted, plagiarism, collusion and the abuse of resource materials.

Classroom Rules of Conduct: Students will refrain from behavior in the classroom that intentionally or unintentionally disrupts the learning process and, thus, impedes the mission of the university. **Cellular telephones and pagers must be turned off before class begins.** Inappropriate behavior in the classroom shall result in a directive to leave class. Students who are especially disruptive also may be reported to the Dean of Students for disciplinary action in accordance with university policy.

Americans with Disabilities Act: It is the policy of Sam Houston State University that no otherwise qualified disabled individual shall, solely by reason of his/her handicap, be excluded from the participation in, be denied the benefits of, or be subject to discrimination under any academic or Student Life program of activity. Disabled students may request assistance with academically related problems stemming from individual disabilities by contacting the Director of Counseling Center in the Lee Drain Annex or by calling (936) 264-1720. Students who have disabilities that may prevent them from fully demonstrating their abilities should contact the instructor as soon as possible to discuss accommodations necessary to ensure the students educational opportunity. All disclosures of disabilities will be kept strictly confidential. NOTE: no accommodation can be made until you register with the Counseling Center.

Religious Holidays: Section 51.911(b) of the Texas Education Code requires that an institution of higher education excuse a student from attending classes or other required activities, including examinations, for the observance of a religious holy day, including travel for that purpose. A student whose absence is excused under this subsection may not be penalized for that absence and shall be allowed to take an examination or complete an assignment from which the student is excused within a reasonable time after the absence. University policy 861001 provides the procedures to be followed by the student and instructor. A student desiring to absent himself/herself from a scheduled class in order to observe (a) religious holy day(s) shall present to each instructor involved a written statement concerning the religious holy day(s). This request must be made in the first fifteen days of the semester or the first seven days of a summer session in which the absence(s) will occur. The instructor will complete a form notifying the student of a reasonable timeframe in which the missed assignments and/or examinations are to be completed.

Key Dates:

Jan. 24	Last day to process schedule changes
Feb. 1	Last day to drop without a "Q" and receive 100% refund
March 7	Last day to drop Fall Semester courses without grade of F
March 8-16	Spring break
March 21	Good Friday
May 8	Last class cay

Fossil Project Guidelines

The research project for this class will focus on an Eocene marine fauna from the Brazos River. This fauna is composed mainly of mollusks and sharks, but also contains some corals and bony fishes. The project will consist of:

Fossil collection
Literature review
Preparation and Identification
Data collection
Data analysis
Research paper

Fossil Collection
Early in the semester the class will travel to the fossil locality outside of Bryan along the Brazos River. Half the class will be given a layer high in the fossil sequence to collect from, while the other half of the class will collect lower. You will collect as many fossils as possible in the allotted time (several hours) trying to get as many different taxa as possible to insure that you have a representative fauna. Each person in the upper layer will have a partner collecting in the lower layer with who they will share data. All fossils collected will ultimately become part of the Sam Houston Vertebrate Museum collection and will not belong to the collector.

Literature Review
You will search the literature for reports and papers about the fauna. This will allow you to understand the types of research undertaken at the site and will assist you with the next step of the project, identification.

Preparation and Identification
The fossils are generally in good shape and preparation will entail mainly washing with water and gently scrubbing. Once clean and dry, you can use a variety of sources to identify the taxa you collected.

Data collection
Once the taxa are known, you will look at several characteristics of the fauna including relative abundance, morphological variation within and between the represented species, and taphonomy (i.e., predation, wear). You will work with your partner on this to insure you are recording the same measurements. This will allow you to compare variation between the upper and lower layers.

Data Analysis
Various statistical methods for analyzing such faunas are available in the literature, including parametric and nonparametric methods. You will research the most appropriate methods for your data and use them to test for significant difference in relative abundance, size and shape variables. The data collected from the upper sequence and lower sequence will be posted so that you can test your fauna against the other to determine of there is any difference in faunas or taxa between the two layers. *You will share your data with your partner no later than 2 weeks prior to the final paper deadline*.

Research Paper
Your paper should be 15-pages in length (not including references, table, or figures) and include the following sections: title, abstract, introduction, methods and analysis, discussion, and conclusion.

Title
No more than 15 words.

Abstract
No more 200 words summarizing your project and findings.

Introduction
Address things such as what is the research project, what past work has been done and what did it find, background on the setting, what questions are being addressed, why it might be interesting.

Methods and Analysis
Collection methods, preparation, data analysis including what measurements will be taken and how, what statistics might be employed to answer the questions. Then present the results of the analysis (i.e. the statistical results, other numerical data, what taxa were found, sample sizes, etc.).

Discussion
Explain what you found and how it fits into the existing information on the site, how do your results fit in with those of others in the class.

Conclusion
Short final section reviewing major finding and explaining future research that might lead from this study.

In preparing your paper follow these guidelines:

- Margins should be 1 inch top and bottom, 1.25 inches right and left.
- You will use a 12 pt Ariel font.
- All citations should follow the style found in the *Texas Journal of Science*.
- All pages should be numbered except the first page.
- Figures and tables should be appended to the paper rather than imbedded.
- Figures and tables should be centered and have a short caption (single spaced).
- Text should be double-spaced except direct quotations.
- Title should be centered and bolded, followed by a paragraph return (empty line).
- Section headings should be in bold.
- You should have a cover page with title (18 pt font), name, course info, and date (all 14 pt font).
- Papers should not be stapled, but placed in a sliding bar report cover.
- The most important part of any assignment is the due date – late work will not be taken!

Final Project Guidelines

The focus of this project is for you to think about a problem, controversy, or interesting question relevant to macroevolution. While it is impractical for you to develop and run a full research project, the objective here is for you to develop and research a potential project. This project may not be a summary of your thesis research or a rehash of some by-gone class project, although a project related to your overall research interests is acceptable. This Final Project should have the following elements:

An introduction
A literature review
A research statement
Methods & analysis
A possible work plan
A note about any other training or information you might need to really pursue this research
Conclusions

Research Proposal Guidelines:
Select a researchable question that you would be interested in pursuing and describe a possible plan for examining that question. A proposal should elaborate on how your research plan addresses your specific question. The kind of question should be carefully considered. A proposal should be between 15-20-pages long (not including references, table, or figures). Proposals will vary but a typical project should have the following elements:

Title
No more than 15 words.

Abstract
This is a summary of the paper and should be no more than 200 words.

Introduction
What, in general, is the research about? Why would this project be important or interesting? What are the broad research questions your project is setting out to answer?

Literature Review
This should be a substantial part of the proposal as it locates your proposed research in its theoretical and empirical context. What other research has been conducted which has directly or indirectly attempted to address your research questions? What is the theoretical basis of this research? How sound is this theoretical basis? How has this field developed? Where is it heading? What methods have been used? What are the limitations of these methods? What are the unanswered questions in this area?

Clear statement of research questions or objectives
What is the question you wish to address? Why is it is important and interesting? How do they relate to the published literature discussed above? Are your questions answerable?

Methods
Which data collection methods might be used? What types of data should be collected? How will this be done? What problems might come up in the collection of the data? What kind of design will be use? In what ways might the methods and the design work to answer your question?

Analysis
In general terms, what will you do with the data you collect? What kinds of tools or techniques might you use and what are the limitations? How will these analyses help to address and answer the research questions?

Work Plan
While this is difficult to specify, in a proposal it is helpful to indicate how you see your work developing and the timescales or any budgetary needs involved.

Research Training
What research training might you need in order to carry out this plan effectively? What aspects of your research skills would you like to improve? What is the relationship between your education or interests and the proposed research plan? Describe how the research might enhance your educational program or goals.

Conclusions
What are your final thoughts? A general wrap up and summary of the papers main ideas.

In preparing your paper follow these guidelines:

- Margins should be 1 inch top and bottom, 1.25 inches right and left.
- You will use a 12 pt Ariel font.
- All citations should follow the style found in the *Texas Journal of Science*.
- All pages should be numbered except the first page.
- Figures and tables should be appended to the paper rather than imbedded.
- Figures and tables should be centered and have a short caption (single spaced).
- Text should be double-spaced except direct quotations.
- Title should be centered and bolded, followed by a paragraph return (empty line).
- Section headings should be in bold.
- You should have a cover page with title (18 pt font), name, course info, and date (all 14 pt font).
- Papers should not be stapled, but placed in a sliding bar report cover.
- The most important part of any assignment is the due date – late work will not be taken!

Class Participation Expectations

DO's:

Read everything at least once, preferable twice
Make notes as you read and jot down questions as they come to you
Check the references for anything that might be important or make the paper clearer
See who the author is (or was) -- what was there specialty, where did they work, who funded the research, etc.
Think about the broader implications of the paper
Make sure you get in the discussion every class period
Be courteous but persistent if you need to get in the discussion
Raise your hand if you can't get in the discussion but have something to say
Ask each other questions, not just me (e.g., discuss!)

DON'T's:

Do not wait until the night before, or worse, the morning of, to do the readings
Prepare excuses for why you couldn't do the readings
Dominate the discussion
Make rude comments or insult others
Just tear down a paper—look for what it has to offer even if it is flawed
Get too far off topic

Writing Summaries

- The goal of writing a summary of an article is to offer as accurately as possible the full sense of the original, but in a more condensed form. A summary restates the author's main point, purpose, intent, and supporting details in your own words.

- The process of summarizing enables you to better grasp the original, and the result shows the reader that you understand it as well. In addition, the knowledge gained allows you to better analyze and critique the original.

- First, try to find the main idea in the reading; it's usually in the first paragraph. Next, skim through the article, glancing at any headings and graphics. Then, read the conclusion. The intent here is both to give yourself a review of the work and to effectively engage yourself with it.

- Now go back and read the original text carefully, jotting down notes on or highlighting the important points. Write the central idea and the author's reasons (purpose and intent) for holding this viewpoint. Note the supporting elements the author uses to explain or back up her/his main information or claim.

- Make an outline that includes the main idea and the supporting details. Arrange your information in a logical order, for example, most to least important or chronological. Your order need not be the same as that in the original, but keep related supporting points together. The way you organize the outline may serve as a model for how you divide and write the summary.

- Write the summary, making sure to state the author's name in the first sentence. Present the main idea, followed by the supporting points. The remainder of your summary should focus on how the author supports, defines, and/or illustrates that main idea. Remember, a summary should contain only the author's views, so try to be as objective as possible.

- As you revise and edit your summary, compare it to the original and ask yourself questions such as: Have I rephrased the author's words without changing their meaning? Have I restated the main idea and the supporting points accurately and in my own words?

- You may want to ask yourself questions such as: Does the author succeed? How and why or why not? What are the strengths, weaknesses? Why? What did the author do well? Not well? Why?

Use the following format for your summaries:

Your Name
Date, Name of Class, etc.

Review of Joe Smith's "Missouri Butterflies"

Smith, J. (2001). "Missouri Butterflies." *Scientific Missourian, 36*(2), 25-28.

Text of summary starts here, single spaced, Ariel font, margins 1 inch top and bottom, 1.25 inches right and left. Do not cite the paper you are summarizing of course, but if you use outside material for some reason please cite it.

How to Give a Good Seminar Presentation

1. Pick a good topic
Choose a topic that is of interest to you and of general interest as well. Remember that a seminar is really a story, and giving a good seminar is the same thing as telling a good story. Selecting a topic that will make a good story is a big first step toward making your seminar a good one.

2. Know your audience
It is important to understand how much your audience is likely to know in advance about your seminar topic. This will determine the amount of time you need to spend on the various portions of your talk. You need to decide if the tone of your seminar should be serious or informal. Is a touch of humor acceptable? How much is too much? How should you dress? Familiarize yourself in advance with the room where you will give your talk and with any equipment that you plan to use. Not only should this make you more comfortable, but it may also help you avoid unexpected technological problems.

3. Begin with a title slide and show a brief outline or list of topics to be covered
Use text slides to designate the beginnings of individual sections of your talk or to introduce a major topic shift. Usually a prominent title in bold letters is adequate. Text slides can be important and very helpful to you and your audience. They demonstrate your organizational skills, help audience members to follow your talk more easily, and let them know where you're headed. They also help to keep you on track and focused during your talk.

4. Introduce your topic well
Your introduction will vary in length and detail, depending on the length of your talk, your topic, and the level of sophistication of your audience. Give the necessary information but be careful not to include large amounts of extraneous material. Visual aids are particularly important here to grab your audience's attention. If you have a snappy photo, an interesting thought or catchy phrase, use it here. The point of the introduction is to catch your audience, let them know what you'll be talking about, get them enthused about the topic, and let them know why your topic is interesting and exciting.

5. Methodology
If you are talking about your own research, you need to present your experimental design and/or methods. Try to make this section short, concise, clear and logical. You can use an outline format or even a flow chart of the experiments and techniques you used. If you are giving a review talk, then simply summarize briefly the methods used.

6. Data presentation is the heart of a successful talk

A. Don't overwhelm your audience with information. Limit the total amount of data you present and limit the amount of information you show on any single slide. Busy slides and complex graphs are not helpful. Even your text slides should be brief and to the point.
B. Paraphrase your text slides and read aloud each major point. The audience will be reading the slides anyway and would otherwise pay no attention to you. **Don't read your slides verbatim** and do not leave text slides up while you discuss another, unrelated idea.
C. Clearly label all axes on figures and give each figure a brief, informative title.
D. Define symbols on figures with a figure legend. All text and symbols on a figure should be large enough to read easily from the back of the room.
E. Explain the information on each slide. Begin by briefly mentioning the parameters shown on each axis of each graph. Discuss treatment versus control results as illustrated by the figure. Remind the audience of the meaning of each symbol on your graphs. Make sure you tell the audience how your data support or refute your basic hypothesis or idea.
F. Choose your graphs carefully. They should follow a logical progression, and you should be able to clearly explain each graph. Make sure each graph illustrates a point, especially when presenting literature information.

G. Cite all sources of information, especially if you did not generate the data yourself. You can either include a reference to the author with date on the slide, or you can tell the audience your source as you present the graph.
H. Use the best graphics available but be careful not to distract your audience by making the artwork more interesting than the information. You should be especially careful in choosing how to present your data. Watch your color and pattern combinations. Don't waste your time trying to make the prettiest or the coolest slides. Focus on content and clarity. Some pizzazz is fine, but don't go to extremes.
I. Limit your use of animation. Too much can be distracting and reduce the impact of your talk. This is one of the most common problems encountered in seminars.
J. Make your presentation visually appealing by using variations in color and texture. Color can be used to unite items related to a single topic, emphasize points and generally enhance the audience's ability to understand your subject.

7. Always give a synthesis or conclusion

Display a brief summary of your conclusions on a slide while you discuss the significance of the material you have presented. Your conclusions should match your talk objectives and should complete your story. Remember, this is the end of your story, so make it memorable (again, in a good way). Even if your talk is based on library research, your conclusions and synthesis **must** have some original content. It is not sufficient to simply repeat the conclusions that other people have reached. You may want to add a slide after your conclusions with future questions that should be addressed. This demonstrates some critical thinking on your part and shows that you have a feel for the big picture of which your topic is a part.

8. Answer questions thoroughly and thoughtfully

Remain relaxed during the question period. Remember, you're the expert on this subject, and this is your chance to demonstrate (but not show off) your expertise in the topic. The question period is not designed to allow the audience to harass you. Your audience is supportive and interested, and they truly want to know more about your topic or they would have gone somewhere else instead. **No one is out to get you!** When answering questions, take your time, compose yourself, make sure you understand the question clearly and think before you answer. If the question is unclear or doesn't make sense to you, ask politely for clarification. Prior to your talk, think carefully about your presentation and you may be able to anticipate major questions. If you suspect that something in particular will come up, prepare an answer. If you have additional slides ready to answer that query, put them in your presentation after your final planned slide and use them as appropriate. If you don't know the answer to a question, try to say something useful and relevant. If you really don't know, "I don't know" is perfectly acceptable, but not for every question.

PRESENTATION EVALUATION FORM

/ 75
Grade:

CLASS: Evolution **SEMESTER:** Spring **YEAR:** 2008

STUDENT: _____ **TOPIC:** _____

ALOTTED TIME: 20 min **START:** _____ **FINISH:** _____ **TIME:** _____

□ +/- 2min (ok) □ +/- 2-4min (-10%) □ +/- 4-6min (-20%) □ +/- 6-8min (-30%) □ +/- 8-10min (-40%)

APPEARANCE: □ **1** □ **2** □ **3** □ **4** □ **5**

Comments: _____

SLIDE/MEDIA PREPARATION: Comments

Font:	□ **1**	□ **2**	□ **3**	□ **4**	□ **5**	_____
Visibility:	□ **1**	□ **2**	□ **3**	□ **4**	□ **5**	_____
Graphics:	□ **1**	□ **2**	□ **3**	□ **4**	□ **5**	_____
Proofreading:	□ **1**	□ **2**	□ **3**	□ **4**	□ **5**	_____
Composition:	□ **1**	□ **2**	□ **3**	□ **4**	□ **5**	_____

COMPORTMENT:

Volume:	□ **1**	□ **2**	□ **3**	□ **4**	□ **5**	_____
Diction:	□ **1**	□ **2**	□ **3**	□ **4**	□ **5**	_____
Body language:	□ **1**	□ **2**	□ **3**	□ **4**	□ **5**	_____
Interaction:	□ **1**	□ **2**	□ **3**	□ **4**	□ **5**	_____
Enthusiasm:	□ **1**	□ **2**	□ **3**	□ **4**	□ **5**	_____
Individuality:	□ **1**	□ **2**	□ **3**	□ **4**	□ **5**	_____

COVERAGE OF TOPIC:

Accuracy:	□ **1**	□ **2**	□ **3**	□ **4**	□ **5**	_____
Organization:	□ **1**	□ **2**	□ **3**	□ **4**	□ **5**	_____
Clarity:	□ **1**	□ **2**	□ **3**	□ **4**	□ **5**	_____

OVERALL EFFECTIVENESS: □ **1** □ **2** □ **3** □ **4** □ **5** _____