Scientific papers communicate new results from a specific project. Reading a paper should provide you with background about the field and identify the relevance of the paper in that context. You should be able to understand the scientific concepts, understand the authors' critical thinking and apply your own, and be able to communicate the concepts and their application.

A scientific paper is divided into four major areas – introduction, materials and methods, results and discussion. Additionally, an abstract may summarize the paper, literature references are provided and people or organizations that aided in the research are acknowledged.

The four major areas are outlined below:

Introduction:
• Gives an overview of the field
• States the relevance, importance or new contribution of the paper identifying specific hypotheses or goals when appropriate

Materials and Methods:
• Identifies organisms
• Describes techniques
• Explains manipulations and experiments
• Details the parameters measured

Results:
• Statistical analysis
• Presentation (tables/figures)
• Interpretation – consideration of other explanations/hypotheses

Discussion:
• Relates the results to the original hypothesis
• Discusses the results with respect to the "big picture"
• Points out strengths/weaknesses of the study
• Suggests future areas for investigation
Essays:
The assigned essays review the papers discussed in class and synthesize a unit.

- Begin with brief description of the topic. Next introduce and summarize the article (include a correct citation). If a specific hypothesis is being tested, state the hypothesis (5 points).
- The second paragraph should include a more detailed description of the issue the unit/article addresses. This information in generally found in the Introduction. Include in your description a summary of the biological process involved. For example, if the article is about deforestation contributing to global warming, include a description of photosynthesis with diagrams/figures. Critically evaluate the two points listed under Introduction. (10 points).
- Briefly describe the methods, state how each experiment or assay investigates a part of the problem. Critically evaluate the four points listed under Materials and Methods. (15 points).
- Describe the results. Include at least one figure or table (and a legend). Critically evaluate the three points listed under Results. (15 points).
- The final paragraph should be a summary of the findings/report. Critically evaluate the four points listed under Discussion. (5 points).

Grading rubric: Within each section you will be graded on:
- Clarity and organization
- Depth of Support
- Quality of Support
- Mechanics/Spelling

Mechanics:
- 3-6 pages of text
- 12 point double spaced
- 2-3 figures, graphs or tables
  - Each must include a legend.

Assignments may not be hand written, except for drawings. Use of color is encouraged.