Marking Period 4 Project: "What the Tech?"

Learning to read a technical paper is a critical skill. At one time or another, every academic is asked to review papers submitted for publication in journals (Nature, Analytical Chemistry, Science, etc.). These reviews play a key role in maintaining the integrity of a journal. In addition, the exercise exposes the author to new ideas and perspectives that he/she might not have thought of.

To assist you in differentiating between a technical paper and an article, the standard structure for technical papers (naturally there are minor variations in these sections) is listed below:

- Abstract (summarizes the paper)
- Introduction (explain why the topic is important)
- Body of the paper (technique, results, discussion)
- Conclusions (should follow directly from the Body of the Paper)
- References (should mostly be current, old references are ok)
- Tables
- Figures (captions)

Keep in mind, that the paper **you** will find and review will have already gone through the peer review process.

Task:

1. Find a technical paper (not an article) from a reputable journal about a topic covered this year in Chemistry. You must obtain the entire article and not just the abstract. This may require some work on your part (you can't just google a technical paper). Most journals require a subscription, so you will have to see what journals our library and/or the Edison public library subscribe to. Watch the following link on how to access papers from our school library. https://youtu.be/9eNfVi_qmLQ www.jpslibrary.com (EBSCO and Gale have professional/academic journals. username is jpslib and password is hawks for all databases except Britannica; username is jpshs with the same password-hawks).
2. Review the technical paper using a modified version of the "three-pass" approach developed by S. Keshav of the University of Waterloo and fill out the online notes page. Submit your review in GCR.
3. Submit a copy of the full article in GCR

The key idea to the "three-pass" approach is that you should read the paper in three passes, instead of starting at the beginning and reading your way to the end. Each pass accomplishes specific goals and builds upon the previous pass:

The First Pass: give you a general idea about the paper.
The Second Pass: gives you a better grasp of the paper's content
The Third Pass: helps you understand the paper in depth.

The First Pass:

The First pass is a quick scan of the paper. This pass should take about five to ten minutes and consists of the following steps:

1. Carefully read the title, introduction, and brief description
2. Read the section and sub-section headings, but ignore everything else
3. Read the conclusions
4. Glance over the references, mentally ticking off the ones you've already read

At the end of the First pass, you must answer the Four Cs:

1. Category: discuss the area of study this paper is about.
2. Context: discuss the situation or environment of the study.
3. Correctness: discuss the paper's approach/method's validity
4. Clarity: discuss whether the paper is well written.

The Second Pass:
In the Second pass, the paper is read with greater care. It helps to jot down the key points, or to make comments in the margins, as you read.

1. Look carefully at the Figures, diagrams and other illustrations in the paper. Do they support the details of the paper? Mistakes in this area will help separate the rushed and shoddy papers from ones that are truly excellent.
2. Remember to read some of their references (this is a good way to learn more about the background of the paper).
3. After this pass, you should be able to grasp the content of the paper. You should be able to summarize the main gist of the paper, with supporting evidence, to someone else.

Sometimes you may not understand a paper even at the end of the second pass. This may be because the subject matter is new to you, with unfamiliar terminology and acronyms. The paper may be poorly written with unsubstantiated assertions (this is unlikely for you because all of the papers you will be reading will have already been published is highly respectable journals, but you never know!).

The Third Pass:
To fully understand a paper requires a third pass. The key to the third pass is to attempt to virtually re-implement the paper: that is, how would you go about it, remember to make the same assumptions as the authors. By comparing this re-creation with the actual paper, you can easily identify no only a paper's innovations, but also its hidden failings and assumptions.

This pass requires great attention to detail.
At the end of the Third pass, you must answer:

1. Identify and challenge every assumption.
2. State how you would present a particular idea.
3. State any ideas you have on how to improve the paper.
4. Identify its strong and weak points.

Review and Evaluation: Before you write a critique, as the following questions:

- Has the author demonstrated HOW to perform this problem?
- Does the author demonstrate knowledge of the subject?
- Has the author provided enough technical or trade information for the reviewer to understand the subject?
- Does the author's approach reflect an expected level or expertise?
- Has the author demonstrated how special considerations impact their work?
- Is the paper well written?
- Is the author successful in communicating his/her points?
- Is the use of figures, tables or examples appropriate?
- Is the organization, spelling, grammar, and style satisfactory?
- Is the paper free of any mathematical errors?

Writing the Critique:
Below is the format that will be used.

1. Summary of the paper (keep it short, but long enough that it shows that you understand the paper).
2. Good things about the paper (one paragraph)
3. Major comments (discuss the author's assumptions, technical approach, analysis, results, conclusions, etc. Be constructive, if possible, suggest improvements.
4. Minor comments (discuss style, figures, grammar, etc. can be written in a list or bullet form.
5. Recommendations (provide insight to back up your comments and suggest how to improve the quality of the paper.

Name:_____ Date_____
Honors Chemistry Period_____

1. Title of Paper_____

2. Journal _____

The First Pass:

3. Provide a few notes on the following:
   a. Category: discuss the area of study this paper is about.

   b. Context: discuss the situation or environment of the study.

   c. Correctness: discuss the paper's approach/method's validity

   d. Clarity: discuss whether the paper is well written.

The Second Pass:

4. Look carefully at the Figures, diagrams and other illustrations in the paper.
   a. Do they support the details of the paper?

   b. Summarize the main gist of the paper, with supporting evidence.

The Third Pass:

5. Briefly answer the following:
   a. Identify and challenge every assumption.

   b. State how you would present a particular idea.

   c. State any ideas you have on how to improve the paper.

   d. Identify its strong and weak points.

Review and Evaluation: (briefly answer with examples when necessary)

6. Has the author demonstrated HOW to perform this problem?

7. Does the author demonstrate knowledge of the subject?

8. Has the author provided enough technical or trade information for the reviewer to understand the subject?

9. Does the author's approach reflect an expected level or expertise?

10. Has the author demonstrated how special considerations impact their work?

11. Is the paper well written?

12. Is the author successful in communicating his/her points?

13. Is the use of figures, tables or examples appropriate?

14. Is the organization, spelling, grammar, and style satisfactory?

15. Is the paper free of any mathematical errors?

Critique:

16. Summary of the paper (keep it short, one or two paragraphs, but long enough that it shows that you understand the paper).

17. Good things about the paper (one paragraph).

18. Major comments (discuss the author's assumptions, technical approach, analysis, results, conclusions, etc. Be constructive, if possible, suggest improvements).

19. Minor comments (discuss style, figures, grammar, etc. can be written in a list or bullet form).

20. Recommendations (provide insight to back up your comments and suggest how to improve the quality of the paper).

Name:_____ Name:_____
Honors Chemistry Period_____ Honors Chemistry Period_____
Topic_____ Topic_____

	Copy of Full Article—10points		**Copy of Full Article—10points**
	Reputable Journal		Reputable Journal
	All pages, figures, references		All pages, figures, references
	First Pass—5 points		**First Pass—5 points**
	Category		Category
	Context		Context
	Correctness		Correctness
	Clarity		Clarity
	Second Pass—5 points		**Second Pass—5 points**
	Figures discussion		Figures discussion
	Main gist of paper		Main gist of paper
	Third Pass—5 points		**Third Pass—5 points**
	Assumptions identified		Assumptions identified
	Presentation suggestion		Presentation suggestion
	Improvement of paper		Improvement of paper
	Strong and weak points identified		Strong and weak points identified
	Review and Evaluation—10 points		**Review and Evaluation—10 points**
	Answers provided with supporting		Answers provided with supporting
	Examples when necessary		Examples when necessary
	Critique —15 points		**Critique —15 points**
	Well written summary		Well written summary
	Major comments stated		Major comments stated
	Minor comments stated		Minor comments stated
	Recommendations stated		Recommendations stated
	Total (50)		**Total (50)**