

Homework 2: Investigating Article Structure (Template)

Article 1

Title:

Authors (1st five):

Journal (no abbreviations):

Primary or secondary literature? **Primary** **Secondary**

Number of pages:

Number of figures:

Main section headings:

Article 2

Title:

Authors (1st five):

Journal (no abbreviations):

Primary or secondary literature? **Primary** **Secondary**

Number of pages:

Number of figures:

Main section headings:

Article 3

Title:

Authors (1st five):

Journal (no abbreviations):

Primary or secondary literature? **Primary** **Secondary**

Number of pages:

Number of figures:

Main section headings:

Article 4

Title:

Authors (1st five):

Journal (no abbreviations):

Primary or secondary literature? **Primary** **Secondary**

Number of pages:

Number of figures:

Main section headings:

Homework 3: Discussion Questions

1. What question does this paper address?
2. What is the point of asking that question? Why does it matter? What impact would a positive result have on the larger scientific community?
3. How did the authors isolate GFAJ-1? What is a decimal-dilution transfer? The authors claim that this process “greatly reduc[ed] any potential carryover of autochthonous phosphorus.” Why was it important to reduce carryover of phosphorus? What assumption are the authors making here?
4. The article uses the phrase “no added phosphate” several times. What is the difference between saying this and saying “media lacking phosphate”? How much phosphate was actually in the +As/-P media?
5. When GFAJ-1 cells were grown under +As/-P conditions, the cells swelled up and had some sort of granules in them. What is it important to determine that these granules are *not* made of in order to support the authors’ conclusions? Did the authors’ do this experiment?
6. The article claims that the amount of phosphorus left in the cells when grown in +As/-P conditions was “far below the 1 to 3% P by dry weight required to support growth in a typical heterotrophic bacterium.” The article that they cite has this quote “and in the case of bacteria, (P) may account for up to 3% of the bacterial dry weight.” How do these two claims differ? Does the original quote support Wolfe-Simon’s position?

Homework 4: Unpacking a Figure (Template)

1. Title and author:
2. Figure number:
3. What is being measured or described in the figure?

4. What technique(s) is/are being used to make this measurement or description?

5. Give a very general description of this technique (examples: PCR is used to amplify a small amount of DNA into a larger amount. Agarose gel electrophoresis is used to separate pieces of DNA by size.)

6. Label as many parts of the figure as you can. Things to note:
 - What scale was used on each panel? Were any adjustments made to the scale before plotting the data?
 - How many replicates were done for each condition?
 - Are there error bars? If so, what do they represent?

7. What controls were used in the experiment(s) that generated the data being shown in the figure?

8. If data from a control is shown, label the part of the figure that shows this data. If no data from a control is shown, write “no control data shown” on the figure.

9. What is the author claiming the figure shows? Write down this claim both as an exact quote and in your own words.

10. Does any part of the figure or experiment draw the author’s conclusion into question? If so, describe the problem.

11. Describe how the data could be displayed differently to address your problem in the previous question. If additional experiments need to be done to answer this question, describe them.

Homework 5: Peer Review (Template)

Title of paper:

Brief summary of the paper (2-3 sentences):

Overall reaction (2-3 sentences):

Reference page and line numbers in all specific comments.

Specific comments (scientific):

Introduction:

Methods:

Results:

Figure legends:

Discussion:

Specific comments (writing clarity/style):

Recommendation (reject, minor revision, major revision, accept):

If recommending revisions, detail them here:

Homework 6: Community Response (Template)

I. Science blog post

- 1) Citation information (URL, author name, post date):

- 2) Name one scientific problem the author of this post raises about the Wolfe-Simon article.

- 3) What additional experiment needs to be done to address this problem?

- 4) Name a second scientific problem the author raises.

- 5) What additional experiment needs to be done to address this problem?

II. Technical comment

- 1) Citation information:

- 2) Name one scientific problem the author of this comment raises about the Wolfe-Simon article.

- 3) What additional experiment needs to be done to address this problem?