Student Name: Student Number:

Vantage 140 SCIE 113

Unit Writing Drafts: Structure and Content

Week Three

Main Task:

Draft Structure and Content: Using your unit writing draft, identify and revise the structure and content using the following template. Remember to use a paper dictionary to check vocabulary and spelling.

My main idea/claim/thesis statement is:

_____

_____

Is my thesis statement clear? YES ☐ NO ☐ NOT SURE ☐

Is my thesis statement grammatically correct? YES ☐ NO ☐ NOT SURE ☐

Does my thesis statement use academic vocabulary? YES ☐ NO ☐ NOT SURE ☐

My development statement is:

_____

_____

Topic Sentence/Reason #1 is:

_____

_____

Evidence List (Specific Examples)

☐

☐

☐

☐

Are all of my examples specific and relevant? YES ☐ NO ☐ NOT SURE ☐

Student Name: Student Number:

Topic Sentence/Reason #2 is:

_____

_____

Evidence List (Specific Examples)

☐

☐

☐

☐

Are all of my examples specific and relevant? YES ☐ NO ☐ NOT SURE ☐

Topic Sentence/Reason #3 (optional) is:

_____

_____

Evidence List (Specific Examples)

☐

☐

☐

☐

Are all of my examples specific and relevant? YES ☐ NO ☐ NOT SURE ☐

My conclusion is:

_____

_____

_____

Vantage 140 SCIE 113

Academic Citation Practices

Week Seven

LESSON PLAN:

Required Materials:	1) Vant 140 Academic Citation Practices Worksheet 2) Teacher's Notes (Original Article) 3) Board markers

LESSON PROCEDURE

Warm-up Task(s)	Resource(s)	Time
Put students into small groups of 3-4. Circulate and help each group to answer the four warm-up questions about academic citation practices. Have each group write their responses on the board in key word point form. Discuss any interesting similarities/differences.	Vant 140 Academic Citation Practices Worksheet Board Markers	10 – 15 mins
Main Task(s)	**Resource(s)**	**Time**
Put students into different small groups of 3-4. Circulate to help students identify which sentences require a citation and why.	Vant 140 Academic Citation Practices Worksheet Teacher's Notes	20 - 25 mins
Wrap-up Task(s)	**Resource(s)**	**Time**
Have each group share their answers with the class. Discuss any differences/justifications. Bring out the distinctions between common knowledge, cited data, and original data (tables, charts, etc.)	Vant 140 Academic Citation Practices Worksheet Teacher's Notes	10 mins
Class wrap-up and REMINDER TO BRING SCIE 113 INTERVIEW QUESTIONS	Board and Markers	5 mins

Comments / Notes:

_____

_____

_____

Materials:

Vantage 140 SCIE 113

Academic Citation Practices

Week Seven

Warm-up Task: In your group, answer the following questions. Make sure to give detailed justifications for each response.

1. In an academic research paper, what needs to be cited (what type of information)?

2. What are the purposes of academic citation (why are academic citations required)?

3. What are the different ways academic citations can be used to strengthen a piece of writing?

4. Are academic citations generally considered to be organizational, interpersonal, or ideational (content)?

Main Task: In your group, decide which of the following sentences should be cited by the author. Provide a detailed justification for each answer.

Sample Introduction

_____ Rivers and streams are important reserves of water available for human consumption, animal life, agriculture, and industry.

_____ Therefore, there is a need to conserve this resource.

_____ However, in the modern world, extensive and growing urbanisation is a threat to the ecosystem of streams, through factors associated with the discharge of sewage. This phenomenon has been called "urban stream syndrome".

_____ Some papers explore the mechanisms driving the syndrome, and identify appropriate goals and methods for ecological restoration of urban streams.

_____ Water systems must meet certain criteria to be considered healthy.

_____ In the past, these criteria included only physicochemical parameters.

_____ Indeed, several studies have shown that urbanization increases the concentration of some nutrients, such as nitrogen, ammonia, nitrate, and phosphorus, decrease the concentration of oxygen and is responsible for pH changes in rivers and streams.

Sample Discussion

_____ Increasing urbanisation has serious impacts on freshwater ecosystems.

_____ It is known that the pollution and discharge of sewage alters the microbial community of freshwater environments.

_____ However, there is still a need to establish biological standards that can evaluate the water quality.

_____ The study presented here attempted to identify the specific differences in the microbial community at two sites along the São Pedro stream that is influenced by urbanisation.

_____

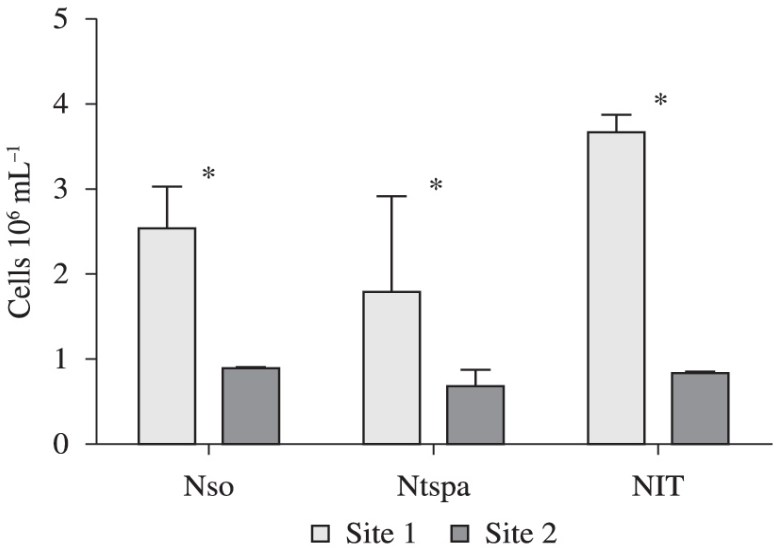

Figure 1. Density of bacteria from groups Nitrosomonadaceae (Nso), Nitrospiraceae (Ntspa), Nitrobacter (NIT) in Site 1 (urban) and Site 2 (rural) by FISH analysis.

Figure designed by the authors to represent their own data.

Reference

Medeiros, J., Araújo, L., Silva, V. d., Diniz, C., Cesar, D., Del'Duca, A., & Coelho, C. (2014). Characterization of the microbial community in a lotic environment to assess the effect of pollution on nitrifying and potentially pathogenic bacteria. *Brazilian Journal of Biology*, 74(3), 612-622. doi:10.1590/1519-6984.26712

1. Introduction

Rivers and streams are important reserves of water available for human consumption, animal life, agriculture, and industry (Kenzaka et al., 2001). Therefore, there is need to conserve this resource. However, in the modern world, extensive and growing urbanisation is a threat to the ecosystem of streams, through factors associated with the discharge of sewage. This phenomenon has been called "urban stream syndrome" (Paul and Meyer, 2001). Some paper explores mechanisms driving the syndrome, and identifies appropriate goals and methods for ecological restoration of urban streams (Komínková, 2012).

Water systems must meet certain criteria to be considered healthy. In the past, these criteria included only physicochemical parameters (Murray et al., 2001). Indeed, several studies have shown that urbanisation increases the concentration of some nutrients, such as nitrogen, ammonia, nitrate, and phosphorus, decrease the concentration of oxygen and is responsible for pH changes in rivers and streams (Hoare, 1984; Meybeck, 1998; Wernick et al., 1998; Martinelli et al., 2010; Cumar and Nagaraja, 2011; Padmalal et al., 2012). However, the analysis of the chemical and physical characteristics of an ecosystem becomes limited when the objective is the understanding of its complexity as the biological components should also be taken into account. In this regard, many studies have demonstrated that knowledge of the structure and dynamics of the microbial community in rivers and streams is essential, mainly due to their role in several biogeochemical cycles (Brümmer et al., 2000; Araya et al., 2003; Kostanjšek et al., 2005). This is especially important for environments modified by anthropogenic action (Böckelmanna et al., 2000; Kenzaka et al., 2001; Tiquia, 2010).

Since it has been shown that urbanisation is related to the incresase in nitrogen, ammonium and nitrate levels (Hoare, 1984; Meybeck, 1998; Wernick et al., 1998; Martinelli et al., 2010; Cumar and Nagaraja, 2011; Padmalal et al., 2012), one can hypothesise that it could influence the density and diversity of nitrifying and denitrifying microbes in impacted ecosystems. Considering the global nitrogen cycle, nitrification and denitrification are important steps. Microorganisms are essentially the group that mediates these processes; bacteria are the major players, followed by fungi and archaea. The nitrifying bacteria include a number of genera. *Nitrosomonas* and *Nitrosospira* are generally known as ammonia oxidising bacteria (AOB), while *Nitrobacter* and *Nitrospira* are nitrite oxidising bacteria (NOB) (Head et al., 1993; Teske et al., 1994; Herbert, 1999).

In addition, urbanisation can be a source of pathogenic bacteria through the discharge of human sewage into water environments (Girones et al., 2010). Through the monitoring of microbes in water, it is possible to identify potential pathogens. Species such as *Pseudomonas aeruginosa*, *Escherichia coli* (including diarrheagenic *E. coli*), *Aeromonas hydrophila*, *Staphylococcus aureus*, *Salmonella* sp., *Enterococcus* sp., *Streptococcus* sp., and *Bacteroides* sp. have been found in urban systems, and the vast majority of these are associated with the fecal material of humans and other animals (Savichtcheva et al., 2007; Gonzalez et al., 2010; Willems et al., 2011). Therefore, it is acknowledged that the presence of these groups in water environments constitutes a potential health hazard.

In spite of the great impact that urbanisation imposes on the microbial community in freshwater, the determination of microbial composition has been a great challenge to microbial ecologists. Conventional methods based on microbiological culture cannot provide a representative composition of the microbial community (Böckelmanna et al., 2000). Alternatively, molecular biology techniques can be used. Although several studies have used molecular tools to study the microbial community in polluted freshwater, to the best of our knowledge, few of those targeted group-specific bacteria (He and Jiang, 2005; Muniesa et al., 2006; Savichtcheva et al., 2007; Gonzalez et al., 2010). Because urbanisation has been related to the increase of nitrogen compounds in the aquatic systems and also a source of pathogenic bacteria through the discharge of sewage, we decided to target the microbes related to those specific aspects posed by the urbanisation phenomenon. Thus, the aim of this study was to investigate microbes from the nitrogen cycle and potentially pathogenic bacteria at urban and rural sites along a stream that receive discharge of domestic sewage and does not have appropriated wastewater management. We hypothesized that there would be a change on the structure of microbial community between the urban and rural region and our finds contribute to the understanding of the anthropogenic impacts on aquatic ecosystems.

2. Material and Methods

2.1. Study area

The São Pedro stream is located in the city of Juiz de Fora, Brazil, and is responsible for supplying water to approximately 10% of the population of this city. A part of the stream that passes through the city is polluted, especially due to the discharge of domestic sewage (Latuf, 2004). A previous study in this area that analysed chemical and biological parameters indicated that the São Pedro stream can be divided in two distinct sites and that this difference may be caused by anthropic actions through the urbanisation process (G. Alfenas et al. manuscript in preparation). Site 1 (661799E/7591070N) is an urban area with homes nearby. At this point, the water has an unpleasant odour and very dark colour. The site 2 (668307E/7591772N) is located in a rural area in a farming region with clean and clear water.

2.2. Seasonal survey

A previous sampling was conducted between May, 2005 and April, 2006, when 1 L of water was collected from the subsurface of the urban and rural areas of São Pedro stream. 20% (w/v) paraformaldehyde in phosphate buffered saline (PBS) was added to an aliquot of the collected sample to a final concentration of 2%. Then, the

Table 3. Concentration of Nutrients (mg/L) dissolved in the studied areas.

	Nitrite (mg/L)	Nitrate (mg/L)	Ammonium nitrogen (mg/L)	Total Org. NIT. (mg/L)	Total P (mg/L)
Rural	ND*	0.121	0.081	0.28	0.021
Urban	0.029	0.558	1.811	1.708	0.420

*Not detected.

3.2. Nitrifying bacteria

Through PCR analysis shown in Figure 1, the groups Nitrosomonadaceae and *Nitrosospira* that function as AOB and *Nitrospira* (one of the NOB groups) were detected in both areas of study. Bacteria of the genus *Nitrobacter*, which convert nitrite into nitrate, were present at urban area and in the rural area were less than the detection limit of our assay. The genes *amoA*, *napA*, and *nfrA*, important molecular markers of the nitrogen cycle, were present in both areas. However, the higher intensity of the bands from the urban area compared to the rural one suggests that the amplicons for *amoA*, *napA* and *nfrA* were more abundant in this site (see Figure 1). Through FISH analysis, it was observed that the groups Nitrosomonadaceae, Nitrospiraceae, and *Nitrobacter* had significantly higher abundance in the urban area (see Figure 2). Considering the domains *Bacteria* and *Archaea*, the abundance of *Bacteria* was significantly higher in the urban area (9.48×10^6 mL^{-1}) compared to the rural area (0.80×10^6 mL^{-1}). For the domain *Archaea*, the abundance was 2.76×10^6 mL^{-1} in the urban area and 0.35×10^6 mL^{-1} in the rural area.

3.3. Potentially pathogenic bactéria

The Figure 3 and 4 show the results of PCR using primers specific for genera and species of already known human pathogens. The genera *Enterococcus sp.* was present in the urban area and was not detected in the rural area. The amplicons for the genera *Salmonella sp*., *Streptococcus sp*., and *Bacteroides/Prevotella/Porphyromonas* had a higher intensity, suggesting that they were more accumulated in the urban area. The same results were observed for the species *P. aeruginosa* and *S. aureus*. In contrast, the amplicons for *A. hydrophila* were present at the same intensity at both sites (as shown in Figure 3).

For *E. coli*, the amplicons were more abundant in the urban area. Enteropathogenic *E. coli* (EPEC) was identified according to the genotype *eae+/bfp+* in both studied areas. Enterohemorrhagic *E. coli* (EHEC) was identified according to the genotype *stx1+/stx2+* only in the urban area and *stx1+/stx2-* in the rural area. Enteroinvasive *E. coli* (EIEC) was classified as *ipaH+* in the two areas and the strain ETEC (enterotoxigenic *E. coli*) was identified according to the genotype *elt+/est-* in the urban area and *elt-/est-* in the rural area. It is important to mention that the amplicons obtained for all the diarrheagenic *E. coli* were more intense at the urban site when compared to the rural site (see Figure 4).

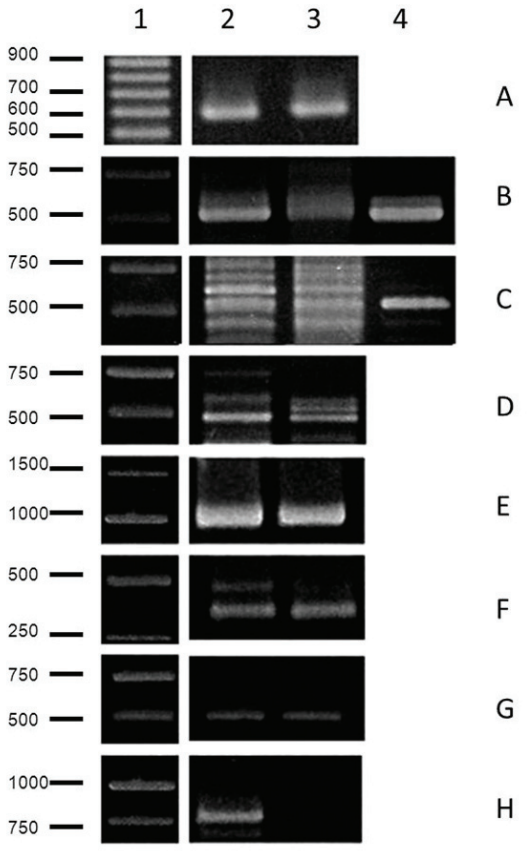

Figure 1. Identification of molecular markers of the nitrogen cycle and nitrifying bacteria by PCR analysis. The images are representative of the experiments. A- *Bacteria,* B- *nrfA*, C- *napA,* D-*amoA,* E- Nitrosomonadaceae, F- *Nitrospira,* G- *Nitrosospira,* H- *Nitrobacter.* 1- Molecular Mass Marker; 2- Site 1; 3- Site 2; 4- Positive Control.

4. Discussion

Increasing urbanisation has serious impacts on freshwater ecosystems. It is known that the pollution and discharge of sewage alters the microbial community of freshwater environments (Paul and Meyer, 2001; Walsh et al., 2005; Girones et al., 2010). However, there is still a need to establish biological standards that can evaluate the water quality. The study presented here attempted to identify the specific differences in the microbial community at two sites along the São Pedro stream that is influenced by urbanisation.

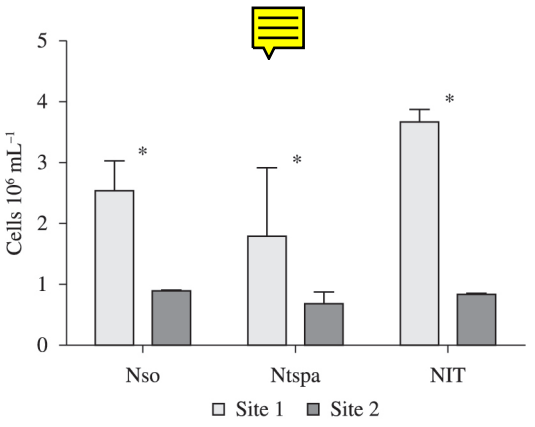

Figure 2. Density of bacteria from groups Nitrosomonadaceae (Nso), Nitrospiraceae (Ntspa), *Nitrobacter* (NIT) in Site 1 (urban) and Site 2 (rural) by FISH analysis.

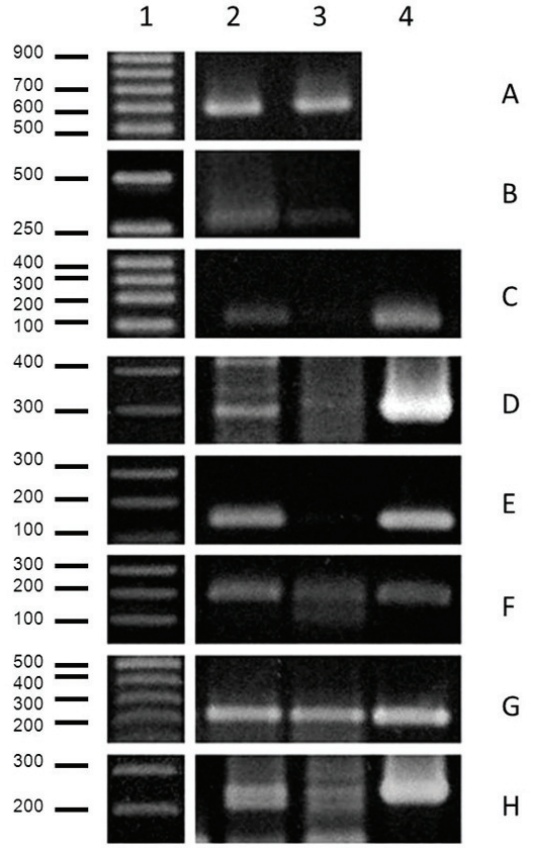

Figure 3. Identification of pathogenic bacteria by PCR analysis. The images are representative of the experiments. A- *Bacteria,* B- *Streptococcus sp.*, C- *Enterococcus sp.,* D- *Salmonella sp.,* E- *Bacteroides/Prevotella/Porphyromonas,* F- *Pseudomonas aeruginosa,* G- *Aeromonashydrophila,* H- *Staphylococcus aureus*. 1- Molecular Mass Marker; 2- Site 1; 3- Site 2; 4- Positive Control.

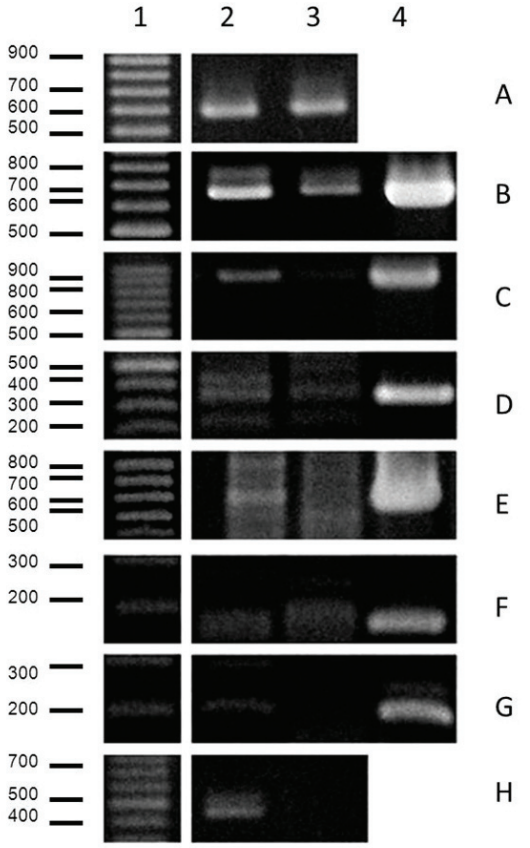

Figure 4. Identification of *Escherichia coli* and diarrheagenic lineages by PCR analysis. The images are representative of the experiments. A- *Bacteria,* B- *Escherichia coli*, C- *E. coli* EPEC (*eae*), D- *E. coli* EPEC (*bfpA*), E- *E. coli* EIEC *(ipaH),* F- *E. coli* EHEC *(stx1),* G- *E. coli* EHEC *(stx2),* H- *E. coli* ETEC *(elt).* 1- Molecular Mass Marker; 2- Site 1; 3- Site 2; 4- Positive Control.

The abundance of bacteria (1×10^7) obtained in the urban area of study was in agreement with Kenzaka et al. (2001) and within the range reported for other polluted rivers that were considered eutrophic systems by Yamaguchi et al. (1997). The concentration of dissolved nutrients obtained in this study in the urban area also corroborated with classifying this area as an eutrophic system since this classification is within the range of nutrients found at this site. This high abundance can be justified by the influx of organic material in this environment, resulting from domestic sewage. The high abundance of *Archaea* in the urban area can be explained since these microbes can easily survive in environments with a higher content of nutrients and could be active in the recycling of nitrogen (Dridi et al., 2011).

PCR analysis showed that the group *Nitrobacter*, was less than the detection limit of our assay in the rural area. This result corroborates with FISH analysis, through which we observed a higher abundance of *Nitrobacter*

Vantage 140 SCIE 113

Paraphrasing Academic Sources

Weeks Ten & Eleven

LESSON PLAN:

Required Materials:	1) Vant 140 Paraphrasing Academic Sources Worksheet 2) Vant 140 Paraphrasing Academic Sources Article Handout 3) Student Laptops 4) Board Markers

LESSON PROCEDURE

Task One	Resource(s)	Time
Put students into small groups of 3 for Task One. Students identify key words that they will need to understand in order to paraphrase. Using their laptops, students find a "quick definition" for the words and then explain how the word is used in the context of the article. Share as a large class.	Vant 140 Paraphrasing Academic Sources Worksheet Paraphrasing Academic Sources Article Handout Student Laptops Board Markers	25 - 30 mins
Task Two	**Resource(s)**	**Time**
In small groups/pairs have students fill out the paraphrasing table being careful to use their own words. Circulate and help students with logical connections, synonyms, etc. Students can write their answers on the board. Discuss any issues that arise. COLLECT PAPERS FOR LESSON TO BE CONTINUED NEXT WEEK	Vant 140 Paraphrasing Academic Sources Worksheet Paraphrasing Academic Sources Article Handout Student Laptops Board Markers	15 – 20 mins
Tasks Three & Four (Week 11)	**Resource(s)**	**Time**
Hand back the student worksheets from Week 10. In small groups of 3, students create a visual representation (graphic organizer) on a large sheet of flipchart paper. They should show all of the logical connections (Cause/Effect) that are expressed in the article.	Flipchart Paper Markers Vant 140 Paraphrasing Academic Sources Worksheet Paraphrasing Academic Sources Article Handout	20 - 25 mins
(Individual or pairs) Using the flipchart visuals and paragraphing charts, students paraphrase the original article. They can check their paraphrases with the checklist at the bottom of page 3. Collect paraphrases for a mark.	Flipchart Paper Markers Vant 140 Paraphrasing Academic Sources Worksheet Paraphrasing Academic Sources Article Handout Board and Markers	20 - 25 mins

Materials: Paraphrasing Academic Sources Article Handout

Vant 140: SCIE 113

Paraphrasing Academic Sources

Weeks Ten & Eleven

Adapted from:

Effects of Salmon-Derived Nitrogen on Riparian Forest Growth and Implications for Stream Productivity

"Although many Alaskan stocks remain healthy, Pacific salmon have disappeared from or are in serious decline throughout most of their historical spawning range in North America. In addition to the resultant cultural and economic consequences, these declines may have important long-term ecological implications for freshwater and terrestrial ecosystems of the Pacific coast. Here we have shown that riparian plants derive a significant proportion of their foliar N from spawning salmon, and that riparian growth rates are significantly enhanced by this nutrient subsidy. This fertilization process may in turn affect the quality of instream spawning and rearing habitat and reproductive success of salmon populations, so that declines in spawning density may result in degraded riverine habitat and further declines in salmon production over the long term. To the extent that this depensatory cycle is mediated by piscivorous animals that depend on the availability of salmon and riparian habitat for their own survival, the viability of salmon populations, riparian forests, and terrestrial piscivores are mutually dependent. These findings have potentially important implications for fisheries management, endangered species legislation, and ecological restoration, as traditionally focused, single-species management approaches will likely be inadequate to address the complexity of interactions between salmon stocks and the river and riparian ecosystems upon which they depend" (Helfield & Naiman, 2001, p. 2408).

Reference

Helfield, J. M., & Naiman, R. J. (2001). Effects of salmon-derived nitrogen on riparian forest growth and implications for stream productivity. *Ecology*, 82(9), 2403-2409. doi:10.1890/0012-9658(2001)082[2403:EOSDNO]2.0.CO;2

Materials: Paraphrasing Academic Sources Worksheet

	Vant 140: SCIE 113 *Paraphrasing Academic Sources* **Weeks Ten & Eleven**

Task One: In your group, underline new academic words that you will need to understand in order to correctly paraphrase the paragraph. Find a "quick definition" and explain how the word is used in the article. An example has been done for you.

New Word	Quick Definition	Meaning in this Context
piscivorous animals	An animal that eats fish	Animals that live near the streams and eat salmon (perhaps bears)

Task Two: Using the article, fill out the paraphrasing table below.

Important Points (Bullet Points) in your own words

Important Relationships (X causes Y)

Linking Phrases and Expressions (Explicit Logic)
So,

Words that Might Establish Other Relationships (Implicit Logic)
Resultant,

Keywords and Synonyms

Correct APA Style In-Text Citation for a Paraphrase

Task Three: In your group, draw a visual representation (graphic organizer) of the information from the article (on the large piece of paper provided to you). Make sure to show all of the logical connections (cause/effect). You can use this space to brainstorm your ideas.

Task Four: Using the information from your visual representation, write an academic paraphrase of the information from the article.

PARAPHRASE:

Paraphrasing Checklist:

This paraphrase:

- ☐ Contains different organizational structure than the original (staging, paragraphing, and theme/rheme structure are original).
- ☐ Contains different keywords than the original. This may be done by packing, unpacking, or re-packing the original content.
- ☐ Correctly cites the original source by using an in-text citation.
- ☐ Does not misrepresent the original meaning. The same meaning has been expressed as in the original.
- ☐ Does not include any new information or express the feelings of the writer about the material.

Reference

Medeiros, J., Araújo, L., Silva, V. d., Diniz, C., Cesar, D., Del'Duca, A., & Coelho, C. (2014). Characterization of the microbial community in a lotic environment to assess the effect of pollution on nitrifying and potentially pathogenic bacteria. *Brazilian Journal of Biology*, 74(3), 612-622. doi:10.1590/1519-6984.26712

Paraphrasing, Summarizing, and Quotations Worksheet

Student Name **Student Number**

You have been asked to complete this worksheet and submit it along with your [assignment]. Complete this worksheet first, then revise your assignment.

By the end of this set of activities you should be able to:

- Use your course syllabus to identify the rules and policies that you must follow in [course]
- Identify whether or not the assignment that you submitted did or did not follow these rules
- Reflect on why UBC has rules about academic misconduct and why the university deals with academic misconduct so seriously
- Define plagiarism
- Describe the differences between paraphrasing, summarizing, and quotations
- Identify strategies you can use to avoid plagiarism and other types of academic misconduct
- Use the strategies you identified to revise your own work
- Practice summarizing from an assigned reading

Task #1. Please read the [course] course syllabus. Course syllabi are often given out on the first day of class. The syllabus outlines the learning you will do in your courses, how you will be assessed and also contains all the policies, rules and regulations that you must follow in the course. The course syllabus is like a contract between you, your instructor and the University.

What are the rules outlined in the [course] course syllabus that apply to all writing submitted in this course?

Did the assignment that you submitted follow these rules?

Yes No I'm not sure

Complete this question after revising your assignment.

Does the revised assignment that you are now submitting follow these rules?

Yes No I'm not sure

Task #2. Please read UBC's policy on Academic Misconduct here:
http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,54,111,959

Please provide a summary of this reading in your own words.

How is plagiarism defined at UBC?

Why do you think UBC has rules about academic misconduct?

Who is affected when a student submits an assignment that contains plagiarism?

Who else at UBC is affected when a student submits an assignment that contains plagiarism?

Task #3. Please read the definitions of Quoting, Paraphrasing, and Summarizing on this resource from OWL,
https://owl.english.purdue.edu/owl/resource/563/01/

Identify one difference between quoting and paraphrasing.

Identify one similarity between quoting and paraphrasing.

Identify two similarities between paraphrasing and summarizing.

Identify one difference between paraphrasing and summarizing.

Task #4. Please read this resource entitled, "Paraphrase: Write it in your own words."
https://owl.english.purdue.edu/owl/resource/563/02/

Identify at least two different strategies that you can you use to avoid plagiarism in your own work.

Complete this question after revising your assignment.

Please comment on how you have revised the assignment that you are resubmitting (You can use the additional space on the back of this page, if necessary).

Reference: *The Purdue OWL Family of Sites.* The Purdue Online Writing Lab and OWL at Purdue U, 1995-2014. Web. Mar. 2014.