Communicating Science Through Studies in Sustainability

AP Chemistry

A Three-Week Unit

By Travis Trombley

Conceptualization

Essential Questions:

1. What are the applications of scientific findings?
2. What are the various ways by which these findings can be communicated?

Breakdown: This unit, in my case, is a special circumstance. It is meant as the concluding unit to an AP Chemistry class for both juniors and seniors (in the school for which this unit is conceived, that specific class runs every other year) AFTER they have taken the AP test. In other words, this is meant to be kind of the fun, post-test unit that will allow the students to perhaps decompress a little while they explore elements of science perhaps not permitted by the strict AP curriculum. This unit is also meant as a practical prep course for college work, as the assumption with AP students is that they will be attending college post high school graduation. In addition, this unit was conceived within the following guidelines: incorporating the theme of sustainability, the study of chemistry, and the discipline of English.

Bearing those elements in mind, this unit’s core is the communication of science and scientific findings. This is an important item in itself to think about, considering that students will soon be moving into different collegiate environments in which they will all be asked—in some capacity—to read, understand, and apply academic articles. An awareness of the rules, mechanisms, and purposes underlying this form of writing specifically will help students orient themselves more effectively. In addition, they will be presented with other reports and rhetoric. We will analyze those, too, teasing apart findings and the application thereof from agenda. Ultimately, the students will have an understanding and practice with three different forms of scientific communication: lab report, PSA video, and a research paper. At the end, the students will have developed skills in writings (specifically within the APA format), videography and video editing, and academic research.

There is a field trip component to this unit. The students will be taken to a Nature Center, where they will do on-site water testing. This will be the focus of their first project: the lab report. Not only will the students get to apply their lab skills out in a fun environment, but they will also catalog and communicate what they did with a brief, APA style lab report (see assignment sheet). The students may also incorporate the trip into their second assignment, the video PSA. This assignment is meant to get the students thinking about a local sustainability issue and using their scientific knowledge to briefly argue for sustainability and then recommend practical means for either sustaining what works or fixing what may not work. This project will get the students thinking about science as an active element—something to be acted upon—and they will communicate a sustainability issue as such, combining it with elements of persuasion. Finally, the research project assignment—again oriented about a sustainability issue—will get the students thinking about science in the frame of argument, and in this context they will do the hard work of academic research and organization to craft an argument for or against a practice of their choosing using scientific findings. The students will explore science and it’s communication through this project, combing elements from the first two assignments (though this is more seeking and analyzing reports than writing one), and ultimately developing skills necessary for success in college, e.g. researching, analyzing, organizing, crafting an argument, and writing. By the unit’s conclusion, the students will have ideally created three items of distinct yet related expression (different ways of talking about the subject of sustainability in science). And that is how this unit will achieve its interdisciplinary value—talking about finding and doing.

At the showcase, the students’ portfolios will be displayed (including the two papers and a DVD/write up of their video). In addition, the students’ videos will be displayed on a monitor.

JUST IN CASE: This unit is not meant to contain any controversial material, though some of the practices related to the political climate in terms of sustainability may prove as much. In recognition of this potentiality, the teacher ought to be prepared to dispel any politically charged debate that may arise by promoting the seeking and use of empirical findings, using the controversy to emphasize the purposes of the unit, not the other way around.

Also, in case the field trip falls through, plan B is to test water near the high school, which is within walking distance. Plan C is to get and bring the water to the classroom for testing.

Texts:

This unit has no defined text, though it will involve excerpts from various texts and articles (see appendix)

Materials:

* All students will use materials from the Water Quality Index (WQI) Field Trip – Student Laboratory Kit (provided by school)
  + “The Water Quality Index (WQI) is an environmental quality “score” that is derived based on a combination of nine different chemical and biological water tests-dissolved oxygen, fecal coliform, pH, biochemical oxygen demand, temperature, phosphate, nitrate, turbidity, and total solids. After performing the nine tests and analyzing the results, students will calculate a quality rating for the water which ranges from 0 (very bad) to 100 (excellent).”
  + <http://www.flinnsci.com/store/Scripts/prodView.asp?idproduct=16759>
  + 
* Students will require cameras or other means of capturing video (smart phones or tablet computers)
* Students will require access to video editing software (Windows Movie Make or iMovie on iPad are pretty standard)
* Students will require access to school databases for research purposes
* Students will read various excerpts from books and articles as examples of argument/employment of scientific findings or discuss the skills being practiced (see appendix for articles).

Standards Addressed

* CR4 The course provides students with the opportunity to connect their knowledge of chemistry and science to major societal or technological components (e.g., concerns, technological advances, innovations) to help them become scientifically literate citizens.
* CR7 The course provides opportunities for students to develop, record, and maintain evidence of their verbal, written, and graphic communication skills through laboratory reports, summaries of literature or scientific investigations, and oral, written, and graphic presentations.

Learning Targets:

* Knowledge: Students will develop a working understanding not only of various forms of communicating scientific findings, but also the underlying purposes and audiences related to the different types.
* Reasoning: Students will possess the ability to communicate scientific findings by various means and for various purposes.
* Demonstration/Production:
  + Water Testing Lab Report (2-3 pages): By the Friday of the first week, each student will turn in a lab report in formal APA format. Students will write an introduction to the tests, which will include at least two outside sources, a research question, and a hypothesis; a methods section that details the tests used and how each was executed, a results section that details findings (graphs are suggested), and a discussion section that relates to the introduction and discusses the implications of the findings.
* Video PSA: using the experience of the water testing activity completed at the Albion College Whitehouse Nature Center, the students will—in groups—create 3-5 minute videos that are meant to inform community members of sustainability issues and means by which these issues can be addressed (either fixing what needs to be fixed or maintaining what is already healthy). Students will write, shoot, edit, and produce their own videos. The purpose of this project is to get students thinking about alternative means and purposes of communicating scientific findings, emphasizing in this case the applicable suggestions based on science for the sake of environmental sustainability.
  + Short Research Paper: Students will be required to write a brief research paper (4-7 pages in APA format) concerning a sustainability topic of their choice. Students will use databases and library texts to research no less than 6 sources for this paper, and they will make an argument for or against an environmental practice of their choice. This paper will focus on correctly formatting the paper and the sources in APA format, practicing academic research, and constructing an extended email.
* Dispositions:
  + To see the various uses and audiences of different forms of scientific communications.
  + To understand how to create intentionally different forms of scientific communications for different purposes.

Assessments

Formative Assessments

* As students will be doing much work on the video and the research paper in class, much of the unit’s formative assessment will be teacher observations and corrections on an individual or group-by-group basis.
* Students will hand in sections of the research paper as they go (see assignment sheet in appendix) for comments and revisions, and they will be given a chance to revise the final paper before receiving a final grade.

Summative Assessments

* Lab Report. After the water testing activity completed during the field trip to the Albion College Whitehouse Nature Center, students will individually write out complete a formal scientific paper about the purposes, methods, results, and possible implications of their findings. These papers will be written in APA style. These papers will be conceptualized as miniature versions of more formal scientific reports. These papers will require the use of at least two outside sources.
* Video PSA. Again, using the experience of the water testing activity completed at the Albion College Whitehouse Nature Center, the students will—in groups—create 3-5 minute videos that are meant to inform community members of sustainability issues and means by which these issues can be addressed (either fixing what needs to be fixed or maintaining what is already healthy). Students will write, shoot, edit, and produce their own videos. The purpose of this project is to get students thinking about alternative means and purposes of communicating scientific findings, emphasizing in this case the applicable suggestions based on science for the sake of environmental sustainability.
* Research Paper. Students will be required to write a brief research paper (4-7 pages in APA format) concerning a sustainability topic of their choice. Students will use databases and library texts to research no less than 6 sources for this paper, and they will make an argument for or against an environmental practice of their choice. This paper will focus on correctly formatting the paper and the sources in APA format, practicing academic research, and constructing an extended email.

Pacing Guide

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Sunday 11  Move-IN  KICKOFF | Monday 12  Intro Day  Prep Day for field trip and projects. | Tuesday 13  Field Trip =) | Wednesday 14  Work on video project and lab report  Intro to video techniques  Hand out “How to Shoot Video that Doesn’t Suck”  Proposals due by the beginning of class the next day. | Thursday 15  Work on video project  Showcase editing methods | Friday 16  Lab report due.  Work on video.  Introduce research paper assignment. | Saturday 17 |
| Sunday 18 | Monday 19  Finalize video in class | Tuesday 20  Video due.  Introduce research paper assignment | Wednesday 21  Go over and build upon research methods  Work on paper | Thursday 22  Go over argument techniques.  Work on paper in class. | Friday 23  Work on paper in class.  Continue going over argument techniques. | Saturday 24 |
| Sunday 19 | Monday 26  *Memorial Day* | Tuesday 27  Peer Editing Day | Wednesday 28  Turn in research paper | Thursday 29  SHOWCASE  Public 6-8 p.m.  For you=  4-9p.m. | Friday 30  Farewells  Turn in potential revisions | Saturday 31  Move Out Day |

Narrative Overview

Day 1—Introductions to Teacher and Unit

Essential Question: Who are you? What are we doing?

* As this is a rather abnormal unit, introducing the unit effectively will be a crucial step, one that will require an entire class’s work. The primary learning outcome for this class is, of course, the introduction to the unit, its purpose, and the guidelines in which it was created—transparency is key, both pedagogically and interpersonally. The other purpose is to, of course, talk about the field trip the following day.
  + The class will probably begin with an introduction of the teacher and the filling out of a personal inventory sheet (see appendix).
  + Move into a discussion of the unit and its aims. Pay attention to why and how it was created.
    - Skill orientations in a collegiate contexts
    - Sustainability and English
    - Portfolios for demonstration
  + Talk about field trip
    - Purposes
      * Field research (different tests)
      * Taking video
      * Fun
    - Logistics
      * Proper clothing
      * Times of departure and return
      * Lunch

Day 2—FIELD TRIP!!!

Essential Questions: How do I take what I learned in the classroom into the field?

Starting the unit off with a bang, the second day is the field trip. The students will be organized into two groups after their first period and put on the bus. Once there and made acclimated, one group will do the water testing while the other goes canoeing, then lunch, then the two will reverse. While testing, students will be advised to film and take not of their actions. They will also fill out worksheets as they go for their lab report assignment (this sheet will be provided once we get a more stable idea of what tests the students will be performing). I will be filming both the testing and canoeing of the students for uses of b-roll for their films and a brief video presentation of my own detailing the field trip.

A rough agenda of the trip follows:

9:00 am—depart from Marshall High School

9:20 am—arrive at Whitehouse Nature Center, get comfy, and organize into groups

9:30 am - 11:00am—Group 1 will perform water tests (yet to be defined) while David Green takes the second group canoeing.

11:00 am - 11:45 am—lunch

12:00 pm - 1:30 pm—Group 2 water testing while other canoes

2:00 pm—decompress and depart for Marshall High School

\*\*\*As for the specific tests that will be performed, we haven’t gotten these completely decided upon just yet. This document will be revised accordingly and include an instruction sheet when those decisions are able to be made.\*\*\*

Day 3—Intro to Video

EQ: How can I use video to talk about a sustainability issue?

Day 4—Video Continued

EQ: ibid

Day 5—Video Work continued

EQ: How do I craft the best video to communicate my desired subject?

This will be a work day for the students.

Materials: students will require laptops or iPads for editing, they will need iPads, phones, or cameras for filming, as well as any props they may have requested or can be supplied. The teacher will need access to a video projector in order to recap the style essentials.

It will begin with a quick recap of the elements of style covered over the past two classes and a class wide check-up on the progress of the videos.

o Framing (rule of thirds)

o Feet zoom

o Using visuals and b-roll

o Lighting

Students will then be given time to work on their videos in their groups. They may have to leave the classroom for this part. Be sure they return at least 5 minutes before the bell.

At the end, the students will have an opportunity to express briefly how they feel they are doing, their plans to complete the project, and their anxieties—if any—regarding the project. Teacher should reiterate email support is available throughout the weekend.

Day 6—Finalize Video Work

EQ: What do I need to do to finalize my video? What CAN I do?

Day 7—Introduction to Research paper

EQ: What sustainability do I want to learn more about? What about a research paper lends itself to learning and arguing about a topic?

Day 8—Research Paper Techniques

EQ: How do I perform research in an academic format? How is APA different from MLA?

Day 9—Argument Techniques

EQ: What are the different ways of making an argument? Are some more effective than others?

Day 10—Work Day

EQ: What can I do in school to finish my paper?

Day 11—Memorial Day

EQ: Should I do homework or get into shenanigans with a day off school?

Day 12—Peer Editing Day

EQ: How can I help my peers improve their papers? How can reading others’ papers help me improve my own writing?

Day 13—Finalize and Turn in Research paper

EQ: How can I finalize and tighten up my paper before handing it in?

Day 14—Revisions and reworking—finalize portfolios.

EQ: What do I need to alter or fix about my paper before turning in the final copy?

Day 15—Fairwells

EQ: How awesome was Mr. T?

Appendix

Research Paper Assignment Sheet

Outline Due Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Final Paper Due Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

This is it—the big paper. You will be writing a 4-7 page (12-point font, Times New Roman) researched argument paper in APA format about a sustainability topic of your choice. You should argue for or against a certain practice (using solar panels, not using windmills, not using pesticides, etc.). Make your position clear and construct a solid argument for it. I suggest the building an argument (a=b, b=c, therefore a=c) rather than the traditional five-paragraph format (because, frankly, that’s boring).

A major component of this paper will be writing it in correct APA format, including layout, title page, abstract, in-text citations, and a references page. See the handouts or the Purdue Owl site for reference.

You will turn in a working outline of this paper by email the weekend before the paper is due. I will respond with comments and suggestions.

Please talk to me about your paper if you have any questions. You may engage me during school hours or send me an email at [tjt11@albion.edu](mailto:tjt11@albion.edu).

Rubric for Research paper (100 points)

I recommend following this format: IntroDefinition paragraph (explain topic)3 paragraphs of argument (specific points from chosen text)Conclusion.

|  |  |  |  |
| --- | --- | --- | --- |
| Points | Needs Work | Good | Excellent |
| Argument (50) | A vague argument is made, though most of paper is descriptive. Uses insufficient evidence. | Argument is clear, but not supported well or contains logic issues. | Argument is clearly stated and supported by textual evidence. Follows a logical order. |
| APA Formatting (35) | Minimal understanding of APA formatting is demonstrated. Citations are erroneous or absent. The layout does not follow APA guidelines. Necessary components like a title page or abstract are absent. | APA is generally followed. There may be minute but important mistakes throughout, demonstrating a fundamental misunderstanding of one or two objects. | APA formatting is adhered in all aspects. There may be some minor typos, but no vital misunderstandings are demonstrated. |
| Mechanics (15) | Paper contains many grammatical and syntactical errors. Paper may also contain simple editing mistakes like misspellings or formatting issues. | Paper is free of simple editing mistakes, but still contains some improperly constructed sentences or grammar issues. | Few grammatical or syntactical issues. Sentences flow logically from one to another, topic sentences define paragraphs, and |

Video PSA Assignment Sheet

Proposal Due Date:\_\_\_\_\_\_\_\_\_\_

Final Project Due Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

In groups no larger than five, you will create a 2-5 minute video PSA about a LOCAL sustainability issue. You could work on paper recycling in the school, the effects of the recent oil spill, pesticides used in farming, etc. Your subject must be Okayed by me and Mrs. Haroff by means of a typed proposal.

The proposal is a short (no more than one page, double spaced) document in which you will identify your subject, your take on the subject, potential sources, and any other ideas about the content or process of filming you may have at this point in the process. Each group need only turn in one proposal.

Rubric for Final Project (100 points)

Content (50 points)

-Subject is clearly defined

-Problem or potential problem described in detail

-Solution is well-defined and easy to follow

-Reliable sources are used

Technique (50 points)

-At least 1 graphic or image is included

-Demonstrates knowledge of editing footage together

-Uses B-roll at least once

-Uses tight framing

-Uses effective lighting

Lab Report Assignment Sheet

This is a simple assignment—write up what you did and found while water testing in an APA lap report form (2-4 pages, double spaced with 12 point Times New Roman font). This will be a miniaturized version of the academic articles you’ll find on databases, complete with a title page, abstract, introduction (with research question(s) and hypothesis), methods, results, discussion, and references sections (see below for layout). You must incorporate two outside sources in your introduction to give context to the testing you did, and these sources must be brought up again later in your discussion section. Otherwise, this is a simple write up of the water testing activities you performed. You will be graded on the accuracy of your explanations, our presentation of findings, your explanation of results, your adherence to APA format, and writing mechanics.

Outline

* Title Page
* Abstract (200 word maximum)
* Introduction
  + Incorporate two sources
  + Give context to the testing
  + Explain research question(s)
  + State hypothesis
* Methods
  + Explain all procedures
* Results
  + State the findings of all the tests
  + Give numerical findings and explain them
  + Use at least one graph for 5 points extra credit.
* Discussion
  + Bring back two outside sources and relate them to the findings
  + Explain the significance (or lack thereof) of the findings
  + Suggest further directions for research
* References
  + Cite at least two sources in APA format

“How to Shoot Video that Doesn’t Suck”

\*\*\*See appended PDF\*\*\*

The following links are to various internet PDF files or websites the students may find helpful when crafting their papers

<http://bcs.bedfordstmartins.com/resdoc5e/pdf/Hacker-Mira-APA-2010.pdf>

<https://owl.english.purdue.edu/owl/resource/560/18/>

<http://www.unwsp.edu/c/document_library/get_file?uuid=a208956c-88e0-46db-a445-87686aadbe72&groupId=2273328>

<https://owl.english.purdue.edu/owl/resource/670/03/>

https://mail.google.com/mail/u/0/images/cleardot.gif

AP Chemistry Field Trip Permission Slip

April 25, 2014

Dear Parents,

On Tuesday, May 13th the AP Chemistry students will have the opportunity to participate in a field trip to the Albion College Whitehouse Nature Center to practice on-site water testing. In addition, students will also get to go canoeing down the Kalamazoo River with Dave Green, the director of the Whitehouse Nature Center.

I encourage you to visit the Whitehouse Nature Center page of the Albion College website: http://www.albion.edu/about-albion/whitehouse-nature-center.

Participation in this field trip is completely optional, but since we will be gone during class time on May 13th those students not participating in the field trip will be required to complete an alternative assignment during their class period on that day.

There is no cost for this field trip. Pizza will be provided for lunch. Students who do not like or may have allergic aversions to pizza are recommended to bring a sack lunch.

Please complete the permission slip below and have your son/daughter return it to me Thursday, May 8th. If you have any questions, please contact me at the high school, 781-1250 ext. 4567. I thank you for your support and I am looking forward to sharing this fabulous experience with the students!

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_Yes, my son/daughter has permission to attend the field trip on Tuesday, May 13th to the Albion College Whitehouse Nature Center with Mrs. Haroff’s AP Chemistry class.

\_\_\_\_\_No, I would prefer that my son/daughter not attend the field trip. I understand that an alternate assignment will be assigned.

If your child has any allergies or disabilities that would like us to know about, or if you have any concerns, please put that information here: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Emergency Contact

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Phone number:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name of Student

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_

Parent Signature Date

References[[1]](#footnote-1)

Stockman, S. (2011). *How to Shoot Video that doesn't Suck.* Workman Publishing Company.

Vimeo. (2014). *Video School*. Web.

Unit Plan Revisions

“There are few things in this world that I can guarantee. One of them is that you WILL change your unit plan as you go.”—Dr. Suellyn Henke

Dr. Henke was correct, but when she said that to us at the beginning of the semester, I had no idea how much that would apply to me. Even before I began working full time in the Maymester, I began to realize that I had created a unit for an imaginary class of students who all work at a college level. My original plan was to ask the students to write a lab report based on the field trip, then—in three school days and a weekend—write, shoot, edit and produce a video PSA, and then use the second half of my three week unit writing research papers on sustainability topics of their choice. The rationale behind this triad of assignments was that the students gain experience in three very distinct forms of communication related to the realm of science: informing and presenting to other scientists, informing the public and public action, and evidence-oriented argument. This metadiscourse, I thought, would make a nice cap to their content-loaded year and prepare them to more effectively read and write such items in college. But in all of our collaborations throughout the semester, nobody thought to suggest, “Hey, Travis, don’t you think that’s a little much for three weeks?” Only after I completed the unit and got into the classroom did I remember a simple and easily overlooked detail: students are people, too. By the second day of Maymester, after realizing the enormity of a video project for high schoolers, especially at this time of year, I had dropped the research paper component of the unit and adjusted by allotting more time to work on the video and to produce an accompanying brochure. While I lost the third component of my three-fold unit on scientific communication—reporting, informing and arguing, focusing on the former two offered enough of a spectrum to cultivate productive discussion and learning about the various types of scientific communications. Additionally, focusing on the same information and methods of scientific persuasion, a concept we talked about often, for both the video and pamphlet really forced the students to learn their material and how to present it most effectively, a benefit that would have been lost if the time had been split between PSA and research paper. In the end, the changes made were certainly for the better—they were much better suited for a classroom of real students with lives outside my class, rather than the imaginary classroom of extremely capable and willing pupils I had concocted in the preparation stages of my unit.

Instructor: Travis Trombley

Date: 12 May 2014

|  |  |
| --- | --- |
| Title of the lesson: | Introduction |
|  | |
| **I. Preliminary Planning** | |
| Objective(s) of the lesson: | Students will be introduced to Mr. Trombley and Maymester, will introduce themselves, and will learn about the water testing field trip. |
| GLCE/HSCE best served:  (no more than 2 or 3) | CR4 The course provides students with the opportunity to connect their knowledge of chemistry and science to major societal or technological components (e.g., concerns, technological advances, innovations) to help them become scientifically literate citizens. |
| Focus question: | Who are you? What are we doing? |
| Key vocabulary/concepts: | Scientific Persuasion: The practice of employing empirically gained information to demonstrate an understanding of a topic and thereby establish authorial authority. |
| Time required: | 50 minutes |
| Materials needed: | Personal Inventory sheets and WQI booklets for handing out |
|  | |
| **II. The Lesson Itself\*** | |
| Lesson launch (aka *the* *hook* or *accessing prior knowledge*): | Students will be handed and asked to fill out personal inventory sheets. After an allotted 5-7 minutes to fill out the sheets, the students will play popcorn—the teacher will play, too. Each student will give their name and answer the question designated for them. Once done, they pick the next person and ask them a question—and so on. |
| How the lesson’s objective(s) will be shared with the students: | Only teacher-led discussion and some small-group discussions will be used beyond the hook. This is just an introduction preceding the field trip, so it’s much logistical clarification. |
| Learning activities (step-by-step):  *These should be complete enough that a good substitute could study them and teach this class.* | 1. Discuss the different purposes for scientific communication (lab reports are generally for other scientists interested in and can understand the results or want to replicate the methods—PSAs or other such works are for general audiences, and they are meant to put scientific findings to application, explaining what to do and why). 2. Discuss academic benefits to the student research projects 3. Discuss the logistics of the field trip. 4. Decide on and break into groups to go over the tests for field trip and divvy up the methods section portions of the report. |
| Checking for understanding:  (formative assessment) | None for this introduction |
| Guided practice/extension: | Get started on the lab reports using the procedures in the book. |
| At the end of the lesson, how will what was learned be summarized for the class? | Question-and-response  An email will be sent out to classes detailing what was covered and assigning the lab report. |
| Post-lesson reflections and ideas for next steps: | Overall, I think my first day in the AP chem class went fairly well. As expected, doing the lesson a second time in 4th block allowed me to make some improvements. I was more confident with the second group, whom I had never met, and I more effectively organized my materials. The students seemed very receptive to my argument—suggested by Suellyn—that the product of this unit could be used for college applications for acceptance or scholarship. I like the idea of justifying/rationalizing assignments to students—making an argument for my teaching. The inventory worked well in both classes. |

PERSONAL INTEREST INVENTORY

1. What is/are your favorite music genre(s)?
2. What radio station(s) do you listen to? (this is partially for my benefit…I need good stations to listen to)
3. Do you play any instruments? Which ones?
4. What sports do you enjoy watching?
5. What sports do you like to play? (In my opinion, Halo multiplayer counts as a sport)
6. What hobbies or interests do you have?
7. What TV shows do you like to watch?
8. Who is your favorite cartoon character?
9. What is/are your favorite movie(s)?
10. What movie are you most looking forward to this summer?
11. What is your favorite book(s)?
12. What three things that you own mean the most to you?
13. What do you like to do after school?
14. What is your favorite subject in school?
15. What is your least favorite subject in school?
16. If you could meet any famous person, living or dead, who would you choose?
17. If you could travel anywhere in the world, where would you go?
18. What is your dream job?
19. Do you have any pets? What are they?
20. Is there anything else that you want me to know about you?
21. Riddle of the Sphinx: Which creature walks on four legs in the morning, two legs in the afternoon, and three legs in the evening?

Thank you for taking the time to complete this inventory

**Abstract**

The abstract of your paper is a short breakdown of the information contained in the report. It should contain a sentence about why you performed the tests, a sentence describing the tests performed (simply list the 9 tests here), and a brief summary of your findings (the overall WQI found).

**Introduction**

In the Introduction of your report you should—as the name may suggest—*introduce* your paper. That entails, to a degree, justifying the test in the first place: w*hy* did you test the water quality of the Kalamazoo River. This is where your two sources will come into play (one of which can be the booklet). For example, I might use a source saying why water in general needs to be tested and then cite the booklet as a viable means of testing water.

**Method**

This is your “materials and procedure” section. Here you will describe each of the nine tests used to discover the WQI. You should have already divvied this portion of the assignment among the three members of your group. Your task is to convert the procedures in the booklet from listed “Do this” language into more “We did this” or “This was done” language in full sentences and paragraphs. If your group did anything different in the field, you need to note that here.

**Results**

In this section, you just need to describe your findings. Do not just list the results, though—you also need to describe what your findings mean. For example, if you get a high turbidity result, you need to explain what that means, too.

**Discussion**

In this final section of the lab report, you need to tell me what your findings mean. Explain the WQI you found as a result of your tests and what that WQI means for the river. Is that good or bad? How? Your two sources from the intro should be mentioned again here, too.

References

*I have provided some APA examples here to help you with your citations.*

Aarnio, K. & Lijndeman, M. (2007). Religious people and paranormal believers: Alike or different? *Journal of Individual Differences*, *28*(1), 1-9.

Beck, R. & Miller, J. P. (2001). Erosion of belief and disbelief: Effects of religiosity and negative affect on beliefs in the paranormal and supernatural. *The Journal of Social Psychology, 141*(2), 277-287.

Hergovich, R. S. & Arendasy, M. (2005). Paranormal belief and religiosity. *The Journal of Parapsychology, 69*(2), 293-303.

## Kelly, M. P. (2010). The evolution of beliefs in God, spirit, and the paranormal. I: Terror management and ritual healing theories. The Journal of Parapsychology,74(2), 335-357.

Tobacyk, J. & Milford, G. (1983). Belief in paranormal phenomena: Assessment instrument development and implications for personality functioning. *Journal of Personality and Social Psychology*, *44*(5), 1029-1037.

Lab Report Assignment Sheet

This is a simple assignment—write up what you did and found while water testing in an APA style lap report (double spaced with 12 point Times New Roman font). This will be a miniaturized version of the academic articles you’ll find on databases, complete with a title page, abstract, introduction (with research question(s) and hypothesis), methods (also known as procedures), results, discussion, and references sections (see below for layout). You must incorporate at least two sources in your introduction to give context to the testing you did, and this/these sources must be brought up again later in your discussion section—you may use the testing booklet as a source. Otherwise, this is a simple write up of the water testing activities you performed. You will be graded on the accuracy of your explanations, your presentation of findings, your explanations of results, your adherence to APA format, and your writing mechanics.

Outline

* Title Page
* Abstract (200 word maximum)
* Introduction
  + Incorporate two sources
  + Give context to the testing
  + Explain research question(s)
  + State hypothesis
* Methods
  + Explain all procedures
* Results
  + State the findings of all the tests
  + Give numerical findings and explain them
  + Use at least one graph for 5 points extra credit.
* Discussion
  + Bring back two outside sources and relate them to the findings
  + Explain the significance (or lack thereof) of the findings
  + Suggest further directions for research
* References
  + Cite at least two sources in APA format

Instructor: Travis Trombley

Date: 13 May 2014

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| --- | --- |
| Title of the lesson: | Testing On-Site: Field Trip to Whitehouse Nature Center |
|  | |
| **I. Preliminary Planning** | |
| Objective(s) of the lesson: | Students will obtain data through a variety of tests on the Kalamazoo River conducted at the Whitehouse Nature Center |
| GLCE/HSCE best served:  (no more than 2 or 3) | CR4 The course provides students with the opportunity to connect their knowledge of chemistry and science to major societal or technological components (e.g., concerns, technological advances, innovations) to help them become scientifically literate citizens. |
| Focus question: | How can I apply the skills obtained in the classroom to the field? |
| Key vocabulary/concepts: | Turbidity: the degree of cloudiness in the water.  Field work: Performing scientific tests outside the lab |
| Time required: | 45 minutes (per water testing session) |
| Materials needed: | * Water Quality Index (WQI) Field Trip – Student Laboratory Kit (<http://www.flinnsci.com/store/Scripts/prodView.asp?idproduct=16759>) * Calculators * Waders |
|  | |
| **II. The Lesson Itself\*** | |
| Lesson launch (aka *the* *hook* or *accessing prior knowledge*): | As this is a field trip, there really isn’t a “hook” to access students prior knowledge beyond the discussions before leaving and on the bus about water testing and the application of chemistry principles to the field. |
| How the lesson’s objective(s) will be shared with the students: | Much of the work for this field trip is student led. The teacher will break down for them the various processes and uses of instruments BEFORE they begin the water tests in groups.  The groups are to be split into two groups, defined by class. While one group tests water for an hour and a half, the other group canoes. Then, after lunch, the two will swap places. |
| Learning activities (step-by-step):  *These should be complete enough that a good substitute could study them and teach this class.* | The overlapping activity for the field trip is, of course, the water testing. The testing booklets provided to the students beforehand contain much of the necessary information about the procedures. The groups will be given the agency to navigate the tests as they desire. The procedure for the teachers is, in this light, simple:   1. Make sure the students are grouped and separated appropriately. 2. Make sure the students know where the necessary materials for testing (chemical tablets, tubes, pH strips) will be—on the bank in the center of the groups on the shore. 3. Provide the students with the laminated charts and color-comparison cards. Make sure the students come to them on the bank and do not take them back to their spot on the shore. 4. Provide students with the tablets and strips they need as they need them. |
| Checking for understanding:  (formative assessment) | * Question and answer * The apparent successes or failures of the tests as seen by colors. |
| Guided practice/extension: | Lab Report |
| At the end of the lesson, how will what was learned be summarized for the class? | Question-and-response.  A discussion at the end of the testing sessions to compare data and methods.  A discussion with all the students at the end or on the bus. |
| Post-lesson reflections and ideas for next steps: | The field trip went swimmingly (pun most definitely intended). I was worried primarily about the weather. Mrs. Haroff and I had done much prep for this trip: permission slips, preliminary water testing, booklet browsing with the students, and scoping out the nature center sites most conducive for testing. What we could control, we tried to have thought about, but the weather was a wild card, and the forecast was not favorable. But, as an answer to my prayers, the weather was wonderful: mostly sunny and warm.  As for the testing—the primary impetus for the trip—everything seemed to work out. The first group was a little more hectic, because I tossed them into the fray with not nearly as much direction as I gave the second group. Again, however, I found the chance to revise a great benefit. With the second group, I more explicitly defined group stations and enforced the boundaries, was more explicit about the placement of testing supplies and charts, and defined the tests to be done. Neither group experienced much of an issue, though if these were less able students, my lack of scaffolding for the first group may have resulted in more chaos. In that, preparation and directions are the big lesson for me from this.  Otherwise, the students had a great time, and I’m extremely proud and happy I was able to provide them this opportunity. Many of them pulled me aside to express their gratitude, and that was awesome, as was the experience of sitting at the front of the bus looking back over MY students—I’d never experienced it from that perspective before.  One kid did get cut while in the river, and we had to fill out an incident report with the school and notify his parents. The student was fine, in the end, and it demonstrates how I need to be extra careful and plan for these kinds of things. We never even thought to bring a first aid kit with us… |

Instructor: Travis Trombley

Date: 14 May 2014

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| --- | --- |
| Title of the lesson: | Crunching the Data from the Field Trip |
|  | |
| **I. Preliminary Planning** | |
| Objective(s) of the lesson: | Students will complete the Total Solids and 5-Day BOD tests left over from the field trip.  Students will find and weigh the Q-Values of their results to determine the WQI. |
| GLCE/HSCE best served:  (no more than 2 or 3) | CR4 The course provides students with the opportunity to connect their knowledge of chemistry and science to major societal or technological components (e.g., concerns, technological advances, innovations) to help them become scientifically literate citizens. |
| Focus question: | What do I need to know to do to complete the water testing exercise? |
| Key vocabulary/concepts: | -- |
| Time required: | 50 minutes |
| Materials needed: | * Water Quality Index (WQI) Field Trip – Student Laboratory Kit (<http://www.flinnsci.com/store/Scripts/prodView.asp?idproduct=16759>) * Q-Value Charts * Calculators * Scales * Hot plates * 300 ML beakers, 1 per group |
|  | |
| **II. The Lesson Itself\*** | |
| Lesson launch (aka *the* *hook* or *accessing prior knowledge*): | There is no planned lesson launch for this lesson. Only a brief address to the class about what they need to get done and where all the supplies will be. |
| How the lesson’s objective(s) will be shared with the students: | Verbal instructions and illustrations through the WQI booklet using the ELMO |
| Learning activities (step-by-step):  *These should be complete enough that a good substitute could study them and teach this class.* | The students will be given scales and hot plates to get to work immediately conducting the lab portion of the total solids experiment:   1. Students will weigh the 300 ML beaker 2. Students poor 30-40 ML of river water into the 300 ML beaker and measure the exact volume. 3. Students boil the water away. 4. Repeat steps 1 and 2 four more times, recording data as necessary. 5. Once beaker is cooled, students weigh the beaker again and subtract the original weight from the new weight t0o determine the total solids.   Next the students will solve for the fecal coliform Q value using the data provided in advance (of 15 tests, 5 were positive for FC)  Finally, students will determine the 5 Day BOD by adding dissolved Oxygen tablets to the tin-foil wrapped samples of water, compare the color of the water after 5 minutes to the code sheets provided, and use the ppm discovered in an equation provided to discover the final Q value  Finally, students should be given time to finish calculations, find Q values, and ask questions about the lab report assignment. |
| Checking for understanding:  (formative assessment) | * Question and answer * WQI and Q-Value sheets |
| Guided practice/extension: | Lab Report |
| At the end of the lesson, how will what was learned be summarized for the class? | Question-and-response. |
| Post-lesson reflections and ideas for next steps: | I didn’t anticipate this use of class time, in all honesty. This was supposed to be the first video lesson, but the students needed class time to complete some of the tests from the field trip that Mrs. Haroff and I didn’t notice took lab time. Lesson 1 from all this: know what your students need to do with the complete lab.  Other than that, I was very impressed, again, with the efficiency with which most of the students approached the lab work again. That said, though, they needed a lot of very specific information. These AP students wanted to know they were doing things correctly, and they sought confirmation often. The lesson was a great way to decompress from the field trip and bring that field work back to the classroom, effectively, I hope, helping them contextualize the whole learning experience. |

Instructor: Travis Trombley

Class: 11th and 12th grade AP Chemistry

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| Title of the lesson: | Introduction to Video |
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| I. Preliminary Planning |  |
| Objective(s) of the lesson: | Students will   1. Become familiar with various videography and video editing techniques 2. Employ those skills in brief, little demos |
| GLCE/CEs/Common Core Standards best served:  (no more than 2 or 3) | * CR4 The course provides students with the opportunity to connect their knowledge of chemistry and science to major societal or technological components (e.g., concerns, technological advances, innovations) to help them become scientifically literate citizens. * CR7 The course provides opportunities for students to develop, record, and maintain evidence of their verbal, written, and graphic communication skills through laboratory reports, summaries of literature or scientific investigations, and oral, written, and graphic presentations. |
| Focus question: | How does one turn questions into theses? |
| Key vocabulary/concepts: | Editing: The process of manipulating raw footage, be that cutting, mixing, altering, or reordering.  Zooms: are great for getting a close view from far away or you can reveal a wider area by zooming out.  Pan: rotating the camera laterally (left and right) while shooting is called a pan.  Tilt: rotating the camera vertically (up and down) while shooting is called a tilt.  Lighting: when you're shooting outside during the day your primary light source is the sun. Your subjects will look better if they face your primary light source instead of having the source behind them or the subject will appear really dark (backlit). To fill in any harsh shadows you might have from the primary light source, you can use a white or reflective material to bounce your light and fill in those shadows.  Composition: Pretend your screen has evenly spaced lines running throughout it, two horizontally and two vertically. The points where the lines intersect are where you want to have your subject. This is called the rule of thirds, for more details on it and composition in general check out [this lesson](http://vimeo.com/videoschool/lesson/8/framing-and-composition).  Definitions from http://vimeo.com/videoschool/lesson/24/video-101-shooting-basics |
| Time required: | 2 class periods, each roughly 50 minutes. |
| Materials needed: | Teacher: whiteboard. Video Projector with access to YouTube.  <http://vimeo.com/videoschool/101>  Students: writing materials and notebook |
|  |  |
| II. The Lesson Itself\* |  |
| Lesson launch (aka *the* *hook* or *accessing prior knowledge*): | Day 1 hook: Try to use a camera cast on projector to talk about the field trip.  Day 2 hook: Get the students to choose a couple movie trailers for upcoming summer films for which they are excited and analyze them using the vocabulary from the first day. |
| How the lesson’s objective(s) will be shared with the students: | Day 1 Lesson—Intro to video   * Watch the several Vimeo Video school videos * In groups, go through the “How to Shoot Video that Doesn’t Suck” booklet * Use fundamentals to go make and post their own short video of anything * They will also get time to discuss/start their video projects   Day 2 Lesson—Continued Video lessons   * Go into editing techniques and software (Show Vimeo Videoschool again) * Demonstrate with video editing demo * Have iPads or laptops on which students can practice |
| Learning activities (step-by-step): | Day 1 Activity: Exploring Videography Techniques   * Students will, in their groups, film some short video of any topic using distinct fundamentals from the HTSVTDS text. * They will upload these videos to computers.   Day 2 Activity: Practicing Editing   * All students will use an iPad or laptop to edit video on their own from the group footage taken the day prior. |
| Checking for understanding:  (formative assessment) | Teacher observations and interactions  Video Proposal |
| Guided practice/extension: | Video Work Sheet (2nd day) |
| At the end of the lesson, how will what was learned be summarized for the class? | Both lessons will be summarized verbally, and students who choose to partake will later be informed of what is expected of them and given access to learning materials via email. |
| Post-lesson reflections and ideas for next steps: | These lessons changed significantly once in practice. In fact, they changed from class to class. On the first day, the intro to video stayed the same. I went over all the basic elements of video (see above), we analyzed some videos on YouTube, and the students used the remainder of the time to plan their videos. However, the first group elected to tale the iPads and actually practice shots by making trailers, as I had planned for, while the second group elected to watch more videos before talking amongst themselves. At the end of class, several students requested that we watch their videos in class for criticism material, so the next day we spent time criticizing student videos in both classes, which worked our really well. The students were more engaged seeing their peers, the student creators were there to comment on their videography choices and experiences, and I think it made more “real” the idea of making a video and showing it to the class. The rest of the time—again—was using the iPads to practice videography (students who finished trailers displayed their trailers for class viewing) and working on their projects. |

*How to Shoot Video That Doesn’t Suck* Questions

Instructions: Read the assigned chapters of the handout and answer the following questions.

Read: 12 Easy Ways to Make Your Video Better Now, Ch. 8 (46), Ch. 9 (49), Ch.17 (71), Ch. 32 (118), Ch. 35 (125)—end.

1. According to Stockman, which of the following is a better description of a shot:
   1. The local pediatrician in his white coat in his downtown office with blue wallpaper
   2. The pediatrician washing his hands

To what does Stockman compare descriptions of shots? (think English class) What would he label the pediatrician in the example above? Why?

1. The professional source you are interviewing want to be shot by a window, and it’s a sunny day. What do you do? Be sure to provide an explanation for your decision.
2. It’s okay to use the digital zoom function, right?
3. In your video, you want to show multiple locations. What type of shot(s) might you use to make the transitions?
4. When filming testimonials, how close should interviewees be to the camera?
5. Stockman warns against heavy use of titles or graphics in video. How might you tastefully use titles or graphics in your video?

Instructor: Travis Trombley

Date: 19 May 2014

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| Title of the lesson: | Researching for the Video |
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| **I. Preliminary Planning** | |
| Objective(s) of the lesson: | Students will use class time to research their elected topics. I will be looking specifically for specificity in their research—students need to explicitly describe how chemistry plays a role in their sustainability projects. |
| GLCE/HSCE best served:  (no more than 2 or 3) | CR4 The course provides students with the opportunity to connect their knowledge of chemistry and science to major societal or technological components (e.g., concerns, technological advances, innovations) to help them become scientifically literate citizens.  CR7 The course provides opportunities for students to develop, record, and maintain evidence of their verbal, written, and graphic communication skills through laboratory reports, summaries of literature or scientific investigations, and oral, written, and graphic presentations. |
| Focus question: | How can I communicate the complicated chemistry associated with my topic to a general audience? |
| Key vocabulary/concepts: | Persuasive clarity: being specific about the workings of a topic so as to establish validity and trustworthiness of the persuasion. |
| Time required: | 50 minutes |
| Materials needed: | * iPads or computers |
|  | |
| **II. The Lesson Itself\*** | |
| Lesson launch (aka *the* *hook* or *accessing prior knowledge*): | Do Now: Students will write about the “coolest” or most interesting part of their PSA project thus far. |
| How the lesson’s objective(s) will be shared with the students: | Verbal discussion and 1-on-1 attention with groups. |
| Learning activities (step-by-step):  *These should be complete enough that a good substitute could study them and teach this class.* | After the Do Now, designed to get students thinking about the interesting science underlying their projects, the students will be allowed to work together in groups to research their projects using iPads, computers, and the assistance of Mrs. Haroff, the resident chemistry teacher.  Students will be encouraged to contact potential sources via email or phone call.  The students will fill out worksheet guides that will help organize their efforts and will be turned in at the end of the hour. |
| Checking for understanding:  (formative assessment) | * Question and answer * Research Guide Worksheet |
| Guided practice/extension: | The video PSA |
| At the end of the lesson, how will what was learned be summarized for the class? | -- |
| Post-lesson reflections and ideas for next steps: | This lesson went well, I thought. Once the students got into their groups and got a hold of some iPads, it was easy for me to go around addressing problems on a group by group basis, as opposed to something more oriented towards the entire class. The research guide I provided the students also worked really well—it guided the students questions and subsequent research really well. Effective answers to those questions became, for many, they layout for their videos and pamphlets, which reduces the amount of work they would have to do later on. Regardless of class, I think such guides or organizers would be useful when doing research or inquiry based projects. |

Research Guide

Describe the problem being addressed in your video.

How does this problem relate to chemistry? Be specific. On a molecular level, describe the involved process(es) and why it/they are unfavorable. What are the exact compounds and phenomena involved?

What is the solution you suggest for this problem? What action or actions will your video suggest? Why?

How does your solution relate to chemistry? In other words, on a molecular level, how does what you suggest people do mitigate the process(es) described above?

Instructor: Travis Trombley

Date: 20 May 2014

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| --- | --- |
| Title of the lesson: | Planning the Video’s Shots |
|  | |
| **I. Preliminary Planning** | |
| Objective(s) of the lesson: | Students will use class time to discuss with group members the storyboard/shot list of their video PSA. |
| GLCE/HSCE best served:  (no more than 2 or 3) | CR4 The course provides students with the opportunity to connect their knowledge of chemistry and science to major societal or technological components (e.g., concerns, technological advances, innovations) to help them become scientifically literate citizens. |
| Focus question: | What shots can I use to most effectively communicate my video’s tone and message? |
| Key vocabulary/concepts: | **Pan:** rotating the camera laterally (left and right) while shooting is called a pan.  **Tilt:** rotating the camera vertically (up and down) while shooting is called a tilt.  **Lighting:** when you're shooting outside during the day your primary light source is the sun. Your subjects will look better if they face your primary light source instead of having the source behind them or the subject will appear really dark (backlit). To fill in any harsh shadows you might have from the primary light source, you can use a white or reflective material to bounce your light and fill in those shadows.  **Composition:** Pretend your screen has evenly spaced lines running throughout it, two horizontally and two vertically. The points where the lines intersect are where you want to have your subject. This is called the rule of thirds, for more details on it and composition in general check out [this lesson](http://vimeo.com/videoschool/lesson/8/framing-and-composition).  **Close**: A shot of the subject’s head, hands, or feet or of an item of interest so that it takes up the entire screen.  **Medium**: Subjects take up the bulk of frame space. Great for interviews  **Wide**: These shots show subjects in full but emphasize the environment. Great for establishing location.  **B-Roll:** cutaway shots that show different footage while playing different audio. |
| Time required: | 50 minutes |
| Materials needed: | * Paper and Writing utensils * iPads (for practice) * The Shot Description Worksheet |
|  | |
| **II. The Lesson Itself\*** | |
| Lesson launch (aka *the* *hook* or *accessing prior knowledge*): | Do Now: “Think of the shot you are most proud of or excited about that your group has considered for your video. Now describe at least two cool shots you could use in your video that you have NOT discussed with your group members.” |
| How the lesson’s objective(s) will be shared with the students: | Verbal  Use of projector to go over shots again |
| Learning activities (step-by-step):  *These should be complete enough that a good substitute could study them and teach this class.* | After the Do Now, the teacher will refresh the students’ on shot descriptions, both their subject-verb nature and the types of shots that can be used.  Then the students will get to work together with their groups and, using the guide provided, start to plan the shots of their video. |
| Checking for understanding:  (formative assessment) | * The Shot Description WS |
| Guided practice/extension: | The Shot Description WS  The Video PSA |
| At the end of the lesson, how will what was learned be summarized for the class? | Question-and-response.  Email, if necessary |
| Post-lesson reflections and ideas for next steps: | This lesson went really well. The students not only provided productive conversation from the DO NOW, but the shot description list that followed really helped the student groups think about and plan their videos in a more professional manner than I think they had previously experienced. Most who discussed the matter with me stated that, if anything, teachers had only had them draft story boards in the past, which don’t really help. |

Shot Description Worksheet

Group members:

The purpose of this organizer is to help you think about and plan some of the shots in your video. Remember, your shots should all be deliberate and precise.

|  |  |  |  |
| --- | --- | --- | --- |
| Shot # | Type of Shot | Description of Shot | Purpose of Shot |
| Ex. | Medium (shoulders up) | Mrs. Haroff talking about how oil molecules affect the river quality. No longer than 7 seconds | To include a professional, in-person source in an interview/testimonial style in the video. |
| Ex. | Wide | An establishing shot of front of Marshall High School from the parking lot. | To establish MHS as location of the scene |
| 1 |  |  |  |
| 2 |  |  |  |
| 3 |  |  |  |
| 4 |  |  |  |
| 5 |  |  |  |

Instructor: Travis Trombley

Date: 21 May 2014

|  |  |
| --- | --- |
| Title of the lesson: | Pamphlet Making |
|  | |
| **I. Preliminary Planning** | |
| Objective(s) of the lesson: | Students will learn about what makes an effective pamphlet.  Students will think about how they can transfer the telos of their video to a pamphlet format. |
| GLCE/CEs/Common Core Standards best served:  (no more than 2 or 3) | * CR4 The course provides students with the opportunity to connect their knowledge of chemistry and science to major societal or technological components (e.g., concerns, technological advances, innovations) to help them become scientifically literate citizens. * CR7 The course provides opportunities for students to develop, record, and maintain evidence of their verbal, written, and graphic communication skills through laboratory reports, summaries of literature or scientific investigations, and oral, written, and graphic presentations. |
| Focus question: | How do I take what I did in my video and make it into a pamphlet? |
| Key vocabulary/concepts: | Audience: Who is the media targeting, and how does its design reflect that intention?  Fact Checking: information included is accurate and corroborated by a number or sources.  Efficiency: the pamphlet does what it is supposed to do.  Brochure-Rack-Test: most important information or eye-catching info is in the top 1/3 of the first page.  http://ianrpubs.unl.edu/live/g2028/build/g2028.pdf |
| Time required: | 50 minutes |
| Materials needed: | * Writing utensils * Computer/projector * Pamphlet template for practice |
|  | |
| **II. The Lesson Itself\*** | |
| Lesson launch (aka *the* *hook* or *accessing prior knowledge*): | Students will write for 3 minutes about what they are learning from this unit, specifically about what they are learning about communicating science. |
| How the lesson’s objective(s) will be shared with the students: | This is another exercise oriented lesson. It will be shared mostly though verbal discussion and illustrations provided by means of computer and projector. Other than that, the students are on their own. |
| Learning activities (step-by-step): | Students will be given the pamphlet assignment sheet.  Students will go over what makes a good pamphlet (see above definition questions)  Students will work in groups to fill out the pamphlet template. |
| Checking for understanding:  (formative assessment) | The template that will be completed and handed in during class. |
| Guided practice/extension: | The production of a pamphlet |
| At the end of the lesson, how will what was learned be summarized for the class? | Verbal discussion with students  Email follow-ups to the templates |
| Post-lesson reflections and ideas for next steps: | The pamphlet template (see below) worked out far more effectively than I had anticipated. Rather than having the students just plan on their own their pamphlets, the template, though they knew they did not have to stick to its form, helped the students see spatially the types of questions I was asking and how they would relate to one another. Furthermore, after I collected the template sheets, many groups asked for them to be returned, because they were so useful in planning that they wanted to use them for actually constructing their pamphlets in the computer lab. |

PSA Pamphlet Assignment Sheet

Due Date: Friday, May 23rd

Every group will produce a pamphlet version of their PSA using the same research and persuasive methods. In other words, I want you to transfer your video to paper. The design and layout (tri-fold, bi-fold, coodie-catcher, etc.) of the brochure are up to you, but your pamphlet must communicate the same information as your video:

* A description of a problem related to sustainability and chemistry
* A chemistry-oriented rationale for why it is a problem
  + Ex.) If you’re problem is water pollution, don’t tell me just the effects, like it kills fish, but tell me about what those pollutants do to the water on molecular level that causes harm.
* A description for how the problem can be solved or prevented
* And a recommendation of simple measures that general audience members can take to solve or mitigate the problem.

Just as your video will be graded on the conventions of videography, so too will your pamphlet be graded on its adherence to effective conventions. These include:

* Visual attractiveness—it has to be pretty and neat
* Use of pictures, illustrations, and/or diagrams—these may be some of the same graphics you used in your video, but you need to include at least some visual aids to help readers understand what you are talking about (the chemistry) and demonstrating (the steps they can take to mitigate the problem—these could be as simple as petitioning people to recycle their plastics or to call/write to their congress person about a piece of legislation)
* Readable—use language that is clear and concise. Rely mostly on complete sentences, but feel free to use bullet points when appropriate

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CATEGORY** | **(4) Excellent** | **(3) Good** | **(2) Almost** | **(1) Not Yet** |
| **Attractiveness & Organization**  **(Organization)** | The brochure has exceptionally attractive formatting and well-organized information. | The brochure has attractive formatting and well-organized information. | The brochure has well-organized information, but lacks visual appeal. | The brochure's formatting and organization of material are confusing to the reader. |
| **Content - Accuracy**  **(Ideas)** | The brochure describes a problem on a molecular level and provides instructions for solutions and why those solutions would work. | The brochure has all of the required information (see checklist). | The brochure has most of the required information (see checklist). | The brochure has little of the required information (see checklist). |
| **Writing – Style and Mechanics**  **(Conventions)** | Writing is clear and concise. Complete sentences and bullet point are used. No spelling, grammatical, or syntactic issues are present. | Writing is free of mechanics errors, and a diversity of writing methods are present, but explanations are too wordy or too terse. | Little diversity of writing methods present. Some mechanical errors may be present. | Writing demonstrates little effort on behalf of the authors to make a presentable product. Mechanical issues are prevalent, and style choices appear random. |
| **Graphics/Pictures** | The graphics go well with the text and there is a good mix of text and graphics. At least one illustration of a chemistry concept is used. | The graphics go well with the text, but there are so many that they distract from the text or not enough to fully demonstrate the information. | The graphics slightly relate to the text, but there are too few. | The graphics do not go with the accompanying text. They appear to be randomly chosen or are absent from the pamphlet |
| **Sources** | There are many citations (minimum of 4) from a variety of sources accurately listed on the brochure. Sources are cited appropriately in-text. | There are some citations from a variety of sources accurately listed on the brochure. | There are a few citations accurately listed on the brochure. | Incomplete citations are listed on the brochure, or citations are absent. |

PAMPHLET TEMPLATE

Instructor: Travis Trombley

Date: 22 May 2014

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| --- | --- |
| Title of the lesson: | Creating the Pamphlet |
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| **I. Preliminary Planning** | |
| Objective(s) of the lesson: | Students will use computer lab resources to create their pamphlets. |
| GLCE/HSCE best served:  (no more than 2 or 3) | CR4 The course provides students with the opportunity to connect their knowledge of chemistry and science to major societal or technological components (e.g., concerns, technological advances, innovations) to help them become scientifically literate citizens.  CR7 The course provides opportunities for students to develop, record, and maintain evidence of their verbal, written, and graphic communication skills through laboratory reports, summaries of literature or scientific investigations, and oral, written, and graphic presentations. |
| Focus question: | How can my group and I put on a pamphlet |
| Key vocabulary/concepts: | -- |
| Time required: | 50 minutes |
| Materials needed: | * Computers * Pamphlet templates |
|  | |
| **II. The Lesson Itself\*** | |
| Lesson launch (aka *the* *hook* or *accessing prior knowledge*): | None—want to get right to work on the pamphlet. Maybe a briefing on video progress. |
| How the lesson’s objective(s) will be shared with the students: | Verbal discussion and 1-on-1 attention with groups. |
| Learning activities (step-by-step):  *These should be complete enough that a good substitute could study them and teach this class.* | Students will use their research and templates to collaborate and create a pamphlet during class time. |
| Checking for understanding:  (formative assessment) | * Pamphlet drafts |
| Guided practice/extension: | Continued work on finalizing the pamphlet |
| At the end of the lesson, how will what was learned be summarized for the class? | Check-ins on pamphlet and video progress/plans |
| Post-lesson reflections and ideas for next steps: | This was the first real “work day: I gave the students. I basically did nothing for the whole class besides sum up the schedule for the week and field some questions. We went to the lab and the students used the hour to craft their pamphlets. Most groups made significant headway on the project using the templates from the preceding day. I walked from group to group throughout the class providing feedback and answering questions. The students were focused and well-behaved. |

Instructor: Travis Trombley

Date: 23 May 2014

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| --- | --- |
| Title of the lesson: | Workday |
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| **I. Preliminary Planning** | |
| Objective(s) of the lesson: | Students will use class time to either complete their pamphlets or work on their videos. |
| GLCE/HSCE best served:  (no more than 2 or 3) | CR4 The course provides students with the opportunity to connect their knowledge of chemistry and science to major societal or technological components (e.g., concerns, technological advances, innovations) to help them become scientifically literate citizens.  CR7 The course provides opportunities for students to develop, record, and maintain evidence of their verbal, written, and graphic communication skills through laboratory reports, summaries of literature or scientific investigations, and oral, written, and graphic presentations. |
| Focus question: | What do I need to get done before the day is over, especially if I am a senior? |
| Key vocabulary/concepts: | -- |
| Time required: | 50 minutes |
| Materials needed: | * Computers * Pamphlet templates |
|  | |
| **II. The Lesson Itself\*** | |
| Lesson launch (aka *the* *hook* or *accessing prior knowledge*): | Check ins |
| How the lesson’s objective(s) will be shared with the students: | Verbal directions |
| Learning activities (step-by-step):  *These should be complete enough that a good substitute could study them and teach this class.* | The focus of this class is just giving the students time, with the help of teacher guidance, to get their projects completed. |
| Checking for understanding:  (formative assessment) | * Final projects (video and pamphlet) * Pamphlet due by the end of school Friday |
| Guided practice/extension: | Continued work on finalizing the video and pamphlet |
| At the end of the lesson, how will what was learned be summarized for the class? | Check-ins on pamphlet and video progress/plans |
| Post-lesson reflections and ideas for next steps: | Again, not much to reflect on pedagogically today. The students were given the entire hour in the computer lab to work on whatever they had left to do—pamphlet or video.  I also returned the grades for the lab reports today. Mostly, this was a positive experience, though I made the mistake of leaving the actual papers in my room, so I could only give grades. This worked out, though, because I had discovered two students who actually cheated by copying one another and turning in similar or exact papers. I gave them a chance to rewrite the papers for up to 85% of the score.  I also brought in candy today. Snickers is not a popular candy bar…not when compared to Milky Way, Twix, or 3 Musketeers, at least. |

Instructor: Travis Trombley

Class: 11th and 12th grade AP Chemistry

Date: 5/27/2014

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| Title of the lesson: | Video Criticism and Editing |
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| I. Preliminary Planning | |
| Objective(s) of the lesson: | Students will   1. Become familiar with various videography and video editing techniques 2. Learn criticism 3. Video psa (1 is 2 many, abuse, give tom brady a high five, 3 funny psa’s) |
| GLCE/CEs/Common Core Standards best served:  (no more than 2 or 3) | * CR4 The course provides students with the opportunity to connect their knowledge of chemistry and science to major societal or technological components (e.g., concerns, technological advances, innovations) to help them become scientifically literate citizens. * CR7 The course provides opportunities for students to develop, record, and maintain evidence of their verbal, written, and graphic communication skills through laboratory reports, summaries of literature or scientific investigations, and oral, written, and graphic presentations. |
| Focus question: | How can I put together and/or improve the video we shot for this project? |
| Key vocabulary/concepts: | Editing: The process of manipulating raw footage, be that cutting, mixing, altering, or reordering.  **Zooms**: are great for getting a close view from far away or you can reveal a wider area by zooming out.  **Pan:** rotating the camera laterally (left and right) while shooting is called a pan.  **Tilt**: rotating the camera vertically (up and down) while shooting is called a tilt.  **Composition:** Pretend your screen has evenly spaced lines running throughout it, two horizontally and two vertically. The points where the lines intersect are where you want to have your subject. This is called the rule of thirds, for more details on it and composition in general check out [this lesson](http://vimeo.com/videoschool/lesson/8/framing-and-composition).  Definitions from http://vimeo.com/videoschool/lesson/24/video-101-shooting-basics |
| Time required: | Each roughly 50 minutes. |
| Materials needed: | Teacher: whiteboard. Video Projector with access to YouTube.  <http://vimeo.com/videoschool/101>  Students: writing materials and notebook |
|  | |
| II. The Lesson Itself\* | |
| Lesson launch (aka *the* *hook* or *accessing prior knowledge*): | Day 1 hook: Critique a video PSA on YouTube. Discuss criticisms, emphasizing the video techniques previously discussed in class. |
| How the lesson’s objective(s) will be shared with the students: | The first part of the class will be back-and-forth discussion orientation. After the Do Now, using the chosen video, the teacher will review the terms of videography.  The class will then watch and critique a variety video PSAs via YouTube, led by the teacher.  The students will be given remaining time to work on their own videos. |
| Learning activities (step-by-step): | The Critique Activity  -Teacher shows a brief video PSA  -While watching and right after, students will organize their thoughts by filling out a critique sheet  -The teacher will lead discussion guided by responses to the questions.  Students will have the remainder of class to work on their videos |
| Checking for understanding:  (formative assessment) | Teacher observations and interactions  Critique sheets  Video PSA |
| Guided practice/extension: | Video PSA |
| At the end of the lesson, how will what was learned be summarized for the class? | Review of critique sheets, verbal discussion |
| Post-lesson reflections and ideas for next steps: |  |

Name:

Instructor: Travis Trombley

Video Title and Subject:

What is the style of the video? What techniques does it employ? What types of shots do they use?

What is the tone of the video? How does it establish this tone?

Do you feel informed or compelled to action after watching the video? Why or why not?

Video Title and Subject:

What is the style of the video? What techniques does it employ? What types of shots do they use?

What is the tone of the video? How does it establish this tone?

Do you feel informed or compelled to action after watching the video? Why or why not?

Class: 11th and 12th grade AP Chemistry

Date: 5/28/2014

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| Title of the lesson: | Video Criticisms |
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| I. Preliminary Planning | |
| Objective(s) of the lesson: | Students will   1. Bring in their own video videos (what they have finished thus far) for peer editing 2. Critique other group’s videos with care and respect |
| GLCE/CEs/Common Core Standards best served:  (no more than 2 or 3) | * CR4 The course provides students with the opportunity to connect their knowledge of chemistry and science to major societal or technological components (e.g., concerns, technological advances, innovations) to help them become scientifically literate citizens. * CR7 The course provides opportunities for students to develop, record, and maintain evidence of their verbal, written, and graphic communication skills through laboratory reports, summaries of literature or scientific investigations, and oral, written, and graphic presentations. |
| Focus question: | How can I learn about and improve my own video skills by critiquing the videos of my peers for the purpose of helping them improve theirs? |
| Key vocabulary/concepts: | Editing: The process of manipulating raw footage, be that cutting, mixing, altering, or reordering.  **Zooms**: are great for getting a close view from far away or you can reveal a wider area by zooming out.  **Pan:** rotating the camera laterally (left and right) while shooting is called a pan.  **Tilt**: rotating the camera vertically (up and down) while shooting is called a tilt.  **Composition:** Pretend your screen has evenly spaced lines running throughout it, two horizontally and two vertically. The points where the lines intersect are where you want to have your subject. This is called the rule of thirds, for more details on it and composition in general check out [this lesson](http://vimeo.com/videoschool/lesson/8/framing-and-composition).  Definitions from http://vimeo.com/videoschool/lesson/24/video-101-shooting-basics |
| Time required: | Each roughly 50 minutes. |
| Materials needed: | Teacher: whiteboard. Video Projector with access to YouTube.  <http://vimeo.com/videoschool/101>  Students: writing materials and notebook |
|  | |
| II. The Lesson Itself\* | |
| Lesson launch (aka *the* *hook* or *accessing prior knowledge*): | Day 1 hook: Students will watch and critique a video made by the teacher. |
| How the lesson’s objective(s) will be shared with the students: | The first part of the class will be back-and-forth discussion orientation. After the Do Now, using the teacher video, the teacher will break the student groups into larger groups for peer editing.  Students will critique one another’s videos using the organ izers provided by the teacher.  The students will be given remaining time to work on their own videos. |
| Learning activities (step-by-step): | The Critique Activity  -student groups will be put in larger groups and asked to watch/critique each other’s video drafts.  -Fill out the critique drafts  Students will have the remainder of class to work on their videos |
| Checking for understanding:  (formative assessment) | Teacher observations and interactions  Critique sheets |
| Guided practice/extension: | Video PSA |
| At the end of the lesson, how will what was learned be summarized for the class? | Review of critique sheets, verbal discussion |
| Post-lesson reflections and ideas for next steps: |  |

Group Critique Sheet

Group:

What was the subject of the video? How did it relate to sustainability?

How would you describe the tone of the video? How do you know?

What were the most effective elements of the video?

What were the least effective parts of the video? What about them didn’t add to or detracted from the purpose of the video?

Do you feel like you learned something from the video? What?

Group:

What was the subject of the video? How did it relate to sustainability?

How would you describe the tone of the video? How do you know?

What were the most effective elements of the video?

What were the least effective parts of the video? What about them didn’t add to or detracted from the purpose of the video?

Do you feel like you learned something from the video? What?

Instructor: Travis Trombley

Class: 11th and 12th grade AP Chemistry

Date: 5/29/2014

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| --- | --- |
| Title of the lesson: | Video Criticisms Final |
|  | |
| I. Preliminary Planning | |
| Objective(s) of the lesson: | Students will   1. Bring in their finished videos for peer viewing 2. Critique other group’s videos with care and respect |
| GLCE/CEs/Common Core Standards best served:  (no more than 2 or 3) | * CR4 The course provides students with the opportunity to connect their knowledge of chemistry and science to major societal or technological components (e.g., concerns, technological advances, innovations) to help them become scientifically literate citizens. * CR7 The course provides opportunities for students to develop, record, and maintain evidence of their verbal, written, and graphic communication skills through laboratory reports, summaries of literature or scientific investigations, and oral, written, and graphic presentations. |
| Focus question: | How can I learn about and improve my own video skills by critiquing the videos of my peers for the purpose of helping them improve theirs? |
| Key vocabulary/concepts: | Editing: The process of manipulating raw footage, be that cutting, mixing, altering, or reordering.  **Zooms**: are great for getting a close view from far away or you can reveal a wider area by zooming out.  **Pan:** rotating the camera laterally (left and right) while shooting is called a pan.  **Tilt**: rotating the camera vertically (up and down) while shooting is called a tilt.  **Composition:** Pretend your screen has evenly spaced lines running throughout it, two horizontally and two vertically. The points where the lines intersect are where you want to have your subject. This is called the rule of thirds, for more details on it and composition in general check out [this lesson](http://vimeo.com/videoschool/lesson/8/framing-and-composition).  Definitions from http://vimeo.com/videoschool/lesson/24/video-101-shooting-basics |
| Time required: | Each roughly 50 minutes. |
| Materials needed: | Teacher: whiteboard. Video Projector with access to YouTube.  <http://vimeo.com/videoschool/101>  Students: writing materials and notebook |
|  | |
| II. The Lesson Itself\* | |
| Lesson launch (aka *the* *hook* or *accessing prior knowledge*): | NO NOW: What did you learn from creating the video and pamphlet? |
| How the lesson’s objective(s) will be shared with the students: | The purpose of the lesson is primarily to view and celebrate students’ videos. This will be shared verbally, and the videos displayed via overheard projector. |
| Learning activities (step-by-step): | The Viewing/Critique Activity   * Each group will present and explain their videos * Students will get the opportunity to ask questions * Viewers will fill out critique sheets |
| Checking for understanding:  (formative assessment) | Teacher observations and interactions  Critique sheets |
| Guided practice/extension: | None—this is the end =) |
| At the end of the lesson, how will what was learned be summarized for the class? | Verbal discussion |
| Post-lesson reflections and ideas for next steps: |  |

1. This is me trying this APA stuff—for the students…I’m nice like that.. [↑](#footnote-ref-1)