

## **Synthesizing Non-fiction and Science: Evaluating Popular Arguments about the State of our Environment**

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### **INTRODUCTION**

Students in an urban high school often have little understanding of the natural world around them. Because of this, they are unable to understand fully the passion behind or the meaning of environmental news. They find it difficult to connect with the arguments put forth by anyone from Al Gore to the Environmental Protection Agency to a column writer for *Newsweek*; even if they do connect, they are often unable to discern which information is true, important, or relevant to them – or if the information should matter to them at all. Compounding these problems is the fact that students in high school English classes are rarely well versed in reading non-fiction. In this curriculum unit, students will read and analyze environmentally charged non-fiction, design and carry out a set of observations judging the state of wetlands in Houston, write their own non-fiction articles displaying their results, and synthesize the information from multiple sources into an argument essay.

The school in which this unit will be taught is an inner-city high school. Many of the students in the school speak English as a second or third language and, therefore, have not had consistent training in English language and literature. This curriculum unit is designed for a Pre-AP sophomore English class at this urban school in Houston, TX, but it can easily be modified for all students. The unit will be taught over a span of approximately four weeks and will likely involve collaboration with a biology teacher or environmental club sponsor. Courses meet three times a week, once for 40 minutes and twice for 95 minutes; therefore, each lesson plan is designed for a 40 or a 95 minute class period.

### **OBJECTIVES**

The objectives for this interdisciplinary unit are quite comprehensive, as this curriculum contains multiple sections. Objectives are based on the Texas Essential Knowledge and Skills for 10<sup>th</sup> grade Language Arts and Biology and on the College Board's Advanced Placement expectations.

#### **Reading**

The student is expected to:

- 6.b – rely on context to determine meanings of words and phrases such as figurative language, idioms, multiple meaning words, and technical vocabulary
- 7.g – draw inferences such as conclusions, generalizations, and predictions and support them with text evidence and experience
- 10.b – use elements of text to defend his/her own responses and interpretations
- 12.b – evaluate the credibility of information sources, including how the writer's motivation may affect that credibility

## **Writing**

The student is expected to:

- 1.c – organize ideas in writing to ensure coherence, logical progression, and support for ideas
- 3.b – demonstrate control over grammatical elements such as subject-verb agreement, pronoun-antecedent agreement, verb forms, and parallelism
- 5.a – evaluate writing for both mechanics and content

## **Viewing and Representing**

The student is expected to:

- 19.b – analyze relationships, ideas, and cultures as represented in various media
- 19.c – distinguish the purposes of various media forms such as informative texts, entertaining texts, and advertisements
- 20.b – deconstruct media to get the main idea of the message's content

## **Biology**

The student is expected to:

- 1.a – demonstrate safe practices during field and lab investigation
- 2.b – collect data and make measurements with precision
- 2.c – organize, analyze, evaluate, make inferences, and predict trends from data
- 2.d – communicate valid conclusions
- 12.c – compare variations, tolerances, and adaptations of plants and animals in different biomes

## **Pre-AP / AP**

This curriculum unit is designed, in part, to prepare Pre-AP sophomores for the Advanced Placement English Language and Literature course. As stated by the College Board, the purpose of this course is to “enable students to read complex texts with understanding and to write prose of sufficient richness and complexity to communicate effectively with mature readers” (*English Language 6*). Therefore, additional objectives of this unit include teaching students to “read...sources carefully, to synthesize material...in their own compositions, and to cite sources” (*English Language 6*).

## **RATIONALE**

This interdisciplinary unit will serve multiple purposes. Students will gain greater experience with reading and interpreting non-fiction, which will allow them to evaluate arguments put forth in the media and to be better prepared for the Advanced Placement English Language and Composition course they will take as juniors. Because they have had little experience with reading non-fiction up to this point, students often find the transition to AP English Language, with its intensive study of rhetoric, difficult. This unit will introduce them to the strategies that non-fiction writers and speakers use so that the analysis will come more naturally when they begin the next year’s intensive study.

My urban high school students, many of whom grew up in developing countries, cannot identify with many of the popular environmental topics discussed in the media or cannot wade through the conflicting “scientific” reports to make an informed decision. Though over half of American wetlands have been drained or converted to other uses, or have suffered “degradation of functions,” leading to an “increase in flood damage, drought damages, and...declining bird populations”, my students, who live in a low-lying coastal area, know little or nothing of this

("Wetlands: Status and Trends"). Similarly, the Intergovernmental Panel on Climate Change report predicts numerous problems for Texas in the future, including rising seas, greater hurricane storm surges, more flooding, and drying rivers, which would cause many Texans to panic, but "a number of think tanks...cast doubt on the conclusion" that humans are affecting the environment, which leaves even the educated among us to wonder whom to believe (Berger). By reading popular science literature and analyzing author's purpose, my students will become learned members of their local scientific community. They will be able to understand facts, judge arguments, and make more informed decisions about their lives and about their planet.

In order to have students feel a personal connection to the science about which they have read, we will also have a practical, hands-on field experience. They will count numbers of species and of individuals in order to hypothesize about the effects of man on some of Houston's wetlands. Based on their study, they will aim to use proper, non-biased reporting to write a clear and well-informed report of their results.

Finally, students will synthesize the information gained throughout the unit to create two final written products that will help prepare them for the new AP English Language Exam synthesis essay, for upper-level science and English courses, and for "real" life beyond high school.

Through the process of researching, writing and understanding non-fiction, students will not only gain rhetorical skill, but they will be better able to make informed judgments on anything from buying a new car, choosing a new governor, or building a home near a protected wetland area.

## **UNIT BACKGROUND**

### **Part I: Legitimacy of Sources**

This unit for Pre-AP sophomore English students has multiple objectives as mentioned above, beginning with improving students' ability to "evaluate the legitimacy and purpose of sources used" in preparation for the Advanced Placement English Language and Composition course they will take as juniors (*English Language* 8). This evaluation includes analyzing authors' intent, recognizing overuse or omission of appeals, and identifying bias in science writing.

#### ***Authors' Intent***

Over the last few years, topics like "global warming," "habitat preservation," "endangered species," and "climate change" are being used with greater frequency in today's media by everyone from scientists to lobbyists to politicians to celebrities. The public often hears that the ice caps and glaciers are melting and the ocean levels are rising, habitats are being destroyed and species are becoming extinct, and all of this is the fault of man. Evidence supporting these assertions is not consistently presented in the popular press, however, and the average person is left to make uninformed decisions.

One topic that students will need to understand is the fact that the popular press, including television and the written press, often misrepresents the truth in order to "equally" present the two sides of an argument. This is often done out of a misguided sense of "fairness" or because "debate" is more interesting than a consensus. The press may exaggerate one side of an argument to make articles simpler or more appealing to the masses, as well. For this portion of the unit, I will create a PowerPoint presentation highlighting the thesis of "Balance as bias: global warming and the US prestige press," which states that popular press articles about global warming "gave 'roughly equal attention' to the view that humans were contributing to global warming, and the other view that exclusively natural fluctuations could explain the earth's temperature increase" (Boykoff and Boykoff 129); this is a divergence from the consensus of the scientific community that humans are the primary cause of global warming (Boykoff and Boykoff 127). Students will

become aware that the media's presentation of topics – and of multiple sides of issues – is often misleading or lends credibility where there should be none.

Students will also work toward evaluating the legitimacy of sources by using the non-fiction analytic tool “SOAPStone” (see Morse). They will evaluate each piece of writing by finding its Speaker, Occasion, Audience, Purpose, Subject, and tone; this information paired with their knowledge of Aristotle's appeals (below) will help them determine the intent of the author and / or the publication.

### Aristotle's Appeals: *Logos*, *pathos* and *ethos*

Once students realize that the information they receive may misinterpret facts or exaggerate, they need tools to identify and interpret language that may be intended to sway them to believe strongly in one side of an argument. Students will learn to recognize Aristotle's appeals, *logos*, *pathos*, and *ethos*. Overuse or omission of these can be used by a speaker or writer to sway an audience away from evaluating facts.

*Logos*, a logical appeal, is usually the easiest for students to identify – or to identify as conspicuously missing from a speech or article. This is the writer's appeal to our minds, when he or she provides us with factual evidence. In the context of this environmental unit, students will search for specific numbers rather than generalizations, or for recent verifiable data reported in legitimate, non-biased sources.

*Pathos*, an emotional appeal, is quite common in environmental reporting. Students will likely be familiar with pictures of starving polar bears on melting ice or with pictures of animals covered in oil – both of which are examples of *pathos*. Writers often use these appeals to exert control over the audience and elicit the types of responses that they want (“The Writer's Audience”). An audience will respond to *pathos* almost without thinking and will feel an immediate, strong connection to the subject. Thus, people want to help that polar bear without knowing the details of its situation – or whether or not their money could even help.

*Ethos*, an ethical appeal, is commonly known as a speaker's appeal to the audience's “gut” response. Questions students may ask when searching for evidence of ethos are: “Is this speaker respectable?” “Does the speaker prove he is knowledgeable?” “Does the speaker have the best interests of the community at heart?” (“The Writer's Audience”). When first searching a speech for *ethos*, I encourage my students to highlight evidence of anything that makes them trust the speaker, focusing on tone and the way he or she identifies with the audience and the topic.

Students will practice identifying these elements in ecological or environmental texts and determine what effect their presence (or absence) has on the audience; recognizing why the authors may have used these elements will lead to greater understanding of the author's intent and, therefore, credibility (see Lesson Plan One below).

### ***Bias in Science***

When it comes to the controversial environmental debates of the 21<sup>st</sup> century, students need to understand also that the media may not always be to blame for faulty or seemingly contradictory information. In many cases, the science itself may have been done poorly, or may not have arrived at a clear final answer. Students will be given an introduction to some common misconceptions about science that also address bias in science; this way they can understand that science can be done poorly and will learn ways to identify bias in the articles that they read (“Bias in Science”). The aforementioned source contains a slideshow that defines bias and gives suggestions on how to find evidence of bias in articles; this lesson can be a strong tool, combined with understanding author's intent, to help students determine credibility of sources – both within the classroom and in their own lives. The slideshow is followed by activities that give students

the chance to practice what they have learned and to use it when evaluating literature about charged environmental issues. I will have my students complete at least one of these activities before we transition into the literature I have chosen for them.

### ***The Literature***

In Part I, students will learn about Aristotle's appeals as well as about scientific and media bias. Active practice with the literature (see Lesson Plan Two below) will encourage them to identify these topics in the articles about the environment that we will read. Students will then analyze the authors' motivations and about the effect that these rhetorical tools should have on the reader. Finally, students will conclude whether or not they deem each article a viable source, or if they feel that the author leaves them wanting or needing more information. They will repeat this process with two articles, and will share their observations with multiple partners; this will require them to revisit the text and to support their arguments with the text as well.

Articles used will be selected from a variety of sources, including newspapers, popular wildlife magazines, politicians' speeches, and publications on websites from local industries (see sample list in Lesson Plan Two below). Other articles may be used, as long as they are representative of a broad range of sources and intents. Teachers should find comparable literature that is current and is relevant to the lives of their students.

### **Part II: "The Wetland Experience"**

Upon completion of the non-fiction introduction, students will create their own informed writing by collecting their own data in a wetland setting. They will read literature relevant to the area to be studied. This might include perhaps introductory information from the Environmental Protection Agency ("America's Wetlands") or an article about studies done on their study site ("Urban Stream Demonstration Project") to become comfortable with various terms they will be using. We will likely focus on Paul Keddy's ecological definition that a wetland is an ecosystem that arises when inundation by water produces soils dominated by anaerobic processes and forces the biota to exhibit adaptations to tolerate flooding, and we will illustrate this definition with local examples of Texas swamps (Batzer and Sharitz 3).

For this informal study, we will compare two buffer zones along Little Turkey Gulley, a tributary of White Oak Bayou that runs through the developed neighborhoods of Shady Acres and Timbergrove in the Inner Loop area of Houston (there are many other areas that could be used, as long as they include two buffer zones: one where development is very close to the wetland and one where a much larger buffer between water and development occurs). This area is a riverine wetland, a nondepressional wetland next to a stream (Kolka and Thompson 35, 39). Typically, a riverine wetland will have water inputs from groundwater, precipitation, and runoff from the land; it may also receive water inputs from overbank flows during flooding, which Houston experiences quite frequently (Kolka and Thompson 39). We will study a riverine wetland because it is not only common in Houston but also safer for students to navigate than other wetlands like swamps or marshes.

At the study site, students will first do a visual scan of the two plots of land to be used and form a quick prediction as to whether or not man has had a larger impact on one plot of land than the other. Some scientists hypothesize that "[most] wetland animals are well adapted to drought and for them, routine drying is not a significant restraint. Extinctions probably occur when an unusual condition develops in a wetland habitat, and not from natural environmental variation" (Cooper and Wissinger 267-268); in other words, man could negatively affect the animals (and plants) of our study area. Though my students will not be addressing extinctions, they will want to consider both manmade and environmental stresses on the area at which they are looking. They

will then design and carry out an inventory of these plots of land (the details of this can be found in Lesson Plan Three below).

This brief voyage into biology will give students a chance to collect data and create primary sources for further reading and discussion. It will also “provide a quantitative way for students to see [whether or not] human activity affects local biological diversity” (Horn 150). Students will use the information collected to hypothesize as to the causes of the differences they have noticed and then write informational pamphlets for their peers and practice using Aristotle’s appeals and avoiding bias (see Part III and Part IV below). The interaction with the wetland will make students more involved in the writing process; their field activity will also make the environmental issues discussed in the media more relevant and important to them. Students will be informed by their own experience.

### **Part III: Write & Publish Pamphlets**

There are many ways that students can publish the results of their observations and their analyses. I will have the students focus on writing their text first, rather than on choosing the format in which it will appear. This way we can all focus on the content and on their message(s), which are the most important.

Each student will write an expository piece in which he or she will describe initial predictions, observations, and conclusions. The tone of these pieces will be educational and yet conversational because a specific audience has not been chosen yet, and we want the final products to appeal to as many people as possible. Content will also include a balance of *logos*, *pathos*, and *ethos*; I want them to relate back to the pieces we read earlier, remember what they learned about the appeals, and understand how to use all three of these effectively to convince their audience of their conclusions while proving themselves to be credible authors.

Students will use their writing to argue either 1) man has had an effect on the area(s) studied or 2) there is no evidence that man has affected the areas. They will be encouraged to consider other variables, but the main goal will be to use the data and the appeals to convince the audience that their thesis is true. These pieces will be used to create pamphlets and to practice the “researched argument” paper (see Part IV below).

Once all writing is complete, students will create informational pamphlets using their writing in conjunction with pictures they took or with graphics. This will be an interdisciplinary activity, as they will use charts or graphs to present their observations and they will use their computer skills on the final product. These may be created in conjunction with media technology classes (or with the help of those teachers).

Finally, the final products can be used in a variety of ways at the discretion of the teacher and students. They can be published in house and distributed in conjunction with the school’s environmental club or a local Bayou Preservation Association, published on the school’s website, or presented to multiple audiences (high school biology or environmental science classes, elementary school classes, local environmental agencies).

### **Part IV: The “Researched Argument Paper”**

Using their classmates’ texts and the professional texts they have already read, students will write “researched argument” papers that force them to consider each source as a text that was itself written for a particular audience and purpose; these papers “remind students that they must sort through disparate interpretations to analyze, reflect upon, and write about a topic” (*English Language* 8). Students will answer a question modeled on the synthesis question of the AP English Language Exam.

See details in Lesson Plan Four below.

## LESSON PLAN ONE: UNDERSTANDING ARISTOTLE’S APPEALS

### Objectives

Reading objectives will require that students rely on context to determine meanings of words and phrases (including figurative language, idioms, multiple meaning words, and technical vocabulary) and evaluate the credibility of information sources (including how the writer’s motivation may affect that credibility) (TEKS 6.b and 12.b).

Viewing and representing objectives will require that students analyze ideas as represented in various media, distinguish the purposes of various media, and deconstruct media to get the main idea of the message’s content (TEKS 19.b, 19.c, and 20.b).

### Resources and Materials

Clips of popular persuasive television commercials will be very helpful to introduce the ideas behind the appeals. Definitions and explanations of Aristotle’s appeals will be needed and can be presented in multiple forms (handouts, overheads, PowerPoints). We will also need “life-sized” silhouettes of the upper body, containing enough room for students to write in sections that will be labeled head, heart, and “gut.” Students can create the silhouettes themselves with butcher paper and markers.

I will draw some information from the *Laying the Foundation* guide for Pre-AP English, but material on the appeals can be found in many places.

### Procedures and Activities

This lesson is designed for one 95-minute class period, though an additional 40-minute period may be needed for the artwork involved in the life-sized appeal posters. Class will begin with a teacher-led brainstorming session as to what “persuasion” is – students will be asked to define and give examples, all of which will be written on the board. The teacher will then transition to visual advertisements, since this is likely the type of persuasion with which students will be most familiar.

Students will watch a fast food commercial and take notes on what the company does or says to make the audience want to buy their product. Notes can be rough, as they will be used later and will likely be amended. Students may notice catchy music, pictures of the food, comparisons with competitors, or a number of other techniques. As a class they will discuss the effectiveness of these – or similar – advertisements.

At this point, the lesson will transition to Aristotle’s appeals. I will explain that Aristotle described three main appeals that writers and speakers use in order to convince an audience to believe the thesis of their argument. *Logos*, *pathos*, and *ethos* will be defined, and students will be asked to try to match some of the notes they took as they watched the fast food commercial with these terms.

We will then watch one more commercial from an organization that asks for donations to support animals or orphans or other needy children; these are all very high in *pathos*. Students will be asked to work with a partner to take specific notes on the *logos*, *pathos*, and *ethos* they find in this new advertisement. *Ethos* is usually very difficult for students to grasp, so I will likely guide them in determining who produced the commercial and whether or not this organization seems trustworthy or seems as if it believes in what it is doing (*i.e.* is not just trying to make money).

Finally, we will transition the discussion to the personal level. Students will be asked if they have ever had to convince someone of their skills and talents (for example, applying for a scholarship, a job, a leadership role in school). They will be asked how they build themselves up and what types of things they divulge in order to earn the scholarship, the job, etc. Students at Lee High

School have very powerful stories, and scholarship applications often tell of families fleeing government turmoil or war, fleeing gang violence, or traveling to America under difficult circumstances. Students will be asked to convince me to give them a fictional “scholarship” (they can be rewarded with free homework passes or candy or any other incentive) and to use all of Aristotle’s appeals in such a way that I am convinced to believe in and to support them.

Students will work with a partner and be given (or create) a copy of a life-sized human body, from the “gut” up, with a heart drawn in. They will be given a handout that asks them to give at least four examples of each appeal and to write those examples in the appropriate section (*logos* will be located in and around the head, *pathos* by the heart, and *ethos* by the “gut”). This handout will contain the rubric for the assessment, as well.

### **Assessment**

Students will be graded on their posters. The rubric will include students’ understanding of the appeals, the strength of their examples, their neatness and effort, and their grammar, usage, mechanics and spelling.

## **LESSON PLAN TWO: SEARCHING FOR APPEALS AND/OR BIAS**

### **Objectives**

Reading objectives will require that students draw inferences such as conclusions, generalizations and predictions and support them with textual evidence and experience, use elements of the text to defend their own opinions, and evaluate the credibility of information sources (including how the writer’s motivation may affect that credibility) (TEKS 7.g, 10.b and 12.b).

### **Resources and Materials**

Multiple magazine, journal, newspaper, and/or Internet sources from a variety of organizations (environmental, industrial, and general public) will be needed, and one copy of each article will be needed per group. I will draw from the following list of sources: Michael Crichton’s speech to the National Press Club in January, 2005; ExxonMobil’s report on their environmental performance; Al Gore’s speech to the Sierra Club in September, 2005; Josh Harkinson’s article about the state of Houston’s wetlands; and Larry Schweiger’s editorial about clean drinking water.

### **Procedures and Activities**

This lesson is designed for one 95-minute class period to follow directly Lesson Plan One. Students will work with a partner and read two different articles to determine authors’ credibility, using the information about bias and appeals they have previously studied.

Before asking students to embark on this assignment themselves, I will model with a short article, perhaps a note in *Science News* or a letter to the editor from *Audubon*. Using the overhead or opaque projector, I will read the article along with the students, following the steps I will ask them to use (below). We will underline tone words, then annotate for examples of *ethos*, *pathos*, and/or *logos*. At each example, I will make a note in the margin and ask students to assess how this rhetorical device makes them feel and I will add that to the note in the margin as well (for example, my note might say “pathos: this description of the polar bear with no ice and no food makes me really sad because I am afraid she and her babies will die and there is nothing I can do about it”). At the bottom of the page, I will, with the assistance of my students, make conclusions. We will make notes as to the following: Does the author/publisher seem to show bias? Is there a lack of evidence (*logos*)? Does the author/publisher appear credible? What does it mean if there is a lack of *ethos* or *logos*? What does it mean if there is a great deal of *pathos*?

Students will then be given the articles to work on with their partner. These articles will have any reference to their origin removed (*i.e.* no header or footer from an internet page, magazine, or journal). Students will be asked to read the first article aloud, listening for (and underlining) words that may relate to the tone of the article. After briefly discussing first impressions, students will return to the text and annotate for examples of *ethos*, *pathos*, *logos* and/or bias. I will remind them at this time that they may not find any or all of these in their articles, and that they should note the absence of each, as well. As they do find examples, they will annotate in the margin and draw conclusions about the credibility of the source as I modeled for them. They will then repeat these steps with the second article.

After annotating and discussing the articles, students will then partner with another group of two that has read the same articles to determine if all parties agree. If the four students do not agree, they will return to the text(s) and support their arguments with evidence until a consensus is reached. Finally, all articles will be shared with the class via overhead or opaque projector and groups will present their observations and conclusions.

### **Assessment**

Students will confer with a partner and then with a small group about their annotations and conclusions, and then all will return to a full-class discussion. We will analyze the articles and determine their intent based on the presence or absence of appeals and bias. Students will also receive a separate grade on their annotations and conclusions, where I will look for their mastery of the following: how well did the student understand the appeals and bias? How correctly did the student correctly identify appeals and bias in the text (and support conclusions with evidence)? How well did the student defend his or her own arguments about the text? How well did the student conclude how the appeals and bias affect the audience?

## **LESSON PLAN THREE: QUANTIFYING POSSIBLE HUMAN EFFECTS ON LITTLE TURKEY GULLEY**

### **Objectives**

Students will be able to collect data safely and precisely, then organize, analyze and evaluate that data. They will also be able to make inferences about that data and successfully communicate their valid conclusions. Finally, students will be able to use their data to compare variations, tolerances, and adaptations of plants and animals in two different settings. The aforementioned represent Biology TEKS 1.a, 2.b, 2.c, 2.d and 12.c.

### **Resources and Materials**

Students will need tools to perform their observations: meter sticks or tape measures, a tool with which to measure right angles, twine, and wooden pegs or plastic stakes. They will also need sturdy clothing and shoes, clipboards, handouts on which to make their observations, and writing utensils in the field.

Because this experience will not take place on Lee High School's campus, all necessities for a field trip, including a bus and permission slips, will be needed. The teacher(s) will need to obtain permission from the proper authorities to perform these observations, whether in a park or in a neighborhood.

Finally, the primary teacher resource will be Henry Horn's "Biodiversity in the Backyard." See also "The Species/Area Curve" and "General Biology" for guidance in collecting and reporting data.

## **Procedures and Activities**

English teachers may want to conduct this half-day survey in conjunction with a biology class or local environmental organization. However, the science involved should be manageable for all interested parties; “the project can be done at any level of complexity” (Horn 150). Student activities are based on the outline of Horn in “Biodiversity in the Backyard.”

Students will form guesses before embarking on the trip – does man affect the waterways in and around Houston? Why, do you think? Upon arrival at the field site, students will begin by creating two areas of study, each measuring 8 meters by 8 meters square. (If squares cannot be created due to the terrain, students can create rectangles of 16 meters by 4 meters). The square in the upper left corner will then be divided into four squares of 2 meters by 2 meters, and again the 2 meter by 2 meter square in the upper left corner will be divided into four 1 meter by 1 meter plots. One area of study (Plot A) will be located between Little Turkey Gulley and an empty, undeveloped lot, and the other (Plot B) will be located between Little Turkey Gulley and a developed neighborhood backyard. In order to make these grids, students will need meter sticks or tape measures, a tool with which to measure right angles, twine, and wooden pegs or plastic stakes.

Working with a small group, students will be assigned a section of Plot A to count the number of different species and the number of individuals within each species. Some plants may make this difficult, like grasses or clover that are prevalent and difficult to identify in number, so students will just identify individual species and estimate area covered by these plants. As for small invertebrates, again, students will estimate, as counting individual ants may prove difficult.

My urban students will likely not know the names of any of the biota we find, so each group will create its own names for everything; the idea is to note the number of species, so name does not matter. Each group will have one student play the role of collector; students will bring individual plants to him or her for naming and he or she will keep track of samples and names for the group. The students will repeat the activity for Plot B, and will be assigned an area of the same size as they had in Plot A.

As for quantifying their observations, students will use a chart modeled after that in “General Biology.” I will create a chart with three columns: name of individual, number present in Plot A, and number present in Plot B. At the bottom of each column, they will total the number of individuals present in each plot; they will also note the number of different species present in each plot.

## **Assessment**

Students will use the information that they collect to write informational pamphlets as mentioned in Part III above. Before they do that, however, they will draw conclusions from their field observations. They will answer questions including topics like the following: how many different species did you find in Plot A? In plot B? Are there more species in Plot A or B? How many different individuals did you find in Plot A? In plot B? Are there more individuals in Plot A or B? What other generalizations can you make (numbers of each species in each plot, for example)? What might cause the differences that you saw?

Finally, students will attempt to answer the question they posed earlier: does man affect the waterways in and around Houston? They will defend their answer to this question in the pamphlets described in Part III above.

## **LESSON PLAN FOUR: THE “RESEARCHED ARGUMENT” PAPER**

### **Objectives**

Reading objectives will require that students will draw inferences such as conclusions, generalizations and predictions and support them with textual evidence and experience, use elements of the text to defend their own opinions, and evaluate the credibility of information sources (including how the writer’s motivation may affect that credibility) (TEKS 7.g, 10.b and 12.b).

AP English Language objectives will require students to “read complex texts with understanding and to write prose of sufficient richness and complexity to communicate effectively with mature readers” and “read...sources carefully, to synthesize material...in their own compositions, and to cite sources” (*English Language 6*).

Writing objectives will be addressed in mini-lessons in class periods following this one. They will require that students organize ideas in writing to ensure coherence, logical progression, and support for ideas, demonstrate control over grammatical elements such as subject-verb agreement, pronoun-antecedent agreement, verb forms, and parallelism, and evaluate their writing for both mechanics and content (TEKS 1.c, 3.b and 5.a).

### **Resources and Materials**

Before beginning this lesson, the teacher will need to prepare the readings for the students to read in conjunction with writing the “researched argument” paper. There should be a total of six or seven pieces; none should be more than about  $\frac{3}{4}$  of a page long, and at least one should be a graph or chart. Many of the sources can be drawn from student pamphlets created in Part III above. The teacher will also need to formulate a question for students to answer (see example in “Procedures and Activities” below).

For the introduction to the unit, the teacher will need either a large sticky pad page or a large piece of chart paper to create a poster that will remain on the classroom wall for the remainder of the school year.

Teachers can also use websites from AP Central as references: “Synthesis Essay for 2007” has sample questions and rubrics that teachers can use to model their questions, and “Preparing for the 2007 Synthesis Question: Six Moves toward Success” is a guide that students can follow to help them successfully answer these questions.

### **Procedures and Activities**

This lesson is designed for a 95-minute class period, but succeeding activities on studying rubrics and revising essays will consume parts of additional class periods. Students will be given a handout based on AP Central’s “Preparing for the 2007 Synthesis Question.” They will work with a partner to read the handout; each group will highlight the main steps and attempt to put them into their own words. The full class will then create a poster on a large piece of sticky paper or of chart paper: under the title “How to Successfully Answer the Synthesis Question,” the class will agree on six clear steps that they can all follow throughout this process. This poster will remain on the wall for the remainder of the year.

Students will be handed the Synthesis Question packet. I will lead the class through reading the first page, which contains directions, an introduction about how man is said to be affecting the environment, and the assignment itself. The question that the students will answer in this lesson plan is based on the sample question found on “Synthesis Essay for 2007”: “*Read the following sources (including any introductory information) carefully. Then, in an essay that synthesizes at least three of the sources for defense of your argument, take a position that defends, challenges,*

or qualifies the claim that man's activity has had a negative impact on the environment." The sources will follow on the remaining pages of the packet.

Students will take turns reading the sources aloud to the class, but we will not discuss the information in them so that students can make their own judgments. They will then begin the six-step process that they defined earlier and begin their brainstorming. Because this assignment would be timed on the actual AP English Language and Composition Exam, they will be encouraged to complete their pre-writing in fifteen minutes.

Teachers should leave approximately forty minutes for students to complete writing their essays in class. The essay will be graded using the AP English Language rubric, but students will have the opportunity to complete the writing process and rewrite their essays to strengthen their writing, revising, and synthesizing skills.

### **Assessment**

Students will be assessed multiple times throughout the writing process. The first, and perhaps most important assessment, will use the College Board's AP English Language Scoring Guidelines ("Synthesis Essay for 2007"). Students will be judged with the common guidelines to judge how they might do on the AP exam; this will also give them an idea of what they need to do to improve their synthesis essay-writing skills.

After the initial assessment, students will be led through a series of full class mini-lessons and individual tutoring sessions in order to improve their essays. The second drafts will be assessed using the same rubric or one modified by the teacher to contain the revision process.

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