The Rhetoric of Science: Finding Common Ground in the Analysis of Nonfiction Texts

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Introduction

The curriculum of The Advanced Placement English Language and Composition Course, sponsored by The College Board, focuses on training students to "analyze, synthesize, and evaluate nonfiction texts." [1] The course offers tremendous variety, and I routinely tell my students that we can apply our analytical strategies to any text at any time. We look at political speeches and sermons, biographies and autobiographies, advertisements and personal reflections. We look at essays and passages from politics, history, social sciences, and the arts. We explore readings in the fields of education and economics, readings focused on civil rights and gender issues, and readings that examine issues of language and popular culture. As the course requirements have expanded, I have incorporated the analysis of visual media including cartoons, art and photography.

As I became more and more comfortable integrating a variety of subjects and media into the course, I began to notice the glaring omission of one particular type of text—those relating to the field of science. I realized that my personal experiences were getting in the way of my ability to fully integrate the required variety into the course. My sister is a scientist; I am an English teacher. I struggled with science throughout high school; she chose science to distinguish herself from me. In keeping my trajectory on a completely separate path, I avoided any focus on texts that addressed topics in the science fields. I rationalized my decision by telling myself that I didn't know how to analyze a text in that field. But The College Board continued to emphasize the importance of these texts in the curriculum. The revised edition of *The Language of Composition*, a highly regarded text often used by instructors in the course, included an entire chapter devoted entirely to writings focused on Environmental Science. [2]

At this point I decided I had to prepare myself and incorporate science texts into my AP English Language curriculum. I started with one particular question guiding my research: Do writers in the field of science use the same rhetorical and stylistic strategies to develop their claims? In other words, would my students utilize the same tools in the analysis of a scientific text, or would they need a completely different skill set for the close reading of writings in this field?

I discovered that the answer was yes—writers in the sciences use the same rhetorical strategies, and even many stylistic devices, that writers use in other fields. And the distinction does not stop with the expected incorporation of logical appeal, ethical appeal,

and emotional appeal; I was surprised to discover writers in the field of science utilize strategies that might often be found in literary selections, including the use of imagery, motif and metaphor. Finally, I discovered that writers in the particular field of Environmental Science utilized not only the same strategies, but the same particulars—the same kinds of imagery, the same motifs.

Background

Teaching Advanced Placement Language and Composition in the Charlotte-Mecklenburg school system is challenging. The primary goal of the AP Language course is to create strong analysts with the skills to write effectively. Students must identify rhetorical choices, connect them to stylistic devices, and explain how the precise language of the text works to achieve the purpose of the author. The focus of The College Board examination is nonfiction; however, in Charlotte the task is complicated by the fact that the course also serves as a student's primary English credit for eleventh grade. In other words, we must teach these skills of nonfiction analysis while also incorporating texts from the traditional American literary canon—along with whatever other local requirements might come along in the ever-evolving implementation of the Graduation Project standards—and suddenly we find ourselves with far less time to focus on the new and challenging curriculum, essentially teaching three classes in one.

The course itself is one of the more difficult sponsored by The College Board. Only thirty-one percent of students who took the test in 2011 scored a four of a five (compared to nearly forty-seven percent of the also popular and accessible AP Psychology course), and only sixty-one percent of the students received a passing score. [3] Yet while the passing rate remains low, the number of students entering the course and taking the exam has increased significantly. The number of students taking the AP Language Exam has increased from 135,428 in 2001 to 412, 466 in 2011. [4]

Further complicating the issue is the fact that students are coming increasingly unprepared for the course. I have taught the course for ten years, and when I began eight years ago, the jump in curriculum was so enormous that I struggled to keep up with the pace. I was fortunate in that I could essentially throw any idea at my students—and because of their ability level they could turn almost anything into a fantastic learning opportunity. I learned right along with them. One would assume that at this point I could be on some sort of "cruise control," but every year teaching the course becomes more difficult. While my mastery of the material and instructional techniques has increased, their agility in working with the language has decreased significantly. The possible explanations for this trend are myriad. Because of the open-enrollment policy, students are entering the course with a variety of skill sets, many with verbal PSAT scores well below the College Board recommendation. No Child Left Behind requirements focus classroom instruction on standardized test improvement—and most of those tests focus

on reading comprehension or other skills for which there is one clear, correct answer—not analysis, writing, or independent thinking.

In other words, students spend most of their educational careers focused on content. Young students enthusiastically memorize the alphabet and multiplication tables. Older students might be able to identify the country in South America with the highest annual rainfall totals or label the parts of the digestive system. At the secondary level, state testing programs have continued to reward students for the regurgitation of content knowledge—they answer multiple choice questions about science, civics and history, but they are not asked to use any skills of analysis, synthesis or application. Even on an English EOC, students might identify a simile, but they have no idea why it is significant to the author's purpose or audience. They might have to identify the appropriate spot for a comma, but they can't explain how punctuation can change the meaning of a text. The focus on content also allows the students to rely on outside information. Increased access to technology means that students are constantly accessing Sparksnotes or other such sources for that "right response," and because of these endeavors they have spent years practicing reading and absorbing what someone else has told them to think—basically reading comprehension –instead of exercising their own powers of analysis and independent thought. It doesn't matter if students are asked about the significance of "The Declaration of Independence" or the American Dream as it is illustrated in *The Great Gatsby*—if they are only graded on content, they can regurgitate someone's answer without thinking or utilizing any skills beyond reading comprehension and memory. They aren't asked to analyze the text and explain how the significance is established.

And students certainly aren't asked to write. Or, if they are asked to write, they receive feedback based on whether the content is right or wrong—which really just makes it a longer form of a multiple-choice or fill-in-the-blank question. Students do not receive relevant feedback based on the construction of their text or the rhetorical and stylistic devices implemented. The lack of focus on literacy has left students without the skills they need for success at the college level. Their writing exhibits problems with clarity, organizational logic, argumentative strategies, development, language—the list goes on. They also have difficulty utilizing sources and entering into a sophisticated dialogue with writers in a given field. Universities are starting to revamp their writing requirements for incoming freshmen. Students at UNC-Chapel Hill, for example, will no longer be able to exempt from the introductory writing course. The class will be divided into three sections—social science, science, and humanities—and students will analyze the nuances of language particular to subject areas and implement those skills as they develop sophisticated arguments and integrate sources in a meaningful way.

The issues of analysis and writing are directly related. Students cannot thoughtfully construct a text with a consideration of audience, purpose and strategy if they have not learned how to analyze a text for these issues. AP Language and Composition, focuses on this analysis. We ask ourselves how an author's choices are based on his purpose. We

analyze rhetorical appeals, argumentative techniques, syntax, diction and other relevant stylistic devices. Our studies focus on nonfiction prose selections that include personal narratives, political documents and explorations of social issues. The course requirements are daunting to the even the most skilled students because they are so advanced and outside the realm of preparation and prior expectations. I find that the mere mention of the word *rhetoric* can induce utter panic—to say nothing of the introduction to *metonymy* or *epanalepsis*. Students need assistance in learning how to break down a text into manageable pieces so they can see how the language creates meaning. They need guidance as they move from the familiar land of reading comprehension to the undefined wilderness of analysis.

This lack of student preparation would seem to necessitate more individualized instruction; however, demographic shifts in our population and economy have compounded the difficulties in facilitating student success in the classroom. I teach at Providence Senior High School in Charlotte, North Carolina. The combination of an explosive growth rate and a dwindling economy has impacted our ability to serve the individualized needs of our students. The Charlotte- Mecklenburg school system has grown at a rate of three percent per year; in other words, approximately four thousand students enter the CMS system each year, and a large percentage of them come from our attendance zone. It is anticipated that this growth will continue for ten years.[5] Yet with recent setbacks in our national, state and local economies, the system has cut approximately twenty percent of the qualified teachers from our school. This reduction in force has led to the elimination of many Advanced Placement courses, and increased class sizes in those that remain. Students who come to the course with limited skills need individual attention, and with class sizes anticipated to be above thirty-five across the board, that individualized instruction will become more and more difficult. Our job as teachers will be to find strategies that will work effectively with larger groups of students.

This unit is constructed around the analysis of nonfiction environmental texts. Using the Environmental Science readings as a point of entry will help students understand that all writers, regardless of content area, have a purpose and an audience and, ultimately, an argument. Students tend to think of an argumentative text as one that deals with an aggressive, controversial issue like abortion or the death penalty. In *Thank You for Arguing,* Jay Heinrichs maintains that we cannot escape argument and rhetoric in our lives and we need "to distinguish rhetorical argument from the blame-shifting, he-said-she-said squabbling" [6]that we tend to define as argument. Fighters attack, blame and try to win. Heinrichs distinguishes an argument as a means to a solution and an attempt to win over an audience.

Starting with this unit also provides a window into the difference between purpose and content—helping students make the transition. If I start with traditional argumentation, we begin with a study of documents like "The Declaration of Independence" and "Letter

From Birmingham Jail"—documents that involve dissolving ties to a country or people fighting for civil rights, and students get so caught up in the content that they don't necessarily see the point about all texts utilizing argumentative strategies to develop a claim. In the field of Environmental Science, different authors might write about the same topic, say climate change or sustainability, and use completely different strategies based on audience and purpose. Exploring writings by scientists and non-scientists will also help students see the variety of rhetorical and stylistic choices.

Objectives

Students will engage in close reading and analysis of nonfiction texts, particularly those within the category of Environmental Science. Students will identify the author's purpose and how the author's choices of rhetorical strategies and stylistic devices contribute to the construction of that claim. As part of this analysis, students will consider the rhetorical triangle of subject, audience and speaker. Students will also focus on logical appeals, ethical appeals and emotional appeals; they will consider syntax, diction and other relevant stylistic and argumentative devices. By juxtaposing their analysis of Environmental Science texts with more traditional argumentative texts, such as political speeches and personal essays, students will recognize "*ordinariness* of rhetoric." [7] It is all around us and inherent in all texts, and "becoming conscious of how rhetoric works can transform speaking, reading, and writing, making us more successful and able communicators and more discerning audiences." Students will be able to effectively analyze the structure of an argument and explain the connection between strategies used by different authors in the fields of science, literature, politics, etc.[8] Improving these analytical skills will help students become stronger writers as they incorporate those same strategies in their own writing.

Rationale

What Do Students Need to Know About Rhetoric?

Historical Context—It's Everywhere

Although they once held positions of value in a classical education, the terms *rhetoric* and *argument* have developed bad reputations over the years. People think of "*argument* as *disagreement*; we think of raised voices, hurt feelings, winners and losers." [9] When the term *argument* is "applied to the darker side of human acts and motives" [10] we do end up with silly, pointless and destructive fights, the "he-said-she-said squabbling that defines conflict today." [11]

Most people also think of *rhetoric* in a negative sense—as "language that sounds good but evades or hides the truth." [12] When people hear the word rhetoric, they assume "that trickery or deception is afoot." [13] We think of advertisers manipulating consumers, [14]

clever lawyers pleading "for the acquittal of a guilty client," [15] and politicians trying to win votes. Ultimately, most people think that rhetoric refers to the use of "empty words contrived to mislead or to disguise the desire to exert power." [16] People think that rhetoric is "the opposite of clear communication, exists in contrast to reality, and acts as a roadblock to making progress on important issues." [17]Heinrichs would argue that this is confusion between the "real-life difference between fighting and arguing." [18]

But texts designed to introduce *rhetoric* and *argument* to students focus on an "older, fuller, and far more positive" discussion of these terms. [19] "At its best, rhetoric is a thoughtful, reflective activity leading to effective communication, including the rational exchange of opposing viewpoints." [20] In fact, Heinrichs opens his text with a quote from David Hume, the Scottish philosopher, who said, "Truth springs from argument among friends." [21] This definition of rhetoric assumes that the writer is trying to persuade the reader because he has "something valuable to say, something that arises from his or her position as an honest, inquiring, ethical person." [22] Students who study rhetoric develop an understanding of how every decision the author makes "constitutes a rhetorical choice based" [23]on what the author thinks will be the most persuasive. Informed citizens and consumers who "understand how rhetoric works" can read between the lines and remain "wary of manipulation" and deception "while appreciating effective and civil communication." [24]

Becoming skilled at rhetoric is a valuable part of education. Teaching students about rhetoric is ultimately teaching them to recognize what they already know "about the way they interact with others." [25] Although they may not realize it, and they may not be able to put a name to it, students are surrounded by rhetoric in their daily lives. Helping students see the pervasiveness of rhetoric in their conversations, advertisements, movies, books, and interactions will help them put a name to something they know about already. They even use rhetoric, whether they realize it or not, "but becoming conscious of how rhetoric works can transform speaking, reading, and writing, making us more successful and able communicators and more discerning audiences." [26] Students skilled at rhetoric can understand the author's point and analyze the decisions the writer makes to accomplish that purpose "for a specific audience." [27] They can apply these same skills in carefully crafted compositions.

The Rhetorical Triangle: Subject, Audience, Speaker

A basic component of rhetorical study is the rhetorical triangle, also called the Aristotelain triangle, which suggests that the person creating or analyzing a text" [28] must consider the interaction of three elements: subject, audience and speaker. Writers must choose a topic and consider "what they already know about it, what others have said about it, and what kind of evidence" [29] will appropriately develop their position. The writer must also create a persona, a "character the speaker creates as he writes," [30] The persona, sometimes called the voice, will change "depending on the context, purpose,

subject, and audience." [31] The writer may emphasize elements of "character and personality and downplay others." [32] Since the elements on the triangle are interactive, these decisions are often based on a consideration of audience's "expectations, knowledge, and disposition with regard to the subject writers explore." [33] Using the triangle can help students "envision the rhetorical situation" [34] continue to explore issues of text construction.

Appeals to Audience: Logos, Pathos, Ethos

Logos, or logical appeal, is "argument by logic." [35] Writers appeal to logic by offering "clear, rational ideas." [36] Of course, the main idea must be logical, and it will be supported with relevant details, examples, expert testimony, facts and statistical data. [37] Logical appeals will be either deductive or inductive in nature. Deductive reasoning applies "a general principal to a particular matter," [38] and inductive reasoning begins with specifics and "moves to the general." [39]

Ethos, or ethical appeal, is "argument by character—using your reputation or someone else's as the basis of argument." [40] The speaker emphasizes shared values between himself and the audience as he demonstrates that he is "credible and trustworthy." [41] In some instances, establish *ethos* with a reputation based on their expertise, knowledge, training and sincerity. [42] Three aspects of ethical appeal are virtue, practical wisdom and disinterest. [43]

Pathos is the appeal to emotion that can change the mood of an audience, make them receptive to logic, and possibly give the audience "an emotional commitment to your goal." [44] Although an argument that employs only emotional appeals is "by definition weak," [45] an effective writer can draw on the audience's emotions so they will be "sympathetically inclined to accept and buy into" his argument. [46]

The Triangle Modified: Purpose, Context.

Teachers can add circles around or inside the traditional rhetorical triangle to discuss two elements that Aristotle omitted in his discussion: purpose and context. Every piece of writing occurs in context, "the convergence of the immediate situation calling forth from the text, any pertinent historical background information about the topic, the persona and identity of the rhetor, and the knowledge and beliefs of the audience." [47] This context influences the development of the argument and can help the student analyst understand the writer's choices. [48]

Understanding purpose might be the most important part of rhetorical analysis. The purpose, also referred to as the intention or the aim, is what the writer "wants to happen as a result of the text, what he . . . wants the audience to believe or do" as a result of reading the text. [49] Intention can be clearly identified in a thesis, but other times it is

simply implied in the text. Rhetoric is ultimately the way to connect a writer's intentions with the intended response—the author makes choices to contribute to his purpose. [50]

Why Study Science Texts?

Correct Misconceptions that Segregate Sciences and Humanities

Jeanne Fahnestock, author of *Rhetorical Figures in Science*, is a leader in the scholarship that chips "away at the profound division in our culture between the science and the humanities." [51] She argues that there is "little point" in the way our culture has so completely divided the disciplines in terms of writings, thinking styles, "types of mind, and even children according to whether they belong in one domain or the other." [52] Students who focus on science believe they can ignore studies of language and literature, and students in the humanities \avoid science beyond a typical graduation requirement. But Fahnestock argues that it is "impossible to argue without exploiting the structures identified in rhetorical tradition." [53] A study of basic argumentative patterns of science texts shows that the "thinking styles and language habits" of the writings in the areas of science are "essentially similar" to those in the humanities.[54] Lawrence Scanion, an AP Language and Composition instructor and a College Board consultant, argues that incorporating science texts will enhance instruction because these writings use "so many of its rhetorical features that we use with our students." [55] He cites Stephen Jay Gould, an evolutionary biologist, who wrote that "science is an inferential exercise, not a catalog of facts." [56] Writers in the field of science pay particular attention to audience and context to "inform the construction of their arguments and the rhetorical flavor of their presentations," offering students the opportunity to investigate the considerations of Aristotle's rhetorical triangle and "the use of classic appeals." [57] Much of recent focus on the study of rhetoric in science writings has been dominated by a focus on metaphor. As a construction "across the disciplines of literary studies, linguistics, psychology, philosophy, and education" the metaphor has been championed as a "fundamental mechanism in language and thinking." [58] Scholars in the rhetoric of science over the last thirty years have been busy "detecting the root or core metaphors underlying or informing scientific creativity and argumentation" [59] that are considered emblematic of "moments of inspiration" that preserve the "notions of genius and innovation." [60] But Fahnestock and others have expanded this focus to include other elements of rhetoric and style. Fahnestock in particular has focused not just on the traditional appeals; *Rhetorical Figures in Science* offers detailed analysis of science writings that use specific figures, including *antithesis, antimetabole, polyptoton, incrementum* and *gradation*. [61]

Fahnestock's work seeks to repair "the historical divisions between rhetoric and the sciences," by focusing on the "continuity in patterns of reasoning across disciplines still traditionally divided" [62] so that we might embrace the true richness and the variety in different disciplines. Too often writers have attempted to arbitrarily create distinctions to elevate their own discipline by tearing down another. The scientific revolution of the

seventeenth century, for example, was focused on “debasing rhetoric to elevate science” [63] and as part of this campaign this community attempted to “purge its discourse of figuration,” a failed effort since these figures, such as metaphor, “represent enduring lines of argument” that are “impossible to remove” from reasoned prose. [64] But Fahnestock is careful to point out that the focus on the use of traditional rhetoric in science writings is not intended as “just another project in this leveling tradition.” [65] The differences in disciplines simply aren’t based on “ubiquitous patterns of expression and argumentation” which cross disciplines. [66] Language “does much of our thinking for us,” [67] and the study of rhetoric can actually serve to “illuminate scientific arguments.” [68]

Relevance and Currency of Content

Students must learn to identify and question the validity of an author’s claim, trace the path of a reasoned argument, “understand the relationship between claims and their support, and understand the purpose of sources, references, and footnoted material.” [69] They have to move from using sources to using sources in conversation together—moving “from the iterative to the discursive,” and science writings provide prose examples with this synthesis. [70] Students can use these texts to “consider the reliability of evidence and the cogency of supported positions” while appreciating the construction of an argument. [71]

This unit uses resources based in the sciences that are written for a more general audience as opposed to one scientist writing for another. Fahnestock notes that one significant difference in the discipline of science is the high “degree of accountability” when there is “more pressure to turn an argument into a prediction or action.” Therefore, while the tactics of argument are the same across disciplines, the differences are in “the consequences expected.” [72] The analysis from a rhetorical perspective is primarily concerned with “explaining textual features . . . as a creative response to the constraints of a particular situation.” [73] Numerous arguments on the same subjects exist, but these written arguments “vary according to the audience addressed.” [74] Fahnestock’s observations suggest that when writing “in popular forums, scientists use appeals that are rarely made explicit in scholarly arguments addressed to colleagues.” [75] The main text used in the activities section is actually written by a non-scientist, but the premise regarding audience is the same and should be considered if selecting different texts.

Frustrated that their messages about urgent and complex issues seem to be falling on deaf ears, writers in the field of science are becoming more conscious of how they can use particular rhetorical strategies to influence audience understanding and behavior. Jeffrey Sachs, the Director of The Earth Institute at Columbia University, says that having the “scientific, engineering, and organizational solutions” to complex problems like climate change is not enough; the public “must be motivated and empowered to adopt the needed changes.” [76] But a survey by the Pew Research Center for People and the Press says that if Americans “do not feel a personal connection” to an issue, it may

slip "to the bottom of the list of American priorities." [77] Writers in the sciences are therefore exploring the principles of effective communication so that people will listen to information on a topic that is "complex, confusing, uncertain, sometimes overwhelming, and often emotionally and politically loaded." [78] Research from the Center for Research on Environmental Decisions (CRED) indicates that such information must be communicated "with appropriate language, metaphor, and analogy; combined with narrative storytelling; made vivid through visual imagery and experiential scenarios; balanced with scientific information; and delivered by trusted messengers." [79]

CRED has actually published a guide that emphasizes the importance of implementing the rhetorical strategies and appeals that have been discussed throughout this unit. One of the organization's suggestions is to translate scientific data into concrete experiences. Evidence from the social sciences indicates that the "experiential processing system is the stronger motivator for action." [80] The experiential processing system is emotional, intuitive and holistic; stories that are emotionally charged, vivid and personal activate this processing system. While one would not want to focus only on these examples, focusing on the analytic processing system with statistics, figures, graphs and charts will not create the type of response that the writers are looking for. [81] The CRED guide also suggests that writers consider their audience and become aware of the mental models that might "influence what people pay attention to in complicated situations and define how people approach and solve problems." [82] Writers can then construct the framework that places an issue "within an appropriate context to achieve a desired interpretation or perspective." [83] These suggestions are essentially directives to focus on the issues addressed in Aristotle's triangle, as well as the traditional appeals of *logos, pathos* and *ethos*, indicating that current texts from the scientific disciplines will purposely use these strategies, offering instructors a wealth of choices for classroom analysis.

Activities and Rationale

Activity One: Analyze a Traditional Text

Most people think of political speeches as a primary example of argumentative writing with attention to the rhetorical situation. Analysis of such texts offers students a strong entry point into rhetorical analysis. Shorter iconic texts by Thomas Jefferson and Thomas Payne, and longer pieces, such as "Letter from Birmingham Jail," by Martin Luther King, Jr., are excellent examples of texts constructed with careful attention to the rhetorical situation.

In keeping with the discussion of more current texts in the previous section, an instructor might also want to select a recent political speech. One suggestion is the speech that Michelle Obama gave at the Democratic National Convention in Charlotte, North Carolina, in September of 2012. Students should read and annotate the speech prior to discussion to see how many strategies they can identify. They should also consider the

particulars of purpose and audience and how her choices were influenced by that particular context. The instructor can use clips of the speech to introduce particular sections prior to whole-group discussion.

The speech offers opportunity to discuss context and audience because the speech was presented at the convention, but even delegates at that convention did not have the same enthusiasm that had engulfed the nation four years prior. So her purpose was really to inspire a base that likely would still vote for her husband—get them to see the excitement of the choice and to feel the call to service instead of just viewing the vote as the best option available. The speech was routinely praised by members of both parties, another interesting nuance of context and audience. The speech uses all three of the traditional appeals. She uses *pathos* in her vivid examples and the narrative structure, speaking of her father going to work despite Multiple Sclerosis and a lack of education, and her date picking her up in "a car that was so rusted out, I could actually see the pavement going by through a hole in the passenger side door." [84] Of course, numerous appeals overlap, as the vivid examples also offer the *ethos* of someone who understands the plight of an average American, and her reference to Barack—the Barack she "loved just the way he was." [85] But it is the sophisticated and varied *logos* that balances the riskier elements of the speech; induction was obvious in the numerous examples of why we can trust Barack Obama, why he is like the rest of us, and why we can make this choice to rise up out of this struggle, but it also uses deductive reasoning to build a bridge between the examples of motherhood and public service. She uses the motif of motherhood throughout the speech, admitting that she had concerns before the last election as she worried about how life in the White House would affect her daughters. In the end she brings this full circle—arguing that to leave a better world for her own daughters, she must work for a better world for others, this great country—we're in this together as opposed to every man for himself. Certainly there are any number of other issues that can be discussed, including anaphora, repetition and syntax.

Activity Two: Analyze a Non-traditional Text

Instructors can then transition to the analysis of a non-political text to initiate students into the idea that these strategies can be used to analyze any piece of writing, including writings across the varied disciplines. One example that crosses genres and introduces the sciences is *The Lorax*, by Dr. Seuss. Not only will students gain experience in recognizing rhetorical strategies in all levels of reading—they will be exposed to an environmental text that heightens awareness without overtly trying to change an attitude. And, ultimately, they will see that recognizing the influence of rhetorical considerations can only enhance the complexity of a text since, as Ian Marshall argues in his article "The Lorax and the Ecopolice," there is always "room for more than one reading in any text." [86]

According to Marshall, *The Lorax* is traditionally viewed as an "environmentalist parable about the Once-ler, an entrepreneur seen only as a pair of busy arms and hands who chops down Truffula trees in order to weave their tufts into shapeless garments called Thneeds" [87] despite the objections of the Lorax. The Once-ler is seen as the selfish villain, while the Lorax, representing nature, is traditionally viewed as the hero. But after applying his knowledge of rhetoric, Marshall sees that the story is more complicated and subtle than it might seem, "and it conveys a moral message for environmentalists as well as for industrialists." [88] Marshall comes to his conclusion based on his analysis of the traditional appeals used—or not used—in the story. He argues that the Lorax is ultimately "not credible and he hardly earns the respect of his audience" [89] based on the traditional concept of *ethos*. The Lorax claims "to speak for nature" but is "a poor advocate." [90] He does not establish an effective *ethos* because he speaks "sharpish and bossy" to the Once-ler, insulting him, yelling and giving unreliable information. He puts the Once-ler on the defensive and suggests that the "other living things in his environment" are "*his* property and responsibility." [91] And although the Once-ler does have an appreciation for nature, the Lorax never uses any *pathos* to that end; the only "pathetic appeal he makes is to try to make the Once-ler feel guilty" about "not enough Truffula Fruit to go 'round." [92] And he never employs any *logos* to challenge the Once-ler's assumption that the "destruction of habitat is an inevitable by-product of the necessary expansion of business." [93] By the end of the story the Once-ler has learned his lesson, but the Lorax remains angry with his "single note of rebuke" that remains ineffectual. [94]

Activity Three: Analyze a Text Grounded in Science

Analyze Excerpt from Longer Text

Depending on time constraints and student ability to handle longer works, the instructor might choose to work with smaller, more manageable excerpts from a longer work. Such an excerpt might also be an introduction to a longer piece from the discipline of science.

The excerpt suggested here is from *Silent Spring*, by Rachel Carson. The first two chapters of the text are "A Fable for Tomorrow," and "The Obligation to Endure." This excerpt offers students another opportunity to identify the traditional appeals of *logos, pathos* and *ethos*. The discussion of audience and context can provide an enlightening comparison to more contemporary texts as students discuss the relevance of her text today and whether there has been any change. Carson also analyzes the faulty logic of opposing views. The text offers numerous examples of imagery and metaphor, including those associated with fairy tales, death, alchemy, chains, trains and abundance. The students can also analyze syntax, repetition, motif, and even such specific techniques as alliteration and phonetic intensives.

Analyze Full-length Text

The text suggested here is *The Omnivore's Dilemma,* by Michael Pollan. Students can read the text over an extended period—summer reading provides the opportunity to focus on one individual text of this complexity and length, but instructors can select the approach that works for their individual classrooms.

The goal is to have students use their tools for analyzing rhetoric and style as they analyze the text based in the discipline of environmental science. If the text is used early in the course, as it is here, the instructor will want to limit the amount of text a student works with at any given time so they will not be overwhelmed by the possibility inherent in over 400 pages.

Students can first work with one of the smaller segments in Chapters Eleven, Twelve and Thirteen (e.g. "Tuesday Morning," "Thursday Morning,"). These segments offer an easy connection with the previously discussed section of *Silent Spring*. Working in pairs or groups, students can analyze their segment and identify connections between their segment of *Omnivore's Dilemma* and *Silent Spring*. Students should construct a sample thesis statement that identifies a point that connects the two segments—these might focus on the issue of sustainability or the interconnectedness of nature. They can outline the examples they would use to explain how the authors use rhetoric and style to prove their point.

A full rhetorical analysis, in the form of an independent essay, will close the unit. Students should write the essay in class so that instructors can assess their current level of comfort and skill with the rhetorical analysis; offering the assignment out-of-class and over an extended period gives students more opportunity to research. The assignment is as follows:

> Choose **one** passage from the section you have randomly selected, and select one additional passage from anywhere in the book. (It must be significantly different in terms of the location in the text.)
> Write an essay in which you explain how Pollan uses rhetorical strategies and stylistic devices to contribute to his overall purpose as highlighted in these two passages.
> Students should focus on one purpose to maintain a cohesive essay. The purpose should be clearly identified in the thesis and should be expressed as a complete thought. There are any number of purposes/points in the text—students should not be alarmed about choosing the correct one as long as they have evidence to support their claim.
> Remember to stay focused on LANGUAGE—rhetoric and style—and don't just start talking about what the author says.
> Recommended breakdown: Plan 30 minutes—write an hour. Or plan longer and write faster ☺

> Write on the front side of the paper only. Write your passages/page #s here and staple to the top of the essay.
>
> The sample passages—put on the board and assigned to rows randomly—are as follows:
> "Industrial: Garden City, Kansas" 72-78; 79-84
> "Taking the Kernel Apart: The Mill" 85-90
> "Putting it Back Together Again: Processed Foods" 92-95 (90-91 can be included: I had used previously as an example of annotations)/ 95-99
> "Green Acres" 123-125
> "The Genius of the Place" 128-128

Included here are sample student responses. These are only excerpts, not the full essays, and they are edited to maintain focus on their use of rhetoric and the possible connections to purpose (instead of other writing issues that might need to be addressed in any student essay).

> Student sample 1: The cows at Chick-fil-a have just one message for consumers—do not eat more beef, eat more chicken. Or as they like to say, "chikin." It would seem their reasoning is that they simply do not want to be slaughtered and eaten by the American public. And the consumers happily oblige, saving the poor, spelling-challenged cows from a terrible fate. Yet it is possible that the cattle are actually rescuing the consumers from death. In *The Omnivore's Dilemma*, author Michael Pollan exposes the problems associated with eating feedlot cattle, alerting the reader to the industrialization of the cattle feedlot that has created health and environmental problems that are difficult to eradicate.
>
> Pollan utilizes an extended metaphor to describe the industrialization of the Poky Feeders feedlot in Garden City, Kansas. He describes the farm as a "machine" that utilizes computer programs to determine the "efficiency" of a cow (80-81). He continues to describe how the farm uses "mechanisms" to create a "product" (81). Pollan's factory imagery demonstrates the industrialization of the feedlot while also appealing to the reader's values. Traditionally, people view factories in a negative manner citing the harmful impact on the environment. Pollan draws out their concern for their environment and directs their concern about the pollution that results from the industrialization of farming.

This essay has a creative introduction and a clear thesis statement. The first paragraph focuses on the extended metaphor of the machine—a metaphor that is common to many of the essays since Pollan uses similar imagery throughout his text. These examples show the variety of ways students identified the connection between the author's use of language and his particular points. Here the metaphor focuses on the industrialization of the feedlot, and the student is careful in his elaboration to come back to the issue of environmental problems introduced in the thesis. This essay continued with a focus on

logos, explaining how Pollan used inductive reasoning to provide multiple examples of how cattle feedlots are harmful to both health and environment.

> Student sample 2: In a constantly evolving world, nations often adapt to ensure their standings as world superpowers. Iran develops weapons to ensure its personal defense, or China reforms its labor strategies in order to maximize efficiency. The United States, however, has chosen to change its agricultural practices, and agriculture itself, in order to inexpensively feed its population. But what cost does this have—the possible jeopardy of humanity? In *The Omnivore's Dilemma*, Michael Pollan illustrates that an acceptance of nature's intricacies is crucial to human survival.
>
> Pollan states that grass, the simplest element of the food chain, is truly "the foundation of the intricate food chain" on which many humans depend for the consumption of food (126). Pollan illustrates the extent of such intricacies in the food chain with an extended metaphor; he compares a small-time organic farmer, Joel Salatin, to a choreographer and the blades of grass to a "verdurous stage" (126). The same complex relationship that exists when choreographing a dance or music at the professional level exists in nature. All parts must work together to form a cohesive whole and the entity in charge of the operation must not abuse the parts of the whole. . .

This essay also begins with a creative introduction and a sophisticated thesis that identifies Pollan's focus on the role nature's intricacies play in human survival. This student focuses on a different metaphor and explains how the role of the farmer is similar to that of a choreographer. The writer uses less quote weaving but offers a more detailed explanation of a complicated metaphor. The essay also went on to discuss how Pollan used *logos* to emphasize nature's complexity when he gave an example of a time when nature was not respected and detailing the consequences.

> Student sample 3: Food for thought: an interest sparked by the flavors of life—a desire to know about one's culture and roots. The ideals that make memories like Grandma's famous recipe or the secret family dish remind people of values, family and simplicity. In *The Omnivore's Dilemma*, Michael Pollan illustrates how food is not simply nourishment for the physical body, but nourishment for the emotional soul.
>
> Pollan reinforces the necessity of recognizing the origins of consumer's food to fulfill the emotional nourishment lacking by current American cuisine. Unlike other cultures, America doesn't have a distinct cultural cuisine. The only emotional satisfaction Americans can achieve from food is physical taste and connecting to the origins of the food . . . He references examples from other chefs who describe the local food as the way they "remember when [they were] kid[s]" (252) and highlights how the "global food market" has "smudged the bright colors

> of the seasonal food calendar we once knew by heart" (253), creating an even greater disconnect between the food and personal understanding . . .
>
> Pollan highlights the importance of understanding the origins of food through contrasting the picturesque Polyface farm with an industrial factory. Pollan describes the Polyface farm as "suspended . . . halfway between the wilderness of forest and the artifice of civilization" (124). He emphasizes the great dichotomy of the "literal American reality" of "agribusiness" companies and the "old world's pastoral dreams" (124), showing how the natural ideals of arming have been clouded by the invention of new technology. Polyface Farm is the representation of how the modern world has lost the importance of understanding where it comes from and how it is made. .. .

This essay offers a completely different focus by identifying the importance of food as part of our culture and emotional stability. The writer explains that our opportunity to bridge the disconnect between food and culture is to identify the origins. He also points out how Pollan uses the industrial imagery to contrast the more natural imagery of the "seasonal food calendar." Here the author could have focused more on the culture of the farm and the routine established within the farming community.

> Student sample 4: Author Michael Pollan takes it upon himself to examine the relationship between Americans and the livestock that become their food. In doing so, he visits a CAFO, Poky Feeders, and explores the ethics of eating meat by reading . . . emphasizes how impersonal the relationship has become between Americans and the animals they eat.
>
> At Poky Feeders, Michael Pollan tracks the life of a single steer, number 534. As he describes his experience, Pollan repeatedly refers to his steer by its number, noting its depersonalization. Additionally, he states that his steer "was a most impressive machine for turning . . . field corn into cuts of beef" (80). He extends this "machine" metaphor by referring to the cow as "sunlight-and-prairie-grass *powered*" (84). By using this metaphor, Pollan is insisting that Americans don't consider that their beef comes from a living organism—and imagine it as a beef-producing piece of machinery. Furthermore, Pollan uses irony in commenting on his steer's weight gain by saying, "He's clearly eating well, though" (80). He reveals that the cattle's diet is not well at all; it has been fed corn even though cows are naturally grass eaters, emphasizing that consumers have a skewed view of the animals they eat and are not aware of the truth of their conditions . . .

This essay also focuses on the disconnect between people and the food they eat, but without the added nuance of culture. The writer again shows us how the students explain how the writer uses metaphor, diction and imagery achieve his purpose, including irony and tone as part of his discussion.

Student sample 5: Pollan gets the reader to favor cows' comfortable, natural existence on grass farms over their poor conditions on industrial feedlots.

In the firsts passage, Pollan describes the terrible, dehumanizing conditions at a Kansas feed yard. The first few paragraphs of the passage use an extended metaphor—the year is negatively compared to a premodern city. The author's choice of words, such as "filthy," "stinking," and "disease" evoke images of teeming squalor and crowded, plague ridden medieval cities. As Pollan continues . . . "local landmarks" like the "towering feed mill" . . .(but-wait-there's more figure) to say that not only is the feedlot a crowded city, but it's also a city built of corn and afloat on petroleum. . . Pollan then moves to inductive logic, listing several disgusting, unnatural ingredients in industrial cow feed (e.g., liquefied fat, urea, and molasses) to emphasis the unnatural . . .

This essay has a simple thesis, simply saying that Pollan's purpose is to get the reader to favor a more natural treatment of cows over the industrial feedlots. Again, we see the variety in the way students can handle the metaphor and imagery; this student is more focused on particular choices in diction and emulates that same language in his writing. The essay also identifies inductive logic and other argumentative strategies such as amplification (but-wait-there's-more).

Annotated Bibliography for Teachers

"AP Examination Volume Changes (2001-2011)," *The College Board,* Accessed September 24, 2012. *http://media.collegeboard.com/digitalServices/pdf/research/AP-Exam-Volume-Change-2011.pdf.*

This website offers detailed information on the numbers of students taking AP exams and how those numbers have increased each year.

"Charlotte Mecklenburg Schools Demographic Overview." *Charlotte Mecklenburg School System*. Accessed July 10, 2019. http://www.cms.k12.nc.us/cmsdepartments /StudentPlacement/Pages/Charlotte-MecklenburgSchoolsDemographicOverview.aspx.

This website offers information on the specifics of the CMS school system.

Crusius, Timothy W., and Carolyn E. Channell. *The Aims of Argument: A Text and Reader*. Boston: McGraw-Hill, 2003.

This textbook offers an approach to teaching argument that focuses less on terminology and division than some traditional texts. The authors place their emphasis on revision and offer fresh reading material.

Fahnestock, J. "Arguing in Different Forums: The Bering Crossover Controversy."

Science, Technology & Human Values 14, no. 1 (1989): 26-42. doi:10.1177/016224398901400103.

While most of this article is specific to the analysis of texts on this particular controversy, Fahnestock makes some interesting comments on science writings for the general audience use different appeals and strategies than those articles written for the scientific community.

Fahnestock, Jeanne. *Rhetorical Figures in Science*. New York: Oxford Univ. Press, 2002.e

The penultimate text examining how scientists use language to construct arguments—probably too intense for use in the high school classroom, but offers insight into particular strategies such as antithesis, metaphor and antimetabole.

Heinrichs, Jay. *Thank You for Arguing: What Aristotle, Lincoln, and Homer Simpson Can Teach Us about the Art of Persuasion*. New York: Three Rivers Press, 2007.

An excellent introduction to the components of argumentative techniques—includes modern, humorous examples to illustrate terms that students often find intimidating. The discussion of *ethos* is particularly strong. This text also has a detailed glossary of terms and a companion website.

Marshall, I. S. "The Lorax and the Ecopolice." *Interdisciplinary Studies in Literature and Environment* 2, no. 2 (1996): 85-92. doi:10.1093/isle/2.2.85.

The author explains how the focus on *logos, pathos* and *ethos* can alter the traditional interpretation of the children's story—therefore also showing how careful analysis can reveal levels of text complexity.

Obama, Michelle. Speech, Democratic National Convention, Time Warner Arena, Charlotte, North Carolina, September 4, 2012. Accessed November 26, 2012. http://www.huffingtonpost.com/2012/09/04/michelle-obama-speech-text_n_1851947.html.

I selected this speech because it was current; it happened the night before in our city, and I wanted students to see that we could identify these strategies in any text on any day. Mrs. Obama's speech is rich in rhetorical strategies, and it was praised by people on both sides of the political arena, making it a safer option during an election year.

Puhr, Kathleen M. *AP English Language and Composition Teacher's Guide*. New York: College Board, 2007. Accessed October 6, 2012. http://apcentral.collegeboard.com/apc/members/repository/ap07_englang_teachersguide.pdf.

Teachers across the country use this guide to plan their syllabus and activities for AP English Language and Composition.

Roskelly, Hephzibah, and David A. Jolliffe. *Everyday Use: Rhetoric at Work in Reading and Writing*. AP ed. New York: Pearson Longman, 2009.

This textbook is a standard in AP English Language and Composition classrooms. The emphasis is on purpose—how to read for the author's purpose and how to write with purpose.

Roskelly, Hepzibah. "What Do Students Need to Know About Rhetoric." In *Special Focus in English Language and Composition: Rhetoric*, 7-13. New York: College Board, 2006. Accessed October 6, 2012. http://apcentral.collegeboard.com/apc/members/repository/ap06_englang_roskelly_50098.pdf.

This article is part of a College Board series on what students need to know about a variety of topics in the AP English Language and Composition Course.

Scanlon, Lawrence. "A Wealth of Arguments: Using Science Writing in AP English Language." College Board: AP Central. Accessed November 26, 2012. http://apcentral.collegeboard.com/apc/members/courses/teachers_corner/44269.html.

Scanlon writes about the value of using nonfiction pieces from the science genre and how they have historically offered opportunities to improve the skills required in the AP Language and Composition course.

Shea, Ren e Hausmann., Lawrence Scanlon, and Robin Dissin. Aufses. *The Language of Composition: Reading, Writing and Rhetoric*. Boston, MA: Bedford/St. Martin's, 2008.

Another standard text in the AP Language and Composition classroom, this text groups modern and classic readings by topics so that instructors can show students how different authors approach the same topic based on purpose and audience. The questions point students to issues of rhetorical and stylistic choice—not just basic comprehension.

Shome, Debika, and Sabrine Marx. "The Psychology of Climate Change Communication." CRED Guide. October 2009. Accessed November 26, 2012. http://guide.cred.columbia.edu/.

The CRED guidelines explain how writers in the field of science can use rhetorical strategies to achieve purpose. The discussion of audience is especially strong.

“Student Grade Distributions.” *The College Board.* Accessed September 24, 2012. http://professionals.collegeboard.com/profdownload/STUDENT_GRADE_ DISTRIBUTIONS _11-3.pdf.

Provides information on student performance on AP exams.

Reading List for Students

Carson, Rachel. *Silent Spring*. Boston: Houghton Mifflin, 1962.

This classic text was one of the first to initiate the discussion of environmental issues in the general public. Al Gore says in his introduction that book “changed the course of history” because it led to the presidential commission on the environment (and the eventual ban of DDT).

Heinrichs, Jay. *Thank You for Arguing: What Aristotle, Lincoln, and Homer Simpson Can Teach Us about the Art of Persuasion*. New York: Three Rivers Press, 2007.

An excellent introduction to the components of argumentative techniques—includes modern, humorous examples to illustrate terms that students often find intimidating. The discussion of *ethos* is particularly strong. This text also has a detailed glossary of terms and a companion website.

Obama, Michelle. Speech, Democratic National Convention, Time Warner Arena, Charlotte, North Carolina, September 4, 2012. Accessed November 26, 2012. http://www.huffingtonpost.com/2012/09/04/michelle-obama-speech-text_n_1851947.html.

I selected this speech because it was current; it happened the night before in our city, and I wanted students to see that we could identify these strategies in any text on any day. Mrs. Obama’s speech is rich in rhetorical strategies, and it was praised by people on both sides of the political arena, making it a safer option during an election year.

Pollan, Michael. *The Omnivore's Dilemma: A Natural History of Four Meals*. New York: Penguin Press, 2006.

Pollan’s book about sustainable eating traces four different food chains from beginning to end. Inspired by what he calls the American paradox of a “notably unhealthy people obsessed by the idea of eating healthy,” Pollan tries to demystify the origins of our food.

Seuss. *The Lorax*. New York: Random House, 1971.

The classic children's text offers students an opportunity to practice their skills in analyzing *logos, pathos* and *ethos* as they work through layers of text complexity.

List of Materials for Classroom Use

Roskelly, Hephzibah, and David A. Jolliffe. *Everyday Use: Rhetoric at Work in Reading and Writing*. AP ed. New York: Pearson Longman, 2009.

This textbook is a standard in AP English Language and Composition classrooms. The emphasis is on purpose—how to read for the author's purpose and how to write with purpose.

Shea, Ren e Hausmann., Lawrence Scanlon, and Robin Dissin. Aufses. *The Language of Composition: Reading, Writing and Rhetoric*. Boston, MA: Bedford/St. Martin's, 2008.

Another standard text in the AP Language and Composition classroom, this text groups modern and classic readings by topics so that instructors can show students how different authors approach the same topic based on purpose and audience. The questions point students to issues of rhetorical and stylistic choice—not just basic comprehension.

Crusius, Timothy W., and Carolyn E. Channell. *The Aims of Argument: A Text and Reader*. Boston: McGraw-Hill, 2003.

This textbook offers an approach to teaching argument that focuses less on terminology and division than some traditional texts. The authors place their emphasis on revision and offer fresh reading material.

Appendix: Implementing Common Core Standards

As a district, we are transitioning to the Common Core National Standards. The Common Core standards as follows are not the only ones addressed by the unit but serve as the primary focus for activities presented here. Most of these standards are practiced daily in some form whether it takes place in or out of class. The parenthetical at the end of each standard denotes which section and number of standards I am addressing for those teachers that are familiar with the Common Core.

1. Students will cite strong and thorough textual evidence to support analysis of text. (RL 1) Text support is required throughout the activities.
2. Students will determine two or more themes or central ideas and discuss how they are developed throughout the text. (RL1/RI 2) Possible themes are listed in the student samples and include sustainability, food origins and the impact of genetic modification.

3. Students will examine and compare texts from various literary time periods and analyze their treatment of similar topics and themes. (RL 9) The texts suggested in the unit range from 1962 to 2012.
4. Students will determine the author's point of view and analyze the rhetoric for its effectiveness, paying close attention to how the style and content contribute to the text's power and beauty. (RI 6) The focus on rhetorical strategies and stylistic choices dominates the unit activities.
5. Students will integrate and evaluate multiple sources to help them address questions and solve problems. (RI 7) Students will explore the environmental issues through the variety of sources.
6. Students will write arguments to support claims in an analysis of substantive topics and texts, using valid reasoning and sufficient and relevant evidence. (W 1) The final activity requires students to write an essay explaining how style and rhetoric impact an author's purpose. Because different students might identify different purposes in the same passage, the assignment is argumentative in that the student is defending a point.
7. Write informative/explanatory texts to examine and convey complex ideas. (W 2) The final activity requires students to write an essay *explaining* how style and rhetoric impact an author's purpose.
8. Initiate and participate effectively in a broad range of collaborative discussions with diverse partners, building on others' ideas and clearly and persuasively expressing their own. (SL 1) Activities require students to work together on analysis.

Notes

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[1] Kathleen M. Puhr, *AP English Language and Composition Teacher's Guide* (New York: College Board, 2007), 1, accessed October 6, 2012, http://apcentral.collegeboard.com /apc/members/repository/ap07_englang_teachersguide.pdf.
[2] Ren e Hausmann. Shea, Lawrence Scanlon, and Robin Dissin Aufses, *The Language of Composition: Reading, Writing and Rhetoric* (Boston, MA: Bedford/St. Martin's, 2008).
[3] "Student Grade Distributions," *The College Board, http://media.collegeboard.com /digitalServices/pdf/research/AP-Student-Score-Distributions-2011.pdf* (accessed September 24, 2012).
[4] "AP Examination Volume Changes (2001-2011)," *The College Board, http://media.collegeboard.com/ digitalServices/pdf/research/AP-Exam-Volume-Change-2011.pdf (*accessed September 24, 2012).
[5] "Charlotte Mecklenburg Schools Demographic Overview," *Charlotte Mecklenburg School System*, http://www.cms.k12.nc.us/cmsdepartments/StudentPlacement/ Pages/Charlotte-MecklenburgSchoolsDemographicOverview.aspx (accessed July 10, 2009).

[6] Jay Heinrichs, *Thank You for Arguing: What Aristotle, Lincoln, and Homer Simpson Can Teach Us about the Art of Persuasion* (New York: Three Rivers Press, 2007), 15.
[7] Hepzibah Roskelly, "What Do Students Need to Know About Rhetoric," in *Special Focus in English Language and Composition: Rhetoric* (New York: College Board, 2006), 7, accessed October 6, 2012, http://apcentral.collegeboard.com /apc/members/repository/ap06_englang_roskelly_50098.pdf.
[8] Ibid.
[9] Timothy W. Crusius and Carolyn E. Channell, *The Aims of Argument: A Text and Reader* (Boston: McGraw-Hill, 2003), 3.
[10] Ibid.
[11] Heinrichs, *Thank You for Arguing*, 15.
[12] Crusius and Channell, *The Aims of Argument,* 3.
[13] Shea, Scanlon and Aufses, *The Language of Composition,*1.
[14] Ibid.
[15] Crusius and Channell, *The Aims of Argument,* 3.
[16] Ibid.
[17] Hephzibah Roskelly and David A. Jolliffe, *Everyday Use: Rhetoric at Work in Reading and Writing*, AP ed. (New York: Pearson Longman, 2009), 3.
[18] Heinrichs, *Thank You for Arguing*, 15.
[19] Crusius and Channell, *The Aims of Argument,* 3.
[20] Shea, Scanlon and Aufses, *The Language of Composition,*1.
[21] Heinrichs, *Thank You for Arguing*, 3.
[22] Roskelly and Jolliffe, *Everyday Use*, 4.
[23] Shea, Scanlon and Aufses, *The Language of Composition,*1.
[24] Ibid.
[25] Roskelly, "What Do Students Need," 7
[26] Ibid., 1.
[27] Roskelly and Jolliffe, *Everyday Use*, 6.
[28] Ibid.
[29] Shea, Scanlon and Aufses, *The Language of Composition,*4.
[30] Roskelly and Jolliffe, *Everyday Use*, 7.
[31] Shea, Scanlon and Aufses, *The Language of Composition,*4.
[32] Roskelly and Jolliffe, *Everyday Use*, 7.
[33] Roskelly, "What Do Students Need," 8.
[34] Ibid.
[35] Heinrichs, *Thank You for Arguing*, 292.
[36] Shea, Scanlon and Aufses, *The Language of Composition,*5.
[37] Ibid.
[38] Heinrichs, *Thank You for Arguing*, 292.
[39] Ibid., 293
[40] Ibid., 288
[41] Shea, Scanlon and Aufses, *The Language of Composition,*4.

[42] Ibid., 5.
[43] Heinrichs, *Thank You for Arguing*, 288.
[44] Ibid., 290.
[45] Shea, Scanlon and Aufses, *The Language of Composition,*7.
[46] Roskelly and Jolliffe, *Everyday Use*, 11.
[47] Ibid., 16.
[48] Roskelly, “What Do Students Need,” 11.
[49] Roskelly and Jolliffe, *Everyday Use*, 17.
[50] Roskelly, “What Do Students Need,” 12.
[51] Jeanne Fahnestock, *Rhetorical Figures in Science* (New York: Oxford Univ. Press, 2002), xii.
[52] Ibid.
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[54] Ibid.
[55] Lawrence Scanlon, "A Wealth of Arguments: Using Science Writing in AP English Language," *College Board, AP Central*, accessed November 26, 2012, http://apcentral.collegeboard.com/apc/ members/courses/teachers_corner/44269.html.
[56] Ibid.
[57] Ibid.
[58] Fahnestock, *Rhetorical Figures*, 4
[59] Ibid., 5.
[60] Ibid.
[61] Ibid.
[62] Ibid., 43.
[63] Ibid., xii.
[64] Ibid., 43.
[65] Ibid.
[66] Ibid.
[67] Ibid., ix.
[68] Ibid., viii.
[69] Scanlon, “A Wealth of Arguments.”
[70] Ibid.
[71] Ibid.
[72] Fahnestock, *Rhetorical Figures*, 43.
[73] Jeanne Fahnestock, "Arguing in Different Forums: The Bering Crossover Controversy," *Science, Technology & Human Values* 14, no. 1 (1989): 27, doi:10.1177/016224398901400103.
[74] Ibid., 26.
[75] Ibid., 27.
[76] Debika Shome and Sabrine Marx, "The Psychology of Climate Change Communication," *CRED Guide*, October 2009, 1, accessed November 26, 2012, http://guide.cred.columbia.edu/.

[77] Ibid.
[78] Ibid., 2.
[79] Ibid.
[80] Ibid., 16.
[81] Ibid., 18.
[82] Ibid., 3.
[83] Ibid., 6.
[84] Michelle Obama (speech, Democratic National Convention, Time Warner Arena, Charlotte, North Carolina, September 4, 2012), accessed November 26, 2012, http://www.huffingtonpost.com/2012/09/04/michelle-obama-speech-text_n_1851947.html.
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[87] Ibid.
[88] Ibid., 86.
[89] Ibid., 89.
[90] Ibid., 88.
[91] Ibid., 89.
[92] Ibid.
[93] Ibid.
[94] Ibid., 90.