**English Day 1:**

**“A Sound of Thunder”: Characterization & Persuasive Language**

**The Purpose of Advertisements – “A Beautiful Reverse”**

**OBJECTIVES:**

* After identifying their own opinions about time travel on a semantic web, students will predict whether there is a possible future industry for time travel in order to assess the believability of the protagonist’s characterization in “A Sound of Thunder,” as time travel holds an intense allure for Eckels.
* After discussing four categories of “interesting words,” students will identify, circle, and record jargon and unknown vocabulary in the first page of “A Sound of Thunder” on AlphaBoxes through the CAFE strategy, “Tune In to Interesting Words,” in order to become more aware of text language and self-monitor vocabulary comprehension during reading.
* After listening to the teacher read aloud the first page of Ray Bradbury’s “A Sound of Thunder,” students will analyze the language in the Time Safari, Inc. advertisement in order to design a flow chart comparing and contrasting the advertisement’s portrayal of the past and the present.
* After creating an anchor chart for the acronym PIE and discussing author’s purpose, students will analyze how the advertisement’s language is persuasive in order to infer the extent to which corporate propaganda plays a role in Eckels’s natural interest in time travel and apply two introduced terms – “propaganda” and “idealization” – to the role and effect of the advertisement.

**STANDARDS:**

**RL.9-10.1** Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text (ELA CCSS, p. 38).

**RL.9-10.4** Determine the meaning of words and phrases as they are used in the text, including figurative and connotative meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language evokes a sense of time and place; how it sets a formal or informal tone) (ELA CCSS, p. 38).

**L.9-10.3** Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening (ELA CCSS, p. 54).

**L.9-10.5** Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.

a. Interpret figures of speech (e.g., euphemism, oxymoron) in context and analyze their role in the text (ELA CCSS, p. 55).

**L.9-10.6** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression (ELA CCSS, p. 55).

**NCTE Standards:**

#3: Students apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts. They draw on their prior experience, their interactions with other readers and writers, their knowledge of word meaning and of other texts, their word identification strategies, and their understanding of textual features (e.g., sound–letter correspondence, sentence structure, context, graphics).

#6: Students apply knowledge of language structure, language conventions (e.g., spelling and punctuation), media techniques, figurative language, and genre to create, critique, and discuss print and nonprint texts.

**MATERIALS:**

* Smartboard or White Board
* Ray Bradbury’s “A Sound of Thunder” (photocopied packets)
* “Time Travel” Semantic Web Worksheet
* “A Beautiful Reverse” Flow Chart
* Author’s Purpose/Characterization Worksheet
* “Tune In to Interesting Words” Reference Sheet
* AlphaBoxes

**DESCRIPTION:**

In this introductory lesson to Ray Bradbury’s science fiction short story, “A Sound of Thunder,” students will evaluate their own opinions about time travel (text-to-self connections) through a pre-reading activity and then close read a section of the opening scene – the Time Safari, Inc. advertisement – to comprehend the nature and purpose of its persuasive language and its relationship to the protagonist’s characterization. Once students reflect on whether they would be interested in time travel if presented with the opportunity to do so through a semantic web, the teacher will conduct a whole-class discussion, polling the class to see whether the majority of students would be eager to time travel. The semantic web sets up later student analysis of whether Eckels’s characterization (i.e. he exhibits an intense interest in time travel by spending a huge sum to participate and memorizing the Time Safari, Inc. advertisement) is realistic. Before reading aloud the first page of “A Sound of Thunder,” the teacher will model the during-reading CAFE strategy, “Tune In to Interesting Words” by reading the first paragraph of the story and circling the word, “quaver.” After distributing a reference sheet identifying four types of “interesting words” (words you can’t pronounce, words you can’t define, jargon, and words you want to remember for your own writing) and discussing the categories, the teacher will explain the importance of the strategy (i.e. raises awareness of text language and helps you self-monitor your vocabulary comprehension, etc.) and explain how students will be practicing the strategy on every in-class and homework reading assignment during the unit, circling the words in-text and recording the words on “AlphaBoxes.” The teacher will then read-aloud the first page of “A Sound of Thunder,” pausing after several paragraphs to elicit the “interesting words” students circled and then continuing on uninterrupted so students have independent practice with the vocabulary strategy.

Through an “I do, We do, You do,” setup, students will break down the language, imagery, and text structure of the Time Safari, Inc advertisement through a flow chart graphic organizer. The four main ways that the advertisement refers to the present day are given in the right column, so the teacher will model how to refer back to the text to pull out the corresponding description of the past. After the teacher and students jointly work to fill in the second box, students will work in pairs to complete the remaining two boxes. The teacher will then introduce the acronym PIE for author’s purpose, explaining that authors write for a reason. After contemplating the purpose of marketing campaigns (the “P” in PIE), students will answer several short response questions independently that prompt them to apply the term “idealize” to Eckels’s positive attitude toward the dinosaur safaris, assess the role of the advertisement’s persuasive language on that positive attitude through the term, “propaganda,” and predict whether the advertisement accurately describes the past. At the end of class, the teacher will introduce the Venn Diagram Word Wall and the daily “exit ticket” dice roll that is associated with it and the AlphaBoxes.

\* “Idealize,” “Propaganda,” and “Author’s Purpose” will be added to the English section of the Venn Diagram Word Wall.

**ASSESSMENT OF STUDENT LEARNING:**  Informal formative assessments will occur throughout the lesson in the form of discussion input, during-reading vocabulary identification (visible by circled words and AlphaBoxes), completion of semantic web, and level of engagement during group work and independent practice. To scan student work, the teacher will circle when students are working on the flow chart and comprehension questions. The comprehension questions after the flow chart serve as the lesson’s formal assessment. The teacher will collect them at the end of class. The questions assess student ability to apply new vocabulary words, understand the purpose of the advertisements, make text-based predictions, and integrate multiple sources of information (i.e. the ad’s persuasive language and their own self-perceptions of time travel) to arrive at an inferred conclusion about the protagonist’s characterization. The daily exit ticket Word Wall dice roll at the end of every lesson will integrate an informal vocabulary assessment into every lesson.

**RATIONALE:**

Ideally, the two short stories in this interdisciplinary unit – beginning with Bradbury’s “A Sound of Thunder” – would actually be the conclusion of the standard 10th grade English short story unit that includes classic works like Guy de Maupassant’s “The Necklace” and W.W. Jacobs’s “The Monkey’s Paw.” So, it’s an interdisciplinary unit embedded within an English-specific unit to adhere to curriculum constraints. Although Bradbury’s science fiction story is usually taught at the middle school level – and is, therefore, a below grade-level text for 10th grade – it precedes the more advanced piece of Gothic fiction, Joy Williams’s “The Girls,” to serve as scaffolding. To elevate it to the high school level – and justify its integration into this unit – “A Sound of Thunder” is paired with grade-level supplemental texts throughout the unit (i.e. a nonfiction article) and advanced vocabulary – like idealization and disillusionment – to elevate the text’s plot elements and characterization. Semantic webs are the overarching pre-reading activity for both the English and science sections of this unit because they provide students with a free-form graphic organizer on which they can activate their prior knowledge, whether it be on general topics or scientific concepts. The open-endedness of semantic web prompts (which are usually a one-to-two word topics presented in a center circle) heightens the chance that the activity will extract all the unique, varied ideas individuals bring to a text.

Students will look at author’s purpose and persuasive language in both their English and science classrooms during this unit, making them two of the main cross-curricular learning objectives. Therefore, analyzing the Time Safari, Inc. advertisement in terms of its role as propaganda launches the English classroom’s work with persuasive writing and begins the cross-curricular scaffolding to students’ persuasive final research letter in science class. Additionally, with the Time Safari Inc. advertisement not only an integral part of the opening scene, but an important feature of Eckels’s characterization, ensuring that students comprehend its dense, metaphoric content and long syntax is essential.

The abundance of vocabulary activities – like the “Tune In to Interesting Words” strategy, the AlphaBoxes, and the Venn Diagram Word Wall - exists because vocabulary is one of the primary components of literacy for both content areas. Just as vocabulary knowledge accounts for as much as 80% of reading comprehension – making a case for vocabulary instruction in the English classroom – one of the main ways scientific language differs from everyday language is in its vocabulary – making a case for vocabulary instruction’s heavy presence in the science classroom (Parkinson, 2000, p 370). Therefore, varied but consistent vocabulary instruction is one of the most integral components of this unit as a whole.

**PROFESSIONAL REFERENCES:**

Boushey, G. & Moser, J. (2009). Ready reference form: Strategy – Tune in to interesting words and use new vocabulary in speaking and writing. In The CAFE book: Engaging all students in daily literacy assessment & instruction (p. 185). Portland, ME: Stenhouse Publishers.

Parkinson, J. (2000). Acquiring scientific literacy through content and genre: A Theme-based language course for science students. *English for Specific Purposes, 19*(4),369-387.

**English Day 2:**

**“A Sound of Thunder”: Setting Visualization & Prediction-Making**

**Accountability – Time Safari, Inc.’s Safety Features**

**OBJECTIVES:**

* After brainstorming various real-life, societal safety features (i.e. band-aids, seatbelts, vaccines, etc.) on a semantic web, students will discuss the consistency of their effectiveness in order to apply the same critical stance to Time Safari, Inc.’s time travel safety features and precautionary measures.
* After brainstorming words with the Latin prefix, “anti,” on a graphic organizer, students will deduce the specific meaning of the Latin element by analyzing how a root word’s meaning changes once the prefix is added in order to predict what the Path – made of an “antigravity metal” – will look like in various visual adaptations of the short story.
* After viewing the safety features of Time Safari, Inc. in a graphic novel and movie adaptation of the short story, students will compare and contrast their predictions about the Path’s appearance to the adaptations’ portrayals in order to sketch the setting.
* After identifying the gaps in real-life safety measures through a semantic web and pre-reading discussion, students will analyze the safety features that Time Safari, Inc. implements on its dinosaur hunts in order to predict possible design flaws and present an improvement to the original design in a writing activity.

**STANDARDS:**

**RL.9-10.1** Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text (ELA CCSS, p. 38).

**RL.9-10.7** Analyze the representation of a subject or a key scene in two different artistic mediums, including what is emphasized or absent in each treatment (e.g., Auden’s “Musée des Beaux Arts” and Breughel’s *Landscape with the Fall of* *Icarus*) (ELA CCSS p. 38).

**W.9-10.1** Write arguments to support claims with clear reasons and relevant evidence.

a. Introduce claim(s) and organize the reasons and evidence clearly.

b. Support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text (ELA CCSS, p. 42).

**W.9-10.9** Draw evidence from literary or informational texts to support analysis,

reflection, and research.

a. Apply *grades 9–10 Reading standards* to literature (e.g., “Analyze how an author draws on and transforms source material in a specific work [e.g., how Shakespeare treats a theme or topic from Ovid or the Bible or how a later author draws on a play by Shakespeare]”) (ELA CCSS, p. 47).

**SL. 9-10.1** Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grades 9–10 topics, texts, and issues,* building on others’ ideas and expressing their own clearly and persuasively.

a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas (ELA CCSS, p. 50).

**NCTE Standards:**

**#1:** Students read a wide range of print and nonprint texts to build an understanding of texts, of themselves, and of the cultures of the United States and the world; to acquire new information; to respond to the needs and demands of society and the workplace; and for personal fulfillment. Among these texts are fiction and nonfiction, classic and contemporary works.

**#3:** Students apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts. They draw on their prior experience, their interactions with other readers and writers, their knowledge of word meaning and of other texts, their word identification strategies, and their understanding of textual features (e.g., sound–letter correspondence, sentence structure, context, graphics).

**MATERIALS:**

* Smartboard
* YouTube Video Clip: “A Sound of Thunder (2005) – Trailer” (0:25-0:57)
* Richard Corben’s 2003 “A Sound of Thunder” Graphic Novel Excerpt (2 Pages)
* Ray Bradbury’s “A Sound of Thunder” Packets
* “Society’s Safety Measure” Semantic Web
* Blank Computer Paper & Colored Pencils
* “Safety Features of Time Travel” Writing Activity Worksheet

**DESCRIPTION:**

Students will come to this lesson with pages 73-75 read for homework. This lesson prompts students to visualize the simultaneously prehistoric (i.e. jungle) and futuristic (i.e. antigravity Path) setting and think critically about the quality and fallibility of plot elements, specifically the safety features that Time Safari, Inc. implements (disallowing students to passively accept plot elements and encouraging them to be active thinkers as they read). To begin, students will brainstorm real-life safety measures that society implements, like seat belts, vaccines, guns, bullet-proof vests, and band-aids, on a semantic web. In a Think-Pair-Share activity, students will contemplate and discuss whether the safety features are consistently effective and guarantee safety, hopefully leading them to recognize the fallibility of our protection measures (i.e. vaccines are not an 100% guarantee against illness, seat belts do not always prevent fatal car accidents, etc). This will lead students to question the extent to which the safety features that Time Safari, Inc. implements on the dinosaur hunts will ensure a safe trip. In a writing activity, students will choose one of the Time Safari safety features (i.e. oxygen helmets, sterilization, antigravity Path, etc) to critique. In a well-developed paragraph, students will hypothesize ways in which their chosen safety feature could fail and design an improvement on the original (i.e. a railing on the antigravity Path, etc.). So that students gain an understanding of what is expected of them, the teacher will model the task by offering the idea of a safari simulation similar to space simulations that astronauts receive. Prior to writing, the teacher will hold a brief class discussion about accountability and why Time Safari, Inc. designed the safety features in the first place. Volunteers will share their creative improvements. By framing this writing activity in light of real-life statistics of safety fallibility, students will hopefully be able to make text-to-world connections.

Before students engage in this writing activity, however, they will be introduced to the Latin element, “anti” in a mini-lesson. After brainstorming words with the prefix on a graphic organizer and deducing the specific meaning of the element based on how it changes the meaning of the root words, students will predict the appearance of the Path due to its “antigravity metal” material. Then students will watch a section from the 2005 movie trailer for *A Sound of Thunder* (a loosely based cinematic adaptation of Bradbury’s short story) and look at two pages from a graphic novel adaptation. The video and graphic novel capture the oxygen helmets and body suits of the men, as well as the anti-gravity Path. Therefore, it will help students visualize the foreign setting. After watching the video, students will quickly sketch the setting on a blank sheet of computer paper, reinforcing how it operates as a safety feature and a component of the setting.

**ASSESSMENT OF STUDENT LEARNING:**  Informal formative assessments will occur throughout the lesson in the form of discussion comments and input, verbalized predictions about the Path, the sketch of antigravity Path, and the oral sharing of safety feature improvements. The safety feature writing activity serves as the formal means of assessment, testing whether students can think critically about plot elements, make predictions, and create an improved safety feature that is well-supported and well-planned.

**RATIONALE:**

Because Hamdan, Vengadasamy, Hashim, & Yusof (2010) found that “students have difficulties relating the works of science fiction to contemporary contexts” through teaching an interdisciplinary college course (p. 415), this lesson prompts text-to-world connections by preceding students’ textual critique of fantastical safety features with a pre-reading discussion of the occasional ineffectiveness of real-life safety features, like seat belts and flu vaccines. Therefore, the juxtaposition seeks to “train students to be perceptive to the connection between science fiction and real life issues,” a goal that emerged from the aforementioned college course (Hamdan et al., 2010, p. 415). Additionally, since the semantic web prompts students to think about the inadequacies of real-life safety features, students will be more receptive to the idea that the safety precautions that Time Safari, Inc. takes might also be fallible. Ideally, it will make them more willing to question the text. Therefore, they will be more able to “challenge and reconstruct the texts of the disciplines” (Moje, 2008, p. 100), pulling apart the plot elements to predict their weaknesses (“challenge”) and designing improvements that Time Safari could make on them (“reconstruct”). By having students think critically about the safety features of Time Safari, Inc., the teacher encourages engagement with the text and discourages passive reading habits. Hamdan et al. (2010) identified several reasons why college-level students struggled with science fiction. This lesson seeks to reduce two of the reasons for difficulty: “unfamiliar terms and concepts imagined by the writers” that made the text hard to follow and setting descriptions that were hard to envision (p. 418). By showing the video clip from the *A Sound of Thunder* trailer and using a graphic novel excerpt, the lesson provides visuals for the short story’s jungle setting and the main “unfamiliar term…imagined by the writer,” the antigravity Path.

Adding to the vocabulary activities and routines already established in the first lesson, a mini-lesson on a Greek or Latin element immediately relevant to the short stories or unit themes will be present throughout this interdisciplinary unit in each discipline. Aiding student word knowledge by explicitly teaching morphology through Greek and Latin elements is supported by many researchers (Kirby & Bowers, 2012; Boushey & Moser, 2009; Gore, 2010). By immediately grounding the Latin prefix “anti” in the text through the Path in “A Sound of Thunder,” the mini-lesson aligns with a key point that Boushy & Moser (2009) make in regards to word part instruction: “As quickly as possible we anchor the words into text…” (p. 187). Additionally, even though “anti” is a relatively well-known prefix and thus one that many students may already be familiar with, “explicit instruction is much more likely to result in extensive, accurate, and generalizable morphological awareness” and therefore should be integrated despite the fact that “many children develop considerable morphological awareness on their own” (Kirby & Bowers, 2012, p. 3).

**PROFESSIONAL REFERENCES:**

Boushey, G. & Moser, J. (2009). Ready reference form: Strategy – Use word parts to determine the meaning of words (compound words, prefixes, suffixes, origins, abbreviations, etc.). In The CAFE book: Engaging all students in daily literacy assessment & instruction (p. 187). Portland, ME: Stenhouse Publishers.

Hamdan, S. I., Vengadasamy, R., Hashim, R. S., & Yusof, N. M. (2010). Creating awareness of real life issues through science fiction. *Procedia Social and Behavioral Sciences, 18,* 415-419.

Moje, E. B. (2008). Foregrounding the disciplines in secondary literacy teaching and learning: A call for change. *Journal or Adolescent and Adult Literacy, 51*(2), 96-107.

Kirby, J. R., & Bowers, P. N. (2012). Morphology works. *What works? Research into Practice,* 1-4.

Gore, M. C. (2010). Key 15: Teach Greek and Latin morphemes. In Inclusion strategies for secondary classrooms: Keys for struggling learners (pp. 58-59). Thousand Oaks, CA: Corwin.

**English Day 3:**

**“A Sound of Thunder”: Interconnectedness & Chaos Theory**

**Paranoia or Possibility? – Mapping Travis’s Mouse Food Chain**

**OBJECTIVES:**

* After brainstorming ideas about food chains from what they learned in science class, students will diagram Travis’s hypothetical food chain on a flow chart in order to label the different trophic levels, construct a construction paper food chain, and discuss whether Travis presents an accurate food chain.
* After a text structure mini-lesson, students will identify sequence text structure “signal words” in Travis’s rant about the societal ramifications that can result from a disruption in a food chain in order to diagram the ripple effect on a flow chart graphic organizer.
* After discussing the definition of “chaos theory” and “interconnectedness,” students will apply the concepts to Travis’s speech about time travel’s potential consequences – as summarized in the two parallel flow charts – in order to discuss whether Travis’s theory is paranoia or a possibility.
* After rereading the text excerpt about Travis’s chaos theory for a second time, students will analyze Steve A. Prince’s linoleum cut painting, “I Pray that Generations…” by coloring in all the embedded faces within the main female subject in order to explain, in a writing activity, how the painting illustrates Travis’s point about the mouse and caveman.

**STANDARDS:**

**RL.9-10.1** Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text (ELA CCSS, p. 38).

**RL.9-10.2** Determine a theme or central idea of a text and analyze in detail its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text (ELA CCSS, p. 38).

**W.9-10.2** Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.

a. Introduce a topic; organize complex ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.

b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience’s knowledge of the topic (ELA CCSS, p. 45).

**W.9-10.9** Draw evidence from literary or informational texts to support analysis,reflection, and research.

a. Apply *grades 9–10 Reading standards* to literature (e.g., “Analyze how an author draws on and transforms source material in a specific work [e.g., how Shakespeare treats a theme or topic from Ovid or the Bible or how a later author draws on a play by Shakespeare]”) (ELA CCSS, p. 47).

**SL. 9-10.1** Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grades 9–10 topics, texts, and issues,* building on others’ ideas and expressing their own clearly and persuasively.

**NCTE Standards:**

**#3:** Students apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts. They draw on their prior experience, their interactions with other readers and writers, their knowledge of word meaning and of other texts, their word identification strategies, and their understanding of textual features (e.g., sound–letter correspondence, sentence structure, context, graphics).

**MATERIALS:**

* Construction paper strips
* Gluestick
* Markers
* “Food Chain” Semantic Web Worksheet
* Steve A. Prince’s Linoleum Cut Painting, “I Pray that Generations…”
* Flow Chart Graphic Organizer Worksheet
* “A Sound of Thunder” Packet
* SmartBoard

**DESCRIPTION:**

Focusing on how “chaos theory” is initially presented in “A Sound of Thunder” – which is as Travis’s foreshadowing rant about time travel’s potential consequences – this lesson aims to help students navigate text structure (“sequence”) and understand central themes and ideas in the short story, like interconnectedness and chaos theory. Because students will have already learned about food chains in science class and the text excerpt to be analyzed in the lesson revolves around a mouse-based food chain, students will first activate that prior science knowledge on a semantic web. After rereading Travis’s explanation of “chaos theory” aloud as a whole-class, students will identify the food chain Travis cites, mapping it out on a flow chart graphic organizer. Working in pairs, students will label each trophic level of the food chain (i.e. producer, tertiary consumer, etc). The teacher will caution the students to be careful in their classifications of the mouse and caveman (i.e. Is the mouse a primary or secondary consumer? Is the caveman a quaternary consumer or an apex predator?). Students will need to draw from their science knowledge to correctly identify the tropic levels and provide the rationale for their classifications in a whole-class, follow-up discussion. Students will also mark the level with the most biomass and energy with their choice of symbol (i.e. star, etc). To further the interdisciplinary connection, in a whole class activity, students will design a construction paper food chain for Travis’s example. In science class, they did a similar activity to learn the different biomes, constructing food chains (with a specific trophic level-color correspondence that will be upheld in the English classroom – yellow = producer, primary consumer = green, etc) in groups of four to map out the different species – and how they interact – in each biome. The construction paper food chain will be hung up on the English classroom wall.

After a text structure mini-lesson that provides students with “sequence” text structure “signal words,” students will highlight the signal words that appear in Travis’s rant when they read it for a second time. On a parallel flow chart beneath the food chain one, students will sequence the chain of socio-political events that could occur – according to Travis – because of a disruption in that food chain. To ensure students understand the relationship between the two flow charts, students will put a red “X” through the species in the food chain that Travis cites as the reason for the societal ripple effects. The teacher will introduce the concept of “chaos theory” and “interconnectedness.” After a discussion of them, they will be added to the “English” side of the English classroom’s Venn Diagram Word Wall (and the “food chain” label on the “Science” side will be moved into the middle of the word wall). Based on their new knowledge of chaos theory, students will vote whether they think Travis’s chaos theory is a possibility or paranoia. Lastly, students will analyze Steve A. Prince’s “I Pray that Generations…” by coloring in – with different colored pencils – the multiple faces embedded within the primary female subject. Students will then write an explanatory paragraph in which they describe how the painting is a visual summary of Travis’s point about the mouse (and similarly, the caveman) being representative of “families and families of mice.”

*Brief explanation of Venn Diagram Word Wall:* Both the English and science classroom will have a Venn Diagram on one of its bulletin boards, labeled as “English & Science Word Wall.” For both classrooms, the left side will be labeled, “Science,” and the right side will be labeled, “English.” Whenever students learn a new concept or term in English, they will add it to the “English” side of the Venn Diagram during “English” class. An identical process – but done on the science classroom’s word wall – would be carried out in the science classroom when new science words were learned. Prior to the unit’s implementation, the teachers will discuss the timing of each new word, so the teachers will know when to add the other discipline’s words to their Venn Diagram. Therefore, when students add a word in English class, it will “automatically” appear on the science word wall in the “English” side. So when terms previously taught in English class are mentioned in the science classroom, students will be able to move the word from the “English” side of the word wall, and place it into the middle of the Venn Diagram (and vice versa with science terminology in English class). Therefore, the Venn Diagram Word Wall ultimately tracks the connections between disciplines and acts as a concrete visual for how the disciplines overlap in key ideas and key vocabulary.

**ASSESSMENT OF STUDENT LEARNING:** Informal formative assessments will occur throughout the lesson in the form of discussion comments/input and volunteerism for oral reading and whole-class construction paper food chain construction. The teacher will be sweeping the room during the students’ completion of the flow chart worksheets, gauging individual progress and understanding of text structure. As the formal assessment for the lesson that will be collected at the end of class, students will write an explanation of how Steve A. Prince’s “I Pray that Generations…” acts as a visual summary of one of Travis’s key points.

**RATIONALE:**

As one of its primary benefits, an interdisciplinary unit enables the teachers in each discipline to make their content area-specific curriculum more meaningful by pulling in concepts and ideas students previously learned in the content area with which they are collaborating. By the time students come to the third lesson in the English classroom, they will have learned about food chains and trophic levels in their science classroom. Therefore, to better understand the food chain Travis presents in “A Sound of Thunder,” the English classroom capitalizes on those “ready-made hooks in prior knowledge” (Bull & Dupuis, 2014, p. 73). Because Travis uses a food chain to illustrate chaos theory, the English teacher can “activate and use the hooks” that students learned in science class to ground the speech (Bull & Dupuis, 2014, p. 77). By applying their scientific knowledge onto the short story, students realize that Travis’s food chain is accurate in its proposed predatory relationships, since they can label the trophic levels. According to Czerneda (2006), science fiction should be used to reinforce science not by having students pick out the flaws in the text’s science, but by showing students good examples of accurate science in science fiction texts (p. 39). By showing students the scientific accuracy of Travis’s food chain, the English teacher shows students that fiction can be a source of truth and information, an important understanding that will bridge the disciplines of science and English in general (Lightman & Goldstein, 2011; Kesler, 2012, p. 341). Analyzing the short story’s fictional food chain in this lesson also benefits the science classroom. Even though it is a fictional example of a food chain, Travis’s food chain provides students with another example that students can recall in the future to activate their knowledge of tropic levels. According to Bixler (2007), “fictitious examples provide entertaining and easy-to-understand scenarios” for students (p. 337), so the short story example may engage students more with the science concepts, and therefore actually act as a more memorable example than the real-life examples provided in science class.

**PROFESSIONAL REFERENCES:**

Bixler, A. (2007). Teaching evolution with the aid of science fiction. *The American Biology Teacher, 69*(6), 337-340.

Bull, K. B., & Dupuis, J. B. (2014). Nonfiction and interdisciplinary inquiry: Multimodal learning in English and biology. *The English Journal, 103*(3), 73-79.

Czerneda, J. E. (2006). Science fiction & scientific literacy. *The Science Teacher, 73*(2), 38-42.

Fisher, D., Brozo, W. G., Frey, N., & Ivey, G. (2011b). 42: Text structures. In *50 Instructional Routines to Develop Content Literacy* (2nd ed.) (pp. 126-128). Boston, MA: Pearson Education, Inc.

Kesler, T. (2012) Evoking the world of poetic nonfiction picture books. *Children’s Literature in Education. 43*, 338-354.

Lightman, A., & Goldestein, R. N. (2011). Bridging the two cultures: A conversation between Alan Lightman and Rebecca Newberger Goldstein. *World Literature Today, 85*(1). Retrieved from <http://www.worldliteraturetoday.org/2011/january/bridging-two-cultures-conversation-between-alan-lightman-and-rebecca-newberger#.UstLk_sliAY>

**English Day 4:**

**“A Sound of Thunder”: Nonfiction Twin Text**

**Is Eckels Really Coming Face-to-Face with the Dinosaur he Imagines?**

**OBJECTIVES:**

* After brainstorming ideas about *Tyrannosaurus rex* on a semantic web, students will interpret an *LA Times* article – “Fossils Suggest *T. rex* was, indeed, King of the Food Chain” – in order to take notes and paraphrase its information at predetermined stopping points through the reading strategy, CHoMP.
* While reading an *LA Times* article, students will apply what they learned in science class about “scavengers” and “apex predators” onto the text in order to discuss how the dinosaur’s place in the Cretaceous food chain relates to how Eckels’s envisions the Tyrant Lizard in “A Sound of Thunder.”

**STANDARDS:**

**RI.9-10** Determine a central idea of a text and analyze its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text (ELA CCSS, p. 40).

**RI.9-10.8** Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and fallacious reasoning (ELA CCSS, p. 40).

**L.9-10.6** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression (ELA CCSS, p. 55).

**SL. 9-10.1** Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grades 9–10 topics, texts, and issues,* building on others’ ideas and expressing their own clearly and persuasively.

**NCTE Standards:**

**#3:** Students apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts. They draw on their prior experience, their interactions with other readers and writers, their knowledge of word meaning and of other texts, their word identification strategies, and their understanding of textual features (e.g., sound–letter correspondence, sentence structure, context, graphics).

**MATERIALS:**

* “A Sound of Thunder” Packet
* Melissa Pandika’s *Los Angeles Times* article, “Fossils suggest, T-rex was, indeed, king of the food chain.”
* Highlighters
* “T. rex” Semantic Web
* Smartboard / White board
* “CHoMP” Anchor Chart

**DESCRIPTION:**

This lesson connects the featured dinosaur in Bradbury’s “A Sound of Thunder” with students’ knowledge of food chain trophic levels – specifically the “scavenger” and “apex predator” levels – that they learned in science class previously. Since the role of *T. rex* in the food chain has been widely debated by paleontologists and Excels’s imagines this great beast, Excels’s vision may be flawed if the *T.rex* was a scavenger and didn’t hunt its prey. Students will first brainstorm ideas about the *T. rex* on a semantic web, and the teacher will elicit definitions for the key science terminology that will benefit students as they read: “scavenger” and “apex predator.” Students will be encouraged to bring their Four-Square Vocabulary Cards to both classes, so the teacher will prompt students to pull out their cards for those two terms and compare and contrast their illustrations with a partner (i.e. “Pair up and look at how someone else chose to visually represent these trophic levels”). After activating the necessary background knowledge, the teacher then introduced the article, established its purpose (i.e. to determine whether the T-rex's "incredible monster" classification by Eckels is an overestimation or a spot-on label based on the dinosaur’s real-life place in the food chain), and modeled the during-reading strategy that would be used to understand and break down the article (and all future popular science articles in either discipline during this interdisciplinary unit).

The teacher will distribute highlighters, the article, and a CHoMP anchor chart worksheet. The anchor chart will be displayed on the SmartBoard to outline the basic components of the strategy. Then the teacher will model CHoMP on the first two paragraphs of the article, reading the text aloud, then crossing out the small words, highlighting the important information, making notes using symbols and pictures, and paraphrasing the notes into original, complete sentences. During the think-aloud, the teacher will explain how the strategy helps reading comprehension and, since it will be necessary in students’ final research projects for science, how it would help students’ integrate the information into their own writing without plagiarizing. The teacher will guide students through the next two paragraphs in the next “We do” section of the lesson, eliciting student participation by having students come up to the board to practice the strategy steps on the SmartBoard and think-aloud for their peers. To finish up the article, several independent work periods should break up the read-aloud. Afterwards, students compiled their original sentences – the “P” step in CHoMP – onto a separate sheet of looseleaf paper to generate an immediate summary of the entire article. Then the teacher conducted a whole-class discussion to link the article’s information to Eckels’s expectations. The teacher will also inform students that they will be meeting the dinosaur in their homework reading that night, so they should keep the article’s information in mind when analyzing how Bradbury portrays the *T. rex.*

**ASSESSMENT OF STUDENT LEARNING:**  Informal formative assessments will occur throughout the lesson in the form of discussion input, text highlighting, student note-taking quality, and task engagement. By circling the room as students work on independently to practice CHoMP, the teacher will scan student work to assess their understanding of each stage of the strategy. For the lesson’s formal formative assessment, students will turn in their compiled paraphrased sentences (step “P” in CHoMP).

**RATIONALE:**

Using Melissa Pandika’s *Los Angeles Times* article, “Fossils suggest, T-rex was, indeed, king of the food chain,” as the nonfiction twin text, the pairing not only addresses the Common Core State Standards push for more “informational texts” in all disciplines (Bull & Dupuis, 2014, p. 76), but it also directly relates to what students are learning in their science class. Instead of a generic article on the *T. Rex,* this article teaches students about the dinosaur through the lens of its place in the food chain. Therefore, the English teacher uses students’ “ready-made hooks in prior knowledge” from science class without necessitating that students manipulate it extensively to see the connection (Bull & Dupuis, 2014, p. 73). With the article’s clear-cut debate on whether *T. rex* was a “scavenger” or “apex predator,” its central terms are directly pulled from students’ science class (evident by the fact that they will have Four-Square Vocabulary Cards for the terms). In addition to the Common Core’s push for fiction and nonfiction pairings in the English classroom, others have established the benefit of the juxtaposition through the idea of “twin texting” (Frye, Trathen, & Wilson, 2009). With this science article validating the “monster” and “Royal Majesty” labels used by Eckels and other Time Safari, Inc. members, the article shows how the short story, again, accurately portrays science even just in diction, which is a goal of English-science interdisciplinary instruction (Czerneda, 2006, p. 39). The article also prepares students for their homework reading by giving them a lens through which to read the dinosaur’s appearance before Eckels (i.e. Does the dinosaur threaten an attack on the travelers like a predator would?). Even though this *LA Times* article is not a scientific research article, Parkinson & Adendorff (2004) argue that students’ scientific literacy benefits from the “valuable addition” of popular science articles to their science class, since the articles are often more comprehensible, human-oriented, and accessible (p. 389). Lastly, the integration of “CHoMP” into both disciplines whenever students engage with a popular science article provides multiple opportunities to practice the strategy and acts as cross-curricular scaffolding to students’ independent reading of articles for their final research project in science class. Using CHoMP in the English classroom offers lower-risk practice that increases students’ “self-efficacy” in the task (Alverman, 2001, p. 6), so – ideally – students will perceive themselves to be capable of completing the task independently when they must do so for their final science projects.

**PROFESSIONAL REFERENCES:**

Alvermann, D. E. (2001). Effective literacy instruction for adolescents. *Executive Summary and Paper Committee.* Chicago, IL: National Reading Conference.

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**English Day 5:**

**“A Sound of Thunder”: The Role of Imagery & Characterization**

**The Effect of the T-rex on Eckels – “A Great Evil God” & “Fools”**

**OBJECTIVES:**

* After reading a *Los Angeles Times* article about T-rex predation in a previous lesson, students will identify which anticipation guide statements about the physical features of T-rex are “true” in order to compare/contrast the facts and predatory theory with Bradbury’s description and decide whether Bradbury’s portrait is realistic.
* After reading aloud Eckels’s reaction to the T-rex, students will compare and contrast Eckels attitude toward time travel before and after the dinosaur sighting in order to list adjectives – and supporting text details - on a T-chart that characterize Eckels at the beginning and end of the short story.
* After brainstorming words with the Latin prefix, “dis” on a graphic organizer, students will deduce the specific meaning of the Latin element by analyzing the change in meaning of root words when the prefix is added and omitted in order to discuss the meaning of “disillusionment” and apply it to Eckels’s character change.
* After applying the terms “dynamic character” and “disillusionment” to Eckels’s shift in attitude, students will identify, with a highlighter, the imagery in Bradbury’s description of the T-rex in order to rewrite several sentences that neutralize the T-rex description and to explain how the original demonizing imagery justifies Eckels’s attitude change and fear.

**STANDARDS:**

**RL.9-10.1** Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text (ELA CCSS, p. 38).

**RL.9-10.3** Analyze how complex characters (e.g., those with multiple or conflicting motivations) develop over the course of a text, interact with other characters, and advance the plot or develop the theme.

**RL.9-10.4** Determine the meaning of words and phrases as they are used in the text, including figurative and connotative meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language evokes a sense of time and place; how it sets a formal or informal tone).

**RI.9-10.2** Determine a central idea of a text and analyze its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text (ELA CCSS, p. 40).

**L.9-10. 3** Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening (ELA CCSS, p. 54).

**L.9-10.5** Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.

**L.9-10.6** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression (ELA CCSS, p. 55).

**NCTE Standards:**

**#3:** Students apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts. They draw on their prior experience, their interactions with other readers and writers, their knowledge of word meaning and of other texts, their word identification strategies, and their understanding of textual features (e.g., sound–letter correspondence, sentence structure, context, graphics).

**MATERIALS:**

* “A Sound of Thunder” Packet
* Eckels Characterization Compare/Contrast T-Chart Worksheet
* Anticipation Guide
* Highlighters
* Greek and Latin Element Graphic Organizer
* Smartboard / White board

**DESCRIPTION:**

In the previous day’s lesson, students read a *Los Angeles Times* article about current theories on T-rex predation that suggest it was at the top of its food chain as a predator, not scavenger. Not only does this article build a shared knowledge based about the dinosaur to impose upon the short story in class, but it provides a prehistoric food chain as another example of a food chain to aid students’ comprehension of that concept in their science class. To launch this lesson, students will evaluate the validity of several facts about the T-rex’s physical features through an anticipation guide. It will be discussed, and then students will synthesize the two sources – the anticipation guide and the *LA Times* article – to decide whether Bradbury’s portrait of the dinosaur is realistic and accurate. However, later on in the lesson, an analysis of the imagery’s function in the text will also be a means by which students determine if Eckels’s fight and panic are justifiable. Students will first reread Eckels’s reaction to the T-rex on pages aloud, and find text details to compile a T-chart that compares and contrasts his emotional state and attitude about time travel before and after his confrontation with the dinosaur. After summarizing Eckels’s change in attitude via adjectives and text details in the T-chart, students will apply the terms “dynamic character” and “disillusionment” onto the change. To scaffold students to the term, “disillusionment,” another Greek and Latin element mini-lesson will occur. Students will brainstorm words with the Latin prefix, “dis,” and deduce its specific meaning as they discuss the change in meaning of root words that the teacher writes on the board and adds the prefix to. Given the word “disillusionment” after a loose definition for “dis” has been established, students will guess its meaning in a Think-Pair-Share activity. Students will then apply the term to Eckels. The teacher will lead a brief discussion that reminds students of how the Time Safari, Inc. advertisement made Eckels “idealize” the past, prompting them to connect the ideas of “idealization” and “disillusionment.” Lastly, the teacher will read-aloud Bradbury’s description of the T-rex while students highlight stand-out words and phrases – imagery – as she reads. The teacher will write the five senses on the board prior to the read-aloud to guide students’ thinking about the imagery. In a short writing exercise, students will select several sentences from the description and rewrite them in a way that neutralizes the description of the T-rex. This will prompt a discussion about why the description uses demonizing imagery and figurative language (i.e. supports Eckel’s panic; if it had been presented in the neutral language of the student rewrites, would Eckels’s terror have been logical and believable?).

**ASSESSMENT OF STUDENT LEARNING:**  Informal formative assessments will occur throughout the lesson in the form of discussion input, text highlighting, Latin element brainstorming, and task engagement. By circling the room as students work on their adjective T-charts, the teacher will gauge their comprehension of the text’s characterization and their ability to identify strong, relevant, and supportive text details. The class discussions in this lesson will serve a key role in assessing student understanding, as they will reveal the extent to which students are able to link the idea of “idealization” with “disillusionment” and if they are able to understand the role of imagery in the T-rex descriptive paragraphs, linking its effectiveness to the ineffectiveness of their neutral rewrites).

**RATIONALE:**

The previous *LA Times* article and the anticipation guide in this lesson builds a nonfiction “shared knowledge base” beyond the science classroom – but in direct supplementation to the science classroom curriculum – that the students and teachers can draw from to discuss whether Bradbury’s T-rex is accurate (i.e. compare/contrast height measurements in anticipation guide to the text detail that the T-rex “towered thirty feet above half of the trees”). By providing these “funds of knowledge” that student can draw on (Miller, 2008, p. 449), class discussion will be based around language and ideas all students can recognize, evening out the differences in T-rex prior knowledge (better than just the semantic web activity in the previous lesson) that students bring to the English classroom on their own. Additionally, the key ideas of “idealization” and “disillusionment” will be later seen in students’ science class as a way to label society’s/man’s view of its/his place in the environment. Therefore, the fictional depiction of the concepts in Eckels scaffolds students to seeing the text-to-world connection: man often “idealizes” his place in the environment by placing himself at the top of the food chain, so he must be “disillusioned.” In addition to persuasion, one of the purposes for writing their science class final research letters will be to “disillusion” the polluters/poachers/deforesters, etc. by explaining to them the true consequences of their actions on a single species.

**PROFESSIONAL REFERENCES:**

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**English Day 6:**

**“A Sound of Thunder”: *The Simpsons* Parody, “Time and Punishment.”**

**Collaborative Creative Writing Project: “Chaos Theory” Short Story Blog**

**OBJECTIVES:**

* After reading Ray Bradbury’s “A Sound of Thunder,” students will apply their understanding of “chaos theory” and its role in the short story on *The Simpsons* parody, “Time and Punishment” in order to identify the episode’s cause/effect text structure on a graphic organizer.
* After reading “A Sound of Thunder” and watching *The Simpsons*’s “Time and Punishment,” students will contrast the characters’ (Homer and Eckels) ability to go back in time after their initial mistake in order to argue whether or not Eckels should have been murdered or allowed to time travel again in terms of which would have held Eckels more “accountable” for his misstep.
* After reading “A Sound of Thunder” and watching *The Simpsons*’s “Time and Punishment,” students will choose a short story genre, a character, a biome, and a keystone species in order to write their own “chaos theory” narrative through collaborative writing on an online blog.

**STANDARDS:**

**RL.9-10.9** Analyze how an author draws on and transforms source material in a specific work (e.g., how Shakespeare treats a theme or topic from Ovid or the Bible or how a later author draws on a play by Shakespeare) (ELA CCSS, p. 38).

**W.9-10. 3** Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences (ELA CCSS, p. 46).

a. Engage and orient the reader by setting out a problem, situation, or observation, establishing one or multiple point(s) of view, and introducing a narrator and/or characters; create a smooth progression of experiences or events.

b. Use narrative techniques, such as dialogue, pacing, description, reflection, and multiple plot lines, to develop experiences, events, and/or characters.

c. Use a variety of techniques to sequence events so that they build on one another to create a coherent whole.

d. Use precise words and phrases, telling details, and sensory language to convey a vivid picture of the experiences, events, setting, and/or characters.

e. Provide a conclusion that follows from and reflects on what is experienced, observed, or resolved over the course of the narrative.

**W.9-10.4** Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience (ELA CCSS, p. 46).

**W.9-10.6** Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology’s capacity to link to other information and to display information flexibly and dynamically (ELA CCSS, p. 46).

**L.9-10.6** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression (ELA CCSS, p. 55).

**SL.9-10.1** Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grades 9-10 topics,* *texts, and issues,* building on others’ ideas and expressing their own clearly and persuasively.

**NCTE Standards:**

**#3**: Students apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts. They draw on their prior experience, their interactions with other readers and writers, their knowledge of word meaning and of other texts, their word identification strategies, and their understanding of textual features (e.g., sound–letter correspondence, sentence structure, context, graphics).

**#5:** Students employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes.

**MATERIALS:**

* “A Sound of Thunder” packet (for reference if necessary)
* *The Simpsons* Season 6 DVD: “Treehouse of Horror V: Time and Punishment” Episode
* Smartboard/DVD player
* “Time and Punishment” Cause & Effect Graphic Organizer
* “A Sound of Thunder: Fair or Unfair?” Writing Activity Worksheet
* Project Requirement Sheet: Collaborative Creative Writing Project – Blog

**DESCRIPTION:**

The teacher will lead a discussion on the conclusion of “A Sound of Thunder,” eliciting student thoughts on the gunshot and the butterfly-induced dictatorship in comparison to the “chaos theory” Travis theorizes. To wrap up Ray Bradbury’s short story, “A Sound of Thunder,” students will watch *The Simpsons* parody in a Season 6 episode: “Treehouse of Horror V – Time and Punishment.” As one of three short parodies in this episode, “Time and Punishment” is only a seven minute clip. Even with the need to introduce and explain the collaborative writing project during this lesson, the episode’s short duration will allow time to discuss the video afterwards. The episode casts Homer Simpson as Eckels. So when he travels back in time through a malfunctioning toaster, his minimal disruption (although they soon become significant disruptions as he grows desperate in his efforts to fix his initial mistake) of the past leads to catastrophic consequences when he transports back to present day. With six cause and effect interactions between the past and the present-day in the episode, students will track this text structure on a graphic organizer as they watch the episode. The graphic organizer prompts them to identify the cause/effect relationship most reminiscent of the one in “A Sound of Thunder.” A semantic web will activate students’ prior knowledge about *The Simpsons* before the viewing. The teacher will lead a discussion afterwards, eliciting personal responses to the episode (i.e. whether they liked it; what they didn’t like about it, if they liked it better than Bradbury’s short story, etc) and explanations of how well it captures “chaos theory” and adheres to its allusion to “A Sound of Thunder.” To synthesize the two texts more concretely, students will argue whether Eckels, at the end of the short story, should have been able to return to the past to try to fix his mistake based on the fact that Homer was able to do this in the parody. Students will be encouraged to think in terms of “accountability,” a key term introduced when discussing Time Safari, Inc. safety features in a previous lesson (i.e. Would a second chance in the past been a better way to hold Eckels accountable than Travis’s murderous “sound of thunder”?).

After discussing the episode, the teacher will introduce a cumulative and cross-curricular writing project inspired by what *The Simpsons* did in “Time and Punishment.” In groups of four, students will choose a short story genre (from any of the genres studied in the English short story unit – which is the unit Bradbury and Williams actually conclude), a biome, a character (from any of the short stories read) and a keystone species (which they will devise a way to kill off) for their own “chaos theory” narrative. Students will receive an assignment sheet that lays out the requirements. After the requirements are discussed, students will receive any free time at the end of class to start planning with their groups. As a five day, out-of-class assignment, students will collaboratively write an exposition that consists of an introduction to the chosen keystone species, a description of its niche, and an “inciting incident,” which is the death of a species member. Students should be able to accomplish this opening writing section after *The Simpsons* video and in the remaining time after the next day’s lesson. It will be uploaded to a class blog. From there, students will be assigned two nights over the next five days (a table is provided on the assignment sheet to facilitate this) to add new paragraphs to the story. In other words, every night, one or two students will be logging into the blog, reading their group members’ additions and building upon the ideas and plot with several new paragraphs. Therefore, the body of the short story is collaborative, but not in the same way as the introduction. For their paragraph additions, the plot must portray the “chaos theory” in some way and students are confined to the traits of the genre and biome they chose, but – as long as it is a logical development to the previous material – creativity and imagination is encouraged. Students must also integrate a character from a short story into their new story, placing them in new situations but having them act and react in accordance with their original personalities. These stories will be shared on Day 12 of this unit. However, the online format of the blog allows students to navigate other groups’ stories in real-time as they are being put together night-by-night. Therefore, if students got hooked on another group’s storyline, they would anticipate their nightly additions and log on to the blog when it is not their assigned homework night (although this ideal result is unlikely, it should still be an available option – just in case).

**ASSESSMENT OF STUDENT LEARNING:** Informal formative assessments will occur throughout the lesson in the form of discussion comments and input. The teacher will sweep the classroom during *The Simpsons* video to gauge the amount of students able to identify the cause/effect text structure, especially looking to see if students are able to identify that the mosquito/Flanders dictatorship is the cause/effect that most directly alludes to “A Sound of Thunder.” The writing activity is the formal formative assessment for the lesson, demonstrating student’s ability to synthesize the television episode with the short story through a key unit term, “accountability.” While students are working in their groups for the collaborative writing blog project, the teacher will be circling to assess the quality of groups’ ideas. The collaborative blog is the unit’s summative assessment, keeping in mind that the English section of this interdisciplinary unit is embedded within a larger short story unit.

**RATIONALE:**

Many interdisciplinary units in the research used classical science fiction exclusively, a flaw in design in terms of student engagement. Therefore, since Bradbury’s “A Sound of Thunder” is a classical short story, pairing it with *The Simpsons* television episode modernizes the storyline. Additionally, based on their experiences with an English-science college course, Hamdan, Vengadasamy, Hashim, & Yusof (2011) suggested that science fiction films be used as “texts to be studied” in addition to the science fiction short stories (p. 418). With the writing activity reminding students of the key unit term, “accountability,” for the second time in the English section, it scaffolds students to the application of the term to their science classroom discussions about man’s role in the environment as polluters, poachers, etc.

The collaborative writing final project integrates cross-curricular concepts (setting is a biome, “inciting incident” is the loss of a keystone species, etc) for realistic limitations to their otherwise creative “chaos theory” portrayals. Additionally, the requirement that they are also limited to a genre read and a character from any of the short story prompts students to demonstrate their knowledge of short story genre and one of the stories’ characterizations in an indirect way. Rather than having students directly describe a character read in a short story on a short-response test question, for example, they must “represent” their knowledge through their ability to integrate him/her believably into new contexts and situations. Assessing students’ ability to integrate short story themes (i.e. chaos theory) and characters and science concepts (i.e. biome, species) effectively, purposefully, and accurately into a new narrative as the means of assessing their overall short story and science comprehension embraces the “transformation of what counts as knowing” induced by the digital age (Miller, 2008, p. 442). With knowledge no longer being “absorbed” so student regurgitation of a “chaos theory” definition or character description on a test is an outdated means of assessment, the digital age allows students to “represent” and demonstrate their knowledge through performance tasks (Miller, 2008, p. 442), which is what the collaborative writing project seeks to become. The “asynchronous” format of the blog reduces the pressure of the online writing and also the quality of writing due to the allowance of reflection and planning time (Grisham & Wolsey, 2006).

To create individual responsibility for the group project, only the exposition is meant to be written together. The homework paragraphs are individual assessments of students’ ability to demonstrate their knowledge of genre, character, and biomes. However, even with the individual paragraphs, the blog still fosters a “community of practice,” as all members must synthesize their ideas and writing with their group’s from the same knowledge learned between their science and English classes (Grisham & Wolsey, 2006). Integrating the biome limitation and the keystone species catalyst brings in students’ science knowledge and allows them to write about science in a narrative form. Therefore, it is a cross-curricular reinforcement of biomes and keystone species because “writing about science concepts assists internalization of science content” (Plummer & Kuhlman, 2008, p. 103). The collaborative writing blog also deeply parallels the interdisciplinary writing activity used by Peterson, Rochwerger, Brigman, & Wood (2006) for reinforcement of physics content. The “chaos theory” blog also “stretch[es] their science writing beyond the traditional laboratory report” (p. 32) and follows the modeling of the creative writing activity through *The Simpsons* episode just like Peterson et al. (2008) used a didactic short story to model the writing expectations (p. 33). Peterson et al. (2008) found that students had extensive genre knowledge and voluntarily brought in storylines and characters from literary texts they’ve read, so making such requirements will not be infeasible for students (p. 35). Additionally, both Peterson et al. (2008) and Grishman & Wolsey (2006) found that writing for a peer audience was motivational. Therefore, each group’s short stories are available to be viewed by their classmates at any time during the process and in-class sharing gives the blog product a more formal peer audience.

**PROFESSIONAL REFERENCES:**

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**English Day 7:**

**“The Girls” – Characterization via Character Names**

**The Significance of “The Girls,” “Father Snow/Ice,” & “Mommy/Daddy”**

**OBJECTIVES:**

* After brainstorming ideas about family dynamics on a semantic web, students will analyze the character relationships in the first five pages of Joy Williams’s “The Girls” during a read-aloud in order to compare and contrast the fictional household to a traditional family and predict the future implications of the fictional family dysfunction.
* After predicting character personalities before-reading based on an out-of-context analysis of their names, students will identify and evaluate text details that characterize three characters – “the girls,” “Father Snow/Ice,” and “Mommy/Daddy” – in order to summarize the text details with character adjectives and explain how the characters names relate to their characterization on a matrix.
* Given the remaining time after finishing the introductory character analysis to Joy Williams “The Girls,” students will work with their short story blog groups in order to continue constructing the exposition and keystone species-based “inciting incident” of their collaborative story.

**STANDARDS:**

**RL.9-10.1** Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text (ELA CCSS, p. 38).

**RL.9.2** Determine a theme or central idea of a text and analyze in detail its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text (ELA CCSS, p. 38).

**RL.9-10.3** Analyze how complex characters (e.g., those with multiple or conflicting motivations) develop over the course of a text, interact with other characters, and advance the plot or develop the theme (ELA CCSS, p. 38).

**RL.9-10.4** Determine the meaning of words and phrases as they are used in the text, including figurative and connotative meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language evokes a sense of time and place; how it sets a formal or informal tone) (ELA CCSS, p. 38).

**L.9-10.6** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression (ELA CCSS, p. 55).

**W.9-10. 3** Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences (ELA CCSS, p. 46).

a. Engage and orient the reader by setting out a problem, situation, or observation, establishing one or multiple point(s) of view, and introducing a narrator and/or characters; create a smooth progression of experiences or events.

b. Use narrative techniques, such as dialogue, pacing, description, reflection, and multiple plot lines, to develop experiences, events, and/or characters.

c. Use a variety of techniques to sequence events so that they build on one another to create a coherent whole.

d. Use precise words and phrases, telling details, and sensory language to convey a vivid picture of the experiences, events, setting, and/or characters.

e. Provide a conclusion that follows from and reflects on what is experienced, observed, or resolved over the course of the narrative.

**W.9-10.4** Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience (ELA CCSS, p. 46).

**SL.9-10.1** Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grades 9-10 topics,* *texts, and issues,* building on others’ ideas and expressing their own clearly and persuasively.

**NCTE Standards:**

**#3:** Students apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts. They draw on their prior experience, their interactions with other readers and writers, their knowledge of word meaning and of other texts, their word identification strategies, and their understanding of textual features (e.g., sound–letter correspondence, sentence structure, context, graphics).

**MATERIALS:**

* “Family Dynamics” Semantic Web
* Joy Williams’s “The Girls”
* Character Name Worksheet
* Collaborative Creative Writing Blog Requirement Sheets

**DESCRIPTION:**

To introduce the concluding short story, Joy Williams’s “The Girls,” this lesson focuses on the character relationships set up in the opening pages of the text to tap into the unit theme of “interconnectedness.” The characters are meaningfully linked in the household, and their relationships are reflected, to varying extents, in their names. Students will brainstorm ideas about “family dynamics” on a semantic web. Then the teacher will review the CAFE strategy, “Tune In to Interesting Words,” the AlphaBoxes, and the key term, “interconnectedness” to set up the introductory read-aloud of the short story. Given a characterization matrix, students will predict the personalities of the short story’s three main characters – “the girls,” “Father Snow/Ice,” and “Mommy/Daddy” – based on just their names. In a Think-Pair-Share activity, students will share their inferences. Prompting the students to circle “interesting words” and focus on the character relationships during the read-aloud, the teacher will begin reading the first five pages, asking for student volunteers after the first page. During-reading questioning will persist throughout the read-aloud, prompting students to make predictions, demonstrate their literal comprehension of the plotline, discuss the characters, and share their “interesting words.” After the read-aloud, the teacher will model how to identify characterization text details for the three characters, summarize them with adjectives, and explain the connection between the text’s characterization and the character names by walking students through the steps for Father Snow/Ice. The teacher will review the components of characterization (i.e. narrator description, what the character does/says/thinks, etc.), putting them up on the white board for reference. They will guide students’ identification of characterization text details, giving them things to look for in the text. In a think-aloud, the teacher will show students how she goes back to the text to find descriptions of the priest and how she derives concise character traits from those prose passages. The teacher will encourage students to become involved in her modeling. Introducing the concept of “irony” to explain the relationship between Father Snow’s name and his characterization, the teacher will discuss with students how Father’s Snow name suggests a personality opposite of his true character traits by showing students how to compare/contrast the connotation of the name with the text characterization. The teacher will allow students to work in pairs for the next character, but will ask them to work independently on the third. After the completion of the matrix, the teacher will lead a discussion about how the label, “the girls,” and their namelessness illustrate the interconnectedness between the sisters and how the label, “Mommy/Daddy,” illustrate the unusually close relationship between the girls and their parents.

If there is remaining time at the end of the lesson, students will be given time to work on their blog short stories, because their expositions and “inciting incident” are meant to be written together, unlike the body and conclusion.

**ASSESSMENT OF STUDENT LEARNING:** Informal formative assessments will occur throughout the lesson in the form of discussion comments, vocabulary circling, and during-reading questioning. Students’ completion of the character matrix is the formal formative assessment in the lesson. The teacher will circle and sweep the room as students fill them in, gauging student comprehension by comparing and contrasting their ability to fill one section out in pairs and their ability to complete one independently.

**RATIONALE:**

Joy Williams’s “The Girls” provides another text to examine the interdisciplinary unit theme of “interconnectedness,” and the character names are important ways that the character relationships are reinforced. Analysis of the names expands students’ thinking about characterization. Discussing the character relationship from the start of the short story also sets them up to be discussed later on in terms of scientific concepts (i.e. symbiotic relationships, especially parasitism) and in terms of theme and an essential question (Is interconnectedness good or bad?).

**English Day 8:**

**“The Girls”: Nonfiction Twin Text for Characterization & Persuasive Writing**

**The Girls v. Arleen – “Invasive Species” Student Debate Part I**

**OBJECTIVES:**

* After brainstorming what they know about cats on a semantic web, students will analyze a *LiveScience* popular science article – “Staggering Stats: Cats Kill Billions of Animals Each Year” – in order to evaluate the accuracy of Arleen’s statistic and the portrayal of the girls’ cats in Williams’s short story.
* After brainstorming about catson a semantic web, students will interpret a *LiveScience* article about cat predation in order to take notes and paraphrase its information at predetermined stopping points through the reading strategy, CHoMP.
* After reading a *LiveScience* article and rereading the text excerpt in which Arleen accuses the girls’ cats of bird predation, students will apply what they learned in science class about “invasive species” in order to debate their peers about whether domestic outdoor cats are an “invasive species” from the perspective of the appropriate story character.

**STANDARDS:**

**RL.9-10.1** Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text (ELA CCSS, p. 38).

**RL.9-10.3** Analyze how complex characters (e.g., those with multiple or conflicting motivations) develop over the course of a text, interact with other characters, and advance the plot or develop the theme.

**RI.9-10.1** Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text (ELA CCSS, p. 39).

**RI.9-10.2** Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments (ELA CCSS, p. 39).

**W.9-10.1** Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

a.Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among claim(s), counterclaims, reasons, and evidence (ELA CCSS, p. 45).

**W.9-10.9** Draw evidence from literary or informational texts to support analysis,reflection, and research.

**L.9-10.6** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression (ELA CCSS, p. 55).

**SL. 9-10.1** Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grades 9–10 topics, texts, and issues,* building on others’ ideas and expressing their own clearly and persuasively (ELA CCSS, p. 50).

**SL.9-10.4** Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task (ELA CCSS, p. 50).

**NCTE Standards:**

**#3** Students apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts. They draw on their prior experience, their interactions with other readers and writers, their knowledge of word meaning and of other texts, their word identification strategies, and their understanding of textual features (e.g., sound–letter correspondence, sentence structure, context, graphics).

**#4:** Students adjust their use of spoken, written, and visual language (e.g., conventions, style, vocabulary) to communicate effectively with a variety of audiences and for different purposes.

**#12:** Students use spoken, written, and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion, and the exchange of information).

**MATERIALS:**

* “Cat” Semantic Web Worksheet
* *LiveScience* Popular Science Article: “Staggering Stats: Cats Kills Billions of Animals Each Year”
* Persuasive Writing Activity Worksheet
* SmartBoard / White Board
* CHoMP Anchor Charts
* Joy Williams’s “The Girls”

**DESCRIPTION:**

As the second nonfiction twin text lesson in the English section of this interdisciplinary unit, this lesson draws from students’ science knowledge – specifically the idea of “invasive species” and “food chains” – to reinforce characterization elements in Joy William’s short story (i.e. the man v. man conflict between Arleen and the girls) and to show the scientifically accurate portrayal of the girls’ cats in the fictional text. First, students will brainstorm ideas about cats on a semantic web and review their CHoMP anchor charts. Then, the teacher will read aloud the text excerpt in which Arleen accuses the girls’ cats of killing a mockingbird and cites a statistic about cat predation. Launching off that fictional portrait of a cat-bird food chain, the teacher will introduce the *LiveScience* popular science article, “Staggering Stats: Cats Kill Billions of Animals Each Year.” Continuing the English classroom’s work with CHoMP, students will perform the strategy at predetermined stopping points in the read-aloud of the article. Students will execute the steps independently each time, but the teacher will ask for student volunteers to read their “P” step before resuming the read-aloud. The teacher will also ask during-reading comprehension questions throughout the read-aloud to guide and check students’ understanding.

After reading, the teacher will lead a discussion prompting students to reflect upon the accuracy of the cats’ portrayal in the text. Then the teacher will introduce the persuasive writing activity and subsequent student debate. She will encourage students to take out their “invasive species” Four-Square Vocabulary Cards to recall the definition of “invasive species” that they learned in science class. Students will be randomly assigned a character – either Arleen and the girls – and they must construct an argument about whether domestic outdoor cats are an “invasive species” – a label some scientists have given the pets. Because each character has a stance that can be inferred from the text (i.e. Arleen would think the cats are an invasive species; the girls would adamantly deny that label on their beloved cats), the debate will reinforce the characterization and man v. man conflict between the characters. Students will argue from the perspective of their assigned character using their science background knowledge about “invasive species” and text details from the short story and the article. In a quick writing strategy mini-lesson to enhance students’ persuasive writing for the debate, students will manipulate neutral or weak words to strengthen their connotative meanings. The teacher will model the strategy by changing “plant” to “flower” and “weed.” She will also develop a word gradation from “nervous” to “terrified.” Students will practice on paint strips with “house” and “bright.” They will be required to use four “loaded words” in their paragraphs. Students will work in pairs to develop their arguments and then read them aloud at the end of class.

**ASSESSMENT OF STUDENT LEARNING:** Informal formative assessments will occur throughout the lesson in the form of discussion input and commentary, during-reading questioning, and CHoMP practice. The persuasive writing paragraph is the formal assessment, since the lesson strives to enable students to assume a character’s perspective on a science issue.

**RATIONALE:**

Using the *LiveScience* article not only addresses the Common Core State Standards push for more “informational texts” in all disciplines (Bull & Dupuis, 2014, p. 76), but it also directly relates to what students are learning in their science class. The short story actually brings up an issue debated in science: whether domestic outdoor cats are an “invasive species.” And injecting this debate into the context of the short story works well because two characters – Arleen and the girls – would assumedly take differing sides of that debate. Therefore, a student debate on the issue not only gets students to think critically about science issues and apply their knowledge of “invasive species,” but it also naturally reinforces the short story’s characterization and man v. man conflict through a real-world issue. The persuasive writing activity leads students to write about the science concept of “invasive species” in a unique, meaningful, and contextualized way, and writing about science concepts helps students’ internalization of science concepts (Plummer & Kuhlman, 2008, p. 103). Since students have already learned about “invasive species” and “food chains” in their science class before this English lesson, this English lesson capitalizes on the “ready-made hooks of prior knowledge” that the science classroom established for the English teacher to use and activate for her own content area-specific and cross-curricular purposes (Bull & Dupuis, 2014, p. 73). In addition to the Common Core’s push for fiction and nonfiction pairings in the English classroom, others have established the benefit of the juxtaposition through the idea of “twin texting” (Frye, Trathen, & Wilson, 2009). The article also validates the statistic that Arleen presents in the short story, so it allows students to see the accuracy of the short story’s portrayal of cat-bird interactions. Instead of using fiction to show students inaccurate science, fiction should be used as sources of scientific knowledge in interdisciplinary studies (Czerneda, 2006, p. 39). Even though this *ScienceLive* article is not a scientific research article, Parkinson & Adendorff (2004) argue that students’ scientific literacy benefits from the “valuable addition” of popular science articles to their science class, since the articles are often more comprehensible, human-oriented, and accessible (p. 389). Lastly, the integration of “CHoMP” into both disciplines whenever students engage with a popular science article provides multiple opportunities to practice the strategy and acts as cross-curricular scaffolding to students’ independent reading of articles for their final research project in science class. Using CHoMP in the science classroom offers lower-risk practice that increases students’ “self-efficacy” in the task (Alverman, 2001, p. 6), so – ideally – students will perceive themselves to be capable of completing the task independently when they must do so for their final science projects

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Parkinson, J., & Adendorff, R. (2004). The use of popular science articles in teaching science articles in teaching scientific literacy. *English for Specific Purposes, 23*(4), 379-396.

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**English Day 9:**

**“The Girls”: Nonfiction Twin Text for Characterization & Persuasive Writing**

**The Girls v. Arleen – “Invasive Species” Student Debate Part II**

**OBJECTIVES:**

* After reading a *LiveScience* article and rereading the text excerpt in which Arleen accuses the girls’ cats of bird predation in a previous lesson, students will apply what they learned in science class about “invasive species” in a writing activity in order to debate their peers about whether domestic outdoor cats are an “invasive species” from the perspective of the appropriate story character.
* After comparing and contrasting the connotative meanings of “loaded words” in a writing strategy mini-lesson, students will argue from the perspective of a story character in a persuasive writing activity in order to role-play in a debate that reinforces the scientific concept of “invasive species” and the short story’s man v. man conflict between the girls and Arleen.

**STANDARDS:**

**RL.9-10.1** Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text (ELA CCSS, p. 38).

**RL.9-10.3** Analyze how complex characters (e.g., those with multiple or conflicting motivations) develop over the course of a text, interact with other characters, and advance the plot or develop the theme.

**RI.9-10.1** Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text (ELA CCSS, p. 39).

**W.9-10.1** Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

a.Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among claim(s), counterclaims, reasons, and evidence (ELA CCSS, p. 45).

**W.9-10.9** Draw evidence from literary or informational texts to support analysis,reflection, and research.

**L.9-10.6** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression (ELA CCSS, p. 55).

**SL. 9-10.1** Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grades 9–10 topics, texts, and issues,* building on others’ ideas and expressing their own clearly and persuasively (ELA CCSS, p. 50).

**SL.9-10.4** Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task (ELA CCSS, p. 50).

**NCTE Standards:**

**#3** Students apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts. They draw on their prior experience, their interactions with other readers and writers, their knowledge of word meaning and of other texts, their word identification strategies, and their understanding of textual features (e.g., sound–letter correspondence, sentence structure, context, graphics).

**#4:** Students adjust their use of spoken, written, and visual language (e.g., conventions, style, vocabulary) to communicate effectively with a variety of audiences and for different purposes.

**#12:** Students use spoken, written, and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion, and the exchange of information).

**MATERIALS:**

* *LiveScience* Popular Science Article: “Staggering Stats: Cats Kills Billions of Animals Each Year”
* Persuasive Writing Activity Worksheet
* Paint Strips
* SmartBoard / White Board
* Joy Williams’s “The Girls”

**DESCRIPTION:**

As a continuation of the previous lesson, this class period serves to guide students’ persuasive writing with a writing strategy mini-lesson – “loaded words” – , offer more time for writing, and hold a closing, informal debate. Students will continue to argue from the perspective of their assigned character using their science background knowledge about “invasive species” and text details from the short story and the article. In a quick writing strategy mini-lesson to enhance students’ persuasive writing for the debate, students will manipulate neutral or weak words to strengthen their connotative meanings. The teacher will model the strategy by changing “plant” to “flower” and “weed.” She will also develop a word gradation from “nervous” to “terrified.” Students will practice on paint strips with “house” and “bright.” They will be required to use four “loaded words” in their paragraphs, circling them to identify them. Students will work in pairs to develop their arguments and then read them aloud at the end of class. All of the pairs who assumed the voice of Arleen will read first in order to get a sense of the collective argument and more easily compare and contrast the different takes.

**ASSESSMENT OF STUDENT LEARNING:** Informal formative assessments will occur throughout the lesson in the form of discussion input, the paint strips, the circled “loaded words” in their own writing, and task engagement. The persuasive writing paragraph is the formal assessment, since the lesson strives to enable students to assume a character’s perspective on a science issue.

**RATIONALE:**

Using the *LiveScience* article not only addresses the Common Core State Standards push for more “informational texts” in all disciplines (Bull & Dupuis, 2014, p. 76), but it also directly relates to what students are learning in their science class. The short story actually brings up an issue debated in science: whether domestic outdoor cats are an “invasive species.” And injecting this debate into the context of the short story works well because two characters – Arleen and the girls – would assumedly take differing sides of that debate. Therefore, a student debate on the issue not only gets students to think critically about science issues and apply their knowledge of “invasive species,” but it also naturally reinforces the short story’s characterization and man v. man conflict through a real-world issue. The persuasive writing activity leads students to write about the science concept of “invasive species” in a unique, meaningful, and contextualized way, and writing about science concepts helps students’ internalization of science concepts (Plummer & Kuhlman, 2008, p. 103). Since students have already learned about “invasive species” and “food chains” in their science class before this English lesson, this English lesson capitalizes on the “ready-made hooks of prior knowledge” that the science classroom established for the English teacher to use and activate for her own content area-specific and cross-curricular purposes (Bull & Dupuis, 2014, p. 73). In addition to the Common Core’s push for fiction and nonfiction pairings in the English classroom, others have established the benefit of the juxtaposition through the idea of “twin texting” (Frye, Trathen, & Wilson, 2009). The article also validates the statistic that Arleen presents in the short story, so it allows students to see the accuracy of the short story’s portrayal of cat-bird interactions. Instead of using fiction to show students inaccurate science, fiction should be used as sources of scientific knowledge in interdisciplinary studies (Czerneda, 2006, p. 39). Even though this *ScienceLive* article is not a scientific research article, Parkinson & Adendorff (2004) argue that students’ scientific literacy benefits from the “valuable addition” of popular science articles to their science class, since the articles are often more comprehensible, human-oriented, and accessible (p. 389).

**PROFESSIONAL REFERENCES:**

Bull, K. B., & Dupuis, J. B. (2014). Nonfiction and interdisciplinary inquiry: Multimodal learning in English and biology. *The English Journal, 103*(3), 73-79.

Czerneda, J. E. (2006). Science fiction & scientific literacy. *The Science Teacher, 73*(2), 38-42.

Frye, E. M., Trathen, W., & Wilson, K. (2009). Pirates in historical fiction and nonfiction: A twin-text unit of study. *Social Studies and the Young Learner, 21*(3), 15-16.

Parkinson, J., & Adendorff, R. (2004). The use of popular science articles in teaching science articles in teaching scientific literacy. *English for Specific Purposes, 23*(4), 379-396.

Plummer, D. M., & Kuhlman, W. (2008). Literacy and science connections in the classroom. *Reading Horizons, 48*(2), 95-110.

**English Day 10:**

**“The Girls”: Death Motif and Foil Characters**

**Individual Worth via Characters’ Reactions to Death-Related Events**

**OBJECTIVES:**

* After brainstorming about death on a semantic web, students will analyze, in a Jigsaw activity, the short story’s death motif through three characters’ reactions to the text’s death-related events in order to explain how their attitudes toward death reveal their beliefs in individual worth.
* After sharing their character analyses with their home groups, students will compare and contrast the three characters’ reactions to death in order to apply the term “foil characters” and explain its relevance to the character relationship between the girls and Father Snow.
* After rereading Father Snow’s speech about repentance, students will categorize the text details for Mommy/Daddy’s reactions to death in pairs based on whether they indicate a “heart” or “mind” reaction in order to discuss whether Mommy/Daddy’s recognize the individual worth in their hit-and-run victim.

**STANDARDS:**

**RL.9-10.1** Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text (ELA CCSS, p. 38).

**RL.9-10.2** Determine a theme or central idea of a text and analyze in detail its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text (ELA CCSS, p. 38).

**RL.9-10.3.** Analyze how complex characters (e.g., those with multiple or conflicting motivations) develop over the course of a text, interact with other characters, and advance the plot or develop the theme (ELA CCSS, p. 38).

**L.9-10.6** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression (ELA CCSS, p. 55).

**SL. 9-10.1** Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grades 9–10 topics, texts, and issues,* building on others’ ideas and expressing their own clearly and persuasively (ELA CCSS, p. 50).

**NCTE Standards:**

**#3:** Students apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts. They draw on their prior experience, their interactions with other readers and writers, their knowledge of word meaning and of other texts, their word identification strategies, and their understanding of textual features (e.g., sound–letter correspondence, sentence structure, context, graphics).

**MATERIALS:**

* Joy Williams’s “The Girls”
* “Death” Semantic Web
* Character Matrix
* Heart/Mind Repentance Graphic Organizer
* SmartBoard / White Board

**DESCRIPTION:**

In this lesson, students will explore the death motif in “The Girls” by examining multiple characters’ reactions to the death-related events in the text. Grounding the death motif in the characters will allow students to recognize possible reasons why death is so omnipresent in the short story. To begin, students will brainstorm their ideas on death in a semantic web. In a follow-up discussion, the teacher will elicit ideas on society’s reaction to and defenses against death and mortality (i.e. grief, funerals, etc.). The teacher will introduce the idea of a literary motif, differentiating it from a theme. On the SmartBoard or white board, the teacher will record the scenes in the short story that relate to death that they can come up with off the top of their head. The list will remain as a reference throughout the Jigsaw activity because it will direct students toward potential text details they can use to show characters’ reactions to death. Students will count off my threes to organize “home groups” and split up the three characters – Father Snow, Arleen, and the girls – among one another. Then, in their “expert groups,” students will scan the text for text details that illustrate their character’s reactions. Prior to splitting up into these “expert groups,” however, the teacher will model the activity by finding a text detail that pinpoints a character’s reaction and a text detail that pinpoints a death-related event to show students the difference (i.e. Death-related event: cat’s kill mockingbird; Character reaction: Mommy says it’s “awful” or the girls deny the action’s occurrence).

Once they identify three text details for their character, expert groups will answer a short response inference question about how the character’s reaction to death indicates their beliefs about individual worth. Then students will share their finding with their home groups. Before students discuss in their home groups, the teacher will introduce the idea of foil character and provide popular culture examples (i.e. Wicked Witch of the West and Glenda the Good Witch). After all group members share their findings, students will discuss how the idea of foil characters relates to Father Snow and the girls (i.e. In way are they opposites?). After the individual expert groups discuss foil characters, the teacher will conduct a whole-class discussion to elicit the group ideas. Then students will reread Father’s Snow repentance speech in the short story and, in an activity with their “expert groups” that is similar to a List-Group-Label activity, they will categorize the text details for Mommy/Daddy’s reaction to death in terms of how genuine they are in their remorse. The teacher will discuss with students what it might mean to “merely feel sorry” and not experience a change in “mind,” so that the categorization is easier. Students will classify the text details on a graphic organizer according to whether they indicate that the parents seek repentance on a heart or mind level (i.e. if more text details are compiled under the heart level, it indicates that the parents still do not recognize the individual worth of their hit-and-run victim). A discussion will conclude the lesson, reviewing the three characters’ stances on death and individual worth.

**ASSESSMENT OF STUDENT LEARNING:** Informal assessment will occur throughout the lesson in the form of task engagement, group productivity and participation, and discussion input. While students are in their home and expert groups, the teacher will circle and sweep the room, gauging student progress and engagement. The short response questions that require students to synthesize the ideas on their character matrix are the formal assessments.

**RATIONALE:**

In their English class, students have already looked at the key unit theme of individual worth through Travis’s chaos theory (which spawns from the death of a single mouse) and Eckels’s realization of its existence when he kills a single butterfly and changes the results of a future governmental election. This lesson continues this interesting pairing of death and individual worth by examining Joy Williams’s death motif in terms of how it reveals her character’s differing beliefs in individual worth. In the science section of this interdisciplinary unit, individual worth is also illuminated through death, specifically animal’s reactions to death, both fictional and real (i.e. Lenny in *Shark Tale* urges his brother not to kill a shrimp; elephants mourn their deceased relatives). The character analysis is split up into a Jigsaw activity to promote peer teaching, social learning, and cooperative development. This specific use of a Jigsaw resembles an approach Fisher, Brozo, Frey, & Ivery (2011) suggest: “A third approach divides a single reading into section, so that it can be fully understood only when each group member has had the opportunity to discuss his or her portion of the reading” (p. 46). Students must come together in their “expert groups” at the end to compare and contrast the characters and apply the key term, “foil characters,” to their analyses.

**PROFESSIONAL REFERENCES:**

Fisher, D., Brozo, W. G., Frey, N., & Ivey, G. (2011). 15: Jigsaw. In *50 Instructional Routines to Develop Content Literacy* (2nd ed.) (pp. 46-47). Boston, MA: Pearson Education, Inc.

**English Day 11:**

**“The Girls”: Analyzing Character Relationships via Symbiotic Relationship Classification – Mutualism, Parasitism, & Commensalism**

**OBJECTIVES:**

* After identifying their prior knowledge about symbiotic relationships from science class on a semantic web, students will list the effects of a parasite on its host in order to match text details describing the girls to the parasite trait they exhibit and the characterization method they portray.
* After rereading Father’s Snow speech on repentance from the preceding day’s lesson, students will brainstorm words with the Greek prefix, “meta,” in order to apply the definition provided by the short story onto the brainstormed words and, later, to predict the meaning of an animal “metaphor” in the text.
* After discussing how the author portrays the girls’ parasitism through multiple components of characterization, students will transfer that character relationship classification to the animal metaphor between the cats and the bloodsuckers in order to analyze how the cats’ relationship with the mockingbird also parallels a character relationship in the short story.
* After examining the girls and Mommy/Daddy’s parasitic relationship in the short story, students will analyze the purpose of Father Snow and Arleen in the household in order to classify the houseguest’s relationship with the parents as either mutualistic or commensalistic in a writing activity.

**STANDARDS:**

**RL.9-10.1** Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text (ELA CCSS, p. 38).

**RL.9-10.2** Determine a theme or central idea of a text and analyze in detail its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text (ELA CCSS, p. 38).

**RL.9-10.3.** Analyze how complex characters (e.g., those with multiple or conflicting motivations) develop over the course of a text, interact with other characters, and advance the plot or develop the theme (ELA CCSS, p. 38).

**L.9-10.6** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression (ELA CCSS, p. 55).

**SL. 9-10.1** Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grades 9–10 topics, texts, and issues,* building on others’ ideas and expressing their own clearly and persuasively (ELA CCSS, p. 50).

**NCTE Standards:**

**#3:** Students apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts. They draw on their prior experience, their interactions with other readers and writers, their knowledge of word meaning and of other texts, their word identification strategies, and their understanding of textual features (e.g., sound–letter correspondence, sentence structure, context, graphics).

**MATERIALS:**

* “Symbiotic Relationships” Semantic Web
* “The Girls’ Parasitism” Matching Worksheet
* Animal Metaphor Graphic Organizer
* Houseguest Writing Activity Worksheet
* SmartBoard / White Board

**DESCRIPTION:**

Students’ analysis of Joy Williams’s “The Girls” comes full circle in this concluding lesson because it looks at character relationships in terms of scientific classifications just as the introductory lesson looked at character relationships through character names. To begin, students will brainstorm their prior knowledge of symbiotic relationships. They will draw from what they have learned in the science section of this interdisciplinary unit, since they covered that material already. The teacher will prompt students to refer to their Four-Square Vocabulary Cards for parasitism, commensalism, and mutualism to brainstorm ideas. In a discussion of the science concept afterwards, the teacher will record students’ thoughts on a semantic web on the white board or SmartBoard. The teacher will then introduce the lesson, describing how students will be looking at character relationships and classifying them as parasitic, commensalistic, or mutualistic. As the first activity, students will reread Father Snow’s repentance speech analyzed in yesterday’s lesson, brainstorming other words with the Greek prefix “meta” on a graphic organizer. Students will then guess the meaning of the words by applying the definition of the Greek prefix as provided in the short story by Father Snow. While this mini-lesson reinforces the material from the last lesson, it will also come into play in this lesson when students predict the meaning of an animal “metaphor” in the short story (and “metaphor” is actually the example Father Snow provides in the text).

As the lesson’s first mini-activity to analyze character relationships, students will list the effects of parasites on their hosts (i.e. drain host’s resources, latch onto hosts, kill hosts, etc). Then the teacher will review the components of characterization and will write them on the board as students identify them (i.e. narrator description, what a character thinks/says/does, etc.). Students will then be given four quotes from the text that involve the girls. They will have to match each text detail to which parasite trait the girls exhibit in it and which characterization component the text detail portrays. The teacher will model the procedure before students work independently to label the text details. The teacher will then lead a discussion about how Williams’ uses multiple components of characterization to develop the girls’s parasitic relationships. Students will provide their opinions on the classification (i.e. Do you believe these text details prove that the girls relationship with their parents can be viewed as parasitic?). The teacher will then introduce the idea of an animal metaphor at work in the text, grounding it in the girls’ cats. Students will hypothesize what such means by identifying the animals the cats interact with. On a graphic organizer that iillustrates the animal food chain in the text with the appropriate energy transfer arrows – mockingbird to cat to “bloodsuckers” – students will explain which characters each species represents, starting by making the connection between the bloodsuckers and the girls (since they just looked at how the girls are parasite). The teacher will lead a discussion on how the cat and mockingbird represent Mommy/Daddy’s hit-and-run victim, ensuring that students realize that the girls’ denial of the cats’ accountability in the death of the mockingbird parallels how Mommy/Daddy never assumed accountability for their vehicular manslaughter. The teacher will also bring up *To Kill a Mockingbird* – because it is usually a 9th grade novel, so many students may be knowledgeable about its plotline – to see if students’ can come up with the symbolism of the mockingbird: innocence. To address all the character relationships in the short story, the lesson will conclude with an analysis of the houseguests and the Mommy/Daddy. The teacher will point out how these housegusts differ from past houseguests and then the teacher will reread several key scenes (i.e. Arleen’s journal; Father Snow’s repentance speech) to infer why the houseguests are actually there. Students will then explain the inferred relationship between Mommy/Daddy and Father Snow and Arleen in a writing activity. They will have to find text details that support their inferred relationship and more text details to argue whether the relationship is comensalistic or mutualistic (i.e. Does either houseguest benefit from the summer visit, too?).

**ASSESSMENT OF STUDENT LEARNING:** Informal formative assessments will occur throughout the lesson in the form of discussion input and commentary, semantic web brainstorming, text detail matching, and graphic organizer completion. The formal assessment occurs in the writing activity for the relationship between the houseguests and the parents. With two requirements – that students support their inference that the houseguests are there to help the parents through their guilt over the hit-and-run victim and that students classify the relationship through text details – the writing assignment necessitates that students use textual evidence to support their interpretations of the text and their application of scientific concepts onto the text.

**RATIONALE:**

To enhance students’ understanding of how characterization and character relationships operates within Joy Williams’s “The Girls,” this lesson capitalizes on students “ready-made hooks in prior knowledge” from their science classroom (Bull & Dupuis, 2014, p. 73). The biological interactions between species from science class provide the English classroom a unique – but relevant – lens to view the fictional character relationships in the short story, especially since the character relationships are even portrayed through animal symbiotic relationships at one point (i.e. when Arleen plucks the bloodsuckers off the girls’ cats). By bookending students’ analysis of “The Girls” with character analysis, the lesson format reinforces one of the main focuses for the reading was the unit theme of “interconnectedness.” Students study the character relationships in the text in multiple ways – through character names and scientific concepts – because the characters are meaningfully interconnectedness. And students will see that such interconnectedness is for better and for worse, since the short story does not present human connections are either entirely positive or entirely negative. Similar to two other mini-lessons in the English section and several in the science classroom, this lesson also integrates a relevant Greek or Latin element to develop students’ word knowledge and to help students’ better understand the short story.

**PROFESSIONAL REFERENCES:**

Bull, K. B., & Dupuis, J. B. (2014). Nonfiction and interdisciplinary inquiry: Multimodal learning in English and biology. *The English Journal, 103*(3), 73-79.

Kirby, J. R., & Bowers, P. N. (2012). Morphology works. *What works? Research into Practice,* 1-4.

Gore, M. C. (2010). Key 15: Teach Greek and Latin morphemes. In Inclusion strategies for secondary classrooms: Keys for struggling learners (pp. 58-59). Thousand Oaks, CA: Corwin.

Boushey, G. & Moser, J. (2009). Ready reference form: Strategy – Use word parts to determine the meaning of words (compound words, prefixes, suffixes, origins, abbreviations, etc.). In The CAFE book: Engaging all students in daily literacy assessment & instruction (p. 187). Portland, ME: Stenhouse Publishers.

**English Day 12:**

**“Portrait d’une Femme”: Diction, Allusion, and Character Relationships**

**Parasitism–How is Human Interconnectedness like the Sargasso Sea?**

**OBJECTIVES:**

* After activating their prior knowledge from science class about the Sargasso Sea on a semantic web, students will rate their level of vocabulary awareness for the nautical jargon in Ezra Pound’s “Portrait d’une Femme” in order to define the words using a dictionary and draw an illustration representing each definition.
* After defining and illustrating the poem’s nautical jargon, students will analyze and annotate “Portrait d’une Femme” in order to identify the “inputs” and “outputs” of the female protagonist’s human interactions and rewrite them in their own words on a graphic organizer.
* After reading Ezra Pound’s poem, “Portrait d’une Femme,” students will apply their knowledge of the Sargasso Sea onto the text’s character relationships in order to discuss how the pre-taught nautical diction extends the poem’s allusion and to explain, in writing, how the female’s interactions with others are cast as detrimental.

**STANDARDS:**

**RL.9-10.1** Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text (ELA CCSS, p. 38).

**RL.9-10.2** Determine a theme or central idea of a text and analyze in detail its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text (ELA CCSS, p. 38).

**RL.9-10.3.** Analyze how complex characters (e.g., those with multiple or conflicting motivations) develop over the course of a text, interact with other characters, and advance the plot or develop the theme (ELA CCSS, p. 38).

**RL.9-10.4** Determine the meaning of words and phrases as they are used in the text, including figurative and connotative meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language evokes a sense of time and place; how it sets a formal or informal tone) (ELA CCSS, p. 38).

**L.9-10.6** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression (ELA CCSS, p. 55).

**SL. 9-10.1** Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grades 9–10 topics, texts, and issues,* building on others’ ideas and expressing their own clearly and persuasively (ELA CCSS, p. 50).

**NCTE Standards:**

**#1:** Students read a wide range of print and nonprint texts to build an understanding of texts, of themselves, and of the cultures of the United States and the world; to acquire new information; to respond to the needs and demands of society and the workplace; and for personal fulfillment. Among these texts are fiction and nonfiction, classic and contemporary works.

#3: Students apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts. They draw on their prior experience, their interactions with other readers and writers, their knowledge of word meaning and of other texts, their word identification strategies, and their understanding of textual features (e.g., sound–letter correspondence, sentence structure, context, graphics).

**MATERIALS:**

* “Sargasso Sea” Semantic Web
* Input/Output Graphic Organizer
* SmartBoard or White Board
* Ezra Pound’s “Portrait d’une Femme”
* Nautical Jargon Worksheet
* Dictionaries

**DESCRIPTION:**

In this lesson, students will explore another text that presents the idea of human interconnectedness as parasitism, integrating another text form – poetry – to supplement the popular science articles and short stories in their exploration of one of the main interdisciplinary themes for the unit. Students will first brainstorm their prior knowledge about the Sargasso Sea, a oceanic phenomenon that students previously studied in science class. Students looked at the Sargasso Sea in science class as an example of an ecosystem harmed by man’s plastic pollution. The teacher will record some of the ideas on the White Board. Students will then be given a list of the jargon in Ezra Pound’s “Portrait d’une Femme.” Students will rate their vocabulary self-awareness according to three categories (addition sign = knows definition of word; subtraction sign = never seen the word before; check mark = familiar with the word (i.e. have seen or heard it before) but doesn’t know exact definition). Students will then pair up to look up the definitions in a dictionary. Once they record the definition on the chart, students will illustrate each vocabulary word. Students will share their illustrations will a partner. If the technology is available, the teacher will project some of the illustrations on the board for all students to see and discuss (i.e “How is this illustration representative of [nautical jargon]”?).

After pre-teaching the necessary Tier 3 jargon, the teacher will introduce the poem, emphasizing that the jargon just explored is diction used by Pound to extend the central allusion to the Sargasso Sea. The teacher will guide the students through the poem by reading it aloud once, and then going back line-by-line to annotate it and elicit student interpretations. After annotating, students will work in groups of two to list the “outputs” and “inputs” of the female protagonist in a T-chart with two columns: “Text Phrase” and “In Your Own Words.” The teacher will model the process by, for example, selecting the text phrase, “fact that leads nowhere,” for an output and translating it to her words, “useless trivia.” The teacher will pull out another text phrase and in a Think-Pair-Share activity, prompt students to translate it. Then students will work in pairs to identify and translate the rest. Students will share their answers in a whole-class discussion afterwards. Lastly, students will explain why this input/output process is detrimental in terms of the woman being linked to the Sargasso Sea (i.e. the useless objects and ideas that other’s give to her get trapped in her – i.e. ocean currents keep the garbage in the Sargasso Sea - and fill her up with nothing but useless items). The students will record their explanation in the center of the input/output graphic organizer.

**ASSESSMENT OF STUDENT LEARNING:**  Informal assessments will occur throughout the lesson in the form of discussion input, “input”/”output” T-chart completion, during-reading annotations, dictionary proficiency, illustration creativeness and accuracy, and brainstormed ideas for the semantic web activity. The formal assessment occurs when students synthesize the Sargasso Sea allusion with the poem’s last lines about how the female protagonist is “nothing that’s quite [her] own” – which will prompt the student to see how the poem presents the character relationships as parasitism.

**RATIONALE:**

Poetry is used to reinforce the interdisciplinary theme of interconnectedness (and individual worth through analysis of specific lines that imply hierarchical, uneven value among people – “Great minds have sought you – lacking someone else. You have been second always”) because it was one of the most praised mediums for teaching science content from an English perspective in the theories between science and literature’s interdisciplinary potential but the most underused in practice. Pound’s poem accurately alludes to the Sargasso Sea to present a metaphorically garbage-filled woman, so its use allows the English classroom to use and activate students “ready-made hooks of prior knowledge” built by their science class (Bull & Dupuis, 2014, p. 73) and shows students that Pound uses the science accurately, an important thing for students to see in an interdisciplinary unit between these two disciplines (Czerneda, 2006, p. 39). Pound even uses an allusion to science in the way Sundaralingam (2011) presented as a high-quality synthesis between English and science: to “reenvision scientific data with fresh metaphors.” Pre-teaching vocabulary is a strategy recommended for literacy instruction in general (Gore, 2010b, p. 112); however, it is also a strategy that Hamdan, Vengadasamy, Hashim, Yusof (2011) suggests for the teaching of science concepts in fiction (“it is proposed that the relevant scientific topics be introduced before studying the texts,” p. 418). Tier 3 jargon was selected for pre-teaching because many were rooted in science (i.e. “ambergris” and “deciduous”) and could not be inferred from context. Having students rate their vocabulary self-awareness (Fisher et al., 2011, p. 138-139), use dictionaries to define the words (Boushey & Moser, 2009, p. 190; ELA Core Curriculum, 2006, p. 72), and sketch the words (Gore, 2010a, p. 52-53) are all recognized instructional activities. The vocabulary preteaching activity with jargon will also be replicated in the science classroom’s use of poetry to reinforce the effect of man’s actions on the environment, so there are parallel literacy activities in the content areas for the analysis of poetry and its embedded science concepts.

**PROFESSIONAL REFERENCES:**

Bull, K. B., & Dupuis, J. B. (2014). Nonfiction and interdisciplinary inquiry: Multimodal learning in English and biology. *The English Journal, 103*(3), 73-79.

Boushey, G. & Moser, J. (2009). Ready reference form: Strategy – Use word parts to determine the meaning of words (compound words, prefixes, suffixes, origins, abbreviations, etc.). In The CAFE book: Engaging all students in daily literacy assessment & instruction (p. 187). Portland, ME: Stenhouse Publishers.

Czerneda, J. E. (2006). Science fiction & scientific literacy. *The Science Teacher, 73*(2), 38-42.

Fisher, D., Brozo, W. G., Frey, N., & Ivey, G. (2011). 46: Vocabulary self-awareness. In *50 Instructional Routines to Develop Content Literacy* (2nd ed.) (pp. 138-139). Boston, MA: Pearson Education, Inc.

Gore, M. C. (2010a). Key 12: Quick sketching a definition. In Inclusion strategies for secondary classrooms: Keys for struggling learners (pp. 52-53). Thousand Oaks, CA: Corwin.

Gore, M. C. (2010b). Key 41: Preteach vocabulary. In Inclusion strategies for secondary classrooms: Keys for struggling learners (pp. 112). Thousand Oaks, CA: Corwin.

Hamdan, S. I., Vengadasamy, R., Hashim, R. S., & Yusof, N. M. (2011). Creating awareness of real life issues through science fiction. *Procedia Social and Behavioral Sciences, 18*, 415-419.

Sundaralingam, P. (2011b). Science and poetry: Predation or symbiosis? World Literature Today, 85(1). Retrieved from <http://www.worldliteraturetoday.org/2011/january/science-and-poetry-predation-or-symbiosis-pireeni-sundaralingam#.UstLl_sliAY>

**English Day 13:**

**Allen Ginsberg’s “Sunflower Sutra” – Diction, Imagery, Setting**

**Individual Worth & Industrial Pollution**

**OBJECTIVES:**

* After activating their prior knowledge from science class about industrial pollution on a semantic web, students will rate their level of vocabulary awareness for the industrial jargon in Allen Ginsberg’s “Sunflower Sutra” in order to define the words using a dictionary and draw an illustration representing each definition.
* After defining and illustrating the poem’s industrial jargon, students will analyze and annotate “Sunflower Sutra” in order to label a diagram with the physical descriptions of the sunflower, compare and contrast the descriptions with the Kinetic City stimulation in science class to determine scientific accuracy, and infer the pollution’s fictionalized internal effects through a carnation-food dye experiment.
* After reading “Save the Whales, Screw the Shrimp” in a previous science lesson and “Sunflower Sutra,” students will analyze how each text presents humans’ perceptions of the polluted environment in order to compare and contrast the two opposing viewpoints in a writing activity.

**STANDARDS:**

**RL.9-10.1** Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text (ELA CCSS, p. 38).

**RL.9-10.2** Determine a theme or central idea of a text and analyze in detail its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text (ELA CCSS, p. 38).

**RL.9-10.3.** Analyze how complex characters (e.g., those with multiple or conflicting motivations) develop over the course of a text, interact with other characters, and advance the plot or develop the theme (ELA CCSS, p. 38).

**RL.9-10.4** Determine the meaning of words and phrases as they are used in the text, including figurative and connotative meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language evokes a sense of time and place; how it sets a formal or informal tone) (ELA CCSS, p. 38).

**L.9-10.6** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression (ELA CCSS, p. 55).

**SL. 9-10.1** Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grades 9–10 topics, texts, and issues,* building on others’ ideas and expressing their own clearly and persuasively (ELA CCSS, p. 50).

**NCTE Standards:**

**#1:** Students read a wide range of print and nonprint texts to build an understanding of texts, of themselves, and of the cultures of the United States and the world; to acquire new information; to respond to the needs and demands of society and the workplace; and for personal fulfillment. Among these texts are fiction and nonfiction, classic and contemporary works.

#3: Students apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts. They draw on their prior experience, their interactions with other readers and writers, their knowledge of word meaning and of other texts, their word identification strategies, and their understanding of textual features (e.g., sound–letter correspondence, sentence structure, context, graphics).

**MATERIALS:**

* “Industrial Pollution” Semantic Web
* Sunflower Diagram Graphic Organizer
* SmartBoard or White Board
* Allen Ginsberg’s “Sunflower Sutra”
* Industrial Jargon Worksheet
* Joy Williams’s “Save the Whales, Screw the Shrimp”
* Dictionaries

**DESCRIPTION:**

In this lesson, students will explore individual worth, the human/environment relationship, and industrial pollution through Allen Ginsberg’s poem, “Sunflower Sutra.” Students will first brainstorm their prior knowledge about industrial pollution, a human-caused environmental threat explored previously in science class. Students looked at smog through a case study of China’s air pollution. The teacher will record some of the ideas on the white board. Students will then be given a list of the jargon in Allen Ginsberg’s poem, “Sunflower Sutra.” Students will rate their vocabulary self-awareness according to three categories (addition sign = knows definition of word; subtraction sign = never seen the word before; check mark = familiar with the word (i.e. have seen or heard it before) but doesn’t know exact definition). Students will then pair up to look up the definitions in a dictionary. Once they record the definition on the chart, students will illustrate each vocabulary word. Students will share their illustrations will a partner. If the technology is available, the teacher will project some of the illustrations on the board for all students to see and discuss (i.e “How is this illustration representative of [industrial jargon]”?). Most likely, students will be more familiar with the extracted industrial jargon than they were with the nautical jargon.

After pre-teaching the necessary Tier 3 jargon, the teacher will introduce the poem, emphasizing that the jargon just explored is diction used by Ginsberg to establish the setting and convey its effect on the sunflower. The teacher will guide the students through the poem by reading it aloud once, and then going back line-by-line to annotate it and elicit student interpretations. After annotating, students will work in groups of two to categorize the descriptions of the sunflower by labeling a diagram of a sunflower on a worksheet. The teacher will model the expectations. The teacher will then show students the 10-day-old product of several carnations in different food dye colors. The teacher will have a separate, untouched carnation to show the “before.” Based on their knowledge of plant biology, students will predict why the food dye changed the color of the flowers in a Think-Pair-Share activity. Once students come up with the idea of water and nutrient uptake in a plant, students will revist the section of the poem about the “sawdust” the sunflower in which the sunflower is planted to infer the metaphorical effect on the plant, leading to the mechanical sunflower diagram and the labeling of the description categories (internal and external affect of industrial pollution). The teacher will also have students refer to their Four-Square Vocabulary cards for “Smog” and have students skim over their graphic organizers to briefly discuss the scientific accuracy of the text ‘s depiction of air pollution’s physical effect by comparing the sunflower descriptions to the Orange-O-Dyne’s effect on the bug forest in the Kinetic City science class stimulation. Lastly, in a writing activity that may become students’ homework, students will compare and contrast the human/environment relationship in “Sunflower Sutra” and Joy Williams’s persuasive essay from science class.

**ASSESSMENT OF STUDENT LEARNING:**  Informal assessments will occur throughout the lesson in the form of discussion input (especially when linking the poem to the unit theme of individual worth), sunflower labeling/diagramming, during-reading annotations, dictionary proficiency, illustration creativeness and accuracy, and brainstormed ideas for the semantic web activity. The formal assessment occurs when students compare and contrast the poem with the science classroom’s persuasive essay.

**RATIONALE:**

Poetry is used to reinforce the interdisciplinary theme of individual worth and the science concept of industrial pollution (as students “ready-made hooks of prior knowledge about air pollution from science class will help students comprehend the poem (Bull & Dupuis, 2014, p. 73). Poetry was one of the most praised mediums for teaching science content from an English perspective in the theories between science and literature’s interdisciplinary potential but the most underused in practice. Pound’s poem accurately describes the effect of industrial pollution on the landscape and flora, so it and shows students that Ginsberg uses the science accurately, an important thing for students to see in an interdisciplinary unit between these two disciplines (Czerneda, 2006, p. 39). Pre-teaching vocabulary is a strategy recommended for literacy instruction in general (Gore, 2010b, p. 112); however, it is also a strategy that Hamdan, Vengadasamy, Hashim, Yusof (2011) suggests for the teaching of science concepts in fiction (“it is proposed that the relevant scientific topics be introduced before studying the texts,” p. 418). Tier 3 jargon was selected for pre-teaching because many were rooted in science (i.e. “corolla” and “smog”) and could not be inferred from context. Having students rate their vocabulary self-awareness (Fisher et al., 2011, p. 138-139), use dictionaries to define the words (Boushey & Moser, 2009, p. 190; ELA Core Curriculum, 2006, p. 72), and sketch the words (Gore, 2010a, p. 52-53) are all recognized instructional activities.

**PROFESSIONAL REFERENCES:**

Bull, K. B., & Dupuis, J. B. (2014). Nonfiction and interdisciplinary inquiry: Multimodal learning in English and biology. *The English Journal, 103*(3), 73-79.

Boushey, G. & Moser, J. (2009). Ready reference form: Strategy – Use word parts to determine the meaning of words (compound words, prefixes, suffixes, origins, abbreviations, etc.). In The CAFE book: Engaging all students in daily literacy assessment & instruction (p. 187). Portland, ME: Stenhouse Publishers.

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Gore, M. C. (2010a). Key 12: Quick sketching a definition. In Inclusion strategies for secondary classrooms: Keys for struggling learners (pp. 52-53). Thousand Oaks, CA: Corwin.

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**English Day 14:**

**“A Sound of Thunder”: Text-to-Self Connections Bulletin Board**

**Individual Worth – “Not Just Any Expendable Man!”**

**OBJECTIVES:**

* After discussing how individual worth appeared in both the English texts and science classroom (i.e. in relation to death), students will summarize why Eckels’s squashed butterfly was individually valuable in order to design an “I Matter Because…” card for the fictional insect .
* After rereading the excerpt in “A Sound of Thunder” in which Travis discusses the worth of a caveman, students will self-reflect on their personal value in order to design an “I Matter Because…” card for themselves and display it on an “We Are Not Just Any Expendable Students!” bulletin board.
* After designing “I Matter Because…” cards for Eckels’s butterfly and themselves, students will recall the species (bee or shark) that they studied in science class to understand real-life global interconnectedness in order to summarize their individual worth on an “I Matter Because…” card as the first part of an “I Am Not Just Any Expendable Species!” bulletin board border.
* After finishing their collaborative writing short stories for homework, students will pitch their storyline to the class in a concise summary in order to choose two to read and critique on a “2 Stars: 1 Wish” peer feedback card.

**STANDARDS:**

**RL.9-10.2** Determine a theme or central idea of a text and analyze in detail its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text. (ELA CCSS, p. 38).

**RI.9-10.2** Determine a central idea of a text and analyze its development over the course

of the text, including how it emerges and is shaped and refined by specific

details; provide an objective summary of the text (ELA CCSS, p. 40).

**W.9-10.3** Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences (ELA CCSS, p. 43).

**W.9-10.6** Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology’s capacity to link to other information and to display information flexibly and dynamically (ELA CCSS, p. 46).

**NCTE Standards:**

**#11:** Students participate as knowledgeable, reflective, creative, and critical members of a variety of literacy communities.

**MATERIALS:**

* Ray Bradbury’s “A Sound of Thunder”
* “I Matter Because…” blank cards, bee/shark cards
* Bulletin Board
* Laptops
* “2 Stars: 1 Wish” Peer Feedback Comment Cards

**DESCRIPTION:**

As the wrap-up lesson for the English section of this interdisciplinary unit, this lesson prompts students to reflect on how the idea of individual worth emerged in many of the texts in relation to death (i.e. Eckels’ squashed butterfly; Donny and Father Snow; elephants and their gravesite visits; endangered species). The opening discussion will elicit student opinion on the significance of this, and the teacher will prompt them to reflect on whether or not the common juxtaposition suggests that we do not adequately recognize and appreciate individual value; we often wait until it’s too late – or until the threat of death looms closely (i.e. endangered species) to show our affections or outwardly appreciate someone. The teacher will record the death examples of individual worth on the white board or SmartBoard as students brainstorm during this opening discussion. As a class, students will fill in the rest of the statement, “I Matter Because…,” for Eckels’s butterfly by brainstorming possible summaries of how the butterfly proved its individual value in the story (i.e. Keith didn’t win the presidential election) . The teacher will then introduce the “We Are Not Just Any Expendable Students!” bulletin board by reading-aloud the text excerpt from Bradbury’s “A Sound of Thunder” in which Travis contemplates the value of a caveman. Students will then fill in “I Matter Because….” cards for themselves. The teacher will provide several prompts to guide students’ self-reflection (i.e. How do we impact our families now? Who would miss us? Why would they miss us? How would the unfulfillment of our current career aspirations affect the future? In that sense, what would the future be missing if we weren't a part of it?). Students will pin their cards to the bulletin board when finished. Names are unnecessary. As the lesson’s cross-curricular tie-in, Students will then organize into groups of three based on bees or elephants from their science class case studies. Students will recall the significance of their studied animal/insect on its ecosystem in order to design an “I Matter Because…” card for the species. Students will receive blank bee and elephant templates. Each group will share their summary with the class Ideally, because of its cross-curricular components, this would be compiled as a hallway bulletin board if access to such is available. Confining it to the English classroom, although it is the Plan B option, might limit students' thinking about its content and its applicability to both disciplines.

Since their collaborative creating writing final English projects were due today and three-part “I Matter Because…” activity will not take the entire class period, each group will pitch their storyline in a concise summary to persuade their peers to read their story. Students will receive the opportunity to rotate around the room to read two stories. Laptop stations will be set up throughout the classroom and each group will pull up their short story on one of them. Students will complete a peer feedback card for each of the two stories they read. The cards require students to reflect on what the group did well and what the group could improve. Each group will receive the “2 Stars: 1 Wish” comment cards that their peers filled in.

**ASSESSMENT OF STUDENT LEARNING:**  Informal formative assessments will occur throughout the lesson in the form of discussion input, the “2 Stars: 1 Wish” comment cards, and the “I Matter Because…” cards.

**RATIONALE:**

This opening of this lesson is broken down into three parts, which all cater to a different textual connection. To design the card for Eckels’s butterfly, students demonstrate their “within” or literal text comprehension and/or recall of the first short story in the interdisciplinary unit, Ray Bradbury’s “A Sound of Thunder.” Then, the next step requires students to make text-to-self connections. Lastly, by having students create “I Matter Because…” comment cards for the species they studied in science for real-life global interconnectedness (bee or shark), they are making text-to-world connections. However, in line with the interdisciplinary nature of the unit, the “world” is found within the curriculum of the science classroom. This text-to-world connection helps students relate Bradbury’s short story to a contemporary context, a goal of interdisciplinary planning between science and literature (Hamdan et al., 2011). The “I Matter Because…” species cards also serves as scaffolding to students’ independent creation of them for their science class final research projects. The bee or shark activity is group practice for future independent creation. The border will officially be completed at the end of this interdisciplinary unit's science research project, which consists of three parts: a research essay in the form of a persuasive letter, a wanted/reward poster, and an "I Matter..." summary card for students’ chosen species. Therefore, students will add part of their science final project to the English classroom's bulletin board border. Since they will function as quick-glance summaries of their entire research project, students practice the one-sentence summary with their bee or shark science case study. This builds students “self-efficacy” in the summarization task (Alvermann, 2001, p. 6), so they will feel more confident and able to complete the activity independently for their final research project. Students’ self-perception of their competency and ability to complete a task (“self-efficacy”) directly correlates to their motivation and ability to complete the task (Alvermann, 2001, p. 2), justifying the group practice in this lesson. The laptop and “2 Stars: 1 Wish” short story sharing provides a formal platform for the intended audience – peers – to read the stories. Providing in-class time for sharing is important, since the final project quality was enhanced by the students’ knowledge that their stories would be ultimately read by their peers. Students’ work quality increases when they write for a peer audience (Grishman & Wolsey, 2006, p. 654; Peterson, Rochwerger, Brigman, & Wood, 2006, p. 35-36). Grishman & Wolsey (2006) found that students’ writing, when only viewed by the teacher, was “acceptable but lifeless” because they wrote “perfunctorily” (p. 654).

**PROFESSIONAL REFERENCES:**

Alvermann, D. E. (2001). Effective literacy instruction for adolescents. *Executive Summary and Paper Committee.* Chicago, IL: National Reading Conference.

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**English Day 15:**

**English Final Project: Thematic Essay**

**“I Am Not Just Any Expendable Species!” Cards**

**OBJECTIVES:**

* After designing “I Matter Because…” cards for a keystone species case study animal in a previous English lesson, students will summarize the importance of their chosen species for their final science research project in order to create an “I Matter Because…” card for the species and display it that on the “I Am Not Just Any Expendable Species” bulletin board border.
* After reading the two short stories and two poems in the English unit, students will list how each text depicts the effects of interconnectedness (i.e. people hurt people; people help people; people hurt nature; people help nature) on a T-chart in order to discuss the general effect of interconnectedness (i.e. positive or negative) in a thematic essay using three of the four texts.

**STANDARDS:**

**RL.9-10.1** Cite strong and thorough textual evidence to support analysis of what the text

says explicitly as well as inferences drawn from the text (ELA CCSS, p. 38).

**RL.9-10.2** Determine a theme or central idea of a text and analyze in detail its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text (ELA CCSS, p. 38).

**RL.9-10.3.** Analyze how complex characters (e.g., those with multiple or conflicting motivations) develop over the course of a text, interact with other characters, and advance the plot or develop the theme (ELA CCSS, p. 38).

**W.9-10.2** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content (ELA CCSS, p. 42).

**L.9-10.6** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression (ELA CCSS, p. 55).

**NCTE Standards:**

**#5:** Students employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes.

**MATERIALS:**

* Colored Pencils & Blank Paper
* Stapler
* Thematic Essay Final Project Requirement Sheet
* Effect of Interconnectedness T-Chart

**DESCRIPTION:**

Students will use the beginning of this last class period to compete the smallest component of their science final project, since it relates to the bulletin board designed in English class based on “A Sound of Thunder.” Drawing from the models already stapled to the bulletin board – the “I Matter Because….” Cards for elephants and bees – students will create an “I Matter Because…” card for their self-selected endangered species, which includes a drawing of the species and a one-sentence summary of their value. The teacher will remind students of the interdisciplinary themes of the unit and distribute a T-chart with two main columns – “people hurt people” and “people help people” – followed by two subcategories – “people hurt nature” and “people help nature.” After the teacher models how to fill out the T-chart, students will work in pairs to pinpoint which category the character relationships (and character-animal/plant relationships) fall into in order to see which texts suggest that interconnectedness is negative and which suggests it is positive and which are split and offer a less decisive stance on the unit theme: the effect of our interconnectedness. The teacher will then review the requirements for the final project: a thematic essay. For the essay, students must use three of the four primary texts from the English unit and ground their discussion of them in the literary elements addressed over the course of the unit to take a decisive stance on the theme (interconnectedness is positive or interconnectedness is negative) and show how the texts support their stance.

**ASSESSMENT OF STUDENT LEARNING:**  This lesson features the unit’s summative assessment: a thematic essay on the effect of interconnectedness. It also includes a component of the science classroom’s final project: the summary “I Matter Because…” cards for students’ self-selected endangered species.

**RATIONALE:**

A cross-curricular work session allows students to create their “I Matter Because…” species cards in the same setting in which they practiced them, despite it being a official component of the science classroom’s final project. The idea for the “I Matter Because…” cards origins from “A Sound of Thunder,” so the opportunity to complete that part of their final research project in English class reinforces its literary connection. Similar to the problem Noskin (1997) found himself in at the end of his English-history interdisciplinary study, this English unit “focused more deeply on the literature than on the [interdisciplinary themes] themselves” (p. 62), so the final project provides students a platform to share how their interpretations of the literature reflect the themes. Additionally, since the thematic essay requirements do not hold any explicit cross-curricular components, the summative assessment allows students to make their own connections “which is the ultimate form of integration” (Noskin, 1997, p. 60).

**PROFESSIONAL REFERENCES:**

Noskin, D. P. (1997). Interdisciplinary English means English first. *English Journal, 86*(7), 59-63.