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| Modified 5 E Unit Plan |
| TOPIC: Resource Conservation-E WasteLast revision 7/22/2014 | DATE(S):  |
| SCIENCE STANDARDS: (Possibly)HS-ESS3-4. Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.\*[Clarification Statement: Examples of data on the impacts of human activities could include the quantities and types of pollutants released, changes to biomass and species diversity, or areal changes in land surface use (such as for urban development, agriculture and livestock, or surface mining). Examples for limiting future impacts could range from local efforts (such as reducing, reusing, and recycling resources) to large-scale geoengineering design solutions (such as altering global temperatures by making large changes to the atmosphere or ocean).\*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea. |
| **COMMON CORE STANDARDS:****CCSS Anchor Reading Standards for Argumentation** 1 – Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. 4 – Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. 7 – Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words. 10 – Read and comprehend complex literary and informational texts independently and proficiently.**CCSS Anchor Writing Standards for Argumentation** 1 – Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. 4 – Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. 5 – Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. 6 – Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others. 7 – Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation. 8 – Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism. 9 – Draw evidence from literary or informational texts to support analysis, reflection, and research. 10 – Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audience**Grades 11-12 Literacy in Science and Technical Subjects****Key Ideas and Details*** [CCSS.ELA-Literacy.RST.11-12.1](http://www.corestandards.org/ELA-Literacy/RST/11-12/1/) Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.
* [CCSS.ELA-Literacy.RST.11-12.2](http://www.corestandards.org/ELA-Literacy/RST/11-12/2/) Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

**Craft and Structure*** [CCSS.ELA-Literacy.RST.11-12.4](http://www.corestandards.org/ELA-Literacy/RST/11-12/4/) Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 11–12 texts and topics*.

**Integration of Knowledge and Ideas*** [CCSS.ELA-Literacy.RST.11-12.7](http://www.corestandards.org/ELA-Literacy/RST/11-12/7/) Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
* [CCSS.ELA-Literacy.RST.11-12.9](http://www.corestandards.org/ELA-Literacy/RST/11-12/9/) Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

**Range of Reading and Level of Text Complexity*** [CCSS.ELA-Literacy.RST.11-12.10](http://www.corestandards.org/ELA-Literacy/RST/11-12/10/) By the end of grade 12, read and comprehend

 science/technical texts in the grades 11–CCR text complexity band independently  and proficiently.**Unit Overview**:Students will practice close reading and annotating with the following pieces of text. **They are available in the “for the student “ materials/handouts.** A close reading worksheet is also available for the first few (or all or none) pieces of text if desired. Note-I copied each piece of text in a different color of paper**#1 Excerpt from Act 1410 of 2001** <http://www.arkleg.state.ar.us/assembly/2001/R/Acts/Act1410.pdf>**IMPORTANT NOTE: ADEQ has NOT established and implemented rules and regulations banning the disposal of all computer and electronic equipment in Arkansas Landfills. Robert Hunter, from the solid waste division at ADEQ said the reason was that this would be an unfunded mandate. However, all of the landfills in Arkansas have done this individually and do not take e-waste. All counties have a local place to take e-waste to dispose of it.****#2-Excerpt from Wikipedia** <http://en.wikipedia.org/wiki/Electronic_waste>**#3-E-Waste Facts and Statistics-UofA** <http://ecycle.uark.edu/ewaste_facts.php>**#4-E-Waste Facts-Uof San Diego** <http://www.sandiego.edu/ewaste/facts.php>**#5-CalRecycle-What is E-Waste** <http://www.calrecycle.ca.gov/Electronics/WhatisEwaste/>**#6-Excerpt from Regulation 23** <http://www.adeq.state.ar.us> (basically says that household electronics are not considered hazardous and may be placed in landfills, however, landfills will not take this material. Summarize this for the students instead of reading it.) You might print only one or two of this text in black and white for reference, if desired.**E Waste Update-EPA** <http://www.epa.gov/wastes/conserve/smm/wastewise/pubs/wwupda14.pdf>After close reading, annotating and discussion of all the text, students will write an argumentative paper that answers this question “Should the Arkansas Department of Environmental Quality establish and implement rules and regulations banning the disposal of all computer and electronic equipment in Arkansas landfills” as stated in Section 12 of Arkansas Act 1410 of 2001, or any question deemed important by the students. Extension: After completing the argumentative paper, students will determine the name of the Arkansas State Senator for their area and will write a letter to that person requesting that the Arkansas Department of Environmental Quality establish and implement rules and regulations banning the disposal of all computer and electronic equipment in Arkansas landfills as stated in Section 12 of Arkansas Act 1410 of 2001, or that Section 12 be repealed, stating their evidence from the paper.Explore will be conducted in groups, final evidence paper and letter will be individual.**Resources/supplies:****Student**s will need:Writing utensils, paper, a copy of each piece of text used as needed, **Teachers** will need:Access to Internet, document camera, markers, board or large paper to record information, different colored paper to copy text for students and copies of all texts listed. |
| **In close reading you annotate and take notes, ask yourself questions, determine problem vocabulary and important vocabulary as you read text for the first time. Then you reread the text and discuss it in a group to determine the meaning of the problem vocabulary and find the answers to your questions. Upon completion of close reading of a piece of text you should be thoroughly knowledgeable of the text and able to ask and answer questions with only brief reexamination of the text. Usually we read the questions and then scan the text for only those answers.**#**1-Excerpt from Act 1410 of 2001** <http://www.arkleg.state.ar.us/assembly/2001/R/Acts/Act1410.pdf> **#2-Excerpt from Wikipedia** <http://en.wikipedia.org/wiki/Electronic_waste>**#3-E-Waste Facts and Statistics-UofA** <http://ecycle.uark.edu/ewaste_facts.php>**#4-E-Waste Facts-Uof San Diego** <http://www.sandiego.edu/ewaste/facts.php>**#5-CalRecycle-What is E-Waste** <http://www.calrecycle.ca.gov/Electronics/WhatisEwaste/>**#6-Excerpt from Regulation 23** <http://www.adeq.state.ar.us> (basically says that household electronics are not considered hazardous and may be placed in landfills, however, landfills will not take this material. You may choose to summarize this instead of reading it.) **Lesson 1:** Model and think aloud one of the texts using a document camera, have students annotate with you. Discuss the difference in the way we usually read and close reading and annotating. Have students read, annotate and discuss in small groups another piece of text. Have each group report out what they annotated and why. **Lesson 2**: Have students continue close reading of text until all pieces of text have been closely read and discussed as a small group and a class. Make sure all text has been read and discussed. **This may take several days.** **Lesson 3:** “Zoom Out” and examine all pieces of text, similarities and differences, sources and credibility, and information contained in the articles. Begin the discussion of the argumentative paper.**Lesson 4**-Discuss the components of an argumentative paper. Check with an English teacher in your school to see if they have a template the students are already familiar with, or would like students to become familiar with. Information about different types of argumentative papers is in the “for the students” materials/handouts for your convenience, however, there are many ways to write an argumentative paper.* Write a claim statement
* Counterclaim
* Signal phrases
* Mini Essay or other argumentative paper format
* Rubric you will use
* Etc.

In class- individually begin the process of writing the argumentative paper. Have students cite their sources using APA format. Confer with the English teachers for help.**Lesson 5-**after student have written the paper in or out of class, have them peer edit in different groups. The teacher is available also, for questions and problems. Students will then complete the paper after group and/or peer editing.  |
| **EXPLAIN: Students** will summarize the results of the EXPLORE phase in oral or written form. This may be a class discussion, reports, or a product. |
| After reading the texts, students will be able to define, explain, and give examples of e-waste.Students will be able to state/list current disposal methods of e-waste.After close reading and discussion of all the text, students will write an argumentative paper that answers this question “Should the Arkansas Department of Environmental Quality establish and implement rules and regulations banning the disposal of all computer and electronic equipment in Arkansas landfills” as stated in Section 12 of Arkansas Act 1410 of 2001, or any other question deemed important by the students. Another example might be “Should the United States export E-waste to underdeveloped countries?” |
| **ELABORATE:** Teachers challenge and extend students’ conceptual understanding and skills. Through new experiences, the students develop deeper and broader understanding, more information, and adequate skills. Students apply their understanding of the concept by conducting additional activities. This may be done before, during, or after any other E. |
| After completing the argumentative paper, students will determine the name of the Arkansas State Senator for their area and will **write a letter to that person requesting** that the Arkansas Department of Environmental Quality **establish and implement rules and regulations** banning the disposal of all computer and electronic equipment in Arkansas landfills as stated in Section 12 of Arkansas Act 1410 of 2001**, or that Section 12 be repealed**, stating their evidence, or address any question that was deemed important by the students.  |
| **EVALUATE:** Use frequent formative evaluations to make instructional decisions about clarifying, reteaching, or moving on. Use Summative evaluations to assign grades. |
| Formative | Summative |
| Circulate while students are working to help with problems and keep students on track. Use a participation/work checklist if desired.Formative 1- have students turn in an annotated piece of text to be graded by the rubric created by the students and teacher.Formative 2-Ask students to write and turn in the answers to these questions 1. Define e-waste2. Discuss one problem associated with e-waste3. Give 4 examples of e-waste.Other formatives included in lesson plans | Use rubric to evaluate the final project and paper.Rubrics included in “for the teacher” materials/handouts.Smarter Balance Rubrics<http://www.smarterbalanced.org/wordpress/wp-content/uploads/2012/05/TaskItemSpecifications/EnglishLanguageArtsLiteracy/ELARubrics.pdf>many rubrics included in notebook |

For More Information:

Reasons for the 5E Lesson Plan: [http://science.education.nih.gov/houseofreps.nsf/b82d55fa138783c2852572c9004f5566/$FILE/Appendix%20D.pdf](http://science.education.nih.gov/houseofreps.nsf/b82d55fa138783c2852572c9004f5566/%24FILE/Appendix%20D.pdf)

CCSS for Literacy:

<http://www.corestandards.org/ELA-Literacy>

Next Generation Science Standards:

<http://www.nextgenscience.org/next-generation-science-standards>

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| Modified 5 E Lesson Plan |
| TOPIC: E-WasteLesson 1 | DATE(S): |
| SCIENCE STANDARDS: (Possibly)HS-ESS3-4. Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.\*[Clarification Statement: Examples of data on the impacts of human activities could include the quantities and types of pollutants released, changes to biomass and species diversity, or areal changes in land surface use (such as for urban development, agriculture and livestock, or surface mining). Examples for limiting future impacts could range from local efforts (such as reducing, reusing, and recycling resources) to large-scale geoengineering design solutions (such as altering global temperatures by making large changes to the atmosphere or ocean).\*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea. |
| MATERIALS: Students-paper, pen or pencil, copy of written quiz if technology not adequate, copy of texts 2, 3, and 5. Teacher-document camera and internet access if technology is adequate. Copies of text 2, 3, and 5 for each student and the teacher. I go in this order:#5-CalRecycle-What is E-Waste <http://www.calrecycle.ca.gov/Electronics/WhatisEwaste/>#3-E-Waste Facts and Statistics-UofA <http://ecycle.uark.edu/ewaste_facts.php>#2-Excerpt from Wikipedia <http://en.wikipedia.org/wiki/Electronic_waste> |
| ENGAGE: Use a piece of text, question, discrete event, video, cartoon, picture, symbol or demonstration that exemplifies the question but not the answer. |
| Before the engage, randomly place students into groups of 3 to work through the explore phase.Final projects are completed individually for grading.20 minutesAsk: What is e-waste? Have students discuss this in groups of 3 and create a definition to discuss with whole class. Give the High-tech-trash quiz using technology or text copyIF TECHNOLOGY IS AVAILABLE, go to this web site as a class and take the **E-Waste Quiz and have students record their initial score.** <http://ngm.nationalgeographic.com/2008/01/high-tech-trash/computer-interactive>**As a class discuss the results of the quiz.****This works best when each student or group of students has access to their own computer or tablet.****A text copy of the quiz is provided if technology is not adequate.** |
| EXPLORE: Identify one or more texts and/or an investigative techniques and/or products to be used/created it the exploration. Describe what the students will do.  |
| 20 minutes1. Teacher models close reading and annotating using document camera, (and if desired use the Close Reading Worksheet) with one of the pieces of text. **I used text #5. While students are reading, I began a list on the board of the elements found in the text. I asked students to add more as they found them during reading, Br, Cu, Pb, etc.**2. Have students read and annotate the next text (I **chose #3**) independently. Have them turn and share their annotations with their table and adjust their own annotations if they choose, then discuss as a class.3. Discuss what a teacher would look for to know if a student is really engaging with the text during reading/annotating. And create a rubric with students input on the board or chart paper.  **Example:**

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| Sample Rubric for Annotation |
| 1= Not so hot | 2= OK | 3= Awesome, Excellent, Super Neat |
| Minimal underlining and | Underlining/circles/boxes | Underlining/circles/boxes |
| Minimal comments | comments | Comments demonstrating thinking |
| Lots of underlining with no additional info | questions | Questions demonstrating thinking |
| ? | ? | ? |

Good place to stop if time is short-begin here tomorrowExit Slip-What is E-waste?30 minutes3. Students are now ready to ready and annotate **text #2** independently and turn it in for assessment using the rubric previously created. 4. When students have completed annotating the text, complete the list of elements that are found in the reading, and add other chemicals to the list such as “phosphors”, dioxin, etc. and assign each element/chemical to a student to research the health hazards to report to the class next period.  |
| EXPLAIN: Students will summarize the results of the EXPLORE phase in oral or written form. This may be a class discussion, reports, or a product. |
| Discuss any of the articles and answer any questions. |
| ELABORATE: Students’ understanding of the concept is challenged and deepened through new experiences. |
| None |
| EVALUATE: Use frequent formative evaluations to make instructional decisions about clarifying, re-teaching, or moving on. Use Summative evaluations to assign grades. |
| Formative | Summative |
| Assess the text that students annotated independently. | None for this lesson |
| Modified 5 E Lesson Plan |
| TOPIC: E-WasteLesson 2 | DATE(S): |
| SCIENCE STANDARDS: same as lesson 1 |
| MATERIALS:  |
| ENGAGE: Use a piece of text, question, discrete event, video, cartoon, picture, symbol or demonstration that exemplifies the question but not the answer. |
| 20 minutesHave students share their research on the elements and chemicals and put this information on the board or large paper.Ask students how close reading/annotating is different from the type of reading we usually do. |
| EXPLORE: Identify one or more texts and/or an investigative techniques and/or products to be used/created it the exploration. Describe what the students will do.  |
| 10 minutesDiscuss Wikipedia-show it on the computer and demonstrate how the citations work.Excerpt from Wikipedia <http://en.wikipedia.org/wiki/Electronic_waste>20 minutesStudents will read and annotate text #1. Have students T&T about the text and make a short summary of the text to present to the class. Discuss as a class. Go over this text carefully. |
| EXPLAIN: Students will summarize the results of the EXPLORE phase in oral or written form. This may be a class discussion, reports, or a product. |
| This is a good place to stop if your time is short…….Formative will be annotated text that student turned in.With any additional time have students finish reading and annotating any of the text they have not completed. Return and discuss the annotated text from last period. Give specific examples of thoughts and questions that indicate thinking deeply.You may begin the “zoom out” here if desired.Leave 8-10 minutes for the Exit slip described in Evaluate. |
| ELABORATE: Students’ understanding of the concept is challenged and deepened through new experiences. |
| None |
| EVALUATE: Use frequent formative evaluations to make instructional decisions about clarifying, re-teaching, or moving on. Use Summative evaluations to assign grades. |
| Formative | Summative |
| Exit slip:Students will define e-waste in their own words,discuss some of the issues associated with e-wastelist at least 4 examples of e-waste | None for this lesson |

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| Modified 5 E Lesson Plan |
| TOPIC: E-WasteLesson 3 | DATE(S): |
| SCIENCE STANDARDS: (Possibly)HS-ESS3-4. Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.\*[Clarification Statement: Examples of data on the impacts of human activities could include the quantities and types of pollutants released, changes to biomass and species diversity, or areal changes in land surface use (such as for urban development, agriculture and livestock, or surface mining). Examples for limiting future impacts could range from local efforts (such as reducing, reusing, and recycling resources) to large-scale geoengineering design solutions (such as altering global temperatures by making large changes to the atmosphere or ocean).\*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea. |
| MATERIALS:  |
| ENGAGE: Use a piece of text, question, discrete event, video, cartoon, picture, symbol or demonstration that exemplifies the question but not the answer. |
| Give back exit slips and discuss the results, clear up any misunderstandings |
| EXPLORE: Identify one or more texts and/or an investigative techniques and/or products to be used/created it the exploration. Describe what the students will do.  |
| Begin the “Zoom Out “ on the board to compare the texts and discuss reliability. (Continue if you began during last lesson)**Example:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Article 1** | **Article 2** | **Article 3** | **Article 4** | **Article 5** | **Article 6** |
| **Source** |  |  |  |  |  | **ADEQ** |
| **Reliability of article** |  |  |  |  |  | **reliable** |
| **Definition of E-waste** |  |  |  |  |  |  |
| **What is valuable in it?** |  |  |  |  |  |  |
| **What is dangerous in it?** |  |  |  |  |  |  |
| **Energy need or use** |  |  |  |  |  |  |
| **Other** |  |  |  |  |  | **Consumer e-waste is not hazardous** |
| **Other** |  |  |  |  |  |  |

After Zoom Out discussions, begin the discussion of argumentative writing, the purpose and the process you want students to follow.Use any of the following templates: 11 Sentence Argument, 11 Sentence Mini-Essay, Argument Organizer, Argumentative Paper Format, or any argument organizer. Contact the English Department for a copy of any district or school specific organization.This is a good place to stop if time is short- exit slip-what are we going to do with our knowledge of e-waste? |
| EXPLAIN: Students will summarize the results of the EXPLORE phase in oral or written form. This may be a class discussion, reports, or a product. |
| Students will formulate questions in groups to discuss with the whole class. Remind students of the original question, and the limits of the questions they can answer from this text.  |
| ELABORATE: Students’ understanding of the concept is challenged and deepened through new experiences. |
| None  |
| EVALUATE: Use frequent formative evaluations to make instructional decisions about clarifying, re-teaching, or moving on. Use Summative evaluations to assign grades. |
| Formative | Summative |
| none |  |

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| Modified 5 E Lesson Plan |
| TOPIC: Resource Conservation-E Waste-Lesson 4Last revision 7/22/2014 | DATE(S): |
| SCIENCE STANDARDS: (Possibly)HS-ESS3-4. Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.\*[Clarification Statement: Examples of data on the impacts of human activities could include the quantities and types of pollutants released, changes to biomass and species diversity, or areal changes in land surface use (such as for urban development, agriculture and livestock, or surface mining). Examples for limiting future impacts could range from local efforts (such as reducing, reusing, and recycling resources) to large-scale geoengineering design solutions (such as altering global temperatures by making large changes to the atmosphere or ocean).\*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea. |
| MATERIALS:  |
| ENGAGE: Use a piece of text, question, discrete event, video, cartoon, picture, symbol or demonstration that exemplifies the question but not the answer. |
| Discuss the questions to be used.1. Should the Arkansas Department of Environmental Quality establish and implement rules and regulations banning the disposal of all computer and electronic equipment in Arkansas landfills
2. Should the United States ban the exporting of e-waste to other countries?
3. Any question students choose that is approved by the teacher.
 |
| EXPLORE: Identify one or more texts and/or an investigative techniques and/or products to be used/created it the exploration. Describe what the students will do.  |
| Explore the parts of an argumentative paper using any of the documents needed.* Claim Counterclaim
* Signal phrases
* Argument organizer
* Rubric
* Mini Essay Format
* APA cheat sheet
* Etc.
 |
| EXPLAIN: Students will summarize the results of the EXPLORE phase in oral or written form. This may be a class discussion, reports, or a product. |
| Teacher shares examples for the parts above, and students create an example to share with group and class. |
| ELABORATE: Students’ understanding of the concept is challenged and deepened through new experiences. |
| none |
| EVALUATE: Use frequent formative evaluations to make instructional decisions about clarifying, re-teaching, or moving on. Use Summative evaluations to assign grades. |
| Formative | Summative |
| Exit Slip for parts of argument |  |

EXIT SLIP Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |
| --- | --- | --- | --- |
| Done—I feel great about my work. | I sort of have it, but it needs work. | I don’t have it | Parts of Argument Constructed in Class Today |
|  |  |  | Position Statement (Claim or Thesis) |
|  |  |  | Two Reasons to Support Your Position |
|  |  |  | 2-3 Pieces of Evidence to Support Each Reason |
|  |  |  | At Least One Opposing Viewpoint  |
|  |  |  | Rebuttal for the Opposing Viewpoint |

EXIT SLIP Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| --- | --- | --- | --- |
| Done—I feel great about my work. | I sort of have it, but it needs work. | I don’t have it | Parts of Argument Constructed in Class Today |
|  |  |  | Position Statement (Claim or Thesis) |
|  |  |  | Two Reasons to Support Your Position |
|  |  |  | 2-3 Pieces of Evidence to Support Each Reason |
|  |  |  | At Least One Opposing Viewpoint  |
|  |  |  | Rebuttal for the Opposing Viewpoint |

EXIT SLIP Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| --- | --- | --- | --- |
| Done—I feel great about my work. | I sort of have it, but it needs work. | I don’t have it | Parts of Argument Constructed in Class Today |
|  |  |  | Position Statement (Claim or Thesis) |
|  |  |  | Two Reasons to Support Your Position |
|  |  |  | 2-3 Pieces of Evidence to Support Each Reason |
|  |  |  | At Least One Opposing Viewpoint  |
|  |  |  | Rebuttal for the Opposing Viewpoint |

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| Modified 5 E Lesson Plan |
| TOPIC: Resource Conservation-E Waste-Lesson 5Last revision 7/22/2014 | DATE(S): |
| SCIENCE STANDARDS: (Possibly)HS-ESS3-4. Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.\*[Clarification Statement: Examples of data on the impacts of human activities could include the quantities and types of pollutants released, changes to biomass and species diversity, or areal changes in land surface use (such as for urban development, agriculture and livestock, or surface mining). Examples for limiting future impacts could range from local efforts (such as reducing, reusing, and recycling resources) to large-scale geoengineering design solutions (such as altering global temperatures by making large changes to the atmosphere or ocean).\*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea. |
| MATERIALS:  |
| ENGAGE: Use a piece of text, question, discrete event, video, cartoon, picture, symbol or demonstration that exemplifies the question but not the answer. |
| none |
| EXPLORE: Identify one or more texts and/or an investigative techniques and/or products to be used/created it the exploration. Describe what the students will do.  |
| Finish the discussion and questions about the parts of the argumentative paper. If desired, have students complete one of the argumentative organizers to help organize their thoughts and paper.Students will work on their papers. Teacher will group students on the basis of the formative assessment to help any who need help. Students will work on their own papers. A typed or well written first draft is due \_\_\_\_\_\_\_\_\_\_\_. On the assigned day, have students form different group and peer edit for about 30 minutes. Students then complete the paper and turn it in\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. |
| EXPLAIN: Students will summarize the results of the EXPLORE phase in oral or written form. This may be a class discussion, reports, or a product. |
|  |
| ELABORATE: Students’ understanding of the concept is challenged and deepened through new experiences. |
|  |
| EVALUATE: Use frequent formative evaluations to make instructional decisions about clarifying, re-teaching, or moving on. Use Summative evaluations to assign grades. |
| Formative | Summative |
| First draft due\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Completed paper due\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |