



**Literacy Design
Collaborative**

Comparing the Chemistry Behind Electricity Generation

by Christopher King

In this reading and writing unit, students are asked to answer the question. "Should nuclear energy be generated from nuclear power or fossil fuels?" Specifically, for this module, students will focus on coal and natural gas as the fossil fuels in question. First, students are introduced to their task through an entry event in which they are given time to "tour" pictures of disasters that relate to each generation method. They will then be given readings that have information about each method. Students will be asked to organize evidence from each of the readings. In a Socratic seminar, students will be asked to speak to each of the three methods and identify the chemistry that speaks to the benefits and drawbacks of each of the methods. Finally, in the writing, students will be asked to select two methods and compare the chemistry between the two, while making a claim as to which of the two is the best method to generate electricity.

GRADES

9 - 10

DISCIPLINE

 **Science**

COURSE

 **Regents
Chemistry**

Section 1: What Task?

Teaching Task

Task Template 4 - Argumentation

Should electrical energy be generated from nuclear power or fossil fuels? After reading informational texts on how electrical energy is generated from these fuels, write an essay in which you compare the chemistry behind the two methods to generate electricity and argue which is the better method for production of electricity in an urban environment. Support your position with evidence from the text(s).

D 1

Be sure to consider competing views.

Common Core State Standards

Reading Standards for Literacy in Science and Technical Subjects 6—12

RST.9-10.1

Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

RST.9-10.2

Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.

RST.9-10.4

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 9—10 texts and topics.

RST.9-10.7

Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

RST.9-10.9

Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.

RST.9-10.10

By the end of grade 10, read and comprehend science/technical texts in the grades 9—10 text complexity band independently and proficiently.

Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 6—12

WHST.9-10.1

Write arguments focused on discipline-specific content.

WHST.9-10.1.d

Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.

WHST.9-10.1.b

Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.

WHST.9-10.1.a

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

WHST.9-10.1.e

Provide a concluding statement or section that follows from or supports the argument presented.

WHST.9-10.1.c

Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.

WHST.9-10.4

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

WHST.9-10.5

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

WHST.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.

WHST.9-10.8

Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.

WHST.9-10.9

Draw evidence from informational texts to support analysis, reflection, and research.

WHST.9-10.10

Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

Additional Standards

New York

Learning Standards for Mathematics, Science, and Technology - Standard 4

NY

Matter is made up of particles whose properties determine the observable characteristics of matter and its reactivity.

NY

use kinetic molecular theory to explain rates of reactions and the relationships among temperature, pressure, and volume of a substance.

NY

describe chemical and physical changes, including changes in states of matter.

NY

use atomic and molecular models to explain common chemical reactions.

NY

develop their own mental models to explain common chemical reactions and changes in states of matter.

NY

distinguish between chemical and physical changes.

NY

explain the properties of materials in terms of the arrangement and properties of the atoms that compose them.

NY

observe and describe properties of materials, such as density, conductivity, and solubility.

NY

observe and describe properties of materials using appropriate tools.

NY

apply the principle of conservation of mass to chemical reactions.

NY

Energy exists in many forms, and when these forms change energy is conserved.

NY

observe and describe the properties of sound, light, magnetism, and electricity.

NY

explain variations in wavelength and frequency in terms of the source of the vibrations that produce them, e.g., molecules, electrons, and nuclear particles.

NY

describe the sources and identify the transformations of energy observed in everyday life.

NY

observe and describe heating and cooling events.

NY

describe a variety of forms of energy (e.g., heat, chemical, light) and the changes that occur in objects when they interact with those forms of energy.

NY

describe situations that support the principle of conservation of energy.

NY

explain the uses and hazards of radioactivity.

NY

observe the way one form of energy can be transformed into another form of energy present in common situations (e.g., mechanical to heat energy, mechanical to electrical energy, chemical to heat energy).

NY

observe and describe transmission of various forms of energy.

NY

observe and describe energy changes as related to chemical reactions.

NY

explain heat in terms of kinetic molecular theory.

NY

Energy and matter interact through forces that result in changes in motion.

NY

describe how forces can operate across distances.

NY

explain chemical bonding in terms of the motion of electrons.

NY

explain and predict different patterns of motion of objects (e.g., linear and angular motion, velocity and acceleration, momentum and inertia).

NY

describe the effects of common forces (pushes and pulls) on objects, such as those caused by gravity, magnetism, and mechanical forces.

NY

compare energy relationships within an atom's nucleus to those outside the nucleus.

NY

describe different patterns of motion of objects.

NY

observe, describe, and compare effects of forces (gravity, electric current, and magnetism) on the motion of objects.

Custom Standards

CUSTOM

3.1o Stability of an isotope is based on the ratio of neutrons and protons in its nucleus. Although most nuclei are stable, some are unstable and spontaneously decay, emitting radiation. 3.1p Spontaneous decay can involve the release of alpha particles, beta

particles, positrons, and/or gamma radiation from the nucleus of an unstable isotope. These emissions differ in mass, charge, ionizing power, and penetrating power.

CUSTOM

4.4a Each radioactive isotope has a specific mode and rate of decay (half-life). 4.4b Nuclear reactions include natural and artificial transmutation, fission, and fusion. 4.4c Nuclear reactions can be represented by equations that include symbols which represent atomic nuclei (with mass number and atomic number), subatomic particles (with mass number and charge), and/or emissions such as gamma radiation. 4.4d Radioactive isotopes have many beneficial uses. Radioactive isotopes are used in medicine and industrial chemistry for radioactive dating, tracing chemical and biological processes, industrial measurement, nuclear power, and detection and treatment of diseases. 4.4e There are inherent risks associated with radioactivity and the use of radioactive isotopes. Risks can include biological exposure, long-term storage and disposal, and nuclear accidents. 4.4f There are benefits and risks associated with fission and fusion reactions.

CUSTOM

5.3a A change in the nucleus of an atom that converts it from one element to another is called transmutation. This can occur naturally or can be induced by the bombardment of the nucleus with high-energy particles. 5.3b Energy released in a nuclear reaction (fission or fusion) comes from the fractional amount of mass that is converted into energy. Nuclear changes convert matter into energy. 5.3c Energy released during nuclear reactions is much greater than the energy released during chemical reactions.

Texts

🔗 **"Clean Coal Gets a Sponge" (Campbell, Whitney - 2013)**

🔗 **"Cleaning Up Coal" (Der, V.)**

🔗 **"Energy Content of Fuels (in Joules)" King, C. (unpublished)**

🔗 **"Nuclear Fallout" (National Resource Defense Council - 2012)**

🔗 **"Natural Gas" (Naturalgas.org - 2011)**

🔗 **"Natural Gas and the Environment" (Naturalgas.org - 2011)**

🔗 **"The Pro and Cons of Nuclear Power" (Smith, Jeffery M.)**

📖 **Chemical Reactions: Types of Chemical Reactions- Combustion**

Wilbraham, Anthony C., et al. (2008). Chemical Reactions: Types of Chemical Reactions-Combustion. Chemistry (pp. 320-351). Boston: Prentice Hall.

📖 **Nuclear Chemistry: Fission and Fusion of Atomic Nuclei**

Wilbraham, Anthony C., et al. (2008). Nuclear Chemistry: Fission and Fusion of Atomic Nuclei-Nuclear Fission, Nuclear Fusion. Chemistry (pp. 798-825). Boston: Prentice Hall.

LDC Student Work Rubric - Argumentation

	Not Yet	Approaches Expectations	Meets Expectations	Advanced
	1	2	3	4
Focus	Attempts to address prompt, but lacks focus or is off-task.	Addresses prompt appropriately and establishes a position, but focus is uneven. D: Addresses additional demands superficially.	Addresses prompt appropriately and maintains a clear, steady focus. Provides a generally convincing position. D: Addresses additional demands sufficiently	Addresses all aspects of prompt appropriately with a consistently strong focus and convincing position. D: Addresses additional demands with thoroughness and makes a connection to claim.
Controlling Idea	Attempts to establish a claim, but lacks a clear purpose.	Establishes a claim.	Establishes a credible claim.	Establishes and maintains a substantive and credible claim or proposal.
Reading/Research	Attempts to reference reading materials to develop response, but lacks connections or relevance to the purpose of the prompt.	Presents information from reading materials relevant to the purpose of the prompt with minor lapses in accuracy or completeness.	Accurately presents details from reading materials relevant to the purpose of the prompt to develop argument or claim.	Accurately and effectively presents important details from reading materials to develop argument or claim.
Development	Attempts to provide details in response to the prompt, but lacks sufficient development or relevance to the purpose of the prompt.	Presents appropriate details to support and develop the focus, controlling idea, or claim, with minor lapses in the reasoning, examples, or explanations.	Presents appropriate and sufficient details to support and develop the focus, controlling idea, or claim.	Presents thorough and detailed information to effectively support and develop the focus, controlling idea, or claim.
Organization	Attempts to organize ideas, but lacks control of structure.	Uses an appropriate organizational structure for development of reasoning and logic, with minor lapses in structure and/or coherence.	Maintains an appropriate organizational structure to address specific requirements of the prompt. Structure reveals the reasoning and logic of the argument.	Maintains an organizational structure that intentionally and effectively enhances the presentation of information as required by the specific prompt. Structure enhances development of the reasoning and logic of the argument.
Conventions	Attempts to demonstrate standard English conventions, but lacks cohesion and control of grammar, usage, and mechanics. Sources are used without citation.	Demonstrates an uneven command of standard English conventions and cohesion. Uses language and tone with some inaccurate, inappropriate, or uneven features. Inconsistently cites sources.	Demonstrates a command of standard English conventions and cohesion, with few errors. Response includes language and tone appropriate to the audience, purpose, and specific requirements of the prompt. Cites sources using appropriate format with only minor errors.	Demonstrates and maintains a well-developed command of standard English conventions and cohesion, with few errors. Response includes language and tone consistently appropriate to the audience, purpose, and specific requirements of the prompt. Consistently cites sources using appropriate format.
Content Understanding	Attempts to include disciplinary content in argument, but understanding of content is weak; content is irrelevant, inappropriate, or inaccurate.	Briefly notes disciplinary content relevant to the prompt; shows basic or uneven understanding of content; minor errors in explanation.	Accurately presents disciplinary content relevant to the prompt with sufficient explanations that demonstrate understanding.	Integrates relevant and accurate disciplinary content with thorough explanations that demonstrate in-depth understanding.

Background for Students

A very common debate in the field of energy generation, is what is the best source to generate energy? With science and technology improving, there are many ways that energy can be generated. In this task, you will make a claim about the best way to generate electricity by comparing the chemistry between two of three methods: nuclear, coal or natural gas.

Extension

Not provided

Section 2: What Skills?

Preparing for the Task

TASK ENGAGEMENT: Ability to connect the task and new content to existing knowledge, skills, experiences, interests, and concerns.

TASK ANALYSIS: Ability to understand and explain the task's prompt and rubric.

Reading Process

ACTIVE READING: Ability to identify the central point and main supporting elements of a text; ability to identify and analyze competing arguments; ability to make clarifying connections and/or provide examples.

ESSENTIAL VOCABULARY: Ability to identify and master terms essential to understanding a text.

ACADEMIC INTEGRITY: Ability to use and credit sources appropriately.

Writing Process I

CLAIM: Ability to establish a claim and consolidate information relevant to task.

Transition to Writing (Socratic Seminar)

PRE-SEMINAR PROCESS: Ability to reflect on personal communication habits and select appropriate speaking and listening goals.

SEMINAR: Ability to think critically and collaboratively in a group about concepts and ideas of a text through a structured Socratic seminar.

POST-SEMINAR PROCESS: Ability to self-assess on speaking and listening skills practiced in the seminar and note relevant communication goals for future discussions.

Writing Process II

CLAIM: Ability to establish a claim and consolidate information relevant to task.

COUNTERCLAIM: Ability to establish and attach a counterclaim to the claim in general and subclaim(s), and information relevant to task.

PLANNING: Ability to develop a line of thought and text structure appropriate to an argumentation task.

DEVELOPMENT: Ability to construct an initial draft with an emerging line of thought and structure; Ability to analyze competing arguments; Ability to make clarifying connections and/or provide examples.

REVISION: Ability to refine text, including line of thought, language usage, and tone as appropriate to audience and purpose.

EDITING: Ability to proofread and format a piece to make it more effective.

COMPLETION: Ability to submit final piece that meets expectations.

Section 3: What Instruction?

PACING	SKILL AND DEFINITION	PRODUCT AND PROMPT	SCORING GUIDE	INSTRUCTIONAL STRATEGIES
Preparing for the Task				
25 mins	<p>TASK ENGAGEMENT: Ability to connect the task and new content to existing knowledge, skills, experiences, interests, and concerns.</p>	<p>SEE, THINK, WONDER OF DISASTER PICTURES (SHORT RESPONSES ON POSTERS) Short writings around pictures on individual student sheets and then students have the opportunity to respond about "their" pictures as they are projected on the SMART Board.</p>	<ul style="list-style-type: none"> Completion 	<ul style="list-style-type: none"> Go around with students and discuss with them their comments in the See, Think, Wonder sections of each picture. <p>PACING: Day 1</p>
<p>Additional Attachments:</p> <p> Appendix 1: See, Think, Wonder Pictures</p>				
25 mins	<p>TASK ENGAGEMENT: Ability to connect the task and new content to existing knowledge, skills, experiences, interests, and concerns.</p>	<p>LOW STAKES SOCRATIC SEMINAR (RESPOND) Student responses and participation in the seminar.</p>	<ul style="list-style-type: none"> Evaluation of participation and contribution to discussion 	<ul style="list-style-type: none"> Ask students what they found interesting about the pictures and See, Think, Wonder Have students use 1 saw..., 1 thought../wondered... as sentence starters at each of the pictures. Push Socratic Seminar Protocols in order to establish ground rules for later use <p>PACING: Day 1</p>
25 mins	<p>TASK ANALYSIS: Ability to understand and explain the task's prompt and rubric.</p>	<p>RUBRIC AND TASK ANALYSIS (BULLETS) In your own words, what are the important features of a good response to this prompt?</p>	<ul style="list-style-type: none"> Students must have 5 of their own thoughts and then record at least 3 of their peers' thoughts 	<ul style="list-style-type: none"> Identify or invite students to identify key features of examples. Create a classroom list: Choose one student to share a few ideas on the board, and ask others to add to it. Share out for group thoughts to make more comprehensive list <p>PACING: Day 2</p>
<p>Additional Attachments:</p> <p> Appendix 2: Task Analysis and Calendar Review</p>				
25 mins	<p>TASK ANALYSIS: Ability to understand and explain the task's prompt and rubric.</p>	<p>CALENDAR REVIEW Students will be presented with a calendar of the unit and asked to annotate important dates.</p>	No Scoring	PACING: Day 2
<p>Additional Attachments:</p> <p> Appendix 2: Task Analysis and Calendar Review</p>				

Comparing the Chemistry Behind Electricity Generation

PACING	SKILL AND DEFINITION	PRODUCT AND PROMPT	SCORING GUIDE	INSTRUCTIONAL STRATEGIES
Reading Process				
3 hrs and 40 mins	<p>ACTIVE READING: Ability to identify the central point and main supporting elements of a text; ability to identify and analyze competing arguments; ability to make clarifying connections and/or provide examples.</p>	<p>SOAR PROTOCOL Students complete a close reading protocol that requires them to Skim to Set an Objective (SO), Annotate Actively (A) and Review and Reflect (R), for each article.</p> <ul style="list-style-type: none"> What competing arguments have you encountered or can you think of? What historical or current examples can you note that relate to the task prompt? 	<ul style="list-style-type: none"> Students will complete the three required readings outlined in the protocol for each of the six articles. The seventh article will be analyzed in a CER format 	<ul style="list-style-type: none"> One class period should be completely devoted to teaching the SOAR process if this is not something that is active at the institution Model active reading strategies and note taking using organizer for students Have students complete the graphic organizer as teacher is completing to develop a model for independent use later on <p>PACING: 4-5 class periods (Days 3-6)</p>
Additional Attachments:				
 Appendix 3: SOAR Protocol				
Not provided	<p>ESSENTIAL VOCABULARY: Ability to identify and master terms essential to understanding a text.</p>	<p>VOCABULARY LIST Students will be provided with an essential vocabulary list (i.e., a glossary that will assist them in their reading of the reading passages after the modeling is over.</p>	<p>SCORING (PRODUCT "MEETS EXPECTATIONS" IF IT...):</p> <ul style="list-style-type: none"> Lists appropriate phrases. Provides accurate definitions 	<ul style="list-style-type: none"> Ask some students to share definitions of terms they found difficult and had to look up on their own because they were not listed in the glossary. <p>PACING: Ongoing</p>
Additional Attachments:				
 Appendix 4: Vocabulary Support				
Not provided	<p>ACADEMIC INTEGRITY: Ability to use and credit sources appropriately.</p>	<p>DEFINITIONS AND STRATEGIES Define "plagiarism" and list ways to avoid it.</p>	<p>SCORING (PRODUCT "MEETS EXPECTATIONS" IF IT...):</p> <ul style="list-style-type: none"> Provides accurate definition. Lists several appropriate strategies. 	<ul style="list-style-type: none"> Discuss respect for others' work to assemble evidence and create texts. Discuss academic penalties for stealing others thoughts and words. Citation modeling provided at end of some texts, students are responsible for citing the other texts properly based on the modeling. <p>PACING: Ongoing</p>
Additional Attachments:				
 Appendix 5: Academic Integrity (Lesson Plan and Student Handout)				
Writing Process I				

Comparing the Chemistry Behind Electricity Generation

PACING	SKILL AND DEFINITION	PRODUCT AND PROMPT	SCORING GUIDE	INSTRUCTIONAL STRATEGIES
45 mins	CLAIM: Ability to establish a claim and consolidate information relevant to task.	OPENING PARAGRAPH Write an opening paragraph that includes a controlling idea and sequences the key points you plan to make in your composition.	SCORING (STUDENT “MEETS EXPECTATIONS” IF HE/SHE...): <ul style="list-style-type: none"> Writes a concise summary statement or draft opening Provides direct answer to main prompt requirements Establishes a controlling idea Identifies key points that support development of argument 	<ul style="list-style-type: none"> Use claim worksheet to address major required components of a claim Use a claim graphic organizer to establish overall claim and subclaims GO should have space next to each subclaim to address counterclaim <p>PACING: Day 7</p>
<p>Additional Attachments:</p> <p> Appendix 6: Claim Graphic Organizer</p>				
Transition to Writing (Socratic Seminar)				
45 mins	SEMINAR: Ability to think critically and collaboratively in a group about concepts and ideas of a text through a structured Socratic seminar.	SOCRATIC SEMINAR Students use what they learned about how to participate in a Socratic Seminar on day 1. Additionally, students will use the claim they established on day 5 as a frame of reference for their conversation.	<ul style="list-style-type: none"> Evaluation of participation and contribution to discussion 	<p>Three questions to drive discussion: Keeping the chemistry of each process in mind:</p> <ol style="list-style-type: none"> What are the benefits and drawbacks to coal-generated electricity? What are the benefits and drawbacks to natural gas-generated electricity? What are the benefits and drawbacks to nuclear-generated electricity? <p>Students will be asked at the end of the seminar to evaluate and, if necessary, re-write their claim.</p> <p>PACING: Day 8</p>
<p>Additional Attachments:</p> <p> Appendix 7: Socratic Seminar Notes</p>				
Writing Process II				

Comparing the Chemistry Behind Electricity Generation

PACING	SKILL AND DEFINITION	PRODUCT AND PROMPT	SCORING GUIDE	INSTRUCTIONAL STRATEGIES
45 mins	<p>CLAIM: Ability to establish a claim and consolidate information relevant to task.</p>	<p>OPENING PARAGRAPH If necessary, rewrite an opening paragraph that includes a controlling idea and sequences the key points you plan to make in your composition.</p>	<p>SCORING (STUDENT "MEETS EXPECTATIONS" IF HE/SHE...):</p> <ul style="list-style-type: none"> Writes a concise summary statement or draft opening. Provides direct answer to main prompt requirements. Establishes a controlling idea. Identifies key points that support development of argument 	<ul style="list-style-type: none"> Use claim worksheet to address major required components of a claim Use a claim graphic organizer to establish overall claim and subclaims GO should have space next to each subclaim to address counterclaim <p>PACING: Day 9</p>
<p>Additional Attachments:</p> <ul style="list-style-type: none">  Appendix 6: Claim Worksheet  Appendix 8: Counterclaim Worksheet 				
45 mins	<p>COUNTERCLAIM: Ability to establish and attach a counterclaim to the claim in general and subclaim(s), and information relevant to task.</p>	<p>OPENING PARAGRAPH Write an counterclaim paragraph that addresses the opposing point(s) of view and prepares reader to consider both sides.</p>	<p>SCORING (STUDENT "MEETS EXPECTATIONS" IF HE/SHE...):</p> <ul style="list-style-type: none"> Writes a concise summary statement of the counterclaim. Use key points from claim and finds a counterclaim to address each point Identifies key points that support development of opposing argument 	<ul style="list-style-type: none"> Teach/review concept of counterclaim Go over examples of counterclaim for students Using the claim organizer, for each subclaim, students should integrate a counterclaim into the worksheet in the space provided Students should be able to list a counter for each subclaim by the end of the class Inform students that the counterclaim for each subclaim needs to be addressed in the same paragraph <p>PACING: Day 10</p>
<p>Additional Attachments:</p> <ul style="list-style-type: none">  Appendix 8: Counterclaim worksheet 				

Comparing the Chemistry Behind Electricity Generation

PACING	SKILL AND DEFINITION	PRODUCT AND PROMPT	SCORING GUIDE	INSTRUCTIONAL STRATEGIES
45 mins	<p>PLANNING: Ability to develop a line of thought and text structure appropriate to an argumentation task.</p>	<p>OUTLINE/ORGANIZER</p> <p>Create an outline based on your notes and I reading in which you state your claim, sequence your points, and note your supporting evidence.</p> <ul style="list-style-type: none"> ● Include competing argument(s). ● Include 2 example(s) of historical or current connections to topic/issue. 	<p>SCORING (PRODUCT "MEETS EXPECTATIONS" IF IT...):</p> <ul style="list-style-type: none"> ● Creates an outline or organizer. ● Supports opening claim. ● Uses evidence from texts read earlier. ● Identifies competing argument(s). ● Provides appropriate number of sound connections. 	<ul style="list-style-type: none"> ● Provide and teach an outline examples. ● Give students free time to plan their essay in the outline format ● Have paired students review each other's outlines and provide feedback. <p>PACING: Day 11</p>
<p>Additional Attachments:</p> <p> Appendix 9: Outline</p>				
1 hr and 30 mins	<p>DEVELOPMENT:</p> <p>Ability to construct an initial draft with an emerging line of thought and structure; Ability to analyze competing arguments; Ability to make clarifying connections and/or provide examples.</p>	<p>INITIAL DRAFT</p> <p>Write an initial draft complete with opening, development, and dosing; insert and cite textual evidence.</p> <ul style="list-style-type: none"> ● Identify competing arguments). ● Provide appropriate number of sound connections. 	<p>SCORING (PRODUCT "MEETS EXPECTATIONS" IF IT...):</p> <ul style="list-style-type: none"> ● Provides complete draft with all parts. ● Supports the opening in the later sections with evidence and citations. 	<ul style="list-style-type: none"> ● Encourage students to re-read prompt partway through writing, to check that they are on track. ● Using Doctopus, teacher will have access to all writings on GoogleDocs and will have the ability to make comments, suggestions, and question student writing as they are in progress. <p>PACING: Days 12-13</p>

Comparing the Chemistry Behind Electricity Generation

PACING	SKILL AND DEFINITION	PRODUCT AND PROMPT	SCORING GUIDE	INSTRUCTIONAL STRATEGIES
45 mins	REVISION: Ability to refine text, including line of thought, language usage, and tone as appropriate to audience and purpose.	MULTIPLE DRAFTS Refine composition's analysis, logic, and organization of ideas/points. Use textual evidence carefully, with accurate citations. Decide what to include and what not to include.	SCORING (PRODUCT "MEETS EXPECTATIONS" IF IT...): <ul style="list-style-type: none"> Provides complete draft with all parts. Supports the opening in the later sections with evidence and citations. Improves earlier edition. Provides draft free from distracting surface errors. Uses format that supports purpose. 	<ul style="list-style-type: none"> Teacher review of drafts using Doctopus. Additionally, teacher will assess the assignment using the LDC rubric to give students feedback on their progress. GoogleDocs will allow in-text comments to address specific concerns. Teacher will notify students that changes are suggested on first instance of error, but should be addressed throughout the paper. Teacher will provide sample pieces of writing (not from this assignment) and have students assess the writing on the categories in the LDC rubric. Students will be engaged in a minitask on how to use a rubric properly. After minitask is complete, students can share a partner on their paper and assess their partner's paper against the LDC rubric. <p>PACING: Day 14</p>
45 mins	EDITING: Ability to proofread and format a piece to make it more effective.	CORRECTED DRAFT Revise draft to have sound spelling, capitalization, punctuation, and grammar. Adjust formatting as needed to provide clear, appealing text	SCORING (PRODUCT "MEETS EXPECTATIONS" IF IT...): <ul style="list-style-type: none"> Provides complete draft with all parts. Supports the opening in the later sections with evidence and citations. Improves earlier edition. Provides draft free from distracting surface errors. Uses format that supports purpose. 	<ul style="list-style-type: none"> Teacher review of drafts using Doctopus. Additionally, teacher will assess the assignment using the LDC rubric to give students feedback on their progress. GoogleDocs will allow in-text comments to address specific concerns. Teacher will notify students that changes are suggested on first instance of error, but should be addressed throughout the paper. Teacher will provide sample pieces of writing (not from this assignment) and have students assess the writing on the categories in the LDC rubric. Students will be engaged in a minitask on how to use a rubric properly. After minitask is complete, students can share a partner on their paper and assess their partner's paper against the LDC rubric. <p>PACING: Day 15</p>
1 hr and 30 mins	COMPLETION: Ability to submit final piece that meets expectations.	FINAL DRAFT Turn in your final drafts, plus the final version of your piece.	SCORING (PRODUCT "MEETS EXPECTATIONS" IF IT...): <ul style="list-style-type: none"> Fits the "Meets Expectations" category in the rubric for the teaching task. 	<ul style="list-style-type: none"> Final Drafts will be graded using Goobric in conjunction with Doctopus. All drafts will be locked on day 17 at 8:00PM to prevent student manipulation after the deadline; permissions will be re-granted after assessment is complete. If the unit is started on a Monday, day 17 will occur on a Sunday, affording students opportunity outside of class to complete the assignment. <p>PACING: Days 16-17 (in and outside of class)</p>

Instructional Resources

No resources specified

Section 4: What Results?

Student Work Samples

Meets Expectations

 **Large collection of scored student work (includes some mini-tasks)**

Teacher Reflection

The following programs were used:

- Management Scripts
- Doctopus V3.0.2
- Goobric