

Unpacking Standards into Outcomes

4th Grade Science and Spanish Language Arts

Unit 3: Our Quest for Energy

Science Content Standards

4-ESS3-1 Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment. [Clarification Statement: Examples of renewable energy resources could include wind energy, water behind dams, and sunlight; non-renewable energy resources are fossil fuels and fissile materials. Examples of environmental effects could include loss of habitat due to dams, loss of habitat due to surface mining, and air pollution from burning of fossil fuels.]	
What does it mean?	What is it not?
- Students obtaining and combining information from books and other reliable media to explain phenomena (though a variety of texts and media can be provided to students) - Students using information they obtain and combine to describe where energy and fuels are derived from. - Students describe that energy and fuels are derived from natural resources. - Students describe that some natural resources are renewable over time, others are not. - Students describe various types of renewable resources humans use for fuel and energy. - Students describe various types of non-renewable resources humans use for fuel and energy. - Students describe that the energy and fuels humans derive from natural resources affect the environment. - Students describe various (negative) effects on the environment from humans using renewable and non-renewable sources for energy and fuel.	Expectations in previous and later grades: - Living things need water, air, and resources from the land, and they live in places that have the things they need (Kinder). - Humans use natural resources for everything they do (Kinder). - Resources are distributed unevenly around the planet as a result of past geologic processes (Middle school). - Resource availability has guided the development of human society and use of natural resources has associated costs, risks, and benefits (high school). For this standard in 4th grade: - Only identifying the types of natural resources - Only identifying the types of natural resources from which humans derive energy and fuels. - Telling students (vs students obtaining and combining information via inquiry from books and other reliable media).
Content obligatory language students will need: - Obtain - Combine - Describe - Energy (wind, water, sun) - Fuels (Fossil fuel, biofuel) - Derived - Natural Resources (renewable and non-renewable) - Affect (positively and negatively impact/effect) - Environment (habitats, ecosystems)	

Outcomes: Students will be able to...

- Identify examples of natural resources.
- Identify examples of energy and fuels that come from natural resources.
- Identify examples of renewable energy sources.
- Identify examples of non-renewable energy sources.
- Describe examples of renewable energy sources.
- Describe examples of non-renewable energy sources.
- Describe the uses of energy and fuels that come from natural resources: renewable and non-renewable.
- Gather related information from the text (digital and print) on the uses of energy and fuels that come from natural resources.
- Combine related information from various sources (digital and print) on the uses of energy and fuels that come from natural resources.
- Describe the environmental effects of renewable energy sources.
- Describe the environmental effects of non-renewable energy sources.
- Gather related information from the text (digital and print) on the environmental effects of energy and fuels that come from natural resources.
- Combine related information from various sources (digital and print) on the environmental effects of energy and fuels that come from natural resources.
- Describe the environmental effects of renewable energy sources in the local community.
- Describe the environmental effects of non-renewable energy sources in the local community.
- Gather related information from the text (digital and print) on the environmental effects of energy and fuels that come from natural resources in the local community and other US states.
- Combine related information from various sources (digital and print) on the environmental effects of energy and fuels that come from natural resources in the local community and other US states.
- Present information on the uses and the environmental effects of energy and fuels that come from natural resources.

3-5 ETS1-1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

What does it mean?	What is it not?
• Students observe and/or learn about simple design problems that reflect the desire to reduce reliance on non-renewable energy for human use (as examples) • Students think of a need or want (reduce the reliance on non-renewable energy). • Students define a simple design problem reflecting the need or want (development of a new system that uses renewable energy) • Students define the limits the problem will address (addressing something people want in current time with current available technology and resources) • Students specify (and agree upon) the criteria for success, including constraints on materials, cost, and/or time.	• Teacher identifies the design problem that reflects the need or want (without student input) • Teacher defines the limits the problem will address (without student input) • The teacher specifies the criteria for success (without student input) • The design problem reflects a need or want not associated with deriving energy or fuel for human use

Students describe the problem they will address, the need or want it will address, and the criteria for success	
Content obligatory language students need: - Define - Simple design problem - Specified criteria for success - Constraints - Materials - Time - Cost	
Outcomes: Students will be able to... - Use related information from text (digital and print) and experiences on the uses and the environmental effects of energy and fuels that come from natural resources. - Use given scientific information and information about a situation or phenomenon to define a simple design problem that includes responding to a need or want (reduce the reliance on non-renewable energy). - Define a problem that can be solved with the development of a new system (source of renewable energy). - Define the limits within which the problem will be addressed, which includes addressing something people want and need at the current time. - Based on the situation people want to change, specify the criteria (required features) of a successful solution. - Describe the constraints or limitations on their system location.	

3-5 ETS1-2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.	
What does it mean?	What is it not?
- Students observe and/or learn about examples solutions to simple design problems that reflect the desire to reduce reliance on non-renewable energy for human use (as examples) - Students generate possible solutions to the simple design problems they identified (development of a new system that reduces reliance on non-renewable energy for human use) - Students explain how the possible solutions they identified address the problem - Students compare the possible solutions (weighing pros and cons) - Comparison of solutions includes how likely each solution is likely to meet the criteria and constraints of the problem	- Teacher offering solutions to the problem and students selecting and defending one - Students only identifying one possible solution, without comparing it to others and/or ignoring the criteria for success or constraints of the problem (for example, proposing a solution that is fictitious or unable to be applied in the given location) - Analyzing only one solution - Students working independently to generate and compare solutions - Suggesting solutions outside of the criteria or constraints of the problem - Guessing rather than using data or evidence for the proposed solution

Content obligatory language students need...

- Generate
- Compare
- Possible Solution
- Problem
- Likely to meet the criteria and constraints

Outcomes: Students will be able to:

- Use grade-appropriate information from research about a given problem, including the causes and effects of the problem and relevant scientific information.
- Generate at least two possible solutions to the problem based on scientific information and understanding of the problem.
- Specify how each design solution (location of system) solves the problem.
- Share ideas and findings with others about design solutions (location of system) to generate a variety of possible solutions.
- Describe the necessary steps for designing a solution to a problem, including conducting research and communicating with others throughout the design process to improve the design [note: emphasis is on what is necessary for designing solutions, not on a step-by-step process].
- Describe how the criteria and constraints will be used to generate and test the design solutions (location of system).
- Use the collected data to identify similarities and differences in solutions based on how well each solution meets the criteria and constraints of the problem.

Reading

RI 4.1 Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.

What does it mean?	What is it not?
• Students explain what the text says explicitly by referring to details and examples within the text • Students draw inferences from the text using details and examples from the text • Referring to details when explaining what they text says explicitly may involve pointing, matching, and/or speaking	Expectations in previous and later grades: • Only asking and answering questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers (3.1) • Quoting accurately from a text when explaining what the text says explicitly and when drawing inferences from the text (5.1) For this standard in 4th grade: • Relying on background knowledge or information outside of the text to explain what the text says • Relying on background knowledge or information outside of the text when drawing inferences from the text • Summarizing the text • The teacher telling students what the text says • The teacher sharing inferences about the text

Content obligatory language students need: • Refer • Details • Examples • Text • Explaining • Explicitly • Drawing inferences
Outcomes: Students will be able to... • Identify what a text says explicitly. • Identify inferences that can be drawn from a text. • Distinguish between what the text says explicitly, and inferences drawn from the text. • Identify details and examples in a text that support the analysis of an informational text. • Explain what the text says explicitly, using details and examples from the text • Draw inferences from the text by referring to details and examples from the text • Explain analysis of, and inferences, conclusions, predictions, and generalizations made from a text by referring to appropriate details and examples.

RI.4.3 Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.	
What does it mean? • Distinguish between events, procedures, ideas, or concepts in a text • Distinguish between a historical, scientific, or technical text • Use specific information from the text to explain the events, procedures, ideas, OR concepts (focusing on one at a time; text usually only focuses on one) • Explain the events, procedures, ideas, OR concepts in the text using specific information from the text may involve pointing, matching, and/or speaking	What is it not? Expectations in previous and later grades: • Only describing the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect (3.3) • Explaining the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text (5.3) For this standard in 4th grade: • Using background knowledge or information not in the text to summarize what the text was about or provide information about the general topic of the text •
Content obligatory language students need: • Explain • Events • Procedures • Ideas • Concepts • Historical	

- Scientific
- Technical
- Specific information

Outcomes: Students will be able to:

- Identify events in a text
- Identify procedure in a text
- Identify ideas in a text
- Identify concepts in a text
- Identify the difference between events, procedures, ideas, or concepts in a text
- Refer to details and examples in a text about renewable and non-renewable energy sources to describe events, procedures, ideas, or concepts.
- Explain what a text says explicitly about the events, procedures, ideas, or concepts in the text (including what happened and why).
- Refer to details and examples in a text about renewable and non-renewable energy sources when explaining what the text says explicitly (including what happened and why) about the events, procedures, ideas, or concepts in the text.
- Make inferences about what a text about renewable and non-renewable energy sources says to explain events, procedures, ideas, or concepts (including what happened and why).
- Refer to details and examples in a text about renewable and non-renewable energy sources when making inferences to explain the events, procedures, ideas, or concepts of the text.

RI.4.4 Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.

What does it mean?	What is it not?
• Using sources and strategies to determine the meaning of words (general academic and domain-specific) in a text • Using a text about energy and fuels that are derived from natural resources and how their uses affect the environment.	Expectations in previous and later grades: • Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a <i>grade 3 or grade 5 topic or subject area (i.e., as defined by the content standards for those grades)</i>. For this standard in 4th grade: • The teacher selecting and defining words for students • Always using the same strategy or source, such a dictionary, to determine the meaning of words in a text • Reading the definition of a word, but not being able to understand what the word means in context

Content obligatory language students need:

- Determine
- Meaning
- General academic words or phrases
- Domain-specific words or phrases
- Relevant

Outcomes: Students will be able to:

- Identify domain-specific word(s) in a text about renewable and non-renewable energy sources.
- Identify general academic word(s) in a text about renewable and non-renewable energy sources
- Describe the meaning of domain-specific word(s) in a text about renewable and non-renewable energy sources using details and examples from the text
- Describe the meaning of general academic word(s) in a text about renewable and non-renewable energy sources using details and examples from the text
- Determine the meaning of general academic phrases in texts about renewable and non-renewable energy sources, referring to examples and details in the text

Determine the meaning of domain-specific phrases in texts about renewable and non-renewable energy sources, referring to examples and details in the text

RI.4.7 Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.

What does it mean?	What is it not?
• Identify various ways information is presented in a text • Interpret information from multiple text features in the same text • Explain how the information in a text (from different text features) goes together	Expectations in previous and later grades: • Only using information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur) (3.7) • Drawing on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently (5.7) For this standard in 4th grade: • Analyzing or interpreting only one specific text feature in a text for information

Content obligatory language students need:

- Interpret
- Information presented visually, orally, or quantitatively
- Charts, graphs, diagrams, timelines, animations, interactive elements on webpages
- Explain
- Contributes to an understanding of the text

Outcomes: Students will be able to....

- Identify visually presented information in a text about renewable and non-renewable energy sources.
- Identify quantitatively presented information in a text about renewable and non-renewable energy sources.
- Identify orally presented information from a video or class discussion about renewable and non-renewable energy sources.
- Name visually and quantitatively presented information in a text about renewable and non-renewable energy sources (e.g., chart, graph, diagrams, timeline, animation, or interactive elements on Web pages)
- Identify how information from graphs, charts, diagrams, timelines, etc. contributes to an understanding of the text
- Use information from charts, diagrams, graphs, timelines, animations, and interactive elements to explain what the text says explicitly.

- Use information from charts, diagrams, graphs, timelines, animations, and interactive elements to make inferences from a text.
- Explain how the information from graphs, charts, diagrams, timelines, etc. helps the reader understand text.

RI 4.10 By the end of year, read and comprehend informational texts, including history/social studies, science, and technical texts, in the grades 4-5 text complexity band proficiently, with scaffolding as needed at the high end of the range.

What does it mean?	What is it not?
• Students read texts in the grade 4-5 text complexity band (with scaffolding as needed) • Students have experience with various types of texts, in this unit, texts that relate to the science standards about energy and fuels that are derived from natural resources and how their uses affect the environment. • Students have experience with texts that include various text features • Using strategies and supports as scaffolding so students can access grade level texts	• Students only reading “books on their level” • Students reading fiction texts • Students reading text not related to the content of this unit • Students (especially those identified as language learners) being expected to read a grade level text without scaffolding
Content obligatory language students need in English: • Read • Comprehend • Informational texts • Proficiently	
Outcomes: Students will be able to: • Listen to books read aloud at the 4-5 text complexity band. • Engage in partner reading with texts (print and digital) at the high end of the grades 4-5 text complexity band. • Engage in small group reading with texts (print and digital) at the high end of the grades 4-5 text complexity band. • Read independently with texts (print and digital) at the high end of the grades 4-5 text complexity band. • Articulate their understanding of the text in multiple ways (orally, in writing, with pictures) as they listen to books, engage in partner reading, small group reading, and reading independently with books at the high end of the grades 4-5 text complexity band.	

W.4.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. W.4.9B Apply grade 4 Reading standards to informational texts (e.g., "Explain how an author uses reasons and evidence to support particular points in a text").	
What does it mean?	What is it not?
- Students write an explanation of what the text says, citing details from the text (4.1) - Students write an inference they made about the text, citing details in the text (4.1) - Students write an explanation of the events, procedures, ideas, OR concepts in the text, citing specific information from the text (4.3) - Students writing the meaning of a word or phrase found in a text (4.4) - Students writing their interpretation of information presented visually, orally, or quantitatively (4.7) - Students writing an explanation of how information from charts, graphs, diagrams, timelines, etc., works together and supports understanding a text (4.7)	- Students copying what the teacher writes - Students summarizing or retelling a text in writing
Content obligatory language students need: - Draw evidence - Literary/Information texts - Support analysis, reflection, and research	
Outcomes: Students will be able to: - Identify key ideas and details to support conclusions. - Identify the author's main idea, central message, or theme. - Cite textual evidence to analyze the explicit information presented in a text. - Draw evidence as support for research. - Use evidence from informational texts about renewable and non-renewable energy sources to support analysis, reflection, and research about the renewable and non-renewable energy sources, the impact of their use on the environment, and how realistic the goal is to be 100% carbon free by 2050.	

Writing

W.4.1 Write opinion pieces on topics or texts, supporting a point of view with reasons and information. - Introduce a topic or text clearly, state an opinion, and create an organizational structure in which related ideas are grouped to support the writer's purpose. - Provide reasons that are supported by facts and details. - Link opinion and reasons using words and phrases (e.g., for instance, in order to, in addition). - Provide a concluding statement or section related to the opinion presented.	
What does it mean?	What is it not?

- Students writing THEIR opinion about a topic (<i>Should the United States try to be 100% carbon-free by the year 2050 by relying on clean energy such as renewable energy, nuclear energy, or waste?</i>) - Students supporting their opinion about the topic with reasons - Students using information (facts and details) about the topic to support their reasons and opinion about the topic - Using an organizational structure to group related ideas and support their opinion - Including a concluding statement or section (at the end) that is related to the opinion presented	In previous and subsequent grades: - Only writing opinion pieces on topics or texts, supporting a point of view with reasons (3.1) - Provide logically ordered reasons that are supported by facts and details (5.1 b) - Link opinion and reasons using clauses (e.g., consequently, specifically) (5.1 c) For this standard in 4th grade: - Students copying what the teacher writes - Students sharing their opinion without reasons, facts, or details - A list of facts
Content obligatory language students need: - Opinion - Topic - Point of view - Reasons - Information - Introduce a topic - Organizational structure - Related ideas - Grouped together to support the writer's purpose - Reasons that are supported by facts and details - Link opinion and reasons - Concluding statement or section	
Outcomes Students will be able to... W.4.1A - Identify the author's purpose - Identify an organizational structure that provides logical grouping for the intended purpose - Formulate an opinion - Generate/identify support that includes facts and details - Sort evidence and supporting details - Draft an introduction that establishes the focus with a topic sentence about the topic, states a point of view or opinion, and addresses an audience and the writing purpose. - Introduce a topic clearly, state an opinion, and create an organizational structure in which related ideas are grouped in order to write an opinion essay to respond the question: <i>Should the United States try to be 100% carbon-free by the year 2050 by relying on clean energy such as renewable energy, nuclear energy, or waste?</i> W.4.1B - Distinguish between opinions and reasons - Differentiate facts or reasons from opinion(s) and select facts and/or details that support reasons - Draft the body to support an opinion or point of view through effective organization of reasons - Establish the focus of each paragraph with a topic sentence - Organize paragraphs with structure (e.g., list, cause/effect, order of importance) - Provide reasons for the author's response to whether the US should be 100% carbon-free by 2050 that are supported by facts and details.	

W.4.1C

- Apply academic vocabulary/domain specific vocabulary to express relationship/ideas correctly
- Establish links between opinions and reasons using words, phrases, and clauses
- Choose words and phrases for effect
- Link an opinion about whether the US should be 100% carbon-free by 2050 and reasons using words, phrases, and clauses (e.g., for instance, in order to, in addition)

W.5.1D

- Draft a conclusion that paraphrases the opinion or point of view
- Revise to ensure a clear statement of opinion supported by a list of reasons
- Provide a concluding statement or section related to the opinion presented about whether the US should be 100% carbon-free by 2050

W.4.4 Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.

What does it mean?	What is it not?
• Students identify and describe the writing task • Students identify the purpose for writing and completing the task • Students determine the audience for the writing, and how that influences its development and organization • Students select an organizational structure for the writing task • Students produce writing that is clear and coherent and accomplished the identified task	• Students copying the teacher's writing • Students writing to complete a task assigned by the teacher without input • Producing writing that does not meet the 4th grade writing standards

Content obligatory language students need in English:

- Development
- Organization
- Task
- Purpose
- Audience

Outcomes

Students will be able to...

- Identify a purpose for writing an opinion essay
- Describe the writing task
- Identify the audience for which the opinion essay will be written
- Describe how the opinion essay will be tailored for the intended audience (e.g., a local government official)
- Use an organizational structure that is appropriate for brainstorming and organizing information for their opinion essay
- Produce a clear and coherent opinion essay about whether the US can be 100% carbon-free by 2050 in which the development and organization are appropriate to task, purpose, and audience.

W.4.6 With some guidance and support from adults, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of one page in a single sitting.	
What does it mean?	What is it not?
• Use technology to produce writing (type vs hand-write) • Use technology to publish writing (either print or publish virtually) • Use technology to interact and collaborate with other (as a way to provide feedback and revise writing; as a way to collaboratively gather and organize information if a group project) • Provide opportunities to build students' stamina and skills so they can type a minimum of one page in a single setting	Expectations in previous and subsequent grades: • Only With guidance and support from adults, use technology to produce and publish writing (using keyboarding skills) as well as to interact and collaborate with others. (3.6) • demonstrate sufficient command of keyboarding skills to type a minimum of two pages in a single sitting (5.6) For this standard In 4th grade: • The teacher typing text for students • Students only hand-writing their notes and opinion pieces
Content obligatory language students need: • Technology • Internet • Produce and publish writing • Interact and collaborate with others • Demonstrate • Command of keyboarding skills	
Outcomes: Students will be able to.... • Use technology (digital tools, including the Internet) to produce their opinion essay • Use technology (digital tools, including the Internet) to publish their opinion essay • Demonstrate keyboarding skills to type one page in a single sitting • Use technology (digital tools) to interact/collaborate with others in the production of their opinion letter (e.g., Google docs) • With some guidance and support from adults, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of one page in a single sitting.	

W.4.8 Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information and provide a list of sources.	
What does it mean?	What is it not?
• Write relevant information from experiences and print and digital sources about energy and fuels that are derived from natural resources and how their uses affect the environment • Take notes about energy and fuels that are derived from natural resources and how their uses affect the environment.	Expectations in previous and subsequent grades: • Only Recalling information (rather than <u>relevant</u> information) from experiences or gather information from print and digital sources (3.8) • Only taking brief notes on sources (3.8) • Sorting evidence into provided categories (3.8) • Summarizing or paraphrasing information in notes and finished work (5.8)

• Categorize and organize information about energy and fuels that are derived from natural resources and how their uses affect the environment, where students come up with the categories • List the source(s) used to obtain details and examples	For this standard in 4th grade: • Summarizing information • Copying information from texts
Content obligatory language students need: • Recall • Relevant information • Gather • Take notes • Categorize information • List of sources	
Outcomes: Students will be able to: • Identify experiences that provide information relevant to renewable and non-renewable energy sources. • Recall information from experiences relevant to renewable and non-renewable energy sources. • Identify print and digital resources relevant to renewable and non-renewable energy sources. • Recall information from experiences relevant to renewable and non-renewable energy sources. • Record information from print and digital resources relevant to renewable and non-renewable energy sources. • Gather and sort information from print and digital sources. • Record print and digital resources relevant to renewable and non-renewable energy sources for citation. • Organize the information gathered throughout the unit into their own words to embed into writing • Use information gathered throughout the unit as evidence or reasons to support their points in their opinion essay • Provide a list of sources consulted for research	

W.4.10 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 discipline-specific tasks, purposes, and audiences.	
What does it mean?	What is it not?
• Writing for multiple purposes throughout the unit (to support research, to remember relevant information from experiences, to describe new learning from experiments) • Write frequently/routinely throughout the unit • Write for short and extended time frames (depending on the task) • Write for different purposes and audiences (identifying each every time engaged in writing)	• Waiting until the end of the unit to engage in writing • Only writing for one specific purpose throughout the unit

Content obligatory language students need in English:

- Write for research, reflection, and revision
- Range of discipline-specific tasks, purposes, and audiences

Outcomes: Students will be able to....

- Engage in writing over shorter time frames during the unit.
- Engage in writing for a range of discipline-specific tasks/purposes.
- Engage in writing for a range of audiences.
- Use the information in their notes from the unit investigations to write an opinion essay.