

# Grade 10 Informational Mini-Assessment

## “Nowhere to Go”

This grade 10 mini-assessment is based on an article about nuclear power plants. This text is considered to be worthy of students’ time to read and also meets the expectations for text complexity at grade 10. Assessments aligned to the Common Core State Standards (CCSS) will employ quality, complex texts such as these.

Questions aligned to the CCSS should be worthy of students’ time to answer and therefore do not focus on minor points of the text. Questions also may address several standards within the same question because complex texts tend to yield rich assessment questions that call for deep analysis. In this mini-assessment there are nine selected-response questions and one technology enhanced item that address the Reading Standards listed below. Additionally, there is an optional writing prompt, which is aligned to both the Reading Standards and the Writing Standards.

We encourage educators to give students the time that they need to read closely and write to the source. While we know that it is helpful to have students complete the mini-assessment in one class period, we encourage educators to allow additional time as is necessary.

### The questions align to the following standards:

RI.9–10.1	Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
RI.9–10.3	Analyze how the author unfolds an analysis or series of ideas or events, including the order in which the points are made, how they are introduced and developed, and the connections that are drawn between them.
RI.9–10.4	Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language of a court opinion differs from that of a newspaper).
RI.9–10.5	Analyze in detail how an author's ideas or claims are developed and refined by particular sentences, paragraphs, or larger portions of a text (e.g., a section or chapter).
RI.9–10.6	Determine an author's point of view or purpose in a text and analyze how an author uses rhetoric to advance that point of view or purpose.
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.9–10.3	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
RST.9–10.5	Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., <i>force</i> , <i>friction</i> , <i>reaction force</i> , <i>energy</i> )
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.
W. 9–10.1	Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.
W. 9–10.9	Draw evidence from literary or informational texts to support analysis, reflection, and research.

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The assessment questions in this document align with the CCSS and reflect the instructional shifts implied by the standards. To learn more about these topics, please go to the following link:

[www.achievethecore.org](http://www.achievethecore.org)

## Grade 10 Mini-Assessment – “Nowhere to Go”

Today you will read an article about radioactive waste generated by nuclear power plants. You will then answer several questions based on this article. I will be happy to answer questions about the directions, but I will not help you with the answers to any questions. You will notice as you answer the questions that some of the questions have two parts. You should answer Part A of the question before you answer Part B.

Take as long as you need to read and answer the questions. If you do not finish when class ends, come see me to discuss the ways you may have additional time.

Now read the passage and answer the questions. I encourage you to write notes in the margin as you read the passages.

# NOWHERE TO GO

## *What will we do with radioactive waste?*

Nuclear power plants produce about one-fifth of the United States’ electricity. They also produce tons of highly radioactive<sup>1</sup> waste that has nowhere to go.



### SPLITTING ATOMS

- 1 Radioactive uranium fuels the United States’ 100 commercial nuclear reactors. Fingertip-sized pellets fill long tubes, which go together in groups called fuel assemblies. Inside the reactor, nuclear fission splits a form of uranium called U-235.
- 2 When a neutron strikes a U-235 atom just right, the nucleus<sup>2</sup> becomes unstable. The nucleus splits and forms other elements, such as barium and krypton. Fission also releases radioactive particles, extra neutrons, and lots of energy. As the neutrons strike more atoms, the process becomes a chain reaction. Fission’s energy is converted to electricity via heat, water, and steam.

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<sup>1</sup> Radioactive: relating to certain elements or isotopes that spontaneously emit various particles or energy, called radiation

<sup>2</sup> Nucleus: In physics, the core of an atom with positively charged particles called protons and neutral-charge particles called neutrons



### OUT WITH THE OLD

- 3 After five or six years, fuel assemblies need replacing. Old ones containing fission's byproducts come out, along with non-fissionable uranium-238.
- 4 "The industry generates about 2,300 metric tons of used fuel a year," says former nuclear reactor operator Tom Kauffman at the Nuclear Energy Institute, an industry organization. All the commercial reactor waste since the 1950s "would sit on a single football field just 21 feet high," he adds.

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<sup>3</sup> Radioactive decay: The process by which certain radioactive atoms change and emit particles to become different elements



- 5 While the volume is relatively small, spent fuel stays highly radioactive for a long time. "It's concentrated lethality," says Kevin Kamps at the Sierra Club's Beyond Nuclear program. Dangers include radiation sickness, cancers, and other health problems. High-level radioactive waste can present hazards "for a million years or more," Kamps says.

### POOLS AND CASKS

- 6 Fuel assemblies are incredibly hot when they come out of the reactor. "They're releasing so much radioactivity that they're very hot thermally," explains nuclear engineer David Lochbaum at the Union of Concerned Scientists (UCS).
- 7 To cool them, workers move used fuel assemblies to deep water, called a spent fuel pool. Water works as a shield from some radioactive decay<sup>3</sup> products too.
- 8 "After five years, there's been enough cooling of the spent fuel that it can be

transferred from the spent fuel pools into dry storage,” says Lochbaum. Dry storage casks are like giant thermoses. Spent fuel goes into large steel tubes about 20 feet tall. Added layers of steel, concrete, or other materials enclose the tube to shield people from radiation. Once waste is in dry storage, air circulation provides any necessary cooling

- 9 So far, about 75 percent of spent fuel still sits in pools. UCS wants waste moved into dry storage more quickly. “The pools are more vulnerable” to natural disasters and other hazards, says Lochbaum.
- 10 The Nuclear Regulatory Commission (NRC) disagrees. “We say that the waste can be stored safely in pool or cask, and that any safety benefit from moving it into the cask is relatively small,” says NRC spokesperson David McIntyre. Plant operators decide when to move the waste.

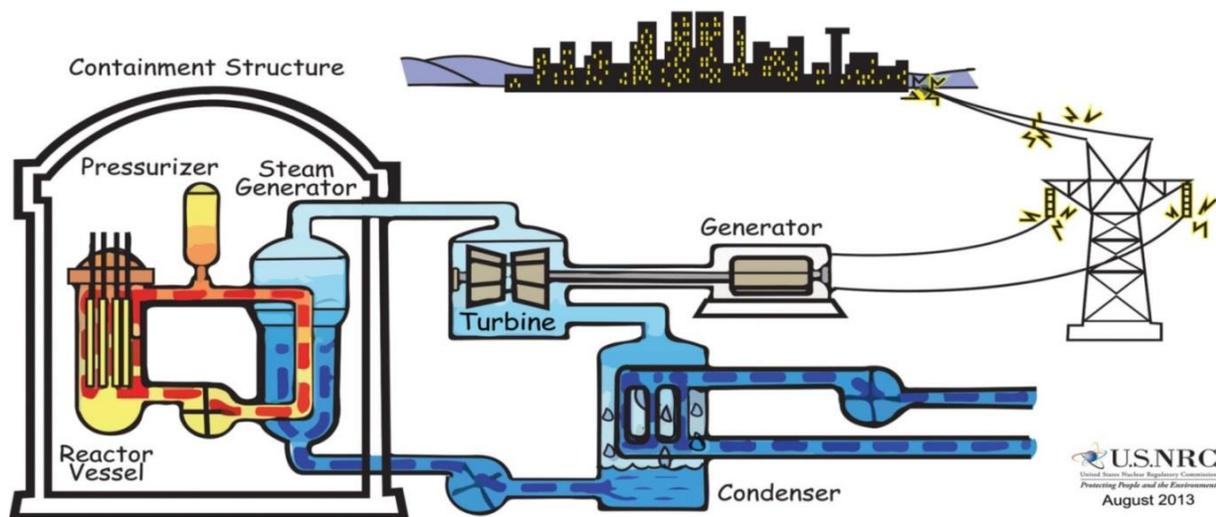
### Nuclear Energy: YES or NO?

Proponents of nuclear energy say the U.S. needs it to meet about 20 percent of its current energy needs. Also, nuclear energy is reliable, “always on” power, and it produces no carbon dioxide or other greenhouse gas emissions.

Critics worry about the potential for danger if certain accidents occur, plus the fact that high-level radioactive waste has nowhere to go. Additionally, nuclear power plants have high fixed costs compared to other types of energy, including renewables.

Pros	Cons
About 20% of U.S. energy needs depend on it	High risk if certain accidents occur
No greenhouse gas emissions	Nowhere for waste to go
Reliable, “always on “ power supply	High fixed costs of operation

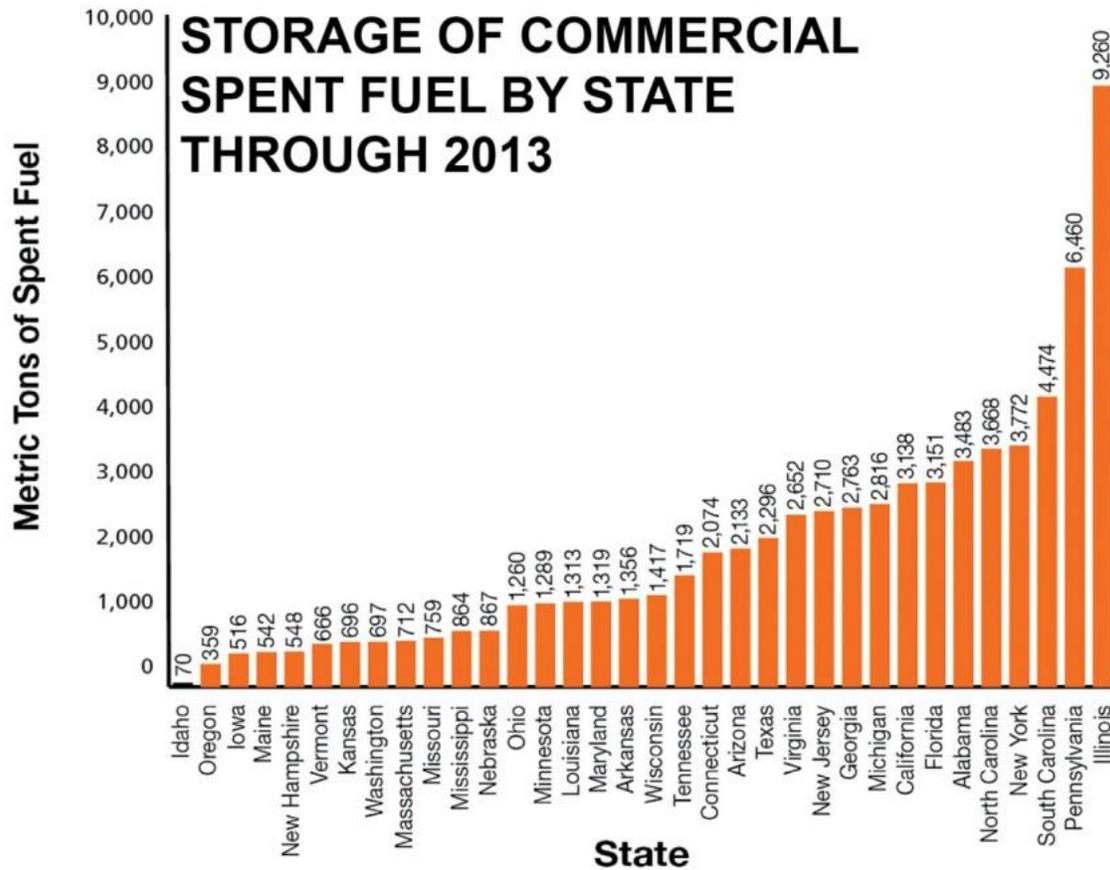
### The Pressurized-Water Reactor (PWR)



U.S.NRC  
United States Nuclear Regulatory Commission  
Protecting People and the Environment  
August 2013

### How Energy Gets from the Nuclear Reactor to You

**Nuclear fission in a pressurized reactor releases energy as heat.** Circulating water inside the reactor carries excess heat energy away from the reactor core. Pipes transfer some of that heat to other water, which boils and produces steam. The steam turns a turbine, and a generator converts that mechanical energy into electricity. The electric grid can then deliver it to homes, schools, and



### SITTING AND SITTING

- 11 Under federal law, the U.S. government was supposed to start taking spent fuel waste to a permanent disposal site in 1988. “They have removed none to date,” Kauffman says.
- 12 The government was also supposed to review 10 possible disposal sites. After various states objected, Congress said to focus on just one site—Yucca Mountain in Nevada. But Nevada Senator Harry Reid and others disagree.
- 13 “Even though it’s in an arid location, underground there’s a lot of moisture” at Yucca Mountain, says Kamps. Steel casks would eventually corrode, he says. The site also sits in “a very active earthquake zone.”

- 14 Site review stopped for a few years, until a 2013 court decision ordered the NRC to resume studies. Now not enough money remains to finish the process. A 2012 report from a government committee concluded that underground disposal is still probably the best choice. Some scientists have suggested certain deep shale and granite sites. Studying them would take even more time and money.
- 15 “Trying to find that repository is like trying to look into a crystal ball,” says Lochbaum. “But it’s more like a bowling ball.” That’s because many things are unclear about geology, human error, and so on.
- 16 “No one knows with precision what 10,000 years in the future will bring,” Lochbaum says. What could happen beyond then is even more imprecise.

17 Some nuclear power plant owners want the government to take waste and store it away from plants' property. Others, like Kamps, worry about transporting waste twice—once for storage and then again for disposal.

18 Meanwhile, nuclear energy keeps powering lights, air conditioning,

appliances, computers, and more. And the dilemma of spent waste disposal remains. For now, McIntyre says, "waste is stored safely and securely" under NRC regulation. But, he stresses, "What to do with the waste ultimately is a policy decision the country needs to make."

Kathiann M. Kowalski toured Westinghouse's Boiling Water Reactor Training Center in Tennessee in 2013. Her 25 books for young people include *Alternative Energy Sources* (Marshall Cavendish Benchmark Books, 2011).

## QUESTIONS

1. The following question has two parts. First answer Part A and then answer Part B.

**Part A: What does *repository* mean in paragraph 15?**

- A. hidden supply
- B. mountainous region
- C. storage area
- D. abundant source

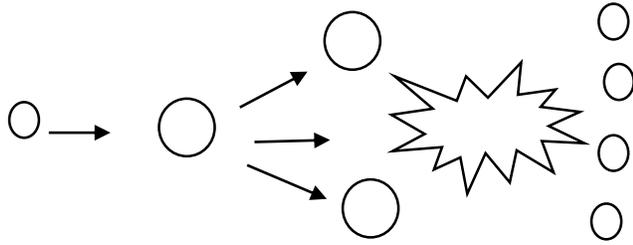
**Part B: Which sentence from the article best helps the reader understand the meaning of *repository*?**

- A. "The government was also supposed to review 10 possible disposal sites."
- B. "After various states objected, Congress said to focus on just one site—Yucca Mountain in Nevada."
- C. "Studying them would take even more time and money."
- D. "That's because many things are unclear about geology, human error, and so on."

2. Which sentence provides the best summary of the article?

- A. Although nuclear energy remains an important source of power, scientists do not agree about the best way to store radioactive waste produced at nuclear power plants.
- B. Nuclear power plants are an important source of power, but they also produce radioactive waste that is dangerous to the environment.
- C. Nuclear power plants can provide power for many years by harnessing the heat produced as a result of nuclear fission.
- D. Spent fuel is a source of much debate among scientists, who do not agree about the best place to store it while it is still radioactive.

3. The diagram below shows the process of nuclear fission. Use the words from the table to correctly label each element of the diagram. You will use each word at least once, and one word twice.



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\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Components involved in Fission				
energy	krypton	neutron	barium	U-235

4. Select three details the author uses to develop the idea that the U.S. government is unlikely to choose a permanent spent fuel waste disposal site anytime soon.
- A. The description of how states and individuals have objected to proposed sites.
  - B. The description of a 2013 court decision regarding the NRC and site reviews.
  - C. The quote from an expert who says anticipating the future is difficult.
  - D. The explanation that in-depth study of proposed sites is needed.
  - E. The indication that Yucca Mountain is no longer a possible site.
  - F. The explanation of how fission continues to add to the growing amount of waste.
  - G. The mention of the financial limitations faced by the NRC.

- 5. In paragraph 5, the author quotes Kevin Kamps' belief that "high levels of radioactive waste can present hazards 'for a million years or more...'" How do the ideas in paragraphs 11–18 build on this claim?**
- A.** Kamps' quote indicates that some people are uncomfortable with consequences of using nuclear power, and paragraphs 11–18 describe how government officials are divided over the issue of disposal.
  - B.** Kamps' quote suggests that nuclear power is dangerous, and paragraphs 11–18 provide details about the negative effects that radioactive waste could have on the environment.
  - C.** Kamps' quote indicates why finding the right disposal site is important, and paragraphs 11–18 explain the obstacles that have so far prevented the government from finding such a site.
  - D.** Kamps' quote shows that radioactive waste will have long-term effects on the planet, and paragraphs 11–18 confirm that such waste will be around much longer than anyone living today.
- 6. Which sentence explains an association between fission and radioactivity in a nuclear reactor?**
- A.** Fission starts the chain reaction that makes particles radioactive.
  - B.** Fission is dangerous to elements because it causes them to be radioactive.
  - C.** The byproducts of fission are highly radioactive and dangerous.
  - D.** Uranium is the result of fission and radioactive elements combining.

7. The following question has two parts. First answer Part A and then answer Part B.

**Part A: Which sentence states one of the author’s purposes in the article?**

- A. To explain the challenges related to storing radioactive waste
- B. To describe why scientists disagree about the future of nuclear power
- C. To show how spent fuel is stored in the different states
- D. To reveal places where nuclear fission is an important source of power

**Part B: The author uses several rhetorical strategies to help achieve her purpose. An example of each rhetorical device is provided below. Fill in the blank next to each device with an explanation of how it contributes to the purpose. You will not use all of the available explanations.**

Example of a rhetorical device	Explanation of how the device contributes to the purpose
Quotes from experts	
Figurative language	
Short sentences and familiar language	

Explanations		
To simplify complex concepts	To explain her own opinions	To provide examples of challenging ideas
To demonstrate why things matter	To provide evidence to support claims	To exaggerate details for powerful effect

8. The following question has two parts. First answer Part A and then answer Part B.

**Part A: Based on information in the article, and the diagram “The Pressurized Water Reactor,” which part of a pressurized-water reactor is most likely to contain fuel assemblies?**

- A. the condenser
- B. the reactor vessel
- C. the steam generator
- D. the pressurizer

**Part B: Which section of the article contains information that most strongly supports the answer to Part A?**

- A. Splitting Atoms
- B. Out with the Old
- C. Pools and Casks
- D. Sitting and Sitting

9. Which two ideas in the article are best supported by the diagram “The Pressurized Water Reactor (PWR)” and its accompanying sidebar, “How Energy Gets from the Nuclear Reactor to You”?

- A. Nuclear power plants have high fixed costs.
- B. Nuclear energy is a reliable source of power.
- C. Steam converts fission-produced heat energy into electricity.
- D. Nuclear power plants are a significant source of energy in the US.
- E. Fission produces radioactive particles along with energy.
- F. Radioactive waste can be safely stored in either pools or casks.

10. What can the reader conclude after analyzing information from both the article and the bar graph titled “Storage of Commercial Spent Fuel by State Through 2013”?

- A. Most states are storing their spent fuel in casks rather than in pools.
- B. Illinois has produced more nuclear energy than any other state.
- C. States have an equal risk of contamination by nuclear waste.
- D. Most American states are looking for new places to store spent fuel.





## Information for Teachers: Quantitative and Qualitative Analyses of the Text

Regular practice with complex texts is necessary to prepare students for college and career readiness. The text for this mini-assessment is placed at grade 10 for the purpose of this exemplar. This section of the exemplar explains the process that was used to place the text at grade 10 and the reasons that it meets the expectations for text complexity in Reading Standard 10. “Appendix A of the Common Core” and the “Supplement to Appendix A: New Research on Text Complexity” lay out a research-based process for selecting complex texts.

1. Place a text or excerpt within a **grade band** based on at least one<sup>4</sup> quantitative measure according to the research-based conversion table provided in the “Supplement to Appendix A: New Research on Text Complexity” ([www.corestandards.org/resources](http://www.corestandards.org/resources)).
2. Place a text or excerpt at a **grade-level** based on a qualitative analysis.

“Nowhere to Go”	<b>Quantitative Measure #1</b>	<b>Quantitative Measure #2</b>
	Lexile: 1060	Flesch-Kincaid: 9.4

After gathering the quantitative measures, the next step is to place the quantitative scores in the Conversion Table found in the “Supplement to Appendix A” ([www.corestandards.org/resources](http://www.corestandards.org/resources)) and determine the **grade band** of the text.

Figure 1 reproduces the conversion table from the Supplement to Appendix A, showing how the initial results from Flesch-Kincaid and the Lexile measure were converted to grade bands.

**Figure 1: Updated Text Complexity Grade Bands and Associated Ranges from Multiple Measures<sup>7</sup>**

Common Core Band	ATOS	Degrees of Reading Power <sup>®</sup>	Flesch-Kincaid <sup>§</sup>	The Lexile Framework <sup>®</sup>	Reading Maturity	SourceRater
2 <sup>nd</sup> – 3 <sup>rd</sup>	2.75 – 5.14	42 – 54	1.98 – 5.34	420 – 820	3.53 – 6.13	0.05 – 2.48
4 <sup>th</sup> – 5 <sup>th</sup>	4.97 – 7.03	52 – 60	4.51 – 7.73	740 – 1010	5.42 – 7.92	0.84 – 5.75
6 <sup>th</sup> – 8 <sup>th</sup>	7.00 – 9.98	57 – 67	6.51 – 10.34	925 – 1185	7.04 – 9.57	4.11 – 10.66
9 <sup>th</sup> – 10 <sup>th</sup>	9.67 – 12.01	62 – 72	8.32 – 12.12	1050 – 1335	8.41 – 10.81	9.02 – 13.93
11 <sup>th</sup> – CCR	11.20 – 14.10	67 – 74	10.34 – 14.2	1185 – 1385	9.57 – 12.00	12.30 – 14.50

<sup>4</sup> For higher stakes tests, it is recommended that two corresponding text complexity measures be used to place a text in a grade band. When two measures are used, both placing the text in the same **band**, the results provide additional assurance that the text selected is appropriate for the band.

To find the **grade-level** of the text within the designated grade band, engage in a systematic analysis of the characteristics of the text. The characteristics that should be analyzed by doing a qualitative analysis can be found in Appendix A of the CCSS. ([www.corestandards.org](http://www.corestandards.org)).

Qualitative Analysis	"Nowhere to Go"	Where to place within the band?					
Category	Notes and comments on text, support for placement in this band	Too Low	Early-mid 9	Mid-end 9	Early – mid 10	End 10	NOT suited to band
Structure: (both story structure or form of piece)	This excerpt is organized in sequential order, outlining the process that occurs in nuclear reactors to create nuclear waste, then tracking waste as it is cooled and stored. Complexity is added in the latter half of the passage as the author introduces various possibilities and perspectives around the issue of storing nuclear waste. Section headings enhance the reader’s understanding and the graphics, pictures, charts, etc. are integral to the comprehension of the content.						
Language Clarity and Conventions	The language in the text is explicit and straightforward. The author includes a mix of simple and compound sentences, with more complex constructions ( <i>Under federal law, the U.S. government was supposed to start taking spent fuel waste to a permanent disposal site in 1988.</i> ). Vocabulary is mostly contemporary and familiar; however, there are many instances of tier three words that may be unfamiliar to students ( <i>krypton, non-fissionable uranium-238, greenhouse emissions, reactor, and electric grid</i> ).						
Knowledge Demands (life, content, cultural/literary)	The article contains a mix of recognizable ideas and abstract concepts that may be challenging to some students. Some background knowledge of chemical reactions, as well as a basic grasp of the idea of nuclear power would be beneficial to students as they read the text.						
Levels of Meaning (chiefly literary)/Purpose (chiefly informational)	The main purpose of the article is directly stated in red text at the beginning of the article, to answer the question, “what will we do with radioactive waste?”						
<b>Overall placement: Grade 10</b>	<b>Justification: Though the structure, language and purpose are relatively straightforward, the knowledge demands and challenging content presented make this text most appropriate for 10<sup>th</sup> grade students.</b>						

## Question Annotations: Correct Answer(s) and Distractor Rationales

Question Number	Correct Answer(s)	Standards	Rationales for Answer Options
1, Part A	C	RI.9–10.4, RI.9–10.1	<p>A. Though it is a reasonable inference to think that waste disposal sites would be “hidden,” repository refers to the storage places themselves, not a “hidden supply” of something.</p> <p>B. Although the storage area is located in a mountainous region, “repository” refers to the underground disposal itself, not the location of it.</p> <p>C. This is the correct answer. A “repository” is a storage area; in this case, it is used for storing nuclear waste.</p> <p>D. “Abundant source” refers to nuclear power’s output of energy, rather than the storage area for the waste it generates.</p>
1, Part B	A		<p>A. This is the correct answer. The “disposal sites” could become repositories for nuclear waste.</p> <p>B. Although Yucca Mountain is a possible disposal site, this sentence focuses on the location of the site, rather than its purpose.</p> <p>C. Although “them” refers to possible disposal site, this sentence focuses on locations of the site, rather than their purpose.</p> <p>D. This sentence explains a concern about disposal sites, not what the repository does.</p>
2	A	RST.9–10.2, RST.9–10.1	<p>A. This is the correct answer. This sentence explains a benefit of nuclear power and focuses on one of the challenges presented by this energy source.</p> <p>B. Although this sentence identifies a result of nuclear power, it does not focus on the article’s specific focus of storing nuclear waste.</p> <p>C. This sentence only highlights a benefit of nuclear power and does not address the challenge of storing nuclear waste.</p> <p>D. Although this sentence addresses the main challenge of storing nuclear waste, it is omits the other central idea from the article, that nuclear energy is still an important power source.</p>

Question Number	Correct Answer(s)	Standards	Rationales for Answer Options
3	Neutron→ U-235→ Barium/Krypton→ Energy→ Neutron	RST.9–10.7, RST.9–10.3, RST.9–10.1	The process of nuclear fission is explained in paragraph 2, “When a neutron strikes a U-235 atom just right, the nucleus <sup>2</sup> becomes unstable. The nucleus splits and forms other elements, such as barium and krypton. Fission also releases radioactive particles, extra neutrons, and lots of energy. As the neutrons strike more U-235 atoms, the process becomes a chain reaction.”
4	A, D, G	RI.9–10.3, RI.9–10.1	<p>A. This is a correct answer. Paragraph 12 explains how all of the proposed disposal sites are contested.</p> <p>B. Although this detail is mentioned in the same section as the correct details, it does not indicate the likelihood of the government selecting a disposal site.</p> <p>C. This expert’s statement refers to a variety of concerns regarding nuclear power, not just the waste disposal.</p> <p>D. This is a correct answer. Studying possible new disposal sites requires time and money, and the author mentions that there is not enough money to finish the process.</p> <p>E. Although people oppose Yucca Mountain as a disposal site, this detail alone does not indicate the government’s likelihood to select another site.</p> <p>F. Although this detail is true, this detail alone does not indicate the government’s likelihood to select another site in the near future.</p> <p>G. This is a correct answer. The lacking funds indicate the government is unlikely to select a new waste disposal site, as the author explains that the process takes money.</p>
5	C	RI.9–10.5, RI.9–10.1	<p>A. Kamps’ quote is about the long-term consequences of nuclear power, as opposed to the way it is viewed by some people.</p> <p>B. Although Kamps’ quote does suggest that there is danger to using nuclear power (as it produces a dangerous byproduct), “Sitting and Sitting” explains the issues of determining a waste disposal site, not the overall harm nuclear waste has on the environment.</p> <p>C. This is the correct answer. Kamps’ quote demonstrates why it is so essential to find a safe storage place for nuclear waste, and “Sitting and Sitting” outlines the challenges to finding such a place. Although Kamps’ quote addresses the future effects of nuclear waste, “Sitting and Sitting” does not confirm this detail.</p> <p>D. Kamps’ quote discusses long term effects on people rather than on the planet and “Sitting and Sitting” mentions the life-span of the waste is longer than a human lifespan, but the focus of this section is on problems securing a repository site.</p>

Question Number	Correct Answer(s)	Standards	Rationales for Answer Options
6	C	RST.9–10.5, RST.9–10.1	<p>A. Although fission is a part of the process that makes radioactive particles, it is not the start of that process.</p> <p>B. Fission does result in some radioactive elements (e.g., U-235 splitting into Krypton and Barium), but it does not cause them to be radioactive. Other radioactive elements are found in nature and not a result of fission. So, fission is not ‘dangerous’ to all elements.</p> <p>C. This is the correct answer. According to paragraph 2, “Fission also releases radioactive particles, extra neutrons, and lots of energy.”</p> <p>D. Fission is not something that combines; it is a process that occurs to Uranium. Fission causes radioactive U-235 to split into two smaller radioactive elements.</p>
7, Part A	A	RI.9–10.6, RI.9–10.1	<p>A. This is the correct answer. The author outlines the variety of concerns related to storing nuclear waste.</p> <p>B. Scientists disagree about the storage of nuclear waste, not nuclear power as an energy supply.</p> <p>C. Though the graph explains how much waste is stored in each state, not how it is stored, this is an important supporting detail to explain how much waste needs to be stored. It is not the overall purpose of the article.</p> <p>D. Although the author briefly explains that nuclear power is an important energy source in the U.S., she does not enumerate other locations where nuclear power is used.</p>
7, Part B	See right column		<p>Quotes: To provide evidence that supports claims <i>By providing expert testimony, the author strengthens her own position.</i></p> <p>Figurative Language: To provide examples of challenging ideas <i>Figurative language serves to expand and clarify through a different way of thinking.</i></p> <p>Short sentences and familiar language: To simplify complex concepts <i>Simplifying the language allows the reader to understand challenging concepts.</i></p>

Question Number	Correct Answer(s)	Standards	Rationales for Answer Options
8, Part A	B		<p>A. Water, not fuel assemblies, is contained in a nuclear reactor condenser.</p> <p>B. This is a correct answer. The reactor vessel is most likely to contain fuel assemblies.</p> <p>C. The steam generator contains water and produces steam, as opposed to fuel assemblies.</p> <p>D. The pressurizer turns on the steam generator, so it does not contain fuel assemblies.</p>
8, Part B	C	RST.9–10.7, RST.9–10.1	<p>A. The Splitting Atoms section explains the process of nuclear fission, not the mechanics of a nuclear reactor.</p> <p>B. The Out with the Old section introduces the concept of nuclear waste, but does not explain the contents of a nuclear reactor.</p> <p>C. This is the correct answer. The Pools and Casks section begins by stating, “Fuel assemblies are incredibly hot when they come out of the reactor.” It provides additional details that explain how the nuclear reactor works.</p> <p>D. The Sitting and Sitting section focuses on the challenges that have delayed the identification of a permanent disposal site, not the mechanics of a nuclear reactor.</p>
9	C, D	RST.9–10.9, RST.9–10.1	<p>A. These text features address the process of generating and transferring nuclear power, as opposed to the cost of nuclear power plants.</p> <p>B. These text features address the process of generating and transferring nuclear power, as opposed to the reliability of such power.</p> <p>C. This is a correct answer. According to the sidebar, “steam turns a turbine, and a generator converts that mechanical energy into electricity.”</p> <p>D. This is a correct answer. The graph shows nuclear energy powering a city, while the sidebar specifies “the electric grid can then deliver it to homes, schools, and businesses.”</p> <p>E. Although this detail is true, it is explained in the Splitting Atoms section, as opposed to within these text features.</p> <p>F. Although this detail is true, it is explained in the Pools and Casks section, as opposed to within these text features.</p>
10	B	RST.9–10.7, RST.9–10.1	<p>A. The bar graph does not explain how states store nuclear waste, only how much nuclear waste they do store.</p> <p>B. This is the correct answer. According to the bar graph, Illinois stores 9,260 metric tons of spent fuel.</p> <p>C. The graph demonstrates that some states have significantly more waste to store than others.</p> <p>D. The article suggests that the country is looking for new places to store spent fuel, as opposed to individual states.</p>

Question Number	Correct Answer(s)	Standards	Rationales for Answer Options
11	See right column	RST.9–10.7, RST.9–10.2, RST.9–10.1, W.9–10.9, W.9–10.1	<p>A top score will include:</p> <p>The consequences of nuclear energy do not outweigh the benefits/nuclear energy should be used:</p> <ul style="list-style-type: none"> <li>• Nuclear energy fills 20% of US energy needs</li> <li>• Nuclear energy does not produce greenhouse gas emissions</li> <li>• Nuclear energy is reliable</li> <li>• The volume of spent fuel (radioactive waste) is relatively small</li> <li>• Some scientists think waste is safe where it is currently stored (NRC)</li> </ul> <p>OR</p> <p>The consequences of nuclear energy do outweigh the benefits/nuclear energy should NOT be used</p> <ul style="list-style-type: none"> <li>• High risk if certain accidents occur</li> <li>• Nowhere for waste to go</li> <li>• High fixed costs of operation</li> <li>• Waste can be radioactive and dangerous for millions of years</li> </ul>

## Additional Resources for Assessment and CCSS Implementation

### **Shift 1 – Complexity:** *Regular practice with complex text and its academic language*

- See Appendix B for examples of informational and literary complex texts  
[http://www.corestandards.org/assets/Appendix\\_B.pdf](http://www.corestandards.org/assets/Appendix_B.pdf)
- See the Text Complexity Collection on [www.achievethecore.org](http://www.achievethecore.org)

### **Shift 2 – Evidence:** *Reading, writing, and speaking grounded in evidence from text, both literary and informational*

- See Close Reading Exemplars for ways to engage students in close reading on <http://www.achievethecore.org/steal-these-tools/close-reading-exemplars>
- See the Basal Alignment Project for examples of text-dependent questions  
<http://www.achievethecore.org/basal-alignment-project>

### **Shift 3 – Knowledge:** *Building knowledge through content-rich nonfiction*

- See Appendix B for examples of informational and literary complex texts  
[http://www.corestandards.org/assets/Appendix\\_B.pdf](http://www.corestandards.org/assets/Appendix_B.pdf)