

The purpose of this tool is to help educators understand each of the grade level standards and how those standards connect to the students' overall preparation for college and career readiness.

Standards are defined as the most critical prerequisite skills and knowledge. This document is color-coded to reflect both anchor and priority standards. Though previous emphasis was placed on priority standards to address lost learning due to COVID-19, New Mexico teachers should note that moving forward, while priority standards allow for acceleration of learning, all standards should be addressed in instruction throughout the school year.

In this guide you will find:

- A [breakdown](#) of each of the grade level standards within the literature strand, including:
 - Vertical alignment guidance
 - Essential vocabulary related to the standard
 - Identification of anchor standards as identified by the CCSS and priority standards as identified by NMPED
- Sample aligned [assessment items](#)
- Companion resources guides that address:
 - [Planning Literacy Instruction with MLSS Guide](#)
 - [Choosing a Complex Text](#)
 - [Text Dependent Questions with Complex Texts](#)
 - [Vocabulary Instruction with Complex Texts](#)
 - [Speaking, Listening, and Writing](#)
 - [Differentiating Support for All Learners](#)
 - [Cross-Curricular Connections with Literacy](#)
 - [Cultural and Linguistic Responsiveness in Literacy](#)

Key		
	<i>Anchor Standard</i>	Anchor standards, as identified by the Common Core, are denoted with an anchor icon. Anchor standards are the fundamental skills we want students to have when they graduate. The College and Career Ready (CCR) and grade-specific standards are necessary complements—the former providing broad standards, the latter providing additional specificity—that together define the skills and understandings that all students must demonstrate. Anchor standards appear from Kindergarten to 12th grade and are aligned to what colleges and workplaces expect students to be able to do.
	<i>Priority Standard</i>	Priority standards, as identified by NMPED, are denoted with red highlighting. Priority standards are the most critical prerequisite skills and knowledge a student needs. This does not mean that these are only standards required to be taught, just these are the standards that will allow for the acceleration the students of New Mexico need during this time.

STANDARDS BREAKDOWN

<ul style="list-style-type: none"> ● Key Ideas and Details <ul style="list-style-type: none"> ○ CCSS.RI.9.1 ○ CCSS.RI.9.2 ○ CCSS.RI.9.3 ● Craft and Structure <ul style="list-style-type: none"> ○ CCSS.RI.9.4 ○ CCSS.RI.9.5 ○ CCSS.RI.9.6 	<ul style="list-style-type: none"> ● Integration of Knowledge and Ideas <ul style="list-style-type: none"> ○ CCSS.RI.9.7 ○ CCSS.RI.9.8 ○ CCSS.RI.9.9 ○ NMSS.9.1 ○ NMSS.9.2 ● Range of Reading Level and Text Complexity <ul style="list-style-type: none"> ○ CCSS.RI.9.10
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RI.9.1



Anchor Standard: Key Ideas and Details

R.1: Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

Grade	CCSS Domain	CCSS Strand	
9	Reading: Informational (RI)	Key Ideas and Details	
Standard		Vertical Alignment	
RI.9.1 Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.		<i>Previous Grades:</i> RI.1.1, RI.2.1, RI.3.1, RI.4.1, RI.5.1, RI.6.1, RI.7.1, RI.8.1	<i>Future Grades:</i> RI.11-12.1
Clarification Statement		Vocabulary for Teacher Development	
Students deliberately choose evidence that is detailed and complete to best support their analyses of what the text directly states (explicit) as well as what the text indirectly states (implicit).		<ul style="list-style-type: none"> ● analysis – a detailed examination of the components of a subject to understand its meaning and/or nature as a whole ● explicit, explicitly – stated clearly and directly, leaving no room for confusion or interpretation ● inference – a conclusion derived from logical reasoning following an investigation of available evidence ● strong and thorough textual evidence – evidence that is judged to be powerful (i.e., having greater rhetorical value) when compared to other information, facts, and data that could be used for support (strong) and encompasses each facet of a particular argument or claim/set of claims such that no area is left vulnerable to simple counterclaims (thorough) ● text – anything that students can read, write, view, listen to, or explore, including books, photographs, films, articles, music, art, and more 	
Students Who Demonstrate Understanding Can...			
<ul style="list-style-type: none"> ● evaluate evidence on a strength scale from weakest to strongest. ● assess the quality of several pieces of evidence. ● write responses to a text-dependent question, using only pieces of evidence deemed strongest. 			

RI.9.2				
	Anchor Standard: Key Ideas and Details <i>R.2: Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.</i>			
Grade	CCSS Domain	CCSS Strand		
9	Reading: Informational (RI)	Key Ideas and Details		
Standard		Vertical Alignment		
Determine a central idea of a text and analyze its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text.		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;"><i>Previous Grades:</i> RI.1.2, RI.2.2, RI.3.2, RI.4.2, RI.5.2, RI.6.2, RI.7.2, RI.8.2</td> <td style="padding: 5px;"><i>Future Grades:</i> RI.11-12.2</td> </tr> </table>	<i>Previous Grades:</i> RI.1.2, RI.2.2, RI.3.2, RI.4.2, RI.5.2, RI.6.2, RI.7.2, RI.8.2	<i>Future Grades:</i> RI.11-12.2
<i>Previous Grades:</i> RI.1.2, RI.2.2, RI.3.2, RI.4.2, RI.5.2, RI.6.2, RI.7.2, RI.8.2	<i>Future Grades:</i> RI.11-12.2			
Clarification Statement		Vocabulary for Teacher Development		
Students establish a text’s central idea, trace it throughout the work, and closely examine how it is first introduced, how it progresses, how it evolves, and how it is clarified through key details. Using the central idea and key details, students summarize the text without bias.		<ul style="list-style-type: none"> ● analyze – to critically examine the components of a subject to understand its meaning and/or nature as a whole ● central idea – the unifying concept within an informational text to which other elements and ideas relate ● objective summary – a brief account of a text’s central or main points, themes, or ideas that is free of bias, prejudice, and personal opinion and does not incorporate outside information ● text – anything that students can read, write, view, listen to, or explore, including books, photographs, films, articles, music, art, and more 		
Students Who Demonstrate Understanding Can...				
<ul style="list-style-type: none"> ● explain how an author introduced a central idea and used key details to shape and refine it. ● revise a biased summary which contains extraneous information to incorporate the central idea and key details as well as to remove biased language and unnecessary information. 				

RI.9.3		
	<p>Anchor Standard: Key Ideas and Details</p> <p><i>R.3: Analyze how and why individuals, events, or ideas develop and interact over the course of a text.</i></p>	
Grade	CCSS Domain	CCSS Strand
9	Reading: Informational (RI)	Key Ideas and Details
Standard	Vertical Alignment	
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.	<p><i>Previous Grades:</i> RI.1.3, RI.2.3, RI.3.3, RI.4.3, RI.5.3, RI.6.3, RI.7.3, RI.8.3</p>	<p><i>Future Grades:</i> RI.11-12.3</p>
Clarification Statement	Vocabulary for Teacher Development	
Students closely examine how an author develops an analysis, a series of events, or a set of ideas within a text, including how they introduce, sequence, and expand upon their points and create relationships between them.	<ul style="list-style-type: none"> ● analyze – to critically examine the components of a subject to understand its meaning and/or nature as a whole ● event – a thing that happens; an occurrence ● series – a set of related/similar things (e.g., people, books, events, etc.) coming one after one another (e.g., a series of books or TV episodes) ● text – anything that students can read, write, view, listen to, or explore, including books, photographs, films, articles, music, art, and more 	
Students Who Demonstrate Understanding Can...		
<ul style="list-style-type: none"> ● explain how an author introduced, sequenced, and developed their points in an effective line of reasoning. ● illustrate how an author developed their analysis, series of events, or set of ideas, including how the author introduced, sequenced, and developed their points and made connections between them. 		

RI.9.4



Anchor Standard: Craft and Structure

R.4: Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

Grade	CCSS Domain	CCSS Strand		
9	Reading: Informational (RI)	Craft and Structure		
Standard		Vertical Alignment		
<p>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).</p>		<table border="1" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><i>Previous Grades:</i> RI.1.4, RI.2.4, RI.3.4, RI.4.4, RI.5.4, RI.6.4, RI.7.4, RI.8.4</p> </td> <td style="width: 50%; vertical-align: top;"> <p><i>Future Grades:</i> RI.11-12.4</p> </td> </tr> </table>	<p><i>Previous Grades:</i> RI.1.4, RI.2.4, RI.3.4, RI.4.4, RI.5.4, RI.6.4, RI.7.4, RI.8.4</p>	<p><i>Future Grades:</i> RI.11-12.4</p>
<p><i>Previous Grades:</i> RI.1.4, RI.2.4, RI.3.4, RI.4.4, RI.5.4, RI.6.4, RI.7.4, RI.8.4</p>	<p><i>Future Grades:</i> RI.11-12.4</p>			
Clarification Statement		Vocabulary for Teacher Development		
<p>Students examine the text to understand the meaning of words or phrases, using the context to inform their thinking. Students consider how particular words and phrases are used to influence the overall meaning and tone of the text, such as how the language of a court opinion differs from that of a newspaper.</p>		<ul style="list-style-type: none"> ● analyze – to critically examine the components of a subject to understand its meaning and/or nature as a whole ● phrase(s) – a small group of words representing a conceptual unit, containing either a subject or a verb, but not both. Both a subject and a verb would constitute a clause (e.g., “Running through the forest, she breathed in the fresh, crisp air.”) ● text – anything that students can read, write, view, listen to, or explore, including books, photographs, films, articles, music, art, and more ● tone – the attitude an author takes toward the subject or topic of a text, generally revealed through word choice, perspective, or point of view 		
Students Who Demonstrate Understanding Can...				
<ul style="list-style-type: none"> ● define a word and explain the word’s tone in a text. ● explain how key words impact the overall meaning and tone of the text. ● replace key words with synonyms and discuss how the synonyms change the meaning and tone of the overall text. 				

RI.9.5				
	Anchor Standard: Craft and Structure <i>R.5: Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole.</i>			
Grade	CCSS Domain	CCSS Strand		
9	Reading: Informational (RI)	Craft and Structure		
Standard		Vertical Alignment		
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).		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;"><i>Previous Grades:</i> RI.1.5, RI.2.5, RI.3.5, RI.4.5, RI.5.5, RI.6.5, RI.7.5, RI.8.5</td> <td style="padding: 5px;"><i>Future Grades:</i> RI.11-12.5</td> </tr> </table>	<i>Previous Grades:</i> RI.1.5, RI.2.5, RI.3.5, RI.4.5, RI.5.5, RI.6.5, RI.7.5, RI.8.5	<i>Future Grades:</i> RI.11-12.5
<i>Previous Grades:</i> RI.1.5, RI.2.5, RI.3.5, RI.4.5, RI.5.5, RI.6.5, RI.7.5, RI.8.5	<i>Future Grades:</i> RI.11-12.5			
Clarification Statement		Vocabulary for Teacher Development		
Students examine how an author arranges sentences, paragraphs, sections, or chapters to build and clarify their ideas or claims.		<ul style="list-style-type: none"> analyze – to critically examine the components of a subject to understand its meaning and/or nature as a whole claim(s) – an assertion(s) of the truth of something, often a value statement; generally, an author uses evidence to support the assertion of truth text – anything that students can read, write, view, listen to, or explore, including books, photographs, films, articles, music, art, and more 		
Students Who Demonstrate Understanding Can...				
<ul style="list-style-type: none"> discuss how an author's ideas or claims are developed or clarified by a particular sentence, paragraphs, or larger portions of texts. explain how a sentence, paragraph, or portion of text develops or refines an idea or claim 				

RI.9.6		
	<p>Anchor Standard: Craft and Structure</p> <p><i>R.6: Assess how point of view or purpose shapes the content and style of a text.</i></p>	
Grade	CCSS Domain	CCSS Strand
9	Reading: Informational (RI)	Craft and Structure
Standard	Vertical Alignment	
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.	<p><i>Previous Grades:</i> RI.1.6, RI.2.6, RI.3.6, RI.4.6, RI.5.6, RI.6.6, RI.7.6, RI.8.6</p>	<p><i>Future Grades:</i> RI.11-12.6</p>
Clarification Statement	Vocabulary for Teacher Development	
Students establish an author's point of view or intention by interpreting how they use language to communicate their opinion and achieve their purpose.	<ul style="list-style-type: none"> ● analyze – to critically examine the components of a subject to understand its meaning and/or nature as a whole ● point of view – a narrator's, writer's, or speaker's position with regard to the events of a narrative; one's stance on events or information given their orientation (physically and/or mentally) to the events or information; the vantage point ● purpose – the reason for a particular action or creation (e.g., literary work or speech); the reason for which something exists (e.g., to persuade, to inform, to express, and/or to entertain) ● respond – to say, show, and/or act in response to a prompt which may be a question, an action or event, a claim or counterclaim, etc. ● rhetoric/rhetorical feature – language (or the art of using language) designed to be persuasive or effective in supporting a claim such that readers or listeners come to agree with the claim, often making use of figurative, sensory, and evocative language; an element of a large literary work that is particularly designed to have a persuasive or emotional impact ● text – anything that students can read, write, view, listen to, or explore, including books, photographs, films, articles, music, art, and more 	

Students Who Demonstrate Understanding Can...

- highlight the rhetorical devices used in a passage to advance the author's point of view or purpose.
- analyze two texts that use different languages to communicate the same point of view or have the same purpose.

RI.9.7		
	Anchor Standard: Integration of Knowledge and Ideas <i>R.7: Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.</i>	
Grade	CCSS Domain	CCSS Strand
9	Reading: Informational (RI)	Integration of Knowledge and Ideas
Standard	Vertical Alignment	
Analyze various accounts of a subject told in different mediums (e.g., a person's life story in both print and multimedia), determining which details are emphasized in each account.	<i>Previous Grades:</i> RI.1.7, RI.2.7, RI.3.7, RI.4.7, RI.5.7, RI.6.7, RI.7.7, RI.8.7	<i>Future Grades:</i> RI.11-12.7
Clarification Statement	Vocabulary for Teacher Development	
Students examine several different reportings that address the same subject in different mediums, such as the reporting of a current event in both print and multimedia. In comparing the texts' similarities and differences, students identify the details that are accentuated in each report and analyze the impact of each.	<ul style="list-style-type: none"> ● analyze – to critically examine the components of a subject to understand its meaning and/or nature as a whole ● medium – the form(s) or material(s) an artist or author uses to express their ideas (e.g., poem, oil paint, etc.) 	
Students Who Demonstrate Understanding Can...		
<ul style="list-style-type: none"> ● read and annotate the similarities and differences between two accounts of a subject, noting what details authors choose to emphasize in each source. ● identify the common and different details that are emphasized between multiple accounts of a subject. 		

RI.9.8		
	<p>Anchor Standard: Integration of Knowledge and Ideas <i>R.8: Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.</i></p>	
Grade	CCSS Domain	CCSS Strand
9	Reading: Informational (RI)	Integration of Knowledge and Ideas
Standard	Vertical Alignment	
Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and fallacious reasoning.	<p><i>Previous Grades:</i> RI.1.8, RI.2.8, RI.3.8, RI.4.8, RI.5.8, RI.6.8, RI.7.8, RI.8.8</p>	<p><i>Future Grades:</i> RI.11-12.8</p>
Clarification Statement	Vocabulary for Teacher Development	
Students precisely describe the argument and specific claims in a text and judge the quality and quantity of evidence presented, as well as the validity of the reasoning. Students also determine if fallacious reasoning or inaccuracies are present in the text’s argument and claims.	<ul style="list-style-type: none"> ● argument – value statement(s) supported by evidence whose purpose is to persuade or explain ● claim(s) – an assertion(s) of the truth of something, often a value statement; generally, an author uses evidence to support the assertion of truth ● delineate – to describe something precisely ● evaluate – to determine quality or value after careful analysis or investigation ● evidence – facts and/or information (quotes, statistics, graphs, etc.) presented together as a body of support for a claim or value statement ● reasons/reasoning – an explanation or justification for a claim, action, or value statement; the process of thinking through an argument, forming judgments, and drawing conclusions using a process of logic ● relevant evidence, observations, ideas, descriptive details – details and other elements that are closely connected and appropriate to that which is being considered, argued, or explained; when making claims, authors choose evidence, details, etc. that are closely related to the idea being expressed by the claim ● text – anything that students can read, write, view, listen to, or explore, including books, photographs, 	

films, articles, music, art, and more

Students Who Demonstrate Understanding Can...

- identify an author's claim.
- determine when an author needs more explanation.
- trace or delineate an author's argument throughout the text.
- analyze whether there is enough evidence to support a claim.
- highlight in a text where reasoning and evidence is insufficient, fallacious, irrational, or inaccurate.
- revise a weak/irrational/insufficient argument in a text so the arguments and claims are valid and rational.

RI.9.9		
	<p>Anchor Standard: Integration of Knowledge and Ideas</p> <p><i>R.9: Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.</i></p>	
Grade	CCSS Domain	CCSS Strand
9	Reading: Informational (RI)	Integration of Knowledge and Ideas
Standard	Vertical Alignment	
<p>Analyze seminal U.S. documents of historical and literary significance (e.g., Washington's Farewell Address, the Gettysburg Address, Roosevelt's Four Freedoms speech, King's "Letter from Birmingham Jail"), including how they address related themes and concepts.</p>	<p><i>Previous Grades:</i> RI.1.9, RI.2.9, RI.3.9, RI.4.9, RI.5.9, RI.6.9, RI.7.9, RI.8.9</p>	<p><i>Future Grades:</i> RI.11-12.9</p>
Clarification Statement	Vocabulary for Teacher Development	
<p>Students examine pivotal documents that reflect important historic events and notable literary styles, such as Washington's "Farewell Address", Roosevelt's "Four Freedoms" speech, and King's "Letter from Birmingham Jail." When examining these documents, students note the similarities and differences in how they address similar themes and subjects.</p>	<ul style="list-style-type: none"> ● analyze – to critically examine the components of a subject to understand its meaning and/or nature as a whole ● theme – the subject or underlying meaning that a literary text directly or indirectly explains, develops, and/or explores 	
Students Who Demonstrate Understanding Can...		
<ul style="list-style-type: none"> ● determine the themes and central ideas of the document under study. ● explain the purpose and audience of a document. ● discuss the similarities and differences between various documents under study. 		

9.1

Grade

NMSS Domain

9

Reading: Informational Text (RI)

Standard

Vertical Alignment

Students in Grade 9 will analyze and evaluate common characteristics of significant works, including Hispanic and Native American oral and written texts.

Previous Grades:
N/A

Future Grades:
11-12.2

Clarification Statement

Vocabulary for Teacher Development

Students can analyze and evaluate the common characteristics of literary works across a variety of texts, oral and written.

- **genre** – a specific type of composition characterized by similarities in form, style, or subject matter
- **characteristic** – a feature or quality belonging typically to a person, place, or thing and serving to identify it.

Students Who Demonstrate Understanding Can...

- analyze multiple texts and determine a common characteristic across these texts.
- describe how a common characteristic serves multiple texts, both oral and written.

9.2

Grade		NMSS Domain	
9	Reading: Informational Text (RI)		
Standard		Vertical Alignment	
Students in Grade 9 will cite strong and thorough textual evidence to support analysis of significant works, including Hispanic and Native American oral and written texts.		<i>Previous Grades:</i> N/A	<i>Future Grades:</i> 11-12.2
Clarification Statement		Vocabulary for Teacher Development	
Students deliberately choose evidence that is detailed and complete to best support their analyses of what the text directly states (explicit) as well as what the text indirectly states (implicit).		<ul style="list-style-type: none"> ● strong and thorough textual evidence – evidence that is judged to be powerful (i.e., having greater rhetorical value) when compared to other information, facts, and data that could be used for support (strong) and encompasses each facet of a particular argument or set of claims such that no area is left vulnerable to simple counter-claims (thorough) 	
Students Who Demonstrate Understanding Can...			
<ul style="list-style-type: none"> ● evaluate evidence on a strength scale from weakest to strongest. ● assess the quality of several pieces of evidence. ● write responses to a text-dependent question, using only pieces of evidence deemed strongest. 			

RI.9.10



Anchor Standard: Range of Reading Level and Text Complexity

R.10: Read and comprehend complex literary and informational texts independently and proficiently.

Grade	CCSS Domain	CCSS Strand		
9	Reading: Informational (RI)	Range of Reading Level and Text Complexity		
Standard		Vertical Alignment		
By the end of Grade 9, read and comprehend literary nonfiction in the Grades 9-10 text complexity band proficiently, with scaffolding as needed at the high end of the range.		<table border="1" style="width: 100%;"> <tr> <td style="width: 60%;"><i>Previous Grades:</i> RI.1.10, RI.2.10, RI.3.10, RI.4.10, RI.5.10, RI.6.10, RI.7.10, RI.8.10</td> <td style="width: 40%;"><i>Future Grades:</i> RI.11-12.10</td> </tr> </table>	<i>Previous Grades:</i> RI.1.10, RI.2.10, RI.3.10, RI.4.10, RI.5.10, RI.6.10, RI.7.10, RI.8.10	<i>Future Grades:</i> RI.11-12.10
<i>Previous Grades:</i> RI.1.10, RI.2.10, RI.3.10, RI.4.10, RI.5.10, RI.6.10, RI.7.10, RI.8.10	<i>Future Grades:</i> RI.11-12.10			
Clarification Statement		Vocabulary for Teacher Development		
By the end of Grade 9, students competently read and understand informational texts within the 9-10 text complexity band (Lexile: 1050-1335). They are able to read independently for an extended time. Students make connections to their background knowledge and relevant experiences to engage with text.		<ul style="list-style-type: none"> ● independently – on one’s own, without aid from another (such as a teacher) 		
Students Who Demonstrate Understanding Can...				
<ul style="list-style-type: none"> ● use a strategy or keep a purpose in mind while independently reading. ● confirm or revise their ideas about a given topic after independently reading a text. 				

ASSESSMENT GUIDE

- **Constructed Response Assessment Task aligned to RI.9.5**
- **Constructed Response Assessment Task aligned to RI.9.9**
 - **Evidence of Text Complexity and Cultural and Linguistic Responsiveness**
 - **VABB Analysis with Example Questions and Exemplar Student Responses**
 - **Example MLSS Universal Supports**
- **Multiple Choice Assessment Items**

Grade	CCSS Domain	CCSS Strand
9	Reading: informational (RI)	Craft and Structure
RI.9.5	Sample Task #1 (Constructed Response)	
	<p>After reading “A Big Surprise from the Edge of the Solar System” by Dr. Tony Phillips students must respond to the following prompt: In the text the author reveals a scientist’s claim that “The magnetic bubbles appear to be our first line of defense against cosmic rays. . .” Choose two sentences from the article that most help to develop this claim and explain your choices.</p>	
	Exemplar Student Responses	
	<p>A strong student response would include the following sentences and explanations:</p> <ul style="list-style-type: none"> • “When these microscopic cannonballs try to enter the solar system, they have to fight through the sun’s magnetic field to reach the inner planets.” This sentence explains how magnetic bubbles offer protection from cosmic rays. • “On the other hand, cosmic rays could get trapped inside the bubbles, which would make the froth a very good shield indeed.” This sentence provides a second example of how magnetic bubbles offer protection from cosmic rays. 	
	DOK	Blooms
	Level 2	Applying
	Possible Aligned Language Objectives	Possible Misconceptions
	<ul style="list-style-type: none"> • Students will analyze how an author's claim is developed and refined by particular sentences. • Students will select evidence in support of a claim. 	<ul style="list-style-type: none"> • Students may select sentences which give information about magnetic bubbles but don’t necessarily support the author’s claim. • Students may simply choose the next sentence after the author’s claim without examining its validity as evidence for the claim.

Grade	CCSS Domain	CCSS Strand
9	Reading: Informational (RI)	Key Ideas and Details
RI.9.9	Sample Task #2 (Constructed Response)	
	<p>After reading Speech 1: Franklin D. Roosevelt’s "Address to Congress Requesting a Declaration of War with Japan" and Speech 2: Japanese Emperor Hirohito “Declares War on the United States and Britain” students must answer: Each speaker establishes a case that his country has been forced into war. Write an essay arguing which speaker presents a stronger case for a declaration of war. Use details and evidence from both speeches in your response.</p>	
	Exemplar Student Responses	
	<p>An essay that takes the position that Roosevelt presents a stronger case for declaration of war would cite:</p> <ul style="list-style-type: none"> ● The deadly attack on Pearl Harbor happened despite the fact the U.S. and Britain were in discussions with Japan, showing any promises by Japan would likely not be kept. ● The various attacks in the Pacific showing Japan as aggressive and determined. ● The premeditated nature of the attack on Pearl Harbor, further showing that even while negotiations were underway, Japan was planning the attack. ● The lack of safety our country would feel until the aggressors were stopped. <p>An essay that argues that Hirohito presents a stronger case for declaration of war would cite:</p> <ul style="list-style-type: none"> ● America’s and Britain’s interference in the region by developing a relationship with China. ● America and Britain have been aggressive for years through economic sanctions and interrupting Japan’s ability to have peaceful commerce. ● America and Britain have caused others surrounding Japan to build up military forces. 	
	DOK Blooms	
	Level 3 Analyzing	
	Possible Aligned Language Objectives Possible Misconceptions	
<ul style="list-style-type: none"> <li style="width: 50%;">● Students will analyze two speeches of historical significance. including how they address related themes and concepts. <li style="width: 50%;">● Students will use textual evidence to support their responses. <li style="width: 50%;">● Students may only pull evidence from one text instead of both. <li style="width: 50%;">● Students may summarize each speaker’s words without evaluating them for strength. 		

Evidence of Text Complexity and Cultural and Linguistic Responsiveness

Text Summary and evidence of Complexity:

- Each speaker establishes a case that his country has been forced into war. President Roosevelt focuses on the attack at Pearl Harbor and appeals to America’s desire to feel safe. Emperor Hirohito focuses on America’s and Britain’s interference in the region, their aggressive economic sanctions, and their unwillingness to come up with cooperative resolutions that bring peace.
- These texts are worthy of students’ time to read/view and also meet the expectations for text complexity at Grades 9-10. In Speech 1, the non-chronological structure, combined with the implicit underlying purposes of showing how calculating Japan was, push this text from grade 9 into grade 10. In Speech 2, the clear relationships among ideas, the use of transitions, and straightforward organization, though, make the text appropriate for grade 10.

Evidence of Cultural and Linguistic Responsiveness:

- **Who is represented in the text used to assess this cluster of standards?**
Americans are represented in President Roosevelt’s speech, and he himself represents white, privileged Americans. President Roosevelt was born to one of New York’s oldest and wealthiest families. Japanese people were represented by Emperor Hirohito’s speech, and he himself represents Japanese wealth. Emperor Hirohito was one of the world’s wealthiest men before he was stripped of his assets following Japan’s defeat during World War II.
- **How are those groups and individuals portrayed?**
Each country’s leader is portrayed positively. The comparison between the two speeches allows for students to see each leader advocating for the protection of their country’s people. It’s an opportunity to humanize the Japanese people in a way that is not always present when studying World War II and the bombing of Pearl Harbor.
- **Does the text provoke critical questions about cultural and linguistic diversity, especially within marginalized communities?**
The text inherently does not provoke critical questions about cultural and linguistic diversity, but it could be used to facilitate such a discussion in a classroom. Especially in the context of better understanding the persecution of Japanese people in America, including the use of concentration camps, during this time.
- **What supports are provided to teachers to identify blind spots?**
No supports are provided by the text. It would be beneficial to supplement these texts with narratives from Japanese citizens' experience. This might be a good opportunity to acknowledge biases/preconceived notions about Japanese people with a pre-reading survey. Understanding the historical context of Japanese discrimination and harmful Asian stereotypes would be beneficial while reading these texts. Also, it would be beneficial to examine the use of the term "internment camp" versus "concentration camp" when discussing the incarceration of Japanese Americans during this time. Some scholars and activists argue that "internment camp" is a euphemism that minimizes the Japanese American experience. Roosevelt himself used the term "concentration camp" to describe the camps.
- **How is this text culturally/linguistically responsive?**

RI.9.9

These texts are culturally responsive when paired together. They humanize both the American and the Japanese experience during World War II. They allow for a more balanced understanding of the actions that led to the war, and the motivations of each country.

VABB Analysis	
RI.9.9	Validate
	<i>The intentional and purposeful legitimization of the home culture and language of the student.</i>
	<p>Question: If you were a citizen in Japan, what would you think about Americans based on Hirohito’s speech? If you were a citizen in America, what would you think about Japanese people based on Roosevelt’s speech? Compare/contrast the different perspectives.</p> <p>ESR: If I were in Japan, I would have been mad at Americans after hearing the speech. I would have thought that it was America’s fault that we were going to war and that my country needed defending. If I was an American, I would have thought the same thing. I would have felt like America was under attack by the Japanese and it needed defending. It’s interesting how similar both speeches were in trying to convince their people that the war was justified.</p>
	Affirm
	<i>The intentional and purposeful effort to reverse the negative stereotypes, images, and representations of marginalized cultures and languages promoted by corporate mainstream.</i>
	<p>Question: There were many negative stereotypes about Japanese and other Asian people during World War II. Why do you think this is? What purpose does creating and perpetuating a negative stereotype do, especially during the middle of a war?</p> <p>ESR: When you turn a group of people into a stereotype, it makes it easier to laugh at them and make fun of them. It’s easier to treat people like they’re a joke and not human beings with feelings. That would be useful to do in the middle of a war because it would make it easier to justify using weapons of mass destruction against them like the nuclear bomb.</p>
	Build
	<i>Create the connections between the home culture/language and the school culture/language through instruction for success in school and the broader social context.</i>
	<p>Question: Many people refer to the location where Japanese Americans were imprisoned during World War II as “internment camps.” Advocates today argue that the use of “internment camps” instead of “concentration camps” is a euphemism that devalues the traumatic experiences of Japanese Americans who endured those camps. Roosevelt himself used the term “concentration camps.” What is the benefit to using a euphemism for something? What is the benefit of using “internment camps” instead of “concentration camps”?</p> <p>ESR: I think the benefit of using a euphemism is that it sounds better. When you say “concentration camps” it</p>
	Bridge
	<i>Create opportunities for situational appropriateness that provides the academic and social skills that students will need to have success beyond school culture.</i>
	<p>Question: During World War II, Japanese Americans were villainized in the media and popular culture, and many were placed into concentration camps against their will. What impact do you think this has on Japanese Americans today? Are there any modern-day examples of discrimination against Asians that continue today? Do you think there’s a connection between the two?</p> <p>ESR: I think the impact it had on Japanese Americans is that it was very traumatic. If that happened to me, I would not trust the government or Americans. During the coronavirus pandemic, there was an increase in violence against Asians in the United</p>

makes me think of the Holocaust and the horrible things that happened there. So, by not using the same words for what happened to the Japanese people, it makes it sound like it wasn't that bad of an experience for them.

States and Asian Americans. I wonder if the lasting effects of the discrimination during World War II played a role in how easy it was for some people to get violent against Asians during the pandemic.

Layer 1: Universal Supports

High-quality core instruction for all students

In New Mexico we believe that all students deserve access to high-quality grade-level texts to show proficiency with reading and comprehension as outlined in the New Mexico standards. These universal supports provide core instruction that allow students to comprehend complex texts by providing access points and opportunities for deep thinking.

1. Pre-teach Tier 2 Vocabulary Words
 - Tier 2 Vocabulary are words that are more likely to appear in text than speech. Pre-teaching these words before diving into a text allows students to better understand the text because their cognitive load can be focused more on comprehension. To learn more, please visit Resource Guide on [Vocabulary Instruction with Complex Texts](#)
 - Choose words that are not implicitly or explicitly defined within the text.
2. Annotate/Create Text-Dependent questions to push student thinking to think about themes and central ideas, knowledge of vocabulary, or syntax and structure following the steps outlined in this resource guide. To learn more, please visit Resource Guide on [Text Dependent Questions with Complex Texts](#)
 - Crafting and using text dependent questions throughout a complex text allows the reader to chunk the text to better focus on meaning. They also teach the reader how to think deeply about a text and use evidence from the text to support that thinking.

Universal Supports

The details listed below apply to the specific text in the bottom-most box and are meant to offer examples of how universal supports can be planned for lessons using an appropriately complex text.

Tier 2 Vocabulary to Preteach

Word: eradicated

Think Aloud: Eradicate means to completely erase or completely destroy. It can have either a negative or a positive connotation depending on how it's used. If you had bugs in your house, you might be excited to eradicate them. If you're a group of people and someone is trying to eradicate your existence, that would be terrifying. In war, it's possible that eradication could be good for some and bad for others. Depending on what side you're on, your perspective about the eradication would be different than the other side.

Text Dependent Question

Question: If the Japanese emperor is mobilizing his forces, what is he doing?

ESR: It means that the Japanese emperor is bringing them all together so that their "united strength" can be used to defeat the United States and the British Empire which the emperor just declared war upon. The emperor is preparing and organizing his troops for battle.

Tier 2 Vocabulary:

"The hallowed spirits of our imperial ancestors guard us from above and we rely upon the loyalty and courage of our subjects in our confident expectation that the task bequeathed by our forefathers will be carried forward and that the source of the evil will be speedily eradicated and an enduring peace immutably established in East Asia, preserving thereby the glory of our empire."

"Japanese Emperor Hirohito Declares War on the United States and Britain" by Emperor Hirohito

[Link to Full Text](#)

Text Dependent Question:

"The men and officers of our army and navy shall do their utmost in prosecuting the war. Our public servants of various departments will perform faithfully and diligently their appointed tasks and all other subjects of ours shall pursue their respective duties. The entire nation with united will shall mobilize their united strength so that nothing will miscarry in the attainment of our royal aims."

“Japanese Emperor Hirohito Declares War on the United States and Britain” by Emperor Hirohito
[Link to Full Text](#)

Multiple Choice Assessment Items		
Grade	CCSS Domain	CCSS Strand
9	Reading: Informational (RI)	Key Ideas and Details
RI.9.2	<p>If true, which finding of a survey of the general population would most undermine the author’s interpretation of Lyubomirsky’s study?</p> <ul style="list-style-type: none"> A. The happiness boost associated with altruistic acts remains constant when more than five altruistic acts are performed in a single day. B. While all altruistic acts confer a happiness boost, altruistic acts that lead to immediate benefits confer the greatest boost. C. The amount of happiness people feel as a result of performing altruistic acts increases with the effort those acts require. D. Occasional altruistic acts result in long-lasting increases in the personal happiness of those who perform them. <p>Text Reference: “What Makes a Hero? The Surprising Science of Selflessness” by Elizabeth Svoboda from the PSAT/NMSQT and PSAT 10 Question Bank</p> <p>Based on the passage, which choice best describes the relationship between emotional support and well-being as shown by Schwartz’s study?</p> <ul style="list-style-type: none"> A. Both givers and recipients of emotional support reported increased well-being. B. Givers of emotional support reported increased well-being, while recipients reported no change. C. Givers of emotional support increased well-being. D. Both givers and recipients of emotional support reported initial well-being followed by a return to their previous condition. <p>Text Reference: “What Makes a Hero? The Surprising Science of Selflessness” by Elizabeth Svoboda from the PSAT/NMSQT and PSAT 10 Question Bank</p>	

Grade	CCSS Domain	CCSS Strand
9	Reading: Informational (RI)	Craft and Structure
RI.9.4	<p>As used in line 1, “positive most nearly means</p> <ul style="list-style-type: none"> A. confident. B. practical. C. specific. D. beneficial. <p>Text Reference: “What Makes a Hero? The Surprising Science of Selflessness” by Elizabeth Svoboda from the PSAT/NMSQT and PSAT 10 Question Bank</p> <p>As used in line 11, “associations” most nearly means</p> <ul style="list-style-type: none"> A. links. B. organizations. C. combinations. D. partnerships. <p>Text Reference: “What Makes a Hero? The Surprising Science of Selflessness” by Elizabeth Svoboda from the PSAT/NMSQT and PSAT 10 Question Bank</p>	
RI.9.6	<p>In line 17-19 the author includes the quotation from Borgonovi most likely to</p> <ul style="list-style-type: none"> A. indicate the hypothesis that Lyubomirsky’s study was intended to test. B. provide a possible explanation for a result of Lyubomirsky’s study. C. criticize Lyubomirsky for failing to consider the benefits of short-term happiness. D. compare the results of Lyubomirsky’s study with those of another study about kind acts. <p>Text Reference: “What Makes a Hero? The Surprising Science of Selflessness” by Elizabeth Svoboda from the PSAT/NMSQT and PSAT 10 Question Bank</p> <p>Which choice best supports Grant’s claim in line 25 (“These...writes”)?</p> <ul style="list-style-type: none"> A. line 18-19 (“Perhaps...colleagues”) B. line 21-22 (“Go back...center”) C. line 22 (“They’re...or 7s”) D. line 22-23 (“In Grant’s...counterparts”) <p>Text Reference: “To Sell is Human: The Surprising Truth About Moving Others” by Daniel H. Pink from the PSAT/NMSQT and PSAT 10 Question Bank</p>	

Grade	CCSS Domain	CCSS Strand
9	Reading: Informational (RI)	Integration of Knowledge and Ideas
RI.9.7	<p>Which of the following choices is a claim in the passage that is supported by the data in the graph?</p> <ul style="list-style-type: none"> A. CAM plants do not leave their stomata open throughout photosynthesis. B. CAM plants demand less water on average than either C3 or C4 plants do. C. CAM plants absorb more CO₂ during the night. D. CAM plants perform a certain phase of photosynthesis in the same manner than C3 plants do. <p>Text Reference: “Does Agave Hold the Secret to Drought-Resistant Farming?” by Niina Heikkinen and ClimateWire from the PSAT/NMSQT and PSAT 10 Question Bank</p> <p>What change to the graph would most directly address a concern raised by Scott?</p> <ul style="list-style-type: none"> A. Adding corresponding measurements for other areas of the brain B. Recording the NAcc activity only between 10 and 20 seconds C. Incorporating the data for music purchased for 99¢ and \$1.29 D. Including an explanation for the decrease in NAcc activity at 20 seconds <p>Text Reference: “Brain’s Music Pleasure Zone Identified” by Alok Jha from the PSAT/NMSQT and PSAT 10 Question Bank</p>	
RI.9.8	<p>Based on information in the passage, it can be reasonably inferred that the majority of survey respondents represented in figure 1</p> <ul style="list-style-type: none"> A. value volunteering because they have a high degree of empathy. B. may have experienced decreases in the level of certain hormones after volunteering. C. are likely to live longer than volunteers who disagreed with the statements. D. always have higher levels of oxytocin circulating in their bloodstreams than do nonvolunteers. <p>Text Reference: “What Makes a Hero? The Surprising Science of Selflessness” by Elizabeth Svoboda from the PSAT/NMSQT and PSAT 10 Question Bank</p> <p>Which choice provides the best evidence for the answer to the previous question?</p> <ul style="list-style-type: none"> A. line 1-2 (“In a...life”) B. line 2-4 (“This connections...measures”) C. line 8-10 (“Even...helped”) D. line 22-23 (“The boost...norepinephrine”) <p>Text Reference: “What Makes a Hero? The Surprising Science of Selflessness” by Elizabeth Svoboda from the PSAT/NMSQT and PSAT 10 Question Bank</p>	

Text Reference for MC Assessment Item RI.9.2, RI.9.4, RI.9.6, RI.9.8

This passage is adapted from Elizabeth Svoboda, *What Makes a Hero? The Surprising Science of Selflessness*. ©2013 by Elizabeth Svoboda.

Line In a 2010 survey of more than 4,500 American volunteers, 89 percent—nearly 9 in 10—stated that volunteering improved their sense of well-being, while a sizable majority reported that it lowered their stress levels and enhanced their sense of purpose in life. This connection appears to hold true regardless of culture: In a 2012 study of older Maori and non-Maori in New Zealand, those who volunteered more often scored higher on happiness measures.

5 In best-case scenarios, regular helping may even help stave off an early death. Analyzing data from more than seven thousand respondents collected for the government’s Longitudinal Study of Aging, the researchers Alex Harris and Carl Thoresen found that frequent volunteers had a 19 percent lower mortality risk than people who never volunteered when the subjects’ level of social support was taken into account. That means volunteering is associated with longer survival independent of the advantages social ties provide. Even more dramatically, when University of Michigan researchers studied 423 older couples who were followed for five years,
10 those who helped others were nearly 60 percent less likely to die during the study period than those who never helped.

While many survey studies have found more or less strong associations between helping and happiness, the University of California, Riverside, psychologist Sonja Lyubomirsky wanted to test the connection in a real-world setting. She asked students to carry out five “random acts of kindness” of their choice every week for six weeks—they could choose anything that benefited others, from making a homeless person a meal to helping a kid with a school assignment. The subjects experienced higher levels of happiness than controls
15 when they performed all five kind acts in one day, suggesting that the well-being boost is pronounced when people help often.

Interestingly, though, students who spaced the kind acts out, performing them on different days, didn’t experience the same happiness boost. Lyubomirsky’s work suggests altruistic acts may need to be frequent in order to confer a lasting change in well-being. With isolated acts of helping, says the London School of Economics social scientist Francesca Borgonovi, “it could be that there’s a very short—narrowly defined in time and space—bump in happiness that doesn’t shift your [overall] happiness in any meaningful way.”

20 On balance, though, being generous boosts your mood and health because it strengthens your sense that you’re really doing something significant. The social psychologist Sara Konrath of the University of Michigan notes that helping others may signal our bodies to release pleasurable chemicals such as oxytocin. The boost we get from helping may also mute our stress response, causing us to release fewer jarring stress hormones such as cortisol and norepinephrine.

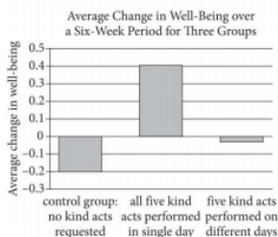
Figure 1

Selected Responses to 2010 Survey of 4,500 American Adults Who Volunteered in the Previous Year

Survey statement	Percent of respondents agreeing
Volunteering has made me feel physically healthier	68%
Volunteering has improved my sense of well-being	89%
Volunteering lowers my stress levels	73%
Volunteering enriches my sense of purpose in life	92%

Adapted from “Volunteering and Your Health: How Giving Back Benefits Everyone.” ©2010 by UnitedHealth Group.

Figure 2



Adapted from Sonja Lyubomirsky, Kennon M. Sheldon, and David Schkade, “Pursuing Happiness: The Architecture of Sustainable Change.” ©2005 by the Educational Publishing Foundation.

Text Reference for MC Assessment Item RI.9.6

This passage is adapted from Daniel H. Pink, *To Sell Is Human: The Surprising Truth about Moving Others*. ©2012 by Daniel H. Pink.

Line When social scientists have investigated the relationship between extraversion and sales success, they've found the link, at best, flimsy. For instance, while supervisors often give extraverts high ratings, several researchers have found that extraversion has "no statistically significant relationship . . . with sales performance" and that "extraversion is not related to sales volume." One of the most comprehensive investigations—a set of three meta-analyses of thirty-five separate studies involving 3,806 salespeople—found that the correlation between extraversion and sales was essentially nonexistent. (Positive correlations are measured on a scale that goes from 0 to 1, with higher numbers—say, 0.62—indicating close correlations and 0 no correlation at all. Across the thirty-five studies, the correlation between extraversion and sales performance was a minuscule 0.07.)

Does this mean that introverts—those soft-spoken souls more at home in a study carrel than at a party—are better at moving others? Not at all. In fact, the evidence, which is emerging in new research, reveals something far more intriguing.

10 Adam Grant is a management professor at the University of Pennsylvania's Wharton School and one of America's top young social psychologists. Some of his previous research had examined extraversion and he'd become curious that a trait so widely associated with sales didn't have much connection to success in that realm. So he decided to find out why.

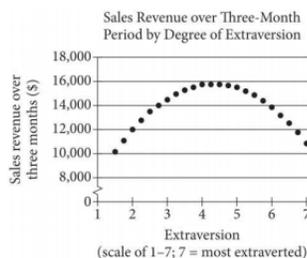
Grant collected data from a software company that operates call centers to sell its products. He began by asking more than three hundred sales representatives to complete several personality assessments, including one that social scientists use to measure where 15 people fall on the introversion-extraversion spectrum. This particular assessment lists statements such as "I am the life of the party" and "I am quiet around strangers" and asks participants to rate themselves on a 1-to-7 scale, with their answers resulting in a numerical measure of extraversion. Then Grant tracked the sales representatives' revenues over the next three months.

Perhaps not surprisingly, introverted sales reps didn't perform as well as extraverted ones, earning an average of \$120 per hour in revenue compared with \$125 per hour for their more outgoing colleagues. But neither did nearly as well as a third group: the ambiverts.

20 Ambi-whats?

These are people who are neither overly extraverted nor wildly introverted. Go back to that 1-to-7 introversion-extraversion scale. Ambiverts sit roughly in the center. They're not 1s or 2s, but they're not 6s or 7s. In Grant's study, these Goldilocks personalities—not too hot, not too cold—earned an average of nearly \$155 per hour, easily besting their counterparts. In fact, the salespeople who had the highest average revenue—\$208 per hour—had extraversion scores between 4.0 and 4.5, smack at the midpoint.

25 "These findings call into question the longstanding belief that the most productive salespeople are extraverted," Grant writes. According to a large study of European and American customers, the "most destructive" behavior of salespeople wasn't being ill-informed. It was an excess of assertiveness and zeal that led to contacting customers too frequently. Extraverts, in other words, often stumble over themselves. They can talk too much and listen too little, which dulls their understanding of others' perspectives. They can fail to strike the proper balance between asserting and holding back, which can be read as pushy and drive people away.



Adapted from Adam M. Grant, "Rethinking the Extraverted Sales Ideal: The Ambivert Advantage."

Text Reference for MC Assessment Item RI.9.7

This passage is adapted from Niina Heikkinen and ClimateWire, "Does Agave Hold the Secret to Drought-Resistant Farming?" ©2015 by Scientific American, a Division of Nature America, Inc.

Line The process is called crassulacean acid metabolism, or CAM, and a small group of scientists have been studying it for several decades because the plants that have it use less water. However, it has only been in the last couple of years that a growing number of researchers have been attempting to fully identify and transfer this photosynthetic pathway to other plant species.

Re-creating an entire metabolic pathway in a plant is far from a simple task. Once scientists figure out all the genes associated with its basic function, as well as its regulation, they then have to find a way to add that genetic material into the target plant, or make existing genes and proteins within the plant work the way they want them to. Altogether, that could involve somewhere around 100 genes, the researchers said, though they don't know the exact number yet.

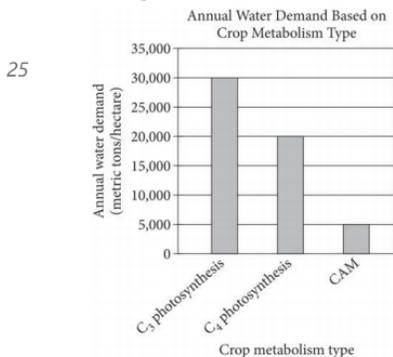
Xiaohan Yang, a staff scientist in the Biosciences Division at Oak Ridge National Laboratory, is one of the researchers working to figure out how to get CAM to work in other types of plants. He said interest in CAM has increased rapidly in the last few years alone, as concern about the effects of drought has gone up and more funding from the federal government has come in.

What makes photosynthesis in agave and cactus so different? Unlike most plants that take up carbon dioxide through stomata [small openings that allow plants to regulate the intake and release of gases] in their leaves during the day (known as C₃ and C₄ plants), CAM plants absorb most of their CO₂ [carbon dioxide] at night. This timing shift means less water evaporates off of the leaves through transpiration. In fact, CAM plants require between a [sixth] and a [fourth] of the water that C₃ and C₄ plants need, respectively.

However, CAM plants also need a way of storing carbon overnight, because just like other plants, they cannot use it to build energy reserves like sugars and starches without sunlight. They do this by temporarily fixing carbon in a transient pool of mostly malic acid. When the sun rises, the plants break down the organic acids, releasing the CO₂. At this point, the plant is able to perform photosynthesis like a C₃ plant, except the stomata don't have to stay open because the carbon is already available in the leaf.

The challenge for researchers like Yang is to find a way to get other plants to create this nocturnal carbon storage. Since the genomes of a number of different CAM plants have been sequenced in the past two years, researchers are beginning to develop a better understanding of how the pathway works.

"We have a very good idea of what genes are important for CAM species," Yang said. "Right now, we are working on how those genes come together, and then we test their efficiency."



Adapted from Xiaohan Yang et al., "A Roadmap for Research on Crassulacean Acid Metabolism (CAM) to Enhance Sustainable Food and Bioenergy Production in a Hotter, Drier World." ©2015 by ORNL/UT-Battelle and New Phytologist Trust.

Text Reference for MC Assessment Item RI.9.7

This passage is adapted from Alok Jha, "Brain's Music Pleasure Zone Identified," ©2013 by Guardian News and Media Limited.

Line Scientists know that music can give intense pleasure by delivering chemical rewards in the brain that are equal to the joy of good food, but now they think they may have identified the part of the brain where this pleasure starts.

5 Researchers scanned the brains of subjects while they listened to new songs and asked how much they would spend on buying the tracks. They found that the most popular songs—those which people were prepared to pay more for—were also the ones that elicited the strongest response in the nucleus accumbens, a structure in the centre of the brain that is involved in reward processing.

"This area is important because it's involved in forming expectations and these are expectations that could be rewarding," said Valorie Salimpoor of McGill University in Montreal, Canada. "What makes music so emotionally powerful is the creation of expectation. Activity in the nucleus accumbens normally would indicate that expectations are being met or surpassed."

10 In the experiment, which is published in *Science*, she and her colleagues scanned the brains of 20 people who used an interface to listen to 30-second clips of songs they had never heard before but were in a genre they generally liked. "Instead of just asking them if they liked the music or not, we gave them a chance to buy the music because that gives us a real understanding of what they really like and want," she said. "Immediately after they hear each clip, they make a decision. They could spend zero dollars, 99¢, \$1.29 or \$2."

15 The brain scans showed a direct relationship between how strong a response someone had in their nucleus accumbens to a song and how much they were willing to pay for it. This part of the brain was not acting alone, however. Salimpoor also found that it was taking in information from the superior temporal gyrus.

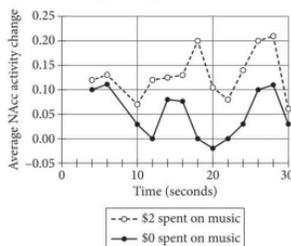
"This part of the brain is the part that has stored all the templates of the music we've heard in the past and will be unique for each individual," she said. "The way that we like music is 100% unique to who we are and what we've heard in the past and the way that our superior temporal gyrus has been shaped. The brain is working a bit like a music-recommendation system."

20 The latest results shed further light into Salimpoor's 2011 study, which found that the experience of pleasure when listening to music was mediated by the release of the brain's reward chemical, dopamine. She said that music seemed to tap into the circuitry in the brain that had evolved to drive human motivation. This ancient reward system, when listening to music, was being used to provide a cognitive reward.

25 Professor Sophie Scott, a neuroscientist at University College London, cautioned that Salimpoor's results should not be over-interpreted. "It is clearly the case that you get rewards for the music you like [but] I don't think we listen to music in any one way, we listen to music in the same way we read books or read poetry or engage with other sorts of art," she said. "One of the reasons they are things we like is because we can engage with them in multiple ways—you could be enjoying music because of the rhythm, because of the way the singer's singing, there's so much going on."

Reward was only a snapshot of one particular brain system and its involvement in music, Scott said. "But don't think it's telling you everything about the totality of how your brain engages with music."

Average Activity in Nucleus Accumbens (NAcc) When Listening to Excerpts of Unfamiliar Music



Adapted from Valorie N. Salimpoor et al., "Interactions between the Nucleus Accumbens and Auditory Cortices Predict Music Reward Value." ©2013 by American Association for the Advancement of Science.

Twenty subjects listened to sixty 30-second song clips and then chose to purchase each clip for \$0, 99¢, \$1.29, or \$2. The researchers averaged the subjects' NAcc activity levels to determine the overall NAcc activity change when the subjects listened to clips they purchased for \$0 and to clips they purchased for \$2.