

Common Core State Standards for English Language Arts: K-12 Close Reading Task

Text grade band placement: 9-12	
Text	Text Complexity Analysis
<p>Title: "Untangling the Roots of Cancer"</p> <p>Author: W. Wayt Gibbs</p> <p>Citation/Publication info: Gibbs, W.Wayt. "Untangling The Roots of Cancer." <i>Scientific American</i> October 2004: 2-10.</p> <p>Link: http://www.ucl.ac.uk/~regonse/Roots_of_Cancer.pdf</p>	<p>Quantitative: Lexile: 1310L</p>
	<p>Qualitative: Meaning/Purpose: Purpose is implied but easy to determine from the context.</p> <p>Text Structure: Connections between ideas are deeper. Text features help the reader to navigate. Graphics are complex but may be essential to understanding parts of the text.</p> <p>Language Features: Language is dense and complex. Contains some complex and domain-specific vocabulary. Many compound sentences are present in the text.</p> <p>Knowledge Demands: Moderate to extensive levels of discipline-specific content knowledge is needed to understand the text.</p>
	<p>Reader and Task: Students may have difficulty with domain-specific vocabulary and tier 2 words.</p> <p>Students may have limited understanding/knowledge of cancer and its causes, DNA structure, mutations, and the effect of mutations on a cellular level.</p>
	ELA/Literacy Common Core Standards addressed by task*

CCSS.ELA-Literacy.CCRA.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.

CCSS.ELA-Literacy.CCRA.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.

CCSS.ELA-Literacy.CCRA.R.6 Assess how point of view or purpose shapes the content and style of a text.

CCSS.ELA-Literacy.CCRA.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.

CCSS.ELA-Literacy.CCRA.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.

CCSS.ELA-Literacy.CCRA.W.1 Write arguments to support claims in an analysis of substantive topics or texts using valid reasoning and relevant and sufficient evidence.

CCSS.ELA-Literacy.CCRA.W.7 Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

CCSS.ELA-Literacy.CCRA.W.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.

What key insights should students take from this text?

1. Environmental factors can stimulate cancer cells to start dividing but are not the root cause of cancer.
2. Cancer is due to cumulative mutations that alter specific locations in a cell's DNA and change the proteins in cancer-related genes at those locations.
3. The two kinds of cancer genes, suppressors and oncogenes, work in opposite roles in the human body to restrain or promote cell division.
4. Mutations cause oncogenes to lock in an active state, thus continually dividing and turning malignant.
5. Carcinogens can cause mutations that result in cancer

Text-Dependent Questions

1. What is the author’s purpose in the article?
2. Within your small group, come to a consensus on the meaning of the following words:
 - a. Malignant
 - b. Carcinogens
 - c. Mutations
3. Categorize the two types of cancer genes that mutations affect. Compare the results of the activation of each type of gene.
4. In the last sentence of the text, the author uses the word axiomatic. Explain why he may have chosen to use this word instead of a more general synonym.
5. The author says, “A cause by definition, leads invariably to its effect.” If cancer is the effect, what are the causes stated by the author?
6. What is the author’s reasoning for shifting from the common, accepted causes of cancer to the scientific causes?

Writing Mode	Writing Prompt
Argument	The author states that recent evidence challenges long-held theories of how cells turn malignant. Research and find a scientific journal article about those long-held theories. Write an argument that distinguishes the author’s claim from the opposing claim, and evaluate which scientific argument is better supported by the evidence. Include reasons and evidence from both texts.

*Because these tasks apply across multiple grades, they are aligned to the College and Career Readiness Anchor Standards (CCRA). R stands for Reading, W for Writing, SL for Speaking and Listening, and L for language.

Scaffolding and support for special education students, English language learners, and struggling readers:

- Pre-teach DNA structure, mutations, and the effect of mutations on a cellular level.
- Pre-teach vocabulary.
- Pair up a struggling reader with a partner to read and discuss the text.
- Allow extra time for the reading and writing tasks.
- Allow foreign language-English dictionary.

How this task supports the content standards for relevant subject area courses in this grade band

This task is relevant for Biology II and/or AP Biology. The task will address standards pertaining to mutations.

Biology II standard 3216.4.6 Recognize how various types of mutations affect gene expression and the sequence of amino acids in the encoded protein.