SCIENCE GRADE ELEVEN-TWELVE: COLLEGE & CAREER READINESS SKILLS

LITERACY	KNOW	UNDERSTAND	DO
COMMON CORE STANDARDS ANCHOR READING STANDARD FOR LITERACY IN SCIENCE			
READING INFORMATION	*(Factual)*	*(Conceptual)*	*(Procedural, Application, Extended Thinking)*
KEY IDEAS AND DETAILS	**RI.1.** Grades 11-12: Cite specific textual evidence to support analysis of science and technical text, attending to the precise details to important distinctions the author makes and to any gaps or inconsistencies in the account.	• Informational text (science expository/technical texts) • How to cite specific textual evidence (e.g., data tables, scientific charts, case studies, quantitative(number based) research and other non-fiction resources) • How to analyze (e.g., bias, credibility, point of view, perspective) • Audience • Purpose • How to draw scientific conclusions • Background knowledge • Critical/analytical judgments • Explicitly stated information from the text(including strengths and limitations) • Peer reviewed text	• Scientists and engineers include key details in informational texts which can help a reader develop and answer scientific questions. • Scientists and engineers scan multiple resources in search of relevant information before they focus on precise details of scientific writing. • Scientists and engineers analyze the reliability of the scientific information within a document/text. • Scientists and engineers use textual evidence, connections to their own understanding of science and their background knowledge to develop scientific conclusions based on evidence from the text	• Use the combination of explicitly stated information, background knowledge, and connections to the text to answer questions they have as they read • Differentiate between quantitative and qualitative data • Describe the connection between the scientist's purpose and the text • Identify/cite and explain information from specific textual evidence including peer reviewed articles (e.g., data tables, scientific charts, case studies, quantitative(number based) • Identify/cite appropriate text support for inferences, hypothesis and conclusions • Differentiate between strong and weak textual support • Develop scientific conclusions about theories in a text • Analyze sources for bias, credibility, point of view, perspective, and purpose for the scientific community • Examine text for relevant information leading to precise details that support and/or refute your research • Cite specific textual evidence to support analysis of science and technical text, attending to the precise details to important distinctions the author makes and to any gaps or inconsistencies in the account.
	RI.2. Grade 11-12: Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.	• Informational text (science, expository/technical texts) • How to explain (e.g., what and why) • Types of text structures (e.g. sequence/ chronological order, classification, definition, simple process, description, comparison) • Different purposes for graphic organizers, based on type of scientific data (quantitative/qualitative) • Difference between central/ main ideas and key details in an informational text • How to analyze scientific text • Characteristics of and how to write an effective summary for scientific text • Relationship between central and specific ideas in an informational text.	• Good readers of science and engineering texts develop effective summaries that are objective and capture the central idea(s) of informational text(s). • Good readers of science and engineering texts analyze how the central idea develops, emerges, and is shaped and refined by specific details and data. • Multiple central ideas interact with and build on one another to create a complex informational text that requires sophisticated analysis.	• Describe or graphically represent the relationship between central ideas and specific details • Determine multiple central idea of an informational text • Describe or graphically represent the relationship between central ideas and specific details • Analyze how authors of scientific and engineering texts reveal, shape, and refine a central idea, utilizing specific details and data • Create an objective summary of scientific informational text • Determine two or more central ideas 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

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KEY IDEAS AND DETAILS	**RI.3.** Grade 11-12: Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.	• Asking questions and solving problems in both science and engineering • Developing and using models • Planning and carrying out an investigation • Analyzing and interpreting data • Using mathematics information and computer technology and computational thinking • Constructing explanations and designing solutions • Engaging in arguments from evidence • Obtaining, evaluating and communicating information	• Good readers of science and engineering analyze the development of individuals, events, ideas/concepts and steps/procedures in order to make meaning of what they read.	• Develop and test theories • Organize and interpret data through tabulating, graphing or statistical analysis • Collect and analyze large data sets, search for distinctive patterns and identify significant relationships and features • Provide explanations aimed at illuminating a particular phenomena, predicting future events about past events • Provide reasoning and arguments to support scientific evidence • Use words, diagrams, tables, charts, graphs, etc. • Reading scientific and engineering text(s) • Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

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CRAFT & STRUCTURE	**RI.4.** Grade 11-12: Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 11-12 texts and topics.*	• Informational text • How to analyze • Context clues • Literal meaning • Technical meaning	• Writers of science and engineering text(s) make purposeful choices to achieve an intended effect within informational text(s). • Good readers of science and engineering text(s) actively seek the meaning of unknown words/phrases to deepen their understanding of informational text(s).	• Read and reread other sentences, words, table(s), diagram(s) and graph(s) to identify context clues to help unlock the meaning of unknown words/phrases • Determine the appropriate definition of words that have more than one meaning • Identify and use scientific language • Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 11-12 texts and topics*
	RI.7. Grade 11-12: Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.	• Informational text (science literary nonfiction and expository/ technical texts) • How to integrate information • How to use information to demonstrate understanding • Media formats (e.g., visual, oral, quantitative) • Text and media topic/message/issue • Relevant vs. irrelevant information • Reliable vs. unreliable resources • Print or digital sources/images/illustrations (e.g., pictures, photographs, charts, graphs, diagrams, time lines, animations, maps, interactive elements on web pages, audio, video)	• Authors of scientific and engineer's texts make decisions about their presentation of information in order to convey a specific message and meet the needs of their audience. • Good readers of science and engineering text develop a coherent understanding of topics or issues by integrating information from a variety of formats. • Authors and presenters of written and visual text choose media forms and formats to present a particular topic or idea for specific audiences.	• Distinguish between relevant vs. interesting or irrelevant information • Distinguish between reliable vs. unreliable resources • Integrate information presented in different formats as well as in words to develop a coherent understanding of a topic or issue • Integrate visual information with other information in print and digital texts

	RI.8. Grade 11-12: Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroboration or challenging conclusions with other sources of information.	• Informational text (science expository/technical texts) • Fact • Opinion • Arguments • How to trace/delineate an author's argument and specific claims • How to evaluate/assess an author's argument and specific claims • Relevant vs. irrelevant details • Relevant, sufficient reasons/ evidence • Sound/logical/justified reasoning based on research findings • Valid vs. invalid claims • Persuasive techniques based on scientific evidence and data	• Good readers of science and engineering text(s) evaluate the reasons and evidence that authors use to support their arguments and specific claims in informational text(s).	• Identify fact • Identify opinion • Identify reasoned judgments based on research findings • Identify the author's argument and specific claims • Identify (e.g., by telling, writing, graphically representing) reasons/examples/evidence that support the author's argument and specific claims • Differentiate between claims which are supported by reasons/evidence and those which are not • Differentiate between valid and invalid claims • Identify false statements and fallacious reasoning in an argument • Recognize when irrelevant evidence is introduced • Assess the extent to which the reasoning and evidence in a text support the author's claims or recommendation for solving a scientific or technical problem. • Research other sources to challenge information presented by an author • Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroboration or challenging conclusions with other sources of information.

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INTEGRATION OF KNOWLEDGE AND IDEAS	**RI.8.** Grade 6-8: Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.	• Informational text (science expository/technical texts) • How to trace/delineate an author's argument and specific claims • Fact • Opinion • Arguments • Sound/logical/justified reasoning • Valid vs. invalid claims	• Good readers of science and engineering text(s) evaluate the reasons and evidence that authors use to support their arguments and specific claims in informational text(s).	• Identify fact • Identify opinion • Identify reasoned judgments based on scientific research • Differentiate between claims which are supported by reasons/evidence and those which are not • Differentiate between valid and invalid claims • Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.
	RI.9. Grade 11-12: Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.	• Informational text (science expository/technical texts) • How to synthesize information • Scientist and engineer's viewpoint/ focus/ attitude/bias • Scientist and engineer's perspective (background) • Scientist and engineer's strategies for shaping presentations (e.g., collecting and interpreting data and research collected) • Interpretation • Fact vs. interpretation	• Authors of scientific and engineering text(s) make choices about what to include and how to present information and key details on topics depending on their purpose and evidence. • Good readers of scientific and engineering text(s) include information based on evidence. • Good readers consult a variety of sources when investigating a topic or an event.	• Communicate results from experiments to other scientists and justify results based on scientific data • Synthesize information from various sources. • Describe how the scientist or engineer's choices reflect their viewpoints, attitudes, positions or biases based on scientific evidence compared to other scientific findings.. • Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.