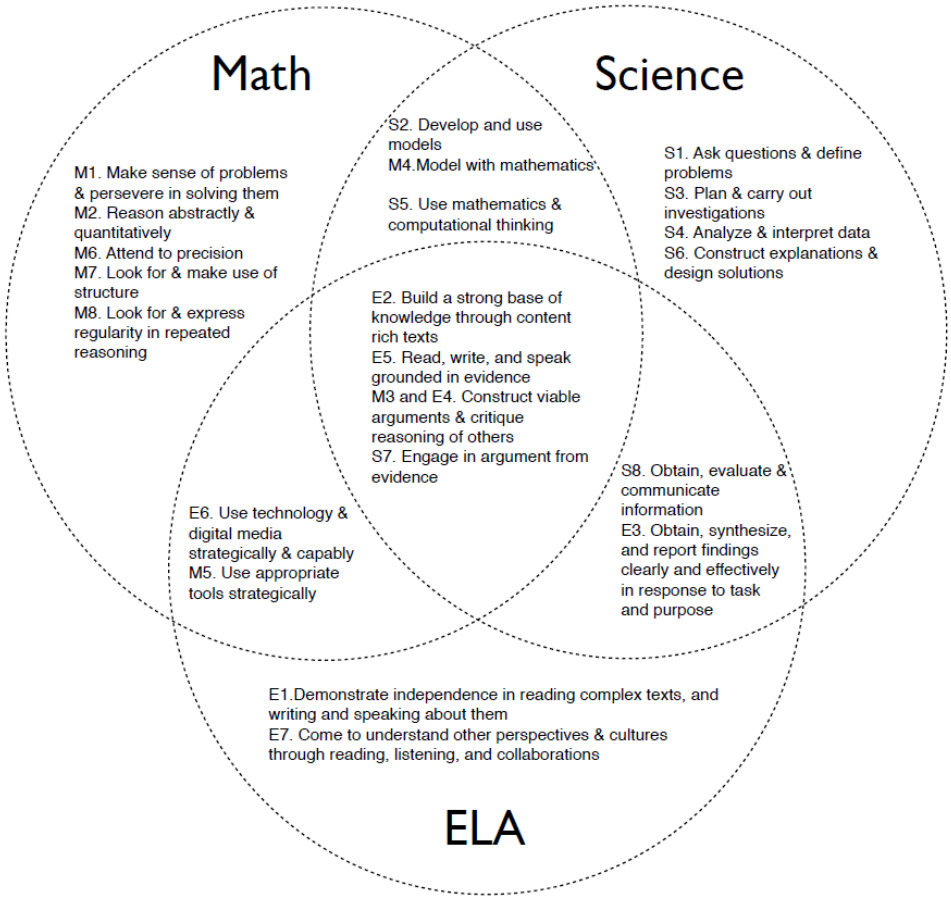
Connections to the Common Core State Standards for Literacy in Kindergarten, First and Second Grade Science

Literacy skills are critical to building knowledge and effective communications in science. To ensure the CCSS literacy standards work in tandem with the specific demands articulated in the NGSS, literacy and science specialists from the NJDOE identified key literacy connections to the specific science practices in the NGSS. As the CCSS affirms, reading in science requires an appreciation of the norms and conventions of the discipline of science, including understanding the nature of evidence used, an attention to precision and detail, and the capacity to make and assess intricate arguments, synthesize complex information, and follow detailed procedures and accounts of events and concepts. Students also need to be able to gain knowledge from diagrams and data that convey information and illustrate scientific concepts. Likewise, writing and presenting information orally are key means for students to assert and defend claims in science, demonstrate what they know about a concept, and convey what they have experienced, imagined, thought, and learned.

This document is based on *the Connections to the Common Core State Standards for Literacy in Science and Technical Subjects for grades 6-12* (Achieve, 2013) and a *Framework for K-12 Science Education* (NRC, 2012).

Convergence of Science, Mathematics and Literacy



Asking Questions and Defining Problems Students at any grade level should be able to ask questions of each other about the texts they read, the features of the phenomena they observe, and the conclusions they draw from their models or scientific investigations. For engineering, they should ask questions to define the problem to be solved and to elicit ideas that lead to the constraints and specifications for its solution (pp. 54-56, NRC, 2012).	
Supporting CCSS Literacy Anchor Standards and Relevant Portions of the Corresponding Standards for Science and Technical Subjects	**Connection to Asking Questions and Defining Problems**
CCR Reading Anchor #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. **Kindergarten** RI.K.1 With prompting and support, ask and answer questions about key details in a text. **First Grade** RI.1.1 Ask and answer questions about key details in a text. **Second Grade** RI.2.1 Ask and answer such questions as *who*, *what*, *where*, *when*, *why*, and *how* to demonstrate understanding of key details in a text.	Evidence plays a critical role in the kinds of questions asked, information gathered, and findings reported in science and technical texts. The notion of close reading in **Reading Standard 1** emphasizes the use of asking and refining questions in order to answer them with evidence that is either explicitly stated or implied.
CCR Reading Anchor #7: Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words. **Kindergarten** RI.K.7.1 With prompting and support, describe the relationship between illustrations and the text in which they appear (e.g., what person, place, thing, or idea in the text an illustration depicts). **First Grade** RI.1.7 Use the illustrations and details in a text to describe its key ideas. **Second Grade** RI.2.7 Explain how specific images (e.g., a diagram showing how a machine works) contribute to and clarify a text.	Scientists and engineers present data in a variety of visual formats in order to reveal meaningful patterns and trends. **Reading Standard 7** speaks directly to the importance of asking questions about and evaluating data presented in different formats.

CCR Reading Anchor #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. **Kindergarten** RI.K.8 With prompting and support, identify the reasons an author gives to support points in a text. **First Grade** RI.1.8 Identify the reasons an author gives to support points in a text. **Second Grade** RI.2.8 Describe how reasons support specific points the author makes in a text.	Challenging or clarifying scientific hypotheses, arguments, experiments or conclusions—and the evidence and premises that support them—are key to this practice. **Reading Standard 8** emphasizes evaluating the validity of arguments and whether the evidence offered backs up the claims logically.
CCR Writing Anchor #7: Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation. **Kindergarten** W.K.7 Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). **First Grade** W.1.7 Participate in shared research and writing projects (e.g., explore a number of "how-to" books on a given topic and use them to write a sequence of instructions). **Second Grade** W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations).	Generating focused questions and well-honed scientific inquiries are key to conducting investigations and defining problems. The research practices reflected in **Writing Standard 7** reflect the skills needed for successful completion of such research-based inquiries.

CCR Speaking & Listening Anchor #1: Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively. **Kindergarten** SL.K.1 Participate in collaborative conversations with diverse partners about *kindergarten topics and texts* with peers and adults in small and larger groups. • SL.K.1a Follow agreed-upon rules for discussions (e.g., listening to others and taking turns speaking about the topics and texts under discussion). • SL.K.1b Continue a conversation through multiple exchanges. **First Grade** SL.1.1 Participate in collaborative conversations with diverse partners about *grade 1 topics and texts* with peers and adults in small and larger groups. • SL.1.1a Follow agreed-upon rules for discussions (e.g., listening to others with care, speaking one at a time about the topics and texts under discussion). • SL.1.1b Build on others' talk in conversations by responding to the comments of others through multiple exchanges. • SL.1.1c Ask questions to clear up any confusion about the topics and texts under discussion. **Second Grade** SL.2.1 Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups. • SL.2.1a Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion). • SL.2.1b Build on others' talk in conversations by linking their comments to the remarks of others. • SL.2.1c Ask for clarification and further explanation as needed about the topics and texts under discussion.	The ability to pose relevant questions, clarify or elaborate on the ideas of others or request information from others are crucial to learning and conducting investigations in science class. **Speaking and Listening Standard 1** speaks directly to the importance of asking and refining questions to clarify ideas that generate solutions and explanations.
CCR Speaking & Listening Anchor #3: Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric. **Kindergarten** SL.K.3 Ask and answer questions in order to seek help, get information, or clarify something that is not	Evaluating the soundness of a speaker's reasoning and evidence concerning scientific theories and concepts through a series of inquiries teaches students to be discriminating thinkers. **Speaking and Listening Standard 3** directly asserts that

understood. **First Grade** SL.1.3 Ask and answer questions about what a speaker says in order to gather additional information or clarify something that is not understood. **Second Grade** SL.2.3 Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.	students must be able to critique a point of view from the perspective of the evidence provided and reasoning advanced.

Planning and Carrying Out Investigations Students should have opportunities to plan and carry out several different kinds of investigations during their K-12 years. At all levels, they should engage in investigations that range from those structured by the teacher—in order to expose an issue or question that they would be unlikely to explore on their own (e.g., measuring specific properties of materials)—to those that emerge from students' own questions (pp. 59-61, NRC, 2012,).	
Supporting CCSS Literacy Anchor Standards and Relevant Portions of the Corresponding Standards for Science and Technical Subjects	**Connection to Planning and Carrying Out Investigations**
CCR Reading Anchor #3: Analyze how and why individuals, events, or ideas develop and interact over the course of a text. **Kindergarten** RI.K.3 With prompting and support, describe the connection between two individuals, events, ideas, or pieces of information in a text. **First Grade** RI.1.3 Describe the connection between two individuals, events, ideas, or pieces of information in a text. **Second Grade:** RI.2.3 Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text.	Systematic investigations in the field or laboratory lie at the heart of scientific inquiry. **Reading Standard 3** emphasizes the importance of accuracy in carrying out such complex experiments and procedures, in following a course of action that will provide the best evidence to support conclusions.
CCR Writing Anchor #7: Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation. **Kindergarten** W.K.7 Participate in shared research and writing projects (e.g., explore a number of books by a favorite author	Planning and carrying out investigations to test hypotheses or designs is central to scientific and engineering activity. The research practices reflected in **Writing Standard 7** reflect the skills needed for

and express opinions about them). **First Grade** W.1.7 Participate in shared research and writing projects (e.g., explore a number of "how-to" books on a given topic and use them to write a sequence of instructions). **Second Grade** W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations).	successful completion of such research-based inquiries.
CCR Writing Anchor #8: Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism. **Kindergarten** W.K.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. **First Grade** W.1.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. **Second Grade:** W.2.8 Recall information from experiences or gather information from provided sources to answer a question.	Collecting relevant data across a broad spectrum of sources in a systematic fashion is a key element of this scientific practice. **Writing Standard 8** spells out the importance of gathering applicable information from multiple reliable sources to support claims.
CCR Speaking & Listening Anchor #1: Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively. **Kindergarten** SL.K.1 Participate in collaborative conversations with diverse partners about *kindergarten topics and texts* with peers and adults in small and larger groups. • SL.K.1a Follow agreed-upon rules for discussions (e.g., listening to others and taking turns speaking about the topics and texts under discussion). • SL.K.1b Continue a conversation through multiple exchanges. **First Grade** SL.1.1: Participate in collaborative conversations with diverse partners about *grade 1 topics and texts* with peers	Carrying out investigations in collaborative settings is crucial to learning in science class and engineering settings. **Speaking and Listening Standard 1** speaks directly to the importance of exchanging theories and evidence cooperatively and collaboratively to carrying out investigations.

and adults in small and larger groups. • SL.1.1a Follow agreed-upon rules for discussions (e.g., listening to others with care, speaking one at a time about the topics and texts under discussion). • SL.1.1b Build on others' talk in conversations by responding to the comments of others through multiple exchanges. • SL.1.1c Ask questions to clear up any confusion about the topics and texts under discussion. **Second Grade** SL.2.1 Participate in collaborative conversations with diverse partners about *grade 2 topics and texts* with peers and adults in small and larger groups. • SL.2.1a Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion). • SL.2.1b Build on others' talk in conversations by linking their comments to the remarks of others. • SL.2.1c Ask for clarification and further explanation as needed about the topics and texts under discussion.	

Analyzing and Interpreting Data

Once collected, data must be presented in a form that can reveal any patterns and relationships and that allows results to be communicated to others. Because raw data as such have little meaning, a major practice of scientists is to organize and interpret data through tabulating, graphing, or statistical analysis. Such analysis can bring out the meaning of data—and their relevance—so that they may be used as evidence.

Engineers, too, make decisions based on evidence that a given design will work; they rarely rely on trial and error. Engineers often analyze a design by creating a model or prototype and collecting extensive data on how it performs, including under extreme conditions. Analysis of this kind of data not only informs design decisions and enables the prediction or assessment of performance but also helps define or clarify problems, determine economic feasibility, evaluate alternatives, and investigate failures (pp. 61-63. NRC, 2012).

Supporting CCSS Literacy Anchor Standards and Relevant Portions of the Corresponding Standards for Science and Technical Subjects	**Connection to Analyzing and Interpreting Data**
CCR Reading Anchor #7: Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words. **Kindergarten** RI.K.7.1 With prompting and support, describe the relationship between illustrations and the text in which they appear (e.g., what person, place, thing, or idea in the text an illustration depicts). **First Grade** RI.1.7 Use the illustrations and details in a text to describe its key ideas. **Second Grade** RI.2.7 Explain how specific images (e.g., a diagram showing how a machine works) contribute to and clarify a text.	Scientists and engineers present data in a myriad of visual formats in order to reveal meaningful patterns and trends. **Reading Standard 7** speaks directly to the importance of understanding and presenting information that has been gathered in various formats to reveal patterns and relationships and allow for deeper explanations and analyses.
CCR Reading Anchor #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. **Kindergarten** RI.K.9 With prompting and support, identify basic similarities in and differences between two texts on the same topic (e.g., in illustrations, descriptions, or procedures). **First Grade** RI.1.9 Identify basic similarities in and differences between two texts on the same topic (e.g., in illustrations, descriptions, or procedures).	Scientists and engineers use technology to allow them to draw on multiple sources of information in order to create data sets. **Reading Standard 9** identifies the importance of analyzing multiple sources in order to inform design decisions and create a coherent understanding of a process or concept.

Second Grade RI.2.9 Compare and contrast the most important points presented by two texts on the same topic.	
CCR Speaking and Listening #2: Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally. **Kindergarten** SL.K.2 Confirm understanding of a text read aloud or information presented orally or through other media by asking and answering questions about key details and requesting clarification if something is not understood. **First Grade** SL.1.2 Ask and answer questions about key details in a text read aloud or information presented orally or through other media. **Second Grade** SL.2.2 Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.	Central to the practice of scientists and engineers is integrating data drawn from multiple sources in order to create a cohesive vision of what the data means. **Speaking and Listening Standard 2** addresses the importance of such synthesizing activities to building knowledge and defining and clarifying problems. This includes evaluating the credibility and accuracy of data and identifying possible sources of error.
CCR Speaking and Listening #5: Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations. **Kindergarten** SL.K.5 Add drawings or other visual displays to descriptions as desired to provide additional detail. **First Grade** SL.1.5 Add drawings or other visual displays to descriptions when appropriate to clarify ideas, thoughts, and feelings. **Second Grade** SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings.	Presenting data for the purposes of cross-comparison is essential for identifying the best design solution or scientific explanation. **Speaking and Listening Standard 5** stresses the importance of visual displays of data within presentations in order to enhance understanding of the relevance of the evidence. That way others can make critical decisions regarding what is being claimed based on the data.

Constructing Explanations and Designing Solutions

Asking students to demonstrate their own understanding of the implications of a scientific idea by developing their own explanations of phenomena, whether based on observations they have made or models they have developed, engages them in an essential part of the process by which conceptual change can occur.

In engineering, the goal is a design rather than an explanation. The process of developing a design is iterative and systematic, as is the process of developing an explanation or a theory in science. Engineers' activities, however, have elements that are distinct from those of scientists. These elements include specifying constraints and criteria for desired qualities of the solution, developing a design plan, producing and testing models or prototypes, selecting among alternative design features to optimize the achievement of design criteria, and refining design ideas based on the performance of a prototype or simulation (pp. 68-69, NRC, 2012).

Supporting CCSS Literacy Anchor Standards and Relevant Portions of the Corresponding Standards for Science and Technical Subjects	**Connection to Constructing Explanations and Designing Solutions**
CCR Reading Anchor #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. **Kindergarten** RI.K.1 With prompting and support, ask and answer questions about key details in a text. **First Grade** RI.1.1 Ask and answer questions about key details in a text. **Second Grade** RI.2.1 Ask and answer such questions as *who*, *what*, *where*, *when*, *why*, and *how* to demonstrate understanding of key details in a text.	Evidence plays a critical role in determining a theory in science and a design solution in engineering. The notion of close reading in **Reading Standard 1** emphasizes pursing investigations into well-supported theories and design solutions on the basis of evidence that is either explicitly stated or implied.
CCR Reading Anchor #2: Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas. **Kindergarten** RI.K.2 With prompting and support, identify the main topic and retell key details of a text. **First Grade** RI.1.2 Identify the main topic and retell key details of a text.	Part of the power of a scientific theory or engineering design is its ability to be cogently explained. That ability to determine and clearly state an idea lies at the heart of **Reading Standard 2**.

Second Grade RI.2.2 Identify the main topic of a multiparagraph text as well as the focus of specific paragraphs within the text.	
CCR Reading Anchor #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. **Kindergarten** RI.K.8 With prompting and support, identify the reasons an author gives to support points in a text. **First Grade** RI.1.8 Identify the reasons an author gives to support points in a text. **Second Grade:** RI.2.8 Describe how reasons support specific points the author makes in a text.	Constructing theories and designing solutions both require analysis that is rooted in rational argument and in evidence stemming from an understanding of the world. **Reading Standard 8** emphasizes evaluating the validity of arguments and whether the evidence offered backs up the claim logically.
CCR Writing Anchor #2: Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. **Kindergarten** W.K.2 Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic. **First Grade** W.1.2 Write informative/explanatory texts in which they name a topic, supply some facts about the topic, and provide some sense of closure. **Second Grade** W.2.2 Write informative/explanatory texts in which they introduce a topic, use facts and definitions to develop points, and provide a concluding statement or section.	Building a theory or a model that explains the natural world requires close attention to how to weave together evidence from multiple sources. With a focus on clearly communicating complex ideas and information by critically choosing, arranging, and analyzing information, **Writing Standard 2** requires students to develop theories with the end goal of explanation in mind.
CCR Writing Anchor #8: Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism. **Kindergarten** W.K.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.	Collecting relevant data across a broad spectrum of sources in a systematic fashion is a key element of constructing a theory with explanatory power or a design that meets multiple constraints. **Writing Standard 8** spells out the importance of gathering applicable information from multiple reliable

First Grade W.1.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. **Second Grade** W.2.8 Recall information from experiences or gather information from provided sources to answer a question.	sources in order to construct well-honed explanations.
CCR Writing Anchor #9: Draw evidence from literary or informational texts to support analysis, reflection, and research. **Kindergarten:** Begins in grade 4. **First Grade:** Begins in grade 4. **Second Grade:** Begins in grade 4.	The route towards constructing a rigorous explanatory account centers on garnering the necessary empirical evidence to support a theory or design. That same focus on generating evidence that can be analyzed is at the heart of **Writing Standard 9**.
CCR Speaking and Listening Anchor #4: Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience. **Kindergarten** SL.K.4 Describe familiar people, places, things, and events and, with prompting and support, provide additional detail. **First Grade** SL.1.4 Describe people, places, things, and events with relevant details, expressing ideas and feelings clearly. **Second Grade** SL.2.4 Tell a story or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences.	A theory in science and a design in engineering is a rational explanatory account of how the world works in light of the evidence. **Speaking and Listening Standard 4** stresses how the presentation of findings crucially relies on how the evidence is used to illuminate the line of reasoning embedded in the explanation offered.

Engaging in Argument from Evidence The study of science and engineering should produce a sense of the process of argument necessary for advancing and defending a new idea or an explanation of a phenomenon and the norms for conducting such arguments. In that spirit, students should argue for the explanations they construct, defend their interpretations of the associated data, and advocate for the designs they propose (pp. 71-74, NRC, 2012).	
Supporting CCSS Literacy Anchor Standards and Relevant Portions of the Corresponding Standards for Science and Technical Subjects	**Connection to Engaging in Argument from Evidence**
CCR Reading Anchor #6: Assess how point of view or purpose shapes the content and style of a text. **Kindergarten** RI.K.6 Name the author and illustrator of a text and define the role of each in presenting the ideas or information in a text. **First Grade** RI.1.6 Distinguish between information provided by pictures or other illustrations and information provided by the words in a text. **Second Grade** RI.2.6 Identify the main purpose of a text, including what the author wants to answer, explain, or describe.	The central motivation of scientists and engineers is to put forth what they believe is the best explanation for a natural phenomena or design solution, and to verify that representation through well wrought arguments. Understanding the point of view of scientists and engineers and how that point of view shapes the content of the explanation is what **Reading Standard 6** asks students to attune to.
CCR Reading Anchor #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. **Kindergarten** RI.K.8 With prompting and support, identify the reasons an author gives to support points in a text. **First Grade** RI.1.8 Identify the reasons an author gives to support points in a text. **Second Grade** RI.2.8 Describe how reasons support specific points the author makes in a text.	Formulating the best explanation or solution to a problem or phenomenon stems from advancing an argument whose premises are rational and supported with evidence. **Reading Standard 8** emphasizes evaluating the validity of arguments and whether the evidence offered backs up the claim logically.
CCR Reading Anchor #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. **Kindergarten** RI.K.9 With prompting and support, identify basic similarities in and differences between two texts on the same topic (e.g., in illustrations, descriptions, or procedures). **First Grade** RI.1.9 Identify basic similarities in and differences between two texts on the same topic (e.g., in illustrations, descriptions, or procedures).	Implicit in the practice of identifying the best explanation or design solution is comparing and contrasting competing proposals. **Reading Standard 9** identifies the importance of comparing different sources in the process of creating a coherent understanding of a phenomenon, concept, or design solution.

Second Grade RI.2.9 Compare and contrast the most important points presented by two texts on the same topic.	
CCR Writing Anchor #1: Write arguments to support claims in an analysis of substantive topics or texts using valid reasoning and relevant and sufficient evidence. **Kindergarten** W.K.1 Use a combination of drawing, dictating, and writing to compose opinion pieces in which they tell a reader the topic or the name of the book they are writing about and state an opinion or preference about the topic or book (e.g., My favorite book is...). **First Grade** W.1.1 Write opinion pieces in which they introduce the topic or name the book they are writing about, state an opinion, supply a reason for the opinion, and provide some sense of closure**.** **Second Grade** W.2.1 Write opinion pieces in which they introduce the topic or book they are writing about, state an opinion, supply reasons that support the opinion, use linking words (e.g., *because*, *and*, *also*) to connect opinion and reasons, and provide a concluding statement or section.	Central to the process of engaging in scientific thought or engineering practices is the notion that what will emerge is backed up by rigorous argument. **Writing Standard 1** places argumentation at the heart of the CCSS for science and technology subjects, stressing the importance of logical reasoning, relevant evidence, and credible sources.
CCR Speaking & Listening Anchor #1: Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively. **Kindergarten** SL.K.1 Participate in collaborative conversations with diverse partners about *kindergarten topics and texts* with peers and adults in small and larger groups. • SL.K.1a Follow agreed-upon rules for discussions (e.g., listening to others and taking turns speaking about the topics and texts under discussion). • SL.K.1b Continue a conversation through multiple exchanges. **First Grade** SL.1.1 Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups. • SL.1.1a Follow agreed-upon rules for discussions (e.g., listening to others with care, speaking one at a time about the topics and texts under discussion). • SL.1.1b Build on others' talk in conversations by responding to the comments of others through multiple exchanges. • SL.1.1c Ask questions to clear up any confusion about the topics and texts under discussion.	Reasoning and argument require critical listening and collaboration skills in order to identify the best explanation for a natural phenomenon or the best solution to a design problem. **Speaking and Listening Standard 1** speaks directly to the importance of comparing and evaluating competing ideas through argument to cooperatively and collaboratively identify the best explanation or solution.

Second Grade SL.2.1 Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups. • SL.2.1a Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion). • SL.2.1b Build on others' talk in conversations by linking their comments to the remarks of others. • SL.2.1c Ask for clarification and further explanation as needed about the topics and texts under discussion.	
CCR Speaking & Listening Anchor #3: Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric. **Kindergarten** SL.K.3 Ask and answer questions in order to seek help, get information, or clarify something that is not understood. **First Grade** SL.1.3 Ask and answer questions about what a speaker says in order to gather additional information or clarify something that is not understood. **Second Grade** SL.2.3 Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.	Evaluating the reasoning in an argument based on the evidence present is crucial for identifying the best design or scientific explanation. **Speaking and Listening Standard 3** directly asserts that students must be able to critique the point of view within an argument presented orally from the perspective of the evidence provided and reasoning advanced by others.
CCR Speaking and Listening Anchor #4: Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience. **Kindergarten** SL.K.4 Describe familiar people, places, things, and events and, with prompting and support, provide additional detail. **First Grade** SL.1.4 Describe people, places, things, and events with relevant details, expressing ideas and feelings clearly. **Second Grade** SL.2.4 Tell a story or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences.	The practice of engaging in argument from evidence is a key ingredient in determining the best explanation for a natural phenomenon or the best solution to a design problem. **Speaking and Listening Standard 4** stresses how the presentation of findings crucially relies on how the evidence is used to illuminate the line of reasoning embedded in the explanation offered.

Obtaining, Evaluating, and Communicating Information Any education in science and engineering needs to develop students' ability to read and produce domain-specific text. As such, every science or engineering lesson is in part a language lesson, particularly reading and producing the genres of texts that are intrinsic to science and engineering (pp. 74-77, NRC, 2012).	
Supporting CCSS Literacy Anchor Standards and Relevant Portions of the Corresponding Standards for Science and Technical Subjects	**Connection to Obtaining, Evaluating, and Communicating Information**
CCR Reading Anchor #2: Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas. **Kindergarten** RI.K.2 With prompting and support, identify the main topic and retell key details of a text. **First Grade** RI.1.2 Identify the main topic and retell key details of a text. **Second Grade** RI.2.2 Identify the main topic of a multiparagraph text as well as the focus of specific paragraphs within the text.	Part of the power of a scientific theory or engineering design is its ability to be cogently explained. That ability to determine and clearly state or summarize a salient scientific concept or phenomena lies at the heart of **Reading Standard 2**.
CCR Reading Anchor #7: Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words. **Kindergarten** RI.K.7 With prompting and support, describe the relationship between illustrations and the text in which they appear (e.g., what person, place, thing, or idea in the text an illustration depicts). **First Grade** RI.1.7 Use the illustrations and details in a text to describe its key ideas. **Second Grade** RI.2.7 Explain how specific images (e.g., a diagram showing how a machine works) contribute to and clarify a text.	A key practice within scientific and engineering communities is communicating about data through the use of tables, diagrams, graphs and models. **Reading Standard 7** speaks directly to the importance of understanding information that has been gathered by investigators in visual formats that reveal deeper explanations and analyses.
CCR Reading Anchor #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. **Kindergarten** RI.K.9 With prompting and support, identify basic similarities in and differences between two texts on the same topic (e.g., in illustrations, descriptions, or procedures). **First Grade** RI.1.9 Identify basic similarities in and differences between two texts on the same topic (e.g., in illustrations, descriptions, or procedures). **Second Grade**	The end goal of these scientific and engineering practices is to position scientists and engineers to be able to evaluate the merit and validity of claims, methods, and designs**. Reading Standard 9** identifies the importance of synthesizing information from a range of sources to the process of creating a coherent understanding of a phenomenon or concept.

RI.2.9 Compare and contrast the most important points presented by two texts on the same topic.	
CCR Reading Anchor #10: Read and comprehend complex literary and informational texts independently and proficiently. **Kindergarten** RI.K.10 Actively engage in group reading activities with purpose and understanding. **First Grade** RI.1.10 With prompting and support, read informational texts appropriately complex for grade 1. **Second Grade** RI.2.10 By the end of year, read and comprehend informational texts, including history/social studies, science, and technical texts, in the grades 2–3 text complexity band proficiently, with scaffolding as needed at the high end of the range.	When reading scientific and technical texts, students need to be able to gain knowledge from challenging texts that often make extensive use of elaborate diagrams and data to convey information and illustrate concepts. Reading Standard 10 asks students to read complex informational texts in these fields with independence and confidence.
CCR Writing Anchor #2: Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. **Kindergarten** W.K.2 Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic. **First Grade** W.1.2 Write informative/explanatory texts in which they name a topic, supply some facts about the topic, and provide some sense of closure. **Second Grade** W.2.2 Write informative/explanatory texts in which they introduce a topic, use facts and definitions to develop points, and provide a concluding statement or section.	The demand for precision in expression is an essential requirement of scientists and engineers, and using the multiple means available to them is a crucial part of that expectation. With a focus on clearly communicating complex ideas and information by critically choosing, arranging, and analyzing information—particularly through the use of visual means—Writing Standard 2 requires students to develop their claims with the end goal of explanation in mind.
CCR Writing Anchor #8: Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism. **Kindergarten** W.K.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. **First Grade** W.1.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.	Collecting relevant data across a broad spectrum of sources in a systematic fashion is a key element of assessing the validity of claims, methods, and designs. **Writing Standard 8** spells out the importance of gathering applicable information from multiple reliable sources so that information can be communicated accurately.

Second Grade W.2.8 Recall information from experiences or gather information from provided sources to answer a question.	
CCR Speaking & Listening Anchor #1: Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively. **Kindergarten** SL.K.1 Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups. • SL.K.1a Follow agreed-upon rules for discussions (e.g., listening to others and taking turns speaking about the topics and texts under discussion). • SL.K.1b Continue a conversation through multiple exchanges. **First Grade** SL.1.1 Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups. • SL.1.1a Follow agreed-upon rules for discussions (e.g., listening to others with care, speaking one at a time about the topics and texts under discussion). • SL.1.1b Build on others' talk in conversations by responding to the comments of others through multiple exchanges. • SL.1.1c Ask questions to clear up any confusion about the topics and texts under discussion. **Second Grade** SL.2.1 Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups. • SL.2.1a Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion). • SL.2.1b Build on others' talk in conversations by linking their comments to the remarks of others. • SL.2.1c Ask for clarification and further explanation as needed about the topics and texts under discussion.	Reasoning and argument require critical listening and collaboration skills in order to evaluate the merit and validity claims, methods, and designs. **Speaking and Listening Standard 1** speaks directly to the importance of comparing and assessing competing ideas through extended discussions grounded in evidence.

CCR Speaking and Listening Anchor #4: Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience. **Kindergarten** SL.K.4 Describe familiar people, places, things, and events and, with prompting and support, provide additional detail. **First Grade** SL.1.4 Describe people, places, things, and events with relevant details, expressing ideas and feelings clearly. **Second Grade** SL.2.4 Tell a story or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences.	Central to the professional activity of scientists and engineers alike is communicating their findings clearly and persuasively. **Speaking and Listening Standard 4** stresses how the presentation of findings crucially relies on how the evidence is used to illuminate the line of reasoning embedded in the explanation offered.
CCR Speaking and Listening #5: Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations. **Kindergarten** SL.K.5 Add drawings or other visual displays to descriptions as desired to provide additional detail. **First Grade** SL.1.5 Add drawings or other visual displays to descriptions when appropriate to clarify ideas, thoughts, and feelings. **Second Grade** SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings.	Presenting data for the purposes of communication is essential for evaluating the merit and validity of claims, methods, and designs. **Speaking and Listening Standard 5** stresses the importance of visual or digital displays of data within presentations in order to enhance understanding of the evidence. That way others can make critical decisions regarding what is being claimed based on the data.

Bibliography

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