

Introduction

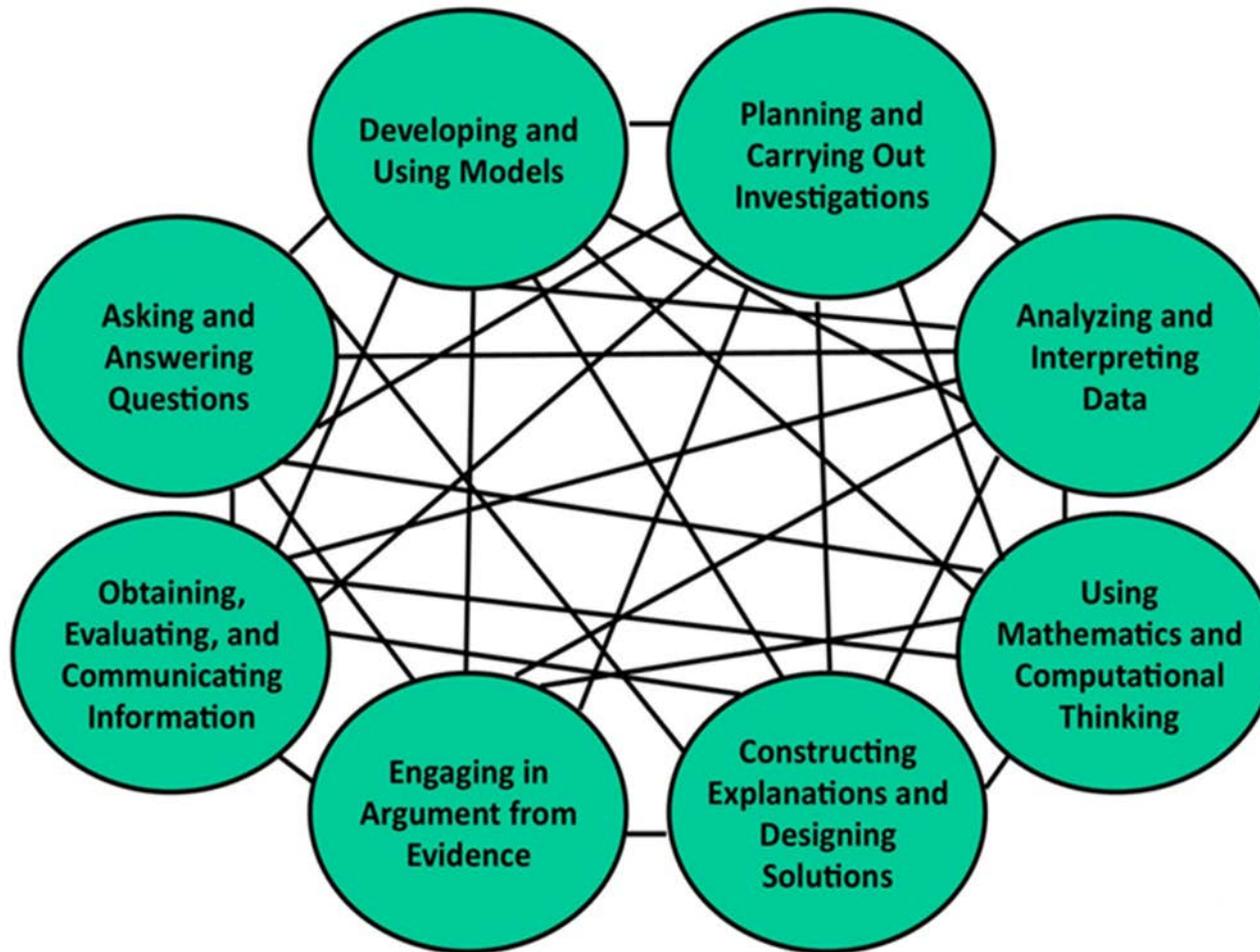
Developing literacy skills within specific content areas is an important life skill for student as they prepare to be college and career ready. The mutually supportive nature of the New Jersey Student Learning Standards for English Language Arts (NJSLS-ELA) and the New Jersey Student Learning Standards for Science (NJSLS-S) makes their integration an opportunity for students to develop proficiencies in both disciplines simultaneously. This document focuses on leveraging the connections between NJSLS-ELA Anchors and the Science and Engineering Practices in grades 3 through 5.

The Science and Engineering Practices are an essential component of the NJSLS-S. The practice are essential because students cannot fully understand scientific and engineering ideas without engaging in the practices of inquiry and the discourses by which such ideas are developed and refined. At the same time, they cannot learn or show competence in practices except in the context of specific core ideas (NRC Framework, 2012, p. 218). See Figure 1: Science and Engineering Practices on page 2.

We use the term “practices” instead of a term such as “skills” to emphasize that engaging in scientific investigation requires not only skill but also knowledge that is specific to each practice (NRC Framework, 2012, p. 30).

Every effort has been made to ensure consistency between the NJSLS-ELA and the NJSLS-S. As is the case with the mathematics standards, NJSLS-S should always be interpreted and implemented in such a way that they do not outpace or misalign to the grade-by-grade standards in the NJSLS-ELA. What follows are the NJSLS-S Science and Engineering Practices and the corresponding NJSLS-ELA Literacy Anchor Standards, explanations of how the two disciplines integrate, examples of the integration from the Model Science Curriculum Framework, and connections to how the integration looks in the professional world.

Figure 1: Science and Engineering Practices



Part 1: 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 ([NRC Framework 2012, p. 56](#)). Video summarizing [Asking Questions and Defining Problems](#).

Asking Questions and Defining Problems in Grades 3 through 5:

- Ask questions about what would happen if a variable is changed.
- Identify scientific (testable) and non-scientific (non-testable) questions.
- Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships.
- Use prior knowledge to describe problems that can be solved.
- Define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost.

NJSLS-ELA Anchor Standard Reading 1: Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

Integration with Asking Questions and Defining Problems: 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.

Reading Anchor 1 and Asking Questions and Defining Problems

NJSLS-ELA Indicators	Students...	Example
•	•	•
•	•	•
•	•	•

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Closely read and analyze text like lab reports, technical manuals and research
- Infer meaning from text
- Question information presented in text
- Determine when more information is needed
- Use information from text to support assertions
- Cite textual information from several sources
- Evaluate information in text

NJSLS-ELA Anchor Standard Reading 7: Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.

Integration with Science and Engineering Practice: 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 asking questions about and evaluating data presented in different formats.

Reading Anchor 7 and Asking Questions and Defining Problems

NJSLS-ELA Indicators	Students...	Example
•	•	•
•	•	•
•	•	•

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Determine the best representation for information
- Read a variety of charts and graphs
- Create charts and graphs from text
- Explain information presented in charts and graphs
- Determine the necessary information from visual representations
- Evaluate information in text

NJSLS-ELA Anchor Standards Reading 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.

Integration with Asking Questions and Defining Problems: 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.

Reading Anchor 8 and Asking Questions and Defining Problems

NJSLS-ELA Indicators	Students...	Example
<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •
<ul style="list-style-type: none"> • Explain how an author uses reasons and evidence to support particular points in a text. RI.4.8. 	<ul style="list-style-type: none"> • Identify reasons and evidence an author uses to support a claim. • Describe how an author uses proof to support a point in the text. 	<ul style="list-style-type: none"> • N/A
<ul style="list-style-type: none"> • Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point(s). RI.5.8. 	<ul style="list-style-type: none"> • Identify the points or claims an author makes in a text. • Identify reasons and evidence for those points or claims made. • Prove each point with evidence from the text. • Explain how an author uses proof to support a point in the text. 	<ul style="list-style-type: none"> • N/A

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Determine if given information is valid

- Question hypotheses, data and conclusions
- Verify that information is correct
- Support analysis of hypotheses, data and conclusions with sources

NJSLS-ELA Anchor Standards Writing 7: Conduct short as well as more sustained research projects, utilizing an inquiry-based research process, based on focused questions, demonstrating understanding of the subject under investigation.

Integration with Asking Questions and Defining Problems: 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.

Writing Anchor 7 and Asking Questions and Defining Problems

NJSLS-ELA Indicators	Students...	Example
•	•	•
<ul style="list-style-type: none"> • Conduct short research projects that build knowledge through investigation of different aspects of a topic. W.4.7 	<ul style="list-style-type: none"> • Research a topic through investigation of the topic. • Explore a topic in greater detail by developing a research question that helps bring focus to the topic. • Gather information to support a topic. • Select relevant information from texts to support main ideas or claims. • Group like ideas to organize writing. 	<ul style="list-style-type: none"> • Conduct short research projects on earth systems that will help them gather additional evidence to support explanations. Grade 4, Unit 1
<ul style="list-style-type: none"> • Conduct short research projects that use several sources to build knowledge through investigation of 	<ul style="list-style-type: none"> • Research a topic through investigation of the topic. 	<ul style="list-style-type: none"> • Conduct short research projects, using both print and digital sources, to build

NJSL-ELA Indicators	Students...	Example
different perspectives of a topic. W.5.7.	<ul style="list-style-type: none"> • Explore a topic in greater detail by developing a research question that helps bring focus to the topic. • Gather information from multiple sources to support a topic. • Select relevant information from texts to support main ideas or claims. • Group like ideas to organize writing. 	their understanding of physical changes to matter. Grade 5, Unit 2

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Create questions to drive investigation
- Broaden or narrow an inquiry when necessary
- Conduct research led by questions
- Appropriately use information discovered in research

NJSLS-ELA Anchor Speaking and Listening 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.

Integration with Asking Questions and Defining Problems: 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.

Speaking and Listening Anchor 1 with Asking Questions and Defining Problems

NJSLS-ELA Indicators	Students...	Example
<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •
<ul style="list-style-type: none"> • Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly. SL.4.1. 	<ul style="list-style-type: none"> • Use previous knowledge to expand discussions about a topic. • Engage in conversations about grade-appropriate topics and texts. • Participate in a variety of rich, structured conversations. • Engage as part of a whole class, in small groups, and with a partner, sharing the roles of participant, leader, and observer. • Engage in collaborative conversations (such as book groups, literature circles, buddy reading), and develop skills in active (close) listening and group discussion (looking at the speaker, turn taking, linking ideas to 	<ul style="list-style-type: none"> • Participate in discussions and write explanations on the transfer of energy, they should refer specifically to text, when appropriate. Grade 4, Unit 6

NJSL-ELA Indicators	Students...	Example
	<p>the speaker’s idea, sharing the floor, etc.).</p>	
<ul style="list-style-type: none"> Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly. SL.5.1. 	<ul style="list-style-type: none"> Use previous knowledge to expand discussions about a topic Engage in conversations about grade-appropriate topics and texts. Participate in a variety of rich, structured conversations. Engage as part of a whole class, in small groups, and with a partner, sharing the roles of participant, leader, and observer. Engage in collaborative conversations (such as book groups, literature circles, buddy reading), and develop skills in active (close) listening and group discussion (looking at the speaker, turn taking, linking ideas to the speaker’s idea, sharing the floor, etc.). 	<ul style="list-style-type: none"> Use the information to answer questions, participate in discussions, solve problems, and support their thinking about movement of matter and the flow of energy through the organisms in an ecosystem. Grade 5, Unit 3

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Gain information and understanding through verbal discourse
- Pose questions of colleagues to gain insight or understanding

- Use sources to support ideas or conclusion

NJSLS-ELA Speaking and Listening Anchor 3: Evaluate a speaker’s point of view, reasoning, and use of evidence and rhetoric.

Integration with Asking Questions and Defining Problems: 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 students must be able to critique a point of view from the perspective of the evidence provided and reasoning advanced.

Speaking and Listening Anchor 3 with Asking Questions and Defining Problems

NJSLS-ELA Indicators	Students should be able to...	Example
•	•	•
<ul style="list-style-type: none"> • Identify the reasons and evidence a speaker provides to support particular points. SL.4.3. 	<ul style="list-style-type: none"> • Determine a speaker’s reasons and evidence. • Decide to what degree the evidence supports the speaker’s points. 	<ul style="list-style-type: none"> • N/A
<ul style="list-style-type: none"> • Summarize the points a speaker makes and explain how each claim is supported by reasons and evidence. SL.5.3. 	<ul style="list-style-type: none"> • Determine a speaker’s reasons and evidence. • Summarize the speaker’s main ideas. • Determine how each point is supported by evidence. 	<ul style="list-style-type: none"> • N/A

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Evaluate the validity of scientific theories or research
- Determine if interpretation of data is false or misleading

- Use the research of others during discourse with colleagues

Part 2: 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 ([NRC Framework, 2012, p. 61](#)). Video summarizing [Planning & Carrying Out Investigations](#).

Planning and Carrying Out Investigations in Grades 3-5:

- Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered.
- Evaluate appropriate methods and/or tools for collecting data.
- Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution.
- Make predictions about what would happen if a variable changes.
- Test two different models of the same proposed object, tool, or process to determine which better meets criteria for success.

NJSLS-ELA Anchor Standard Reading 3: Analyze how and why individuals, events, and ideas develop and interact over the course of a text.

Integration with Planning and Carrying out Investigations: 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.

Reading Anchor 3 and Planning and Carrying out Investigations

NJSLS-ELA Indicators	Students...	Example
<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •
<ul style="list-style-type: none"> • Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text. RI.4.3. 	<ul style="list-style-type: none"> • Read text closely to identify key details. • Explain how or why historical events, scientific ideas or “how to” procedures happened. • Use the text to support their answers. 	<ul style="list-style-type: none"> • Read content-specific texts to deepen their understanding of the cause-and-effect relationships within earth systems. Grade 4, Unit 1
<ul style="list-style-type: none"> • Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text. RI.5.3. 	<ul style="list-style-type: none"> • Identify the relationships or interactions between people, places and ideas in text • Explain the relationship to analyze the text 	<ul style="list-style-type: none"> • Draw evidence from informational texts to support their design choices as they build and share their models of matter at the particle level. Grade 5, Unit 1

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Carefully read and follow procedures
- Modify procedures when necessary

- Pose questions when steps are unclear
- Interpret the results expected from following a procedure

NJSLS-ELA Anchor Standard Writing 7: Conduct short as well as more sustained research projects, utilizing an inquiry-based research process, based on focused questions, demonstrating understanding of the subject under investigation.

Integration with Writing Anchor 7 with Planning and Carrying out Investigations: 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 successful completion of such research-based inquiries.

Writing Anchor 7 and Planning and Carrying out Investigations

NJSLS-ELA Indicators	Students...	Example
•	•	•
<ul style="list-style-type: none"> • Conduct short research projects that build knowledge through investigation of different aspects of a topic. W.4.7. 	<ul style="list-style-type: none"> • Research a topic through investigation of the topic. • Explore a topic in greater detail by developing a research question that helps bring focus to the topic. • Gather information to support a topic. • Select relevant information from texts to support main ideas or claims. • Group like ideas to organize writing. 	<ul style="list-style-type: none"> • Conduct short research projects on the earth’s processes that will help them gather additional evidence to support explanations. Grade 4, Unit 1
<ul style="list-style-type: none"> • Conduct short research projects that use several sources to build knowledge through investigation of different perspectives of a topic. W.5.7. 	<ul style="list-style-type: none"> • Research a topic through investigation of the topic. 	<ul style="list-style-type: none"> • Conduct short research projects, using both print and digital sources, to build their understanding of physical changes to matter. Grade 5, Unit 2

NJSL-ELA Indicators	Students...	Example
	<ul style="list-style-type: none"> • Explore a topic in greater detail by developing a research question that helps bring focus to the topic. • Gather information from multiple sources to support a topic. • Select relevant information from texts to support main ideas or claims. • Group like ideas to organize writing. 	

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Create a plan to test a hypothesis or design
- Follow a carefully thought-out research plan
- Adapt the research plan, when appropriate and necessary

NJSLS-ELA Anchor Standard Writing 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.

Integration with Planning and Carrying out Investigations: 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.

Writing Anchor 8 and Planning and Carrying out Investigations

NJSLS-ELA Indicators	Students should be able to...	Example
<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •
<ul style="list-style-type: none"> • Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources. W.4.8. 	<ul style="list-style-type: none"> • Research information from print and digital sources. • Integrate information from personal experience. • Take notes and organize their information into categories. • List the sources used. 	<ul style="list-style-type: none"> • Use text and online media resources when appropriate to understand how animals receive and process information they receive from the environment, and to develop a conceptual understanding of what happens when light reflects off objects and enters the eye. Grade 4, Unit 4
<ul style="list-style-type: none"> • Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources. W.5.8. 	<ul style="list-style-type: none"> • Locate information from print and digital sources. • Integrate information from personal experiences. • Include a list of sources used. • Take notes on information gathered from the sources to support the topic. 	<ul style="list-style-type: none"> • Conduct research by using text and media resources to build their knowledge of the physical properties of matter. Grade 5, Unit 1

	<ul style="list-style-type: none"> • Synthesize information to avoid plagiarism. • Organize information into categories. 	
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Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Collect data from a variety of sources, both print and digital
- Determine if a particular source is relevant
- Determine if the information in a source is reliable and valid

NJSLS-ELA Anchor Speaking and Listening 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.

Integration with Planning and Carrying out Investigations: 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.

Speaking and Listening with Planning and Carrying Out Investigations

NJSLS-ELA Indicators	Students...	Examples
•	•	•
<ul style="list-style-type: none"> • Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly. SL.4.1. 	<ul style="list-style-type: none"> • Use previous knowledge to expand discussions about a topic. • Engage in conversations about grade-appropriate topics and texts. • Participate in a variety of rich, structured conversations. 	<ul style="list-style-type: none"> • Participate in discussions and write explanations, they should refer specifically to text, when appropriate. Grade 4, Unit 6

NJSL-ELA Indicators	Students...	Examples
	<ul style="list-style-type: none"> Engage as part of a whole class, in small groups, and with a partner, sharing the roles of participant, leader, and observer. Engage in collaborative conversations (such as book groups, literature circles, buddy reading), and develop skills in active (close) listening and group discussion (looking at the speaker, turn taking, linking ideas to the speaker’s idea, sharing the floor, etc.). 	
<ul style="list-style-type: none"> Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly. SL.5.1. 	<ul style="list-style-type: none"> Use previous knowledge to expand discussions about a topic. Engage in conversations about grade-appropriate topics and texts. Participate in a variety of rich, structured conversations. Engage as part of a whole class, in small groups, and with a partner, sharing the roles of participant, leader, and observer. Engage in collaborative conversations (such as book groups, literature circles, buddy reading), and develop skills in active (close) listening and 	<ul style="list-style-type: none"> Use information to answer questions, participate in discussions, solve problems, and support their thinking about movement of matter and the flow of energy through the organisms in an ecosystem. Grade 5, Unit 3

NJSL-ELA Indicators	Students...	Examples
	group discussion (looking at the speaker, turn taking, linking ideas to the speaker's idea, sharing the floor, etc.).	

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Gain information and understanding through verbal discourse
- Pose questions of colleagues to gain insight or understanding
- Use sources to support ideas or conclusion

Part 3: 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 ([NRC Framework, 2012, p. 61-62](#)). Video summarizing [Analyzing and Interpreting Data](#).

Analyzing and Interpreting Data in Grades 3-5:

- Represent data in tables and/or various graphical displays (bar graphs, pictographs and/or pie charts) to reveal patterns that indicate relationships.
- Analyze and interpret data to make sense of phenomena, using logical reasoning, mathematics, and/or computation.
- Compare and contrast data collected by different groups in order to discuss similarities and differences in their findings.
- Analyze data to refine a problem statement or the design of a proposed object, tool, or process.
- Use data to evaluate and refine design solutions.

NJSLS-ELA Anchor Standard Reading 7: Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.

Integration with Analyzing and Interpreting Data: 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.

Reading Anchor 7 and Analyzing and Interpreting Data

NJSLS-ELA Indicators	Students...	Examples
<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •
<ul style="list-style-type: none"> • Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears. RI.4.7. 	<ul style="list-style-type: none"> • Analyze information presented in various formats to identify the key details. • Understand what is heard, viewed, or presented through various media formats to help make meaning of the text. • Explain how the information presented in various formats aids to the overall meaning. 	<ul style="list-style-type: none"> • Read, analyze, and interpret information from nonfiction text, charts, graphs, diagrams, timelines, and interactive elements on the Internet. Grade 4, Unit 2
<ul style="list-style-type: none"> • Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. RI.5.7. 	<ul style="list-style-type: none"> • Read texts closely to determine the main ideas and important details. • Synthesize information from multiple sources. 	<ul style="list-style-type: none"> • Use information from print and digital sources to build their understanding of the Earth’s gravitational force on objects. • The differences in the apparent brightness of the sun compared to that

NJSL-ELA Indicators	Students...	Examples
	<ul style="list-style-type: none"> • Use media efficiently to answer questions and to solve problems. 	<p>of other stars due to their relative distances from Earth.</p> <ul style="list-style-type: none"> • Patterns of change that occur due to the position and motion of the Earth, sun, moon, and stars. Grade 5, Unit 6

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Determine the best representation for information
- Read a variety of charts and graphs
- Create charts and graphs from text
- Explain information presented in charts and graphs
- Determine the necessary information from visual representations
- Evaluate information in text

NJSLS-ELA Anchor Standard Reading 9: Analyze and reflect on how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

Integration with Analyzing and Interpreting Data: 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.

Reading Anchor 9 and Analyzing and Interpreting Data

NJSLS-ELA Indicators	Students...	Example
<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •
<ul style="list-style-type: none"> • Integrate and reflect on (e.g. practical knowledge, historical/cultural context, and background knowledge) information from two texts on the same topic in order to write or speak about the subject knowledgeably. RI.4.9. 	<ul style="list-style-type: none"> • Read two texts closely on the same subject to identify key details. • Synthesize information from two texts about the same subject in a written or oral response that demonstrates knowledge of the subject. 	<ul style="list-style-type: none"> • Draw evidence from literary and information texts on transferring energy in order to analyze and reflect on their findings. Grade 4, Unit 5
<ul style="list-style-type: none"> • Integrate and reflect on (e.g. practical knowledge, historical/cultural context, and background knowledge) information from several texts on the same topic in order to write or speak about the subject knowledgeably. RI.5.9 	<ul style="list-style-type: none"> • Find similarities and differences in themes and topics when reading stories of the same genre. • Connect the text to other knowledge (e.g. practical knowledge, historical/cultural context, and background knowledge). • Combine information from several texts about the same subject in a written or oral response that 	<ul style="list-style-type: none"> • Read and gather information from multiple sources to integrate and use the information to answer questions and support their thinking during discussions and in their writing. Grade 5, Unit 6

NJSL-ELA Indicators	Students...	Example
	demonstrates knowledge of the subject.	

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Analyze multiple sources to create data sets
- Use information from multiple sources to inform future work

NJSL-ELA Anchor Standard Listening 2: Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

Integration with Analyzing and Interpreting Data: 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.

Speaking and Listening Anchor with Analyzing and Interpreting Data

NJSL-ELA Indicators	Students...	Example
•	•	•
<ul style="list-style-type: none"> • Paraphrase portions of a text read aloud or information presented in diverse media and formats (e.g. visually, quantitatively, and orally). SL.4.2. 	<ul style="list-style-type: none"> • Identify the key points and supporting details of a text presented orally. • Restate the key information from a written text read aloud or information presented in multiple formats. 	<ul style="list-style-type: none"> • Summarize or paraphrase notes to support their work throughout the engineering design process. Grade 4, Unit 2

NJSL-ELA Indicators	Students...	Example
<ul style="list-style-type: none"> Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally (e.g., visually, quantitatively, and orally). SL.5.2. 	<ul style="list-style-type: none"> Identify the key points and supporting details of a text presented orally. Summarize a written text read aloud or information presented in multiple formats. 	<ul style="list-style-type: none"> Summarize or paraphrase research as they take notes in their science journals. Grade 5, Unit 1

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Use sources in diverse formats to present information
- Determine if a presenter’s information is valid
- Disprove illogical or faulty reasoning
- Provide proof to disprove faulty logic

NJSL-ELA Anchor Standard Speaking and Listening 5: Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

Integration with Analyzing and Interpreting Data: 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.

Speaking and Listening Standard 5 with Analyzing and Interpreting Data

NJSL-ELA Indicators	Students...	Examples
<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none">

NJSL-ELA Indicators	Students...	Examples
<ul style="list-style-type: none"> Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes. SL.4.5. 	<ul style="list-style-type: none"> Integrate audio recordings and visual displays, when appropriate, to enhance the development of main ideas or themes. 	<ul style="list-style-type: none"> Use visual displays to enhance observations and explanations of the concepts of how animals receive and process. Grade 4, Unit 4
<ul style="list-style-type: none"> Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes. SL.5.5. 	<ul style="list-style-type: none"> Identify main ideas and themes of a presentation. Combine audio recordings and visual displays when appropriate to enhance the development of main ideas or themes. 	<ul style="list-style-type: none"> Create foldables, charts, or PowerPoint presentations to accompany models. Grade 5, Unit 1

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Present information in a clear, concise format
- Utilize diverse media formats to present findings and research

Part 4: Constructing Explanations and Designing Solutions

The goal of science is the construction of theories that provide explanatory accounts of the world. A theory becomes accepted when it has multiple lines of empirical evidence and greater explanatory power of phenomena than previous theories ([NRC Framework, 2012, p. 52](#)). Video summary of [Constructing Explanations and Designing Solutions](#).

Elements of Constructing explanations (for science) and designing solutions (for engineering) in Grades 3-5:

- Construct an explanation of observed relationships (e.g., the distribution of plants in the back yard).
- Use evidence (e.g., measurements, observations, patterns) to construct or support an explanation or design a solution to a problem.
- Identify the evidence that supports particular points in an explanation.
- Apply scientific ideas to solve design problems.
- Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution.

NJSLS-ELA Anchor Standard Reading 1: Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

Integration with Constructing Explanations and Designing Solutions: 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 pursuing investigations into well-supported theories and design solutions on the basis of evidence that is either explicitly stated or implied.

Reading Anchor 1 and Constructing Explanations and Designing Solutions

NJSLS-ELA Indicators	Students...	Examples
<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •
<ul style="list-style-type: none"> • Refer to details and examples in a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text. RI.4.1. 	<ul style="list-style-type: none"> • Read texts closely (questioning, determining importance, looking for patterns) to make meaning of what was read. • Make personal connections, make connections to other texts, and/or make global connections when relevant. • Use quotes or references from a text when explaining what the text says explicitly and/or when explaining inferences drawn from the text. • Refer to the text when drawing conclusions as well as when answering directly stated questions. 	<ul style="list-style-type: none"> • Use information from observations and research to explain the patterns of change that occur when objects move and collide. Grade 4, Unit 6
<ul style="list-style-type: none"> • Quote accurately from a text and make relevant connections when 	<ul style="list-style-type: none"> • Read texts closely (questioning, determining importance, looking for 	<ul style="list-style-type: none"> • Draw evidence from informational texts to support design choices when

NJSLS-ELA Indicators	Students...	Examples
explaining what the text says explicitly and when drawing inferences from the text. RI.5.1.	patterns) to make meaning of what was read. <ul style="list-style-type: none"> • Make personal connections, make connections to other texts, and/or make global connections when relevant. • Use quotes or references from a text when explaining what the text says explicitly and/or when explaining inferences drawn from the text. 	building and sharing models of matter at the particle level. Grade 5, Unit 1

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Closely read and analyze text like lab reports, technical manuals and research;
- Infer scientific theory or design solution from text
- Use explicit or implicit text details to support a theory or a design
- Determine when more information is needed
- Cite textual information from several sources

NJSLS-ELA Anchor Standard Reading 2: Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

Integration with Constructing Explanations and Designing Solutions: 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**.

Reading Anchor 2 and Constructing Explanations and Designing Solutions

NJSLS-ELA Indicators	Students...	Examples
<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •
<ul style="list-style-type: none"> • Determine the main idea of a text and explain how it is supported by key details; summarize the text. RI.4.2. 	<ul style="list-style-type: none"> • Identify the key details of a text that support the main idea. • Analyze the actions and thoughts of characters or speakers in texts, looking for patterns. • Determine the theme or main idea of the text. • Summarize the key points of a text. • Explain how the author supports main ideas in informational text with key details. 	<ul style="list-style-type: none"> • Summarize or paraphrase notes to support the work throughout the engineering design process. Grade 4, Unit 2
<ul style="list-style-type: none"> • Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text. RI.5.2. 	<ul style="list-style-type: none"> • Summarize the key points of a text. • Identify details to support the main idea. • Identify at least two main ideas in informational texts. 	<ul style="list-style-type: none"> • Summarize information in order to describe the amounts and percentages of fresh water and salt water on the Earth. Grade 5, Unit 4

NJSL-ELA Indicators	Students...	Examples
	<ul style="list-style-type: none"> Explain how the author supports main ideas in informational text with key details. 	

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Determine the central idea of scientific text
- Support the explanation of the central idea with details
- Objectively summarize text, free of personal bias

NJSL-ELA Anchor Standard Reading 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.

Integration with Constructing Explanations and Designing Solutions: 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.

Reading Anchor 8 and Constructing Explanations and Designing Solutions

NJSL-ELA Indicators	Students...	Examples
<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none">
<ul style="list-style-type: none"> Explain how an author uses reasons and evidence to support particular points in a text. RI.4.8. 	<ul style="list-style-type: none"> Identify reasons and evidence an author uses to support a claim. Describe how an author uses proof to support a point in the text. 	<ul style="list-style-type: none"> N/A

NJSL-ELA Indicators	Students...	Examples
<ul style="list-style-type: none"> Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point(s). RI.5.8. 	<ul style="list-style-type: none"> Identify the points or claims an author makes in a text. Identify reasons and evidence for those points or claims made. Prove each point with evidence from the text. Explain how an author uses proof to support a point in the text. 	<ul style="list-style-type: none"> N/A

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Determine if given information is valid
- Question hypotheses, data and conclusions
- Verify that information is correct
- Support analysis of hypotheses, data and conclusions with sources

NJSLS-ELA Anchor Standard Writing 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.

Integration with Constructing Explanations and Designing Solutions: 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.

Writing Anchor 2 with Constructing Explanations and Designing Solutions

NJSLS-ELA Indicators	Students...	Examples
<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •
<ul style="list-style-type: none"> • Write informative/explanatory texts to examine a topic and convey ideas and information clearly. W.4.2. 	<ul style="list-style-type: none"> • Introduce a topic clearly. • Compose a clear thesis statement. • Group related information in paragraphs and sections. • Use text features such as (e.g., headings), illustrations, and multimedia to support the information when appropriate. • Purposefully select information to develop the topic. • Link ideas within paragraphs and sections of information using words and phrases. • Use transitional words and phrases. 	<ul style="list-style-type: none"> • Use information from class experiences and from print and digital sources to write informative/explanatory texts on transfer of energy. Grade 4, Unit 6

NJSL-ELA Indicators	Students...	Examples
	<ul style="list-style-type: none"> • Select specific language and vocabulary to convey ideas and information. • Provide a conclusion related to the information or explanation. 	
<ul style="list-style-type: none"> • Write informative/explanatory texts to examine a topic and convey ideas and information clearly. W.5.2. 	<ul style="list-style-type: none"> • Organize ideas using various strategies. • Introduce a topic clearly. • Compose a clear thesis statement. • Provide a general observation and focus. • Group related information logically. • Use text features such as (e.g., headings), illustrations, and multimedia to support the information when appropriate. • Purposefully select information to develop the topic. • Link ideas within paragraphs and sections of information. • Use transitional words, phrases, and clauses. 	<ul style="list-style-type: none"> • Explain the changes that occur as substances are heated, cooled, dissolved, or mixed. Grade 5, Unit 2

NJSL-ELA Indicators	Students...	Examples
	<ul style="list-style-type: none"> • Select specific language and vocabulary to convey ideas and information. • Write a conclusion that is related to the information or explanation. 	

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Clearly explain information to a variety of audiences
- Use the research of others to support their theories and ideas
- Use multimedia to aid in explanation

NJSL-ELA Anchor Standard Writing 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.

Integration with Constructing Explanations and Designing Solutions: 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.

ELA Anchor W8 with Constructing Explanations and Designing Solutions

NJSL-ELA Indicators	Students...	Examples
<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •
<ul style="list-style-type: none"> • Recall relevant information from experiences or gather relevant information from print and digital 	<ul style="list-style-type: none"> • Research information from print and digital sources. 	<ul style="list-style-type: none"> • Using the information they collect during research, as well as information from their experiences with waves,

NJSL-ELA Indicators	Students...	Examples
<p>sources; take notes and categorize information, and provide a list of sources. W.4.8.</p>	<ul style="list-style-type: none"> • Integrate information from personal experience. • Take notes and organize their information into categories. • List the sources used. 	<p>sound, and light, integrate the information and use it to design a device or process that can be used to communicate over a distance using patterns. Grade 4, Unit 8</p>
<ul style="list-style-type: none"> • Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources. W.5.8. 	<ul style="list-style-type: none"> • Locate information from print and digital sources. • Integrate information from personal experiences. • Include a list of sources used. • Take notes on information gathered from the sources to support the topic. • Synthesize information to avoid plagiarism. • Organize information into categories. 	<ul style="list-style-type: none"> • Use print and digital sources to gather information and data that describe the amount of fresh water and salt water on the Earth and where it is found. Grade 5, Unit 4

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Collect data from a variety of sources, both print and digital
- Determine if a particular source is relevant
- Determine if the information in a source is reliable and valid

NJSLS-ELA Anchor Standard Writing 9: Draw evidence from literary or informational texts to support analysis, reflection, and research.

Integration with Constructing Explanations and Designing Solutions: 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.

Writing 9 and Constructing Explanations and Designing Solutions

NJSLS-ELA Indicators	Students...	Examples
<ul style="list-style-type: none"> • Draw evidence from literary or informational texts to support analysis, reflection, and research. W.4.9. 	<ul style="list-style-type: none"> • Use strategies for reading literary and informational text to investigate topics. • Refer to specific details in literary text when finding the similarities and differences between two or more characters, settings or events. • Explain how an author uses proof to support a point in informational text. • Prove each point with evidence from the text. • Combine information from several texts about the same subject in a written or oral response that demonstrates knowledge of the subject. 	<ul style="list-style-type: none"> • Draw evidence from literary and information texts on energy, transfer of energy and natural sources of energy in order to analyze and reflect on their findings. Grade 4, Unit 5

NJSL-ELA Indicators	Students...	Examples
<ul style="list-style-type: none"> Draw evidence from literary or informational texts to support analysis, reflection, and research. W.5.9. 	<ul style="list-style-type: none"> Use strategies for reading literary and informational text to investigate topics. Refer to specific details in literary text when finding the similarities and differences between two or more characters, settings or events. Explain how an author uses proof to support a point in informational text. Prove each point with evidence from the text. Combine information from several texts about the same subject in a written or oral response that demonstrates knowledge of the subject. 	<ul style="list-style-type: none"> Draw evidence from texts about the changes in matter to support analysis, reflection, and research. Grade 5, Unit 2

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Collect empirical evidence from a variety of sources
- Integrate evidence in written communication

NJSLS-ELA Anchor Standard Speaking and Listening 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.

Integration with Constructing Explanations and Designing Solutions: 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.

Speaking and Listening 4 with Constructing Explanations and Designing Solutions

NJSLS-ELA Indicators	Students...	Examples
<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •
<ul style="list-style-type: none"> • Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace. SL.4.4. 	<ul style="list-style-type: none"> • Report on a topic or text, telling a story, or recounting an event in an organized, logical manner. • Present information orally and in coherent, spoken sentences. • Use an appropriate pace when presenting • Present and logically support personal opinions. 	<ul style="list-style-type: none"> • Create presentations that detail how their design solutions can be used to communicate, they should use details and examples from both their research and experiences to explain how patterns are used in their design to communicate over a distance. Grade 4, Unit 8
<ul style="list-style-type: none"> • Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace. SL.5.4. 	<ul style="list-style-type: none"> • Report on a topic or text, telling a story, or recounting an event in an organized, logical manner. • Present information orally and in coherent, spoken sentences. 	<ul style="list-style-type: none"> • Create presentations that describe ways in which communities are using science ideas to protect Earth’s resources and environments. Grade 5, Unit 4

NJSL-ELA Indicators	Students...	Examples
	<ul style="list-style-type: none"> • Use an appropriate pace when presenting • Present and logically support personal opinions. 	

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Clearly communicate findings to peers
- Use evidence to support findings
- Adapt speech to audience and purpose

Part 5: 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. ([NRC Framework, 2012, p. 73](#)). Video summary of [Engaging in Argument from Evidence](#).

Engaging in Argument from Evidence in Grades 3-5:

- Compare and refine arguments based on an evaluation of the evidence presented.
- Distinguish among facts, reasoned judgment based on research findings, and speculation in an explanation.
- Respectfully provide and receive critiques from peers about a proposed procedure, explanation, or model by citing relevant evidence and posing specific questions.
- Construct and/or support an argument with evidence, data, and/or a model.
- Use data to evaluate claims about cause and effect.
- Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem.

NJSLS-ELA Anchor Standard Reading 6: Assess how point of view or purpose shapes the content and style of a text.

Integration with Engaging in Argument from Evidence: The central motivation of scientists and engineers is to put forth what they believe is the best explanation for a natural phenomenon 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.

Reading 6 and Engaging in Argument from Evidence

NJSLS-ELA Indicators	Students...	Examples
•	•	•

NJSL-ELA Indicators	Students...	Examples
<ul style="list-style-type: none"> Compare and contrast a firsthand and secondhand account of the same event or topic; describe the differences in focus and the information provided. RI.4.6. 	<ul style="list-style-type: none"> Identify similarities and differences between firsthand and secondhand accounts. Explain how the point of view impacts the delivery of information in the text. 	<ul style="list-style-type: none"> Read content-specific texts to deepen their understanding of the cause-and-effect relationships within earth systems. Grade 4, Unit 1
<ul style="list-style-type: none"> Analyze multiple accounts of the same event or topic, noting important similarities and differences in the point of view they represent. RI.5.6. 	<ul style="list-style-type: none"> Discuss the similarities and differences unique to the various perspectives presented in text. Give descriptions about how the information is presented for each perspective. 	<ul style="list-style-type: none"> Use information from print and digital sources to build their understanding of energy and matter in ecosystems. Grade 5, Unit 3

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Analyze the work of other experts in the field
- Understand the point of view of other scientists and technicians in their field of study
- Determine how a colleagues point of view shapes their understanding of a topic

NJSLS-ELA Anchor Standard Reading 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.

Integration with Engaging in Argument from Evidence: 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.

Reading Standard 8 with Engaging in Argument from Evidence

NJSLS-ELA Indicators	Students...	Examples
<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •
<ul style="list-style-type: none"> • Explain how an author uses reasons and evidence to support particular points in a text. RI.4.8. 	<ul style="list-style-type: none"> • Identify reasons and evidence an author uses to support a claim. • Describe how an author uses proof to support a point in the text. 	<ul style="list-style-type: none"> • N/A
<ul style="list-style-type: none"> • Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point(s). RI.5.8. 	<ul style="list-style-type: none"> • Identify the points or claims an author makes in a text. • Identify reasons and evidence for those points or claims made. • Prove each point with evidence from the text. • Explain how an author uses proof to support a point in the text. 	<ul style="list-style-type: none"> • N/A

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Determine if given information is valid

- Question hypotheses, data and conclusions
- Verify that information is correct
- Support analysis of hypotheses, data and conclusions with sources

NJSLS-ELA Anchor Standard Reading 9: Analyze and reflect on how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

Integration with Engaging in Argument from Evidence: 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.

Reading 9 and Engaging in Argument from Evidence

NJSLS-ELA Indicators	Students...	Examples
•	•	•
<ul style="list-style-type: none"> • Integrate and reflect on (e.g. practical knowledge, historical/cultural context, and background knowledge) information from two texts on the same topic in order to write or speak about the subject knowledgeably. RI.4.9. 	<ul style="list-style-type: none"> • Read two texts closely on the same subject to identify key details • Synthesize information from two texts about the same subject in a written or oral response that demonstrates knowledge of the subject. 	<ul style="list-style-type: none"> • Draw evidence from literary and information texts on transferring energy in order to analyze and reflect on their findings. Grade 4, Unit 5
<ul style="list-style-type: none"> • Integrate and reflect on (e.g. practical knowledge, historical/cultural context, and background knowledge) information from several texts on the same topic in order to write or speak about the subject knowledgeably. RI.5.9 	<ul style="list-style-type: none"> • Find similarities and differences in themes and topics when reading stories of the same genre. • Connect the text to other knowledge (e.g. practical knowledge, 	<ul style="list-style-type: none"> • Read and gather information from multiple sources to integrate and use the information to answer questions and support their thinking during discussions and in their writing. Grade 5, Unit 6

NJSL-ELA Indicators	Students...	Examples
	historical/cultural context, and background knowledge). <ul style="list-style-type: none"> Combine information from several texts about the same subject in a written or oral response that demonstrates knowledge of the subject. 	

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Analyze multiple sources to create data sets
- Use information from multiple sources to inform future work

NJSL-ELA Anchor Standard Writing 1: Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

Integration with Engaging in Argument from Evidence: 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.

Writing 1 with Engaging in Argument from Evidence

NJSL-ELA Indicators	Students...	Examples
<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none">
<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Use the evidence from their observations of plants and animals to support the claim that all organisms are systems with structures that

NJSL-ELA Indicators	Students...	Examples
		function in growth, survival, behavior, and/or reproduction. Grade 4, Unit 3
<ul style="list-style-type: none"> Write opinion pieces on topics or texts, supporting a point of view with reasons and information. W.5.1. 	<ul style="list-style-type: none"> Distinguish fact from opinions. Organize text by using a specific organizational structure(i.e.: cause/effect chronological order, etc.). Group supporting details to support the writer’s purpose. Introduce a topic or text clearly. State an opinion to be supported with evidence. Write a thesis statement to focus the writing. Organize ideas into a specific structure in which ideas are logically grouped to support the writer's purpose. Logically order reasons that are supported by facts and details. Quote directly from text when appropriate. 	<ul style="list-style-type: none"> N/A

NJSL-ELA Indicators	Students...	Examples
	<ul style="list-style-type: none"> • Link opinion and reasons using words, phrases, and clauses (e.g., consequently, specifically). • Provide a conclusion or section related to the opinion presented. 	

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Clearly and logically debate a topic
- Use relevant sources to support their claim
- Prepare for and counter opposing viewpoints
- Evaluate resources for their validity and credibility

NJSL-ELA Anchor Standard Speaking and Listening 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.

Integration with Engaging in Argument from Evidence: 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.

Speaking and Listening 1 with Engaging in Argument from Evidence

NJSL-ELA Indicators	Students...	Examples
<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •
<ul style="list-style-type: none"> • Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with 	<ul style="list-style-type: none"> • Use previous knowledge to expand discussions about a topic. 	<ul style="list-style-type: none"> • Participate in discussions and write explanations, they should refer

NJSL-ELA Indicators	Students...	Examples
<p>diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly. SL.4.1.</p>	<ul style="list-style-type: none"> • Engage in conversations about grade-appropriate topics and texts. • Participate in a variety of rich, structured conversations. • Engage as part of a whole class, in small groups, and with a partner, sharing the roles of participant, leader, and observer. • Engage in collaborative conversations (such as book groups, literature circles, buddy reading), and develop skills in active (close) listening and group discussion (looking at the speaker, turn taking, linking ideas to the speaker's idea, sharing the floor, etc.). 	<p>specifically to text, when appropriate. Grade 4, Unit 6</p>
<ul style="list-style-type: none"> • Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly. SL.5.1. 	<ul style="list-style-type: none"> • Use previous knowledge to expand discussions about a topic. • Engage in conversations about grade-appropriate topics and texts. • Participate in a variety of rich, structured conversations. • Engage as part of a whole class, in small groups, and with a partner, 	<ul style="list-style-type: none"> • Use information to answer questions, participate in discussions, solve problems, and support their thinking about movement of matter and the flow of energy through the organisms in an ecosystem. Grade 5, Unit 3

NJSL-ELA Indicators	Students...	Examples
	sharing the roles of participant, leader, and observer. <ul style="list-style-type: none"> Engage in collaborative conversations (such as book groups, literature circles, buddy reading), and develop skills in active (close) listening and group discussion (looking at the speaker, turn taking, linking ideas to the speaker’s idea, sharing the floor, etc.). 	

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Gain information and understanding through verbal discourse
- Pose questions of colleagues to gain insight or understanding

NJSL-ELA Anchor Standard Speaking and Listening 3: Evaluate a speaker’s point of view, reasoning, and use of evidence and rhetoric.

Integration with Engaging in Argument from Evidence: 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 students must be able to critique a point of view from the perspective of the evidence provided and reasoning advanced.

Speaking and Listening 3 with Engaging in Argument from Evidence

NJSL-ELA Indicators	Students...	Examples
<ul style="list-style-type: none"> Identify the reasons and evidence a speaker provides to support particular points. SL.4.3. 	<ul style="list-style-type: none"> Determine a speaker’s reasons and evidence. 	<ul style="list-style-type: none"> N/A

NJSL-ELA Indicators	Students...	Examples
	<ul style="list-style-type: none"> Decide to what degree the evidence supports the speaker's points. 	
<ul style="list-style-type: none"> Summarize the points a speaker makes and explain how each claim is supported by reasons and evidence. SL.5.3. 	<ul style="list-style-type: none"> Determine a speaker's reasons and evidence. Summarize the speaker's main ideas. Determine how each point is supported by evidence. 	<ul style="list-style-type: none"> N/A

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Evaluate the validity of scientific theories or research
- Determine if interpretation of data is false or misleading
- Use the research of others during discourse with colleagues

NJSLS-ELA Anchor Standard Speaking and Listening 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.

Integration with Engaging in Argument from Evidence: 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.

Speaking and Listening 4 with Engaging in Argument from Evidence

NJSLS-ELA Indicators	Students...	Examples
<ul style="list-style-type: none"> Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace. SL.4.4. 	<ul style="list-style-type: none"> Report on a topic or text, telling a story, or recounting an event in an organized, logical manner. Present information orally and in coherent, spoken sentences. Use an appropriate pace when presenting. Present and logically support personal opinions. 	<ul style="list-style-type: none"> Create presentations that detail how their design solutions can be used to communicate, they should use details and examples from both their research and experiences to explain how patterns are used in their design to communicate over a distance. Grade 4, Unit 8
<ul style="list-style-type: none"> Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace. SL.5.4. 	<ul style="list-style-type: none"> Report on a topic or text, telling a story, or recounting an event in an organized, logical manner. Present information orally and in coherent, spoken sentences. Use an appropriate pace when presenting. 	<ul style="list-style-type: none"> Create presentations that describe ways in which communities are using science ideas to protect Earth’s resources and environments. Grade 5, Unit 4

NJSL-ELA Indicators	Students...	Examples
	<ul style="list-style-type: none"> • Present and logically support personal opinions. 	

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Clearly communicate findings to peers
- Use evidence to support findings
- Adapt speech to audience and purpose

Part 6: 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 ([NRC Framework, 2012, p. 76](#)). Video summary of [Obtaining, Evaluating, and Communicating Information](#).

Obtaining, Evaluating, and Communicating Information in Grades 3 through 5:

- Read and comprehend grade appropriate complex texts and/or other reliable media to summarize and obtain scientific and technical ideas and describe how they are supported by evidence.
- Compare and/or combine across complex texts and/or other reliable media to support the engagement in other scientific and/or engineering practices.
- Combine information in written text with that contained in corresponding tables, diagrams, and/or charts to support the engagement in other scientific and/or engineering practices.
- Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to a design problem.
- Communicate scientific and/or technical information orally and/or in written formats, including various forms of media as well as tables, diagrams, and charts.

NJSLS-ELA Anchor Standard Reading 2: Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

Integration with Obtaining, Evaluating and Communicating Information: 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**.

Reading 2 with Obtaining, Evaluating and Communicating Information

NJSLS-ELA Indicators	Students ...	Examples
•	•	•

NJSL-ELA Indicators	Students ...	Examples
<ul style="list-style-type: none"> Determine the main idea of a text and explain how it is supported by key details; summarize the text. RI.4.2. 	<ul style="list-style-type: none"> Identify the key details of a text that support the main idea. Analyze the actions and thoughts of characters or speakers in texts, looking for patterns. Determine the theme or main idea of the text. Summarize the key points of a text. Explain how the author supports main ideas in informational text with key details. 	<ul style="list-style-type: none"> Summarize or paraphrase notes to support the work throughout the engineering design process. Grade 4, Unit 2
<ul style="list-style-type: none"> Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text. RI.5.2. 	<ul style="list-style-type: none"> Summarize the key points of a text. Identify details to support the main idea. Identify at least two main ideas in informational texts. Explain how the author supports main ideas in informational text with key details. 	<ul style="list-style-type: none"> Summarize information in order to describe the amounts and percentages of fresh water and salt water on the Earth. Grade 5, Unit 4

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Determine the central idea of scientific text
- Support the explanation of the central idea with details

- Objectively summarize text, free of personal bias

NJSLS-ELA Anchor Standard Reading 7: Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.

Integrating with Obtaining, Evaluating and Communicating Information: 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.

Reading 7 and Obtaining, Evaluating and Communicating Information

NJSLS-ELA Indicators	Students...	Examples
<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •
<ul style="list-style-type: none"> • Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears. RI.4.7. 	<ul style="list-style-type: none"> • Analyze information presented in various formats to identify the key details. • Understand what is heard, viewed, or presented through various media formats to help make meaning of the text. • Explain how the information presented in various formats aids to the overall meaning. 	<ul style="list-style-type: none"> • Use the evidence from their observations of plants and animals to support the claim that all organisms are systems with structures that function in growth, survival, behavior, and/or reproduction. Students need opportunities to observe plants and animals closely, taking notes and drawing pictures, so that they can describe various structures and their functions. Grade 4, Unit 3
<ul style="list-style-type: none"> • Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. RI.5.7. 	<ul style="list-style-type: none"> • Read texts closely to determine the main ideas and important details. • Synthesize information from multiple sources. 	<ul style="list-style-type: none"> • Draw evidence from informational texts to support their design choices as they build and share their models of matter at the particle level. Grade 5, Unit 1

NJSL-ELA Indicators	Students...	Examples
	<ul style="list-style-type: none"> Use media efficiently to answer questions and to solve problems. 	

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Determine the best representation for information
- Read a variety of charts and graphs
- Create charts and graphs from text
- Explain information presented in charts and graphs
- Determine the necessary information from visual representations
- Evaluate information in text

NJSL-ELA Anchor Standard Reading 9: Analyze and reflect on how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

Integration with Obtaining, Evaluating and Communicating Information: 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.

Reading 9 and Obtaining, Evaluating and Communicating Information

NJSL-ELA Indicators	Students to...	Examples
<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none">
<ul style="list-style-type: none"> Integrate and reflect on (e.g. practical knowledge, historical/cultural 	<ul style="list-style-type: none"> Read two texts closely on the same subject to identify key details. 	<ul style="list-style-type: none"> Draw evidence from literary and information texts on transferring

NJSL-ELA Indicators	Students to...	Examples
<p>context, and background knowledge) information from two texts on the same topic in order to write or speak about the subject knowledgeably. RI.4.9.</p>	<ul style="list-style-type: none"> • Synthesize information from two texts about the same subject in a written or oral response that demonstrates knowledge of the subject. 	<p>energy in order to analyze and reflect on their findings. Grade 4, Unit 5</p>
<ul style="list-style-type: none"> • Integrate and reflect on (e.g. practical knowledge, historical/cultural context, and background knowledge) information from several texts on the same topic in order to write or speak about the subject knowledgeably. RI.5.9 	<ul style="list-style-type: none"> • Find similarities and differences in themes and topics when reading stories of the same genre. • Connect the text to other knowledge (e.g. practical knowledge, historical/cultural context, and background knowledge). • Combine information from several texts about the same subject in a written or oral response that demonstrates knowledge of the subject. 	<ul style="list-style-type: none"> • Read and gather information from multiple sources to integrate and use the information to answer questions and support their thinking during discussions and in their writing. Grade 5, Unit 6

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Analyze multiple sources to create data sets
- Use information from multiple sources to inform future work

NJSLS-ELA Anchor Standard Reading 10: Read and comprehend complex literary and informational texts independently and proficiently with scaffolding as needed.

Integrating with Obtaining, Evaluating and Communicating Information: 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.

Reading 10 and Obtaining, Evaluating and Communicating Information

NJSLS-ELA Indicators	Students...	Examples
<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •
<ul style="list-style-type: none"> • By the end of the year, read and comprehend literature, including stories, dramas, and poems at grade level text-complexity or above, with scaffolding as needed. RI.4.10. 	<ul style="list-style-type: none"> • Read and understand a wide range of informational and literary texts within the grade level efficiently by the end of the year. • Develop the mature language skills and the conceptual knowledge needed for success in school and life by encountering appropriately complex texts. • Read texts with scaffolding as needed. 	<ul style="list-style-type: none"> • N/A
<ul style="list-style-type: none"> • By the end of the year, read and comprehend literature, including stories, dramas, and poems at grade level text-complexity or above, with scaffolding as needed. RI.5.10. 	<ul style="list-style-type: none"> • Read and understand a wide range of informational and literary texts within the grade level efficiently by the end of the year. • Develop the mature language skills and the conceptual knowledge 	<ul style="list-style-type: none"> • N/A

NJSL-ELA Indicators	Students...	Examples
	<p>needed for success in school and life by encountering appropriately complex texts.</p> <ul style="list-style-type: none"> • Read texts with scaffolding as needed. 	

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Read and comprehend complex scientific and technical text
- Employ strategies when having difficulty comprehending text

NJSL-ELA Anchor Standard Writing 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.

Writing 2 with Obtaining, Evaluating and Communicating Information: 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.

Writing 2 with Obtaining, Evaluating and Communicating Information

NJSL-ELA Indicators	Students...	Examples
<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •
<ul style="list-style-type: none"> • Write informative/explanatory texts to examine a topic and convey ideas and information clearly. W.4.2. 	<ul style="list-style-type: none"> • Introduce a topic clearly. • Compose a clear thesis statement. 	<ul style="list-style-type: none"> • Use information from class experiences and from print and digital sources to write

NJSL-ELA Indicators	Students...	Examples
	<ul style="list-style-type: none"> • Group related information in paragraphs and sections. • Use text features such as (e.g., headings), illustrations, and multimedia to support the information when appropriate. • Purposefully select information to develop the topic. • Link ideas within paragraphs and sections of information using words and phrases. • Use transitional words and phrases. • Select specific language and vocabulary to convey ideas and information. • Provide a conclusion related to the information or explanation. 	<p>informative/explanatory texts on transfer of energy. Grade 4, Unit 6</p>
<ul style="list-style-type: none"> • Write informative/explanatory texts to examine a topic and convey ideas and information clearly. W.5.2. 	<ul style="list-style-type: none"> • Organize ideas using various strategies. • Introduce a topic clearly. • Compose a clear thesis statement. • Provide a general observation and focus. • Group related information logically. 	<ul style="list-style-type: none"> • Explain the changes that occur as substances are heated, cooled, dissolved, or mixed. Grade 5, Unit 2

NJSL-ELA Indicators	Students...	Examples
	<ul style="list-style-type: none"> • Use text features such as (e.g., headings), illustrations, and multimedia to support the information when appropriate. • Purposefully select information to develop the topic. • Link ideas within paragraphs and sections of information. • Use transitional words, phrases, and clauses. • Select specific language and vocabulary to convey ideas and information. • Write a conclusion that is related to the information or explanation. 	

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Clearly explain information to a variety of audiences
- Use the research of others to support their theories and ideas
- Use multimedia to aid in explanation

NJSLS-ELA Anchor Standard Writing 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.

Integrating with Evaluating and Communicating Information: 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.

Writing 8 and Evaluating and Communicating Information

NJSLS-ELA Indicators	Students...	Examples
<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •
<ul style="list-style-type: none"> • Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources. W.4.8. 	<ul style="list-style-type: none"> • Research information from print and digital sources. • Integrate information from personal experience. • Take notes and organize their information into categories. • List the sources used. 	<ul style="list-style-type: none"> • Using the information they collect during research, as well as information from their experiences with waves, sound, and light, integrate the information and use it to design a device or process that can be used to communicate over a distance using patterns. Grade 4, Unit 8
<ul style="list-style-type: none"> • Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources. W.5.8. 	<ul style="list-style-type: none"> • Locate information from print and digital sources. • Integrate information from personal experiences. • Include a list of sources used. • Take notes on information gathered from the sources to support the topic. 	<ul style="list-style-type: none"> • Use print and digital sources to gather information and data that describe the amount of fresh water and salt water on the Earth and where it is found. Grade 5, Unit 4

NJSLS-ELA Indicators	Students...	Examples
	<ul style="list-style-type: none"> • Synthesize information to avoid plagiarism. • Organize information into categories. 	

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Collect data from a variety of sources, both print and digital
- Determine if a particular source is relevant
- Determine if the information in a source is reliable and valid

NJSLS-ELA Anchor Standard Speaking and Listening 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.

Integrating with Obtaining, Evaluating and Communicating Information: 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.

Speaking and Listening 1 with Obtaining, Evaluating and Communicating Information

NJSLS-ELA Indicators	Students...	Examples
<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •
<ul style="list-style-type: none"> • Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and 	<ul style="list-style-type: none"> • Use previous knowledge to expand discussions about a topic. • Engage in conversations about grade-appropriate topics and texts. 	<ul style="list-style-type: none"> • Participate in discussions and write explanations, they should refer specifically to text, when appropriate. Grade 4, Unit 6

NJSL-ELA Indicators	Students...	Examples
<p>texts, building on others' ideas and expressing their own clearly. SL.4.1.</p>	<ul style="list-style-type: none"> • Participate in a variety of rich, structured conversations. • Engage as part of a whole class, in small groups, and with a partner, sharing the roles of participant, leader, and observer. • Engage in collaborative conversations (such as book groups, literature circles, buddy reading), and develop skills in active (close) listening and group discussion (looking at the speaker, turn taking, linking ideas to the speaker’s idea, sharing the floor, etc.). 	
<ul style="list-style-type: none"> • Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly. SL.5.1. 	<ul style="list-style-type: none"> • Use previous knowledge to expand discussions about a topic. • Engage in conversations about grade-appropriate topics and texts. • Participate in a variety of rich, structured conversations. • Engage as part of a whole class, in small groups, and with a partner, sharing the roles of participant, leader, and observer. • Engage in collaborative conversations (such as book groups, literature 	<ul style="list-style-type: none"> • Use information to answer questions, participate in discussions, solve problems, and support their thinking about movement of matter and the flow of energy through the organisms in an ecosystem. Grade 5, Unit 3

NJSL-ELA Indicators	Students...	Examples
	circles, buddy reading), and develop skills in active (close) listening and group discussion (looking at the speaker, turn taking, linking ideas to the speaker’s idea, sharing the floor, etc.).	

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Gain information and understanding through verbal discourse
- Pose questions of colleagues to gain insight or understanding
- Use sources to support ideas or conclusion

NJSL-ELA Anchor Standard Speaking and Listening 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.

Integrating with Obtaining, Evaluating and Communicating Information: 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.

Speaking and Listening 4 with Obtaining, Evaluating and Communicating Information

NJSL-ELA Indicators	Students...	Examples
•	•	•

NJSL-ELA Indicators	Students...	Examples
<ul style="list-style-type: none"> Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace. SL.4.4. 	<ul style="list-style-type: none"> Report on a topic or text, telling a story, or recounting an event in an organized, logical manner. Present information orally and in coherent, spoken sentences. Use an appropriate pace when presenting. Present and logically support personal opinions. 	<ul style="list-style-type: none"> Create presentations that detail how their design solutions can be used to communicate, they should use details and examples from both their research and experiences to explain how patterns are used in their design to communicate over a distance. Grade 4, Unit 8
<ul style="list-style-type: none"> Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace. SL.5.4. 	<ul style="list-style-type: none"> Report on a topic or text, telling a story, or recounting an event in an organized, logical manner. Present information orally and in coherent, spoken sentences. Use an appropriate pace when presenting. Present and logically support personal opinions. 	<ul style="list-style-type: none"> Create presentations that describe ways in which communities are using science ideas to protect Earth’s resources and environments. Grade 5, Unit 4

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Clearly communicate findings to peers
- Use evidence to support findings
- Adapt speech to audience and purpose

NJSLS-ELA Anchor Standard Speaking and Listening 5: Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

Integrating with Obtaining, Evaluating and Communicating Information: 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.

Speaking and Listening with Obtaining, Evaluating and Communicating Information

NJSLS-ELA Indicators	Students...	Examples
<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •
<ul style="list-style-type: none"> • Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes. SL.4.5. 	<ul style="list-style-type: none"> • Integrate audio recordings and visual displays, when appropriate, to enhance the development of main ideas or themes. 	<ul style="list-style-type: none"> • Use visual displays to enhance observations and explanations of the concepts of how animals receive and process. Grade 4, Unit 4
<ul style="list-style-type: none"> • Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes. SL.5.5. 	<ul style="list-style-type: none"> • Identify main ideas and themes of a presentation. • Combine audio recordings and visual displays when appropriate to enhance the development of main ideas or themes. 	<ul style="list-style-type: none"> • Create foldables, charts, or PowerPoint presentations to accompany models. Grade 5, Unit 1

Connection to Careers in Science and Technical Fields

Those in science and technical fields need to be able to...

- Present information in a clear, concise format
- Utilize diverse media formats to present findings and research