ELD STANDARDS FRAMEWORK FOR DEVELOPING THE LANGUAGE OF SCIENCE GRADES 6-8

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Section 1: Purpose

The purpose of the English Language Development (ELD) Standards Framework and Instructional Guidance documents is to provide clarity in the implementation and integration of the Nevada ELD Standards with Nevada Academic Content Standards and instruction. In addition, they support the application of the Nevada Educator Performance Framework (NEPF) Standards of best practices for multilingual learners and other diverse student populations.

These Nevada ELD Standards documents specify the connection between the WIDA ELD Standards and the content disciplinary practices of English Language Arts (ELA), Mathematics (MA), Next Generation Science Standards (NGSS) and Social Studies (SS) Practices. The practices identified in this document were created within the **Next Generation Science Standards (NGSS) and National Science Teachers Association (NSTA**. The ELD Standards Instructional Guidance documents conceptualize the Nevada ELD Standards as intertwined with learning the Nevada Academic Content Standards and College and Career Readiness Standards.

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Section 1: Key Uses of Academic Language

These purposes, referred to as **Key Uses**, were identified based on reviews of literature and a language analysis of college and career readiness standards:

KEY USES	KEY USES DESCRIPTION
NARRATE	Highlights language to convey real or imaginary experiences through stories and histories. Example tasks for the Key Use of **Narrate** include telling or summarizing stories, sharing past experiences, recounting an incident, or to chronicle a report.
INFORM	Highlights language to provide factual information, to tell, give knowledge, apprise, notify, to make aware of ideas, actions, or phenomena. Example tasks for the Key Use of **Inform** include defining, describing, comparing, contrasting, categorizing, or classifying concepts, ideas, or phenomena.
EXPLAIN	Highlights language to give an account for how things work or why things happen to clarify ideas, actions, or phenomena. Example tasks for the Key Use of **Explain** include interpreting, elaborating, illustrating, simplifying ideas, actions, or phenomena.
ARGUE	Highlights language to justify claims using evidence and reasoning, constructing arguments with evidence, or stating preferences or opinions. Example tasks for the Key Use of **Argue** include advancing or defending an idea or solution, changing the audience's point of view, or evaluating an issue.
DISCUSS	Highlights language to interact with others to build meaning and to share knowledge. Example tasks for the Key Use of **Discuss** include participating in small or large group activities and projects. **Discuss** can be found in Standard 1: Language of Social and Instructional Purposes of the WIDA 2002 Standards Framework.

SECTION 2: ELD FRAMEWORK FOR DEVELOPING THE LANGUAGE OF SCIENCE GRADES 6-8

Section 2A: Student Moves: Language Expectations

With appropriate instructional support (visual, graphic, and interactive), multilingual learners can…

Language Domains	Entering/Emerging (Levels 1-2)	Developing/Expanding (Levels 3-4)	Bridging/Reaching (Levels 5-6)
Interpretive: Listening, Reading, & Viewing	• **Match** scientific tools or instruments with pictures from oral statements (e.g., sundial). • **Classify** scientific tools or instruments with pictures and labels from oral directions (e.g., telescopes and sundials go with the sky.). • **Match** labeled diagrams of cycles or processes with vocabulary from word/phrase banks (e.g., nitrogen cycle). • **Sort** or **classify** descriptive phrases and diagrams by cycles or processes.	• **Identify** examples of scientific tools or instruments and their uses from pictures and oral discourse. • **Compare/contract** examples of scientific tools or instruments and uses from oral descriptions (e.g., differences between telescopes and microscopes). • **Sequence** descriptive sentences and diagrams according to cycles or processes (e.g., mitosis or meiosis). • **Identify** cycles or processes from descriptive paragraphs and diagrams.	• **Infer** uses of scientific tools or instruments from oral reading of grade level materials. • **Anticipate** consequences of alteration of cycles or processes from grade-level text.

Section 2A: Student Moves: Language Expectations (continued)

With appropriate instructional support (visual, graphic, and interactive), multilingual learners can…

Language Domains	Entering/Emerging (Levels 1-2)	Developing/Expanding (Levels 3-4)	Bridging/Reaching (Levels 5-6)
Expressive: Speaking, Writing, & Representing	• **Use** vocabulary associated with scientific discoveries based on illustrations (e.g., machine or x-ray). • **Describe** scientific inventions or discoveries based on illustrations. • **Match** or **classify** forms of energy from everyday illustrated examples and models (e.g., light, sound, heat). • **List** and **describe** examples of illustrated forms of energy from word/phrase banks.	• **Compare/contrast** scientific discoveries described orally with visual support (e.g.,_____is similar to/ different from – because_____). • **Imagine** future scientific inventions or discoveries based on oral and visual clues. • **Compare/contrast** two forms of energy depicted visually (e.g., _____ and_____are alike/different in these ways). • **Explain** uses of different forms of energy depicted visually (e.g., _____is used to_____).	• **Predict** potential impact of scientific inventions or discoveries on life based on oral evidence (e.g., "in 100 years, we could/may/might"). • **Predict** consequences of alternation of cycles or processes from grade-level text.

Section 2B: Teacher Moves: Supports for Developing Interpretive and Expressive Language

What general supports can teachers provide to students at **different language proficiency levels** to interpret and express **academic language** in all language domains?

Entering/Emerging (Levels 1-2)	Developing/Expanding (Levels 3-4)	Bridging/Reaching (Levels 5-6)
● **Build** background in key language and concepts. ● **Provide** explicit instruction and practice in key social and instructional vocabulary. ● **Model** orally the academic language. ● **Use** Wait Time ● **Provide** explicit instruction and practice for students to construct the language using sentence and discourse starters and visual aids from the text. ● **Use** physical gestures to accompany oral directives. ● **Label v**isuals and objects with target vocabulary. ● **Introduce** cognates to aid comprehension. ● **Give** two step Contextualized directions. ● **Restate/rephrase** and **use** Patterned Oral Language routines. ● **Preview** the text content with pictures, demos, charts, or experiences. ● **Use** K-W-L charts before reading. ● **Pair** students to read one text together. ● **Preview** text with a Picture Walk. ● **Provide** a list of important concepts on a graphic organizer. ● **Use** Shared Reading and/or simplify the text. ● **Provide** a content vocabulary Word Bank with non-linguistic representations. ● **Provide** opportunities for translanguaging and multilingual supports during the task.	● **Build** background in key language and concepts. ● **Model** orally the academic language. ● **Use** wait time. ● **Provide** explicit instruction and practice for students to construct the language using sentence and discourse starters and visual aids from the text. ● **Provide** a system for students to record and process key vocabulary. ● **Check** Comprehension of all students frequently. **Use** Wait Time. ● **Require** full sentence responses by asking open ended questions. ● **Use** Varied Presentation Formats such as role plays. ● **Scaffold** oral reports with note cards and provide time for prior practice. ● **Require** the use of academic language. ● **Require** oral reporting for summarizing group work. ● **Pair** students to read one text together. ● **Use** K-W-L charts before reading. ● **Provide** a list of important concepts on a graphic organizer. ● **Provide** a content vocabulary Word Bank with non-linguistic representations. ● **Use** Jigsaw Reading to scaffold independent reading. ● **Provide** opportunities for translanguaging and multilingual supports during the task.	● **Build** background in key language and concepts. ● **Use** complex sentence and discourse starters. ● **Model** orally the academic language and specific vocabulary. ● **Use** Video Observation Guides. ● **Confirm** students' prior knowledge of content topics. ● **Ask** students to analyze text structure and select an appropriate Graphic Organizer for summarizing. ● **Use** Reciprocal Teaching to scaffold independent reading. ● **Extend** content vocabulary with multiple examples and non-examples. ● **Provide** opportunities for translanguaging during the task.

Section 2C: Teacher Moves: Supports for Collaborating in the Academic Language

How can teachers provide ongoing opportunities for students to collaborate using academic language?

Entering/Emerging (Levels 1-2)	Developing/Expanding (Levels 3-4)	Bridging/Reaching (Levels 5-6)
Prior to reading, writing, and discussion, Teacher prepares collaborative discourse structures for students to… • **Engage in pair work (in L1 if possible)** to prepare questions for discussion using graphic, interactive, and/or language supports. • **Participate in pair/triad/small group** discussions using graphic, interactive, and/or language supports (including L1 as appropriate). • **Use** Clock Buddies. • **Use** Numbered Heads Together. • **Use** Think-Pair-Share Squared. • **Use** key sentence frames for pair interactions • **Participate with Strategic Partners** at a higher English proficiency level and/or with a same primary language peer(s). • **Use** a Roving Chart in small group work. • **Use** Interactive Journals. • **Use** Think-Write-Pair Share. • **Use** Cloze sentences with a Word Bank. • **Use dialogue structures** (e.g.): My turn/ your turn; Partner A/Partner B; Collaborative groups.	**Prior to reading, writing, and discussion**, Teacher prepares collaborative discourse structures for students to… • **Engage pair work** to prepare questions for discussion using graphic, interactive, and/or language supports as needed. • **Contribute to pair/triad/small group discussions** by supporting with examples, asking clarifying questions, and using graphic, interactive, and/or language supports as needed. • **Engage with whole/large group discussions** by connecting ideas with supporting details, generating original questions, and using graphic, interactive, and/or language supports as needed. • **Use** Graphic Organizers or notes to scaffold oral retelling. • **Use** Think-Pair-Share. • **Repeat and expand** their responses and other students' responses in a Collaborative Dialogue. • **Use dialogue structures** (e.g.): My turn/ your turn; Partner A/Partner B; Collaborative groups.	**Prior to reading, writing, and discussion**, Teacher prepares collaborative discourse structures for students to… • **Engage in structured pair work** to process. • **Inform and formulate** thinking, then prepare questions for discussion. • **Contribute to pair/triad/small group discussions** to share individual ideas and compare with other ideas in the group, using graphic, interactive, and/or language supports as needed. • **Engage with whole/large group discussions** by generating original questions and/or building on the ideas of others using graphic, interactive, and/or language supports as needed. • **Use** oral reporting for summarizing group work. • **Use dialogue structures** (e.g.): My turn/ your turn; Partner A/Partner B; Collaborative groups.

SECTION 3: INSTRUCTIONAL GUIDANCE

for English Language Development in the Content Area of Science and Engineering Practices Grades 6-8

Based on the **Science & Engineering Practices** (SEPs) developed by the National Science Teachers Association (NSTA)

Science and Engineering Practices

SECTION 3: INSTRUCTIONAL GUIDANCE: SCIENCE AND ENGINEERING PRACTICES GRADES 6-8

Section 3A: Summary: Content Disciplinary Practices and Example Tasks

Table of example tasks for each practice, with sample proficiency descriptors for each **Key Use of Academic Language**: (For a complete continuum of grade-level Proficiency Level Descriptors to support mastery of content area standards see WIDA ELD Standards 2020)

WIDA English Language Development Standards Framework, 2020 Edition Kindergarten - Grade 12 (wisc.edu)

Science & Engineering Practices	Example Tasks	Narrate/Inform	Explain	Argue	Discuss
1. **Asking** Questions and **Defining** Problems MS-PS2-3 Motion and Stability: Forces and Interactions MS-ESS3-5 Earth and Human Activity MS-ETS1-1 Engineering Design	• **Ask questions about data** to determine the factors that affect the strength of electric and magnetic forces.	Proficient students can… • Use pictures, diagrams, technical language, and relating verb groups to state relationships or attributes (have, be, belong to) in order to **describe** careful observation of phenomena, models, or unexpected results, to clarify and/or seek additional information.	Proficient students can… • Describe information from observations using technical vocabulary, expanded noun groups to add details (energy releasing reactions) to **explain** the factors that affect the strength of electronic and magnetic forces. • Ask questions to **expound** on the relationships (e.g. cause/effect, compare/contrast) between independent and dependent variables and relationships in diagrams, models, data, and graphics to add support to claim or evidence.	Proficient students can… • Use technical nouns, a variety of clause types to state logical relationships among reasoning, evidence, data, and/or a model when asking questions to state a claim or **clarify** evidence and/or the premise(s) of an argument. • Ask questions to **debate** and **challenge** the premise(s) of an argument or the interpretation of a data set.	Proficient students can… • **Discuss** the validity of questions in order to advance their understanding and move investigations forward, utilizing everyday, cross disciplinary, and technical language.

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Science & Engineering Practices	Example Tasks	Narrate/Inform	Explain	Argue	Discuss
2. **Developing** and **Using** Models MS-PS1-1 Matter and its Interactions MS-LS1-2 From Molecules to Organisms: Structures and Processes MS-ESS1-1 Earth's Place in the Universe MS-ETS1-4 Engineering Design	• **Develop models** to describe the atomic composition of simple molecules and extended structures. • **Develop and use a model** to describe the function of a cell as a whole and ways parts of cells contribute to the function. • **Develop and use a model** of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun, moon, and seasons.	Proficient students can… • **Describe** phenomena by using a model (use pictures, diagrams, and/or technical language, in order to develop reasoning given new patterns to link relationships, add new details, and condense information into abstract nouns. • **Record** data generated by a model developed to test ideas about phenomena in natural or designed systems through labeling/describing diagrams, graphics, data, statistics to add information about a phenomenon.	Proficient students can… • **Explain** the strengths and limitations of the model or tool by summarizing patterns in evidence, making trade-offs, revising and retesting. • **Predict** or **describe** what happens if a variable or component of a system model is changed by asking and answering questions to theorize, clarify, and make extrapolations about a phenomenon. • **Elaborate** on how a model shows the relationships among variables, including those that are not observable but predict observable phenomena.	Proficient students can… • **Justify** modifications made to a model based **on** what happens if a variable or component of that system model is changed by supporting a claim based on data and evidence through connectors to link clauses and establish logical relationships (as a result, therefore, however, on the other hand).	Proficient students can… • **Present** organized ideas and information on content topics including the use of graphics and multimedia to establish and maintain a neutral or objective stance through passive voice and declarative statements to establish a factual stance. • Synthesize ideas of several speakers, **pose** questions, and **respond** with evidence, examples, and ideas.

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Science & Engineering Practices	Example Tasks	Narrate/Inform	Explain	Argue	Discuss
3. **Planning** and **Carrying** out Investigations MS-PS2-2 Motion and Stability: Forces and Interactions MS-LS1-1 From Molecules to Organisms: Structures and Processes MS-ESS2-5 Earth's Systems	• **Plan an investigation** to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object. • **Conduct an investigation** to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells. • **Collect data to provide evidence** for how the motions and complex interactions of air masses results in changes in weather conditions.	Proficient students can … • **Describe** the goals of an investigation based on information provided. • **State** the independent and dependent variables and controls, and what tools are needed to gather and record data to support a claim. • **Collect, record and organize** data and evidence from an investigation, or about the performance of a proposed object, tool, process, or system under a range of conditions by summarizing patterns in evidence, making trade-offs, revising and retesting through labeling/describing diagrams, graphics, data, statistics to add information about a phenomenon.	Proficient students can … • **Read** and **clarify** data in order to evaluate and/or revise an experimental design. • **Explain** data in order to evaluate the accuracy of various methods for collecting data, establishing a neutral or objective stance in how results are communicated through passive voice and declarative statements. • **Describe** the data and evidence of testing design solutions under a range of conditions.	Proficient students can… • **Justify** answers to scientific questions based on data and evidence collected through investigations to introduce and contextualize phenomena in issues related to the natural and designed world(s).	Proficient students can… • **Present** organized ideas and information on content topics including the use of graphics and multimedia, utilizing everyday, cross disciplinary, and technical language • **Synthesize** ideas and **pose** questions, and **respond** with evidence, examples, and ideas. • **Collaborate** with peers to plan an investigation.

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Science & Engineering Practices	Example Tasks	Narrate/Inform	Explain	Argue	Discuss
4. **Analyzing** and **Interpreting** Data MS-PS1-2 Matter and its Interaction MS-LS2-1 Ecosystems: Interactions, Energy, and Dynamics MS-ESS1-3 Earth's Place in the Universe MS-ETS1-3 Engineering Design	• **Analyze and interpret data** on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred. • **Analyze and interpret data** to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. • **Analyze and interpret data** to determine scale properties of objects in the solar system. • **Analyze data from tests** to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.	Proficient students can… • **Read** and **articulate** graphical displays (e.g., maps, charts, graphs, and/or tables) of large data sets to describe coherence and cohesion throughout graphical displays using technical nouns and organizational features, such as headings, to **describe** temporal and spatial relationships.	Proficient students can… • **Analyze**, and/or **interpret** graphical displays of data and/or large data sets to **identify** and **explain** linear and nonlinear relationships about a phenomenon using abstract nouns, technical terms and relating verbs to state relationships or attributes (have, be, belong to). • Analyze, interpret, and **explain** data to provide evidence for phenomena. Comprehend and **explain** the concepts of statistics and probability (including mean, median, and mode) variability to analyze and characterize data. • **Comprehend** and **describe** limitations of data analysis (e.g., measurement error), and/or seek to improve precision and accuracy of data with better technological tools and methods (e.g., multiple trials).	Proficient students can… • **Comprehend** and **distinguish** between causal and correlational relationships in data and to **justify** reasoning to support a claim based on data and evidence through connectors to link clauses and establish logical relationships and/or a variety of clause types to express causality)	Proficient students can… • **Present** organized ideas and information on content topics including the use of graphics and multimedia to maintain a neutral or objective stance through passive voice and declarative statements to establish a factual stance. • Synthesize ideas of several speakers, **pose** questions, and **respond** with evidence, examples, and ideas.

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Science & Engineering Practices	Example Tasks	Narrate/inform	Explain	Argue	Discuss
5. **Using** Mathematics and Computational Thinking MS-PS4-1 Waves and their Applications in Technologies for Information Transfer MS-LS4-6 Biological Evolution: Unity and Diversity	• **Use mathematical representations to describe** a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave. • **Use mathematical representations to support explanations** of how natural selection may lead to increases and decreases of specific traits in populations over time.	Proficient students can… • **Narrate** the use of digital tools (e.g., computers) through a wide variety of words and phrases in cross-disciplinary and technical language in order to analyze large data sets for patterns and trends. • Create and **write** algorithms (a series of ordered steps) to solve a problem.	Proficient students can… • **Explain** how mathematical representations describe and/or support scientific conclusions and design solutions through the use of expanded noun groups with a wide variety of embedded clauses to show understanding of how ideas, concepts, and principles are connected. • **Comprehend** and **illuminate** orally mathematical concepts and/or processes (such as ratio, rate, percent, basic operations, and simple algebra) to scientific and engineering questions and problems.	Proficient students can… • **Deliberate** the requirements of an investigation and **determine** when to use qualitative vs. quantitative data to introduce and contextualize topic/phenomenon in issues related to the natural and designed world(s) through a variety of ways to define phenomenon (relative clauses, declarative statements, relational verbs)	Proficient students can • **Present** organized ideas and information on content topics including the use of graphics and multimedia, utilizing everyday, cross disciplinary, and technical language. • **Synthesize** ideas of several speakers, **pose** questions, and **respond** with evidence, examples, and ideas.

ELD STANDARDS FRAMEWORK FOR DEVELOPING THE LANGUAGE OF SCIENCE GRADES 6-8

Science & Engineering Practices	Example Tasks	Narrate/Inform	Explain	Argue	Discuss
6. **Constructing** Explanations and **Designing** Solutions MS-PS1-6 Matter and its Interactions MS-LS1-5 From Molecules to Organisms: Structures and Processes MS-ESS1-4 Earth's Place in the Universe	• **Undertake a design project to construct, test, and modify** a device that either releases or absorbs thermal energy by chemical processes. • **Construct a scientific explanation based on evidence** for how environmental and genetic factors influence the growth of organisms.	Proficient students can… • **Communicate** scientific ideas, principles, and/or evidence to construct, revise and/or use an explanation for real-world phenomena, using technical language, cohesive devices to signal logical relationships among reasoning, evidence, data, and/or a model when making or defending a claim or counterclaim through connectors to signal **time** (next, at the same time), **causality** (therefore, consequently, as a result, because) **clarification** (for example, this shows how…). • **Describe** scientific ideas or principles to design, construct, and/or test a design of an object, tool, process or system.	Proficient students can… • Construct an explanation that includes qualitative or quantitative relationships between variables and **describe** phenomena using technical language, cohesive devices, relating verbs and comparatives in order to construct a scientific explanation and **verify** valid and reliable evidence obtained from sources (including the students' own experiments. • **Describe** engineering design cycle - orally and in writing - to construct and/or implement a solution that meets specific design criteria and constraints.	Proficient students can… • Develop a logical sequence between evidence and claim using comparatives, connectors in order to apply scientific reasoning to **justify** why the data or evidence is adequate for the explanation or conclusion.	Proficient students can… • **Present** organized ideas and information on content topics including the use of graphics and multimedia, to maintain a neutral or objective stance through passive voice and declarative statements to establish a factual stance. • **Synthesize** ideas of several speakers, **pose** questions, and **respond** with evidence, examples, and ideas.

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Science & Engineering Practices	Example Tasks	Narrate/Inform	Explain	Argue	Discuss
7. **Engaging** in Argument from Evidence MS-PS2-4 Motion and Stability: Forces and Interactions MS-LS1-3 From Molecules to Organisms: Structures and Processes MS-ESS3-4 Earth and Human Activity MS-ETS1-2 Engineering Design	• **Construct and present arguments** using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects. • **Use argument supported by evidence** for how the body is a system of interacting subsystems composed of groups of cells. • **Construct an argument supported by evidence** for how increases in human population and per-capita consumption of natural resources impacts Earth's systems. • **Evaluate competing design solutions** using a systematic process to determine how well they meet the criteria and constraints of the problem	Proficient students can… • Compare, critique and **relate** two arguments on the same topic and analyze whether they emphasize similar or different evidence and/or interpretations of facts to support or refute a claim based on data and evidence through connectors to link clauses and establish logical relationships (as a result, therefore, to be more precise, instead, however, on the other hand).	Proficient students can… • Respectfully **clarify** and receive critiques about one's explanations, procedures, models and questions by citing relevant evidence and posing and responding to questions that elicit pertinent elaboration and detail to establish and maintain a neutral or objective stance through word choices to moderate stance (hedging) (could/might, a possibility, usually, often).	Proficient students can… • **Present** an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem. • **Make** an oral or written argument that supports or refutes the advertised performance of a device, process, or system, based on empirical evidence concerning whether or not the technology meets relevant criteria and constraints. • Review **orally** competing design solutions and evaluate based on jointly developed and agreed-upon design criteria.	Proficient students can… • Respectfully participate in **oral critiques** of explanations, procedures, models and questions by citing relevant evidence and posing and responding to questions that elicit pertinent elaboration and detail, using technical language, cohesive devices to signal logical relationships among reasoning, evidence, data, and/or a model when making or defending a claim or counterclaim through connectors to signal **time** (next, at the same time), **causality** (therefore, consequently, as a result, because) or **clarification** (for example, this shows how…).

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Science & Engineering Practices	Example Tasks	Narrate/Inform	Explain	Argue	Discuss
8. **Obtaining**, **Evaluating**, and **Communicating** Information MS-PS1-3 Matter and its Interactions MS-LS1-8 From Molecules to Organisms: Structures and Processes	• **Gather and make sense of information** to describe that synthetic materials come from natural resources and impact society. • **Gather and synthesize information** that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.	Proficient students can… • Describe a topic and its components using adverbial and prepositional phrases, technical language in order to specify times, place to contextualize phenomena, to introduce phenomena or events. • Analyze, and **paraphrase information of** how an idea is introduced, illustrated, and elaborated in oral or written text (e.g., through examples, evidence, or anecdotes) • Critically read scientific to determine the central ideas and or obtain scientific and/or technical information to **describe** patterns or evidence about the natural and designed world(s).	Proficient students can… • **Comprehend** and **explain** data, hypotheses, and/or conclusions in scientific and technical texts in light of competing information or accounts to establish perspective for communicating outcomes, consequences, or documentation through passive voice to emphasize the main topic. • **Communicate** scientific and/or technical information (e.g. about a proposed object, tool, process, system) in writing and/or through oral presentations.	Proficient students can… • Integrate qualitative and/or quantitative scientific and/or technical information in written text with that contained in media and visual displays to **clarify** claims and findings through a variety of clauses to frame details, examples, quotes, data (according to, several sources suggest, these data suggest). • Gather, read, synthesize and articulate information from multiple appropriate sources to assess the credibility, accuracy, and possible bias of each publication and methods use, and **describe** how they are supported or not supported by evidence.	Proficient students can… • **Present** organized ideas and information on content topics including the use of graphics and multimedia, to maintain a neutral or objective stance through passive voice and declarative statements to establish a factual stance. • Synthesize ideas of several speakers, **pose** questions, and **respond** with evidence, examples, and ideas. • **Pose** questions that elicit elaboration and/or **respond** to others' questions and comments.

Distribution of Science Key Language Uses in Grades 6-8				
WIDA ELD STANDARD	Narrate	Inform	Explain	Argue
1. Language for Science	○	◐	●	●

● Most Prominent ◐ Prominent ○ Present

Adapted from the WIDA 2020 Standards Framework p. 290-292

Section 3B: Science and Engineering Disciplinary Practices

Practice 1a: Asking Questions and Defining Problems – Teacher Moves

Teacher Moves: What supports can teachers provide students at different proficiency levels **to use language to interpret or make meaning** of the content? Examples:

Entering/Emerging (Levels 1-2)	Developing/Expanding (Levels 3-4)	Bridging/Reaching (Levels 5-6)
• **Model** orally the academic language and specific vocabulary required to ask and answer simple and wh- questions specific to this practice. • **Provide** an illustrated word bank/ labeled illustrations of key technical vocabulary, as they occur during investigations and explanations. • **Use** text with picture support for students to elaborate and ask and answer questions about key details in a text or investigation. • **Provide** language frames to develop simple questions and simple sentence or phrase responses ❖ **Ex 1:** How does (the independent variable) affect the (dependent variable)? ➢ e.g. How does distance affect attractive/repulsive force? ❖ **Ex 2:** The criteria for a successful design of (an engineering solution) include: (list of success criteria): ➢ e.g. The criteria for a successful design of a device to carry eggs include: ✓ the device fits in the container ✓ the egg does not break ✓ we can use the device again **(NEPF – IP.1.2; 2.1; 2.2; 3.1; 3.2; 5.3)**	• **Model** orally the academic language and specific vocabulary required to ask and answer simple questions about key details in the investigation and observations specific to this practice. • **Provide** an illustrated word bank/ labeled illustrations of key technical vocabulary, as they occur during investigations and explanations. • **Use** text with picture support for students to elaborate and ask and answer questions about key details in a text or investigation. • **Provide** language frames to develop questions and sentence or paragraph responses with detail ❖ **Ex 1:** How does (the independent variable) affect the (dependent variable)? ➢ e.g. How does the magnet's distance affect the amount of attractive/repulsive force? ❖ **Ex 2:** The criteria for a successful design of (an engineering solution) include: (list of success criteria): ➢ e.g. The criteria for a successful design of a device for transporting eggs include: ✓ the device must fit in the container ✓ the egg must not break ✓ the device must be sustainable **(NEPF – IP.1.2; 2.1; 2.2; 3.1; 3.2; 5.3)**	• **Provide** mentor questions for students to pose independently testable yes/no and wh- (information) questions for driving investigations and defining problems. • **Provide** language frames for students to develop complex questions, paragraph responses, and elaboration of content. • **Provide** an illustrated word bank/ labeled illustrations of key technical vocabulary, as they occur during investigations and explanations. • **Provide** language frames to develop complex questions, paragraph responses, and elaboration of content ❖ **Ex 1:** How does (the independent variable) affect the (dependent variable)? ➢ e.g. How does the distance between two magnets affect the resulting magnitude of attractive/repulsive force? ❖ **Ex 2:** The criteria for a successful design of (an engineering solution) include: (list of success criteria): ➢ e.g. The criteria for a successful design of an egg transporting device include: ✓ the size of the device must fit within the given parameters ✓ the device must be sustainable to prevent the egg from breaking **(NEPF – IP.1.2; 2.1; 2.2; 3.1; 3.2; 5.3)**

Section 3B: Science and Engineering Disciplinary Practices (continued)

Practice 1b: Asking Questions and Defining Problems – Success Criteria

Success Criteria: How will students be able to **communicate or demonstrate** their learning of language and content at **different language proficiency levels**? Examples: Task formats: See STEM Teaching Tools

Entering/Emerging (Levels 1-2)	Developing/Expanding (Levels 3-4)	Bridging/Reaching (Levels 5-6)
Success Criteria **Students will use** simple sentence starters, frames, visuals, and L1 supports to… ● **Identify** testable scientific questions by generating simple questions using sentence frames and word banks and by sorting them based on criteria for testability. ● Based on visual/multimedia descriptions of a scenario or phenomenon supported by simplified text students will: ➢ **describe** the problem using simple sentences (with frames as needed) ➢ **define** the criteria and constraints for acceptable solutions using simple language (with frames as needed) ● **Determine** what evidence is needed to evaluate the solution's viability by providing simplified question and answer stems and/or selecting from predetermined options **(NEPF – IP.1.3; 2.2; 3.4; 5.3)**	**Success Criteria** **Students will use** compound and complex sentence starters, frames and visual supports to… ● **Identify** testable scientific questions by generating questions using sentence frames (and word banks as needed) and by working with a group to apply criteria for testability. ● Based on a textual and visual/multimedia description of a scenario or phenomenon students will: ➢ **describe** the problem using simple and complex sentences (with frames as needed) ➢ **define** the criteria and constraints for acceptable solutions using appropriate language (with frames as needed) ● **Determine** what evidence is needed to evaluate the solution's viability by providing appropriate question and answer stems (as needed) **(NEPF – IP.1.3; 2.2; 3.4; 5.3)**	**Success Criteria** **Students will use** complex language frames and other supports as needed to… ● Identify testable scientific questions by generating questions (using complex sentence frames as needed), discussing and refining them with a group, and applying criteria for testability. ● Based on a (textual) description of a scenario or phenomenon (supported by visuals/multimedia) students will: ➢ **describe** the problem (using complex sentence frames as needed) ➢ **define** the criteria and constraints for acceptable solutions (using language frames as needed) ● Determine what evidence is needed to evaluate the solution's viability (by providing question and answer stems as needed) **(NEPF – IP.1.3; 2.2; 3.4; 5.3)**

Section 3B: Science and Engineering Disciplinary Practices (continued)

Practice 2a: Developing and Using Models – Teacher Moves

Teacher Moves: What supports can teachers provide students at different proficiency levels **to use language to interpret or make meaning** of the content? Examples:

Entering/Emerging (Levels 1-2)	Developing/Expanding (Levels 3-4)	Bridging/Reaching (Levels 5-6)
● **Provide** an illustrated word bank/ labeled illustrations of key technical vocabulary, as they occur during investigations and explanations. ● **Use** text with picture support for students to elaborate on newly acquired knowledge. ● **Provide** language frames to: ➢ **describe** in simple sentences or phrases using key vocabulary how a model (pictorial, verbal, graphical, mathematical, physical) predicts or explains a phenomenon ➢ **identify, explain**, and **elaborate** on the components of a model in simple sentences or phrases using key vocabulary ➢ **justify** predictions based on changes to a model in simple sentences or phrases using key vocabulary ❖ **Ex 1 (prediction): I predict** (change to one element of the model) **so** (effect)**. This is because** (relationship between the elements of the model). ➢ e.g. I predict the coyote population decreases so the jackrabbit population increases. This is because coyotes eat jackrabbits. ❖ **Ex 2 (explanation): The reason (that)** (change to one element of the model) **is (that)** (cause). **This happens because** (relationship between the elements of the model). ➢ e.g. The reason (that) the jackrabbit population increases is (that) the coyote population decreases. This is because coyotes eat jackrabbits. **(NEPF – IP.1.2; 2.1; 2.2; 3.1; 3.2; 5.3)**	● **Provide** an illustrated word bank/ labeled illustrations of key technical vocabulary, as they occur during investigations and explanations. ● **Provide** language frames to: ➢ **describe** in simple or complex sentences with detail how a model (pictorial, verbal, graphical, mathematical, physical) predicts or explains a phenomenon ➢ **identify, explain,** and **elaborate** on the components of a model using sentence or paragraph responses with detail ➢ **justify** predictions using sentence or paragraph responses with detail based on changes to a model ❖ **Ex 1 (prediction): I predict that if** (change to one element of the model) **then** (effect) **because** (relationship between the elements of the model). ➢ e.g. I predict that if the coyote population decreases then the jackrabbit population will increase because coyotes are predators of jackrabbits. ❖ **Ex 2 (explanation): The reason that** (a change to one element of the model) **is that** (cause) **because** (relationship between the elements of the model). ➢ e.g. The reason that the jackrabbit population increases is that the coyote population decreases, because coyotes are predators of jackrabbits. **(NEPF – IP.1.2; 2.1; 2.2; 3.1; 3.2; 5.3)**	● **Provide** language frames to: ➢ **describe** how a model (pictorial, verbal, graphical, mathematical, physical) predicts or explains a phenomenon using complex questions, paragraph responses, and elaboration of content ➢ **identify, explain,** and **elaborate** using complex questions, paragraph responses, and elaboration of content on the components of a model ➢ **justify** predictions using complex questions, paragraph responses, and elaboration of content based on changes to a model ❖ **Ex 1 (prediction): If** (change to one element of the model) **then** (effect) **because** (relationship between the elements of the model). ➢ e.g. If there is a decrease in the coyote population then the jackrabbit population will increase because the coyote is a natural predator of the jackrabbit. ❖ **Ex 2 (explanation):** (A change to one element of the model) **is due to** (cause) **because** (relationship between the elements of the model). ➢ e.g. The increase in the jackrabbit population is due to the decrease in the coyote population because the coyote is a natural predator of the jackrabbit. **(NEPF – IP.1.2; 2.1; 2.2; 3.1; 3.2; 5.3)**

Section 3B: Science and Engineering Disciplinary Practices (continued)

Practice 2b: Developing and Using Models – Success Criteria

Success Criteria: How will students be able to **communicate or demonstrate their learning** of language and content at **different language proficiency levels?** Examples: See STEM Teaching Tool #30

Entering/Emerging (Levels 1-2)	Developing/Expanding (Levels 3-4)	Bridging/Reaching (Levels 5-6)
Success Criteria From a simplified textual description of an observable scientific phenomenon, and a word/phrase bank, **students will use simple sentence starters, frames and visual and L1 supports to…** ● **Draw** and **label** (in writing or orally) a model and its components, interactions among components, and mechanisms in the model, using a simplified paragraph frame and word bank to explain the phenomenon. ● **Draw** and **label** (in writing or orally) a model that helps explain how this phenomenon occurs by applying their understanding of a disciplinary core idea, and to make a prediction about something that might happen in the future that could be explained by the model. (**NEPF – IP.1.3; 2.2; 3.4; 5.3)**	**Success Criteria** From a simplified textual description of an observable scientific phenomenon, and a word/phrase bank as needed, **students will use compound and complex sentence starters, frames and visual supports to…** ● **Draw** and **label** a model and its components, interactions among components, and mechanisms in the model, using a paragraph frame **as needed**, to write an explanation for the phenomenon. ● **Draw** and **label** a model that helps explain how this phenomenon occurs by applying their understanding of a disciplinary core idea, and using a paragraph frame **as needed**, write a prediction about something that might happen in the future that could be explained by the model. **(NEPF – IP.1.3; 2.2; 3.4; 5.3)**	**Success Criteria** From a textual description of an observable scientific phenomenon, **students will use complex language frames and other supports as needed to…** ● **Draw** and **label** a model and its components, interactions among components, and mechanisms in the model, using a paragraph frame **as needed**, to write an explanation for the phenomenon. ● **Draw** a model that helps to explain how this phenomenon occurs by applying their understanding of a disciplinary core idea, and using a paragraph frame **as needed**, write a prediction about something that might happen in the future that could be explained by the model. **(NEPF – IP.1.3; 2.2; 3.4; 5.3)**

Section 3B: Science and Engineering Disciplinary Practices (continued)

Practice 3a: Planning and Carrying out Investigations – Teacher Moves

Teacher Moves: What supports can teachers provide students at different proficiency levels **to use language to interpret or make meaning** of the content? Examples:

Entering/Emerging (Levels 1-2)	Developing/Expanding (Levels 3-4)	Bridging/Reaching (Levels 5-6)
● To support planning and carrying out investigations provide illustrated, kinesthetic (sorts), and/or annotated (in L1) graphic organizers to aid in: ➢ planning the structure of an investigation; collecting and organizing data; interpreting data. ● **Provide** language frames to: ➢ **describe** investigation structure; **identify**, **explain**, and **elaborate** on the components of the investigation and **justify** answers to scientific questions based on data and evidence collected through investigations using simple sentences or phrases and key vocabulary. ❖ **Ex 1 (describe):** This investigation will explain how (variable 2) affect(s) (variable 1). ➢ e.g. This investigation will explain how forces and mass affect the motion of an object. ❖ **Ex 2 (justify):** This investigation shows (conclusion – list of evidence/data) that motions of air masses change weather. **(NEPF – IP.1.2; 2.1; 2.2; 3.1; 3.2; 5.3)**	● To support planning and carrying out investigations provide illustrated, kinesthetic (sorts), and/or annotated graphic organizers to aid in: ➢ planning the structure of an investigation; collecting and organizing data, and interpreting data. ● **Provide** language frames to: ➢ **describe** investigation structure; **identify, explain**, and **elaborate** on the components of the investigation and **justify** answers to scientific questions based on data and evidence collected through investigations using simple sentence or paragraph responses and key details. ❖ **Ex 1 (describe):** This investigation will explain with evidence how (variable 2) **affect(s)** (variable 1). ➢ e.g. This investigation will explain with evidence how the forces on the object and the mass of the object affect the object's motion. ➢ **Ex 2 (justify):** This investigation shows that motions and interactions of air masses change weather conditions because in the evidence we can see how a cold air mass met a warm air mass and created thunderstorms in the area. **(NEPF – IP.1.2; 2.1; 2.2; 3.1; 3.2; 5.3)**	● To support planning and carrying out investigations provide graphic organizers to aid in: ➢ planning the structure of an investigation; collecting and organizing data, and interpreting data ● **Provide** language frames to: ➢ **describe** investigation structure; **identify**, **explain**, and **elaborate** on the components of the investigation, and **justify** answers to scientific questions based on data and evidence collected through investigations using complex statements, paragraph responses, and elaboration of content. ❖ **Ex 1 (describe):** This investigation will provide evidence to explain how the change in (variable 1) is affected **by** (variable 2). ➢ e.g. This investigation will provide evidence to explain how the change in an object's motion is affected by the sum of the forces on the object and the mass of the object. ❖ **Ex 2 (justify**): This investigation indicates/proves that (conclusion) because the data/evidence shows that/how (connect evidence/data to conclusion). ➢ e.g. This investigation indicates that the motions and complex interactions of air masses result in changes in weather conditions because the evidence shows that when a cold air mass met a warm air mass, the front created thunderstorms in the area. **(NEPF – IP.1.2; 2.1; 2.2; 3.1; 3.2; 5.3)**

Section 3B: Science and Engineering Disciplinary Practices (continued)

Practice 3b: Planning and Carrying out Investigations – Success Criteria

Success Criteria: How will students be able to **communicate or demonstrate their learning** of language and content at **different language proficiency levels?** Examples: See STEM Teaching Tool #30

Entering/Emerging (Levels 1-2)	Developing/Expanding (Levels 3-4)	Bridging/Reaching (Levels 5-6)
Success Criteria	**Success Criteria**	**Success Criteria**
Students will use simple sentence starters, frames, visuals, and L1 supports to… ● **Read, listen to, and/or observe** an adapted, illustrated or simply annotated scientific phenomenon or scientific model to **generate** a research question to investigate the phenomenon or model using question frames and word banks. ● **evaluate** different ways of observing or measuring the phenomenon by sorting or matching illustrations and simple descriptions ● **identify** the variables needed in the investigation to explain the phenomenon or model by selecting from an illustrated or annotated list. ● **characterize** each variable as dependent or independent by sorting picture cards with simple descriptions ● working with a partner and/or L1 and other language supports, conduct the investigation and collect data to serve as evidence to answer the scientific question. **(NEPF – IP.1.3; 2.2; 3.4; 5.3)**	**Students will use** compound and complex sentence starters, frames and visual supports to… ● **Read, listen to, and/or observe** an adapted, illustrated or annotated scientific phenomenon or scientific model, then, using question/ sentence frames, word banks, or other language supports as needed to **generat**e a research question to investigate the phenomenon or model with classroom resources. ● **evaluate** different ways of observing or measuring the phenomenon to determine which will best answer the question ● **characterize** each variable as dependent or independent and explain any variables to be controlled and why. ● **create** an investigation plan to study the scientific phenomenon or model that includes variables, tools used, and methods for recording observations. ● **describe** how the investigation will generate relevant patterns of evidence for answering the scientific question or supporting the model ● **conduct** the investigation and collect data to serve as evidence to answer the scientific question. (**NEPF – IP.1.3; 2.2; 3.4; 5.3)**	**Students will use** complex language frames and other supports as needed to… ● **Read, listen to, and/or observe** a scientific phenomenon or scientific model, to **generat**e a research question to investigate the phenomenon or model with classroom resources. ● **evaluate** different ways of observing or measuring the phenomenon to determine which will best answer the question. ● **characterize** each variable as dependent or independent and explain any variables to be controlled and why. ● **create** an investigation plan to study the scientific phenomenon or model that includes variables, tools used, and methods for recording observations. ● **describe** how the investigation will generate relevant patterns of evidence for answering the scientific question or supporting the model. ● **conduct** the investigation and collect data to serve as evidence to answer the scientific question. **(NEPF – IP.1.3; 2.2; 3.4; 5.3)**

Section 3B: Science and Engineering Disciplinary Practices (continued)

Practice 4a: Analyzing and Interpreting Data – Teacher Moves

Teacher Moves: What supports can teachers provide students at different proficiency levels **to use language to interpret or make meaning** of the content? Examples:

Entering/Emerging (Levels 1-2)	Developing/Expanding (Levels 3-4)	Bridging/Reaching (Levels 5-6)
To support comprehending, interpreting and analyzing data provide illustrated, kinesthetic (sorts), and/or annotated graphic organizers to aid in: organization, representation, categorization, comparison/contrast and examination. ● Provide language frames to: ➢ describe how the organization of data helps them to analyze the data using simple sentences ➢ describe patterns or relationships inferred from data using simple sentences with comparatives ❖ **Ex 1 (describe organization)**: We used (variable 1 noun) to organize the data. This shows the effect of (variable 1) on (variable 2). ➢ e.g. We used the number of coils to organize the data. This shows the effect of the number of coils on the magnetic field. ❖ **Ex 2 (describe patterns)**: More/less (variable 1 noun, possibly + adjective) results in more/less (variable 2 noun, possibly + adjective). ➢ e.g. More SPF results in less reaction. ➢ e.g. More wire results in more magnetic field. **(NEPF – IP.1.2; 2.1; 2.2; 3.1; 3.2; 5.3)**	To support comprehending, interpreting and analyzing data provide illustrated, kinesthetic (sorts), and/or annotated graphic organizers to aid in: organization, representation, categorization, comparison/contrast, and examination. ● Provide language frames to: ➢ describe how the organization of data helps them to analyze the data using extended sentences with prepositions ➢ describe patterns or relationships inferred from data using comparative sentences ❖ **Ex 1 (describe organization)**: This data is organized by (variable 1 noun/noun phrase) to show the effect of (variable 1) on (variable 2). ➢ e.g. This data is organized by the number of coils of wire to show the effect of the number of coils on the magnetic field. ❖ **Ex 2 (describe patterns):** The more/less/-er (variable 1 noun) the more/less/-er (variable 2 noun). ➢ e.g. The higher the SPF the lower the reaction. ➢ e.g. The more wire the stronger the magnetic field. **(NEPF – IP.1.2; 2.1; 2.2; 3.1; 3.2; 5.3)**	To support comprehending, interpreting and analyzing data, provide graphic organizers to aid in: organization, representation, categorization, comparison/contrast, and examination. ● Provide language frames to: ➢ describe how the organization of data helps them to analyze the data using extended sentences and elaboration of content ➢ describe patterns or relationships inferred from data using comparative sentences and elaboration of content ❖ **Ex 1 (describe organization):** This data is organized by (variable 1 noun/noun phrase) in order to show (effect on variable 2). ➢ e.g. This data is organized by strength of SPF in order to show how SPF affects the reaction on the UV-sensitive material. ❖ **Ex 2 (describe patterns):** The more/less/-er (variable 1 noun/noun phrase) the more/less/-er (variable 2 noun/noun phrase. ➢ e.g. The higher the SPF in the lotion the lower the reaction on the test material. ➢ e.g. The more wire wrapped around a nail the stronger the magnetic field generated. **(NEPF – IP.1.2; 2.1; 2.2; 3.1; 3.2; 5.3)**

Section 3B: Science and Engineering Disciplinary Practices (continued)

Practice 4b: Analyzing and Interpreting Data – Success Criteria

Success Criteria: How will students be able to **communicate or demonstrate their learning** of language and content at **different language proficiency levels?** Examples: See STEM Teaching Tool #30

Entering/Emerging (Levels 1-2)	Developing/Expanding (Levels 3-4)	Bridging/Reaching (Levels 5-6)
Success Criteria **Students will read, listen to, and/or observe** a simplified visual, multimedia representation of an observable scientific phenomenon with simplified text, then using a word/phrase bank, draw and label (in writing or orally) a model and its components, interactions among components, and mechanisms in the model, and ● using a simplified paragraph frame, write (or speak) an explanation for the phenomenon, using the model as supporting evidence ● using a word/phrase bank, draw and label (in writing or orally) a model that helps explain how this phenomenon occurs by applying their understanding of a disciplinary core idea, and ● using a simplified paragraph frame, write (or speak) a prediction about something that might happen in the future that could be explained by the model. **(NEPF – IP.1.3; 2.2; 3.4; 5.3)**	**Success Criteria** **Students will read, listen to, and/or observe** a simplified textual description of an observable scientific phenomenon, then using a word bank **as needed**, draw and label a model and its components, interactions among components, and mechanisms in the model, and ● using a paragraph frame **as needed**, write an explanation for the phenomenon, using the model as supporting evidence ● using a word bank **as needed**, draw and label a model that helps explain how this phenomenon occurs by applying their understanding of a disciplinary core idea, and ● using a paragraph frame **as needed**, write a prediction about something that might happen in the future that could be explained by the mode. **(NEPF – IP.1.3; 2.2; 3.4; 5.3)**	**Success Criteria** **Students will read, listen to, and/or observe** recorded observations from an investigation, then organize the data (tables, graphs etc.) and describe how organization aids in analysis, ● identify and describe patterns within the organized data ● record observations from an investigation, and ● determine whether data presented provide causal or correlational evidence. **(NEPF – IP.1.3; 2.2; 3.4; 5.3)**

Section 3B: Science and Engineering Disciplinary Practices (continued)

Practice 5a: Using Mathematics and Computational Thinking – Teacher Moves

Teacher Moves: What supports can teachers provide students at different proficiency levels **to use language to interpret or make meaning** of the content? Examples:

Entering/Emerging (Levels 1-2)	Developing/Expanding (Levels 3-4)	Bridging/Reaching (Levels 5-6)
To support comprehending, interpreting and analyzing data **provide** illustrated, kinesthetic (sorts), and/or annotated graphic organizers to aid in: using mathematical representations to support claims; evaluating the requirements of an investigation and creating/writing algorithms (series of steps) to solve a problem. ● **Provide** keys or glossaries for putting mathematical symbols into words, e.g. E = energy (of a wave) a = amplitude (of a wave) $\propto$ = is proportional to ^{2} = squared ● Provide language frames for using mathematical representations to describe scientific phenomena in simple sentences. ❖ **Ex 1: The equation** (equation) **means** (mathematical symbols written with words). **For example, if we** (mathematical function), **then we have to** (mathematical function). ➢ e.g. The equation $E \propto a^2$ means energy of a wave is proportional to amplitude of a wave squared. For example, if we multiply energy by x, then we have to multiply amplitude by x^2. **(NEPF – IP.1.2; 2.1; 2.2; 3.1; 3.2; 5.3)**	To support comprehending, interpreting and analyzing data **provide** illustrated, kinesthetic (sorts), and/or annotated graphic organizers to aid in: using mathematical representations to support claims; evaluating the requirements of an investigation, and creating/writing algorithms (series of steps) to solve a problem. ● **Provide** keys or glossaries for putting mathematical symbols into words, e.g. E = energy (of a wave) a = amplitude (of a wave) $\propto$ = is proportional to ^{2} = squared ● Provide language frames to use mathematical representations to describe scientific phenomena with increasingly complex sentences and vocabulary. ❖ **Ex 1: The equation** (equation) **means** (mathematical symbols written with words). **For example, if we change** (variable 1) **by** (description of change), **then we have to change** (variable 2) **by** (description of change). ➢ e.g. The equation $E \propto a^2$ means energy of a wave is proportional to amplitude of a wave squared. For example, if we change the energy by a factor of x, then we have to change the amplitude by a factor of x^2. **(NEPF – IP.1.2; 2.1; 2.2; 3.1; 3.2; 5.3)**	To support using mathematics and computational thinking, **provide** graphic organizers to aid in: using mathematical representations to support claims; evaluating the requirements of an investigation, and creating/writing algorithms (series of steps) to solve a problem. ● **Provide** language frames to use mathematical representations to describe scientific phenomena using extended sentences and elaboration of content ❖ **Ex 1: The equation** (equation) **explains the relationship between** (the variables found in the equation). **This means** (the mathematical relationship explained in words). ➢ e.g. The equation $E \propto a^2$ explains the relationship between the energy and amplitude of a wave. This means as the energy units of a wave increase by a factor of x, the amplitude units of the wave increase by a factor of x^2. ❖ **Ex 2: The pattern in the data shows us that when** (variable 1) (undergoes a mathematical change) **then** (variable 2) (undergoes a mathematical change). ➢ e.g. The pattern in the data shows us that when the starting amount of energy is doubled then the corresponding amplitude quadrupled. **(NEPF – IP.1.2; 2.1; 2.2; 3.1; 3.2; 5.3)**

Section 3B: Science and Engineering Disciplinary Practices (continued)

Practice 5b: Using Mathematics and Computational Thinking – Success Criteria

Success Criteria: How will students be able to **communicate or demonstrate their learning** of language and content at **different language proficiency levels?** Examples: See STEM Teaching Tool #30, (pp.11)

Entering/Emerging (Levels 1-2)	Developing/Expanding (Levels 3-4)	Bridging/Reaching (Levels 5-6)
Success Criteria **Students will read and interpret** a simplified textual description or visual/multimedia representation, measured quantities of data, and a mathematical equation of an observable scientific phenomenon, then: ● select from visual options to make a prediction about the state of the phenomenon in the future that the equation can be used to support; label the selected option using a word bank (as needed) ● using a simplified paragraph frame, write an explanation for the prediction, using the mathematical model as supporting evidence ● using a large data set from an investigation, the question the data are intended to answer in simplified/present tense), and computer tools for analyzing the data set develop statistical summaries (mean, median, mode, variability) of the dataset. **(NEPF – IP.1.3; 2.2; 3.4; 5.3)**	**Success Criteria** **Students will read and interpret** a simplified textual description, measured quantities of data, and a mathematical equation of an observable scientific phenomenon, then: ● using a simplified paragraph frame, write a prediction and explanation for the prediction, using the mathematical model as supporting evidence. ● using a large data set from an investigation, the question the data are intended to answer, and computer tools for analyzing the data set, then develop statistical summaries (mean, median, mode, variability) of the data set that help them answer the question about the dataset. **(NEPF – IP.1.3; 2.2; 3.4; 5.3)**	**Success Criteria** **Students will read and interpret** a textual description, measured quantities of data, and a mathematical equation of an observable scientific phenomenon, then: ● make a prediction about the state of the phenomenon in the future that the equation can be used to support ● write an explanation for the prediction, using the mathematical model as supporting evidence ● using a large data set from an investigation, the question the data are intended to answer, and computer tools for analyzing the data set, then develop statistical summaries (mean, median, mode, variability) of the data set that help them answer the question about the dataset. **(NEPF – IP.1.3; 2.2; 3.4; 5.3)**

Section 3B: Science and Engineering Disciplinary Practices (continued)

Practice 6a: Constructing Explanations and Designing Solutions – Teacher Moves

Teacher Moves: What supports can teachers provide students at different proficiency levels **to use language to interpret or make meaning** of the content? Examples:

Entering/Emerging (Levels 1-2)	Developing/Expanding (Levels 3-4)	Bridging/Reaching (Levels 5-6)
To support constructing explanations and designing solutions provide illustrated, kinesthetic (sorts), and/or annotated (in L1) graphic organizers to aid in: identifying and organizing cause/effect relationships and sequencing the engineering design process. • **Provide** language frames to: ➢ respond to Why/How questions with explanations using simple sentences and content vocabulary. ➢ propose and evaluate engineering design solutions using complex questions, paragraph responses, and elaboration of content. ❖ **Ex 1 (explanation):** (factual statement); (causal transition signal) (factual statement). ➢ e.g. How do we know where the oldest rocks in the Grand Canyon are? We know the rock strata in the Grand Canyon are oldest at the bottom because new rocks deposit on top of old rocks to form sedimentary rocks. ❖ **Ex 2 (propose/evaluate):** (This aspect) of solution A was successful. (This aspect) of solution B was successful. We can optimize our design by (combining them).	To support constructing explanations and designing solutions provide illustrated, kinesthetic (sorts), and/or annotated graphic organizers to aid in: identifying and organizing cause/effect relationships and sequencing the engineering design process. • **Provide** language frames to: ➢ respond to Why/How questions with explanations using extended sentences, simple paragraphs, content vocabulary, and content details. ➢ propose and evaluate engineering design solutions using extended sentences, simple paragraphs, content vocabulary, and content details. ❖ **Ex 1 (explanation):** (factual statement); **(causal transition signal)** (factual statement)**.** ➢ e.g. How do we know where the oldest rocks in the Grand Canyon are located? We know the strata of rock in the Grand Canyon are younger at the bottom than at the top as a result of the way new rocks deposit on top of old rocks to form sedimentary rocks.	To support constructing explanations and designing solutions, provide graphic organizers to aid in: identifying and organizing cause/effect relationships and sequencing the engineering design process. • **Provide** language frames to: ➢ respond to Why/How questions with explanations using complex sentences, paragraph responses, content vocabulary, and elaboration of content. ➢ propose and evaluate engineering design solutions using complex questions, paragraph responses, and elaboration of content. ❖ **Ex 1 (explanation):** (factual statement); (causal transition signal) (factual statement). ➢ e.g. How do we know where the oldest rocks in the Grand Canyon are located? The strata of rock in the Grand Canyon become progressively younger from bottom to top; this is due to the way sedimentary rocks are deposited and formed. ❖ **Ex 2 (explanation)**: (Causal transition signal) (factual statement), (factual statement)

Section 3B: Science and Engineering Disciplinary Practices (continued)

Practice 6a: Constructing Explanations and Designing Solutions – Teacher Moves (continued)

Entering/Emerging (Levels 1-2)	Developing/Expanding (Levels 3-4)	Bridging/Reaching (Levels 5-6)
➢ e.g. The Styrofoam of solution A was successful. The chemicals of solution B were successful. We can optimize our design by using both the Styrofoam and the chemicals. **(NEPF – IP.1.2; 2.1; 2.2; 3.1; 3.2; 5.3)**	❖ **Ex 2 (explanation)**: (**Causal transition signal)** (factual statement), (factual statement)**.** ➢ e.g. How do we know where the oldest rocks in the Grand Canyon are located? **As a result of** the way new rocks deposit on top of old rocks to form sedimentary rocks, we know the strata of rock in the Grand Canyon are younger at the bottom than at the top. ❖ **Ex 3 (**propose/evaluate): (This aspect) of solution A was successful and (this aspect) of solution B was successful. **As a result,** we propose to optimize our design by (combining them). ➢ e.g. The Styrofoam design of solution A was successful, and the chemical reactants of solution B were successful. As a result, we propose to optimize our design by using both the Styrofoam and the chemical reactants. **(NEPF – IP.1.2; 2.1; 2.2; 3.1; 3.2; 5.3)**	➢ e.g. How do we know where the oldest rocks in the Grand Canyon are located? Due to the way sedimentary rocks are deposited and formed, the strata of rock in the Grand Canyon become progressively younger from bottom to top. ❖ **Ex 3 (propose/evaluate)**: Because (this aspect) of solution A was successful and (this aspect) of solution B was successful, we propose to optimize our design by (combining them). ➢ e.g. Because the Styrofoam design of solution A was successful and the chemical reactants of solution B were successful, we propose to optimize our design by using both the Styrofoam and the chemical reactants **(NEPF – IP.1.2; 2.1; 2.2; 3.1; 3.2; 5.3)**

Section 3B: Science and Engineering Disciplinary Practices (continued)

Practice 6b: Constructing Explanations and Designing Solutions – Success Criteria

Success Criteria: How will students be able to **communicate or demonstrate their learning** of language and content at **different language proficiency levels?** Examples: See STEM Teaching Tool #30, (pp.12-13)

Entering/Emerging (Levels 1-2)	Developing/Expanding (Levels 3-4)	Bridging/Reaching (Levels 5-6)
Success Criteria **Students will read, listen to, and/or observe** a simplified and/or illustrated and labeled description of a phenomenon and the qualitative and quantitative data for independent and dependent variables, then: ● orally or in writing, use sentence frames and word/phrase banks to produce a causal account that explains how the independent variables relate to the dependent ● read, listen to, and/or observe a simplified and/or illustrated and labeled description of a designed system and data from a failure scenario associated with the design, then ● analyze the data; ● identify the scientific causes of the failure by selecting from a range of visual or simply stated options; sketch a design iteration that may be an improvement to the design. **(NEPF – IP.1.3; 2.2; 3.4; 5.3)**	**Success Criteria** **Students will read, listen to, and/or observe** a simplified description of a phenomenon and the qualitative and quantitative data for independent and dependent variables, then: ● orally or in writing, use paragraph frames and word/phrase banks to produce a causal account that explains how the independent variables relate to the dependent variables. ● read, listen to, and/or observe a simplified description of a designed system and data from a failure scenario associated with the design, then ● analyze the data; ● identify the scientific causes of the failure by selecting from a range of simply stated options; ● sketch or describe in simple terms a design iteration that may be an improvement to the design. **(NEPF – IP.1.3; 2.2; 3.4; 5.3)**	**Success Criteria** **Students read, listen to, and/or observe** the description of a phenomenon and the qualitative and quantitative data for independent and dependent variables, then: ● orally or in writing, use supports as needed to produce a causal account that explains how the independent variables relate to the dependent variables. ● read, listen to, and/or observe the description of a designed system and data from a failure scenario associated with the design, then ● analyze the data ● identify the scientific causes of the failure. ● sketch or describe a design iteration that may be an improvement to the design. **(NEPF – IP.1.3; 2.2; 3.4; 5.3)**

Section 3B: Science and Engineering Disciplinary Practices (continued)

Practice 7a: Engaging in Argument from Evidence – Teacher Moves

Teacher Moves: What supports can teachers provide students at different proficiency levels **to use language to interpret or make meaning** of the content? Examples:

Entering/Emerging (Levels 1-2)	Developing/Expanding (Levels 3-4)	Bridging/Reaching (Levels 5-6)
To support engaging in argument from evidence provide illustrated, kinesthetic (sorts), and/or annotated graphic organizers to aid in: connecting evidence to claims and comparing and evaluating evidence based on a claim. • **Provide** language frames to: ➢ **Compare** and **critique** arguments by citing evidence and posing questions using simple and compound sentences ➢ **Use** scientific reasoning supported by language frames and language banks to explain why or how evidence supports a claim. ❖ **Ex 1 (compare/critique):** How are the arguments similar or different? The arguments for both/all claims emphasize (type of evidence). ➢ e.g. The arguments for both claims emphasize human population. The argument for claim 1 emphasizes (type of evidence), but the argument for claim 2 emphasizes (different type of evidence). ➢ e.g. The argument for claim 1 emphasizes human population, but the argument for claim 2 emphasizes motor vehicles. ❖ **Ex 2 (compare/critique):** What is the source of your evidence for (specific claim)? The evidence for (claim) is data from (source).	To support engaging in argument from evidence provide illustrated, kinesthetic (sorts), and/or annotated graphic organizers to aid in: connecting evidence to claims and comparing and evaluating evidence based on a claim. • **Provide** language frames to: ➢ **Compare** and **critique** arguments by citing evidence and posing questions using compound and increasingly complex sentences. ➢ Use scientific reasoning supported by complex language frames and language banks to explain why or how evidence supports a claim. ❖ **Ex 1 (compare/critique):** How are the arguments similar or different? The arguments for both/all claims emphasize (type of evidence). ➢ e.g. The arguments for both claims emphasize the effect of human population. The argument for claim 1 emphasizes (type of evidence); however, the argument for claim 2 emphasizes (different type of evidence). ➢ e.g. The argument for claim 1 emphasizes the effect of human population; however, the argument for claim 2 emphasizes motor vehicle emissions.	To support engaging in argument from evidence, provide graphic organizers to aid in: connecting evidence to claims and comparing and evaluating evidence based on a claim. • **Provide language frames to:** ➢ **Compare** and **critique** arguments by citing evidence and posing questions using extended sentences and elaboration of content ➢ **Use** scientific reasoning and extended sentences and elaboration of content to explain why or how evidence supports a claim. ❖ **Ex 1 (compare/critique):** How are the arguments similar or different? The argument for claim 1 emphasizes (type of evidence), as does the argument for claim 2. ➢ e.g. The argument for claim 1 emphasizes the effect of human population, as does the argument for claim 2. The argument for claim 1 emphasizes (type of evidence), while the argument for claim 2 emphasizes (different type of evidence). ➢ e.g. The argument for claim 1 emphasizes the effect of human population, while the argument for claim 2 emphasizes motor vehicle emissions.

Section 3B: Science and Engineering Disciplinary Practices (continued)

Practice 7a: Engaging in Argument from Evidence – Teacher Moves (continued)

Entering/Emerging (Levels 1-2)	Developing/Expanding (Levels 3-4)	Bridging/Reaching (Levels 5-6)
➢ e.g. What is the source of your evidence for the effect of human population? The evidence for human population is data from a study from the Environmental Protection Agency. ❖ **Ex 3 (compare/critique):** How does (specific evidence) support/refute your claim that (simple statement of claim)? ➢ e.g. How does the number of cars support your claim that cars negatively impact air quality? ❖ **Ex 4 (Claim) (Evidence) (Reasoning):** Provide paragraph frames and word banks based on the topic. ➢ e.g. **(Claim)** Human population and consumption of natural resources **negatively impact** air quality. **(Evidence)** Data from the EPA about air quality show more pollutants over cities. **(Reasoning)** The conclusion is population and consumption cause bad air quality because air quality is worse where more people use more resources. ❖ Language Bank: air quality, bad/worse, consumption (of), effect, good/better, human population, impact, more/less, natural resources, negatively, pollutants, positively, the EPA, the Internet **(NEPF – IP.1.2; 2.1; 2.2; 3.1; 3.2; 5.3)**	❖ **Ex 2 (compare/critique):** What is the source of your evidence for (specific claim)? The evidence for (claim) is data from (source). ➢ e.g. What is the source of your evidence for the effect of human population? The evidence for human population is data from a study from the Environmental Protection Agency. ❖ **Ex 3 (compare/critique):** How does (specific evidence) support/refute your claim that (simple statement of claim)? ➢ e.g. How does the number of cars support your claim that cars negatively impact air quality? ❖ **Ex 4 (Claim) (Evidence) (Reasoning):** Provide language banks based on the topic. ➢ e.g. **(Claim)** Human population and consumption of natural resources **negatively impact** air quality. **(Evidence)** Data from the EPA about air quality show more pollutants over cities. **(Reasoning)** The conclusion is population and consumption cause bad air quality because air quality is worse where more people use more resources. ❖ Language Bank: air quality, consumption (of), effect, human population, impact, natural resources, negatively, pollutants, positively **(NEPF – IP.1.2; 2.1; 2.2; 3.1; 3.2; 5.3)**	❖ **Ex 2 (compare/critique):** What is the source of your evidence for (specific claim)? The evidence for (claim) is data from (source). ➢ e.g. What is the source of your evidence for the effect of human population on decreasing air quality? The evidence for the effect of human population on decreasing air quality is data from a 22-year study produced by the Environmental Protection Agency. ❖ **Ex 3 (compare/critique):** How does (specific evidence) support/refute the claim that (claim)? ➢ e.g. How does the number of vehicles per household support the claim that motor vehicle emissions negatively impact air quality? ❖ **Ex 4 (Claim) (Evidence) (Reasoning):** ➢ e.g. **(Claim)** Increases in human population and the per capita consumption of natural resources negatively impacts Earth's air quality. **(Evidence)** Air quality data from the EPA indicates a high concentration of pollutants over urban areas. **(Reasoning)** We can conclude that population and consumption cause a decrease in air quality because this high concentration of pollutants occurs over urban areas where there are more people who use more natural resources. **(NEPF – IP.1.2; 2.1; 2.2; 3.1; 3.2; 5.3)**

Section 3B: Science and Engineering Disciplinary Practices (continued)

Practice 7b: Engaging in Argument from Evidence – Success Criteria

Success Criteria: How will students be able to **communicate or demonstrate their learning** of language and content at **different language proficiency levels?** Examples: See STEM Teaching Tool #30, (pp. 14)

Entering/Emerging (Levels 1-2)	Developing/Expanding (Levels 3-4)	Bridging/Reaching (Levels 5-6)
Success Criteria **Students will read, listen to, and/or observe** a simplified and/or illustrated and labeled description of a phenomenon, then, using graphic organizers, simple sentence frames, and glossaries/dictionaries: ● state a claim about that phenomenon; ● identify or match evidence that supports that claim; ● match the scientific principle(s)that connect each piece of evidence to the claim. **NEPF – IP.1.3; 2.2; 3.4; 5.3)**	**Success Criteria** **Students will read, listen to, and/or observe** an illustrated and/or labeled description of a phenomenon, then, using graphic organizers, paragraph frames, and/or glossaries or dictionaries **as needed**: ● articulate (construct) a claim about that phenomenon; ● identify evidence that supports that claim; ● articulate or match the scientific principle(s)that connect each piece of evidence to the claim. **(NEPF – IP.1.3; 2.2; 3.4; 5.3)**	**Success Criteria** **Students read, listen to, and/or observe** a description of a phenomenon, then, using graphic organizers, complex sentence frames, and glossaries or dictionaries **as needed**: ● articulate (construct) a claim about that phenomenon; ● identify evidence that supports that claim; ● articulate the scientific principle(s)that connect each piece of evidence to the claim. **(NEPF – IP.1.3; 2.2; 3.4; 5.3)**

Section 3B: Science and Engineering Disciplinary Practices (continued)

Practice 8a: Obtaining, Evaluating, and Communicating Information – Teacher Moves

Teacher Moves: What supports can teachers provide students at different proficiency levels **to use language to interpret or make meaning** of the content? Examples:

Entering/Emerging (Levels 1-2)	Developing/Expanding (Levels 3-4)	Bridging/Reaching (Levels 5-6)
❖ For critically reading scientific texts, supports may include: • ordering or sorting central ideas, events, and conclusions • matching details, evidence, causes, etc. to central ideas or conclusions • highlighting text evidence • categorizing details obtained from oral, written, or multimedia texts ❖ For gathering, synthesizing, and integrating, and assessing information, supports may include: • graphic organizers for gathering and classifying information • a list of relevant questions for analyzing and evaluating information • working with a partner to sort a list of sources according to credibility ❖ For communicating scientific and/or technical information, supports may include: • graphic organizers and other supports noted above and in all other practices • sentence frames and other linguistic supports as described in all other practices **(NEPF – IP.1.2; 2.1; 2.2; 3.1; 3.2; 5.3)**	❖ For critically reading scientific texts, supports may include: • ordering or sorting central ideas, events, and conclusions • matching details, evidence, causes, etc. to central ideas or conclusions • highlighting text evidence • categorizing details obtained from oral, written, or multimedia texts ❖ For gathering, synthesizing, and integrating, and assessing information, supports may include: • graphic organizers for gathering and classifying information • a list of relevant questions for analyzing and evaluating information • working with a partner to sort a list of sources according to credibility ❖ For communicating scientific and/or technical information, supports may include: • graphic organizers and other supports noted above and in all other practices • sentence frames and other linguistic supports as described in all other practices **(NEPF – IP.1.2; 2.1; 2.2; 3.1; 3.2; 5.3)**	❖ For critically reading scientific texts, supports may include: • ordering or sorting central ideas, events, and conclusions • matching details, evidence, causes, etc. to central ideas or conclusions • highlighting text evidence • categorizing details obtained from oral, written, or multimedia texts ❖ For gathering, synthesizing, and integrating, and assessing information, supports may include: • graphic organizers for gathering and classifying information • a list of relevant questions for analyzing and evaluating information • working with a partner to sort a list of sources according to credibility ❖ For communicating scientific and/or technical information, supports may include: • **graphic** organizers and other supports noted above and in all other practices • sentence frames and other linguistic supports as described in all other practices **(NEPF – IP.1.2; 2.1; 2.2; 3.1; 3.2; 5.3)**

Section 3B: Science and Engineering Disciplinary Practices (continued)

Practice 8b: Obtaining, Evaluating, and Communicating Information – Success Criteria

Success Criteria: How will students be able to **communicate or demonstrate their learning** of language and content at **different language proficiency levels?** Examples: See STEM Teaching Tool #30, (pp. 15)

Entering/Emerging (Levels 1-2)	Developing/Expanding (Levels 3-4)	Bridging/Reaching (Levels 5-6)
Success Criteria **Students will read and/or listen to** an adapted/simplified description of a phenomenon that includes a (multimodal), adapted, illustrated or annotated set of resources including adapted/simplified grade-appropriate texts, data displays, tables, diagrams, equations, graphs, and models, then, using simple language frames, L1 resources, and other linguistic supports, ● synthesize the information from across the texts by categorizing or sorting, and/or ● compare and contrast information across the texts in a graphic organizer to determine which are most relevant to explaining the phenomenon, and/or ● communicate information from the resources in oral or written form using simple language frames and other linguistic supports, and/or construct a visual, oral, or written (using sentence frames) explanation of the phenomenon, and/or	**Success Criteria** **Students will be presented** with a scenario that describes a phenomenon and includes a (multimodal), adapted, illustrated or annotated set of resources including grade-appropriate texts, data displays, tables, diagrams, equations, graphs, and models, then, using graphic organizers, language frames, and other linguistic supports **as needed**, ● synthesize the information from across the resources and/or ● compare and contrast information across the resources to determine which are most relevant to explaining the phenomenon, and/or ● communicate information from the resources in oral or written form, and/or ● construct a visual, oral, or written (using paragraph frames) explanation of the phenomenon, and/or integrate information across the resources using graphic organizers and language frames in order to explain,	**Success Criteria** **Students will be presented** with a scenario that describes a phenomenon and includes a (multimodal) set of resources including grade-appropriate texts, data displays, tables, diagrams, equations, graphs, and models, then ● synthesize the information from across the resources, and/or ● compare and contrast information across the resources to determine which are most relevant to explaining the phenomenon, and/or ● communicate information from the resources in oral or written form, and/or ● construct an explanation of the phenomenon, and/or ● integrate information across the resources in order to explain, clarify, or ask questions about claims and findings, and/or evaluate and integrate information from across the resources to address a scientific question or solve a problem.

Practice 8b: Obtaining, Evaluating, and Communicating Information – Success Criteria (continued)

Entering/Emerging (Levels 1-2)	Developing/Expanding (Levels 3-4)	Bridging/Reaching (Levels 5-6)
● integrate information across the resources using graphic organizers and L1 and other language supports in order to explain, clarify, or ask questions about claims and findings, and/or ● evaluate and integrate information from across the resources using graphic organizers and L1 and other language supports to address a scientific question or solve a problem. ● read and/or listen to a set of adapted/simplified scientific texts or a scenario that describes a phenomenon or an investigation of a phenomenon using text, images, video, and/or data, then, using simple language frames, L1 resources, and other linguistic supports, ● analyze using visuals and graphics, then speak or write simple statements about the validity and reliability of the information, and/or ● evaluate and synthesize the information presented using graphic organizers, visuals, and other supports to address a scientific question or solve a problem and/or to ask questions about the phenomenon based on information, and/or use multiple forms of simple scientific texts and multiple ways to present information to communicate visually, orally, or in writing about the phenomenon to a given audience or an audience of their choosing. **(NEPF – IP.1.3; 2.2; 3.4; 5.3)**	clarify, or ask questions about claims and findings, and/or ● evaluate and integrate information from across the resources using graphic organizers and language frames to address a scientific question or solve a problem. ● be presented with a set of scientific texts or a scenario that describes a phenomenon or an investigation of a phenomenon using text, images, video, and/or data, then using graphic organizers, language frames, and other linguistic supports **as needed**, ● analyze and write about the validity and reliability of the information, and/or ● evaluate and synthesize the information presented to address a scientific question or solve a problem and/or to ask questions about the phenomenon based on information, and/or use multiple forms of scientific texts and multiple ways to present information to communicate about the phenomenon to a given audience or an audience of their choosing. **(NEPF – IP.1.3; 2.2; 3.4; 5.3)**	● be presented with a set of scientific texts or a scenario that describes a phenomenon or an investigation of a phenomenon using text, images, video, and/or data, then ● analyze and write about the validity and reliability of the information, and/or ● evaluate and synthesize the information presented to address a scientific question or solve a problem and/or to ask questions about the phenomenon based on information, and/or use multiple forms of scientific texts and multiple ways to present information to communicate about the phenomenon to a given audience or an audience of their choosing. **(NEPF – IP.1.3; 2.2; 3.4; 5.3)**