National Science Standards (National Academy of Sciences)

NS.K-4.1 Science as Inquiry
- Abilities necessary to do scientific inquiry

NS.K-4.2 Physical Science
- Properties of objects and material

NS.K-4.3 Life Science
- Organisms and environments

NS.K-4.4 Earth and Space Science
- Properties of Earth materials
- Changes in Earth and sky

NS.5-8.3 Life Science
- Diversity and adaptations of organisms

NS.5-8.4 Earth and Space Science
- Structure of the Earth system
- Earth’s history

Next Generation Science Standards (National Academy of Sciences)

NGSS-2-ESS1-1 Use information from several sources to provide evidence that Earth events can occur quickly or slowly

NGSS-3-LS4-1 Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago

GSS-4-ESS1-1 Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time

NGSS-4-ESS2-1 Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation

NGSS-5-ESS2-1 Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact

NGSS-MS-ESS1-4 Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth’s 4.6-billion-year-old history

NGSS-MS-ESS2-1 Develop a model to describe the cycling of Earth’s materials and the flow of energy that drives this process

NGSS-MS-ESS2-2 Construct an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying time and spatial scales

NGSS-MS-ESS2-3 Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions

National Social Studies - Geography Standards (National Geographic)
NSS-G.K-12.1  The World in Spatial Terms
- Understand how to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective

NSS-G.K-12.3  Physical Systems
- Understand the physical processes that shape the patterns of Earth’s surface

Common Core State Standards (National Governors Association and the Council of Chief State School Officers) CCSS.ELA-Lit.RI: Reading Standards for Informational Texts

4th Grade:
4.1: Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.

4.2: Determine the main idea of a text and explain how it is supported by key details; summarize the text.

4.3: 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.

4.4: Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.

4.9: Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably

5th grade:
5.1: Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.

5.2: Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.

5.3: 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.

5.4: Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.

5.7: 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.

5.9: Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably

6th grade:
6.1: Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

6.2: Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.

6.4: Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.

6.7: Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.

7th grade:

7.1: Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

7.3: Analyze the interactions between individuals, events, and ideas in a text (e.g., how ideas influence individuals or events, or how individuals influence ideas or events).

7.4: Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of a specific word choice on meaning and tone.

CCSS.ELA-Lit.RF: Reading Standards: Foundational Skills

4th grade:

4.3: Know and apply grade-level phonics and word analysis skills in decoding words. a. Use combined knowledge of all letter-sound correspondences, syllabication patterns, and morphology (e.g., roots and affixes) to read accurately unfamiliar multisyllabic words in context and out of context.

4.4: Read with sufficient accuracy and fluency to support comprehension.
   a. Read grade-level text with purpose and understanding.
   b. Read grade-level prose and poetry orally with accuracy, appropriate rate, and expression on successive readings.
   c. Use context to confirm or self-correct word recognition and understanding, rereading as necessary.

5th grade:

5.3: Know and apply grade-level phonics and word analysis skills in decoding words. a. Use combined knowledge of all letter-sound correspondences, syllabication patterns, and morphology (e.g., roots and affixes) to read accurately unfamiliar multisyllabic words in context and out of context.

5.4: Read with sufficient accuracy and fluency to support comprehension.
   a. Read grade-level text with purpose and understanding.
   b. Read grade-level prose and poetry orally with accuracy, appropriate rate, and expression on successive readings.
   c. Use context to confirm or self-correct word recognition and understanding, rereading as necessary.
CCSS.ELA-Lit.W: Writing Standards

4th grade:
4.2: Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
   a. Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension.
   b. Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic.
   c. Link ideas within categories of information using words and phrases (e.g., another, for example, also, because).
   d. Use precise language and domain-specific vocabulary to inform about or explain the topic.
   e. Provide a concluding statement or section related to the information or explanation presented.

4.7: Conduct short research projects that build knowledge through investigation of different aspects of a topic.

4.8: 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.

4.9: Draw evidence from literary or informational texts to support analysis, reflection, and research.
   b. Apply grade 4 Reading standards to informational texts (e.g., “Explain how an author uses reasons and evidence to support particular points in a text”).

5th grade:
5.2: Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
   a. Introduce a topic clearly, provide a general observation and focus, and group related information logically; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension.
   b. Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic.
   c. Link ideas within and across categories of information using words, phrases, and clauses (e.g., in contrast, especially).
   d. Use precise language and domain-specific vocabulary to inform about or explain the topic.
   e. Provide a concluding statement or section related to the information or explanation presented.

5.7: Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic.

5.8: 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.
5.9: Draw evidence from literary or informational texts to support analysis, reflection, and research.
   b. Apply grade 5 Reading standards to informational texts (e.g., “Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point[s]”).

6th grade:
6.2: Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
   a. Introduce a topic; organize ideas, concepts, and information, using strategies such as definition, classification, comparison/contrast, and cause/effect; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.
   b. Develop the topic with relevant facts, definitions, concrete details, quotations, or other information and examples.
   c. Use appropriate transitions to clarify the relationships among ideas and concepts.
   d. Use precise language and domain-specific vocabulary to inform about or explain the topic.
   e. Establish and maintain a formal style.
   f. Provide a concluding statement or section that follows from the information or explanation presented.

6.7: Conduct short research projects to answer a question, drawing on several sources and refocusing the inquiry when appropriate.

6.8: Gather relevant information from multiple print and digital sources; assess the credibility of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and providing basic bibliographic information for sources.

6.9: Draw evidence from literary or informational texts to support analysis, reflection, and research.
   b. Apply grade 6 Reading standards to literary nonfiction (e.g., “Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not”).

CCSS.ELA-Lit.SL: Speaking and Listening Standards
4.1: 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.
   a. Come to discussions prepared having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.
   b. Follow agreed-upon rules for discussions and carry out assigned roles.
   c. Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.
   d. Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.
4.2: Paraphrase portions of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

4.4: 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.

4.6: Differentiate between contexts that call for formal English (e.g., presenting ideas) and situations where informal discourse is appropriate (e.g., small-group discussion); use formal English when appropriate to task and situation. (See grade 4 Language standards 1 on page 28 for specific expectations.)

5th grade:
5.1: 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.
   a. Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.
   b. Follow agreed-upon rules for discussions and carry out assigned roles.
   c. Pose and respond to specific questions by making comments that contribute to the discussion and elaborate on the remarks of others.
   d. Review the key ideas expressed and draw conclusions in light of information and knowledge gained from the discussions.

5.2: Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

5.4: 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.

5.6: Adapt speech to a variety of contexts and tasks, using formal English when appropriate to task and situation. (See grade 5 Language standards 1 and 3 on page 28 for specific expectations.)

6th grade:
6.1: Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher led) with diverse partners on grade 6 topics, texts, and issues, building on others’ ideas and expressing their own clearly.
   a. Come to discussions prepared, having read or studied required material; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.
   b. Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.
c. Pose and respond to specific questions with elaboration and detail by making comments that contribute to the topic, text, or issue under discussion.
d. Review the key ideas expressed and demonstrate understanding of multiple perspectives through reflection and paraphrasing.

6.4: Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation.
6.6: Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate. (See grade 6 Language standards 1 and 3 on page 53 for specific expectations.)

CCSS.ELA-Lit.L: Language Standards
4th grade:
4.1: Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
   a. Use relative pronouns (who, whose, whom, which, that) and relative adverbs (where, when, why).
   b. Form and use the progressive (e.g., I was walking; I am walking; I will be walking) verb tenses.
   c. Use modal auxiliaries (e.g., can, may, must) to convey various conditions.
   d. Order adjectives within sentences according to conventional patterns (e.g., a small red bag rather than a red small bag).
   e. Form and use prepositional phrases.
   f. Produce complete sentences, recognizing and correcting inappropriate fragments and run-ons.
   g. Correctly use frequently confused words (e.g., to, too, two; there, their).

4.3: Use knowledge of language and its conventions when writing, speaking, reading, or listening.
   a. Choose words and phrases to convey ideas precisely.
   b. Choose punctuation for effect.
   c. Differentiate between contexts that call for formal English (e.g., presenting ideas) and situations where informal discourse is appropriate (e.g., small-group discussion).

4.4: Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 4 reading and content, choosing flexibly from a range of strategies.
   a. Use context (e.g., definitions, examples, or restatements in text) as a clue to the meaning of a word or phrase.
   b. Use common, grade-appropriate Greek and Latin affixes and roots as clues to the meaning of a word (e.g., telegraph, photograph, autograph).
   c. Consult reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation and determine or clarify the precise meaning of key words and phrases.

4.6: Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal precise actions, emotions, or states of being (e.g., quizzed, whined,
stammered) and that are basic to a particular topic (e.g., wildlife, conservation, and endangered when discussing animal preservation)

5th grade:
5.1: Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
   a. Explain the function of conjunctions, prepositions, and interjections in general and their function in particular sentences.
   b. Form and use the perfect (e.g., I had walked; I have walked; I will have walked) verb tenses.
   c. Use verb tense to convey various times, sequences, states, and conditions.
   d. Recognize and correct inappropriate shifts in verb tense.
   e. Use correlative conjunctions (e.g., either/or, neither/nor).

5.3: Use knowledge of language and its conventions when writing, speaking, reading, or listening.
   a. Expand, combine, and reduce sentences for meaning, reader/listener interest, and style.
   b. Compare and contrast the varieties of English (e.g., dialects, registers) used in stories, dramas, or poems.

5.4: Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 5 reading and content, choosing flexibly from a range of strategies.
   a. Use context (e.g., cause/effect relationships and comparisons in text) as a clue to the meaning of a word or phrase.
   b. Use common, grade-appropriate Greek and Latin affixes and roots as clues to the meaning of a word (e.g., photograph, photosynthesis).
   c. Consult reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation and determine or clarify the precise meaning of key words and phrases.

5.6: Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal contrast, addition, and other logical relationships (e.g., however, although, nevertheless, similarly, moreover, in addition).

6th grade:
6.1: Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
   a. Ensure that pronouns are in the proper case (subjective, objective, possessive).
   b. Use intensive pronouns (e.g., myself, ourselves).
   c. Recognize and correct inappropriate shifts in pronoun number and person.
   d. Recognize and correct vague pronouns (i.e., ones with unclear or ambiguous antecedents).
   e. Recognize variations from standard English in their own and others’ writing and speaking, and identify and use strategies to improve expression in conventional language.

6.3: Use knowledge of language and its conventions when writing, speaking, reading, or listening.
a. Vary sentence patterns for meaning, reader/listener interest, and style.
b. Maintain consistency in style and tone.

6.4: Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 6 reading and content, choosing flexibly from a range of strategies.
   a. Use context (e.g., the overall meaning of a sentence or paragraph; a word’s position or function in a sentence) as a clue to the meaning of a word or phrase.
   b. Use common, grade-appropriate Greek or Latin affixes and roots as clues to the meaning of a word (e.g., audience, auditory, audible).
   c. Consult reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning or its part of speech.
   d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).

6.6: Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.

**CCSS.ELA-Lit.RST.6-8: Reading Standards for Literacy in Science and Technology**

1: Cite specific textual evidence to support analysis of science and technical texts.

2: Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

4: Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.

7: Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

**CCSS.ELA-Lit.WHST.6-8: Writing Standards for History, Science, and Technology**

2: Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.
   a. Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories as appropriate to achieving purpose; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.
   b. Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.
   c. Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.
   d. Use precise language and domain-specific vocabulary to inform about or explain the topic.
   e. Establish and maintain a formal style and objective tone.
f. Provide a concluding statement or section that follows from and supports the information or explanation presented.

7: Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

8: Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

9: Draw evidence from informational texts to support analysis reflection, and research.

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