

Correlation of
Seeds of Science/Roots of Reading[®]
Integrated Science and Literacy Units

Light Energy
Weather and Water
Variation and Adaptation
Digestion and Body Systems

with the State of Ohio
English Language Arts Standards
for Grades 3 and 4

Created March 2009



Seeds of Science/Roots of Reading[®] was created with partial support from the National Science Foundation under grant numbers ESI-0242733 and ESI-0628272. The program was created by a team at the Lawrence Hall of Science at the University of California, Berkeley.

Grade Three

| | Light Energy | Weather & Water | Variation & Adaptation | Digestion & Body Systems |
|---|-----------------|--------------------|---------------------------|--------------------------------|
| Phonemic Awareness, Word Recognition and Fluency | | | | |
| 1. Identify rhyming words with the same or different spelling patterns. | | | | |
| 2. Use letter-sound knowledge and structural analysis to decode words. | | | | |
| 3. Use knowledge of common word families (e.g., -ite or -ate) and complex word families (e.g., -ould, -ight) to sound out unfamiliar words. | | | | |
| 4. Demonstrate a growing stock of sight words. | ● | ● | ● | ● |
| 5. Read text using fluid and automatic decoding skills. | ●● | ●● | ●● | ●● |
| 6. Read passages fluently with changes in tone, voice, timing and expression to demonstrate meaningful comprehension. | ●● | ●● | ●● | ●● |
| Acquisition of Vocabulary | | | | |
| 1. Determine the meaning of unknown words using a variety of context clues, including word, sentence and paragraph clues. | ● | ● | ● | ● |
| 2. Use context clues to determine the meaning of homophones, homonyms and homographs. | ● | ● | ● | ● |
| 3. Apply the meaning of the terms synonyms and antonyms. | | | | |
| 4. Read accurately high-frequency sight words. | ● | ● | ● | ● |
| 5. Apply knowledge of individual words in unknown compound words to determine their meanings. | | | | |
| 6. Use knowledge of contractions and common abbreviations to identify whole words. | | | | |
| 7. Apply knowledge of prefixes, including un-, re-, pre- and suffixes, including -er, -est, -ful and -less to determine meaning of words. | ●● | ● | ● | ● |
| 8. Decode and determine the meaning of words by using knowledge of root words and their various inflections. | ●● | ● | ● | ● |
| 9. Determine the meanings and pronunciations of unknown words by using dictionaries, glossaries, technology and textual features, such as definitional footnotes or sidebars. | ●●● | ●●● | ●●● | ●●● |
| Reading Processes: Concepts of Print, Comprehension | | | | |
| Strategies and Self-Monitoring Strategies | | | | |
| 1. Establish a purpose for reading (e.g., to be informed, to follow directions or to be entertained). | ●● | ●● | ●● | ●● |

| | Light Energy | Weather & Water | Variation & Adaptation | Digestion & Body Systems |
|--|--------------|-----------------|------------------------|--------------------------|
| 2. Predict content, events and outcomes by using chapter titles, section headers, illustrations and story topics, and support those predictions with examples from the text. | ●●● | ●● | ●● | ●● |
| 3. Compare and contrast information between texts and across subject areas. | ●●● | ●●● | ●●● | ●●● |
| 4. Summarize texts, sequencing information accurately and include main ideas and details as appropriate. | ●●● | ●● | ●● | ●● |
| 5. Make inferences regarding events and possible outcomes from information in text. | ●● | ●● | ●●● | ●● |
| 6. Create and use graphic organizers, such as Venn diagrams and webs, to demonstrate comprehension. | ●●● | ●●● | ●●● | ●●● |
| 7. Answer literal, inferential and evaluative questions to demonstrate comprehension of grade-appropriate print texts and electronic and visual media. | ●●● | ●●● | ●●● | ●●● |
| 8. Monitor own comprehension by adjusting speed to fit the purpose, or by skimming, scanning, reading on or looking back. | ●● | ●● | ●● | ●● |
| 9. Use criteria to choose independent reading materials (e.g., personal interest, knowledge of authors and genres or recommendations from others). | | | | |
| 10. Independently read books for various purposes (e.g., for enjoyment, for literary experience, to gain information or to perform a task). | ●●● | ●●● | ●●● | ●●● |
| Reading Applications: Informational, Technical and | | | | |
| Persuasive Text | | | | |
| 1. Use the table of contents, chapter headings, glossary, index, captions and illustrations to locate information and comprehend texts. | ●●● | ●●● | ●●● | ●●● |
| 2. List questions about essential elements (e.g., why, who, where, what, when and how) from informational text and identify answers. | ●● | ●●● | ●● | ●● |
| 3. Identify and list the important central ideas and supporting details of informational text. | ●●● | ●● | ●● | ●● |
| 4. Draw conclusions from information in maps, charts, graphs and diagrams. | ●●● | ●●● | ●●● | ●●● |
| 5. Analyze a set of directions for proper sequencing, clarity and completeness. | ● | ● | ● | ● |
| Reading Applications: Literary Text | | | | |
| 1. Recognize and describe similarities and differences of plot across literary works. | | | | |
| 2. Use concrete details from the text to describe characters and setting. | | | | |
| 3. Retell the plot sequence. | | | ● | ●● |

| | Light Energy | Weather & Water | Variation & Adaptation | Digestion & Body Systems |
|--|--------------|-----------------|------------------------|--------------------------|
| 4. Identify and explain the defining characteristics of literary forms and genres, including fairy tales, folk tales, poetry, fiction and non-fiction. | ●● | ●● | ●● | ●● |
| 5. Explain how an author's choice of words appeals to the senses. | | | | ●●● |
| 6. Identify stated and implied themes. | ●●● | ●●● | ●●● | ●●● |
| 7. Describe methods authors use to influence readers' feelings and attitudes (e.g., appeal of characters in a picture book; use of figurative language). | | | | |
| Writing Processes | | | | |
| 1. Generate writing ideas through discussions with others and from printed material. | ●●● | ●●● | ●●● | ●●● |
| 2. Develop a clear main idea for writing. | ●●● | ●●● | ●●● | ●●● |
| 3. Develop a purpose and audience for writing. | ●●● | ●●● | ●●● | ●● |
| 4. Use organizational strategies (e.g., brainstorming, lists, webs and Venn diagrams) to plan writing. | ●●● | ●●● | ●●● | ●●● |
| 5. Organize writing by providing a simple introduction, body and a clear sense of closure. | ●● | ●●● | ●●● | ●● |
| 6. Use a wide range of simple, compound and complex sentences. | | | | |
| 7. Create paragraphs with topic sentences and supporting sentences that are marked by indentation and are linked by transitional words and phrases. | ●●● | ●●● | ●●● | ●●● |
| 8. Use language for writing that is different from oral language, mimicking writing style of books when appropriate. | ●●● | ●●● | ●●● | ●●● |
| 9. Use available technology to compose text. | | | | |
| 10. Reread and assess writing for clarity, using a variety of methods (e.g., writer's circle or author's chair). | ● | ● | ● | ● |
| 11. Add descriptive words and details and delete extraneous information. | | | | ●● |
| 12. Rearrange words, sentences and paragraphs to clarify meaning. | | | | |
| 13. Use resources and reference materials, including dictionaries, to select more effective vocabulary. | ●●● | ●●● | ●●● | ●●● |
| 14. writing and edit to improve conventions (e.g., grammar, spelling, punctuation and capitalization) and identify and correct fragments and run-ons. | | | | |
| 15. Apply tools (e.g., rubric, checklist and feedback) to judge the quality of writing. | | | | |
| 16. Rewrite and illustrate writing samples for display and for sharing with others. | ● | ●● | ● | ●● |

| | Light Energy | Weather & Water | Variation & Adaptation | Digestion & Body Systems |
|--|--------------|-----------------|------------------------|--------------------------|
| Writing Applications | | | | |
| 1. Write stories that sequence events and include descriptive details and vivid language to develop characters, setting and plot. | | | | |
| 2. Write responses to novels, stories and poems that demonstrate an understanding of the text and support judgments with specific references to the text. | | | | |
| 3. Write formal and informal letters (e.g., thank you notes, letters of request) that include relevant information and date, proper salutation, body, closing and signature. | | | | |
| 4. Write informational reports that include the main ideas and significant details from the text. | ●●● | ●● | ●● | ●● |
| 5. Produce informal writings (e.g., messages, journals, note and, poems) for various purposes. | ●●● | ●●● | ●●● | ●●● |
| Writing Conventions | | | | |
| 1. Write legibly in cursive, spacing letters, words and sentences appropriately. | | | | |
| 2. Spell multi-syllabic words correctly. | | | | |
| 3. Spell all familiar high-frequency words, words with short vowels and common endings correctly. | | | | |
| 4. Spell contractions, compounds and homonyms (e.g., hair and hare) correctly. | | | | |
| 5. Use correct spelling of words with common suffixes such as -ion, -ment and -ly. | | | | |
| 6. Follow common spelling generalizations (e.g., consonant doubling, dropping e and changing y to i). | | | | |
| 7. Use resources to check spelling (e.g., a dictionary, spell check). | | | | |
| 8. Use end punctuation marks correctly. | | | | |
| 9. Use quotation marks around dialogue, commas in a series and apostrophes in contractions and possessives. | | | | |
| 10. Use correct capitalization. | | | | |
| 11. Use nouns, verbs and adjectives correctly. | | | | |
| 12. Use subjects and verbs that are in agreement. | | | | |
| 13. Use irregular plural nouns. | | | | |
| 14. Use nouns and pronouns that are in agreement. | | | | |
| 15. Use past, present and future verb tenses. | | | | |
| 16. Use possessive nouns and pronouns. | | | | |
| 17. Use conjunctions. | | | | |

| | Light Energy | Weather & Water | Variation & Adaptation | Digestion & Body Systems |
|--|--------------|-----------------|------------------------|--------------------------|
| Research | | | | |
| 1. Choose a topic for research from a list of questions, assigned topic or personal area of interest. | ● | ●●● | ● | ● |
| 2. Utilize appropriate searching techniques to gather information from a variety of locations (e.g., classroom, school library, public library or community resources). | ●●● | ●●● | ●●● | ●●● |
| 3. Acquire information from multiple sources (e.g., books, magazines, videotapes, CD-ROMs, Web sites) and collect data (e.g., interviews, experiments, observations or surveys) about the topic. | ●●● | ●●● | ●●● | ●●● |
| 4. Identify important information found in the sources and summarize the important findings. | ●●● | ●●● | ●●● | ●●● |
| 5. Sort relevant information into categories about the topic. | ●● | ●●● | ● | ●● |
| 6. Understand the importance of citing sources. | | | | |
| 7. Use a variety of communication techniques, including oral, visual, written or multimedia reports, to present information gathered. | ●● | ●●● | ●● | ●● |
| Communication: Oral and Visual | | | | |
| 1. Ask questions for clarification and explanation, and respond to others' ideas. | ●●● | ●●● | ●●● | ●●● |
| 2. Identify the main idea, supporting details and purpose of oral presentations and visual media. | ●●● | ●● | ●● | ● |
| 3. Identify the difference between facts and opinions in presentations and visual media. | | | | |
| 4. Demonstrate an understanding of the rules of the English language. | | | | |
| 5. Select language appropriate to purpose and audience. | ●● | ●● | ●● | ●● |
| 6. Use clear diction and tone, and adjust volume and tempo to stress important ideas. | ● | ● | ● | ● |
| 7. Adjust speaking content according to the needs of the audience. | ● | ● | ● | ● |

| 8. | Light Energy | Weather & Water | Variation & Adaptation | Digestion & Body Systems |
|---|--------------|-----------------|------------------------|--------------------------|
| 9. Deliver informational presentations that: | ●●● | ●●● | ●●● | ●●● |
| a. present events or ideas in logical sequence and maintain a clear focus; | ●●● | ●●● | ●●● | ●●● |
| b. demonstrate an understanding of the topic; | ●●● | ●●● | ●●● | ●●● |
| c. include relevant facts and details from multiple sources to develop topic; | ●●● | ●●● | ●●● | ●● |
| d. organize information, including a clear introduction, body and conclusion; | ●● | ●●● | ●●● | ●● |
| e. use appropriate visual materials (e.g., diagrams, charts, illustrations) and available technology; and | ●● | ●●● | ●● | ●● |
| f. identify sources. | ●●● | ●●● | ●●● | ●●● |
| 10. Deliver formal and informal descriptive presentations recalling an event or personal experience that convey relevant information and descriptive details. | ●●● | ●●● | ●●● | ●●● |

Grade Four

| | Light Energy | Weather & Water | Variation & Adaptation | Digestion & Body Systems |
|--|--------------|-----------------|------------------------|--------------------------|
| Phonemic Awareness, Word Recognition and Fluency | | | | |
| Acquisition of Vocabulary | | | | |
| 1. Determine the meaning of unknown words by using a variety of context clues, including word, sentence and paragraph clues. | ● | ● | ● | ● |
| 2. Use context clues to determine the meaning of synonyms, antonyms, homophones, homonyms and homographs. | ● | ● | ● | ● |
| 3. Recognize the difference between the meanings of connotation and denotation. | | | | |
| 4. Identify and apply the meaning of the terms synonym, antonym, homophone and homograph. | | | | |
| 5. Identify and understand new uses of words and phrases in text, such as similes and metaphors. | | | | |
| 6. Identify word origins to determine the meaning of unknown words and phrases. | | | | |

| | Light Energy | Weather & Water | Variation & Adaptation | Digestion & Body Systems |
|---|--------------|-----------------|------------------------|--------------------------|
| 7. Identify the meanings of prefixes, suffixes and roots and their various forms to determine the meanings of words. | •• | • | • | • |
| 8. Identify the meanings of abbreviations. | | | | |
| 9. Determine the meanings and pronunciations of unknown words by using dictionaries, glossaries, technology and textual features, such as definitional footnotes or sidebars. | ••• | ••• | ••• | ••• |
| Reading Process: Concepts of Print, Comprehension Strategies and Self-Monitoring Strategies | | | | |
| 1. Establish and adjust purposes for reading, including to find out, to understand, to interpret, to enjoy and to solve problems. | ••• | ••• | ••• | ••• |
| 2. Predict and support predictions using an awareness of new vocabulary, text structures and familiar plot patterns. | ••• | •• | •• | •• |
| 3. Compare and contrast information on a single topic or theme across different text and non-text resources. | ••• | ••• | ••• | ••• |
| 4. Summarize important information in texts to demonstrate comprehension. | ••• | •• | •• | •• |
| 5. Make inferences or draw conclusions about what has been read and support those conclusions with textual evidence. | •• | •• | ••• | •• |
| 6. Select, create and use graphic organizers to interpret textual information. | •• | •• | •• | •• |
| 7. Answer literal, inferential and evaluative questions to demonstrate comprehension of grade-appropriate print texts and electronic and visual media. | ••• | ••• | ••• | ••• |
| 8. Monitor own comprehension by adjusting speed to fit the purpose, or by skimming, scanning, reading on or looking back. | • | • | • | • |
| 9. List questions and search for answers within the text to construct meaning. | •• | ••• | •• | •• |
| 10. Use criteria to choose independent reading materials (e.g., personal interest, knowledge of authors and genres or recommendations from others). | | | | |
| 11. Independently read books for various purposes (e.g., for enjoyment, for literary experience, to gain information or to perform a task). | ••• | ••• | ••• | ••• |
| Reading Applications: Informational, Technical and Persuasive Text | | | | |
| 1. Make inferences about informational text from the title page, table of contents and chapter headings. | ••• | ••• | ••• | ••• |
| 2. Summarize main ideas in informational text, using supporting details as appropriate. | ••• | •• | •• | •• |
| 3. Locate important details about a topic using different sources of information including books, magazines, newspapers and online resources. | ••• | ••• | ••• | ••• |
| 4. Identify examples of cause and effect used in informational text. | •• | •• | •• | •• |

| | Light Energy | Weather & Water | Variation & Adaptation | Digestion & Body Systems |
|--|--------------|-----------------|------------------------|--------------------------|
| 5. Draw conclusions from information in maps, charts, graphs and diagrams. | ●● | ●●● | ●● | ●● |
| 6. Clarify steps in a set of instructions or procedures for completeness. | ● | ● | ● | ● |
| 7. Distinguish fact from opinion. | ●●● | ●●● | ●●● | ●●● |
| Reading Applications: Literary Text | | | | |
| 1. Describe the thoughts, words and interactions of characters. | | | | |
| 2. Describe the thoughts, words and interactions of characters. | | | | |
| 3. Identify the main incidents of a plot sequence, identifying the major conflict and its resolution. | | | | ● |
| 4. Identify the speaker and recognize the difference between first- and third-person narration. | | | | |
| 5. Determine the theme and whether it is implied or stated directly. | | | | |
| 6. Identify and explain the defining characteristics of literary forms and genres, including poetry, drama, fables, fantasies, chapter books, fiction and non-fiction. | ●● | ●● | ●● | ●● |
| 7. Explain how an author's choice of words appeals to the senses and suggests mood. | | | | ●● |
| 8. Identify figurative language in literary works, including idioms, similes and metaphors. | | | | |
| Writing Processes | | | | |
| 1. Generate writing ideas through discussions with others and from printed material. | ●●● | ●●● | ●●● | ●●● |
| 2. State and develop a clear main idea for writing. | ●●● | ●●● | ●●● | ●●● |
| 3. Develop a purpose and audience for writing. | ●● | ●● | ●● | ●● |
| 4. Use organizational strategies (e.g., brainstorming, lists, webs and Venn diagrams) to plan writing. | ●●● | ●●● | ●●● | ●●● |
| 5. Organize writing, beginning with an introduction, body and a resolution of plot, followed by a closing statement or a summary of important ideas and details. | ●●● | ●●● | ●● | ●● |
| 6. Vary simple, compound and complex sentence structures. | | | | |
| 7. Create paragraphs with topic sentences and supporting sentences that are marked by indentation) and are linked by transitional words and phrases. | ●●● | ●●● | ●●● | ●●● |
| 8. Vary language and style as appropriate to audience and purpose. | | | | |
| 9. Use available technology to compose text. | | | | |
| 10. Reread and assess writing for clarity, using a variety of methods (e.g., writer's circle or author's chair). | | | | |

| | Light Energy | Weather & Water | Variation & Adaptation | Digestion & Body Systems |
|--|--------------|-----------------|------------------------|--------------------------|
| 11. Add descriptive words and details and delete extraneous information. | | | | ●● |
| 12. Rearrange words, sentences and paragraphs to clarify meaning. | | | | |
| 13. Use resources and reference materials, including dictionaries, to select more effective vocabulary. | ●● | ●● | ●● | ●● |
| 14. Proofread writing and edit to improve conventions (e.g., grammar, spelling, punctuation and capitalization) and identify and correct fragments and run-ons | ● | ● | ● | ● |
| 15. Apply tools (e.g., rubric, checklist and feedback) to judge the quality of writing. | | | | |
| 16. Prepare for publication (e.g., for display or for sharing with others) writing that follows a format appropriate to the purpose using techniques such as electronic resources and graphics to enhance the final product. | ●● | ●● | ●● | ●● |
| Writing Applications | | | | |
| 1. Write narratives that sequence events, including descriptive details and vivid language to develop plot, characters and setting and to establish a point of view. | | | | |
| 2. Write responses to novels, stories and poems that include a simple interpretation of a literary work and support judgments with specific references to the original text and to prior knowledge. | | | | |
| 3. Write formal and informal letters (e.g., thank you notes, letters of request) that follow letter format (e.g., date, proper salutation, body, closing and signature), include important information and demonstrate a sense of closure. | | | | |
| 4. Write informational reports that include facts and examples and present important details in a logical order. | ●●● | ●●● | ●●● | ●●● |
| 5. Produce informal writings (e.g., messages, journals, notes and poems) for various purposes. | ●●● | ●●● | ●●● | ●●● |
| Writing Conventions | | | | |
| 1. Write legibly in cursive, spacing letters, words and sentences appropriately. | | | | |
| 2. Spell high-frequency words correctly. | | | | |
| 3. Spell plurals and inflectional endings correctly. | | | | |
| 4. Spell roots, suffixes and prefixes correctly. | | | | |
| 5. Use commas, end marks, apostrophes and quotation marks correctly. | | | | |
| 6. Use correct capitalization. | | | | |
| 7. Use various parts of speech such as nouns, pronouns and verbs (e.g., regular and irregular, past, present and future). | | | | |
| 8. Use conjunctions and interjections. | | | | |
| 9. Use adverbs. | | | | |
| 10. Use prepositions and prepositional phrases. | | | | |

| | Light Energy | Weather & Water | Variation & Adaptation | Digestion & Body Systems |
|--|--------------|-----------------|------------------------|--------------------------|
| 11. Use objective and nominative case pronouns. | | | | |
| 12. Use subjects and verbs that are in agreement. | | | | |
| 13. Use irregular plural nouns. | | | | |
| Research | | | | |
| 1. Identify a topic and questions for research and develop a plan for gathering information. | •• | ••• | •• | •• |
| 2. Locate sources and collect relevant information from multiple sources (e.g., school library catalogs, online databases, electronic resources and Internet-based resources). | •• | •• | •• | •• |
| 3. Identify important information found in the sources and summarize important findings. | ••• | ••• | ••• | ••• |
| 4. Create categories to sort and organize relevant information charts, tables or graphic organizers. | •• | ••• | •• | •• |
| 5. Discuss the meaning of plagiarism and create a list of sources. | | | | |
| 6. Use a variety of communication techniques, including oral, visual, written or multimedia reports, to present information gathered. | •• | ••• | •• | •• |
| Communications: Oral and Visual | | | | |
| 1. Demonstrate active listening strategies (e.g., asking focused questions, responding to cues, making visual contact). | ••• | ••• | ••• | ••• |
| 2. Recall the main idea, including relevant supporting details, and identify the purpose of presentations and visual media. | •• | •• | •• | •• |
| 3. Distinguish between a speaker's opinions and verifiable facts. | •• | •• | •• | •• |
| 4. Demonstrate an understanding of the rules of the English language. | | | | |
| 5. Select language appropriate to purpose and audience. | •• | •• | •• | •• |
| 6. Use clear diction and tone, and adjust volume and tempo to stress important ideas. | • | • | • | • |
| 7. Adjust speaking content according to the needs of the audience. | • | • | • | • |
| 8. Deliver informational presentations (e.g., expository, research) that: | ••• | ••• | ••• | ••• |
| a. present events or ideas in a logical sequence and maintain a clear focus; | ••• | ••• | ••• | ••• |
| b. demonstrate an understanding of the topic; | ••• | ••• | ••• | ••• |
| c. include relevant facts, details, examples, quotations, statistics, stories and anecdotes to clarify and explain information; | ••• | ••• | ••• | ••• |
| d. organize information to include a clear introduction, body and conclusion; | •• | •• | •• | •• |

| | Light Energy | Weather & Water | Variation & Adaptation | Digestion & Body Systems |
|--|--------------|-----------------|------------------------|--------------------------|
| e. use appropriate visual materials (e.g., diagrams, charts, illustrations) and available technology; and | ●● | ●●● | ●● | ●● |
| f. draw from several sources and identify sources used. | ●●● | ●●● | ●●● | ●●● |
| 9. Deliver formal and informal descriptive presentations recalling an event or personal experience that convey relevant information and descriptive details. | | | | |