WRITTEN-LANGUAGE PRODUCTION STANDARDS FOR

Handwriting & Keyboarding

(Grades K–8)

Introduction: From Crayons to Keyboards

Children need both handwriting and keyboarding instruction to succeed in their schools and later in the world of college and work. Yet explicit, evidence-based guidelines for teaching these skills are absent from the Common Core State Standards (CCSS). Although the CCSS provide a solid framework for students to achieve 21st century success, the standards cannot realistically include every skill necessary for achieving this goal. Developed with a "focus on results rather than means," the standards thus empower educators to integrate any additional relevant topics that will help achieve the objectives set out in the CCSS (National Governors Association Center for Best Practices, Council of Chief State School Officers, 2010).

The national discussion around handwriting instruction in particular has been elevated since the release of the CCSS in 2010. In response to this concern, researchers and educators gathered in Washington, DC, on January 23, 2012, for Handwriting in the 21st Century? An Educational Summit. This Summit further crystallized the need for educators and policy makers to give handwriting and keyboarding serious attention. Most participants concurred that there is a clear need for a set of benchmarked, developmentally appropriate handwriting standards that will provide all students with equal access to this foundational skill. (More information about the Summit and the research presented there is available online at www.hw21summit.com.)

The resulting set of national standards for written-language production offer developmentally appropriate, research-based indicators to integrate handwriting and keyboarding—two essential skills for 21st century success—into the curriculum.

Handwriting

Handwriting is a foundational skill crucial for literacy success. It teaches letter formation and supports reading and language acquisition. Additionally, through perceptual and motor skills practice, handwriting advances neurological development and augments writing fluency.

Handwriting letters leads directly to reading acquisition. According to the National Reading Panel, letter knowledge and phonemic awareness are the two best predictors of reading proficiency. Writing letters by hand has been proven to help children recognize and remember letters more easily than if they typed them (James, 2012; Longcamp et al., 2005; Berninger et al., 2002, 2006; NICHD, 2000).

Writing by hand engages the brain in learning. Through modern brain-imaging techniques, researchers have found that neural activity in children who practiced printing (also known as manuscript writing) by hand was far more advanced than in children who just looked at the letters. Handwriting seems, based on empirical evidence from neuroscience, to play a large role in the visual recognition and learning of letters (James & Atwood, 2009; James & Gauthier, 2006; James, Wong, & Jobard, 2010; Longcamp et al., 2008).

Students write most assignments and tests by hand. A 2008 study showed that older students produce at least half of their writing for school by hand. Younger students handwrite nearly 90 percent of their schoolwork. Even in the Common Core State Standards (Appendix C) document, for example, almost half of the sample K–8 student essays are handwritten (Denton, Cope, & Moser, 2006; Cutler & Graham, 2008).

Standardized essay scores are influenced by handwriting. More troubling, solid research finds that handwritten tests are graded differently based on the legibility of the handwriting (Graham & Harris, 2002; Conti, 2012; Vander Hart et al., 2010). Poor handwriting can drop a paper from the 50th percentile to the 10th or 22nd percentile (Graham, Harris, & Herbert, 2011). Essay graders of handwritten standardized tests read more than 100 essays an hour, making legibility even more important (ACT, 2011).

Handwriting instruction supports automaticity, speed, and output. When students develop the fine motor skills that accompany learning to write by hand, their speed and output increase (Graham & Harris, 2005; Graham & Weintraub, 1996). Additionally, with consistent handwriting practice, the processes involved become less demanding and more automatic, enabling students to devote a higher amount of neurological resources to critical thinking and thought organization (Peverly, 2012). Students require manuscript handwriting skills in order to become accustomed to the common letterforms in books and environmental text. Cursive (also known as script) handwriting skills are necessary for students to decipher teachers' comments on written assignments, to pen

their signatures, and to read a variety of historical documents—including the founding papers of the United States of America. As students become acquainted with both manuscript and cursive handwriting, they are better able to determine their preference for the handwriting style (manuscript, cursive, or manuscript-cursive hybrid) that best serves them in terms of speed, automaticity, and output for notetaking, in-class assignments, and high-stakes tests.

Handwriting fluency continues to develop past the early grades. Studies show that handwriting instruction improves legibility and fluency through grade 9; in addition, the overall quality of writing and the length of writing passages increases through grade 9 with handwriting instruction (Graham & Santangelo, 2012).

Keyboarding

Keyboarding is handwriting's complement for 21st century environments, and it is a practice that will become increasingly important for students' writing success. Children access all types of technology at home—even before they attend school—and schools can provide the developmentally appropriate instruction to bolster their fluency and efficiency in using keyboard-input devices to make them truly "bilingual by hand" (Berninger, 2012).

Keyboarding instruction bolsters fluency and automaticity. Touch typing is a skill that will help all students in their education, as well as their later careers, by making the physical production of their texts efficient, leaving them with more cognitive freedom to develop ideas and arguments. Some research shows that students write essays with more words and sentences when they type (Barrera, 2001; Goldberg, Russell, & Cook, 2003).

Keyboarding skills are necessary in higher education. The majority of the work that students submit in postsecondary schools must be typewritten (Grabowski, 2008). Obtaining keyboarding instruction during their elementary and middle school years makes students less likely to be distracted by the technological tool they use in college because they can type fluently and easily (Cook, 2007).

Many high-stakes tests will become computer based. In 2011, the National Assessment of Educational Progress (NAEP) announced a pilot test of computer-based writing assessment for grade 4 students in 2012 (NAEP, 2011).

Eighth grade students and high school seniors already have the option of completing this assessment using a computer. Because most standardized testing will eventually offer computer-based assessment, students must encounter those situations with a solid base of word processing and keyboarding knowledge.

Keyboarding supports successful writing processes and strategies. Modern keyboards and word processing allow students to write, revise, edit, and format with ease. Some research suggests that students using word processing are more likely to spend time revising their work (Goldberg et al., 2003; Warschauer, 2008). Students can also access the higher operations of the applications when they have a firm foundation of the basics of typing, shortcut keys, and function keys.

Keyboard fluency affects writing quality. Studies show that if children are not systematically taught keyboarding skills, their writing quality is poorer when compositions are typed versus handwritten (Connelly, Gee, & Walsh, 2007; Surh et al., 2010). Interestingly, some research shows that students who are comfortable writing with computers also achieve higher scores on handwritten writing tests (Silvernail et al., 2011).

These skills transfer easily to other devices. Other devices common to students' lives, such as smartphones and tablets with touchscreens, reproduce some version of the standard QWERTY layout.

How the Written-Language Production Standards Were Developed

The Written-Language Production Standards are research based and incorporate

- basic letter-formation and keyboarding indicators included in the Common Core State Standards for English Language Arts.
- national and local technology standards and policy.
- state handwriting and keyboarding standards.
- studies in motor skills development from occupational therapists.

Anchor Standards for Written-Language Production

The K–8 standards on the following pages define what students should understand and do by the end of each grade. They correspond to the anchor standards below by number. The anchor and grade-specific standards are necessary complements—the former providing broad standards, the latter providing additional specificity—that together define the skills and understandings that all students should demonstrate when producing text.

Form and Production

1. Form legible letters, numerals, and punctuation using manuscript writing, demonstrating an understanding of the basic features of print direction (top to bottom, left to right across a page).

2. Demonstrate an understanding of proper proportion and size as well as appropriate spacing between letters, words, sentences, and paragraphs in manuscript writing.

3. Write legibly in cursive, demonstrating an understanding of proper proportion, size, and slant; joinings between letters; and appropriate spacing between letters, words, sentences, and paragraphs.

4. Use a keyboard and related devices to create accurately typed letters, words, and sentences appropriate for grade level and task.

5. Demonstrate an understanding of automatic spacing (e.g., kerning, leading, line turns) and deliberate space and size choices (e.g., size and formatting) in electronic documents.

Fluency

6. Write fluently by hand at a rate appropriate for grade level and task.

7. Type accurately at a rate appropriate for grade level and task, increasing the time spent looking away from the keyboard.

Writing Application and Word Processing

8. Produce shorter and longer written text by applying handwriting skills appropriate to grade level, task, and audience.

9. Create, save, access, and edit electronic documents by applying keyboarding skills appropriate to grade level and task.

10. Demonstrate knowledge of basic/intermediate word processing skills (e.g., inserting images, formatting text, using spell checking and thesaurus tools, accessing special characters, and creating tables).

Note:
Each grade-specific Written-Language Production standard corresponds to the same-numbered anchor standard. Put another way, each anchor standard has an accompanying grade-specific standard translating the broader statement into grade-appropriate end-of-year expectations.

Individual Written-Language Production standards are identified by their strand, grade, and number (or number and letter, where applicable)—so WLP.1.6.a., for example, stands for Written-Language Production, grade 1, standard 6 (which corresponds to anchor standard 6). The "a." refers to the first substandard; in this example, it would be "Print individual uppercase letters accurately within 3–4 seconds after dictated by the teacher."

Kindergartners:	Grade 1 students:	Grade 2 students:
Form and Production		

WLP.K.1. Identify and print letters and numerals with assistance on grade-level appropriate lined paper.
    a. Identify and create basic manuscript[1] lines (vertical, horizontal, circle, slant).
    b. Form lines and letters following the organization of print (left to right, top to bottom).
    c. Identify and print with assistance most uppercase and lowercase letters.
    d. Identify and print numerals 0 through 9 with assistance.
    e. Begin short letters at the midpoint dotted line and end them on the lower line/baseline.
    f. Begin tall letters at the top line and end them on the lower line/baseline.
	WLP.1.1. Independently print legible letters, numerals, and punctuation on grade-level appropriate lined paper.
	    a. Identify and form uppercase and lowercase letters independently and legibly[2], with minimal rotations or reversals.
	    b. Use uppercase letter for *I*.
	    c. Identify and form numerals 0–9, including two-digit numeral pairs (e.g., 27).
	    d. Identify and form sentence end punctuation (period, exclamation point, question mark).
		WLP.2.1. Form all uppercase and lowercase letters legibly in manuscript, with no rotations or reversals.
		    a. Consistently maintain proper proportion of ascenders, descenders, and letter parts.
		    b. Self-assess manuscript legibility against models
		    c. Print sentences that begin with uppercase letters and that include end and internal punctuation.

WLP.K.2. With assistance, produce printed letters, words, and sentences with proper proportion, size, and spacing on grade-level appropriate paper.
    a. Control size of uppercase letters between top and bottom lines.
    b. Begin to print letters with proper proportions of ascenders and descenders (e.g., descenders should approach lower dotted line, ascenders should approach top line, midpoints should align with midpoint dotted line).
    c. With assistance, print whole words with correct spacing between letters (e.g., letters should not touch or "crash" into each other).
    d. With assistance, print sentences with correct spacing between words (e.g., spaces between words should be the size of an individual letter) and between sentences (e.g., spaces between sentences should be the size of two letters).
	WLP.1.2. Produce printed letters, words, and sentences with proper proportion, size, and spacing on grade-level appropriate paper.
	    a. Control size of uppercase letters relative to lowercase letters.
	    b. Print letters with ascenders approaching top line and descenders approaching bottom line.
	    c. Align letter midpoints with midpoint dotted line.
	    d. Print whole words with correct spacing between letters.
	    e. Print sentences using correct spacing between words and between sentences.
	    f. Print two-digit numerals using correct spacing.
		WLP.2.2. Use grade-level appropriate paper to produce printed letters, words, and sentences with proper proportion, size, and spacing.
		    a. Print manuscript letters with proper spacing relative to top, bottom, and midlines.
		    b. Print words and sentences using correct spacing between letters, words, and sentences.
		    c. Print paragraphs using correct indentation and appropriate margins.

[1] The term "manuscript" as used in the Written-Language Production Standards can be interchangeable with "print" or other related terms for this style of writing.

[2] Legibility is defined as the letter being recognizable to readers in isolation from other letters in a word or other indications of what the letter might be (e.g., accompanying picture). It also includes the completion of all parts of a letter, such as crossing t and f. Rotation means writing p for b; reversal, or mirroring, means writing d for b.

Kindergartners:	Grade 1 students:	Grade 2 students:
Form and Production, continued		
WLP.K.3. (Begins in grade 2)	**WLP.I.3.** (Begins in grade 2)	**WLP.2.3.** Understand that cursive writing is different from manuscript. a. Begin to understand the difference between manuscript and cursive[3] writing by matching manuscript letters to their cursive counterparts and identifying where joinings occur.
WLP.K.4. (Begins in grade 3)	**WLP.I.4.** (Begins in grade 3)	**WLP.2.4.** (Begins in grade 3)
WLP.K.5. (Begins in grade 3)	**WLP.I.5.** (Begins in grade 3)	**WLP.2.5.** (Begins in grade 3)
Fluency		

WLP.K.6. With assistance, print most uppercase and lowercase letters and numerals with speed appropriate to kindergarten.
    a. Print most individual uppercase letters within 5–6 seconds after dictated by the teacher.
    b. Print most individual lowercase letters within 5–6 seconds after dictated by the teacher.
    c. Print numerals 0 to 9 in order within one minute, with or without dictation by the teacher.
	WLP.I.6. Print uppercase and lowercase letters and numerals with speed and fluency appropriate for grade 1.
	    a. Print individual uppercase letters accurately within 3–4 seconds after dictated by the teacher.
	    b. Print individual lowercase letters accurately within 3–4 seconds after dictated by the teacher.
	    c. Print numerals 0 to 9 in order within 20 seconds, with or without dictation by the teacher.
		WLP.2.6. Print uppercase and lowercase letters and numerals with speed and fluency appropriate for grade 2.
		    a. Print legible sentences and paragraphs under timed condition.
		    b. Print copied text at a rate of at least 25 letters per minute.

WLP.K.7. (Begins in grade 3)	**WLP.I.7.** (Begins in grade 3)	**WLP.2.7.** (Begins in grade 3)

[3] The term "cursive" is interchangeable with "script" or other related terms for this style of joined letterforms.

Kindergartners:	Grade 1 students:	Grade 2 students:
Writing Application and Word Processing		

WLP.K.8. With assistance, use letters and letter-like forms to produce written text.
    a. Print letters and letter-like forms to create identifiable words.
    b. Print first and last name.
    c. Begin to copy sentences.
	WLP.1.8. Use letters and words to produce written sentences.
	    a. Print identifiable words within sentences to create a story or response.
	    b. Start sentences with a capital letter.
	    c. Print first and last name legibly.
		WLP.2.8. Produce written text, including multiple sentences organized into paragraphs.
		    a. Print identifiable words and sentences within paragraphs to create a story or response.

WLP.K.9. With assistance, identify a keyboard and mouse.
    a. Understand that a keyboard contains letters and numbers.
    b. Identify several letters on a keyboard.
    c. Identify numbers on a number pad.
    d. Identify a mouse.
	WLP.1.9. Know and apply basic keyboarding skills.
	    a. Identify all letters on a keyboard and that they are not in alphabetical order.
	    b. Use left hand to depress letter keys on the left side of the keyboard and vice versa.
	    c. Identify the space bar and its function.
	    d. Use a mouse and understand "clicking" and "double clicking."
		WLP.2.9. Demonstrate basic knowledge of keyboard entry and mouse clicking.
		    a. With different fingers and both hands, type the alphabet in order using a keyboard.
		    b. Identify the Enter key and its function.
		    c. Understand that clicking the mouse makes an insertion point in a document.
		    d. Use the mouse to highlight (double-click) a word.

WLP.K.10 (Begins in grade 4)	**WLP.1.10** (Begins in grade 4)	**WLP.2.10** (Begins in grade 4)

Grade 3 students:	Grade 4 students:	Grade 5 students:
Form and Production		
WLP.3.2. Produce words, sentences, and paragraphs with proper proportion, size, and spacing on lined paper using manuscript writing.	**WLP.4.2.** Maintain legibility in manuscript writing.	**WLP.5.2.** Maintain legibility in manuscript writing.

WLP.3.3. Form legible letters and numerals using cursive writing.
  a. Identify and create four basic cursive lines (undercurve, downcurve, overcurve, slant).
  b. Form individual uppercase and lowercase cursive letters and numerals with acceptable legibility.
  c. Write letters in cursive using consistent slant.
  d. Form joinings to connect letters, maintaining proportion of letters to joinings.
  e. Form cursive words using correct spacing between letters and proportional letter sizes.
  f. Form sentences using cursive handwriting with correct spacing between words and with punctuation.
  g. Form cursive paragraphs using proper indentation and margins.
  h. Self-assess cursive legibility using model letters and words.
	WLP.4.3. Form legible letters and numerals using cursive writing.
	  a. Write words, using proper joinings, legibly in cursive.
	  b. Legibly write sentences and paragraphs in cursive with proper spacing.
		WLP.5.3. Maintain legibility in cursive.

WLP.3.4. Begin to use a keyboard to enter text.
  a. Identify and use the home keys (A, S, D, F, J, K, L, ;).
  b. Use the Shift key to capitalize.
  c. Identify and use punctuation on the keyboard, including punctuation needing the Shift key (:, ", ?).
  d. Type letters and words while looking at the keyboard.
	WLP.4.4. Use a keyboard to create written documents.
	  a. Consistently use the home keys (A, S, D, F, J, K, L, ;).
	  b. Type words and sentences with punctuation, increasing the proportion of time not looking at the keyboard.
	  c. Use the Enter key to create new paragraphs.
	  d. Use the Backspace and Delete keys to remove text.
	  e. Type special characters ($, #, *, etc.) as needed with proper finger strokes, including little finger on the Shift key.
		WLP.5.4. Use a keyboard to create written documents.
		  a. Consistently use the home keys.
		  b. Consistently type words and sentences with punctuation without looking at the keyboard.
		  c. Maintain accuracy in typed documents.

Grade 3 students:	Grade 4 students:	Grade 5 students:
Form and Production (continued)		
WLP.3.5. Demonstrate an understanding of proper spacing in electronic text. a. Use the spacebar to place spaces between words.	**WLP.4.5.** Demonstrate an understanding of proper spacing in electronic text. a. Enter one space between words and after punctuation marks. b. Recognize the space differences (kerning) between common typefaces (e.g., Arial versus Times New Roman).	**WLP.5.5.** Demonstrate an understanding of spacing choices in electronic text. a. Use the spacebar and Tab key as appropriate for the deliberate spacing of typed text. b. Understand and create superscript and subscript text. c. Understand paragraph spacing (single-spaced, double-spaced) and spacing between lines of a paragraph (leading). d. Understand paragraph justification and use the paragraph justification menu.
Fluency		
WLP.3.6. Write by hand with speed and fluency appropriate for grade 3. a. Print legible sentences and paragraphs under timed conditions. b. Print copied text at a rate of at least 45 letters per minute. c. Increase the use of cursive writing for untimed, in-class writing.	**WLP.4.6.** Write by hand with speed and fluency appropriate for grade 4. a. Use cursive writing under timed conditions. b. Write copied text at a rate of at least 60 letters per minute.	**WLP.5.6.** Write by hand with speed and fluency appropriate for grade 5. a. Write copied text at a rate of at least 70 letters per minute.
WLP.3.7. Create accurate typed text with speed appropriate for grade 3. a. Type 5–10 words per minute from copy.	**WLP.4.7.** Create accurate typed text with speed appropriate for grade 4. a. Type 10–15 words per minute from copy. b. Increase proportion of their time looking away from the keyboard.	**WLP.5.7.** Create accurate typed text with speed appropriate for grade 5. a. Type 15–20 words per minute from copy. b. Spend most of the time looking at the screen or the copy instead of the keyboard.

Grade 3 students:	Grade 4 students:	Grade 5 students:
Writing Application and Word Processing		

WLP.3.8. Know and apply grade-level handwriting skills.
  a. Understand when cursive and manuscript may be used and choose appropriately for the task and audience.
	WLP.4.8. Know and apply grade-level handwriting skills.
	  a. Choose handwriting or keyboarding as appropriate for the task and audience.
		WLP.5.8. Know and apply grade-level handwriting skills.
		  a. Choose handwriting or keyboarding as appropriate for the task and audience.

WLP.3.9. Know and apply grade-level keyboarding skills.
  a. Find home keys by their "bumps" without looking at keyboard.
  b. Identify which fingers type which letters on standard QWERTY keyboard.
  c. Use the left little finger on the Shift key to capitalize letters on the right side of the keyboard and vice versa.
  d. Understand the difference between the Shift and Caps Lock keys.
  e. Use thumb to depress the space bar.
  f. Type non-word drills while looking at the keyboard.
  g. Practice typing with the keyboard covered or masked.
  h. Type several letters and words without looking at keyboard.
  i. Know and apply grade-level skills with other devices (e.g., use a mouse to highlight portions of text, use right-click to access alternative menus).
	WLP.4.9. Know and apply grade-level keyboarding skills.
	  a. Use keyboarding skills for a variety of class work, such as spelling lists and composition.
	  b. Type most high-frequency words (*the, I, and,* etc.) and first and last name without looking at keyboard.
	  c. Increase the proportion of time looking away from the keyboard.
	  d. Type at least one page in a single setting.
		WLP.5.9. Know and apply grade-level keyboarding skills.
		  a. Type most words and sentences without looking at the keyboard.
		  b. Achieve 85% accuracy in typed documents.
		  c. Use numeric keypad for entry of numbers as appropriate for the task.
		  d. Access function keys as needed in software applications.
		  e. Type at least two pages in a single setting.

WLP.3.10. (Begins in grade 4)	**WLP.4.10.** Demonstrate beginning knowledge of word processing skills to produce written text.
	  a. Create a new file.
	  b. Type out a document first written by hand.
	  c. Open an existing file.
	  d. Use menu and ruler formatting tools to change margins.
	  e. Use menu-driven commands to change paragraph settings (justification, indentation, line spacing).
	  f. Understand how a computer stores files and save a file to the correct location.
	  g. Retrieve a saved file.
		WLP.5.10. Demonstrate knowledge of basic word processing skills to produce written text.
		  a. Electronically edit a previously saved document.
		  b. Experiment with basic text formatting tools to change font, size, color, and style (bold, italic, underline), using both menus and key commands.
		  c. Use common keyboard shortcuts (e.g., CTRL + z to undo).
		  d. Navigate to save a file to removable media (flash drive, CD-ROM).
		  e. Insert an image into text.
		  f. Demonstrate efficient text editing (copy and paste, highlight and move, keystrokes) techniques.

Grade 6 students:	Grade 7 students:	Grade 8 students:
Form and Production		
WLP.6.2. Maintain legible manuscript writing with proper proportion and spacing.	**WLP.7.2.** Maintain legible manuscript writing with proper proportion and spacing.	**WLP.8.2.** Maintain legible manuscript writing with proper proportion and spacing.
WLP.6.3. Maintain legible cursive writing with correct form. 　a. Maintain manuscript and cursive writing with proper spacing of words, sentences, and paragraphs and consistent slant. 　b. Use an adaptive but legible manuscript-cursive hybrid[4] when appropriate.	**WLP.7.3.** Maintain legible cursive (or hybrid manuscript-cursive) writing with proper spacing and consistent slant.	**WLP.8.3.** Maintain legible cursive (or hybrid manuscript-cursive) writing with proper spacing and consistent slant.
WLP.6.4. Maintain accuracy in typed text. 　a. Type on nonstandard keyboards (e.g., smartphones) with accuracy.	**WLP.7.4.** Maintain accuracy in typed documents. 　a. Type on nonstandard keyboards (e.g., tablet touchscreen keyboards) with accuracy.	**WLP.8.4.** Maintain accuracy in typed documents. 　a. Type on nonstandard keyboards (e.g., tablet touchscreen keyboards) with accuracy.
WLP.6.5. Demonstrate an understanding of spacing choices in electronic text. 　a. Use advanced spacing tools (leading, character spacing, etc.) for visual effect. 　b. Use the rule to adjust paragraph indentation. 　c. Choose final text sizes appropriate for the task and audience.	**WLP.7.5.** Demonstrate an understanding of spacing choices in electronic text. 　a. Identify appropriate spacing between text and images for visual appeal. 　b. Access and use the page layout menu to adjust document margins. 　c. Choose final text sizes appropriate for the task and audience.	**WLP.8.5.** Demonstrate an understanding of spacing choices in electronic text. 　a. Identify appropriate spacing between text and tables and within table cells for visual appeal. 　b. Access and use the page layout menu to adjust margins in different document sections. 　c. Choose final text sizes appropriate for the task and audience.
Fluency		
WLP.6.6. Write by hand with speed and fluency appropriate for grade 6. 　a. Write copied text at a rate of at least 80 letters per minute using cursive or manuscript-cursive hybrid. 　b. Use pen/pencil lifts as needed for comfort, speed, and legibility.	**WLP.7.6.** Write by hand with speed and fluency appropriate for grade 7. 　a. Write copied text at a rate of at least 90 letters per minute using cursive or manuscript-cursive hybrid. 　b. Use pen/pencil lifts as needed for comfort, speed, and legibility.	**WLP.8.6.** Write by hand with speed and fluency appropriate for grade 8. 　a. Write copied text at a rate of at least 100 letters per minute using cursive or manuscript-cursive hybrid. 　b. Use pen/pencil lifts as needed for comfort, speed, and legibility.

[4] By grade 6, some students find that a hybrid manuscript-cursive style (i.e., some letters are unjoined) provides them with greater fluency and legibility.

Grade 6 students:	Grade 7 students:	Grade 8 students:

Fluency (continued)

Grade 6 students:	Grade 7 students:	Grade 8 students:

WLP.6.7. Create accurate typed text with speed appropriate for grade 6.
    a. Type 20–25 words per minute from copy.
    b. Look at the screen or the copy instead of the keyboard.
	WLP.7.7. Create accurate typed text with speed appropriate for grade 7.
	    a. Type at least 25 words per minute from copy, looking almost exclusively at the screen or copy.
		WLP.8.7. Create accurate typed text with speed appropriate for grade 8.
		    a. Type at least 30 words per minute from copy, looking almost exclusively at the screen or copy.

Writing Application and Word Processing

Grade 6 students:	Grade 7 students:	Grade 8 students:

WLP.6.8. Know and apply grade-level handwriting skills.
    a. Choose handwriting or keyboarding as appropriate for the task and audience.
	WLP.7.8. Know and apply grade-level handwriting skills.
	    a. Choose handwriting or keyboarding as appropriate for the task and audience.
		WLP.8.8. Know and apply grade-level handwriting skills.
		    a. Choose handwriting or keyboarding as appropriate for the task and audience.

WLP.6.9. Know and apply grade-level keyboarding skills.
    a. Type words and sentences without looking at keyboard.
    b. Achieve 90% accuracy in typed documents.
    c. Access function keys as needed in software applications.
    d. Type at least three pages in a single setting.
	WLP.7.9. Know and apply grade-level keyboarding skills.
	    a. Type words and sentences without looking at keyboard.
	    b. Achieve 90% accuracy in typed documents.
	    c. Access function keys as needed in software applications.
	    d. Type at least five pages in a single setting.
		WLP.8.9. Know and apply grade-level keyboarding skills.
		    a. Type words and sentences without looking at keyboard.
		    b. Achieve 90% accuracy in typed documents.
		    c. Access function keys as needed in software applications.
		    d. Type at least seven pages in a single setting.

WLP.6.10. Demonstrate knowledge of intermediate word processing skills to produce written text.
    a. Compose writing assignments at the keyboard.
    b. Use spell checker and thesaurus to augment editing.
    c. Understand and use headings.
    d. Add page numbers to documents.
    e. Format an inserted image (e.g., change wraparound).
    f. Access special characters menu.
	WLP.7.10. Demonstrate knowledge of intermediate word processing skills to produce written text.
	    a. Understand and use common templates (e.g., built-in templates for letters, resumes, calendars.
	    b. Understand the concept of "styles" and use the Style menu to create and change paragraph styles.
	    c. Create and format bulleted and numbered lists.
	    d. Insert a table into text.
	    e. Use captions for images.
	    f. Use drawing tools.
	    g. Understand and use find-and-replace strategies as an editing task.
		WLP.8.10. Demonstrate knowledge of advanced word processing skills to produce written text.
		    a. Create and use a personal Style sheet.
		    b. Understand and apply section breaks to create document parts with different layouts.
		    c. Create a document with multiple columns.
		    d. Create a basic Table of Contents using automated tools.
		    e. Understand the use of automated references and bibliographies.
		    f. Format tables in a text manually and understand how the Style menu applies to tables.
		    g. Create a basic chart/graph using the tools provided by the word processing program.

Bibliography

American College Testing. (2011). Scoring guidelines. Accessed April 19, 2012, http://www.actstudent.org/writing/scores/guidelines.html

Barrera III, M.T., Rule, A.C. & Diemart, A. (2001). The effect of writing with computers versus handwriting on the writing achievement of first-graders. *Information Technology in Childhood Education Annual, 2001*(1), 215–229.

Berninger, V.W. (2012). Evidence-based, developmentally appropriate writing skills K to 5: Teaching the orthographic loop of working memory to write letters so developing writers can spell words and express ideas. Paper presented at Handwriting in the 21st Century? An Educational Summit, Washington, DC, January 23, 2012.

Berninger, V.W., Abbott, R.D., Abbott, S.P., Graham, S., & Richards, T. (2002). Writing and reading: Connections between language by hand and by eye. *Journal of Learning Disabilities, 35,* 39–56.

Berninger, V.W., Abbott, R.D., Jones, J., Wolf, B., Gould, L., Anderson-Youngstrom, M., et al. (2006). Early development of language by hand: Composing, reading, listening, and speaking connections; three letter-writing modes; and fast mapping in spelling. *Developmental Neuropsychology, 29*(1), 61–92.

Berninger, V.W., Abbott, R.D., Augsburger, A., and Garcia, N. (2009). Comparison of pen and keyboard transcription modes in children with and without learning disabilities. *Learning Disability Quarterly, 32*(3), 11–18.

Conti, G. E. Handwriting characteristics and the prediction of illegibility in 3rd and 5th grade students. Paper presented at Handwriting in the 21st Century? An Educational Summit, Washington, DC, January 23, 2012.

Cook, C., & Bennett, L. (2007). Does using a computer disturb the organization of children's writing? *British Journal of Developmental Psychology, 25,* 313–321.

Cutler, L., & Graham, S. (2008). Primary grade writing instruction: A national survey. *Journal of Educational Psychology, 100*(4), 907–919.

Denton, P.L., Cope, S., & Moser, C. (2006).The effects of sensorimotor-based intervention versus therapeutic practice on improving handwriting performance in 6- to 11-year-old children. *American Journal of Occupational Therapy, 60,* 16–27.

Goldberg, A., Russell, M., & Cook, A. (2003).The effect of computers on student writing: A meta-analysis of studies from 1992 to 2002. *Journal of Technology, Learning, and Assessment, 2*(1), 3–50.

Grabowski, J. (2008). The internal structure of university students' keyboard skills. *Journal of Writing Research, 1*(1), 27–52.

Graham, S., & Harris, K. (2005). Improving the writing performance of young struggling writers: Theoretical and programmatic research from the Center on Accelerating Student Learning. *Journal of Special Education, 39*(1), 24–26.

Graham, S., & Harris, K. (2002). Prevention and intervention for struggling writers. In M. R. Shinn (Ed.), *Interventions for academic and behavior problems II: Preventative and remedial approaches* (pp. 589–610). Washington, DC: National Association of School Psychologists.

Graham, S., & Weintraub, N. (1996). A review of handwriting research: Progress and prospects from 1980 to 1994. *Educational Psychology Review, 8,* 7–87.

James, K.H. (2012). The neural correlates of handwriting and its affect on reading acquisition. Paper presented at Handwriting in the 21st Century? An Educational Summit, Washington, DC, January 23, 2012.

James, K.H., & Atwood, T.P. (2009). The role of sensorimotor learning in the perception of letter-like forms: Tracking the causes of neural specialization for letters. *Cognitive Neuropsychology, 26*(1), 91–110.

James, K.H., & Gauthier, I. (2006). Letter processing automatically recruits a sensory-motor brain network. *Neuropsychologia, 44,* 2937–2949.

James, K.H., Wong, C-N, & Jobard, G. (2010). The case for letter expertise. In Gauthier, I., Bub, D., & Tarr, M.J. (Eds.), *Perceptual expertise: Bridging brain and behavior* (305–331). New York, NY, Oxford University Press.

Jones, D., & Christensen, C. A. (1999). The relationship between automaticity in handwriting and students' ability to generate written text. *Journal of Educational Psychology, 91,* 44–49.

Longcamp, M., Zerbato-Poudou, M., and Velay, J. (2005). The influence of writing practice on letter recognition in preschool children: A comparison between handwriting and typing. *Acta Psychologica, 119,* 67–79.

Longcamp, M., Boucard, C., Gilhodes, J., Anton, J., Roth, M., Nazarian, B., et al. (2008). Learning through hand- or typewriting influences visual recognition of new graphic shapes: Behavioral and functional imaging evidence. *Journal of Cognitive Neuroscience, 20*(5), 802–815.

National Assessment of Educational Progress. (2011, December 7). NAEP writing computer-based assessment. Accessed April 19, 2012, http://nces.ed.gov/nationsreportcard/writing/cba.asp

National Governors Association Center for Best Practices, Council of Chief State School Officers. (2010). Common Core State Standards for English Language Arts: Introduction. Washington, DC.

National Institute of Child Health & Human Development (NICHHD). (2000). *Report of the National Reading Panel: Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction.* (NIH Publication No. 004769). Washington, DC: U. S. Government Printing Office.

Peverly, S. (2012). The relationship of transcription speed and other cognitive variables to note-taking and test performance. Paper presented at Handwriting in the 21st Century? An Educational Summit, Washington, DC, January 23, 2012.

Silvernail, D. L., Pinkham, C. A., Wintle, S. E., Walker, L. C., & Bartlett, C. L. (2011). A middle school one-to-one laptop program: The Maine experience. Center for Education Policy, Applied Research, & Evaluation, University of Southern Maine. Accessed April 18, 2012, http://www.usm.maine.edu/cepare/maine-learning-technology-initiative-mlti

Suhr, K. A., Hernandez, D. A., Grimes, D., & Warschauer, M. (2010). Laptops and fourth-grade literacy: Assisting the jump over the fourth-grade slump. *Journal of Technology, Learning, and Assessment, 9,* 4–45.

Vander Hart, N., Fitzpatrick, P., & Cortesa, C. (2010). In-depth analysis of handwriting curriculum and instruction in four kindergarten classrooms. *Reading and Writing, 23,* 673–399.

Warschauer, M. (2008). Laptops and literacy: A multi-site case study. *Pedagogies: An International Journal, 3,* 52–67.