



A New Vision for Literacy Research in Iowa

How to Make Handwriting a Part of Early Literacy Instruction

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Handwriting is a foundational academic skill. Despite rapid growth in computer technologies, handwriting with a pen or pencil remains one of the primary ways students document information and show understanding across elementary to high school grades (Brindle, Graham, Harris, & Hebert, 2015; Cutler & Graham, 2008; Gilbert & Graham, 2010; Kiuvara, Graham, & Hawken, 2009). The time spent learning and engaging in handwriting is important to overall writing development. Several studies have found that transcription skills, including handwriting and spelling, correlate with writing production and quality (Datchuk & Kubina, 2013). In other words, the ability to fluently handwrite and spell words promotes longer compositions that are judged to be of higher overall quality. Fluent and effortless transcription allows students to focus on other aspects of writing such as content, organization, and strategy use (Berninger & Amtmann, 2003).

Handwriting does not naturally develop for elementary-aged students. It is helped by making it an important part of writing and literacy instruction. This white paper describes how to emphasize handwriting as part of literacy instruction and focuses on four aspects of the handwriting literature for elementary aged students (Datchuk, 2015; Datchuk & Kubina, 2013). First, it will define handwriting and briefly describe the processes involved in it. Second, it will discuss how to administer two types of handwriting assessments. Third, the post will detail how to analyze the handwriting assessments. Fourth, it will describe several research-based instructional techniques to improve the handwriting of elementary aged students.

What is handwriting?

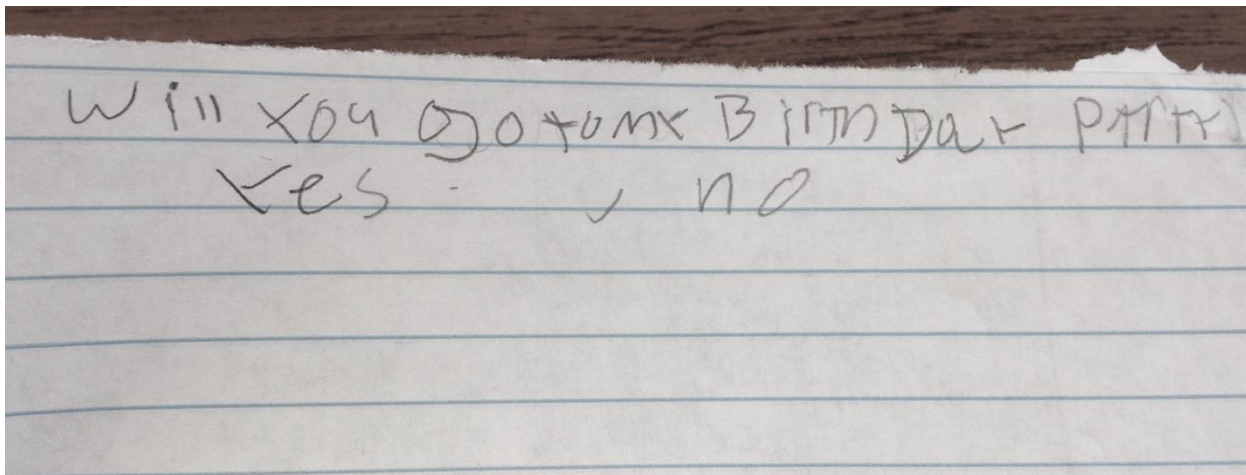


Figure 1. A handwritten birthday invitation

Passing handwritten notes, such as an informal invitation to a birthday party shown in Figure 1, is a time-honored tradition among students of all grade levels. To write such a note, students must coordinate several processes: orthographic coding, fine-motor movement, and visual-motor

coordination. Handwriting refers to the production of alphabetic letters with a writing tool. For handwriting, students draw upon their orthographic coding (i.e., knowledge of alphabetic letters from memory), make tiny adjustments to fine-motor movements (i.e., grip the pen or pencil and move their fingers and hands), and orchestrate all the movements with visual-motor coordination (i.e., view the lines and spaces on the writing surface and adjust as necessary). To handwrite a note to a friend or show their understanding of academic concepts, students have to use all these related processes to successfully convey their message.

To ensure these processes develop successfully, many students receive either comprehensive or supplemental handwriting instruction beginning in the early elementary grades. Academic standards adopted by the majority of states across the United States, including the Iowa Core Academic Standards, call for students to be proficient in handwriting all upper- and lowercase letters by the end of first grade (Common Core State Standards, 2010). How quickly this goal is achieved for individual students can be enhanced by timely and formative assessment and figuring out ways of complimenting early literacy instruction.

How is Handwriting Assessed?

Handwriting can be assessed quickly with two types of measures: a copy task and an alphabet task. In a copy task, students are given text to copy within a specific time limit, such as 1 minute. The text can include letters, words, phrases, or sentences from classroom text or sources familiar to the student. The key is to select text with a diverse range of letters. As an alternative, the following sentence contains all the letters in the alphabet and is suitable for a copy task: *The quick brown fox jumps over the lazy dog*. In an alphabet task, students are told to write the alphabet from memory, *a* to *z*, as many times as possible within a specific time limit such as 1 minute. Be sure to specify upper- or lowercase letters prior to the start of the task. Below is a table describing the steps for each handwriting assessment.

Table 1

Guidelines to Administer a Copy or Alphabet Task

	<i>Copy Task</i>	<i>Alphabet Task</i>
Materials	<ol style="list-style-type: none"> 1. Pen or pencil 2. Lined paper 3. Text to copy (printed on the lined paper or close by) 4. Timer 	<ol style="list-style-type: none"> 1. Pen or pencil 2. Lined paper 3. Timer
Administration	Students are given a specific time (e.g., 30 seconds or 1 minute) to copy the text as many times as possible. Emphasize the need to work quickly and neatly.	Students are given a specific time (e.g., 30 seconds or 1 minute) to write the alphabet as many times as possible. Specify whether it is lower or upper case and emphasize the need to work quickly and neatly.

Both types of handwriting assessments can be analyzed along three broad criteria: alphabetic knowledge, letter formation, and speed. The first criterion, alphabetic knowledge, refers to production of all letters of the alphabet within the alphabetic sequence (i.e., the skill of writing all letters from memory and writing all letters within the correct order). Alphabetic knowledge is most easily assessed through an alphabet task. Take a careful look at completed alphabet tasks and see if specific letters are omitted, skipped, or written out of sequence. These types of errors may indicate the need to provide instruction on the alphabet sequence.

The second criterion, letter formation, is the legible production of letters. Letter formation encompasses several aspects (Vaughn & Bos, 2014): spacing, alignment, slant, size, intensity, and shape. Take a look at the handwriting assessments and make notes on specific letters or reoccurring issues. Is adequate spacing between letters given? Do letters align between the horizontal lines of the page (i.e., do lowercase letters rest on the bottom line)? Are letters slightly slanted with appropriate size—lowercase letters approach the middle and uppercase letters touch the top horizontal line? Are the curves and lines of letters smooth and easy to view with an appropriate intensity (i.e., not too light or too dark)? As a practice activity, look at the handwritten birthday invitation in Figure 1 and note any potential issues with letter formation.

The third and final category, speed, is precisely defined as the number of legible letters handwritten within 1 minute. Legible handwriting is not enough; handwriting needs to occur with speed and legibility to be ultimately useful. Count the number of legible letters produced in copy or alphabet tasks. A large-scale handwriting study reported the mean correct letters per minute on copy tasks for students enrolled in first to ninth grades (Graham, Berninger, Weintraub, & Schafer, 1998). Compare the completed handwriting assessments to the mean scores presented in Table 2. If a student scores below the mean, then this can indicate the need for continued practice with a focus on handwriting speed.

Table 2

Mean Correct Letters per Minute on a Copy Task (Graham et al., 1998)

<i>Grade</i>	<i>Boys</i>	<i>Girls</i>	<i>All students</i>
1	17	21	19
2	32	37	34
3	45	50	47
4	61	66	63
5	71	75	72
6	78	91	85
7	91	109	100
8	112	118	115
9	114	121	118

The assessments can be administered before instruction to determine specific areas of difficulty for students, and then administered periodically to monitor handwriting progress and judge the

effectiveness of handwriting instruction. For example, an alphabet task can be administered on three separate occasions before handwriting instruction. The alphabet task subsequently can be administered once a week during instruction to monitor progress.

What are Ways to Improve Handwriting?

Results of handwriting assessments might suggest a need to take a comprehensive or supplemental approach. If students produce a small number of legible letters during the assessments, a comprehensive approach to instruction is warranted. In a comprehensive approach, instruction and practice are provided on all letters and aspects of alphabetic knowledge, letter formation, and speed. A supplemental approach, which focuses on select letters or letter formation issues, might be suitable if students produce virtually all letters of the alphabet but show several areas for improvement. There are four research-based instructional techniques for comprehensive or supplemental approaches (Datchuk & Kubina, 2013): visual cues, memory retrieval, timed practice, and orthographic coding activities.

Visual cues are dotted lines, arrows, and numbers indicating the direction and sequence of strokes to form letters. Figure 2 shows examples of visual cues with the letters *t* and *b*. Visual cues provide clear directions for letter formation and should be provided on student materials. Using visual cues at first, then gradually removing the cues from materials will help students commit aspects of letter formation to memory.

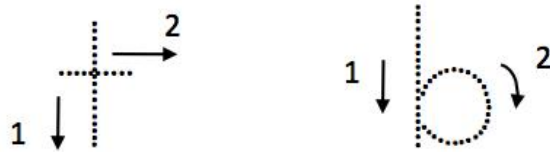


Figure 2. Examples of visual cues for handwriting

As another instructional practice, actively encourage students to retrieve letter shapes from memory. One way to do this is to teach students to use a cover-copy-compare procedure. First, have students view a letter or series of letters. Second, have the student cover the letters and then try to copy the letters from memory. Third, have students uncover the letters and compare their handwriting to the original letters. Students should proceed to additional letters if their handwriting is legible with correct formation or repeat the steps if errors are made. Figure 3 shows a cover-copy-compare folder that can be made with a manila folder. To make the folder, cut a manila folder into two or three horizontal sections, then paper clip a piece of lined paper to the inside. Teach students to raise or lower the corresponding sections for each cover-copy-compare step.



Figure 3. An example of a cover-copy-compare folder

Another way to encourage memory retrieval is to schedule time for cumulative practice of previously learned letters. For example, letters learned the previous week can be orally presented (i.e., “Last week we wrote the letters *a*, *h*, *p*, and *r*. Write the letter *a* five times on the first line. Raise your hand when you’re done.”). Handwriting speed can be emphasized with these activities by requiring students to write previously learned letters quickly and legibly within a specific period of time. For example, present a cumulative list of all previously learned letters and give students 1 minute to copy the list as many times as possible. At the end of 1 minute, count the number of legibly written letters. On subsequent timings, have students try to improve their score.

As a final research-based instructional practice, present orthographic coding activities or activities designed to encourage the letter shapes, names, and alphabet sequence to memory. These can be fun activities, such as singing the alphabet song or filling in the missing letters in an alphabet sequence. For example, present students with the sequence *a*, *b*, *c*, *d*, _____, _____, _____, *h*, *i*, *j*, and ask them to fill in the missing letters.

When Can Instruction Occur?

Handwriting instruction can take place as a supplemental or comprehensive program. As a supplement to early literacy instruction, students can handwrite the alphabetic letters they have learned (i.e., in addition to learning the letter’s sound or name, students also handwrite the letter). This can be accomplished by appending a few minutes at the end of each early literacy lesson to write the letters learned that day or in previous lessons. If pursuing a supplemental approach, it

is important to either follow the sequence of letters introduced in an accompanying early literacy program or to separate commonly confused letters, such as *b/d*, *e/a*, and *h/n*.

Alternatively, a comprehensive approach can be used to teach all letters of the alphabet. As a comprehensive program, the Center for Accelerated Student Learning (CASL) Handwriting Program was developed in 1999 as part of a collaborative partnership between faculty members of Columbia University, Vanderbilt University, and the University of Maryland (Graham, Harris, & Fink, 2000). It is a research-based program that encompasses many of the recommendations described in this paper. The program is available for free as a PDF download at the archived [CASL website](#). The CASL Handwriting Program is a comprehensive approach to handwriting instruction designed for students in first grade.

Whether taking a comprehensive or supplemental approach to instruction, several research-based techniques can improve the handwriting of your students during or following literacy instruction or activities. This paper detailed four ways of making handwriting an important part of your instruction and literacy programming. Research has found that following the suggested practices for as little as 15 minutes a day, a few days a week, can result in sustained handwriting gains (Graham, Harris, & Fink, 2000). Some students with orthopedic impairments or sustained writing difficulties might benefit from the addition of assistive technology or other types of accommodations and modifications.

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