

Handwriting, Response to Intervention, and Dysgraphia

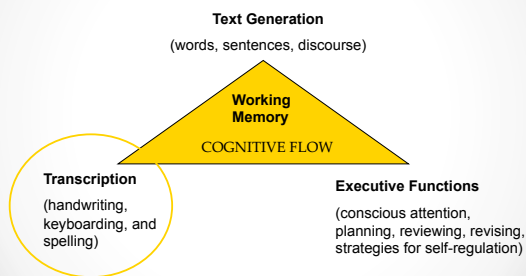
19th Annual State Dyslexia Summer Institute

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Overview

- Components of the writing process
- General education classroom instruction, screening, and intervention
- Information about dysgraphia and why children have difficulties with handwriting
- Handwriting/dysgraphia assessment

Simple (or not so simple) View of Writing



Berninger, Garcia, & Abbott 2009

Research

- Juel (1988) found that 1/3 of fourth graders had difficulty with low-level writing skills (i.e., handwriting, spelling)
- Another 1/3 had difficulty with high-level skills (i.e., composition)
- Another 1/3 had difficulty with both

Mather, N., & Wendling, B. J. (2009). *Essentials of evidence-based academic interventions*. p. 140

Why Teach Handwriting?

- "Handwriting leads to better perception of letters than does keyboarding. Forming letters might help create the letter form in the mind's eye better than does selecting them by key press."

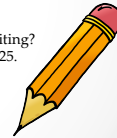
Berninger, V. W. (May/June 2012). Strengthening the mind's eye: The case for continued handwriting instruction in the 21st century. *Principal*, 28-31.



Why Teach Handwriting?

- "In dozens of studies, researchers have found that, done right, early handwriting instruction improves students' writing. **Not just its legibility, but its quantity and quality.**"

Graham, S. (2009-2010). Want to improve children's writing? Don't neglect their handwriting. *American Educator*, 20-25.



Tier 1: Core Instruction

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State Standards
District Curriculum
Classroom Instruction
Screening Measure

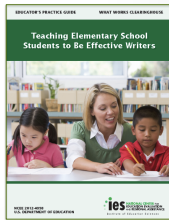
Components of Handwriting

- Recall the appearance of the letters (orthographic memory)
- Coordinate the motor patterns needed to form the letters (motor)
- Judge the amount of space that is needed between the letters and words and try to position the letters on the writing lines (spatial)

Mather, N., Wendling, B., & Roberts, R. (2009). *Writing Assessment and Instruction for Students with Learning Disabilities* (p. 9)

What Works Clearinghouse: *Teaching Elementary Students to Be Effective Writers (June 2012)*

- Recommendation 3:
Teach students to become
fluent with handwriting,
spelling, sentence
construction, typing, and
word processing



Classroom Instruction

- What Works Clearinghouse:
**Teach very young writers to hold a pencil
correctly and form letters fluently and
efficiently**



Understanding the Hand

Two sides:

1. Mobile side: thumb, index finger, and middle finger; these fingers move when you write
2. Stable side: ring and pinky finger; these two fingers are generally closed and resting on the table during writing



• From: *Hold On....You Have to Teach Grip*, Handwriting Without Tears

Teaching Handwriting: Grip

- Tripod grip
- Pencil held at a 45-degree angle to the page
- Pencil should rest in the "web space"
- Students should hold the pencil firmly with a relaxed arm and hand
- Pencil should point toward the shoulder of the writing arm



• *Teaching Students with Dyslexia and Dysgraphia*,
Berninger & Wolf, 2009

Teaching Handwriting: Grip

- Most children are ready to begin handwriting instruction by the second half of kindergarten
- Explicit teacher modeling of pencil and paper positioning
- Teacher-guided instruction on the writing mechanics of proper grip, posture, and paper position

Vander Hart, N., Fitzpatrick, P., & Cortesa, C. (2010). In-depth analysis of handwriting curriculum and instruction in four kindergarten classrooms. *Reading and Writing*, 23, 673-699.

Teaching Handwriting: Grip

- The older the child, the harder it is to change the pencil grip
- Try to change grips if it hurts to write, or if the grip makes writing inefficient
- Use physical devices only if demonstration and practice haven't worked

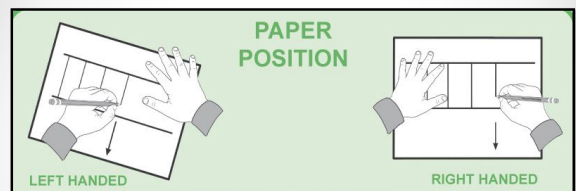
From: *Hold On...You Have to Teach Grip*, Handwriting Without Tears

“Stop, pinch, lift”

- **Redirection for pencil grip:**
 - “Stop, place your pencils on the desk with the point toward you.”
 - “Pinch your pencil.” Index finger and thumb in a pinch position; light grasp; 1 inch from the point or where the point begins
 - “Lift your pencil.”

Teaching Students with Dyslexia and Dysgraphia, Berninger & Wolf, 2009

Teaching Handwriting



Rotate paper somewhat clockwise and hold their pencil slightly farther back (about one and a half inches from the tip)

Place the paper squarely in front of them with the left side at about the center of the body

Graham, 2009-2010

Teaching Handwriting

- Posture:
children should be encouraged to sit in an upright position, leaning slightly forward



90 – 90 – 90

Teaching Handwriting

- Developmental order of transcription instruction at the subword level:
 - **accuracy** of letter production
 - **automaticity** of letter production
 - functional keyboarding skills

Teaching Students with Dyslexia and Dysgraphia,
Berninger & Wolf, 2009, pp. 107-108

Teaching Handwriting: Letter Formation

- Explicit teacher modeling of how the letter is formed
- Describe how the letter is similar & different from other letters
- Provide practice tracing, copying, and writing the letter from memory

Graham, S., & Harris, K. (Fall, 2010). Preventing writing difficulties.
CASL News: Promoting Success in Grades K-3.

Teaching Handwriting: Letter Formation

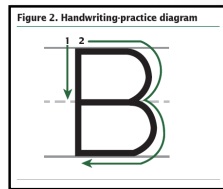
- Use of corrective feedback
- Monitoring students' handwriting to give specific corrections about letter formation, spacing, slant, alignment, and line quality
- Praising students for correct letter formation

Vander Hart, N., Fitzpatrick, P., & Cortesa, C. (2010). In-depth analysis of handwriting curriculum and instruction in four kindergarten classrooms.
Reading and Writing, 23, 673-699.

Teaching Handwriting: Letter Formation

What Works Clearinghouse:

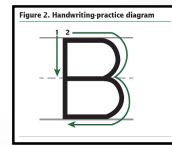
- Guided practice:
 - use letters with numbered arrows depicting the order and direction of each stroke



Teaching Handwriting: Letter Formation

What Works Clearinghouse:

- Students should practice writing letters from memory (assists with **automaticity**)
 - show the letter with numbered arrows
 - cover the letter while the students practice writing it from memory
 - gradually increase the length of time the letter is covered before students write it



Teaching Handwriting: Letter Formation

What Works Clearinghouse:

- Because handwriting is a motor skill, it is best to practice in multiple short sessions
- Students might practice a specific letter only five to eight times before moving to another activity
- Students should apply their handwriting skills in sentences and in authentic writing activities

Teaching Handwriting

- Provide children opportunities to use different types of writing instruments and paper
- Make sure students master one style of handwriting before introducing a second style

Graham, S. (2009-2010). Want to improve children's writing? Don't neglect their handwriting. *American Educator*, 20-29.

Teaching Handwriting

- Place special emphasis on the teaching of difficult letters:
 - a, q, j, z, u, n, k
 - reversals



Graham, 2009-2010

Why RTI?

- **Early intervention for students at risk for handwriting and spelling difficulties can prevent more serious writing disabilities later in school**

Mather, N., & Wendling, B. J. (2009). *Essentials of evidence-based academic interventions*. p. 141

Screening Measures

- Handwriting Without Tears – [Screener of Handwriting Proficiency](#) (free)
 - Memory
 - Orientation
 - Placement
 - Sentence
 - Formation
 - Size
 - Neatness
 - Speed
 - Posture, Pencil Grip, Helper Hand

Screening for Handwriting (K-1st)

- Use of eraserless pencil & primary-lined paper
- Have students cross out and rewrite if they make a mistake
- Use of handwriting style used in instruction; lowercase letters
- Alphabet letters on display are covered
- Kindergarten – untimed; 1st grade - timed

Berninger, Vaughn, Abbott, Rogan, Brooks, Reed, & Graham. (1997);
Berninger, Mizokawa, & Bragg. (1991)

Directions:

The pencil you will use does not have an eraser. Whenever you want to make a correction, cross out and write the change above or below what you want to correct. With this pencil write the entire alphabet in order in lower-case, manuscript letters. Make sure you print and do not use cursive handwriting. Work as quickly as you can without making mistakes. Remember to print in lower-case letters, not capital letters. Ready? Go.

Berninger & Rutberg. (1992)

Screening: Alphabet task

- Students write the alphabet in lowercase letters as quickly and accurately as possible.
- Score: number of letters correctly produced
- 1st grade: note where the student is at the end of 60 seconds, or mark the student's paper, and let the student complete the task.

Berninger, Vaughn, Abbott, Rogan, Brooks, Reed, & Graham. (1997); Berninger, Mizokawa, & Bragg. (1991)

Screening: Alphabet task

- Scoring - Errors:
 - letter omissions
 - case confusion (substituting upper-case letters)
 - letter sequencing (letters out of order)
 - letter reversal (letter pointing left instead of right or vice versa)
 - letter substitution

Berninger, Vaughn, Abbott, Rogan, Brooks, Reed, & Graham. (1997); Berninger, Mizokawa, & Bragg. (1991)

Alphabet task ~ Means for error types **Not to be used for diagnosis**

End of Kindergarten	Mean	Standard Deviation
Top group	5	2.9
Middle-level group	11.8	7.9
Low-level group	14.3	4.2
End of First	Mean	Standard Deviation
Top group	0.7	1.3
Middle-level group	2.3	3.2
Low-level group	3.6	5.0

Interventions

- For additions, omissions, & substitutions:
 - have the student name and write the letter that comes after a designated letter
- For mixing case formats:
 - categorize letters into upper- and lower-case groups

Berninger, Mizokawa, & Bragg, 1991, p. 71

Interventions

- For retracings that reflect nonautomatic graphomotor planning
 - retrain letter formation
 - emphasize a consistent sequence of strokes
- For inaccurate letter formation, including reversals
 - retrain letter formation
 - emphasize letter characteristics that help the student to differentiate letters from each other

Berninger, Mizokawa, & Bragg, 1991, p. 71

Interventions

- For slow retrieval
 - have the student practice writing the alphabet from memory within time limits
 - gradually decrease the time limit

Berninger, Mizokawa, & Bragg, 1991, p. 71

Handwriting Fluency

- Required to decrease interference with other writing processes
- According to researchers, handwriting fluency continues to account for 42% of the variability of students' writing in grades 4 – 6.
- Handwriting speed continues to increase until approximately 9th grade.

Graham, 2009-2010

Assess speed:

- select a short paragraph from a grade-level book
- have students legibly copy as much as they can in 1 & ½ minutes
- extra instruction:
 - 1st (score 7 below)
 - 2nd (score 13 below)
 - 3rd (score 14 below)
- extra assistance for older students who score 20 below

Fluency

Mean Handwriting Speeds: Letters per minute		
	Girls	Boys
Grade 1	21	17
Grade 2	36	32
Grade 3	50	45
Grade 4	66	61
Grade 5	75	71
Grade 6	91	78
Grade 7	109	91
Grade 8	118	112
Grade 9	121	114

Graham, 2009-2010

Handwriting Programs

- CASL *Handwriting Program* – Grade 1 (Graham & Harris) – free
- Big Strokes for Little Folks* (Rubel, Therapy Skill Builders)
 - ages 5-9; to develop **accuracy** of letter formation

Handwriting Programs

- Process Assessment of the Learner: Guides for Intervention* (Berninger, Pearson)
 - Contains handwriting lessons designed to develop **automaticity**
- Loops and Groups: A Kinesthetic Writing System* (Therapy Skill Builders)
 - For grades 2 – HS; introduces **curative** through common letter strokes

Classroom Instruction: Typing

What Works Clearinghouse:

Teach students to type fluently and to use a word processor to compose

- Grade 1 – students should be introduced to typing
- Grade 2 – students should begin regular typing practice
- By the end of Grade 2/3 – students should be able to type as fast as they can write by hand
- By the end of Grade 2 – students should be able to use a word processor to produce and revise text

Instructional Tools for Keyboarding

- Fry, E. (1993) *Computer keyboarding for beginners*. Westminister, CA. Teachers Created Materials, Inc.
- *Mavis Beacon*. Novato, CA: Software Toolworks. For IBM or Macintosh - www.broderbund.com
- *Type to Learn*. Sunburst Communications
- *Read, Write, and Type* - www.talkingfingers.com

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What are some “at risk” characteristics?

- Cramped fingers on writing tool
- Odd wrist, body, and paper positions
- Excessive erasures
- Mixture of upper- and lowercase letters
- Inconsistent letter formations and slant
- Irregular letter sizes and shapes
- Unfinished cursive letters
- Misuse of line and margin
- Poor organization on the page

• Richards, R. (1999). *The Source for Dyslexia and Dysgraphia*. LinguSystems

What are some “at risk” characteristics?

- Inefficient speed in copying
- Decreased speed of writing
- Excessive speed when writing
- General illegibility
- Inattentiveness about details when writing

• Richards, R., 1999

What are some “at risk” characteristics?

- Frequent need for verbal cues and use of sub-vocalizing
- Heavy reliance on vision to monitor what the hand is doing during writing
- Slow implementation of verbal directions that involve sequencing and planning

• Richards, R., 1999

What are some “at risk” characteristics?

- Endurance – become fatigued with longer written tasks
- Attention to task
- Motivation – needs excessive encouragement from the teacher

Pollock, N., et al., 2009

Tier 2

Tier 2

- Explicit instruction
- Small group setting
- Additional opportunities for practice
- Progress monitoring
- Add physical devices (e.g., pencil gripper, slant board)
- Consult with OT



Components of handwriting and sources of difficulty

Graphomotor Function

- Writing letters and numbers involves:
 - pencil control
 - memory for movements involved in forming the letter
 - memory for what the final product should look like

Pohlman, C. (2008). *Revealing Minds: Assessing to Understand and Support Struggling Learners*.

Graphomotor Function

- Common graphomotor difficulties:
 - Motor memory
 - Motor implementation
 - Motor feedback

Levine, M. (2002). *Educational care: A system for understanding and helping children with learning differences at home and in school, 2nd Edition*.

Motor Memory

- Rapid and accurate recall of letter shapes and the muscle movements needed to execute them
- Weak connections between memory and fingers



Levine, 2002

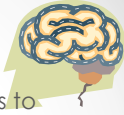
Motor Memory

- Characteristics:
 - Writing is often slow, hesitant, and labored
 - Inconsistent letter formations
 - Frequent crossing out or erasures
 - Reduced legibility
 - Preference for printing



Levine, 2002

Motor Implementation



- Assigning specific muscles in fingers to specific responsibilities during letter formation
- Different muscles have different writing assignments – some stabilize the pencil; others move the pencil to form symbols



Levine, 2002

Motor Implementation

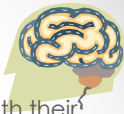


- When young, may have a feeble pencil hold and may keep dropping the pencil
- Some compensate with a tight and pressured grip – grip may be fistlike or may hold the pencil close to the point and perpendicular to the page



Levine, 2002

Motor Implementation

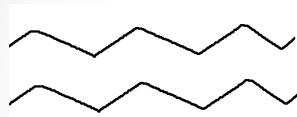


- Students may seem to be writing with their elbows rather than fingers
- Writing may be slow and labored
- Writing may be difficult to decipher
- May have history of speech articulation difficulties



Levine, 2002

Graphomotor control versus memory



Trace through a simple maze



Motor Feedback

- Knowing where the writing utensil is during letter formation
- Children compensate by keeping eyes very close to the page to visually monitor the pencil point

Levine, 2002

Motor Feedback

- Some students start using their larger joints (wrist) - may demonstrate an awkward and uncomfortable pencil grip
- May use excessive pressure – causes hand to get tired or cramped
- May produce legible handwriting at a reduced rate

Levine, 2002

- Research studies completed in the area of writing concluded that graphomotor function is necessary but not sufficient for handwriting – orthographic processes and their **integration with** graphomotor function are also important.

Berninger, V. W., & Wolf, B. J. (2009). *Teaching students with dyslexia and dysgraphia: Lessons from teaching and science.*

Orthographic and Memory Processes

- Representation of letter forms in short-term and long term memory,
- Access to and retrieval of these representations in memory, and
- Planning for letter production

Berninger, V. W. (2004). Understanding the graphia in dysgraphia. In D. Dewey & D. Tupper (Eds.), *Developmental motor disorders: A neuropsychological perspective.* Guilford.

Orthographic and Memory Processes



- Students with difficulties in this area may have crossed out letters and words
- Make letters different ways
- **Make frequent letter reversals**
- Leave as much space between letters as between words
- Many may also have difficulty picturing whole words, which can lead to spelling delays
- **May experience difficulty copying from the board**

Levine, 2002

Orthographic and Memory Processes

- Students with severe motor problems are likely to have handwriting problems, but children with motor development within the normal range may also have handwriting problems, which are more directly related to orthographic than motor processing skills.

Berninger, V. W., & Amtmann, D. (2003).
Handbook of Learning Disabilities.

Dysgraphia

...

What it is
How it relates to dyslexia

Understanding Dysgraphia Fact Sheet,
IDA

- ***Dysgraphia* is the condition of impaired letter writing by hand, that is, disabled handwriting and sometimes spelling.**

Dysgraphia

- Some handwriting problems involve **legibility**
- Other handwriting problems involve **automaticity** (ability to produce legible letters rapidly and effortlessly)
- Yet others involve **orthographic coding**

Berninger, 2004

Relationship: Dyslexia and Dysgraphia

- Dyslexia is not just a reading disorder – it is also a **writing disorder** because of the spelling problems that interfere with development of written composition

(Berninger, Nielson, Abbott, Wijsman, & Raskind, 2008)

Tier 3

...

Section 504 Process

Dysgraphia Assessment

- Once assessment for handwriting/ dysgraphia is recommended, the procedures for Section 504 must be followed:
 - Provide Section 504 Rights information
 - Provide Notice of Assessment
 - Obtain permission for the assessment if this is an initial assessment for the student

Dysgraphia Assessment

1. Informal: Records based assessment



- **Look through School Records:**
 - Is there a history of difficulty with writing?
 - Is there information about the student's medical history?
 - Are there any assessments that have been completed by the school or an agency outside of the school?
 - Has the student's vision been checked by the nurse?
 - Are there any other difficulties noted in the student's records besides difficulties in the area of handwriting?

- **Collect samples of the student's written work:**

- Worksheets or answers to questions in a textbook
- Spelling tests
- Journal writing
- Short classroom assignments (three to four paragraphs)
- Reports or essays (more than one page)
- Examples of note taking
- Homework assignments

- Obtain information from the student's parents and teacher(s)
 - Example: *Written Productivity Needs Assessment (Written Productivity Profile; DeCoste)*
 - Use a questionnaire already established by OTs in your district

- Obtain information from the student about their handwriting
 - Examples: *Handwriting Evaluation Scale (Informal Assessment and Instruction in Written Language; Mather and Roberts)*
 - *The Writing Interview (Educational Care; Levine)*

2. Individual Assessment – Informal or Formal

- Assessment of the student's handwriting and related processes:
 - Areas to assess:
 - Legibility
 - Automaticity (rate)
 - Orthographic processing
 - Spelling
 - Keyboarding (optional)



Legibility



- Questions to consider:
 - What hand does the child use for writing?
 - Is the pencil held in an appropriate grasp?
 - Is appropriate tension used in holding the pencil?
 - Is the paper positioned correctly on the writing surface for right or left handed writing?
 - Is the non-writing hand used to anchor the paper?
 - Is posture correct?

Cicci, 1995

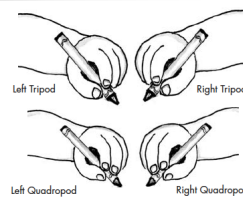
Legibility



- Questions to consider:
 - Are letters formed consistently?
 - Are letters formed correctly?
 - Is size consistent?
 - Is slant consistent?
 - Are letters positioned correctly to use lines and spaces when lined paper is used?
 - What is the writer's preferred writing, cursive or manuscript?
 - If cursive writing is used, are connections between the letters correct?

Cicci, 1995

From: *Hold On....You Have to Teach Grip, Handwriting Without Tears*



Look at a neighbor's handwriting grip.....is it standard?

If not, mark what is standard and what is not.

	Standard	Not standard
Thumb position	_____	_____
Index position	_____	_____
Middle position	_____	_____
Position of last two fingers	_____	_____
Pencil position or angle	_____	_____

Legibility

- Legible handwriting includes the following characteristics:
 - Letter formation
 - Size – of the letters and proportional size between upper and lowercase letters
 - Spacing – between letters and words
 - Line quality – steadiness and thickness of line
 - Slant – consistency in direction
 - alignment – uniformity of size and consistency on the writing line

Mather, N., Wendling, B., & Roberts, R. (2009). *Writing Assessment and Instruction for Students with Learning Disabilities* (p. 10)

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Letter formations, Size, & Proportion

- Are letters recognizable out of context?
- Are letters consistently formed?
- Are there large fluctuations in the size of the letters?
- Are letters proportional to each other and to case?
- Are letters capitalized appropriately?

Spacing & Alignment

- Is there crowding of words, letters, or lines?
- Are lines of text reasonably straight?
- Are margins relatively balanced?

Phelps, Stempel, & Speck (1984).
Children's Handwriting Evaluation Scale

Line Quality

- Is there uneven pressure?
- Is there pressure that is too heavy?
- Is there pressure that is too light?

Slant

- Is the slant generally consistent?

General Appearance

- Are there excessive erasures or strikeovers (messy)?
- Is the writing too small for reading?
- Is the writing too large for reading?

Phelps, Stempel, & Speck (1984).
Children's Handwriting Evaluation Scale

Scoring

Quality Classification Table:

0-1	Very Poor
2	Poor
3	Satisfactory
4	Good
5	Very Good

Phelps, Stempel, & Speck (1984).
Children's Handwriting Evaluation Scale

Assessment Resource: Informal

- *Children's Handwriting Evaluation Scale (CHES)*
Jody Phelps
5530 Farquhar
Dallas, TX 75209
214-366-3667
- It is recommended to use classifications rather than standard scores due to age of test (1984)

Rate

- Handwriting abilities as well as handwriting speeds develop over time.
- Composing requires more reflection and thought, so it is not unexpected that letter-per-minute or word-per-minute rates would be lower for tasks requiring composing than for copying tasks.

DeCoste, 2005

Rate

Mather & Goldstein, 2001

- To do a **simple evaluation**, ask the student to copy a sentence that contains most or all of the letters of the alphabet, such as "The quick brown fox jumps over the lazy dog."
- Have the student practice the sentence one time, and then ask the student to copy the sentence as quickly as possible in 3 minutes.

The quick brown fox jumps over the lazy dog.
The quick brown fox jumps over the lazy dog.
The quick brown fox jumps ov

Rate

Mather & Goldstein, 2001

- Count the total number of letters the student has written in the 3-minute period.
- Divide this number by 3 to get the total letters per minute (lpm).

$$93 \div 3 = 31 \text{ lpm}$$

The quick brown fox jumps over the lazy dog.
The quick brown fox jumps over the lazy dog.
The quick brown fox jumps ov

Rate

Mather & Goldstein, 2001

- Compare the student's proficiency to the following scale:

Grade 1: 25 lpm
Grade 2: 30 lpm
Grade 3: 38 lpm
Grade 4: 45 lpm
Grade 5: 60 lpm
Grade 6: 67 lpm
Grade 7: 74 lpm

31 lpm

Orthographic Processing

- Building Blocks Questionnaire:

Adapted from: Mather & Goldstein (2001). *Learning disabilities and challenging behaviors: A guide to intervention and classroom management*. Brookes Publishing

- Compare student's spelling of words that are decodable (i.e., short vowel CVC words) and words that are irregular (i.e., they, said, put).

Orthographic Processing: Standardized Measures

- *Early Reading Assessment (ERA)*
 - Pro-Ed
- *Test of Orthographic Competence (TOC)*
 - Pro-Ed
- *Symbol Imagery Test*
 - Lindamood Bell (also sold by Pro-Ed)

Spelling

- Can use a norm-referenced measure or an informal developmental measure (example: *Words Their Way: Word Study for Phonics, Vocabulary, and Spelling Instruction*)
- Compare the student's ability to orally spell words to the student's written spelling

Assessment Resources:

- *Assistive Technology Assessment: Developing a Written Productivity Profile* by Denise DeCoste (Don Johnston Incorporated) see also Montgomery County Public Schools – High Incidence Accessible Technology (HIAT) www.mcps.k12.md.us/departments/hiat/
 - Handwriting Assessment
 - Keyboarding Assessment
 - Spelling (developmental)
 - Writing Traits

Assessment Resources:

- Developing a Written Productivity Profile:
 - Handwriting Profile Assessment
 - Obtain background information
 - Obtain handwriting samples
 - Obtain timed writing samples
 - Writing the full alphabet
 - Sentence copying
 - Writing a sentence from dictation
 - Writing an independently composed sentence



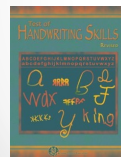
Assessment Resources

- *The Print Tool: Evaluation and Remediation Package* (Handwriting Without Tears)
 - One-on-one assessment used to evaluate and remediate capital letters, lowercase letters, and numbers
 - Grades K - 5



Assessment Resources:

Process Assessment of the Learner (PAL) – II
Harcourt Assessment



*Test of Handwriting Skills-
Revised (THS-R)*



Keyboarding Effectiveness

- Keyboarding is not always practical:
 - If the student does not retain the ability to quickly locate the keys with ease
 - The speed of handwriting is currently faster than the speed of keyboarding after a sufficient amount of experience and practice.
 - If there is a high rate of keyboarding errors.

DeCoste, 2005

Keyboarding Effectiveness

- Keyboarding is appropriate:
 - If handwriting is too difficult or illegible
 - If keyboarding speed is faster than handwriting speed and better enables the student to keep pace with written expression abilities.



DeCoste, 2005

Differential Diagnosis

- Dysgraphia is not due to damage to motor systems of the brain
- Dysgraphia is not due to other developmental difficulties that may incorporate difficulties with fine motor (i.e. mental retardation, autism, pervasive developmental disorder)

Berninger, V. W. (2004). Understanding the graphia in dysgraphia. In D. Dewey & D. Tupper (Eds.), *Developmental motor disorders: A neuropsychological perspective*. Guilford.

Differential Diagnosis

- Not due to other conditions such as fetal alcohol syndrome, cerebral palsy, significant prematurity, meningitis, etc.
- Not due to generalized fine-motor deficit or coordination difficulties (Developmental Coordination Disorder)

Berninger, V. W. (2004). Understanding the graphia in dysgraphia. In D. Dewey & D. Tupper (Eds.), *Developmental motor disorders: A neuropsychological perspective*. Guilford.

Scoring Samples

Screening - Alphabet



A handwritten sample of the English alphabet from 'a' to 'z'. The letters are written in a cursive, somewhat messy style. A vertical blue line is drawn through the middle of the sample, separating the letters 'a' through 'm' on the left from 'n' through 'z' on the right. The letters 'n' through 'z' appear slightly more distorted or less clearly defined than the first half.

Scoring – Errors:

___ letter omissions

___ case confusion (substituting upper-case letters)

___ letter sequencing (letters out of order)

___ letter reversal (letter pointing left instead of right or vice versa)

___ letter substitution

Interventions:

Legibility

I woke up it was snowing but I said it would not stick
The next day it was piling down in snow.
Then we had snow ball fights, and we made forts.
Then we got cold came back in, but we went back out
so we made snow angels.

General Appearance:

Letter formations, Size, & Proportion:

Spacing & Alignment:

Line quality:

Slant:

Score:

Legibility: 3rd grade student

Joe was coming to
home from school. Then
some 7th graders came
up to him and give
~~us~~^{us} you're monkey or Fight!
Joe said I don't have any
so that's how he became
like this. With the ice pack
on his eye because they
beats him up.

Scoring:

___ letter formations, size, & proportion

___ spacing & alignment

___ line quality

___ slant

___ general appearance

Overall score and description _____

Rate - 5th Grade

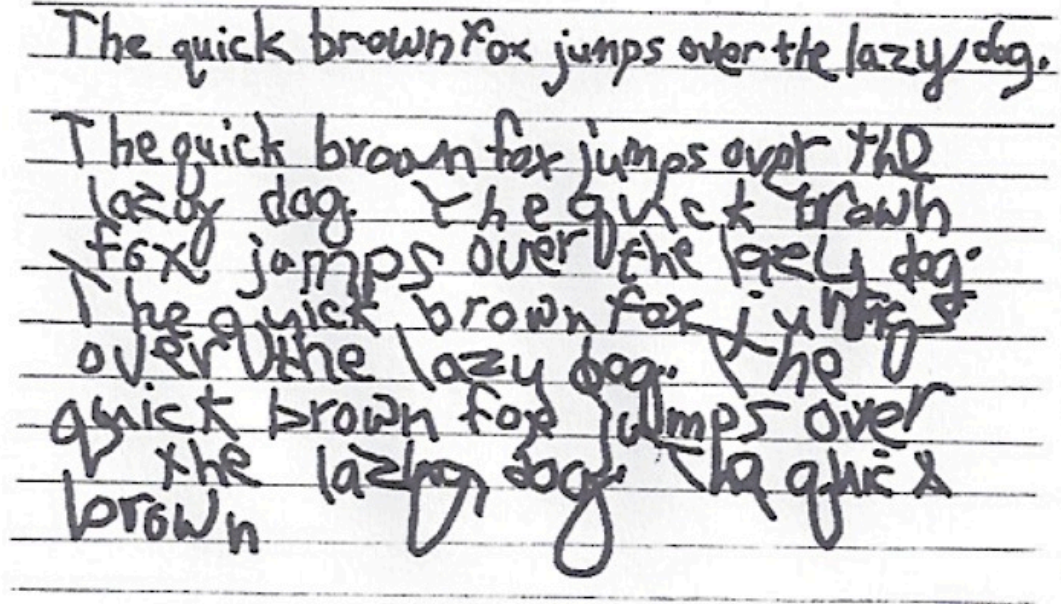


Figure 8.4. Jon's Three-Minute Handwriting Sample.

Mather, N., Wendling, B., & Roberts, R. (2009). *Writing Assessment and Instruction for Students with Learning Disabilities* (p. 222)

Scoring:

Letters total: _____

Letters total divided by 3: _____ lpm

Describe student's rate: