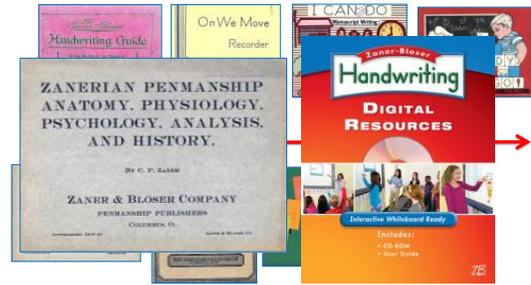


## Creating a Co-Teaching Model with Teachers for Handwriting in the 21<sup>st</sup> Century Classroom

Presented by:  
 Carol Armann, OTR/L  
 Kathleen S. Wright, National Handwriting Administrator

### Zaner-Bloser - A History of Handwriting in the Classroom



### How important is legible handwriting?

- Poor handwriting costs American businesses and taxpayers \$200 million a year.
- An illegibly written barometer reading is blamed for a plane crash that killed 5 people.
- 38 million illegibly addressed letters cost the U.S. Postal Service \$4 million a year.
- Nearly 20% of hospital medicine orders are returned by pharmacists as illegible.
- According to the USDA there are 7,000 deaths a year caused by drug errors and a quarter of those are likely caused by drug name mix-ups.

### Why is Handwriting Instruction Important?

- Students still need to know how to write by hand.
- Good handwriting makes a good impression.
- Handwriting is a foundational skill for literacy, math skills and executive function!
- Teaching handwriting boosts writing and reading proficiency.
- Students with good handwriting score better on tests.

### Researchers



Dr. Virginia Berninger,  
University of Washington



Dr. Jane Case-Smith,  
The Ohio State University



Dr. Gerry Conti,  
Wayne State University



Dr. Steve Graham,  
Vanderbilt University, and  
Dr. Tonya Santangelo, Arcadia University



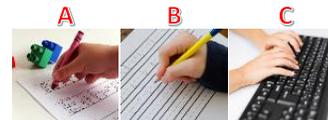
Dr. Karin Hamman James,  
Indiana University



Dr. Stephen Fefferly,  
Teachers' College,  
Columbia University

www.hw21summit.com

Can you guess which activity activates the language area of the brain?





“Self-generated action, in the form of handwriting, is a crucial component in setting up brain systems for reading acquisition.”  
(Karin Harman James, 2011)

#### Handwriting Instruction Improves Written Expression

“One of the first things educators can do to ensure that students with special needs develop good writing skills, besides teaching them spelling and basic writing processes, is to provide them with formal handwriting instruction.”

(Berninger and Fuller)

Repetitive manipulation of the thumb and fingers in the handwriting process helps activate the left brain, which manages functions such as planning, monitoring, organizing and revising – skills critical to educational achievement and self-management.

(Farmer, Shalin, Wilson, Doidge)

#### **HANDWRITING improves spelling/word learning**

The motor act of producing a word by hand results in tactile sensations in the brain that link letters into a single written word unit.

(James, Richards, 2009)

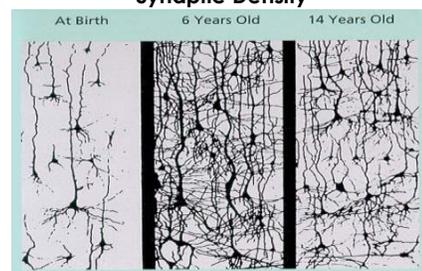
#### **HANDWRITING boosts writing proficiency**

More ideas were expressed and more complete sentences were produced in students utilizing handwriting as compared to keyboarding.

(Berninger, Abbott, Augsburger, & Garcia, 2009)

#### **Use It or Lose It!**

##### Synaptic Density



From *Rebuilding the Brain: New Insights into Early Development* by Doreen Stoeberl, Facilitator and Host, Inside, 10/2/12.  
Synaptic Density: Synapses are created with astonishing speed in the first three years of life. For the rest of the first decade, children's brains have twice as many synapses as adults have. (Drawing supplied by N.T. Chagnac)

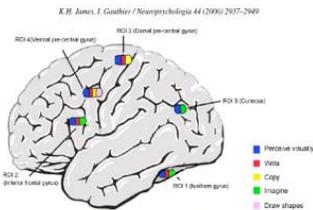


Fig. 4. A schematic of the results from the present study demonstrating a multistage network of activation for letter processing.

Brain Imaging (fMRI's) have shown that the serial finger movement (of handwriting) activates regions in the brain associated with cognitive, metacognitive, and language processes in writers. (Richards, Berninger & Stock, 2009)



## Handwriting Readiness

"Preschoolers' ability to imitate strokes; copy letters, numerals, and shapes; and draw simple objects is associated with reading and math achievement in second grade."

"Preschool children are rarely able to read fluently, but it doesn't keep us from working on foundational skills that prepare children to become efficient readers in the future."

"In one study, young children who wrote letters were more likely to recognize the letters than children who simply pressed letters on a keyboard."



Dr. Laura Dinehart,  
Assistant Professor,  
Florida International  
University

Research is beginning to show that handwriting readiness is important in early childhood.

- Early fine motor skills, particularly writing, are associated with later academic achievement.
- Visual-motor tasks are associated with inhibitory control, a component of executive function and important to school readiness and achievement. (Dinehart, 2014)

What are these fine motor skills?

- Fine motor manipulation
- Graphomotor
- Visual-motor integration

## Fine Motor Manipulation

Children with better skills in manipulation in preschool demonstrate better math performance in second grade.

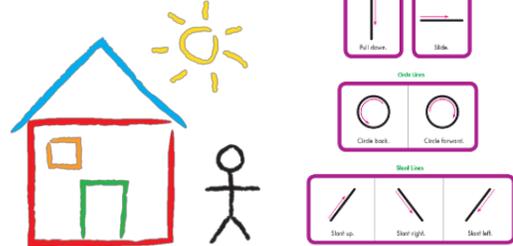
These are activities that involve using the fingers to pick up, release and manipulate a variety of objects with precision movements including the grasping of writing utensils.

## Graphomotor

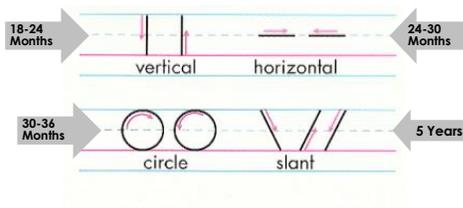
Children with better pre-writing skills in preschool demonstrate better reading performance in second grade.

These are learning the basic strokes for handwriting.

## Graphomotor Skills



## When do graphomotor skills begin?



## Visual-Motor Integration

Visual-motor tasks are associated with inhibitory control, a component of executive function and important to school readiness and achievement.

These are skills that involve using two hands together on tasks that require visual attention to task.

In its most basic form, early writing is an exercise of fine motor control. Fine motor activities are said to stimulate the prefrontal cortex, an area of the brain that houses elements of self-regulation and executive function (EF).

-Diamond, 2000

## Why a Co-Teaching Model Between OTs and Teachers?

According to Dr. Jane Case-Smith:  
"Although teachers agree that handwriting has important consequences for students, they also report that they have not been adequately prepared to teach handwriting."

(Case-Smith, 2011)

### What does the OT/Teacher Co-Teaching Model Do?

1. Promotes full inclusion
2. OT's model handwriting modifications
3. Teachers and OT's share instruction
4. Teachers integrate handwriting practice into instructional day

### What is collaboration and co-teaching?

- Collaboration is 2 or more people working together towards a common goal. i.e. handwriting
- Co-teaching is one of several approaches to collaboration.
- Collaboration is an Interactive Team Process.

Collaborating for Student Success: A Guide for School-Based Occupational Therapy, Hanft and Shepherd (2008)

### Collaboration is a dynamic process that includes...



### HOW? Key Elements of Co-Teaching

1. Common planning time
2. Defined roles and responsibility
3. High-level communication skills
4. Administrative support

(Arguelles, Hughes, & Schumm, 2000)

### What are obstacles?

- Team members using overly technical terms or methods.
- Classroom Disruptions
- Team members not having common goals.
- Interpersonal challenges

OT/Teacher Partnership

↓  
5 Minutes of Direct Instruction

↓  
10 minutes of Guided and/or Independent Practice

↓  
Monitored Self-evaluation

### "Automatic" Handwriting Enhances Writing



"In the early years, orthographic-motor skills involved in handwriting have a significant effect on a child's ability to generate written text."  
(1999) Diane Jones and Carol A. Christiansen

### Writing/Handwriting Readiness 7 Key Skills:

- ✓ Gross motor skills
- ✓ Fine-motor skills
- ✓ Spatial awareness
- ✓ Print awareness
- ✓ Letter recognition
- ✓ Sound-symbol relationship
- ✓ Handwriting skills



### Research Suggests...

#### Teach a Simple Vertical Manuscript Alphabet

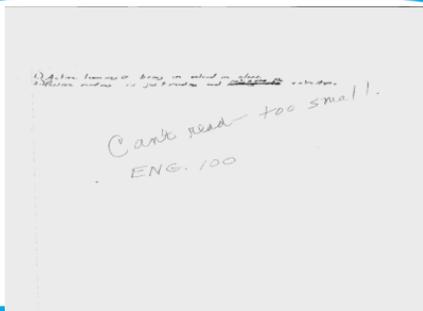


### Reasons for Writing in the Classroom:

- ★ Writing to Learn
- ★ Writing to Demonstrate Learning
- ★ Writing for Evaluation or to Publish



### Writing for Evaluation





**Kindergarten Reading Foundational Skills**

**CCSS.ELA-Literacy Print Concepts**

- RF.K.1a** Follow words from left to right, top to bottom, and page by page.
- RF.K.1b** Recognize that spoken words are represented in written language by specific sequences of letters.
- RF.K.1c** Understand that words are separated by spaces in print.
- RF.K.1d** Recognize and name all upper- and lowercase letters of the alphabet.

**Phonological Awareness**

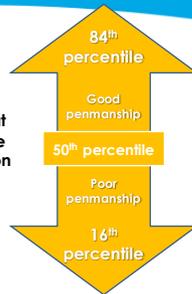
- RF.K.2** Demonstrate understanding of spoken words, syllables, and sounds (phonemes).
- RF.K.2a** Recognize and produce rhyming words.
- RF.K.2b** Count, pronounce, blend, and segment syllables in spoken words.
- RF.K.2c** Blend and segment onsets and rimes of single-syllable spoken words.
- RF.K.2d** Isolate and pronounce the initial, medial vowel, and final sounds (phonemes) in three-phoneme (consonant-vowel-consonant, or CVC) words.
- RF.K.2e** Add or substitute individual sounds (phonemes) in simple, one-syllable words to make new words.

**Good Handwriting is Legible Handwriting**

- >Legibility is the goal of handwriting.
- >Legibility is handwriting that can be easily read by many people.
- >Legible writing shows personal style.
- >Legibility is the lifelong standard for everyone's handwriting.

"There is a reader effect that is insidious. People judge the quality of your ideas based on your handwriting."

(Graham, 2015)



**Your Turn to Write**

The quick brown fox jumps over the lazy dog.

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

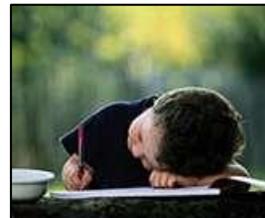
"3 Ps" of Handwriting



- P**osture
- P**aper
- P**encil



Writing can be "hard work!"

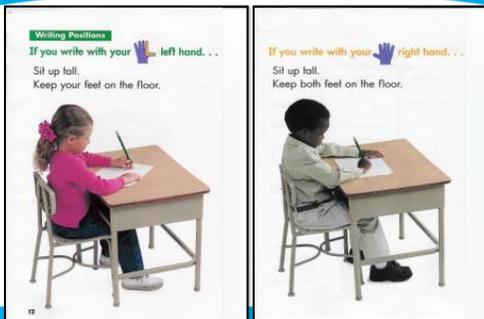


# Activity: Glow Writing!

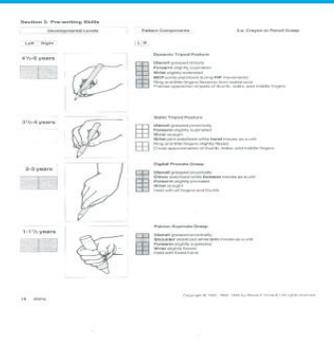
## Using Interactive Whiteboard Technology Can Enhance Gross- to Fine Motor Skill Development!



### Posture



### How Do You Hold Your Pencil?



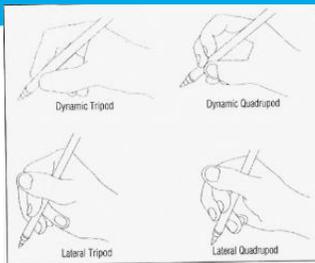


Figure 1. Four mature grasp patterns: Dynamic tripod, dynamic quadropod, lateral tripod, and lateral quadropod.

Schwelnus, et al. 2012  
American Journal of Occupational Therapy, 2012

## Use a Pencil That Fits!



Left Hand Right Hand  
DO Model and Teach correct grip, hand preference and helping hand.

Very young students can't be expected to write well-formed letters or to accurately size or space them.

"Tip, Flip, Grip"

short (golf) pencils, "Pip Squeaks"  
ball in hand

## Alternate Pencil Grip

**Note:** Children who have difficulty with the traditional pencil position may prefer the alternate method of holding the pencil between the first and second fingers. Once mastered, the position can be easily changed to the traditional grip.



## Take Time to Teach How to Hold the Pencil

- Early on, children may successfully change a poor pencil grip.
- Poor pencil position can cause fatigue and discomfort.
- MODEL and reinforce a good pencil grip.

## How do we "fix" a pencil grip?

- Hand mechanics---vertical surface
- Grips and Aids
- Provide a variety of utensils---broken crayons, golf pencils

## Fine Motor Development Takes Time and Practice

- Handwriting is a motor challenge for young children.
- Handwriting involves learning specific motor patterns.
- In handwriting, "practice makes permanent."
- In handwriting, teachers should think of themselves as coaches.



- Created in cooperation with Mary Benbow, noted occupational therapist, teacher, and researcher.



## 5-Minute Fine Motor Activities

(Fine Motor Development = improved handwriting skills = better reading skills = better math skills)



## Fine-Motor Development Summary:

- It occurs over time.
- A child needs more variety of fine motor practice than just using brushes and scissors at an art center.
- Activities require supervision by a teacher or parent. If the movements aren't done correctly the child will simply reinforce the incorrect motions that are causing the difficulty.
- Fine-motor development is a key to handwriting. A child's repetition of specific activities helps them learn the correct motions needed for writing by hand.
- Teachers need a frame of reference as to when to consult a special needs provider.

## What IMPACTs Legible Handwriting?

- ★ Posture
- ★ Pencil grip
- ★ Paper position



## Paper Position- Right Handed



- >Keep your paper straight.
- >Put both arms on the desk
- >Pull your pencil toward the middle of your body.
- >Use your left hand to move the paper.

### Left Handed Paper Position?

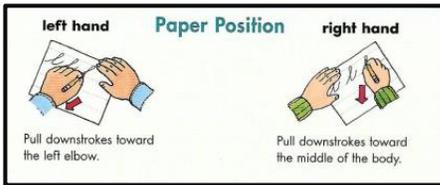


### Paper Position- Left Handed



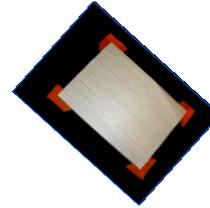
- >Slant your paper.
- >Put both arms on the desk.
- >Pull your pencil toward your left elbow.
- >Use your right hand to move the paper.

### Cursive Paper Position

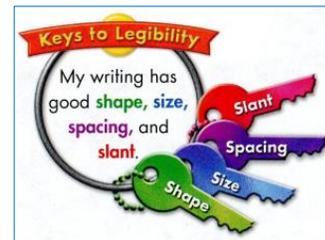
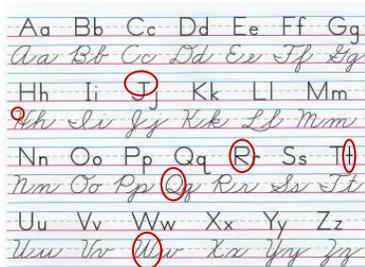


Provide Letter Models On the Left for Right-handers  
Provide Letter Models On the Right for Left-handers

### Create A Masking Tape Frame



### Zaner-Bloser Alphabet



Teach 4"Keys" to Legibility

## Handwriting Rubrics

A Handwriting Rubric

	YES	NO
Shape	☺	☹
Size		
Spacing		
Slant		

Zaner-Bloser

Handwriting Key to Legibility

Category	Criteria	Yes/No
Shape	good rise	<input type="checkbox"/>
	good rise	<input type="checkbox"/>
	good rise	<input type="checkbox"/>
	good rise	<input type="checkbox"/>

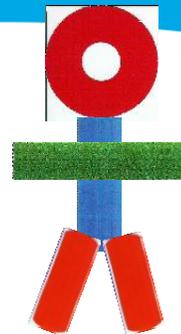
There are Four Elements ("Keys") to Legibility

- **SHAPE** – Appearance of the strokes
- **SIZE** – The height of letters
- **SPACING** – between letters, words, and sentences
- **SLANT** – The angle of the writing on the paper

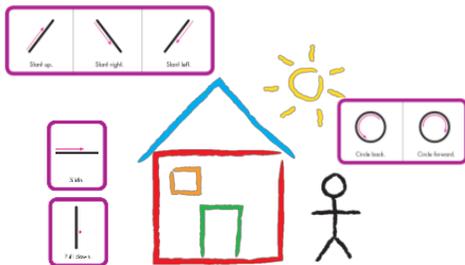
## SHAPE



Letter **Shape** is the Most Fundamental Key to Legibility



## 4 Basic Strokes



What do you notice?



### Use a Developmentally Appropriate Instructional Sequence for Manuscript/Print

- Introduce manuscript letters according to their beginning strokes.
- Introduce lower case letters and upper case letters are simultaneously.
- Use CLEAR verbal cues

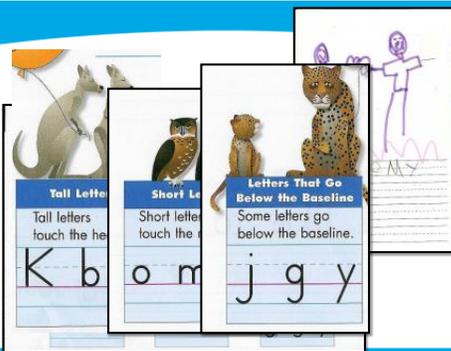
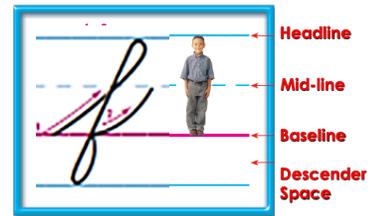
### Letter Reversals are Common

- Frequently reversed letters are b, d, f, q, j, p, and s.
- Reversals are a developmental issue and will improve.
- Reversing some letters is a normal stage and is not a sign of dyslexia or another learning disability.

### Four Elements/Keys of Legibility

- **SHAPE**
- **SIZE** – The height of the letters
- **SPACING**
- **SLANT**

### Handwriting Guidelines Support Instruction and Practice



### Use Grade Level Appropriate Paper

Grade	Line Height	Example
1	5/8"	My cat is fat.
2	1/2"	My cat is fat. 2M
3	3/8"	My cat is fat. 2C

**A Letter Sort**  
(teaches students to sort visually)

Short?	or	Tall?
i		L
g		A
n		t

**Four Elements/Keys of Legibility**

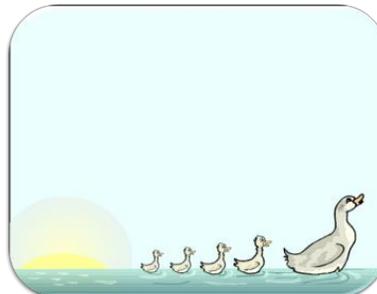
- **SHAPE**
- **SIZE**
- **SPACING** –between letters, words, and sentences
- **SLANT**

**SPACING**

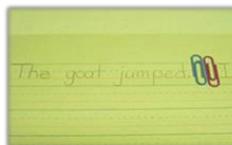
Spacing may be the most difficult key for young children to master.



**SPACING** Between Letters:



**Spacing**  
**Between**  
**Words**



**Spacing**  
**Between**  
**Sentences**



## Four Elements/Keys of Legibility

- **SHAPE**
- **SIZE**
- **SPACING**
- **SLANT** – the angle of the writing on the paper

## Slant is the Fourth Key to Legibility

- The Zaner-Bloser manuscript features the absence of slant, or straight-up-and-down letters: standard print.



## Good SLANT is Achieved by Doing Three Things:



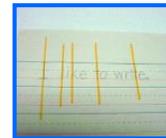
- Positioning the paper correctly on the desk.
- Pulling the slant strokes in the correct direction.
- Shifting the paper as the writing progresses across the page.

## To Evaluate SLANT:

Draw a line through each slant line

Are the lines parallel?

Is the slant consistent?



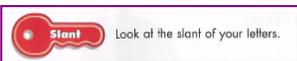
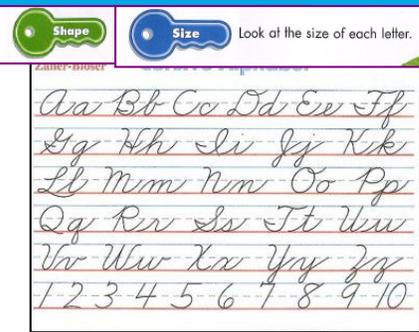
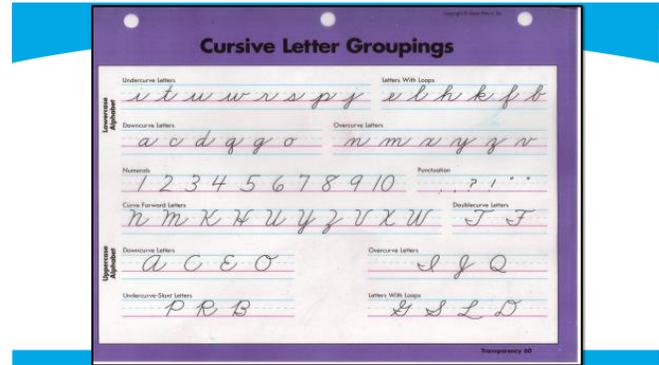
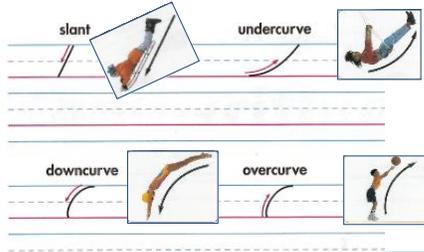
## Prior to Learning Cursive Students Should Demonstrate:

- Near grade (2<sup>nd</sup>/3<sup>rd</sup>) level reading proficiency
- Ability to write legibly in manuscript
- Ability to recognize cursive letters
  - Ability to read cursive words

## Keys of Legibility for Cursive

<b>Shape</b>	Look at the shape of each letter.
<b>Size</b>	Look at the size of each letter.
<b>Spacing</b>	Look at the spacing between letters and words. There should be space for <i>O</i> between letters.
<b>Slant</b>	Look at the slant of your letters.

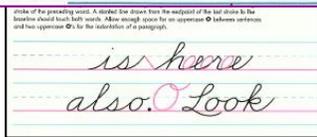
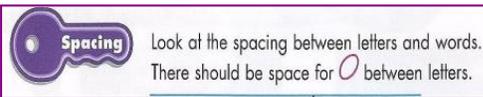
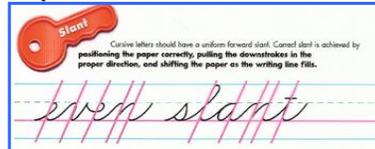
### SHAPE = 4 Basic Cursive Strokes



Draw a line through each slant line of your writing.

Are the lines parallel?

Is your **slant** consistent?



### K-2 Handwriting Goals



### Grade 3-5 Handwriting Goals



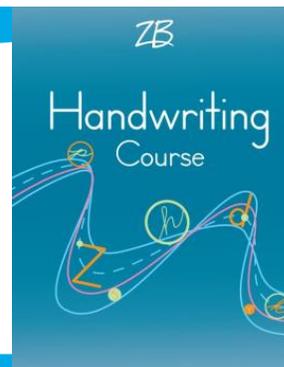
Encourage and Monitor **Self-Evaluation**

Instruction Requires  
**NO MORE**  
Than  
**15 Minutes**  
**PER DAY!**



Nicholas Kim Special Award for Excellent Penmanship

Zaner-Bloser National Handwriting Contest - 2012



**Free Resources**

- ZBFONTSOURCEPLUS- you can create handwriting tasks using appropriate paper size for manuscript or cursive in ZB method.
- Facebook page- [Zaner-Bloser Handwriting Training for OT's, COTA's and Teachers](#)



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