



# **“I hate writing!”**

## **The Nitty Gritty Writing Assessment**

***Autism In Education Webinar***

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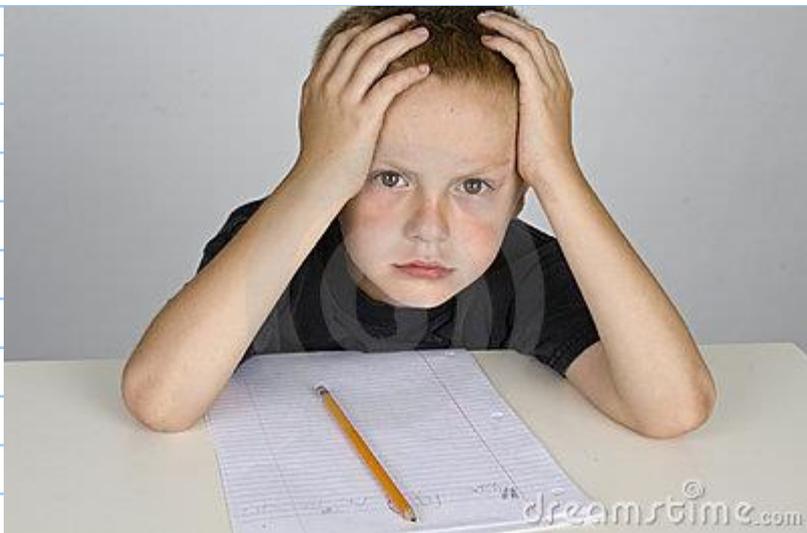
# Goals

- **Identify common problem areas related to handwriting for learners with ASD**
- **Review relevant research related to ASD**
- **Describe informal writing assessment process**
- **Prioritize initial intervention for improving handwriting**





# I have a student who...





Eeyore was saying to himself, 'This writing business. Pencils and what-not. Over-rated, if you ask me. Silly stuff. Nothing in it.'

*A.A. Milne*





# What do we know?

- **Learners with ASD often demonstrate non-compliance, tantrums and other forms of problem behaviour around writing tasks**
- **ASD is associated with a high prevalence of fine motor and manual dexterity difficulties.**
- **Deficits in this area can lead to illegible and slow handwriting**





# What do we know?

- **Writing is considered socially significant behaviour, a target for intervention.**
- **Affects self expression, academic outcomes, social acceptance, self esteem and long term career options**





# What do we know?



A **behavioural approach** requires that we...

- 1. try to understand the function of the behavior**
- 2. use antecedent interventions to reduce the need for the behaviour to occur**
- 3. teach the new skills that are needed**
- 4. AND reinforce the new skills**





# Key questions...

- **What specific skills are needed for writing?**
- **What may contribute to making writing a non-preferred task?**
- **What research is available to inform us?**
- **What strategies could potentially make the task less challenging?**





# Writing – a complex skill

***The elements of written expression—handwriting, prewriting, writing, and writing conventions—require a set of complicated skills that go beyond the act of holding a pencil and putting words on paper. It includes the complex interaction among physical, cognitive, and sensory systems.***

***(Kushki et al, 2011)***





# Writing – a complex skill

**Eye-hand coordination?**

**Motor planning?**

**Manual dexterity?**

**Sensory differences?**

**Communication ?**

**Concepts?**

**Vocabulary?**

**Literacy skills?**





# Language Issues

- **Writing request not matched with spontaneous language level**
- **Auditory memory problems**
- **Word finding problems**
- **Can say but not write**
- **Difficulty organizing thoughts and sequencing events**





# JUST KIDDING



# Writing – a complex skill



# The research...

Evidence  
-based  
practice?





# Writing – a complex skill

**Scoping review of the literature in this area (Kushki et al., 2011)**

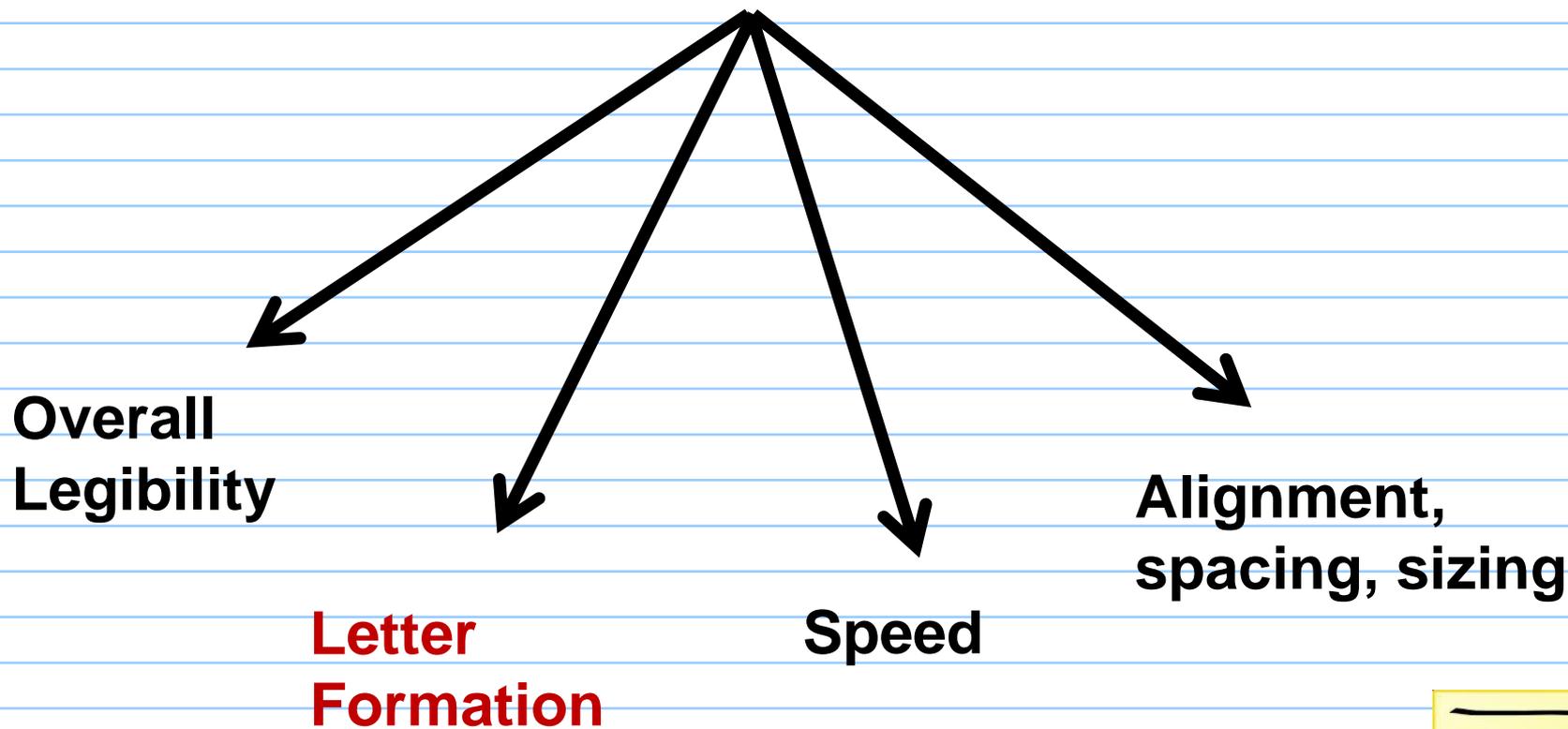
- **Only a small number of studies addressed the handwriting difficulties of children with ASD (1943-2011)**
- **4/7 report poor legibility, esp. compared to typically developing children**





# Writing – a complex skill

## Handwriting Studies with Children with ASD



(Kushki et al, 2011; Cartmill et al, 2009)





# **Writing – a complex skill**

**First study to examine handwriting quality in children with autism spectrum disorders**

- Children with ASD show overall worse performance on a handwriting tasks than do age- and intelligence-matched controls**
- Motor abilities strongly predict handwriting performance**

**(Fuentes et al, 2009)**





# Writing – a complex skill

- **Identified fine motor control as a root source of the problem**
- **Demonstrated that children with ASD may not experience difficulties across all domains, just forming letters.**

**(Fuentes et al, 2009)**





# Writing – a complex skill

- **General difficulties with motor control contribute to lower quality handwriting.**
- **Recommend therapies targeting motor control as the best approach to improving handwriting in individuals with autism.**

**(Fuentes et al, 2009)**





# Writing – a complex skill

**Mayes et al (2007) compared over 1000 8 year old children (typical, ASD, ADHD, other disorders)...**

***Learning, attention, graphomotor, and processing speed weaknesses tend to cluster together and these weaknesses differentiate children with ADHD and ASD from typical children.***





# Writing – a complex skill

**Cartmill, et al. (2009) studied handwriting variables in 8 year olds with ASD compared to typically developing children**

- The accuracy of letter formation was significantly different**
- Handwriting speed of children with ASD was slower and less accurate than peers**
- Faster writing correlated with less consistent letter formation**





# Writing – a complex skill

**Some variables [requisites] in the handwriting process**

- **Sense position, movement of fingers and hand (kinesthesia)**
- **Recognize, name letters**
- **Produce sounds for different letter combinations**
- **Remember letters, strings of letters for a period of time**
- **Accurately form the letters**
- **Maintain consistent letter formation, size**

**(Cartmill et al, 2009)**





# Writing – a complex skill

The combination of complexity of handwriting and the broad range of impaired performance in children with ASD meant that **no single stage in the process emerged as the problem area**

*Acquisition and mastery of these skills requires abilities in several domains*

(Kushki, 2011)





# Why is this important?

- **Problems with mechanics of handwriting may interfere with higher order cognitive/language process related to composition**
- **“ Mechanics of writing account for a large portion of variance in composition and quality” (Kushki, 2011;Graham et al. 1997)**





# Why is this important?

- **Production of written text requires simultaneous processing of motor and cognitive demands**
- **Need to develop “automaticity”:  
retrieve and produce letters  
automatically (Medwell & Wray,  
2014)**
- **Focus on the information rather  
than the process/mechanics of  
writing**





# Why is this important?

- **Handwriting automaticity is a strong predictor of quality of composition in normally developing and disabled writers**

*"If letter production is automatic, memory space is freed up for higher level cognitive processes, such as deciding what to write about, what to say and how to say it."*

**(Medwell & Wray, 2014)**





# What comes first?



***Parsimony:*** Rule out simple explanations and solutions before more complex ones





# A starting point...

"Knowing the causes of impairment allows us to strategically identify techniques that will help children with ASD improve their handwriting. Our study suggests that **teaching children how to form letters**, in combination with general training of fine motor control through techniques that include **stabilizing the arm and the use of proper writing utensils**, may be the best direction for improving handwriting performance." (Fuentes, 2009)





# Summary

- **Handwriting requires skills in several domains that are particularly challenging for learners with Autism (language, fine motor, organization, attention)**
- **The motor aspects of handwriting often pose significant problems and may be contributing to related problem behaviours**





# Summary

- **The mechanics of handwriting need to be explicitly taught and practiced to promote automaticity**
- **Improvement in this area may make the task easier and allow instruction in core components of writing**



# A starting point...?

Where?





# **Nitty Gritty Writing Assessment**



- **Conducted during regular routines**
- **Not language dependent**
- **Practical, efficient**
- **Time commitment manageable**
- **Includes direct observation and hands-on instruction**





# Nitty Gritty Writing Assessment

## *What it is -*

- **Structured observation tool**
- **Focuses on factors that influence the mechanics of handwriting**
- **Helps determine if these may be contributing to the child's motivation to escape the task**
- ***Provides a starting point* for instruction**





# **Nitty Gritty Writing Assessment**

## ***Components***

- 1. Direct observation using the Factor Checklist (~15 minutes)**
- 2. Direct assessment to probe strategies for improvement (~15 minutes)**
- 3. Summary and recommendations**





# Nitty Gritty Writing Assessment – *Part I*

- ***Observe*** during a typical activity where writing is required.
- Student can be working independently or with staff support.
- Avoid interacting with the student or staff during the observation.
- Using the ***Factor Checklist*** as a guide, comment on each section
- Following the observation, ***rate each section*** in the right column regarding level of concern.





# Factor Checklist Elements

**Variables identified in the checklist are based on key skills for handwriting and help bring the observer's attention to these critical components.**

**Check  
it out!**





# Factor Checklist Elements

- Environment**
- Physical Elements**
- Materials**
- Support**
- Quality**





# 1. Environment

- Furniture
- Lighting
- Copy distance
- Desktop space





# **1. Environment**

**Appropriate seating support often positively impacts handwriting performance without additional or with fewer accommodations.**

**(Coffin, 2016)**





## 2. Physical Elements

**Elbows rest on table**



**Feet flat on floor**



**Back supported**





## **2. Physical Elements**

- Posture and body position**
- Eye-hand coordination**
- Forearm on desk**
- Non-dominant [support] hand position**
- Hand/wrist below the line of writing**





## 2. Physical Elements



**What's wrong here?**





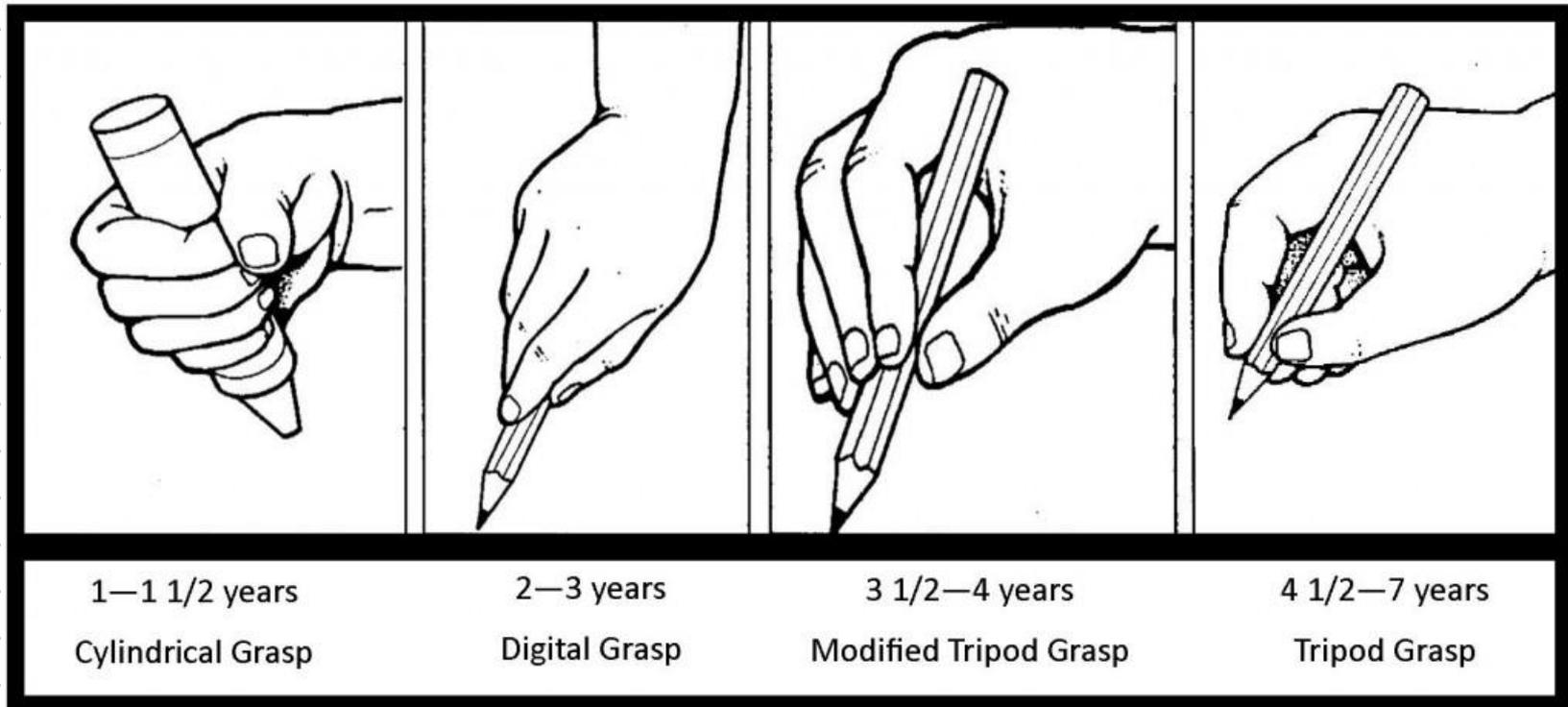
## **2. Physical Elements**

- Hand and shoulder coordination-movement**
- Body movement (arm, hand, trunk)**
- Hand dominance**
- Utensil grasp**



## 2. Physical Elements

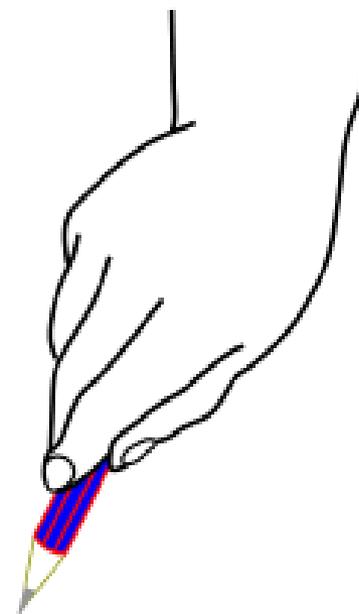
### *Grasp Development*





## 2. Physical Elements

### *Grasp Development*



**What's wrong here?**





## 2. Physical Elements

### *Grasp Development*



**What's wrong here?**





## 2. Physical Elements

### *Grasp Development*





# 3. Materials

- Type of paper**
- Paper position**
- Type of utensil**
- Adaptations**

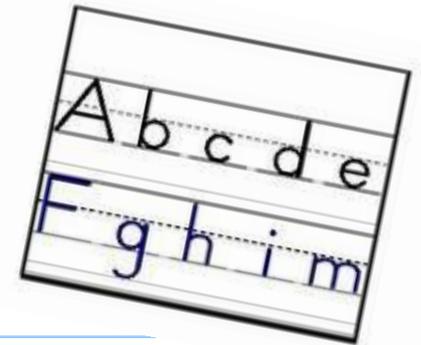
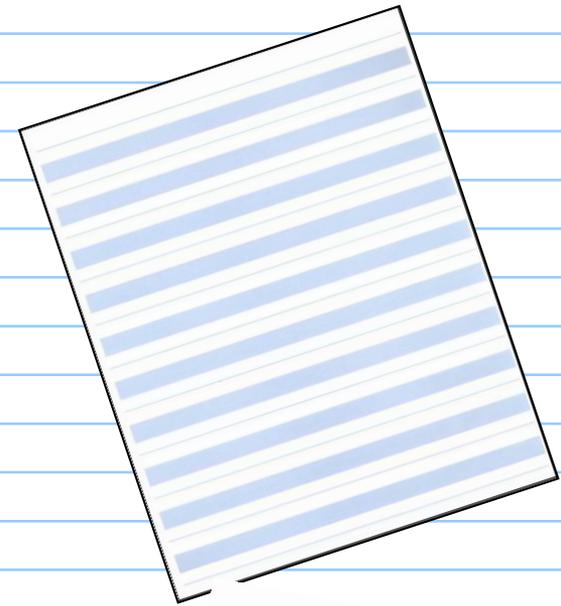




# 3. Materials

## *Paper*

- **Space between lines**
- **Middle line**
- **Color cues**
- **Texture cues**
- **Arrow cues**
- **“box writing”**





### **3. Materials**

**Many times special papers can be used to support instruction in handwriting development, as well as provide ongoing visual supports for maintenance of developed skills**

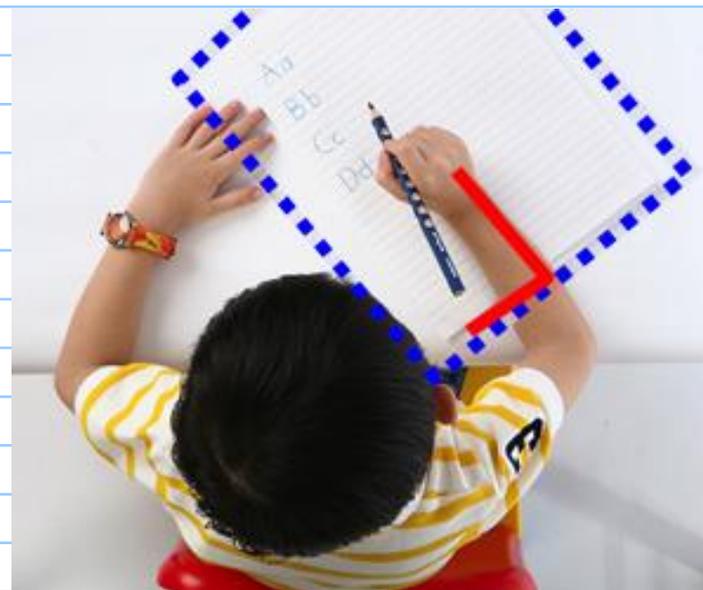
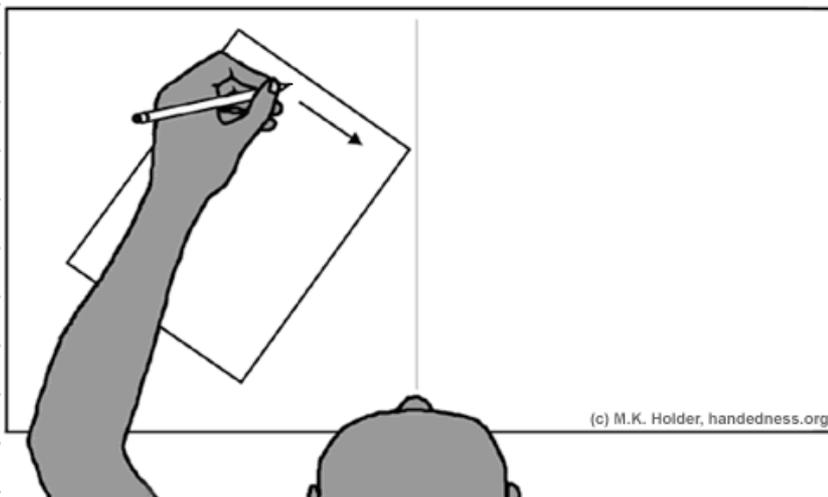
**(Coffin et al, 2016)**





# 3. Materials

## *Paper Position*

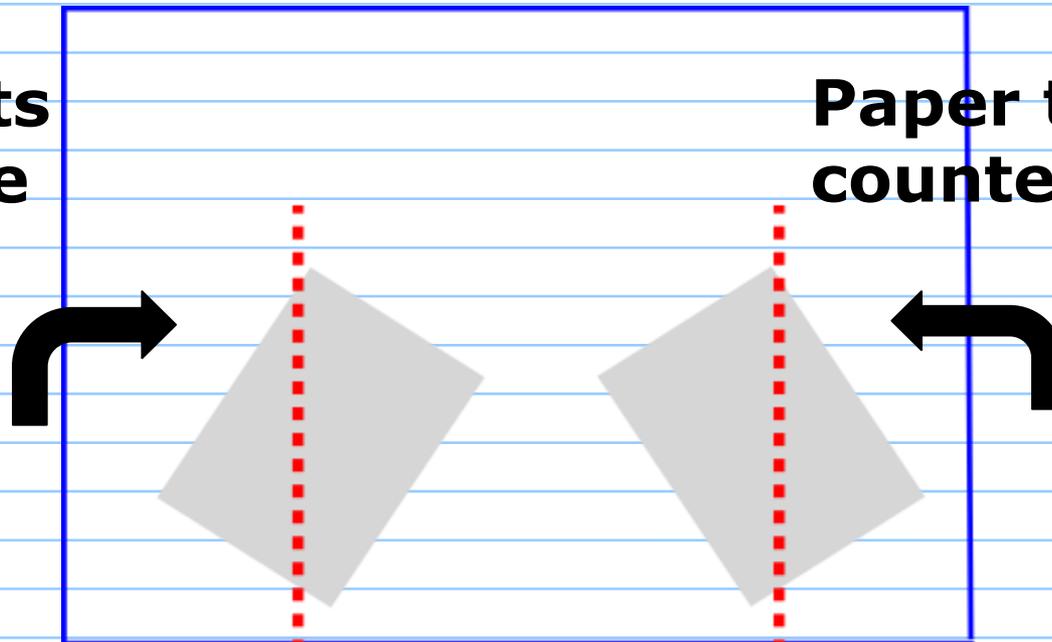




# *Paper Position*

**Paper tilts  
clockwise**

**Paper tilts  
counterclockwise**



**Left handed  
writer**

**Right handed  
writer**



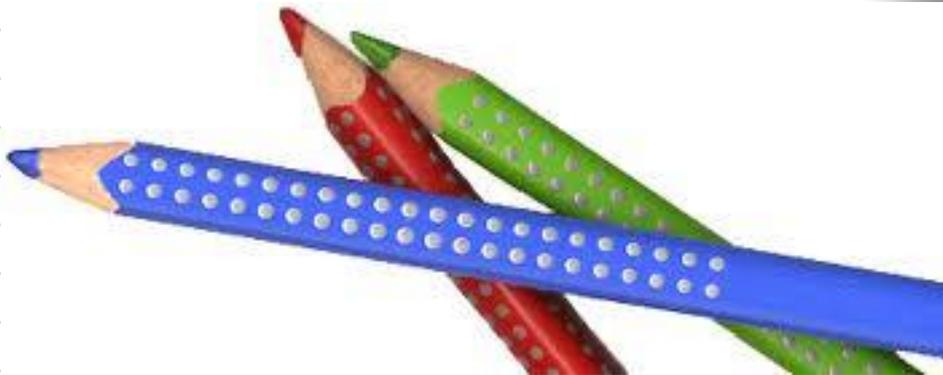
**Body midline**





# 3. Materials

- Utensil
- Adaptations





# *Utensil Variables*

- **Width**
- **Length**
- **Shape**
- **Amount of pressure needed**



# *Adapted Grips*





# *Support*

- Staff position**
- Prompt level (full, partial, initial)**
- Reinforcement provided**

A+





# *Support*

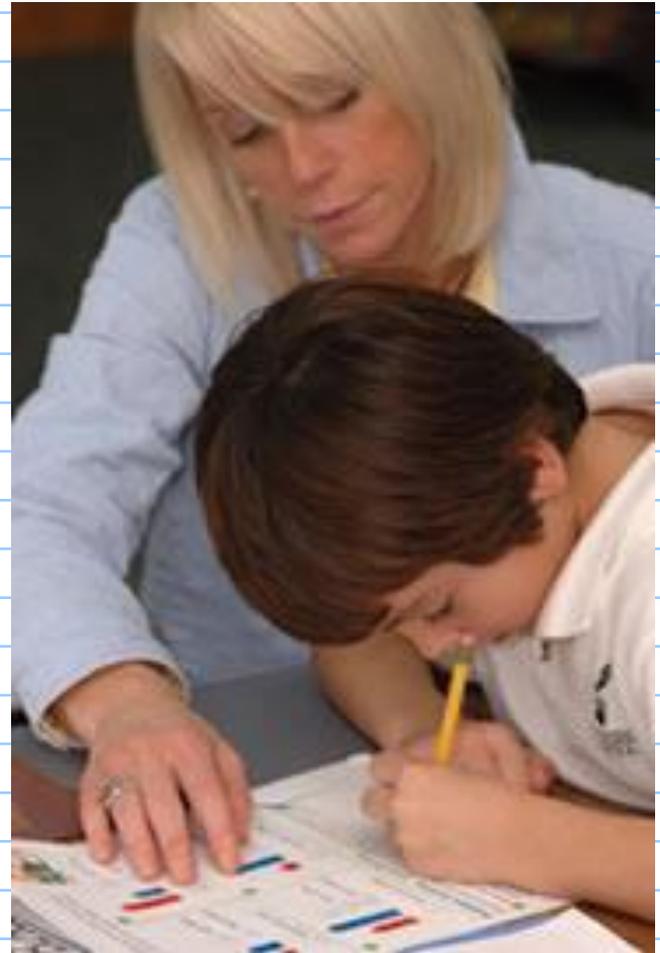


**What's wrong here?**





# *Support*



**What's wrong here?**





## 4. Quality

- Type (manuscript, cursive)**
- Legibility (recognizable letters)**
- Size (fit within lines, consistent)**
- Orientation (letters correct direction)**
- Control (on line, drifting)**





## 4. Quality

- Spacing (between letters/words; uses guide)**
- Upper-lowercase (uses as appropriate; mixes upper and lower)**
- Speed (note if very slow or very fast)**

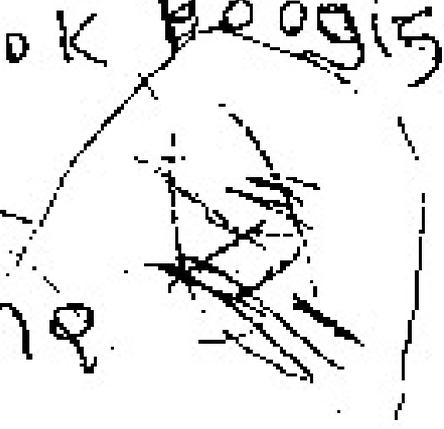




## 4. Quality

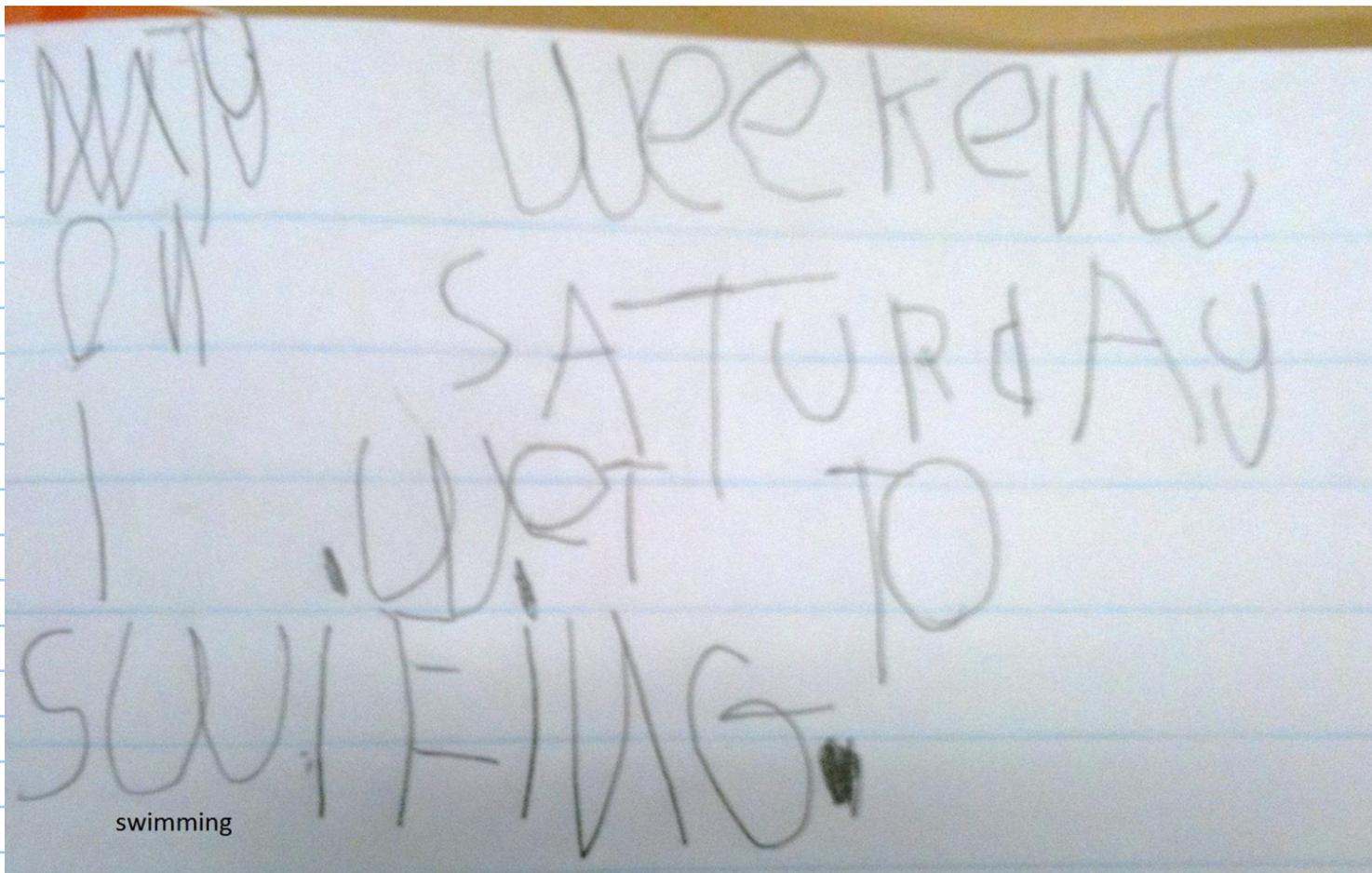
Figure 3. Molly's free writing. She was asked to write but did so with great reluctance.

I went to the car and  
and took Poozie for a  
walk  
in the  
wood





# 4. Quality



swimming





# Nitty Gritty Writing Assessment – *Part II*

- ***Highlight*** all areas of concern on the Factor Checklist
- Write the identified concerns in the ***Factor*** column of the assessment summary
- Plan for 10-20 minute lesson to probe for effective strategies
- Prepare materials
- Consider reinforcement





# **Nitty Gritty Writing Assessment – *Part II***

- 1. Involve the student**
- 2. Correct environment elements identified as concerns**
- 3. Prompt for correct position, posture, grasp, paper position**
- 4. Request short writing samples, including trace/copy, and from dictation**





# **Nitty Gritty Writing Assessment – *Part II***

- **Probe for effective adult position**
- **Check for effective prompt level**
- **Initial and date writing samples and note level of prompt needed**
- **Try out different utensils and paper if a concern**





# Summary

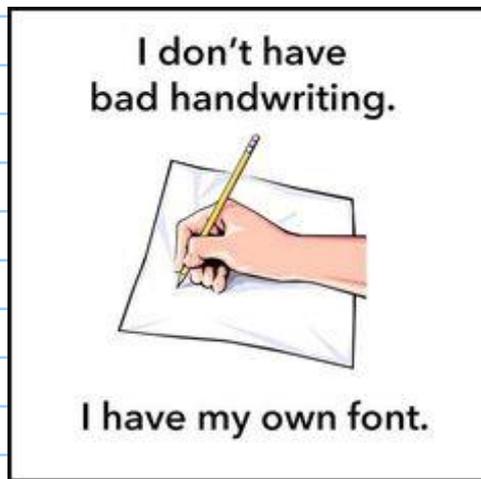
- **Identify areas of concern**
- **Suggest initial recommendations for each concern**
- **Write observable , measurable IEP objective(s)**
- **Monitor through regular work samples**
- **Repeat assessment at report periods**





# Summary

**Sometimes, lower tech solutions can be implemented more easily and with minimal distress for the student.**





# **Print? Write? Type?**

**When in doubt, consider...**

- **Age of student**
- **Level of frustration**
- **Parent priorities**
- **Methods already tried**
- **Rate of progress**
- **Literacy skills**





# Print? Write? Type?

**When in doubt, consider...**

- **Functionality (for the student)**
- **Support available**
- **Technology options**
- **Equipment available  
(home/school)**
- **Instructional time available  
(home/school)**





# Print? Write? Type?

- **Other physical limitations**
- **Delays and immaturity**
- **Handedness**





# Resources

## *Video Modelling*

- **How to hold paper and pencil for left and right handers**
- **Task analyzed and presented slowly and clearly**

[www.youtube.com/watch?v=fRk\\_t49dZ2Q](http://www.youtube.com/watch?v=fRk_t49dZ2Q)





# Resources

***abcteach Handwriting Tool*** - Create custom worksheets for tracing and copying practice  
***<http://www.abcteach.com/handwriting>***

**Animations of correct sequence for printing each letter**

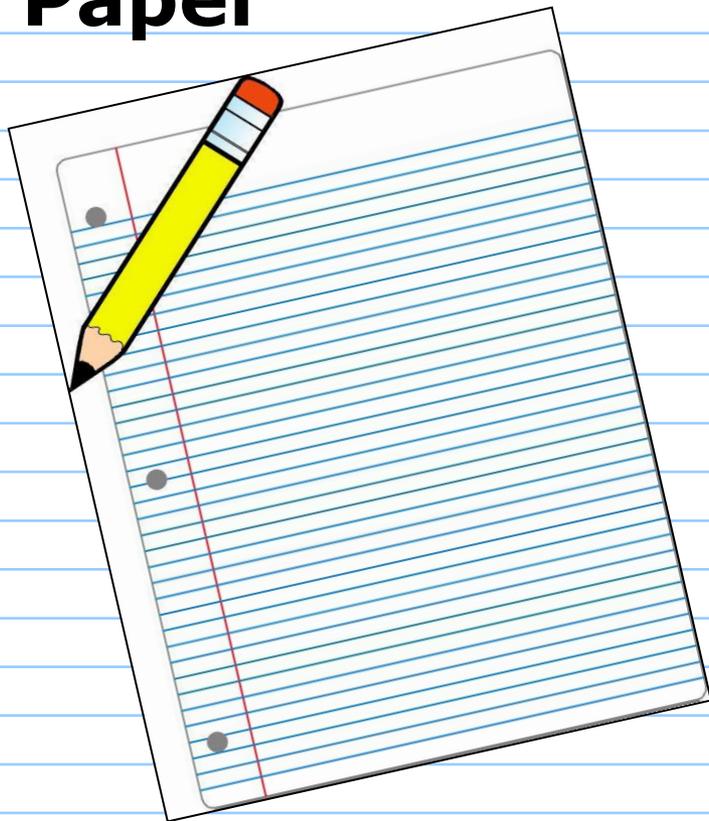
***[www.teachhandwriting.co.uk/print-letters-beginners.html](http://www.teachhandwriting.co.uk/print-letters-beginners.html)***





# Resources

## Paper



[Superduperinc.com](http://Superduperinc.com)





# Resource

**Review of the literature on writing interventions (1994-2011), including computer aided instruction and self-regulated strategy development.**

***Currently no single intervention has enough research to qualify as an evidence based intervention in this area.***

**(Pennington & Delano, 2012)**





# Resource

**Available as Ebook online**

**<http://www.springer.com/us/book/9783319208718>**

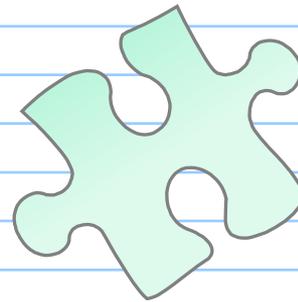
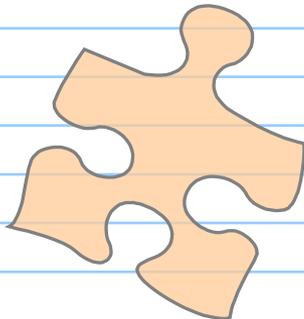
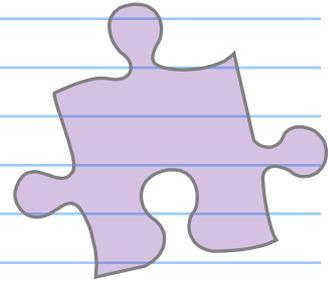
**Coffin, A. B., Myles, B. S., Rogers, J., & Szakacs, W. (2016). Supporting the Writing Skills of Individuals with Autism Spectrum Disorder Through Assistive Technologies. In *Technology and the Treatment of Children with Autism Spectrum Disorder* (pp. 59-73). Springer International Publishing.**

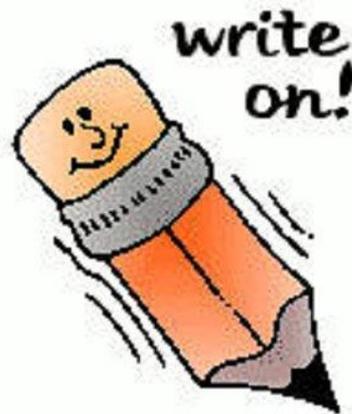




# Writing – a complex skill

**We are just beginning to understand how each of the components of writing may contribute to the behaviours we see. The Nitty Gritty Writing Assessment may help us put some of the puzzle together.**





**Feedback would be appreciated!**

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