# Component Skills for Pre-Writing in Early Childhood

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## What will be covered in this presentation?

- Developmental components that contribute to pre-handwriting skills
- Assessment tools that relate to these developmental components
- The role of the OT in providing activities to help develop these component skills in preparation for printing instruction

## Learning Objectives

- Name at least four component skills for pre-writing
- List at least three assessment tools for developmental tasks related to pre-writing
- Select at least three activities to develop component skills for pre-writing

## Introduction

- Expectations for early writing can vary among teachers, parents, administrators, and programs
- Are expectations in line with typical variations in development throughout early childhood?
- The occupational therapist can contribute to the team by:
  - providing information on typical developmental sequences and component skills of pre-writing
  - suggesting and modifying activities to support component skills of pre-writing
  - providing intervention services

## OT Role in Pre-Writing Skill Development

- Discuss age appropriate expectations for fine motor development and components of pre-writing skills
- Collaborate with teacher regarding movement activities and centers in the classroom
- Identify seating and positioning options for table work
- Suggest strategies and conduct groups for pre-writing and motor groups (general) following district guidelines for need of parent permission or physician referral
- Implement intervention activities for students with OT services (specific to IEP goals)

## Developmental Components

- Several developmental checklist sources are available as a quick reference for developmental skills achieved between the ages of three and six
- The OT can choose developmental skills that most relate to pre-writing skills to share with the staff and parents through handouts and inservice training
- Help team identify underlying components that are needed for pre-writing and suggest activities

## Components of Pre-Writing Skills

- Gross motor and motor planning (core control, using both arms, crossing midline, imitate movements, learn new movements)
- Fine motor and development (separates thumb and fingers, develops skill and stable side of hand, develops a lead and assist hand, manipulates objects, efficient grasp, tactile and kinesthetic sensory awareness and discrimination)
- Visual perceptual and visual motor (ocular-motor control, visual attention, figure ground, form perception and discrimination, spatial analysis, eye hand coordination, visual motor integration)
- Cognitive and Language (attention, directional concepts, memory, sequencing, following simple directions, awareness of print, differentiation of written symbols and drawing)

## Centers in the Classroom

- Motor play area: mats, trampoline, push cart, scooter board, bike, obstacle course
- Tactile play area: water table, play dough, material textures for dress-up, finger paints, sand, rice
- Fine motor center: manipulatives, different types of scissors, tongs, puzzles, geoboards, lacing cards
- "Writing" center: post office, stampers, stickers, markers, various papers, crayons, easel, paints

## Seating and Positioning Options

- Ideal table position for child: feet are on the floor (or foot rest), seat depth is right (may need pillow behind back if seat depth is too large), arms are comfortably supported on the table surface (table surface 2" above bent elbow) and materials are presented at a comfortable viewing angle (may need to use table top easel)
- Stand at higher table with arms comfortably supported or at easel
- Alternate positions: prone on floor, sitting on floor with lap desk

## Strategies for the Classroom (General)

- The OT can plan and conduct stations, circle time, motor groups with teacher following district guidelines
- Include a variety of manipulatives at classroom centers (balls, bean bags, containers, tongs)
- Have various sized markers, crayons, and paint brushes, and papers available to encourage typical development of 'writing' and 'drawing'
- Provide alternatives for "writing"; magnetic letters/numbers, alphabet stamps and stickers, paper letters, foam letters, I Pad, Computer

## Activities to Develop Component Skills

- Motor group (scooter boards, obstacle course)
- Tactile play (water table, textures, finger paints, play dough)
- Bilateral arm use (pushing cart, play dough, Simon Says, musical instruments, arm and hand actions to songs)
- Working at an easel (drawing, painting, 'writing')
- Fine motor play activities, puzzles, blocks, finger puppets

## Classroom Motor Group

## Building 'Mat Man' during Circle Time

## Building Letters at Fine Motor Station

## OT Intervention Services

- Team may notice a student who is having more difficulty with participation and completion of tasks when compared to peers and make a referral for OT – the district referral process is then initiated
- Student may have an existing IEP from early intervention services
- OT evaluation may include student observation, teacher and parent checklists, and standardized assessments – methods of evaluation focus on the team's concerns and OT school observation

## OT Observations for Pre-Writing

- Postural control in sitting at circle time and table activities – quality of movement within the classroom
- Visual attention to hands and activity (cutting, drawing, puzzles, games, toys)
- Uses both hands together as lead and assist (holds paper when cutting with scissors)
- Isolates thumb and finger control to pick up small objects

## Classroom Observations for Pre-Writing

- Can manipulate objects within the hand (pick up and place small objects, turn pages, turn dials, rotate puzzle pieces) as appropriate for age
- Uses a power or precision grip that is appropriate for an activity
- Demonstrates use of a skilled side of the hand (thumb and first two fingers) and a stable side of the hand (fourth and fifth fingers) as age appropriate
- Has an open web space between the thumb and index finger

## Classroom Observations for Pre-Writing

- Can manipulate fasteners appropriate for age
- Use eating utensils with appropriate grasp for age – opens containers
- Follows simple motor directions
- Participates in 'messy' activities (finger paints, play dough, water table)
- Copies age appropriate lines and shapes
- Has age appropriate drawings

## Choosing an Assessment

- Based upon the team's concerns, classroom observations, and knowledge of component skills needed to complete fine motor and pre-writing tasks, the OT decides which assessment, or combination of assessments, would provide the most information to guide interventions
- For example: for a child who does not like to use messy media, and who appears to have delays in fine motor skills, the OT may choose to administer the Sensory Processing Measure – Preschool and the Peabody Developmental Motor Scales.

## Summary Information on Assessments

- **Bruininks-Oseretsky Test of Motor Proficiency (BOT-2) (**Bruininks & Bruininks, 2005) Takes approx. 60 min. to complete full form, also has screening form – subtests include: Fine Manual Control, Manual Coordination, Body Coordination, Strength and Agility – Ages: **4yrs. – 21 yr 11 mo**
- Bruininks, R. H., & Bruininks, B. D. (2005) *Bruininks-Oseretsky Test of Motor Proficiency (2nd Ed) Manual*. Circle Pines, MN: AGS Publ.

## Summary Information on Assessments

- **Peabody Developmental Motor Scales (2nd Ed.) (**Folio and Fewell, 2000) Takes approx. 60 min. to administer – covers developmental gross motor and fine motor skills - (Reflexes/Stationary; Gross Motor/Locomotion; Object Manipulation; Grasping; Visual Motor) Ages: **1 month through 6 yrs.**
- Folio, M.R., & Fewell, R. R. (2000). *Peabody Developmental Motor Scales (2nd Ed*). Austin, TX: Pro-Ed.

## Summary Information on Assessments

- **Sensory Processing Measure – Preschool** (Miller-Kuhanek, Henry, & Glennon, 20 10) School Form Questionnairre on behaviors that reflect sensory processing for: Vision, Hearing, Touch, Body Awareness, Balance and Motion, Social Participation, Planning and Ideas, and Total Sensory Systems – Ages: 2yrs. – 5 yrs.
- Miller-Kuhaneck, H., Henry, D. A., & Glennon, T. J. (2010) *Sensory Processing Measure – Preschool.* Los Angeles, CA: WPS

## Summary Information on Assessments

- **The Miller Function and Participation Scales** (Miller, 2006) takes about an hour to complete has context relevant tasks related to typical early childhood activities (postural, hand function, executive function, non-motor visual perception) Teacher and parent participation questionnaires Ages: 2.6 yrs. – 7.11 yrs.
- Miller, L. J. (2006) *Miller Function and Participation Scales Examiner's Manual*. San Antonio, TX: The Psychological Corporation

## Summary Information on Assessments

- **The Developmental Test of Visual Perception II** (Hammill, Pearson, and Voress, 1993) takes 30 -40 to administer. Subtests include items from both visual-motor and non-motor visual perception: Eye-Hand Coordination, Copying, Spatial Relations, Position in Space, Figure Ground, Visual Closure, Visual-Motor Speed, and Form Constancy – Ages: 4 yrs. – 10 yrs.
- Hammill, D. D., Pearson, N. A., & Voress, J. K. (1993). *Developmental Test of Visual Perception (2nd Ed)*. Austin, TX: Pro-Ed.

## Summary Information on Assessments

- **The Beery-Buktenica Developmental Test of Visual Motor Integration, 6th Ed.,** (Beery and Beery, 2010) a visual motor line and geometric design copy test – has new norms for two year olds – has short form ages 2 through 7 and long form (2 yrs. – 18+) - also includes a supplemental visual perception and motor subtest on the same VMI forms – manual includes developmental milestone information on gross motor, fine motor, visual perception and visual motor skills that may be helpful to teachers/parents
- Beery, K. E. & Beery, N. A.(2010) *The Beery-Buktenica Developmental Test of Visual-Motor Integration (6th Ed).* San Antonio, TX: Pearson Education.

## Summary Information on Assessments

- **Wide Range Assessment of Visual Motor Abilities (WRAVMA**) (Adams and Sheslow, 1995).The WRAVMA takes about 30 min. to administer and includes 3 subtests: Drawing (copying lines/geometric shapes), Matching (non-motor visual spatial- find the correct visual design) and Pegboard (fine motor accuracy and speed test) Ages: 3 yrs. – 17 years
- Adams, W. & Sheslo, D. (1995) *Wide Range Assessment of Visual Motor Abilities.* Wilmington, DE: Wide Range, Inc.

## Applying Evaluation Information

- Following the OT evaluation and decisions regarding IEP goals, intervention activities can target specific areas of need related to pre-writing components
- Develop activities that can easily be embedded into the curriculum and that target pre-writing component skills
  - Scooter board
  - Obstacle courses
  - Play dough
  - Balls and bean bags
  - Easel
  - Manipulatives

## Example of Activity

- **Obstacle course:** belly crawl up incline mat (bilateral arm, core, motor planning, directional concept of 'up'), roll down other side (changes plane of position from vertical upright, directional concept of 'down'), then move on mat to find magnetic letters that are in name (print/alphabet awareness, figure-ground, crossing midline) gather letters in hand (precision grip, in-hand manipulation) stand up and place letters on easel (wrist extension, developing skilled side of hand, sequencing letters)

## Gross Motor and Motor Planning

- Why? Kids today may need more emphasis on activities that include anti-gravity positions (especially prone) for core control, movement of the head and body through different planes in space (other than upright vertical) for awareness of directional concepts related to body movement through space, and weight bearing through the arms and hands to develop separation and control of shoulder, elbow, wrist, and thumb, and the radial and ulnar side of the hand
- Scooter board games, obstacle courses, rolling, crawling, prone over roll walking on hands, animal walks, ball activities, pushing against objects, pushing backward on scooter, wall push ups, pulling self along rope on scooter, playgound

## Scooter Board Play

## Obstacle Course

## Bilateral Arm and Hand Use; Lead and Assist

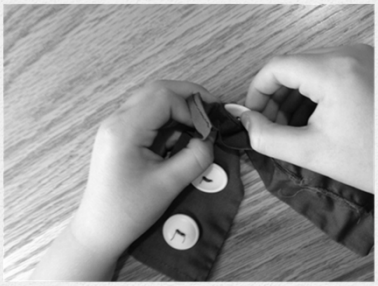
- Why? Most activities require the use of both hands together (pushing a cart) or one hand holding and the other manipulating (cutting out a shape with scissors) In pre-writing, the assist arm starts to hold the paper while the moving hand controls the crayon – some children may seem to ignore using one hand as an assist, others may not cross midline
- Pushing cart, hitting suspended ball with cardboard tube held in both hands, holding parachute, following arm/hand movements of songs or hand clapping rhymes, cooking – stirring, passing the ball with both hands, imitate movements with hula hoop, musical instruments – drums, lifting and carrying

## Pushing a Cart

## Pushing Against a Ball

## Arm Pushing Against Vertical Surface

## Bilateral Hand Manipulation Activity



## Lead and Assist Hand Activity

## Tactile and Kinesthetic Awareness of Hands

- Why? Contributes to the position of the hand and the amount of force used to grasp the writing tool and stabilize the paper, as well as hand movements. Some kids may not be aware of the position or action of the assist hand when they can't see it (cutting with a scissor activities); other kids may avoid pre-writing activities like sand trays, finger paints, or shaving cream because they don't like the feel of the media
- Consider hyposensitive or hypersensitive responses to tactile media when planning activities (play dough, water table with variety of media, trays with paint, rice, sand), handling different weighted objects, finger play songs, sign language, tissue paper tearing, hitting therapy ball like a drum, pushing therapy ball

## Activity for Tactile/Kinesthetic Awareness

## Tactile, Kinesthetic, and Bilateral Hand Activity

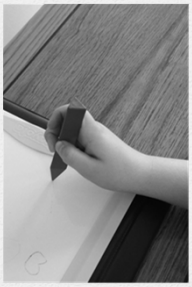
## Efficient Grasp of Tools

- Why? Grasp and tool use proceeds in the sequence of: primitive, transitional, and mature. A power or precision grip may be used depending upon the nature of the task. Some kids rely on a primitive, power grip for grasping a crayon or holding a spoon; kids with instability at the wrist and thumb joints may perform many fine motor activities with thumb adduction and hyperextension of the distal thumb joint, or they may continue to hold their thumb in a downward position or when using a spoon or cutting with a scissors
- Pulling out pegs and chips, dot markers, threading, work at easel, play dough

## Palmar Grasp

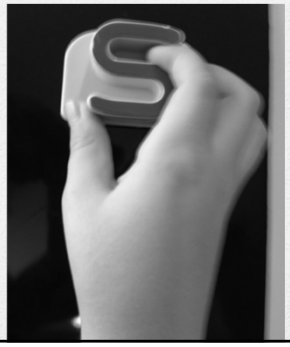
## Inefficient Grasp

## Weak Hand Grasp



## Weak Hand Grasp Improved

## Use of Magnetic Letters



## Static Tripod Grasp

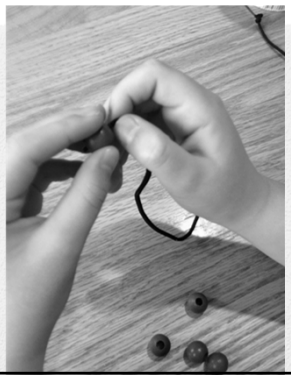
## Manipulation

- Why? Need to develop independent thumb and finger use, hand arches, and skilled side and stable side of the hand to hold and reposition tools, and to move objects within the hand without dropping them
- Play dough pizzas (flattening, rolling, forming large and small balls), squirt bottles, pennies in the bank, holding pegs in hand and placing them, fasteners, paper punch, tongs, dice, piano

## Individual Thumb and Finger Movement

## Pulling Out Peg

## Use of Both Hands



## Reinforcing Use of Assist and Lead Hand

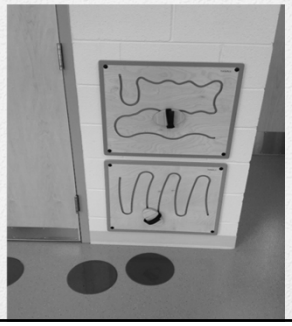
## Pulling Out Chip Reinforces Open Web Space

## Reinforces In-Hand Manipulation Skills

## Visual Motor Integration

- Why? Copying lines and shapes has been consistently linked with beginning printing and readiness for printing instruction - dependent upon visual attention to hands, tasks, and objects, requires visual-spatial analysis (perceiving a square, then copying it), and requires both motor planning and coordination
- Lacing cards, stringing beads, driving toy car between lines (roads), connecting dot pictures, tracing around a shape, copying block designs, simple mazes – note tracing around letters may not be effective way to teach motor plan – however, certain iPad apps provide auditory feedback for start and stop places in letter tracing

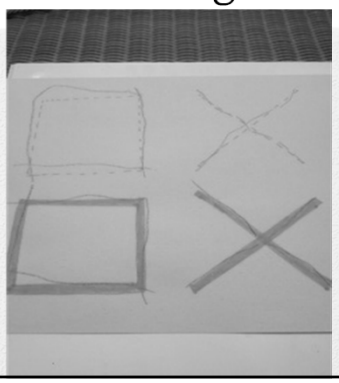
## Large Arm Visual Motor Task



## Draw-A-Person

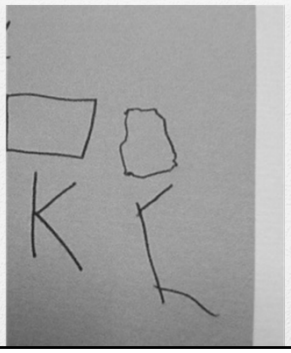

## Imitation

## Tracing



## Tracing

## Copying



## Learning Directional Concepts

- Why? To prepare the young child for more formal writing instruction in Kindergarten that requires following motor directions (start at the top, go down, go half-way up and circle around) the child must start to have experience with directional concepts related to self, movement in space, and among objects in space – child begins with directional concepts related to self
- Activities: obstacle courses, Simon Says, block building, scooter boards, playground equipment (swing, slide, climb over and under and in between), riding bike around obstacle course

## Learning New Motor Actions

- Why? To prepare for formal printing instruction in Kindergarten, each letter (that has not been previously learned) will require the child to follow directions for a novel motor task and develop a motor plan to print the letter – feedback from the results will help the child alter the plan as necessary – eventually with practice, the letter will be printed with less conscious effort
- Activities: Novel obstacle courses, novel ways to use gross motor equipment and fine motor toys, follow the leader with motor actions, switch leader and follower, encourage novel actions in outdoor play

## Orientation to Print

- Why? Child begins with scribbling, but gradually demonstrates awareness that there is a difference between printing and drawing – needs a lot of exposure to printed materials, letters, and numbers and time to experiment with the typical course of early 'writing.'

## Summary

- After it is all said and done, the best preschool programs provide lots of opportunity for various types of play and exploration of media; time to listen to music and 'dance', time to ride bikes, swing, slide, and climb; time to build with blocks, look at books, and listen to a story; time to experiment with paints, crayons, chalk drawings, and 'writing'; time for 'dress-up', 'cooking', water, sand, and play dough, and most important of all: time for fun

## Resources


- Benbow, M. (1999) Activities to Develop Hand Skills in Young Children/Fine Motor Development Kit. Columbus, OH: Zaner-Bloser.
- Benbow, M. (2006) Principles and practices of teaching handwriting. In A. Henderson & C. Pehoski (Eds.) Hand Function in the child: Foundations for remediation (2nd ed, 321-342) St. Louis: Mosby/Elsevier.
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- Dankert, H. L., Davies, P. L. & Gavin, W. J. (2003) Occupational therapy effects on visual-motor skills in preschool children. AJOT, 57, 542-549.
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- Isbell, C. (2010) Mighty fine motor fun: Fine motor activities for young children. Silver Spring, MD: Gryphon House, Inc.

# Resources


- McClesky, J. (2002) First Strokes Multi-Sensory Print Program Instructor's Manual.(www.thehandwritingclinic.com)
- Olsen, J. Z.& Knapton, E. F. (2006) The Print Tool: The TOOL to evaluate and remediate. Cabin John, MD: Handwriting Without Tears (www.hwtears.com)
- Pape, L. & Ryba, K. (2004) Practical Considerations for School-Based Occupational Therapists. Bethseda, MD: AOTA Press.
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# Resources


- Sheets, L. (2005) Handwriting PEP: Building basics. Seneca, WI: Paperwork Literacy
- Vreeland, E. (1998) Handwriting: Not just in the hands. Springfield, NH: Maxanna Learning Systems