



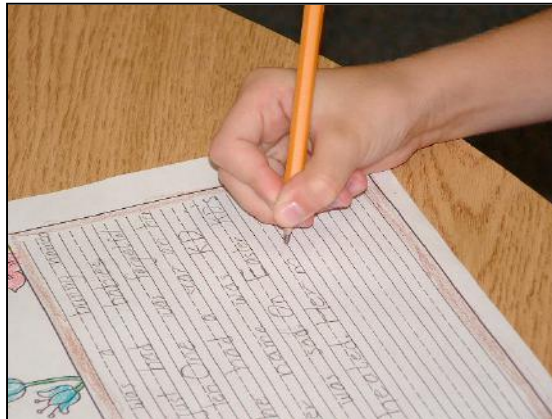
Presents

The Write Stuff

Developing Fine Motor Skills & Handwriting in Students

by:

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I. Introduction

- a. About the presenter
- b. Course Objectives
- c. Importance of Hands
- d. History of Hands
- e. Decrease in Hand Skills
- f. Increase in Curriculum Demands

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- g. Desperate Pencil Grip

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- c. Let's Take a Look

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XII. Summary

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- b. Pre-writing skills (developmental strokes)
- c. Holding a pencil
- d. Teach Handwriting

XIII. Other

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- b. Resources
- c. Glossary of terms

THE WRITE STUFF COURSE OBJECTIVES

The participants will learn the following objectives:

- Understand the stages of hand development
- Understand the importance and relevance of hand development to the occupation of school performance in students
- Recognize and apply necessary pre-writing skills
- Learn how to develop pre-writing and handwriting skills in young students
- Define and identify components for developing good handwriting
- Learn to identify and problem solve fine motor delays in students
- Discover and implement therapeutic fine motor activities for the classroom
- Learn how to link fine motor activities to IEP and academic goals
- Understand terminology in order to collaborate with the school occupational therapist

History of Hands

- **The CMC Joint**
- **Cavemen and Tools**
- **Era of Crafts**
- **Industrial Age**
- **Technological Age**



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- Thumb opposition led to tool making
- Tools develop hands
- Hand skills develop Occupations
- Occupations develop people
- The CMC joint

A Child's Occupation

A Child's occupation is:

- PLAY
- SCHOOL
 - Both bring about cognitive, motor, social, and emotional development

How have the dynamics of PLAY changed and what impact are they having in today's children?

Decline of Hand Skills

- **Passive Entertainment**
- **SIDS**
- **Baby Carriers**
- **Benign Changes in the environment - Benign changes in the environment - we should be aware of what they are and how they impact human development!**

Sample Curriculum Demands
Kindergarten Language Arts
Excerpts from Lewisville ISD Curriculum Fall 1998

The following is a sampling of a Kindergarten curriculum:

Objective:

Write original texts to learn and develop the foundations of writing.

- Write messages, stories, labels and notes
- Use tools to compose text - pencil, technology
- Generate ideas before writing on self-selected and assigned tasks

FIRST SIX WEEKS

Key Concepts:

Listen, speak, express ideas, dictate stories, print awareness, respond to stories

Texas Essential Knowledge and Skills:

Writing/spelling/penmanship. The student develops the foundations of writing.

- The student will write his/her own name and other important words.

SECOND SIX WEEKS "Print Rich, Print Wise"

The students will continue to be given opportunities to write independently and during shared writing, which will include activities such as labeling of charts and pictures.

Overarching Processes:

Purposeful listening and speaking
Effective communication
Phonological awareness
Letter-sound knowledge
Vocabulary development
Comprehension strategies

Extensive writing

Key Concepts:

Print awareness, writing experiences

Texas Essential Knowledge and Skills:

Writing/Composition. The student composes original texts.

- The student will write labels, notes, and captions for illustrations, possessions, charts, centers.

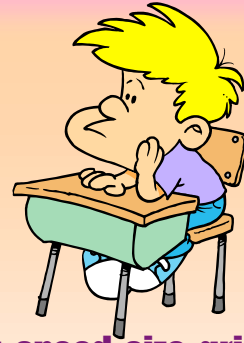
IDEAL World Curriculum Handwriting Expectations

<u>Grade</u>	<u>Instruction</u>
Kindergarten	Pre-writing skills Introduction to Manuscript
First Grade	Manuscript Instruction Numerals 1-9
Second Grade	Review and Refinement of Manuscript Speed of Manuscript
Third Grade	Review of Manuscript Introduction to Cursive
Fourth Grade	Review and Refinement of Cursive/Manuscript Speed of Cursive
Fifth Grade	Review of Cursive/Manuscript in Content Connecting of Letters Speed Self-Evaluation of Skills
Sixth to Eighth	Review of Cursive/Manuscript Speed Development of personal Style Self-evaluation skills

Maxanna Learning Systems 1998

What You See:

- **Manipulation/avoidance**
- **Poor fine motor skills**
 - decreased precision, speed
- **Poor Handwriting/Drawing**
 - messy, dark or light, spacing, speed, size, grip
- **Poor coloring skills**
- **Ragged cutting**
 - Flaring of fingers
- **Desperate Pencil Grip**
- **“Soft” hands**



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- Other:
- Flat hands
- squeezing pencil
 - Closed web space
- Movement from shoulder, not fingers
- Slow, labored writing
- Proximal Instability:
 - Falls out of chair
- Slumps
 - Props head

Try this exercise. You will be given six handwriting samples on the next few pages. Try to match the given six diagnoses to the appropriate handwriting sample.

Handwriting Sample (A - F)

Diagnosis

ADHD

Emotionally Disturbed

Fine Motor (mild CP)

Learning Disability

Emotionally Disabled

ADHD

What is the **Write Stuff** for writing?.....

The Write Stuff includes all of the developmental components necessary for being able to accomplish the complex task of handwriting.

Hand structure, sensory processing and visual processing are all required components for the skill of writing. These are the building blocks for being able to write letters. Without them, students will compensate and learn bad habits. **Handy Learning®** addresses these foundational skills by providing the young student with fun activities designed to build The Write Stuff for handwriting.

The student needs to develop the following to adequately control his/her pencil with precision and ultimately produce legible handwriting:

The Foundation:

Proximal Stability

Proximal is a term that means "towards the center" or the midline of the body. Trunk muscles work together to create an upright and stable posture so that the fingers have a solid platform to develop precision movements. This stable base is provided through proximal stability of the trunk and shoulder.

Distal Mobility

Distal means towards the extremities or ends of our body, like the fingers. When a student writes letters by moving the pencil with the fingers, they are demonstrating "distal mobility". Distal mobility can not be achieved without proximal stability as a platform.

Dissociation-

The Hand-Mouth association -

"Mobility on Stability"

Hand Function & Structure

Joint Stability

Proximal stability is supported by the joints of the hand and fingers. Joint laxity or "double jointed" makes for decreased stability in the hand.

Hand Arches

Like the foot, the hand has arches. These arches provide stability within the hand so that refined movement at the fingertips can be accomplished. Without stability, the hand is "floppy" or "soft". The hand arches provide a stable platform to perform controlled movement at the fingers.

- Three Arches
 - Transverse Distal
 - Transverse Proximal
 - Longitudinal

What is the function of hand arches: _____

HAND MUSCLES: (skip to anatomy section)

Intrinsic Hand muscles

These muscles are located inside the hand and do not cross the wrist. They are the fine, small muscles of the hand that allow for precision and control.

Extrinsic Muscles

Extrinsic muscles are the muscles located outside the hand. These muscles are in your forearm but have tendons that cross the wrist. Extrinsic muscle development is important to maintaining stable wrist extension during fine motor tasks.

Thenar Eminence

The thenar eminence is the main muscle belly of the thumb. It is considered a "skilled" muscle rather than a "power" muscle. It allows for thumb opposition. It is the main muscle for holding and moving a pencil in a tripod grasp.

Thumb Function

Movements -

- Opposition
- Abduction

Need or function:

- Web-space
- Stability
 - CMC
 - MP

Hand Separation

The hand has two sides with two different functions. The development of hand separation is important for fine motor control. One side, the pinky and ring finger offers stability. These fingers are often tucked or curled into the palm when performing fine motor tasks to provide stability. The other side, the thumb, index and middle finger, perform the precision and manipulation skills such as writing with a pencil or buttoning a button.

Hand Separation and Cutting -

Wrist Extension

Wrist extension is the best position for hand function. Wrist extension is when the hand is slightly bent upwards (the back of the hand towards the forearm). Stable wrist extension facilitates refined movements and control at the fingertips. Having students write, color or paint on a vertical surface promotes proper wrist extension.

Pronation/Supination

The ability to turn the palm upwards towards the ceiling is called supination. Turning the palm down towards the floor is pronation. Positioning the hands in partial supination during fine motor tasks is considered a mature motor pattern, while a pronated hand position during fine motor tasks is considered more primitive.

Sensory Processing

Proprioception

Like kinesthesia, proprioception is the ability to feel one's own body position in space. There are a multitude of nerve endings in our joints called proprioceptors. These receive input when the joints are compressed from gravity, deep pressure or heavy work activities like jumping.

Vestibular

The vestibular sense is activated through our inner ear and helps us with balance, movement sense and allowing us to know where our body is in space. It is stimulated by swinging, riding a bike, jumping on a trampoline or any other movement that activates the inner ear. Our vestibular center helps us organize and interpret sensory information.

Tactile Discrimination

Tactile discrimination is the ability to feel and discriminate tactile qualities. The hands have many touch sensors in the palm. This sense of touch and the ability to interpret it accurately is integral to performing fine motor tasks.

Kinesthesia

Kinesthesia is the ability to feel one's own body as it moves through space. Body awareness in space is integral to developing concepts such as boundaries and visual perceptual skills.

*****Extra Material*****

Crossing Midline

This is the ability to cross over an imaginary line running through the center of our body. A child with midline problems will often switch hands depending on which side the marker or crayon is placed. The ability to cross midline is important in developing efficient motor patterns as well as being able to draw letters. A student with midline problems will draw a cross by drawing the horizontal line as two separate lines, one on each side of the vertical line.

Bimanual Hand Use

The use of both hands in a lead-assist relationship. Usually one hand stabilizes the task (holds the paper) while the other manipulates the task (cuts the paper).

Bilateral Integration

Bilateral integration is a sophisticated combination of sensory processing. If the student's sensory processing is developed properly, the student will be able to coordinate the two sides of the body to accomplish functional tasks.

Motor Planning

Motor planning is the ability to perform a novel motor task without difficulties and transfer the learned movement patterns to a new task. Motor planning is required to learn and remember any new task.

Visual Processing

Visual Acuity

Visual acuity is the ability to see things clearly. It includes distance and close vision as well as depth perception.

Visual Perception

Visual perception is the ability to see, discern and recognize shapes visually. If a student does not accurately perceive a square, then he can not draw a square. The student uses visual perception to recognize subtle differences between letters such as an "f" versus a "t" or a "t" and an "x".

Visual Motor

Visual motor skills are the ability to draw or reproduce what one sees. Visual motor skills are also involved in activities such as copying block configurations, tracing along a maze, and cutting along a line. Without visual-motor skill development, the student can not be expected to write letters.

See page 43 for Developmental Strokes

Hand Anatomy

Joints and Bones

- Forearm
- Joints of the Hand
 - Carpals
 - Metacarpals
 - Phalangeals

Muscles of the Hands

- Extrinsic
 - Cross the wrist
 - Two “sets”
 - Palmer = finger/wrist flexion
 - Dorsal = finger/wrist extension
 - Power muscles
- Intrinsic
 - 3 primary sets
 - Interossei - 2 sets
 - Lumbricals

Thumb Muscles

Abductor pollicis brevis
Flexor Pollicis brevis
Opponens pollicis

Adductor Pollicis

Peripheral Nerves

Ulnar nerve
Median nerve

NEUROLOGY - THE BRAIN AND THE HAND

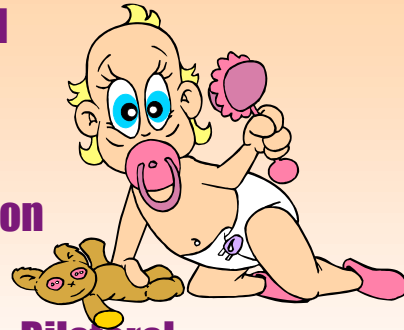
- Resting EMG

- Mylenization

(See Handwriting Warm up activities in back of workbook)

Hand Development

- Reflexive to volitional
- Cephalo-Caudal
- Proximal to Distal
- Pronation to Supination
- Ulnar to Radial
- Bimanual - Unilateral - Bilateral



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IN-HAND MANIPULATION SKILLS

Translation

Shift

Rotation

In-Hand Manipulation Skills

- Equal = Intrinsic muscle development
- Develop between the ages of: _____
- Key to _____
- Difficult to target through activity

"DEVELOPMENTALLY SEQUENCED HAND ACTIVITIES
SHOULD BE THE MAJOR FINE MOTOR FOCUS IN
PRESCHOOLS AND EARLY ELEMENTARY EDUCATION"

--Mary Benbow, OTR

Handy Learning[®] Activities

The following *Handy Learning[®]* activities are listed and arranged in the notebook in alphabetical order:

CHALKBOARDS
CLOTHESPINs
CUTTING KIT
FEEL N' FIND
FINISH THE PICTURE LACING CARDS
HOLE PUNCH
LITE BRIGHT
MACARONI BIN
MAGNADOODLE
NUTS N' BOLTS
PEGBOARD RESOURCE SET
PLAYDOH FUN
SQUIGGLE PEN
STAMPS
STENCILS - GIANT
STENCILS - LARGE
STEREOGNOSIS BOX
STRAW CONNECTORS
STRINGING BEADS
TABLE-TOP EASEL
TACTILE BINS
THERAPUTTY
TONGS
TOOTHPICKS AND STYROFOAM
WATER PLAY
WIKKI STIX

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CLOTHESPINS

Description of Activity: Clothespins must be held correctly to strengthen the correct muscles. Please refer to photographs.

Clothespins can be used in a variety of ways. Here are a few suggestions:

- Use clothespins to attach matching cards together
- Write letters on ends of clothespins and have students spell words by clothes pinning on the edge of an upright umbrella
- Create a cardboard dinosaur and have the students place clothespins on the dinosaur back to create the dinosaur "spines and horns"
- Have students sort shapes by clothes pinning like shapes together
- Have students clothes pin items from smallest to largest
- Have students hang up play clothes with clothespins and sort according to color or attire (pants, shirts, jacket, etc.)
- Have students sort and clothes pin pieces of clothes by texture
- Have students pick up items with clothespins as you would tongs
- Place a number on the outside of a coffee can. Have students place correct amount of clothespins around the lip of the can.
- Write numbers or letters on the clothespin itself. Have the student put the clothespins on a sheet of cardboard in sequential order. Cues can be written on the cardboard if needed.
- The provided clothespins are colored. Create a color pattern for the student to repeat.

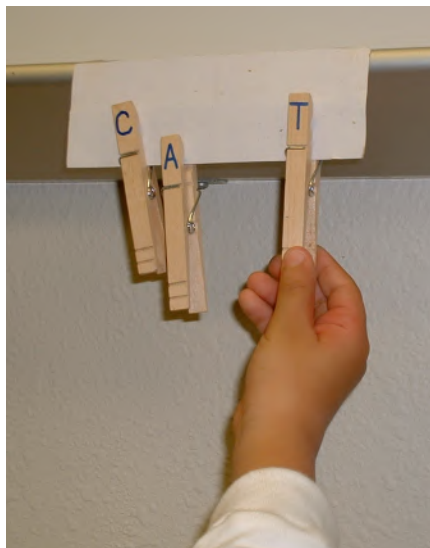
CLOTHESPINS, continued

Developmental Goals:

- Colors
- Shapes
- Matching
- Sorting and Grouping
- Numbers and Letters
- One-to-one correspondence/Counting
- Sequencing and Patterning
- Seriation (small to large, etc.)
- Descriptive Qualities (with fabrics -soft, fuzzy, checkered, polka-dotted, etc.)

Fine Motor Development:

- Hand separation/arches
- Intrinsic muscle development
- Thumb opposition
- Motor sequencing
- Visual-perception (matching shapes, etc.)
- Forearm supination/pronation



ACTIVITIES BY COMPONENTS

Activities for Pronation/Supination:

- Pouring
- Cutting
- Cupping & carrying,
- Eating
- Clothespins
- Nuts n Bolts

Activities for Hand Separation/Arches:

- Tongs
- Cutting
- Make-up Wedges
- H2O play
- Broken Crayons
- Clothing Fasteners
- Stringing beads
- Lite Brite
- Theraputty
- Multi-pegs
- Toothpicks

Activities for Wrist Extension:

- Lite Brite
- On a vertical surface:
 - Magnadoodle
 - Chalkboard
 - Painting with a brush
 - Pegboard Designs
 - Stencils

Activities for Grasp Patterns

- All of the above
- Macaroni
- Broken chalk/crayons

SCAVENGER HUNT

1. Find the tool that exercises the skilled triad muscles of the thumb with resistive opposition. _____

2. This child has problems motor planning and sequencing the task of cutting. What two tools would you have this student use to develop cutting skills?
 - _____
 - _____

3. Find two manipulatives that facilitate a tripod grasp.
 - _____
 - _____

4. You want your student to learn upper and lower case letters by matching them. Which fine motor activity could facilitate this?

5. List three activities that could be used to teach left-to-right progression:
 - _____
 - _____
 - _____

6. This student has poor intrinsic hand development with reduced in-hand-manipulation skills. If you were to set up two centers, what activities would they include?
 - _____
 - _____

7. The student requires an activity to promote pronation/supination. List two activities:
 - _____
 - _____

8. Find an activity (or two) for simple rotation: _____

What Makes an Activity Good?

- **Proximal Stability**
- **Wrist Extension**
- **Pronation/Supination**
- **Hand separation/arches**
- **Variety of Grasp Patterns**
- **Goal Oriented**
- **Size**



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Proximal Stability

- **Weight bearing**
 - arch development
 - intrinsic muscle development
- **Vertical surface**
 - wrist extension
 - Shoulder stability



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ACTIVITY: Mirror Game

Vertical surfaces pull thumb into opposition

Vertical surfaces imposes wrist extension

Imposes stabilization at the shoulder

Working on floor facilitates co-contraction of the shoulder muscles along with wrist extension

Pronation/Supination

- **Primitive to Mature patterns**
 - hand over hand assist
- **Clothespins**
- **Cutting**
- **Pouring from hands**



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Clothespin

- target must be positioned **at or above** the child's eye level to promote supination and proximal stability.
- Do not allow lateral pinch

Cutting

- Move the child away from the table



Hand separation and arches

- tongs
- scissors
- make-up wedges
- pincer games
- eye droppers
- squirt bottles
- broken crayons/chalk
- fasteners
- ziploc bags
- small beads
- Squirreling
- Lite Brite
- Playdoh hide-n-seek
- Clothespins

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Tong positioning -

- under the hand = working hand arches
- Above the hand = intrinsics and thumb adduction/abduction

Scissors Positioning

- Index finger guides and stabilizes
- Make-up wedges to prevent finger flaring

•What is Squirreling?

What Makes an Activity Good; Part II

- **GOAL Oriented**

- **Size**

- Set-up the Environment
- Positioning
- Degree of Intervention

Therapeutic Use of Self

Part II

School Related Skills

- Cutting
- Holding a Pencil
- Handwriting

Specific Skills- (a review in context)

- **Tripod Grasp**

- Web space
- arches
- thumb opposition
- hand separation
- joint stability
- wrist extension
- pronation/supination
- distal control
- postural stability
- sensory feedback

- **Cutting**

- Web space
- arches
- thumb opposition
- hand separation
- wrist control
- Pronation/supination
- proximal stability
- visual motor skill
- bimanual skills



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CUTTING

To facilitate cutting:

- tongs
- strawberry hullers, picklers, tweezers
- Make-up wedges - positioning MIDDLE FINGER AND THUMB
- Spring loaded scissors
- Cutting straws

CUTTING KIT

Description of Activity: Students cut various media according to skill level to develop cutting skills. Media is roughly graded from easiest to most difficult as follows. Lines can be added to any of the media to increase visual-motor skills.

- Cutting straws
- Snipping Playdoh
- Snipping Index cards
- Cutting card stock strips 1" in width
- Cutting index cards
- Cutting half page of card stock
- Cutting full page of card stock
- Snipping regular paper
- Cutting half page of regular paper
- Cutting regular paper



Generally, the thicker and the smaller the media, the easier it is for the child to cut. Benbow scissors are highly recommended to encourage proper hand placement during cutting. See your campus OT to acquire these scissors.

Developmental Goals:

- Manipulate school tools
- Sequencing (motor)
- Visual-motor skill development

Fine-motor Development:

- Eye-hand coordination
- Bilateral Integration/Sequencing
- Hand separation

Suggested Positioning: Do not allow the child to stabilize their trunk against the table or to prop their arms on the table during cutting. Elbows should rest at their side and not be stabilized against their trunk. The dominant hand should be in wrist extension NOT flexion. The assist hand should hold the paper with the palm side up.



Specific Skills- (a review in context)

• Tripod Grasp - Web space - arches - thumb opposition - hand separation - joint stability - wrist extension - pronation/supination - distal control - postural stability - sensory feedback	• Cutting - Web space - arches - thumb opposition - hand separation - wrist control - Pronation/supination - proximal stability - visual motor skill - bimanual skills
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TRIPOD GRASP

To facilitate tripod grasp:

- broken crayons/chalk
- chalkboard (vertical surfaces pulls thumb into opposition)
- etch-a-sketch, light bright, small pegs, lacing cards, macaroni in top

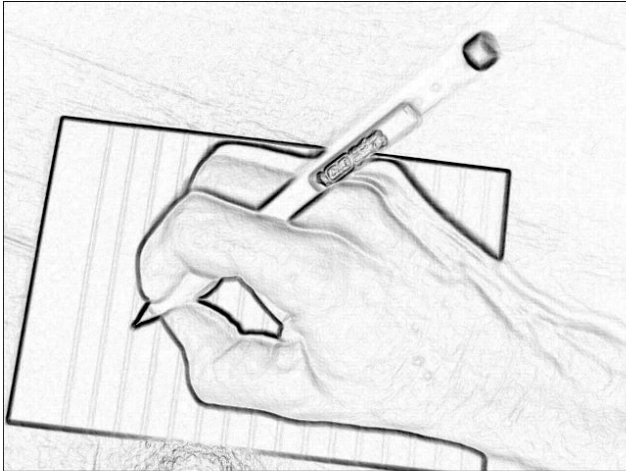
A word about pencil grips

- BE CAUTIOUS WITH PENCIL GRIPS
- The Writing Claw works! www.writingclaw.com

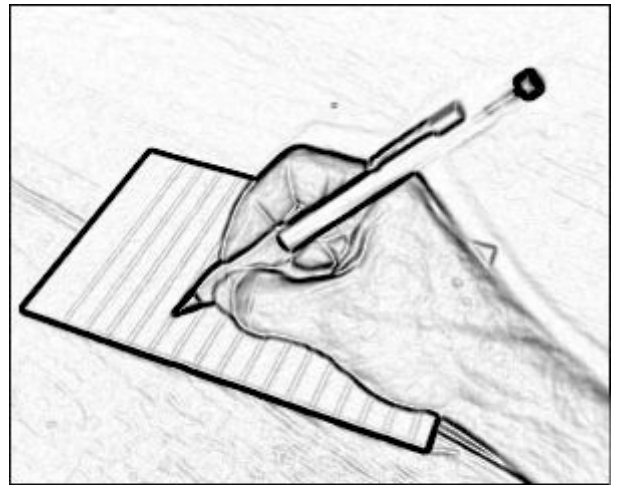
(Adapted from Mary Benbow, OTR – Efficient and Inefficient Pencil Grasps)

Acceptable Pencil Grasps

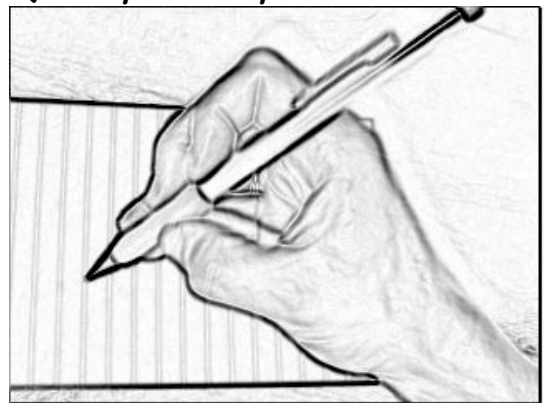
Adapted Tripod Grasp



Tripod Grasp

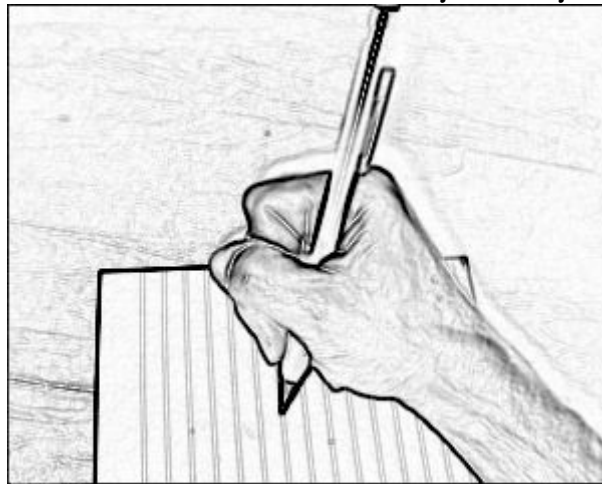


Quadropod Grasp

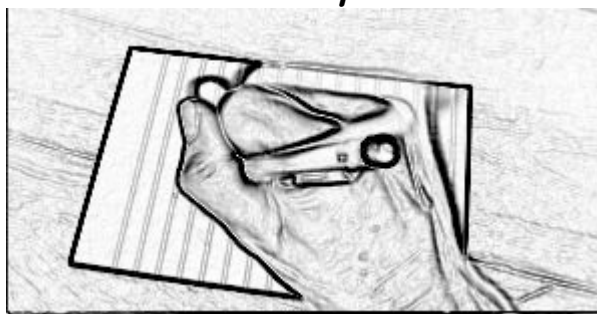


Less Acceptable Pencil Grasps

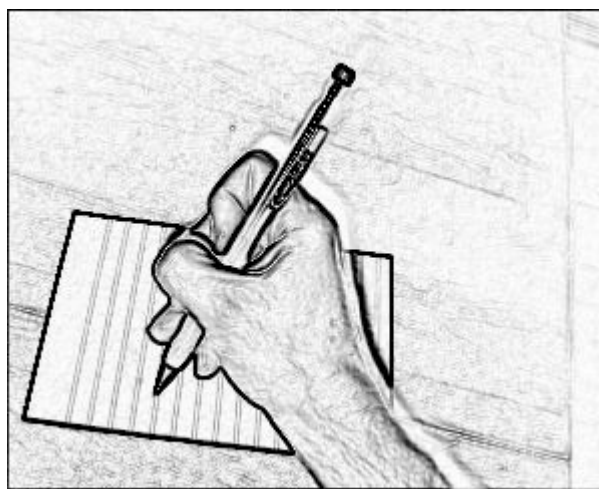
Thumb Wrap Grasp



Lateral Pinch Grasp

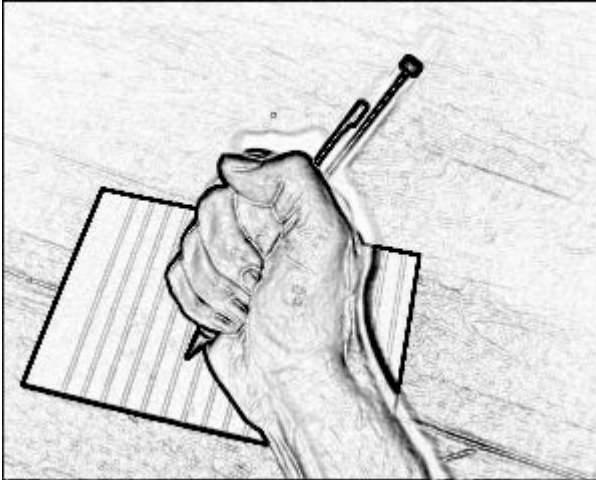


Index Hook Grasp

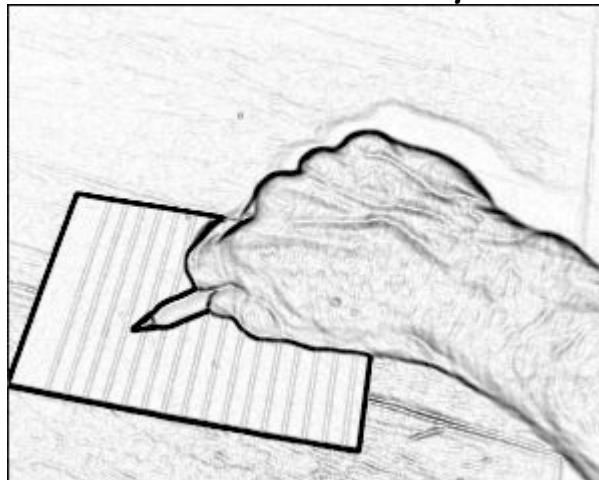


Primitive Pencil Grasps

Palmar Grasp



Pronated Grasp



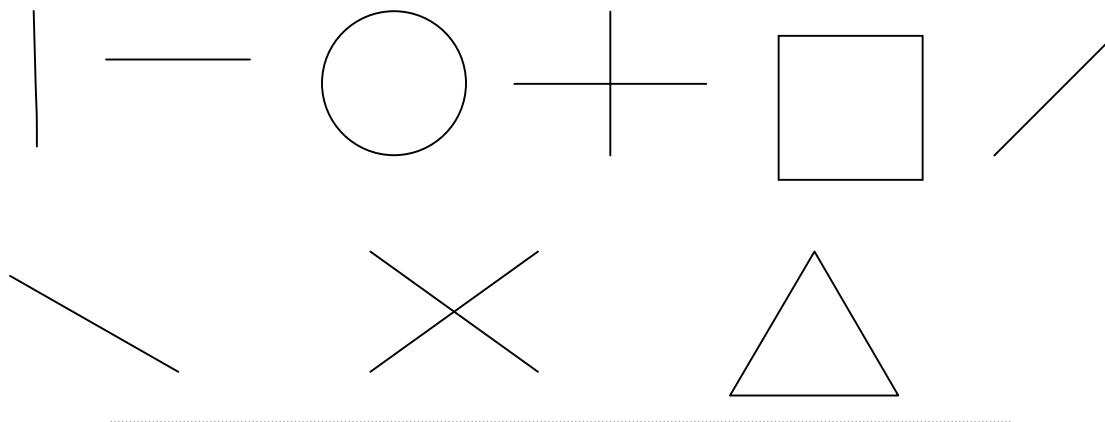
A Word About Paper

- What Paper is your teacher using?
- What paper works best (see pages in back of workbook)
- Empathy exercise - large paper for adults

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Developmental Strokes

Developmental strokes are basic drawings that a student should be able to perform before expecting them to write letters. The **nine Developmental Strokes are below**. Diagonal strokes, such as those in the "x" are the last to develop and are therefore, the most difficult.



According to research, the ability to draw these nine developmental strokes has a strong correlation to the ability to write legibly.

Daily use of the ***Handy Learning***[®] program has proven to be effective in developing the foundational hand skills needed for students to be successful with handwriting. In a pilot case study, after daily exposure to the ***Handy Learning***[®] program, 95% of students with disabilities were able to naturally (without instruction) hold their pencil with a tripod grasp and were able to draw developmental strokes by age 5.

Use *Handy Learning*[®] to promote the Write Stuff!

THE DEVELOPMENT OF DRAWING

Shift from constructional to contoured forms between ages 3-7 years old.

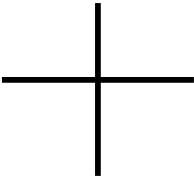
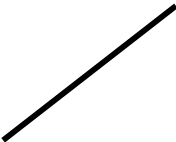
<u>Age in Years</u>	<u>Skill</u>
2-3	Scribbles with no intent
3-4	Interprets after drawing something
4-5	Drawing announced <u>before</u> drawing is attempted, but desired outcome is difficult.
6-7	Includes all characteristics of the desired object
8	Includes visual perspective, position & orientation.

(Ziviani, 1995)

PRE-WRITING WORKSHEET

Copy each shape in the space provided.

Adopted from *Look, Write & Remember*. Scholastic Professional Books: Harcourt Brace

Pre-writing Skills

The mastery of handwriting requires development of pre-writing skills. Addressing these skills through activities, play, and instruction will help build a strong foundation for handwriting. By the latter half of kindergarten, most normally developing students have developed the pre-writing skills needed for handwriting (Weil & Amundson, 1994). These skills include:

- An established hand dominance for coloring, drawing, or using a fork.
- The ability to cross the midline of the body.
- A functional pencil grasp.
- An understanding of directional terms and the ability to recognize similarities and differences in forms.
- The ability to copy basic lines and shapes.
- The ability to use two hands in an activity.
- The ability to coordinate eyes and hands together.
- The ability to maintain an adequate sitting posture.
- Orientation to print.

Activities to promote these and other underlying skills can be easily incorporated into the school day.

Vreeland, E. (1998) Maxanna Learning Systems

Handwriting Performance Components

Handwriting is a complex perceptual, cognitive, and motor skill. It requires many underlying performance components:

Sensory/Motor:

Cognitive:

Psychosocial:

Handwriting Performance Components

Handwriting is a complex perceptual, cognitive, and motor skill. It requires many underlying performance components:

Sensory/Motor

- Body and Spatial Awareness
- Laterality
- Directionality
- Visual Perception
- Visual Motor Integration
- Postural Stability
- Postural Control
- Proximal Stability
- In-Hand Manipulation
- Hand Separation
- Hand Strength
- Movement and Position Awareness
- Motor Planning
- Ocular Motor Control
- Bilateral Integration
- Eye-Hand Coordination
- Sensory Integration
- Tactile Discrimination

Cognitive:

- Memory
- Attention
- Orientation to Letters
- Sequencing

Psychosocial:

- Self Esteem and Concept
- Social Interaction
- Values

Vreeland, E. (1998), Maxanna Learning Systems

The Ergonomics of Handwriting

Adopted from: Vreeland, E. (1998), Maxanna Learning Systems

Ergonomics is the science of adapting the work space or work conditions in order for the worker to be successful.

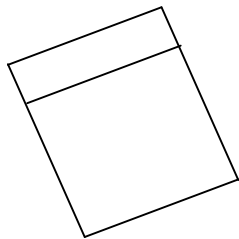
Writing Posture:

A comfortable and upright sitting posture needs to be reinforced. The chair should allow the student to sit with his/her feet flat on the floor, back to the chair and knees and hips flexed at 90 degrees. The desk should be at a height that allows the arms to rest comfortably (about two inches above the elbow).

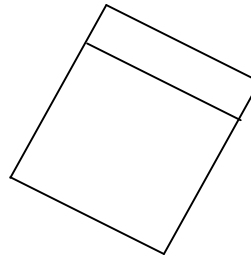
- **This posture is dependent on having a chair and desk that fit properly.**
- **Only then will the child have appropriate proximal stability for the refined and challenging skill of writing!**

Paper Position:

For cursive, paper should be slanted about 30 degrees to the left for right-handers and 35 to 45 degrees to the right for left-handers (Levine, 1991). When the paper is angled correctly, it will be parallel to the writing hand when the hands are held at midline. Another way to remember this is that the lower left-hand corner (for right-handers) point to the student's belly. For left-handers it is the lower right-hand corner of the paper. A time-saving step is to have masking tape or a stencil mark the correct slant to that students have a visual reminder.



Right-handed Paper Position



Left-handed Paper Position

Paper:

Research presents strong evidence that lined paper facilitates more legible handwriting for most students (Pasternicki, 1987). However, access to a variety of lined and unlined paper should be available to meet individual student needs. Beginning writers can be shown how to form letters on unlined paper and then may benefit from the use of a baseline.

MOTOR LEARNING

- **Three Stages of Motor Learning**

- _____

- _____

- _____

Writing Lesson

(an experience in the stages of motor learning)

Key:

a	b	c	d	e	f	g	h
α	β	ξ	δ	ϵ	ϕ	γ	η

i	j	k	l	m	n	o	p
ι	φ	κ	λ	μ	ν	$\omicron$	π

q	r	s	t	u	v	w	x
θ	ρ	σ	τ	υ	ϖ		
ω	ξ						

y	z
ψ	ζ

Adapted from Vreeland, E. (1998). Maxanna Learning Systems

A Production Consistency Sheet

Mary Benbow, MS/OTR

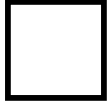
This task is designed to observe a child's aptitude to write and space words using his kinesthetic sense. A continuous line is used to duplicate the size and shape of the printed $\frac{1}{2}$ " model displayed in the upper left hand corner of a half sheet of unlined paper. Models include a square; a circle, a triangle and a cursive capital A. Instructions are for the shapes to be freely drawn and in three evenly spaced rows of five figures. ON completion of the fifteenth figure, the child is asked to close his eyes and draw a fourth row that looks and is spaced like those above. The quality of the first three rows reveals the child's visual motor control of horizontal, vertical, diagonal, and circular lines. The consistency of the fourth row is a demonstration of his kinesthetic learning potential.



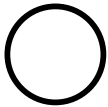
Production Consistency

Name _____ Date _____ Grade _____

Draw three rows with five shapes as pictured in the left upper corner of these half sheets of paper. Space the columns evenly. On completion of the fifteenth shape, close your eyes and draw a fourth row.



Fold here -----



Benbow, M. (2003) – Workshop

HANDWRITING TEACHING SEQUENCE

- Warm up (wake-up the neurons) - *see handwriting warm-ups (p.51)*
- "Stack your blocks"
- "Check your grip"
- Teacher models letter
- Teacher says the strokes
- Students trace on desk (or chalkboard), eyes open
- Students trace on desk, eyes closed
- Students write 10 letters/trials on paper
- **Students self-evaluate**
- Students write 20 more
- Students write eyes closed

(Benbow, 1995)

Handwriting Warm-ups and Strategies

Desk Dance - Deep pressure to arms. The students keep their arms straight and weight-bear on their desk through their arms and up through the shoulders. No bent elbows! Have them sway left and right, forward and back to music.

Hungry Tennis Ball - Students feed the tennis ball (wide slit open for the mouth). Students hold several beans in their dominant hand, and bring them to their fingertips without assistance from their other hand as they feed the ball. (hand separation and translation).

Playdoh Peas - Children roll playdoh into small balls between the index finger, middle finger and thumb. (thumb opposition, tripod grasp, hand separation, tactile discrimination).

Dancing Popeye Frog - (squeeze toy from Oriental Express; \$4.95 per dozen). Do this activity to music for repetition. Make sure students are using thumb, index and middle finger to squeeze the frog and not using a lateral pinch. (tripod grasp, hand separation, hand arches and intrinsic muscle strengthening).

Tweezers Too - Students use tweezers to pick up small items and place them into a container. Students can race or do this to music for rhythm and fun.

Macaroni Drill - Students push small elbow macaroni through a small hole in the top of a margarine or yogurt container. The smaller the hole, the more the resistance. Students can race to see who can put in the most in a timed period. (Hand separation, tripod grasp, thumb opposition).

Wet, Dry, Try (adapted from Handwriting Without Tears). Students practice each letter on their own personal chalkboard in this order:

WET - Student dip their index finger or a very small piece of sponge (1/4") in water and draw the letter with water on the chalkboard.

DRY - The student uses chalk to write the letter. Use small or broken pieces of chalk to facilitate hand separation and tripod grasp.

TRY - Now the student writes the letter on paper.

Warm-up Supplies:

Make-up wedges - children hold make-up wedges between the fourth and fifth digits during these warm-up activities to facilitate hand separation.

MANUSCRIPT LETTER GROUPINGS BY STROKES

(LOWER CASE D'NEALIAN)

Counter Clockwise Strokes - a, c, d, g, o, q, e

Clockwise Strokes - b, p

Top Down - l, i, t, f, j

Letters with scoops and humps - r, m, n, h, u, y, v, w, k

Other - s, x, z

Which Hand Writing Program is the BEST??

What two elements must be present to make a handwriting program effective?

1.

2.

Borrowing from HWT -

ADAPTATIONS AND MODIFICATIONS

Pencil Pressure

Things underneath - stacks of paper, dycem, books

Mechanical Pencil

Therapy ball in other hand to squeeze while writing

Organization on a page

Visual parameters

Colors, Boxes, Highlights and Lines

Window Index Card

Wikki Stiks

Raised Line Paper

Spacing

Popsicle sticks

Underline each word after writing each word (must stop to underline the word)

Exaggerated spaces as a model

COMMON HANDWRITING ERRORS

Identify and cluster errors. Often fixing a few letters results in legibility versus illegibility.

- Loops that descend
- Incomplete closure of round letters a,o,g,q
- Formation of: a, e, r, t -

"It has been found that only four letters - a, e, r, t - account for about 50 percent of all cursive malformed letters at any grade level. Focusing on these common errors can thus improve the quality and speed of student's handwriting."
(Graham & Miller, 1980; Hammill, 1986)

Handwriting and Technology -

- No Child Left Behind
 - Enhanced Education Through Technology
- Palm Pilots - CopyWrite Handwriting program
 - www.revcomputing.com
- Tablet PC's
- UMPC

Manuscript vs. Cursive

During the early 1900s writing completed in cursive and was passed down from parent to child. Cursive writing was very difficult for some young children to master thus a simplified script was proposed. This script would later be called manuscript. Manuscript writing was thus introduced in the United States during the 1920's (Graham & Miller, 1980).

Today, manuscript and cursive writing are both taught. Manuscript writing in the United States is most often introduced in first grade and instruction in cursive writing usually begins in third grade. There is no empirical evidence to support this practice.

There is currently much discussion regarding the need to learn two systems of writing. According to Graham and Miller (1980), those who support the use of **manuscript writing** indicate that it:

- is more legible than cursive handwriting
- more closely resembles book print and, therefore, is an aid to both reading and spelling instruction.
- Consists of simple movements and hence is easier to learn than cursive
- can be written as fast as the cursive style
- is required on documents including employment applications
- may be the preferred style for children with poor vision or motor difficulties.
- Requires fewer reciprocal movements and changes of letter forms than does cursive writing
- Promotes the independence of letters within and between words (Bergman & McLaughlin, 1988; Graham & Miller, 1980).

Vreeland, E. (1998). Maxanna Learning Systems

Those who support the use of **cursive writing** indicate that cursive writing is:

- Faster than manuscript handwriting
- Continuous and connected, and therefore, perceived as a whole unit
- A preferred style for orthopedically handicapped children
- Results in less directional confusion than manuscript handwriting, and therefore fewer reversals
- Preferred by parents, students, and teachers
- More rhythmic and less cramping than the manuscript form
- A prerequisite to reading cursive script
- Easier to write (Bergman & McLaughlin, 1988; Graham & Miller, (1980)

Not all of these claims for cursive and manuscript writing have been supported by research results reviewed by this author.

Vreeland, E. (1998)Maxanna Learning Systems

In the Lewisville (Texas) Independent School District a short study was completed where the percentage of middle school students using cursive writing for school assignments was sampled. In this small study, 90% of students chose to write in manuscript.

Mary Benbow, OTR uses Loops and Groups for teaching cursive writing. She advocates the following strengths for cursive:

- Cursive is learned kinesthetically as a whole
- The kinesthetic system has a stronger imprint on the brain for memory
- Children with part-to-whole difficulties may do better with cursive from the start rather than piece-meal "drawing" manuscript letters.
- Cursive utilizes a slanted stroke that is more natural to the hand anatomy and musculature.

From the Benbow workshop, (2003).

Getting a Grip

1. What comes first?

- Hand arches
- Hand separation
- Hand muscles
- Hand stability



2. Fun Activities for at Home

- Tops, Marbles and Jacks
- Tongs
- Water Play
- Play Doh
- Birdseed Hunt
- Lite Brite
- Toothpicks
- Macaroni
- Chalkboards
- Nuts and Bolts
- Wikki Stiks
- Stamps



3. The Pencil Grasp

- Good Grips

Tripod

Adapted

- Inefficient Grips

Palmer Grasp

Pronated Grasp

Thumb Wrap



4. Learning to Cut

5. Learning to Write



FINE MOTOR WORKSHOP

For Teachers

Skills for Writing Well

- Proximal Stability
- Distal Development/Dissociation
- Joint Stability
- Hand Arches
- Hand Muscles
 - Intrinsic
 - Extrinsic
- Thumb Opposition
- Hand Separation
- Tactile Discrimination
- Visual-motor Skill

Fine Motor Activities

- Refer to Handy Learning activities
- Activities of your own
- Goal directed and fun
- Coordinated with IEP/Academic goals

Getting a Grip

- Pencil
 - Efficient vs. Non-efficient
- Scissors
 - Sequence of teaching
 - Hand positioning

Handwriting Warm-ups

- Desk Dance
- Stack Your Blocks (posture)
- The Hungry Tennis Ball
- Tweezers Too
- Dancing Popeye Frogs
- Macaroni Drill
- Playdoh Peas
- Wet, Dry, Try

Glossary

Copyright Susan Thompson, 2002; *Handy Learning*.

Bilateral Integration	The coordinated use of the two sides of the body to accomplish a functional task.
Bimanual Hand use	The use of both hands in a lead-assist relationship.
Crossing Midline	The ability to spontaneously cross over the middle of the body.
Developmental Strokes	Pre-writing strokes that include horizontal and vertical lines, a cross and a circle.
Distal	Farthest from the center. "Distal fingers" means at the fingertips as opposed to at the palm.
Extrinsic muscles	Larger muscles of the hand which attach at the elbow and cross the wrist. These muscles primarily offer stability.
Graded Activity	An activity that can be made more difficult or easier through adaptations and changes.
Hand Arches	The transverse and longitudinal arches of the hand which indicate proper hand development; strength and stability.
Hand Separation	The development of two different sides of the hand - one side (pinky and ring finger) side offers stability, while the other (thumb, index and middle) offer mobility and manipulation skills.
Hypothenar Eminence	The muscle body of the little finger.
Intrinsic muscles	The small muscles of the hand that attach within the hand. These muscles offer precision mobility as well as stability.
Kinesthetic	The sense of movement.
M.O.R.E. Program	An oral motor program that emphasizes the use of food textures, tastes and temperatures as well as blow/suck toys to develop oral motor skills and sensory modulation.
Motor Planning	The ability to move through a novel motor task without difficulties and transfer learned movement patterns to new tasks.

Motor Sequencing	Performing motor tasks steps in the proper order and with efficient timing.
Neurological Tract	Pathways of the nervous system.
Palmer Grasp	A crude grasp where the child holds the implement in the palm of the hand and wraps his fingers around the item in a fistful grasp.
Pincer Grasp	The ability to hold a small item between the thumb and index finger at the finger tips.
Pronation	Rotating the forearm so that the hand faces down.
Proprioception	The sense of body position in space through pressure in the joints.
Proximal Stability	The ability to maintain a fixed posture without external support. i.e. sitting in a chair. "Proximal" means towards the center of the body.
Seriation	The cognitive skill of ordering items according to qualities.
Shoulder Girdle	The muscles of the shoulder and scapula.
Stereognosis	The ability to identify items and qualities of items by touch alone.
Supination	Rotating the forearm so that the hand faces up.
Tactile Discrimination	The ability to discriminate tactile qualities.
Thenar Eminence	The muscle body of the thumb.
Thumb/Finger Opposition	The ability to bring the thumb towards the fingers and hold items. Essential for holding writing implements and for precision skills.
Translation skills	Moving small items from the palm of the hand to the fingertips with one hand. Also, rotation items across the fingers, from index to pinky with one hand.
Tripod Grasp	Using the index, thumb and middle finger in a triangle-type grasp to hold a pencil or marker.
Trunk	Central part of the body, the core of the body.
Visual Perception	The ability to see, discern and recognize shapes visually.
Visual-motor skills	The ability to draw or reproduce what one sees.
Wrist Extension	The position of the wrist for optimal hand function. The wrist is slightly extended.

RESOURCES

Therapro - www.theraproducts.com

- Excellent source of therapeutic fine motor activities and manipulatives and adapted materials.
- Benbow scissors, squeeze scissors and a variety of pencil grips.
- Get-A-Grip-On Patterns
- Wikki Stiks and Activities
- Start Right Pencil Grip
- Self-Opening Scissors
- Children's Learning Scissors (similar to Benbow scissors)

Pocket Full of Therapy - www.pfot.com

- Source for tongs and adapted materials, Benbow scissors and grips.
- Multi-pegs

OTIdeas - www.otideas.com

- Another growing source for therapeutic fine motor items.

Lakeshore Learning - www.lakeshorelearning.com

- My favorite resource for educational manipulatives!

Others:

Abilitations - www.abilitations.com

- Items specifically for children with disabilities.

School Specialty -

- Discounts for schools that have contracts with the company. Can get items such as pegboard, easel, wikki stiks, chalkboards through them.

Discount Teacher Supply - www.earlychildhood.com

U.S. Toys/Constructive Playthings - www.ustoy.com

- Small items to pick up with tweezers/water squeeze toys
- Bulging eyed frogs

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For annotated bibliography of relevant articles, see
www.handylearning.com/resources

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294 Participants 7-16 years old

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CASE STUDY

Directions:

- *Read the following case study. Discuss Jessie's needs with your group.*
- *Target two or three of Jessie's IEP goals, selecting goals from different categories (ex. Academic/Language/Fine motor).*
- *Choose three activities from the fine motor lab that can address Jessie's IEP goals.*
- *Consider positioning of the student, adaptation of the activity and modifications in order to make the activity most effective therapeutically.*

Use the space below for notes:

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

IMPLEMENTING HANDY LEARNING

A CASE STUDY

(Words in bold print are in the workbook-- glossary of terms).

Jessie Lotone is a four year old girl with a medical history significant for heart malformation, several reparative heart surgeries and febrile seizures. Her condition, however, is stabilized and she is able to participate in all activities without restrictions.

Jesse demonstrates skills indicative of a one-year delay. Her speech has improved dramatically from being completely non-verbal one year ago, to now speaking in occasional five-word sentences. Jessie is energetic, personable and outgoing. Her strengths include cognitive and social skills.

Jessie can recognize and identify some letters of the alphabet and all numbers. She cannot, however, count items beyond four. She has difficulties with sequencing, following multi-step directions, prepositions, counting with one to one correlation, and categorizing objects.

Jessie has delayed hand skills with poorly developed **hand arches** and no **hand separation**. She has poor proximal stability at the shoulder. She has a difficult time visually tracking or visually attending to a task for more than a few seconds. She is able to imitate all of her **developmental strokes** but can not yet draw shapes. She can, however, identify shapes correctly. In addition, Jessie has poor **tactile discrimination**.

Jessie's IEP goals are as follows:

Cognitive:

- Demonstrate knowledge of number concepts by taking/giving or matching quantities to numerals or verbal requests for numbers one through ten.
- Obey four of four prepositional commands with objects (ex. "put the block beside, behind, in front of, in back of the box.")
- Sequence three to four steps of an activity
- Recognize all lower case letters of the alphabet

Communication:

- Demonstrate basic categories by sorting and naming objects that belong together
- Follow 3 part directions in order to complete a given task
- Answer "why" and "how" questions by giving a reason

Fine Motor:

- Hold writing implement with index finger and radial fingers
- Draw a square (corners not rounded)
- Identify 4/5 objects by touch alone

[illegible]

70

Name _____ Date _____

Handwriting practice lines (left column):

Line 1: Solid top line, dashed middle line, solid bottom line.

Line 2: Solid top line, dashed middle line, solid bottom line.

Line 3: Solid top line, dashed middle line, solid bottom line.

Line 4: Solid top line, dashed middle line, solid bottom line.

Line 5: Solid top line, dashed middle line, solid bottom line.

Line 6: Solid top line, dashed middle line, solid bottom line.

Line 7: Solid top line, dashed middle line, solid bottom line.

Line 8: Solid top line, dashed middle line, solid bottom line.

Line 9: Solid top line, dashed middle line, solid bottom line.

Line 10: Solid top line, dashed middle line, solid bottom line.

Line 11: Solid top line, dashed middle line, solid bottom line.

Line 12: Solid top line, dashed middle line, solid bottom line.

Line 13: Solid top line, dashed middle line, solid bottom line.

Line 14: Solid top line, dashed middle line, solid bottom line.

Handwriting practice lines (right column):

Line 1: Solid top line, dashed middle line, solid bottom line.

Line 2: Solid top line, dashed middle line, solid bottom line.

Line 3: Solid top line, dashed middle line, solid bottom line.

Line 4: Solid top line, dashed middle line, solid bottom line.

Line 5: Solid top line, dashed middle line, solid bottom line.

Line 6: Solid top line, dashed middle line, solid bottom line.

Line 7: Solid top line, dashed middle line, solid bottom line.

Line 8: Solid top line, dashed middle line, solid bottom line.

Line 9: Solid top line, dashed middle line, solid bottom line.

Line 10: Solid top line, dashed middle line, solid bottom line.

Line 11: Solid top line, dashed middle line, solid bottom line.

Line 12: Solid top line, dashed middle line, solid bottom line.

Line 13: Solid top line, dashed middle line, solid bottom line.

Line 14: Solid top line, dashed middle line, solid bottom line.

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Name



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HANDY LEARNING

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Phone: _____			
Email: _____			
Quantity	Description	Unit Price	TOTAL
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Method of payment (please include payment with order):			
Check # _____			Shipping add \$5 per book:
-----			Total:
Credit Card			Office use only:
Type – Mastercard or Visa			
Number: _____			
Expiration: _____			
Signature: _____			
Print Name on Card: _____			

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