

Helping Hands:

A fine motor and handwriting resource guide

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INTRODUCTION

Fine motor coordination skills are especially important for school-aged children, since they spend much of their day manipulating small objects, and participating in handwriting, coloring, cutting, and gluing activities. This resource guide was designed to offer practical advice and strategies for teachers and therapists who work with students with various ability levels.



Posture

Good posture provides the foundation for correct movement. When starting a desk activity, make sure that the child follows the 90-90-90 rule (Figure 1.1). The child's feet should be flat on the ground with a 90 degree angle at the ankles, knees and hips. The child's arms should comfortably rest on the desk with their neck, shoulders, arms, hands, and fingers relaxed allowing the child to have a supporting hand (Figure 1.2) on the paper while writing.

Fig. 1.1
90-90-90 Rule

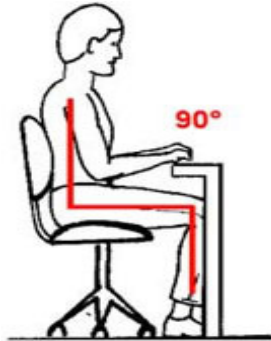
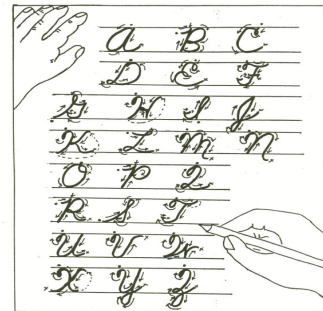


Fig. 1.2
Child's Supporting Hand-used to stabilize the piece of paper



Classroom Strategies: Posture

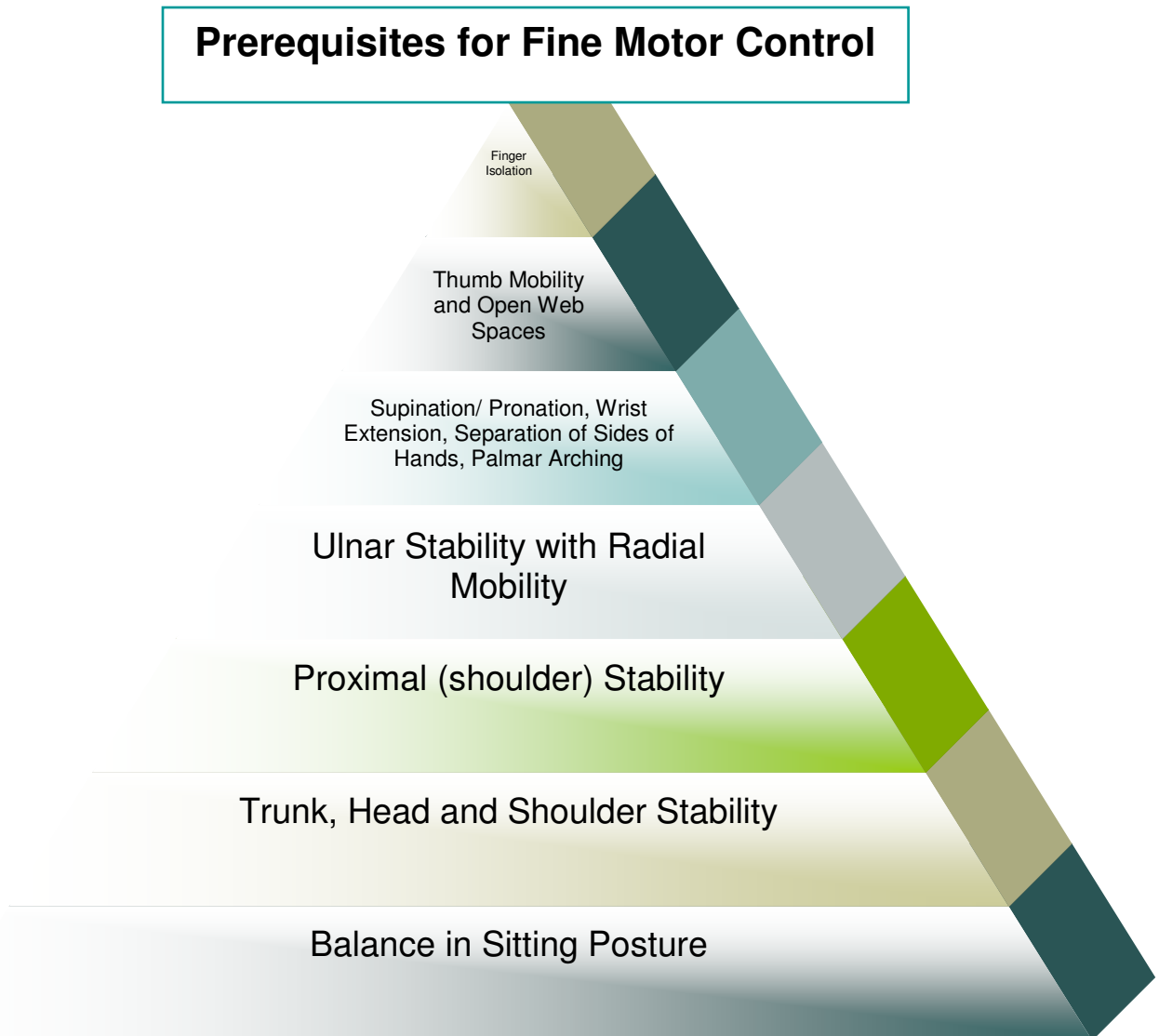
- Allow the child to work in various positions other than seated (standing at a vertical surface, lying on the floor propped on elbows). Standing at a vertical surface helps the child put the wrist in a functional writing position and also works on shoulder stability. Lying prone on the floor puts weight on the child's arms and helps to stabilize them.
- Let the child to do warm-up activities to provide kinesthetic input to large and small muscles groups (Jumping jacks, Dancing Finger songs, Donkey Kicks or Animal Walks).
- Adjust the child's desk and/ or chair height so that his/ her hips-knees-ankles are all at ~90 degrees.
- Use footstool to support feet if the child's feet do not rest flat on the floor.

Note: (Proximal (shoulder) Stability): Many muscles around the shoulder work together to hold the shoulder joint stable. When writing, we use very slow, well controlled shoulder movements. If a child has poor shoulder stability, he cannot hold this joint stable. If this joint is loose, then fine motor control needed for writing is difficult to achieve

To develop shoulder, elbow, and wrist stability:

- *Provide general upper body strengthening exercises (i.e. wheelbarrow walking, animal walks, modified push-ups)*
- *Practice fine motor activities at a vertical work surface*
- *Encourage floor time where the child is laying prone on the floor*

Fine Motor Skills



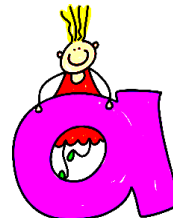
Fine motor coordination involves the ability to control the small muscles of the hand and fingers to perform precise manipulative movements.

Students benefit from activities that encourage the development of fine motor skills in the hands and fingers. Children should have the strength and dexterity in their hands before being expected to hold a pencil or crayon correctly and write. The following activities involve the use of manipulatives, which will support the student's fine motor skill development and will help to build the strength and dexterity needed to hold a pencil properly.



Classroom Strategies: Fine Motor Skills

- Squeeze ball/ stress ball
- Collect a box of objects. With eyes closed, have the child pick up an object and see if s/he can guess what it is. Collect objects that feel different to each other (i.e. hard, soft, bumpy, prickly, rough, smooth).
- Have the children “bury” their hands in a bucket filled with sand, rice, or very small beads for sensory input. Practice writing letters, numerals, and words in the sand.
- Student can use clothespins to hang up their artwork on clotheslines hung in the classroom
- Playdough-roll into small balls or use scissors to cut playdough
- Tweezers to pick up small items or cotton balls
- Play games with that involve the handling of cards, tongs, and small game pieces
- Games that help develop fine motor skills: Bed Bugs, Operation, Lite Brite, Topple, Pick-Up-Sticks, Pick-Up-Sticks, Jenga, marbles, Connect Four, yo-yo’s, Perfection, Don’t Break the Ice, Legos, Ants in the Pants, Hungry-Hungry Hippos
- Use a spray bottle to water classroom plants or to spray chalkboard to clean it
- Use eye droppers to pick up colored water and make designs on paper
- String beads
- Use hole punchers
- Open/ close zip lock bags
- Bake cookies and mix dough with your hands
- Tear newspaper into strips or crumple newspaper
- Clothespin activities
- Play card games, shuffle cards or play activities that use dice rolled in cupped hands
- Place 10-20 pennies on a table. Practice turning pennies over with the fingers of one hand. To make this more difficult, place pennies in two rows and the turn pennies over with both hands simultaneously.
- Pick up 5-10 pennies one at a time and move them in to the palm of the hand. Once all the pennies are in the palm, use the thumb to help move the pennies one at a time back to the fingertips. Try this with the right and left hand! This can be done with various other small items to make it more challenging.
- Practice picking up small items with the fingers (beads, small pegs, pennies etc.) and place them in a container
- Learn to braid hair, rope, or string. Perform games with string such as “Cat’s in the Cradle”
- Learn and practice origami (many craft stores sell books to help learn). Practice folding paper to make an airplane, a table football, or “fortune teller” game.
- Practice tracing around a stencil
- Model “house” made out of toothpicks
- Legos, Kinex, building blocks, linker cubes, Erector Sets
- Tanagrams with blocks
- Puzzles
- Play tic-tac-toe with letters of the alphabet that you are practicing
- Complete activities on a vertical surface. An easel is not necessary; try taping a coloring sheet or activity page on the wall, refrigerator, or any other hard surface.
- Touch thumb to fingers of each hand individually, then simultaneously. Make this more challenging by closing your eyes!



- Place a rubber band around knuckles-open and close hand/ fingers.
 - Make an "L" shape with the thumb and then move it in toward other fingers and then back out
- Egg carton with small manipulatives such as Pepperidge Farm Goldfish. The child is asked to use his "crabs" (thumb and index finger) to get the fish, one at a time. For the children who don't need the snack as a motivational means, small pegs, buttons, etc. can also be used.
- Create an entire fish bowl scene using Goldfish and adding Cheerios as the bubbles they blow in the water. Have them color in the fish bowl for added fine motor activities.
- Vinyl sticker activities placed on vertical surface
- Spin small tops, twirl markers, etc.

Hand Dominance

Hand dominance is an attribute of humans defined by the unequal distribution of [fine motor skill](#) between the left and right [hands](#). It is comprised of musculoskeletal and neurological components which work together to allow for dominant hand use. By 6 years of age, children should use one hand consistently all the time. The dominant hand should develop skill and precision to perform fine motor tasks, while the non-dominant hand acts as an assist.

Classroom Strategies: Hand Dominance

- Present an activity or tool at midline, observe which hand a child reaches with
- Observe which hand a child feeds him/ herself with or brushes his/ her hair with
- Encourage the child to start and end an activity with the same hand
- In cases where a child switches hands, evaluate the child's skill level in both hands to determine which hand is more skilled.

Pencil Grasp

The complex motor skill of handwriting is dependent on the maturation of the student's sensory-motor abilities along with proper instruction. When a student shows signs of writing difficulties, the first component generally targeted is the student's ability to properly grasp and manipulate the writing implement. However, the causes of a dysfunctional grasping pattern are often multifactorial; influenced by sensory reception and feedback, motor planning, the student's behavioral and cognitive abilities, and instruction provided by the teacher.

Often improper pencil grasp is a compensatory strategy that starts at an early age when a child is given a writing tool that their hand muscles are not ready for (Figure 2.1). An inefficient and/ or immature pencil grasp can lead to poorly formed letters, difficulty with gradation of pressure, and/ or slow handwriting. An efficient and mature pencil grasp must allow the child to write legibly, write with adequate speed, and write without discomfort.



Fig. 2.1 Examples of Inefficient Grasping Patterns



Fisted grasp



Thumb tuck grasp



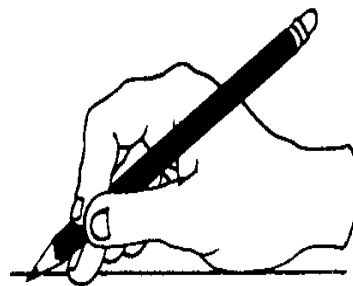
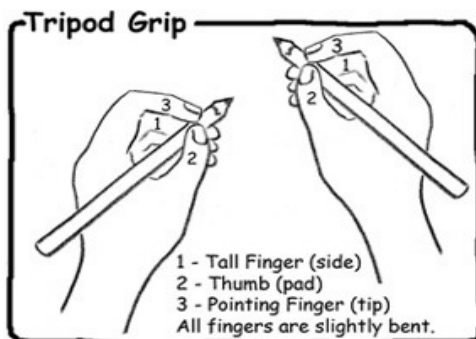
Five finger grasp

By approximately 6 years of age a child should have developed the necessary fine motor skills to be able to assume and maintain a mature pencil grasp: a dynamic tripod grasping pattern (Figure 2.2). In the dynamic tripod grasp, the pencil is held between the thumb and index finger, with the pencil resting on the middle finger. The thumb and index finger form a circle.

How to hold a crayon/pencil:

1. Have the child make an “okay” with fingers (thumb and index finger make a circle, with last 3 fingers held in the air)
2. Drop the last 3 fingers and open the thumb and index finger
3. “Pinch” pencil between thumb and index finger with eraser end point toward shoulder. The pencil rests on the middle finger

Fig. 2.2
Dynamic Tripod Grasp



Classroom Strategies: Pencil Grasp

- Place rubber band/ small piece of tape on pencil where fingers should go
- Provide students with various writing utensils
- Reinforce handwriting with a vibrating pen
- Draw dots on the pencil where the child's fingers should go
- Have students make an “OK” sign with their thumb and index finger touching and their last 3 digits held in the air. Drop the last 3 digits and open the thumb and

- index finger. Pinch the pencil between the thumb and index finger with the eraser end pointing toward the shoulder. The pencil rests on the middle finger.
- To maintain a tripod (mature) grasp, have the student hold a small bead or eraser between the ring and little finger and the palm of the hand.
 - Practice writing skills on a vertical plane (blackboard, slant/ tilt-board (Figure 2.3), 3-ring binder – to encourage proper grasp and wrist extension)
 - During graphomotor tasks, have students use small (short~1”-2”) pencils, chalk, or crayon bits
 - Place stickers or dots on fingers for location of grasp on the writing utensil
 - Have students write in various positions (i.e. chalkboard/ easel while lying prone, or kneeling to encourage shoulder strengthening and stability)
 - Have the student manipulate playdough or theraputty to increase hand strength
 - Use a Stetro Pencil Grip (Figure 2.4) or other pencil grip
 - Use indented pencils or triangle pencils

Fig.2.3
Slant Board



Fig. 2.4
Stetro Pencil Grip



Classroom Strategies: Pencil Pressure

- For children who demonstrate:
 - Decreased Pressure:
 - Have the child use a ballpoint pen or marker
 - Have the child practice coloring shapes light gray, medium gray, dark gray and black to increase awareness of different degrees of pressure on the pencil
 - Try a weighted pencil to give the child more awareness of the pencil.
 - Carbon paper can be used to challenge a student to produce his work so that it shows on the carbon copy
 - Increased Pressure:
 - Have the child use a mechanical pencil. The pencil point will “break” if the student presses too hard.
 - Carbon paper can be utilized to challenge a student to *NOT* have his writing show up on the carbon copy.
 - Have the child practice coloring shapes light gray, medium gray, dark gray and black to increase awareness of different degrees of pressure on the pencil
 - Cardboard, sandpaper, aluminum foil, etc. can be placed under student’s paper as a tactile cue to lighten pressure when writing.
 - Place bubble wrap under the paper. The child must adjust his/her grasp on pencil in order to not tear the paper.
 - If a student erases too heavily try providing the student with a soft eraser or artist’s eraser. This type of eraser is more stretchable and requires little effort to erase.

Writing Tools

There are a variety of writing tools and pencil grips that can be used as a child grows and develops. Crayons and pencils come in many sizes and shapes. Although primary (“chunky”) pencils are frequently used with younger children, they are not always appropriate for students with a poor grasp. They can be difficult to manage for a child who already has a poor grasp due to muscle weakness and poor stability. If the child is demonstrating difficulty with managing a primary pencil, have him or her use pencil stubs (approximately 1-2” long) to write. Children do not necessarily need to write with large pencils. They should use pencils in proportion to their hand size, muscle strength, and stability level.

It is important to try to modify a student’s pencil grasp as early as possible. Adaptive pencil grips may be helpful in teaching students to modify their grasp. A pencil grip positions the fingers correctly and helps the fingers stay in the position as a child writes. Pencil grips come in several styles: pencil grips that slide on the barrel and position the fingers naturally in place (i.e. Stetro Grip, Triangular Grip, Soft Grip) (Figure 3.1); a Pencil Pal (Figure 3.2) is a ring that fingers slip through before taking their proper place; and a Handi-Writer (Figure 3.3) is a pencil grip that fits around the child’s wrist and holds the pencil at just the right angle. These pencil grips may help discourage ineffective grasping patterns and reduce or eliminate fatigue when writing.

Fig. 3.1
Stetro Grip, Triangular Grip, Soft Grip

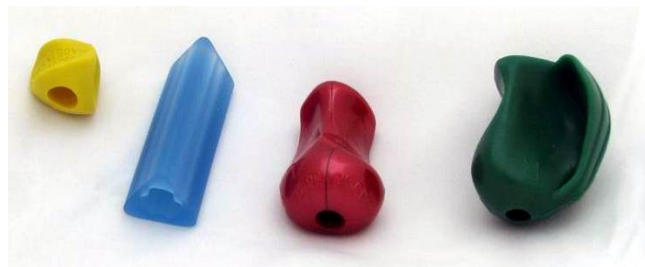


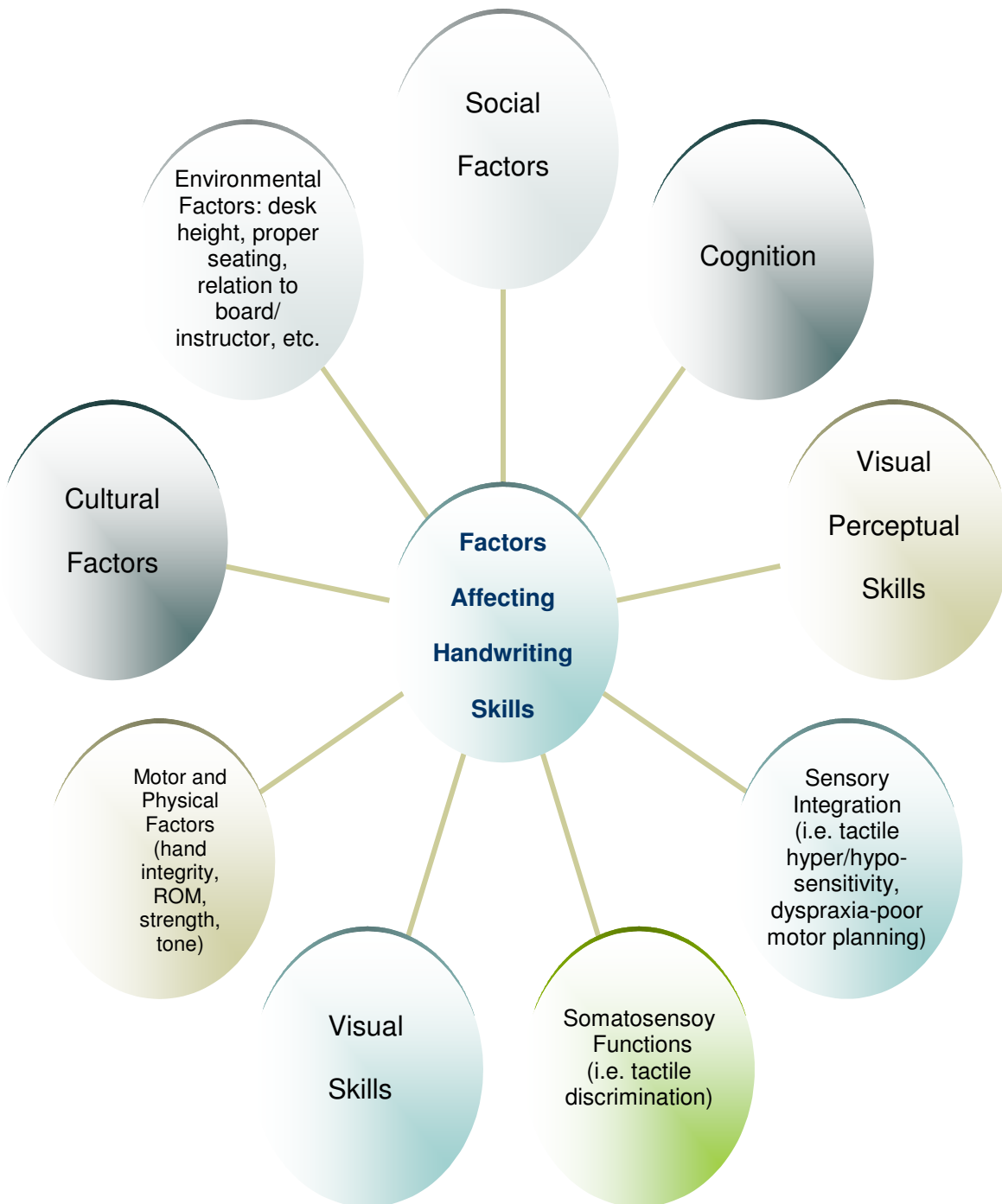
Fig. 3.2
Pencil Pal



Fig. 3.3
Handi-Writer



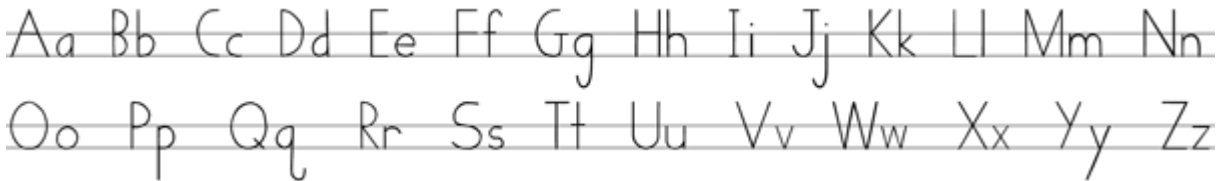
Handwriting Skills





Letter Formation, Size, and Reversals

Many students demonstrate difficulty with correct letter formation and often form letters that are erratically sized. Students may form letters “bottom to top”, they may reverse letters and numbers, omit parts of letters, leave parts of letters disconnected, and/ or use too many strokes to form letters. All of these can lead to illegible and slow handwriting, and difficulty with near-point and far-point copying activities.



Classroom Strategies: Letter Formation, Size, and Reversals

- Utilize a writing program for classroom use
- If using tracing sheets, make sure that the student is guided through the proper formation as independent tracing can lead to poor handwriting habits
- Review starting points of letters and numbers
- Keep commonly forgotten/ poorly formed/ reversed letters on an alphabet strip on student's desktop
- Provide visual cues (i.e. “write from the green dot → red dot”) to help with the progression of left → right
- During graphomotor tasks highlight top line green, bottom line red-to help the student write on the line/ write within an indicated area
- Decrease visual clutter on paper
 - use a blank sheet of paper to cover up the items that the student is not currently writing
 - i.e. if the student has to copy a series of words, cover up the remainder of the paper to reduce visual stimulation and help the student better attend to the words he is currently writing
- Use a multi-sensory approach when practicing the correct letter formation. Resistive surfaces and writing utensils (i.e. crayons, carpet squares, chalk/ chalkboard, shaving cream, etc.) provide extra information to the student's skin, muscles, and joints, which can enhance the learning process.
- Practice forming the letters in the air with eyes closed using large arm motions (keep elbow straight)
- Write between Wikki Sticks
- Have student highlight (in a magazine/ newspaper) a specific letter that they struggle with. (i.e. highlight all “b” and “d”)
- When correcting papers with reversals use an arrow to show the correct direction of the reversed letter
- Board games, such as Candyland, Trouble and Shoots-and-Ladders, help children learn directionality
- Allow student to use a slant board. This allows for correct paper orientation





Line Usage

Many students demonstrate difficulty with placing words, letters, and/ or numerals on or in-between the writing guidelines. Poor line usage of words, letters, and/ or numerals can make assignments difficult to read.

Classroom Strategies: Line Usage



- Ensure that the student is wearing appropriate corrective lenses, if needed
- Make sure that the student's vision has been recently checked
- Provide colored/ highlighted lines
- Review tall letters versus small letters and where they belong on the line
- Popcorn Letters: This concept will help make students aware of the correct placement of letters on lined paper. Incorrectly placed letters (popping above or below a line) are called "popcorn letters." Teachers can use the cue of "no popcorn letters" to help children think about proper text alignment.
- Draw a box on the lined paper representing where letters should be placed and have students practice placing the letters in the box
- Provide raised lines on paper
 - Trace each line on the piece of paper with Elmer's glue. Let the glue dry. The dried glue will leave a tactile cue for the student when s/he is writing.



Note: Younger students (kindergarten-first grade) have a difficult time perceiving dotted lines. If you are using paper with dotted lines, highlight the dotted centerline with a bright color.

Spacing

Many students demonstrate difficulty with spacing of letters, numerals, and words. Large gaps, overlapping letters, spacing between lines, and writing within the margins can make it difficult to read an assignment.

Classroom Strategies: Spacing

- Ensure that the student is wearing appropriate corrective lenses, if needed
- Make sure that the student's vision has been recently checked
- Finger space or place a dash between words
- Try using a stamp pad and have the student stamp his/ her fingerprint between each word
- Place stickers or strips of post-it notes between words
- Use graph paper or raised graph paper
- Cue students with a "no touching" rule between letters
- Color code columns for math number alignment
- Turn notebook vertically and use columns to line up numbers for math number alignment
- Spacer stick (popsicle)
- Place Wikki Sticks on margins for tactile cues
- Color code margins for visual cues
- Use whiteout tape to make raised margin lines for tactile cues



- Have students skip a line for vertical spacing
- Pre-number lines on paper
- Experiment with different kinds of paper:
 - Bi-color
 - Raised lines
 - “Dirt-Grass-Sky”
 - Skip lines
 - Highlight baseline
 - Highlight margins (Green light-go for left margin; Red light-stop for right margin)

Classroom Supplies to Keep on Hand

- Large chalkboard
- Dry erase board (s)
- Easel
- Wide and thin tipped markers
- Crayons and pencils of various widths/ lengths
- Broken pieces of chalk
- Finger paint
- Shaving cream
- Playdough
- Unlined/ lined paper-Elmer’s glue for outlining lines (for tactile feedback)
- Paper of various types to tear, cut, crumple (construction, newspaper, tissue paper, aluminum foil, etc.)
- Beads to string
- Blocks, manipulatives, games (see “Classroom Suggestions”)
- Clothespins
- Pipe cleaners/ Wikki Sticks
- Rubber bands
- Squirt bottles
- Tweezers, tongs, chop sticks









Helping Hands






Near-Point and Far-Point Copying



Copying written material from near-point (i.e. textbooks) and far-point (i.e. dry erase board/ Smart Board) sources often presents problems for students with visual perceptual and visual motor integration difficulties. Visual perception is the brain's ability to make sense of visual information; it is not visual acuity. How a child sees information influences body movements. Coordinating the information from the eyes with the body is considered hand-eye coordination, also known as visual motor integration. For example, when learning the alphabet children must be able to recognize the letter, remember what it looks like, and discriminate between two similar letters such as "b" and "d". These are the perceptual skills. Next, the brain must communicate to the hand and fingers to make strokes to form the correct letter. These are the visual motor skills. Both visual perception and visual motor integration are needed prior to learning handwriting. Another important skill needed for handwriting and reading is the ability for the eyes to work together, also known as ocular-motor control. A child should be able to visually track an object in the field of vision without moving his head. Directionality is also a key component needed prior to learning to read and write. During reading and writing children must know to begin at the top left side of the page, working toward the right. All of these skills influence a student's ability to print, write, and accurately copy information.

Classroom Strategies:

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- Print daily assignments on the morning board and position the assignments in the same place on the board everyday. Some students seem to function better in the mornings. They may demonstrate less difficulty transcribing from the board when school first begins. (There also might be less information on the board at the beginning of the day.)
 - Reduce visual clutter on the board. Extraneous material is often distracting to students with visual/ attention difficulties.
 - Print in large, block letters when writing on the board
 - Use short assignment terms and use the same terminology.
 - Make the note-taking process easier and more productive by providing an outline at the beginning of the class with space for the student to fill in specific



information. This serves as a preview of the new material and also highlights the important information that the teacher is expecting the student to take away from the lesson. Looking at that outline later also allows the student and the adults to determine whether or not the student has gotten the most important information written down.



- Minimize copying from the board. This seems like such a straightforward task, but can be very difficult for some students. Copying from the board requires students to keep information in their heads as they transfer it from the board to the paper. The children have to keep track of what they last wrote, keep that in mind as they look back up at the board, find where they left off, look at the next few letters or words, carry the information back to the paper, and keep it in their heads long enough to finish writing it down.



- Monitor daily assignment sheets and copied material on a daily basis. Asking to see the student's work before they leave school would be a way of checking to ensure all material was copied accurately.



- Enlarge print and make sure there is no glare on information to be copied
- Seat student closer to information needed to be copied



- Highlight or underline important information the student needs to copy
- Have student copy small amounts of information at a time



- Provide a desktop model of information to be copied. Place copy above paper, as up and down eye movements are easier than side-to-side movements. As the student becomes more proficient with his or her copying skills, gradually move the copy away so that the child continues to be successful with copying the information.



- Make sure the material to be copied has a clear background and foreground contrast to maximize visibility
- Teach students to chunk letters (copy 2-3 letters at a time). Gradually increase the number of letters a student can chunk at a time



- Frame math problems in different colored chalk so that they are easily distinguishable
- Use colored chalk to write important information



- Use writing guidelines (similar to what students are using on their paper) on the chalkboard to help with visual cues
- Reduce clutter on student's desktop when copying to eliminate distractions

Organizational Skills



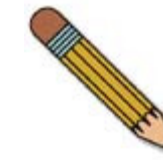
It's common for elementary aged students to have difficulty with organizational skills and time management. Teachers can help provide needed structure, assist in becoming organized, and support these critical skills for success. The assistance you provide will depend on the child's age and ability.



Classroom Strategies:

Classroom organization

- Teach students how to organize materials, desk, etc. Provide necessary supplies/time to get organized.
- Encourage students to organize materials at the beginning or end of class.
- Provide time and assistance (peer or adult) for cleaning out/sorting students' desks and backpacks.
- Have periodic desk/binder checks and positively reinforce (e.g. prizes, privilege) for compliance.
- Clearly identify certain places in the room (e.g. trays, shelves, color-coded folders/boxes) where students know where to turn in assignments or store unfinished work.
- Present all assignments, page numbers, due dates, etc. to students verbally and visually. Break down assignments into "mini-assignments." Build in reinforcement as the student finishes each part.



Materials

- The use of a 3-ring binder/notebook, subject dividers, and pencil pouch (with sharpened pencils, erasers, highlighter, and other essentials) may help improve students' organizational skills
- The use of a monthly assignment calendar and/ or daily/weekly assignment sheets may help improve students' organizational skills
- Pre "3-hole" punch any handouts/papers you give students (to be put in their 3-ring binder)
- Provide students with a clipboard for papers on their desk.
- Provide bins, boxes and/or organizing trays for supplies and materials.
- Recommend labeling of materials/supplies with students' names.
- Encourage the use of self-stick notes for marking pages in books, jotting down key words and notes.





Visual cues

- Color-code books, folders, and materials. For example: blue math book, blue math notebook/ section/folder, daily schedule has the subject 'math' highlighted in blue.
- Color-code important notices, handouts, and assignment details. Example: book reports in pink, weekly/monthly newsletters in blue. Try giving two copies (one for the notebook, and one for home).
- Use visual/graphic organizers with high frequency activities (e.g. sequence charts, story maps, sentence maps, webs, clusters, flow charts, Venn diagrams).
- Provide framed outlines for filling in missing words and phrases during instruction.
- Arrange the child's seating next to students who are organized as to encourage modeling and imitation of desired behaviors.
- Picture prompts may also be effective to establish a "look then do" sequence, and promote independence.

