GROSS MOTOR SKILLS AND HANDWRITING

The gross motor skills involved in handwriting mainly refer to the postural control that is required for writing. Efficient control of the larger muscle groups in the neck, shoulder and trunk is necessary to maintain stability in order for the fingers and hands to move to complete the handwriting task. As children develop, control and stability begins at the trunk, progressing to the elbow, wrist and finally the hand. With normal development, fine motor skills are developed from gross motor skills. For example, a baby will first learn to swat, then reach, then grasp and then manipulate a toy. Children need to develop the proximal muscles (closer to the center of the body) of the trunk and shoulder girdle in order to use the distal muscles (further from the center of the body) in the fingers and hands. These proximal muscles develop in children with gross motor movements such as reaching, tummy time, rolling, all fours position, crawling, standing and walking.

Children also must develop the ability to plan and execute gross motor skill actions. With handwriting tasks, this motor planning requires muscle groups to work together with the proper force, timing and actions to produce an acceptable outcome (ie legible handwriting). For example, in order to write with a pencil, the brain has to plan and carry out the skill in the correct sequence. Starting with the pectoral muscles, the trapezius and the rhomboid muscles coactivating with the proper force and timing to stabilize the shoulder in order for the fingers and hand to move the pencil along the paper efficiently. Children with decreased motor planning skills exhibit poor legibility of handwriting compared to their peers (Tseng & Murray, 1994).

Eye hand coordination skills require the vision system to coordinate the information received through the eyes to control, guide, and direct the hands in the accomplishment of a given task. Again, this direction requires the gross motor movements of reaching and grading the control of the arm.

DEFICITS IN GROSS MOTOR SKILLS AND THE EFFECTS ON HANDWRITING

As mentioned previously, proximal muscles function as a stabilizer during handwriting tasks. Children with low postural muscle tone may have difficulty sustaining contractions in the proximal musculature. Research indicates muscles that work primarily as stabilizers, display less variability than muscles that work dynamically (Pepper & Carson, 1999). When the proximal muscles stabilize correctly, the decreased variability in the distal muscles has been shown to be associated with a faster handwriting speed (Naider-Steinhart & Katz-Leurer, 2007).

The act of forming letters requires many steps. The more steps required to complete an action results in higher levels of motor planning. Research has indicated that children with decreased motor planning skills exhibit poor legibility of handwriting compared to their peers (Tseng & Murray, 1994).

When the visual system does not send the correct message to the trunk, shoulders and hands on where to move, you are not able to produce coordinated motor actions. Decreased

eye-hand coordination abilities have been shown to be predictive of decreased quality of handwriting (Kaiser, 2009).

GROSS MOTOR SKILL ACTIVITY SUGGESTIONS FOR HANDWRITING SKILLS

Gross motor activities that will improve postural control and muscle strength in the proximal muscles are beneficial when it comes to developing handwriting skills. Suggested activities:

1. Hanging activities – practice monkey bars, chins ups, pull ups or swing from the tree limbs to increase the muscle strength in the shoulder girdle muscles.
2. Climbing activities – climb the ladders and ropes on the playground.
3. Pushing and pulling activities – pull a heavy wagon or push a child on a swing. These pushing and pulling motions help the shoulder learn to coactivate to produce the right amount of force and stability.
4. Weight bearing activities through the arms – animal walks, wheelbarrow walking, crawling, and push ups/planks all help to increase muscle strength and improve coactivation of the shoulder and postural muscles.
5. Yoga Poses – provide muscle strengthening and postural control
6. Large art projects – hang some paper on a wall or use an easel. Children can reach up, left and right while painting.

Motor planning skills can be practiced with the following gross motor movements:

1. Sky Writing – air write the letters using your entire arm describing each step as you go
2. Obstacle courses – handwriting requires the ability to formulate a motor plan to complete multiple steps just like completing an obstacle course. Include activities from the list above. For example, crawl to a scooter board, lay on your tummy and pull yourself along a line and wheelbarrow walk to the finish line.
3. Body Letter Formation – children can practice making their bodies into letters to improve the imprint on the brain of how the letter is formed. Activities like the Action Alphabet are beneficial.
4. Coordination activities – jumping jacks, jumping rope, hand clapping games, etc all require extensive motor planning and coordination skills. Need some ideas for coordination skills – check out 25 Bilateral Coordination Activities.

Eye hand coordination activities to help develop handwriting skills include any type of ball skills – throwing, catching and shooting balls in order to practice guiding the hands to go in the proper direction and location.

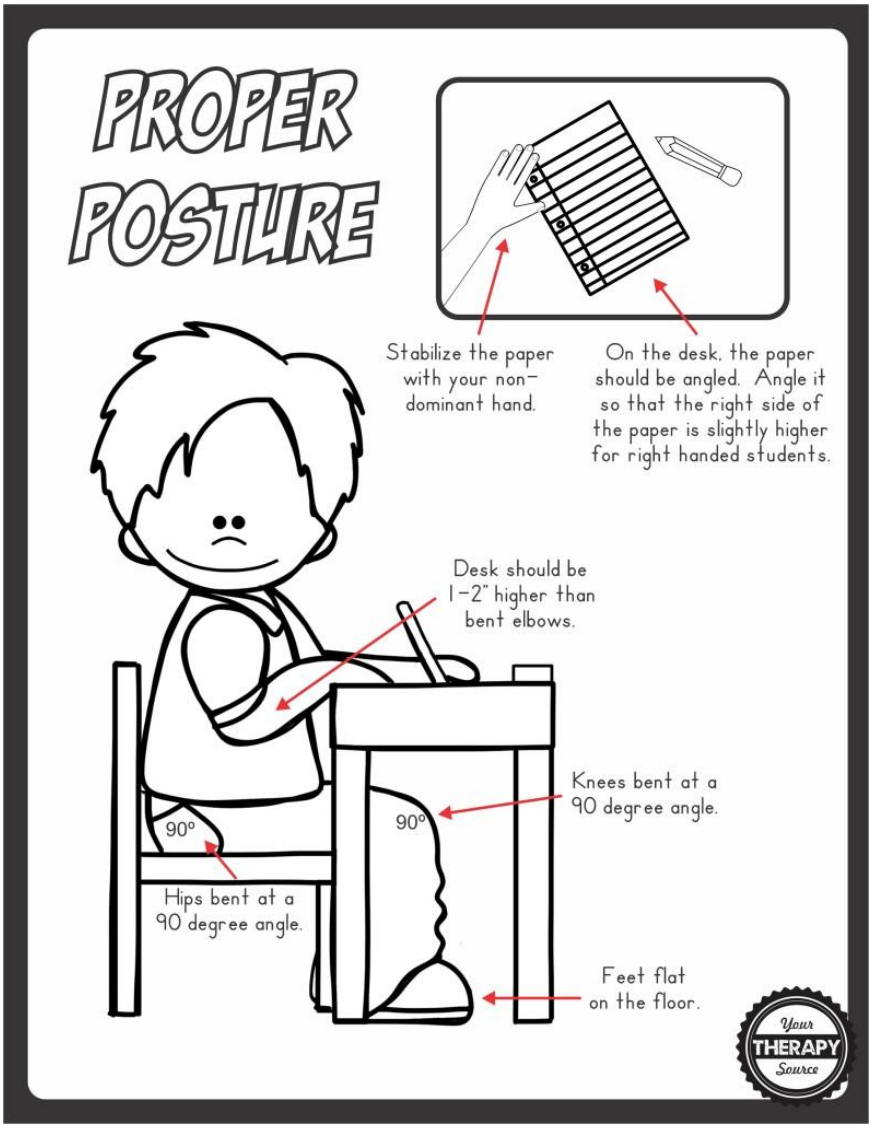
MODIFICATIONS TO HELP WITH GROSS MOTOR SKILLS AND HANDWRITING

1. First and foremost, children should be properly positioned for handwriting:

   a.) the feet should have a stable base of support

   b.) hips, knees and ankles should be bent at 90 degrees

   c.) desk should be 1-2” higher than bent elbows



You can download a free positioning poster for handwriting here.

2. For proximal muscle fatigue while writing, try changing positions. Perhaps lying on the floor to complete the writing assignment or providing a slant board may help. Try breaking up writing assignments into smaller chunks to prevent proximal muscle fatigue.

3. Take frequent breaks to stretch the muscles in the shoulder, neck and back.

The best suggestion is to sometimes put down the pencils, take a break from routine handwriting practice and get children moving!

Check out Handwriting Stations – includes positioning poster, warm up activities and postural exercises. Find out more.