Reflexes and the 3 R’s

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WHAT DOES READING, WRITING AND ARITHMETIC ENTAIL?
Reading according to ReadingRockets.org is “a multifaceted process involving word recognition, comprehension, fluency, and motivation”. Reading also the main skill underpinning most, if not all, learning. Writing is “a method of representing language in visual or tactile form. Writing systems use sets of symbols to represent the sounds of speech, and may also have symbols for such things as punctuation and numerals” (Omniglot.com, nd). Arithmetic or mathematic skill “refers to the conceptual understanding of numbers, their relationships, combinations, and operations. Mathematics also includes shapes and their structure; reasoning; measurement; classification; and patterns” (Headstart, 2015). Mathematic skills are dependent on both reading and writing skills.

WHAT ARE REFLEXES AND WHAT DO THEY HAVE TO DO WITH READING, WRITING AND ARITHMETIC?
There are several types of reflexes in humans; however, Mind Moves® concentrates primarily on Primitive reflexes. Primitive reflexes are stereotypical movements that start in utero and are present at birth to assist with the birthing process. Primitive reflexes are controlled by the brain stem and are meant to have a limited lifespan (De Jager, 2009).

During the first year of life primitive reflexes stimulate sensory-motor development and build neural pathways in the brain in a sequential manner. When these reflexes are done with the required neural wiring they are meant to go to rest so that the next pathway can be built. If they do not go to rest (inhibit) the brain cannot wire properly and the skills needed for learning like reading, writing and arithmetic are affected (De Jager, 2009).

WHICH REFLEXES ARE USEFUL FOR READING, WRITING AND MATHEMATICS?
In order to read, write and do general mathematics the senses, brain and muscles need to be developed or “wired” correctly.
The **Moro Reflex** “is an involuntary survival reaction that is triggered in reaction to stimulation. The Moro reflex responds to a perceived threat and wakes up the vestibular system and cerebellum” (De Jager, 2009). The vestibular system is responsible for balance, sensory integration and stress response. When stressed the “hypothalamus signals the adrenal glands to produce more of the hormones adrenaline and cortisol and release them into the bloodstream. These hormones speed up heart rate, breathing rate, blood pressure, and metabolism. Blood vessels open wider to let more blood flow to large muscle groups, putting our muscles on alert. Pupils dilate to improve vision. The liver releases some of its stored glucose to increase the body’s energy. And sweat is produced to cool the body. All of these physical changes prepare a person to react quickly and effectively to handle the pressure of the moment” (KidsHealth.org, 2016). If a child is in a stress state, learning how to read, write and do mathematics are secondary to their survival. Children function in the survival brain which does not allow for the skills required to reading, writing and mathematics.

The **Tonic Labyrinthine Reflex** (TLR) is a reflex that is responsible for developing the near senses and hearing. The muscles of the neck, core and shoulders/hips are developed with this reflex. Since the TLR is meant to develop the near senses a child with an active TLR has no sense of where he is in space. This child may find it “difficult to experience space, judge distance, depth, strength and speed needed to complete a task” (de Jager, 2009: 21). These skills are important in order to be able to do basic mathematics. Letter reversals, poor motor planning, postural problems and auditory and visual perception problems may be noted with an active TLR (de Jager, 2009).

The **Palmar Reflex** is responsible for developing the sense of touch. It is also responsible for developing the muscles in the shoulder, hands and fingers. (De Jager, 2009). The Palmar reflex’s main job is to unfold and stretch the hand and in doing so strengthen the hand and fingers enough to be able to do fine motor activities like writing, threading, cutting etc. If a Palmar reflex is not inhibited the learner may have poor pencil grip, poor or slow handwriting, low muscle tone and many not be able to distinguish between textures (De Jager, 2009). A well-developed hand is important for writing in all subjects, including mathematics.
The Asymmetrical Tonic Neck Reflex (ATNR) is in charge of developing the near senses, hearing and sight. The muscles implicated in the process of development are the neck and core, arms, legs as well as eye-hand coordination. This reflex allows for the head to follow the hand when moving. It is essentially the first step in hand eye coordination and later the ability to cross the midline that is established by the ATNR. If the ATNR is still active the learner may have poor visual perception, poor hand-eye coordination, inability to cross the midline, poor sequential skills as well as hand writing difficulties to name a few. These are all skills that are imperative to reading, writing and mathematics skills.

MIND MOVES TO HELP WITH READING, WRITING AND MATHEMATICS SKILLS
Primitive reflexes follow the same pattern during their life cycle which is to emerge at a specific age and to develop through repetition of reflexive movements. Once enough repetitions have been completed the reflex may integrate and finally to go to rest or inhibit once the neural pathways in the brain have developed.

The following Mind Move exercises (De Jager, 2009) listed below help to complete the neural pathways needed to finish wiring the brain so that a child can use these neural pathways to read, write and do mathematics with greater ease.
Antenna adjuster
Massage both ear lobes simultaneously from top to bottom using circular movements. This move develops the near senses, auditory processing, auditory perception as well as receptive language ability.

Mouse pad
The eyes are to the brain what the mouse is to the computer. The eyes access different parts of the brain when turning up, down, horizontal, left and right. Focus on the thumb held at elbow distance from the eyes. Move the thumb upwards, first around the left eye and then around the right eye outlining the shape of an infinity sign. Repeat five times. Swap hands and repeat the same process, always first drawing a circle around the left eye and then around the right eye. This move stimulates the visual, auditory and kinaesthetic receptive ability, while crossing the midline to integrate the left and right parts of the brain and body. It develops eye-hand coordination and visual integration.

Palm stretch
Extend the fingers as wide as possible for a count of eight, then relax. Make a tight fist, hold for a count of eight, and relax. Breathe slowly while doing the move. Repeat at least three times. This move improves muscle tone in the hands, penmanship, fine motor control and bilateral integration. It also promotes fluent speech.

Core workout
Step 1:
Lie flat on your back; raise your left arm and left leg up simultaneously in a straight line, turn your head to look at the left side. Switch over to your right arm and leg do exactly the same. Repeat this action 10 times.

Step 2:
Remain on your back; do exactly the same, as in step 1, this time move your head in the opposite direction. Repeat this 10 times.

Step 3:
Still remaining on your back, this time cross your left arm with your right leg, touching elbow on knee cap. This time, no head movement though. Repeat this 10 times.

Step 4:
As soon as step 1 to 3 can be performed without difficulty, step 4 can be approached. Crawl on all fours, while turning your head to the left and right. The core workout helps with: integration of the left and right brain hemispheres; developing the core muscles of the body (helping to improve low muscle tone); crossing the midline; developing the skills for reading, writing, reasoning and spelling. The core workout exercise needs to be done more than the normal three repetitions to speed up gross motor integration.

Rise and shine
Fling the arms wide open while breathing in deeply and slowly. Close the arms over the chest in a hug, breathe out deeply and slowly. The parent may simultaneously hug from behind. This move boosts relaxation, rhythmic breathing and a sense of wellbeing.
**References**


