# Forward, Backwards, Upside Down: The Body-Brain Connection Pre-K to 2nd Grade

*What make us think, also makes us move-Blaydes Madigan…Way we learn is through movement-Hannaford…The part of the brain that processes movement is the same part of the brain that's processing learning-Strick… As infants learn how to move, patterns form in older childhood-Eddy*

## Did you know?

- Inverting the head regulates and organizes the nervous system and can calm or alert.
- Joint traction (climb or hang from a tree) is a form of proprioception. Helps to develop body awareness and body in space. Promotes self-regulation-calming or alert.
- Motor development typically occurs in an orderly sequence from head to trunk to hands to feet, from midline to extremities, and from gross to fine muscles. Stable posture and sensory input facilitate controlled and refined movements and mobility. *Martin*

- Fine and gross motor typical and atypical development utilizing movement interventions. Many music and movement activities can be incorporated as part of intervention.

## Sensory Tips

- Brain responds best to purposeful and meaningful activity
- Never force an activity
- Eye contact is way overrated
- Refrain from tickling-give brain mixed message of pain and pleasure
- Proprioception is "go-to" for calming and organizing
- Inverting head is a powerful tool
- When in doubt, squish box
- Vestibular input is powerful tool. 15 minutes can have a 6-8 hour impact on the brain
- Deep breathing one of most effective tools to keep fight or flight at bay
  *Source: Angie Voss-www.asensorylife.com*

## Squish Box-Sensory Retreat

*www.asensorylife.com/sensory-retreats*

Decreased sensory input overall-calm, quiet, low light setting, deep pressure touch and proprioception (achieved by cozy small space)
*Source: Voss*

## Power Sensations-Vestibular, Proprioceptive, Tactile Input

Foundation for sensory integration, sensory processing skills and ALL development. Provide basis for brain development (besides physiological). When work on one area, impacts processing of other two.
*Voss*

## 5 Ways To Boost Brain Power

At birth brain not fully developed. Cells need to communicate with each other to grow. Connections begin with movement. More connections, more brain develops. With life experiences, brain will double in size by age 1. By age 2, same number of connections between cells as an adult. When interacting, try to involve senses.

- Play with your food-Uses several senses at same time. More senses used in play, more learning. Senses send message to brain, link up & form neural pathways in brain.

- Spin around and around-Spinning, swinging & rocking-Helps develop strong vestibular system, without which sitting, crawling, are not possible. Vestibular is sensory system providing information to the brain that relates to balance, movement & spatial awareness.

- Wave arms in the air crossing to opposite side of body
  The midline is an imaginary line that runs down the body. Crossing one part of body to the other side. Integrates left and right sides of brain to communicate and work together, strengthening pathway that link the two sides. Important part of co-ordination and learning to read and write, as requires working from one side of page to other.

- Sing songs and rhymes
  Uses lots of senses & helps build many skills. Singing is only activity that uses both sides of brain, boosting activity that goes on within it and helping it to grow. Helps to develop language and memory, creativity and imagination, co-ordination & rhythm, build listening & concentration, which are fundamental to learning. It's fun for everyone.

- Get physical
  Movement activates & grows brain. Messages travel around brain, helping child to learn & understand more about selves & the world. Gross motor & muscle tone in body, must be developed before fine motor can be mastered.
  *Source: Totsplay.co.uk*

### Building Better Brains through Movement

- Movement activities involving the 19 senses are necessary components to enhance whole brain learning and to access the parts of the brain that may be otherwise underdeveloped.
- Reinforces the three basic human motor movements that lay framework for learning: rolling, crawling/walking, and jumping. These directly correspond with the way that information travels in the brain: side to side across the corpus callous, back to front across the motor cortex and up and down from the bottom to the top of the brain.
- The brain uses its motor patterns as the framework for other learning.
- Uses repetitive gross motor movement to aid brain in putting patterns into a sequence.
- Moves body in space (spatial awareness) to help brain see letters & numbers on a page.
- Engages static &dynamic balance to put brain & body into focus & attention
- Novelty wakes the brain up-repetition wires it.

### Movement

- Facilitates cognition
- Anchors learning when more senses involved
- Grows new brain cells in learning and memory center of brain(hippocampus)
- Gesture increases the brain and body communication increased abilities to problem solve
- Motor skills lay the framework for pattern sequencing
- Prepares the brain for learning
- Promotes emotional safety through positive social feedback with partners and groups
- Reduces stress naturally
- Regulates mood & behavior by naturally balancing neurotransmitters
- Novelty wakes up the brain…repetition wires it
- Accelerates motivation, increases self-esteem, promotes cooperation and communication skills

**Cross lateralization/crossing the midline**

- Brain makes new connections and right and left hemispheres begin to work together
- Organizes brain for better concentration and problem solving
- Integrates brain hemispheres to enable brain to organize itself
- Blood flow is increased in all parts of brain, making more alert & energized for stronger, more cohesive learning.
- Unify cognitive & motor regions of brain: cerebellum, basal ganglia, and corpus callosum
- Stimulates production of neurotrophins that increase number of synaptic connections. (*Dennison, Hannaford)*

*Source: Jean Blaydes Madigan-Building Better Brains through Movement*
http://abllab.com/wp-content/themes/abl/doc/abl-handout.pdf

**Musical Patterning Makes Brains Thrive**

Babies born with almost all neurons brain will have. Many neurons aren't wired together yet. Sights, sounds, tactile & kinetic sensations associated with making music cause neurons to fire, building connections with other neurons. Strong music patterns=strong pathways through underlying beat, rhythmic fragments repeat & fit together, rhyme schemes make predicting next lyric easy, repeated words give pleasure to ear & tongue. Pleasurable to have neurons firing & laying down robust pathways. Effective in all kinds of learning; literacy, numeracy. *Source: C. Biddiss-Musical Child*

When children are engaged in swinging, jumping or any movement based activity, also involve in an activity which involves sound, such as listening to music, singing, following beat with clapping or mouth sounds. This provides opportunities to work on auditory processing & cognitive skills as well as communication and speech language. ***Voss***

**Sensory Benefits of Inverting the Head**

- Regulates and organizes nervous system
- Calming or alerting depending on state of regulation
- Unique vestibular experience and powerful does of input
- Joint traction or compression on the spine
- Known to stop hiccups
- Can help recover from fight or flight or sensory meltdown
- Supports attention to task, focus, and concentration
  *Voss-Asensorylife.com*

Follow the Leader-paper plates

- Creates a steady beat to develop the language brain's ability to receive and express language. Tapping down the sides of the body helps the brain identify its vertical midline. If synchronized tapping, brain is integrated.
- Start with plates above head and twist each hand as lower plates out to side. This strengthens the muscles used for handwriting. Marks peripheral vision field to help with visual literacy.
- Rub together up and down midline, bending knees-rubbing together stimulates tactile response and helps brain to visualize its vertical midline.
- Giant circles clockwise, counter, lazy 8's. This helps to encode brain with our alphabet symbols. The brain has to be taught symbols.
- Bring over head and bend arms at elbows-plates drop behind shoulders-helps upper body strength.
- Bring out and in at shoulders, make funny faces for AEIOU. Exaggerate each long vowel sound as you alternate hiding your face behind plate.
- Hold up high to right side, touch left knee, up again. Alternate up and down to the beat. Repeat on other side. Crossing midline integrates, organizes and energizes the brain.
- Hold above head, touch shoulder, toe, elbow and bow. Body and spatial awareness. *Source: Blaydes Madigan*

***Nursery Rhymes combined with movement-Based on the work of Anne Green Gilbert of Creator of 'Braindance'.***

"…a series of exercises based on eight developmental movement patterns that healthy humans naturally move through in the first year of life. Research has shown these patterns are crucial to the wiring of our central nervous system. As babies we did these movements on the floor...these patterns at any age, have been found to be beneficial in reorganizing our central nervous system…repeating patterns may help fill in any missing gaps in our neurological development or not enough tummy time as a baby…it is a centering body/brain exercise for brain organization, oxygenation, and recuperation." *Anne Gilbert*

The patterns impact

- Breath-All movements & rhythms are based on breath.
- Tactile-Variety of touch leads to bonding, sensory integration, proprioception & appropriate behavior.
- Core-distal-Reaching out connects us to world beyond selves. Curling back returns us to our own self.
- Head-tail-Propels us through space, creates open path for central nervous system to function.
- Upper-lower-Grounding reach into space, relate to people, emotional stability, reach goals & set boundaries.
- Body-Side-Left & right brain hemispheres are strengthened. Develop horizontal eye tracking for READING
- Cross-lateral-Connects both sides of the brain, for higher thinking. Vertical eye tracking for READING.
- Vestibular-Moving off balance develops vestibular system. Strengthens eye tracking, hearing proprioception, balance & coordination. Every movement stimulates the brain.

*Source: 'BrainDance' DVD*

For Activity Suggestion List including Vestibular, Balance, bilateral, laterality, directionality, crossing midline, body awareness, motor planning, proprioception. *Google Activity Suggestion List-Nancy C. Freda …*

Big projects encourage cross lateral. Big cardboard with glue lines for children to trace with fingers

*We see the world clearly when we're children and then spend the rest of our lives trying to remember what we saw.*
*Garrison Keillor*