Moving and Learning: The Body Brain Connection Babies to 5s

Crawling/walking, rolling in both directions, jumping, spinning, skipping is reading readiness. Blaydes Madigan
Rhythm is perceived differently by the brain, so kids are more attentive when you say things musically. Campbell

Young children come into the world with an innate receptivity to music and movement. Immersed in rhythm and sound, children are seemingly pre-wired for music. They are born ready and expecting to move and this is how they learn.

Music matters. Everything about appropriate musical experiences is positive & impacts all developmental domains. Research suggests it nourishes brain development, can strengthen learning, listening and literacy, motor skills, co-ordination, language, problem solving, spatial temporal performance as well as contribute to social success and emotional well-being. Music will enrich children's lives and tap into their creative energy.

We now know that movement matters too. 'Leave no child behind' has left children sitting in their seats and on carpet squares. Brief moments of physical activity can improve attitude, attention, memory and content achievement. Research tells us that what makes us move, also makes us think & movement combined with language, impacts cognition.

The current focus on the academics may leave the crucial role of social-emotional development behind. It is difficult for children to develop cognitively if that emotional component is not stable. Music and movement experiences can be at the core of social connections formed between children, their significant other and their peers.

So let's get moving! Music and movement can be your best friend. In our hurry up dot com world we are sitting children as young as 12 months in front of computers. With "teach your baby to read" commercials on TV and less playtime outside, more than ever, we need to nurture their natural love of music and movement. Children desperately need their childhood and often, we are taking it away sooner and sooner.

What children need for healthy development has not changed. Keep them safe, read, sing and dance with them, do open-ended art, write down their stories, tape record their songs, make eye contact with every child every day. Take time to listen-time to just be.

Today we will explore the research and the benefits of movement. A sampler of musical movement activities will be presented for transitions with lots of ideas to incorporate throughout your day. Tips for group management and books that enhance listening and create movement too.

And it's not just for the children. It's for everyone. Musical experiences can positively affect staff efficiency, productivity and stress level. The essence of this presentation is to not only provide ways to incorporate movement into your curriculum, but to acknowledge the magnitude of your profession. Your time spent with the children can have an enormous impact on their lives. What you do it the most important work I know of. Children learn about love and trust from you. Thank you for what you do.

Remember, when all else fails, Sing–a Song and Dance-A Long. It really works…

Movement Vocabulary

When the body is in motion, the auditory system is engaged. This is due to the vestibular-cochlear nerve. When the vestibular nerve (motion) is firing and activated, the cochlear nerve is activated as well, which is responsible for auditory input. Work on auditory processing, speech and language. When child is engaged in swinging, jumping, or any movement based activity, also engage in an activity which involves sounds such as, listening to music, singing, following certain beats, memory or other thinking games. *Angie Voss*

When children are engaged in swinging, jumping or any movement base 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 and language. *Denita Dinger*

Before children can understand numbers, they must have spatial-temporal reasoning. This is the ability to understand your body in time and space. Understanding how you fit and move in space internalizes our ability to 'get' numbers. Playing games like "In and Out the Windows" or "Blue Bird Through My Window" are fundamentally very important in preschool because the whole body is involved in understanding how it moves, takes up space and interacts with other objects in space. Marching does the same thing as children must stay in step with others, keep the pattern and keep the beat along with others. *Maryann Harman*

Proprioception
This is the unconscious sensation of movement of the muscles and joints in the body. The proprioceptive system is stimulated by movement and gravity, especially compression and stretching. This enables the brain to determine without excessive effort where each part of the body is and how they move in relationship to each other. *Source unknown from list compiled by Freda & Hickson*

Vestibular
The vestibular system processes sensations from the gravity and movement receptors in the inner ear. This system reacts to changes in head position (up/down; side-to-side) and a person's movement of his/her body. It is important in maintaining balance, coordination of both sides of the body. Vestibular input activities are movements, which are up & down; side-to-side; circular or spinning. Movements, which are slow and repetitive can be relaxing and calming to a child. Movements, which are fast, circular or spinning can "wake" a child up. *Source unknown from list compiled by Freda & Hickson*

Importance of Movement to Learning
The vestibular (inner ear) and cerebellar system (motor activity) is the first sensory system to mature. In this system, the inner ear's semicircular canals and the vestibular nuclei are an information gathering and feedback source for movements. Those impulses travel through nerve tracts back and forth from the cerebellum to the rest of the brain, including the visual system and the sensory cortex. This area is critical to our attentional system, since it regulates incoming sensory data. This interaction helps us keep our balance, turn thinking into actions, and coordinate moves. That's why there's value in playground games that stimulate inner ear motion like swinging, rolling, and jumping. *Carla Hannaford*

Traced a pathway from cerebellum back to parts of the brain involved in memory, attention, and spatial perception…the part of the brain that processes movement is the same part of the brain that's processing learning. *Peter Strick-Veteran Affaira Medical Center of Syracuse New York*

Movement does a couple of different things for learning. It helps orient the person and anchor them in their experience, as to what they're learning. But it also helps with memory consolidation. *Layne Kalbeleisch-Cognitive Neuroscientist*

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*

The brain seeks patterns. Locomotor movements are built on patterns. Information that is arranged in patterns is more easily processed, retained and retrieved. *Blaydes-Madigan*

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 as an adult. When interacting try to involve senses. *Source: Totsplay.co.uk*

- 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.

Language & music use different sides of brain, language on left -music on right. When singing, using both sides of brain.

Building Better Brains through Movement

Novelty wakes the brain up-repetition wires it

What Makes Us Move is Also What Makes Us Think

- New learning follows established motor patterns first before it is stored in the cortex
- Move better= better thinkers
- Brain seeks patterns
- Locomotor movement are built on patterns
- Information arranged in patterns is more easily processed, retained and retrieved

Movement

Prepares the Brain for Learning

- 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.
- Engages static &dynamic balance to put brain & body into focus & attention
- Facilitates cognition
- Anchors learning when more senses involved
- Moves body in space (spatial awareness) to help brain see letters & numbers on a page
- In hearing a steady beat (awareness) & keeping (competency) SB develops language areas of brain
- Grows new brain cells in learning and memory center of brain (hippocampus)
- Gesture increases the brain and body communication increased abilities to problem solve
- Uses repetitive gross motor movement to lay the framework for putting patterns into a sequence
- Promotes emotional safety through positive social feedback with partners and groups
- Reduces stress naturally & acts as anti-depressant
- Regulates mood & behavior by naturally balancing neurotransmitters
- Accelerates motivation, increases self-esteem, promotes cooperation and communication skills

Cross Lateralization-Crossing the Midline

Activates Whole Brain Function-Organizes Brain for Better Concentration and Problem Solving

- Brain makes new connections and right and left hemispheres begin to work together
- Aids in coordination of movements & thoughts by organizing, integrating & energizing brain's hemispheres
- 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)*

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

Eye Fitness

- Increases tracking and visual fitness to enhance ability to follow words on a page
- Trouble with reading and lack of eye tracking and peripheral vision development
- Watching screens, eyes lock in constant distant vision and muscles that control eye movement atrophy

Source: Jean Blaydes Madigan-Building Better Brains through Movement

Benefits of Movement

The part of the brain that processes movement is the same part of the brain that's processing learning. Peter Strick

- Strengthens learning
- Nourishment for brain
- Affects total development
- Impact on language
- Social & emotional component
- Physical activity
- Listening & thinking skills
- Crossing midline
- Body awareness
- Attention span

Way Learn is Through Movement

- Growing new nerve cells mainly in hippocampus
- Elements of enriched environment causing cells to grow
- Cross lateral movement activates whole brain function
- Bare feet give proprioception sense of our world. Need to be barefoot, sense of grounding

Movement is Important During Early Development

- Grow and develop brain
- On belly a lot when awake so can do reflexes like tonic neck allow them to hear
- Crawling have to for cross lateral integration in brain
- Trouble with eyes teaming (working together) and auditory teaming, being able to discriminate sounds
- Dyslexia, hearing problem, secondary visual problem, have to move, whole system connected together
- Entailing inner cochlear balance, more we move, more we hear, more able to move and more brain grows
- Climbing, twirling, rolling, walking on even ground helps with head righting reflex so able to read, so eyes will teem together. *Source: Carla Hannaford-Neurophysiologist*

Why Move?
Not Just For the Children. For Staff Too!

Dopamine can be released through music listening. Sufoo & Akiyama

- Children are born to move and that is how they learn
- Integrate the right and left hemispheres of the brain to bring balance.
- Thinking is moving…moving is thinking. What makes us move makes us think. *Jean Blaydes Madigan*
- Learning and teaching tool
- Engages all learners
- Clears the mind
- Develops & stimulates creativity
- Fosters community
- Relax and focus

- Invigorates
- Ease with transitions
- Boosts immune system
- Stimulates inner ear function (balance)
- Releases tension
- Productivity and efficiency
- Natural stress buster
- Games that use alternation locomotion steps like jumping, hopping & skipping will help release excessive energy.
- Focus energy activities that require focused listening & minimal or no talking
- FUN…*Source: Movement in the Classroom Martha Eddy*…http://www.wellnesscke.net

Physical activity = Increased Brain Compatible Learning

- Novelty wakes the brain up….Repetition wires the brain
- Wants body to move. Is stimulated & learns through moving
- Social organ that needs to interact with people
- Movement activities encourage cooperative learning experiences
- Learning primarily emotional process. Fun & engaging enhances learning process
- Exposing brain to hands-on learning experiences is critical to memory & retrieval
- Prefers active, not passive, learning.
- Always trying to create a reason for learning. Movement creates increased brain connectivity= problem solving & thinking skills.

Source: Kinesthetic activities help studnets of all ages learn by doing. Mike Kuczala and James Mc Call New Jersey Education Association

http://www.njea.org/news-and-publications/njea-review/april-2011/get-your-students-moving/additional-examples-of-kinesthetic-learning

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*

Brain Break

Stand up Massage the mandible joint in the jaw and give a big yawn with lots of noise
Pull on the ears while unrolling the ear lobes
Reach to touch the ceiling with right hand and then left hand ….BOTH hands
Jump up and down three times …Turn around three times TWICE…Clap three times …Stomp three times TWICE
Yell, "Yay!" Sit down Check data collected before standing and see if there is any difference in the physiology.

A Moving Child is a Learning Child

Gill Connell & Cheryl McCarthy

Movement Matters

- All learning begins with the body and is linked to movement
- The brain prioritizes movement on a child's developmental calendar
- The brain can do only one conscious thinking task at a time-essential to automate movement in early years so brain can move on to develop higher thinking and reasoning tasks
- When movement becomes automated child's mind will be free to think

Containerized Kids

- Children are born to take risks
- Deserve right and room to move-choose to give child freedom as much as possible

Movement Unlocks Brain for Learning

- Brain develops from bottom up
- Neural connections are built in early childhood-movement facilitates this process of "wiring" the brain
- Young children are wiring their brains-process of myelination occurs for many years, but most intensely in the 1st two years. Myelination speeds up brains' processing of experiences into permanent memories
- Experience develops memory- need context to store and retrieve-context comes from physical, tangible experiences
- Young children have limited memory skills-preschoolers remember two fewer instructions than their age.
- Different learning styles-learning modalities-visual, auditory, kinesthetic.

How Child Develops

- Gain awareness and control from top down and inside out
- Movement happens step by step-building one competency upon another in long journey toward fully coordinated, automated movement.
- Each child is unique-develops according to needs of brain-following a different order or skipping a task not cause for concern as long as shows signs of progress
- The Kinetic Scale-intricate weave of developmental engineering encompassing raw ingredients of movement including reflexes, sensory tools and motor tools. When combined with language, from the foundations for learning and understanding selves & world

Origins of Movement

- Postural reflexes-help get & stay upright & on two-footed way-straightening, head-righting, crawling & swimming, falling
- Reflexes initiate movement before birth, then foster controlled, deliberate movement development through early years.
- Child's reflex schedule depends upon brains unique needs
- Daily routine of eating, sleeping and playing is all needs to release primitive reflexes & trigger postural

Origin of Senses

- Sensory tools-familiar senses, balance, intuition (proprioception-sense of spatial orientation and movement.
- Sensory tools provide raw information brain needs to learn about & interact with the world.
- Movement stimulates senses to collect information for brain to analyze.

Sense of Balance

- Vestibular governs internal sense of balance.
- Balance-underpins all aspects of daily lives is critical for overall development.
- Balance is learned-through movement.
- Vestibular controls posture, balance, alertness, concentration, stillness
- RAS, reticular activating system-redirects brain for focus and concentration
- Highest form of balance=STILLNESS-can't learn to sit still by practicing sitting still.
- Ways to stimulate vestibular-spinning slowly, rolling slowly, hanging upside down

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

Let us realize that the privilege to work is a gift. The power to work is a blessing and the love of work is success. David O. McKay

Songs, Stories and Singing Games

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 and language. ***Voss***

Songs, Stories & Singing Games Provide

- a child's first introduction to poetry, committing verse to memory…
- a sequence similar to a child develops in play from solitary to co-operative…
- a possible correlation between a child's early songs & beginning reading skills…
- easy learning and remembering through the 3 Rs…rhyme-repetition-rhythm…
- support of a child's sequential development of gross motor skills...
- vehicle to learn-movement may nourish brain-impacts total development
- impact on and enrichment of language…
- comfort with un-imposed discipline and moving through space…
- a safe environment where children can make mistakes…
- a link between control of movement patterns and cognitive development…

Active Singing vs. Ordinary Songs

- children are least auditory-experiences need to be visual & kinesthetic…
- need to experience the joy of discovery through play…
- co-ordination of mind, voice and body, builds game-musical & social know how…
- an active part of the learning process occurs when game is new…
- the words provide a model of complete sentences & may introduce new parts of speech in a most easy and enjoyable way…
- activities have a way of bringing people together-providing a sense of community…
- opportunities for children to celebrate their heritage & diverse ethnic backgrounds…
- children are wired for movement, energizes and relieves stress…
- help soothe a cranky soul, build trust, self-esteem…safe vehicle for self-expression…

A Great Deal of Learning Takes Place During Singing Games

- impacts early literacy…
- games often require thinking skills…
- learn melodies-perform actions that reinforce rhythms & phrases of songs…
- improves listening skills-must listen for change in music to change directions
- once children know game they will anticipate the next movement w/ their bodies…
- games contribute to social skills as they learn to share & take turns…
- activities can be altered to meet new occasions or moods…
- traditional games enrich lives-expand knowledge of other times & cultures…

Howle, Mary Jeanette. "Play Party Games in the Modern Classroom." MENC Journal (March 1997)

http://www.edu-papers.com/a-correlational-study-of-the-relationships-between-music-aptitude-and-phonemic-awareness-of-kindergarten-children/ *Perspectives Journal.. ECMMA. Spring 2011*

Benefits of Nursery Rhymes

- Impact emergent literacy through language development and phonemic awareness.
- Kinesthesis and language play, specifically rhyming are important components in connecting literacy to learning…learn best when movement is involved. *Jensen*
- Fun, engaging oral activities facilitates language acquisition, increases phonological awareness & improves phonemic awareness through rhyme recognition. *Widdowson*
- Rhyme is particularity beneficial for struggling and reluctant readers. *Beers*
- Nurture social skills and emotional well-being.
- Most natural introduction to poetry. *R.Luken*
- When combined with movement give children a multi dimensional sensory experience.
- Provide a link between home and school that fosters a feeling of security. *J. Glazer*
- Perpetuate our literary heritage, linking generations together. *Mary E. Shorey*
- Exposure by age 3 more likely to have higher level of phonemic awareness when enter Kindergarten.
- One indicator of how well children read is their ability to recite nursery rhymes when walk in the kindergarten. *Cunningham et al*
- Encourage children to enjoy participating in music-making through various activities of listening, predicting, singing and moving to music. *Biddiss*
- Singing helps form social bonds…singing together releases oxytocin, known to be involved in establishing bonds of trust between people. *Levitin*
- Pass on common knowledge i.e. counting, alphabet, days of week.
- Rhyming, rhythm and song aid memory, beat attracting attention. Poetic imagery is powerful pathway to storing memory. Melody & harmony attract the brain to listen because they give enjoyment. *Biddiss*
- Possibility that types of song helped to shape us throughout tens of thousands of years. *Levitin*

Circles

Sense of community-Social skills-Non Verbal language & spatial awareness-Sequencing & memory through repetitive patterns-Moving to pulse of music for beat competency, necessary for speaking, walking, cutting w/scissors-awareness of different cultures-working together as group-power of group energy-peace & harmony-self-esteem & confidence

Tips For Group Management

Allow observers to watch & not be pushed to join the group…Make sure the material is relevant to the children… Provide time for children to explore and add their own ideas…Do not restrict to carpet squares or sitting on bottoms… Stop before they tire.

Relax-Regroup

Breathing is a guaranteed never fails, group management tool….hiss like snake…growl like lion…balloon breath...THIS is my TRUNK. *Google*

Music speaks what cannot be expressed. Soothes the mind and gives it rest. Heals the heart and makes it whole. Flows from heaven to the soul…Source unknown

The world is changing a lot. Because of the com and the dot. It's all new today or that's what they say, but friend, it really is not….Arlo and Janis-Jimmy Johnson…

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