The Physiological Basis of Learning
Teaching the Brain Through Games

Wendy Piret, Licensed Educational Kinesiologist & Leah Kalish, MA
wendy@move-with-me.com - leah@move-with-me.com

www.move-with-me.com
Objectives

• Understand why movement & mindfulness are essential to well-being, learning and social-emotional development.

• Learn how integrating more movement & mindfulness can easily and immediately shift a child’s (or your) State of Mind.

• Be inspired to use slow intentional movement, breathing, and/or movement stories to model daily self-awareness and self-care skills.

• Discover new resources for bringing movement & mindfulness to your classroom.
Overview

• Pre-Activity
• Adventure Skills
• Post-Activity
• Triune Brain Theory
• The Power of Hydration - Game
• A Musical Bus Tour of the Brain
• State of Mind - Game
• Pass the Message - Game
• (Time Allowing) Veggie Story
Pre-Activity

• Turn head to left.
  – Notice how it feels.
  – Notice range of peripheral vision.

• Turn head to right.
  – Notice sensation and vision.

• Fold from hips into forward bend
  – Notice sensation and range of motion, touch your fingers lightly on your knees or shins to mark ROM

• Snap Test
  – Notice ease or difficulty.
• Adventure Skill # 1

• Adventure Skill # 2

• Adventure Skill # 3

• Adventure Skill #

*Ordered to coincide with Brain Gym®’s PACE
Post-Activity

• Turn head to left.
  – Notice how it feels.
  – Notice range of peripheral vision.

• Turn head to right.
  – Notice sensation and vision.

• Fold from hips into forward bend
  – Notice sensation and range of motion, touch your fingers lightly on your knees or shins to mark ROM

• Snap Test
  – Notice ease or difficulty.
Result - A Shift in your State of Mind

Why? How?
• When you play more, you stress less
• When you stress less, you have greater access
• When you have greater access, you learn from and understand more of the world around you

Mindfulness is increasingly recognized as an essential educational tool. It develops attention, emotional and cognitive understanding, bodily awareness and coordination, as well as interpersonal awareness and skills. Because it diminishes stress, anxiety, and hostility, mindfulness enhances our total well-being, peacefulness, confidence, and joy.

- Thich Nhat Hahn
## Triune Brain Theory

*Professor Paul D. McLean*

<table>
<thead>
<tr>
<th>Lizard Brain</th>
<th>Mammal Brain</th>
<th>Human Brain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brain stem &amp; cerebelum</td>
<td>Limbic System</td>
<td>Neocortex</td>
</tr>
<tr>
<td>Fight or flight</td>
<td>Emotions, memories, habits</td>
<td>Language, abstract thought, imagination, consciousness</td>
</tr>
<tr>
<td>Autopilot</td>
<td>Decisions</td>
<td>Reasons, rationalizes</td>
</tr>
</tbody>
</table>
March of the Penguins
A Musical Bus Tour of the Brain

Brain Area - Dimension

Neocortex - Communication
- Robots
- Shoulders/Neck

Limbic - Coordination
- Swimmers
- Chest/Stomach

Reptilian - Focus
- Penguins
- Back/Calves
Adventure Skill #1

Drink Water

Drink water regularly to sustain feeling well, thinking clearly and being friendly.

Enhances:

- Electro-chemical activity in Central Nervous System
- Processing speed
- Stress release
The Power of Hydration

**Purpose:** To reinforce the principle that water is the most easily accessed and frequently needed Adventure Skill, to demonstrate that water is a powerful conductor of electricity and that the human body, consisting of between 60%-75% water, needs to remain well-hydrated in order to deliver its millions of electrochemical messages.

**Materials:** Dehydrated green plant, energy ball*, cup of water

**Standards Addressed:** AtL, LR, LD, SKS, PHD
Think Drink Chant:
I’m a water drinker
All day long
I’m a water drinker
So I stay strong
Sip, sip, sip
Gurgle, swig, chug
I’m a water drinker
Glug, glug, glug
English Language Development
The ten domains above apply to all children. One domain, English Language Development, applies only to children who are dual language learners (DLLs). These children speak a language other than English at home.
Early Learning Framework

- Physical Development & Health (PDH)
- Social & Emotional Development (SED)
- Approaches to Learning (AtL)
- Logic and Reasoning (LR)
- Language Development (LD)
- Literacy Knowledge & Skills (LKS)
- Mathematics Knowledge & Skills (MKS)
- Science Knowledge & Skills (SKS)
- Creative Arts Expression (CAE)
- Social Studies Knowledge and Skills (SSKS)
- English Language Development (ELD)
State of Mind Game

**Purpose:** To understand the three different levels of cognition or “States of Mind”, to develop the ability to intentionally self-regulate by shifting our state of mind.

**Materials:** 4 large dice, sidewalk chalk

**Standards Addressed:** PDH, SED, AtL, LR, LD, LKS, MKS, SKS, CAE, ELD
Adventure Skill #2

Humming Breath*

Rub spots under collarbone with thumb and one finger while holding other hand over navel and tracking eyes horizontally. Deep breath and HUMMMMMMMMMM to calm and focus.

Stimulates:
- Flow of oxygen to the brain
- Hemispheric integration
- Binocular vision - eye teaming
- Reticular Activating System –filter sensory info

*Similar to Brain Buttons in Brain Gym®
Humming Breath Chant

One hand on my belly, I let it rest
I bring the other hand up to my chest
I find a pair of buttons beneath the shelf
And Huuuuuuummmmmm
To calm myself
I move my eyes slowly
From the left to the right
Heart calm, mind clear
Body strong, eyes bright!

Humming Breath Video
http://vimeo.com/68339890
Adventure Skill #3

Monkey Wisdom*

March in place, alternately touching hands to opposite knees to energize body and wake up brain.

Enhances:
- Crossing the visual/auditory/kinesthetic/tactile midlines
- Hemispheric integration
- Binocular vision
- Binaural hearing
- Left right coordination
- Stability in the walking gait

*Cross Crawl in Brain Gym®
Monkey Wisdom Chant

I am healthy
I play every day
I drink lots of water
I don’t float away
I rest when I’m tired
I breathe when I’m mad
I eat fruits & veggies
‘Cause they are rad
Red, orange, yellow, green
At every meal and in between!

[Monkey Wisdom Video](http://vimeo.com/68339892)
Adventure Skill #4

Deep Down Wisdom*

1. Cross your ankles and wrists. Clasp hands and rest them at your sternum.
2. Breathe and think of something or someone you love.

Supports:
- Emotional centering
- Grounding
- Respiration
- Self-control and boundaries

*Hook ups in Brain Gym®
Deep Down Wisdom Chant:
Feel your upset melt away
As your wisdom comes to play
Your heart will know what’s best to do.
Listen deep down and let it guide you.

Deep Down Wisdom Video
http://vimeo.com/68339891
Executive Function

• Kids need access to frontal cortex for higher levels of learning
• Stress blocks that access:
  o Dehydration
  o Poor nutrition
  o Inability to self-soothe or regulate
  o Developmentally inappropriate activities / expectations
  o Your stress about assessment or behavior management
Shifters
Decrease Stress for Greater Access

• Embodied Self-Care and Regulation
• Play & Games
• Slow Intentional Coordinated Movement:
  Yoga, Karate, Thai Chi, Gymnastics
• Movement Stories
Pass the Message

Purpose: To demonstrate that learning new tasks is easier and faster with repetition, to show, kinesthetically, how the brain prunes what isn’t used, in order to become more efficient and strengthen what is being used, to develop higher level thinking such as: cooperation, decision making.

Materials: Paper, timer

Standards Addressed: PDH, SED, ATL, LR, LKS, MKS, SKS, ELD
Research Highlights

**EMBODIED SELF-REGULATION SKILLS**

- Decrease off-task behavior in preschool age children (Dr. Jennifer Dustow, Autism Project, 2009)


**MINDFULNESS**

- Increases attention span and ability to ignore distractions and concentrate effectively

SLOW INTENTIONAL MOVEMENT

• Unifies and integrates mind/body experience (Journal of Cognitive and Behavioral Practice 2009)

• Organizes whole-brain function for optimal learning (Dennison and Hannaford, 1999)

• Improves executive functions (Science 2011)

• Concentrates BDNF in the hippocampus, enhances long term memory retention (Ratey, 2008)
CARDIO EXERCISE

• Over-rides the body's physiological response to stress
• Stimulates the release of BDNF, which grows the brain (Ratey, 2008)
• Improves the cognitive control of attention
• Enhances academic performance (Hillman, CH, Pontifex, MB, Raine, LB, Castelli, DM, Hall, EE, Kramer, AF, 2009)

STORIES

• Focus attention and engage participant in an empathic response, creating a significant physiological effect on the body and on behavioral choices. (Paul Zak, 2013)

• Activate episodic memory and light up the whole brain for learning (Dr. John Medina, Brain Rules, 2010)
Story in Motion

Purpose: To inspire early literacy, movement, creativity, and a love of learning. To integrate self-care/self-regulation skills with characters from the story. Reading supports a wide range of positive outcomes, from phonological awareness to social emotional learning and self-awareness.

Materials: The recommended lesson book or a book of your choice

Standards: PDH, SED, ATL, LD, LKS, CAE, SSKS, ELD

Procedure: Read each book at least twice in the course of the week
Veggie Story Prep

• Bring in a basket of LOTS of different fresh vegetable
• Let children touch, smell. Discuss colors, qualities, nutrients.
• Invite children to “BE” each one of the veggies with their bodies. This is a great warm up for the movement story.
• Tell Veggie Story on next slide …
• Be dramatic. Have fun with it. Play music.
• CAPITALS indicate where a pose or movements go.
• Pause as needed to make space for poses / movement.
• Encourage children to explore different qualities, levels, speeds in their movement while being a bird, cricket, etc.
• Invite children to make expressive sounds.
Veggie Story

Once upon a time, a TINY SEED SNUGGLED DOWN into the earth. There, it SIPPED WATER from the RAIN and ATE MINERALS from the SOIL and made friends with the WORMS that WIGGLED through the dirt so seed could BREATHE and have room to GROW. First, it SPROUTS and SHOOTS a stem up toward the SUN. Then, leaves UNFOLD. A BUTTERFLY flits and a LADYBUG visits... BIRDS fly by and BEES and CRICKETS play nearby. Seed GROWS into a BIG, BEAUTIFUL PLANT, just the one it came from ... Show us which yummy, nutritious VEGGIE YOU ARE. (Encourage each child to BECOME one of the vegetables while you guess, such as: are you a bushy broccoli and leafy kale, and are you long, thin green beans or asparagus? If a child has difficulties, ask if they would like to do an Adventure Skill, then decide)

Now let's all be each veggie. (Coach children to copy each other's pose and/or movement one at a time)

Now show me a way YOU LIKE TO MOVE when you eat veggies and feel HAPPY & STRONG. Do you JUMP, HOP, KICK, SKIP, PRANCE, SHAKE, FLAP, STOMP, TWIST, BEND, SLIDE, or BOP? (Demo and invite movements.)

And now, let's all SIT, then LIE on our BACKS and REST. Put your HANDS on your BELLY & FEEL your BREATH come in & go out. Ahhhhh 😊
Movement Story Demo

Veggie Story Video
http://vimeo.com/68337532
Self-Care Review

Drink Water every 20-30 min throughout the day

Humming Breath – to calm and focus at circle time, after outside time, before or after transitions

Monkey Wisdom – to energize as well as prepare for gross and fine motor skill activities and reading

Deep Down Wisdom – to ground and center when upset, angry, frightened
Resources

- Move-with-Me.com
- Imaginazium.com: Yoga Kit for Kids:
- Barefootbooks.com: Yoga Pretzel/Planet Decks
- Yogaed.com: Yoga Tools for Preschool Teachers
- Omazingkids.com
- Braingym.org
- LearningStationMusic.com
- mindfulnesseducation4life.com
- victoriatennantconsulting.com
- EveKodiak.com
Bibliography


- Sally Goddard Blythe - http://www.sallygoddardblythe.co.uk/index.php

- Dr. John Medina - http://www.brainrules.net/
Science Research Highlights

Bibliography

Stories/Literature:


Embodied Self-Regulation Skills:


Science Research Highlights

Bibliography

Mindfulness:


Cardio-Exercise


Slow Intentional Movement


Link - [http://kch.illinois.edu/research/labs/neurocognitive-kinesiology/files/Articles/Gothe_2013_TheEffectsOfA.pdf](http://kch.illinois.edu/research/labs/neurocognitive-kinesiology/files/Articles/Gothe_2013_TheEffectsOfA.pdf)