

The Kinesthetic Classroom: Teaching and Learning through Movement

Presented by

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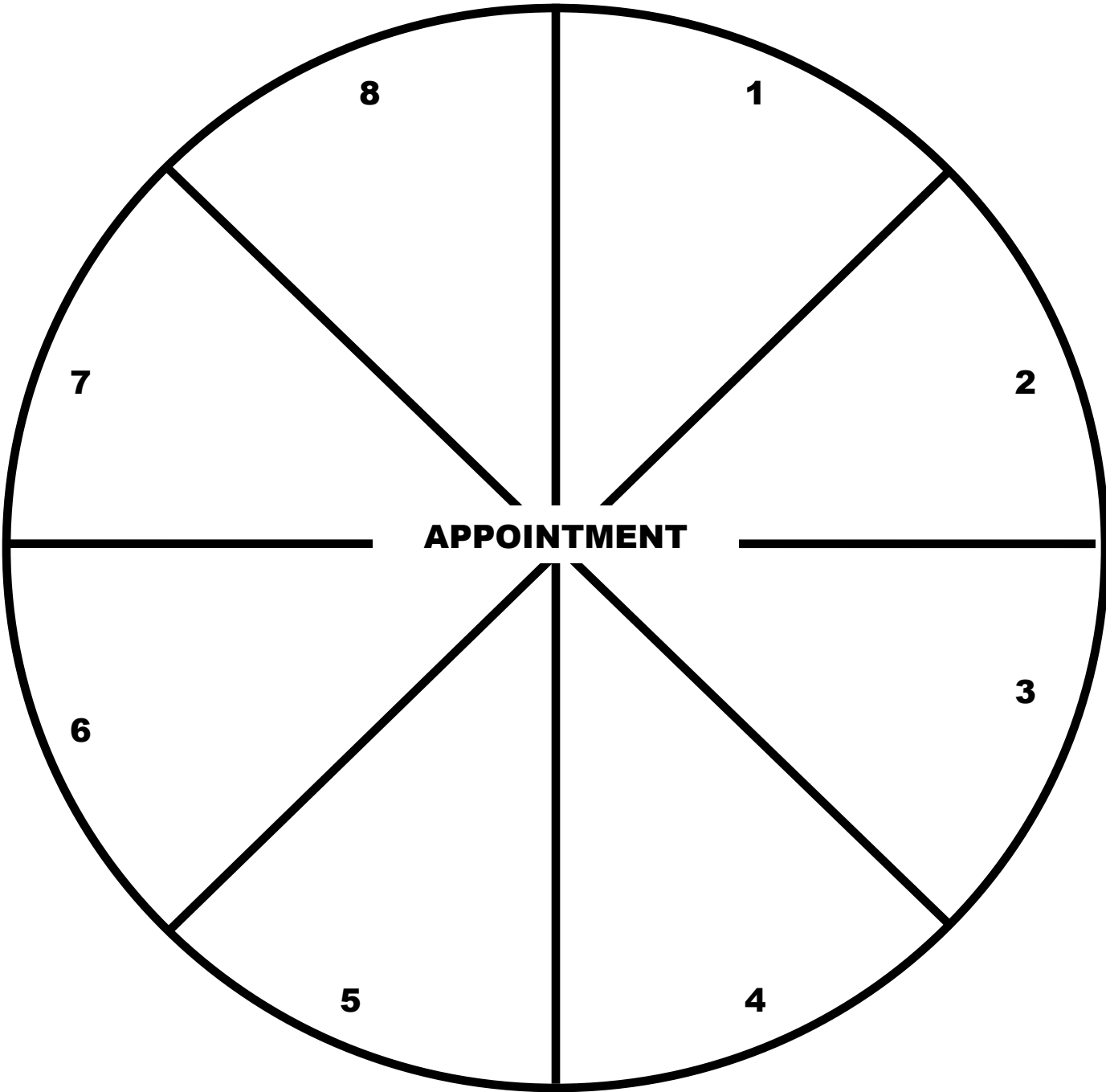
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Brain Principles Related to Movement

1. The Brain Responds to Novelty
2. The Brain Responds to Movement
3. The Brain is Always Trying to Make Meaning
4. The Brain Thrives on Concrete Experience
5. Emotions Help the Brain Remember Experiences
6. The Brain Needs Social and Environmental Interaction

The other 6 . . .

1. The Brain Needs Glucose as Food for the Brain
2. The Brain Automatically Searches for Patterns
3. The Brain Connects Old Experiences to New
4. The Brain Needs Incubation Time for Memories to Form
5. The Brain Needs Choice/Control of Experiences
6. Primary Needs Get Served first Under Stress

Why does movement enhance the learning process?

- Enhances brain function
- Increased circulation
- Refocuses attention
- It changes the brain chemically
- Reduces sitting time
- Reduces stress
- Can stimulate neurogenesis (prolonged aerobic activity)
- Provides a break from learning
- Enhances episodic memory
- Provides opportunity for implicit learning
- Provides for motivation and the meeting of basic human needs
- It's the best available manager of state
- Provides an opportunity to differentiate instruction
- Sensory engagement
- Finally, because the research says so . . .

Implicit Learning is the brain's preferred way to acquire information yet most school learning happens through explicit channels. Implicit learning often happens through movement, emotions, and life experiences. Explicit learning occurs on a very conscious level and, in a school setting, often happens through reading, listening, discussion, lecture, and work sheets. Learning something implicitly usually involves more neural pathways and sensory cues allowing for information to be learned more quickly and remembered more accurately. Using movement in the classroom opens more implicit learning channels which improves the chance for academic success.

State management refers to the ability to manage mind/body physical, mental and emotional states. Managing learner states is critical for teachers to understand because of the following:

- Limited learner attention spans
- The need for students to learn to self-regulate mood and state
- Mind/body state influences meaning making

Movement, novelty, and music are three relatively simple ways to manage state.

The 6 Purposes for Movement

Preparing the Brain

Studies have suggested a connection between abstract thinking and a well-developed sense of spatial awareness. The developing brain needs to activate this system adequately so movement and cognitive growth can develop (Jensen, 2000). Various spinning, balancing, jumping, rolling, turning, and combination activities can help develop and improve the vestibular system and spatial awareness. Movements that stimulate the inner ear alert the brain to sensory stimuli (Hannaford, 1995). The more senses that are used for learning, the more likely information will be stored and retrieved from memory.

One movement activity that crosses the midline of the body and helps improve visual tracking is **hand clapping – toe tapping**: have students stand with feet shoulder width apart and arms reaching out to their sides. Cross the right foot in front of the left leg and tap the toe to the ground. At the same time, cross the right arm over the body and clap with the left hand. Now go back to the beginning position and continue with the movement to the opposite side.

One movement activity that helps to develop the vestibular system and spatial awareness is **spinning**: Have students bend their knee so their right foot is close to their buttocks. Now with their left hand, they will reach behind their back and grab their right foot. While hopping on their left foot they spin in a clockwise rotation (then counterclockwise). Continue activity with opposite foot and hand.

Providing Brain Breaks

Brain breaks are useful for giving necessary content breaks, state management, incorporating fun into a lesson, and re-focusing attention. Listed below are several easy brain breaks that can be incorporated immediately:

Handshake Creations: Stand up, move around the room, and in the time allotted greet as many people as possible and each time you meet with someone create a new handshake.

Finger Snatch: Stand facing your partner. Each person puts their right hand out in front of them and puts their left pointer finger in the palm of the other person. When the teacher yells “go” each person simultaneously tries to grab the other person’s pointer finger and pull their own pointer finger out of the palm of the other person.

Rock, Paper, Scissors Math: Participants play rock, paper, scissors but instead of shooting a rock, paper, or scissors, each person shoots a number (1-5). Both people quickly add up the two numbers and the first to yell out the answer wins. Try also with multiplication and subtraction.

Supporting Exercise and Fitness

Ratey (2008) states that research on exercise and cognition shows that:

- In one landmark study aerobic exercise was as effective as antidepressants
- Women who exercise lower their chances of developing dementia by 50%
- Aerobic exercise sparks new brain-cell growth
- A revolutionary fitness program helped put one U.S. school district of 19,000 kids first in the world in science
- Aerobic exercise really is the best defense from everything from mood disorders to ADHD to addiction to menopause to Alzheimer's.

Aerobic exercise needs to be re-framed as benefitting the brain just as much, if not more than, the body. Examples of easy-to-use exercises in the classroom include jumping jacks, mountain climbers, scissor kicks, jog in place, and crisscrosses.

Developing Class Cohesion

These activities serve to build cooperative and relationship skills, teamwork, and a sense of belonging in a fun, movement oriented atmosphere. One of the activities you were a part of today is called **Balloon Pop**.

Objective: To participate in a cooperative game while using team work and strategies to make balloons pop up in to the air.

Materials Needed: Balloons and a whistle.

Activity Directions: The instructor will split the class in two equal teams. All team members will make a small, tight circle. All members of each team must stay hooked together by either joining hands or linking forearms. The instructor will give each team a balloon (should be approximately the size of a volleyball). Each team has to stay linked together while making their balloon pop into the air. The participants can use any part of their body to keep the balloon up, however they need to play safely and be aware of their other teammates. After each team is given a few minutes to practice with the one balloon, the instructor can add another balloon. If a balloon starts to drift away from a team, the entire team must stay linked together as they all move to get the balloon and keep it popping. After a few minutes of practice, the real game begins. This game is a friendly competition where one team is playing against the other. The first team to earn 3 or 5 points (instructor's decision) will be the winning team. A team can earn a point by keeping their balloon in the air longer than the other team. As soon as a balloon hits the ground, the other team earns a point.

Note: a minimum of 8 participants are needed for this game, if less than 8 participants are present the instructor will refer to the challenge game

Challenge: The instructor will now place the two teams together. The goal is for both teams to link hands to keep all the balloons popping up in to the air. This is easier said than done. Encourage

participants to develop strategies. Set goals and see how many balloons they can keep up in the air at one time. Good luck trying to stop some of your participants from laughing!

Reviewing Content Using Movement

These activities are wonderful for content review because of their fun and motivational nature. They allow students to review information in an enthusiastic and playful manner. These games are applicable to all classrooms in all grade levels. There are many examples of these types of activities and the one we played today is called

Content Footloose

Objective: To recall information about sport in a silent, action-based activity.

Materials Needed: Footloose answer sheet and content questions on a note card or on cut up pieces of paper.

Activity Directions: This is a silent review game. The instructor will give each player a blank footloose chart that has 10 to 20 square blocks in it. There will be a question that corresponds with each block. The questions will be made up from specific content areas. Some questions may be written more than once if the instructor wishes. These questions will be placed on index cards. The instructor will then pass out the cards so that each player has a card. At the signal, participants will turn their card over, read the question and write the appropriate answer in the same numbered square. If the participant does not know the answer, he/she will leave it blank. At any time a participant can get up to move around the room and exchange questions with another person that is also moving in search of an exchange. The student cannot look at the new question until he/she gets back to his/her seat. Once the participant gets back to the seat they can check to see if he/she knows the answer to this question. If it is a question that he/she already had, they must get back up out of their seat to search for a new question. The game progresses until time is called. The goal is to get as many answers as you can before the end of the game. The game length is up to the instructor's discretion. As noted this is a silent game. Anyone talking during the game will be placed in to the penalty box for a twenty second time-out. If a student receives a second penalty, the time-out will be increased by ten seconds. At the conclusion of the game the instructor can have the students check their own sheets or exchange sheets with a partner.

Challenge: To create a more challenging experience the instructor may choose to play this game at the beginning of the unit or implement some higher order questions.

Many educators love the idea of students being active, on task and QUIET! This activity is great for reviewing many different content areas.

Teaching New Content Using Movement

The brain and body have unfortunately been separated for both medical and educational purposes for far too long. The body is simply an outwardly extension of the brain. Using the body to learn is a simple, readily available, and efficient for way for students to learn and remember content. In fact, when I teach graduate courses on the brain I have participants learn about the characteristics of a neuron using their

arm, hand, and fingers. This way, I know the information can be easily accessed and readily available for later use because of its implicit nature. This strategy can be used in all classrooms in nearly all content areas. In this session you've been a part of solving several math problems. Here is an example of one:

Finding the circumference and diameter of a circle:

Create enough space for all students to form a circle. Have one student walk heel to toe around the entire circle making sure to count his steps and finish at the same spot where he started. At the original starting point have that same student turn toward the circle (the students should open the circle) and walk a straight line from one side of the circle to the other, heel to toe and counting all of his steps. That student has just marked both the circumference and diameter of a circle. The relationship is pi. The general equation is the circumference of a circle is a bit more than three times the diameter of the same circle ($\pi = 3.141$). Doing this kinesthetically could produce an inexact result but will be close enough to teach the concept. If walking the entire circle produced 27 steps and walking the diameter produced 8.5 steps, the result would be 3.176.

A Brief Overview of Research on Movement, Fitness, Cognition and Academic Performance

- 17 of the 250 action research designs from the 2009 Master of Arts in Education graduating class of Gratz College focused on using movement in the classroom. Taken as a whole this research informs us that using kinesthetic activity increases motivation, creates positive learning states and classroom environments, can raise test scores, prepares the brain and body for learning, increases levels of student participation, attention, and engagement, and helps students to more easily retain and recall information; as cited in *The Kinesthetic Classroom* (Kuczala and Lengel, 2010).
- Students involved with the Learning Readiness PE program used in the Naperville (IL) School District have shown significant increases in reading ability and comprehension, and math. Initially, students voluntarily took the 7:00 a.m. physical education class before attending their regular reading and math classes. In one semester, those with LRPE improved their reading and comprehension scores by 0.5 grade levels more than those students in the study who took the literacy class alone. The results were just as compelling with the students who took LRPE before math class. These students increased their algebra readiness by an average of 20.4% compared to 3.87% in the students without LRPE. Currently, the program is mandatory; as cited in *The Kinesthetic Classroom* (Kuczala and Lengel, 2010).
- In 2002, A California Department of Education study matched scores from 954,000 students on the spring 2001 administration of the Stanford 9 Test (SAT-9) with the results of the same students' performance on the state-mandated 2001 physical fitness test and found that academic achievement is related to their levels of physical fitness (Winger and Thomas, 2002) as cited in *Action-Packed Classrooms* (Summerford).

- Hyperactive children who run before class have improved their behavior so significantly that doctors were able to decrease stimulant doses in children who ran every day (Putnam, 2003) as cited in *Action-Packed Classrooms* (Summerford).
- Mental focus and concentration levels in young children improve significantly after engaging in structured physical activity (Caternio and Polak, 1999) as reported in the *Action Based Learning Lab Manual* (Hess and Madigan).
- A 2009 study found that of 2.4 million Texas students those who are physically fit are more likely to do well on the state's standardized test, have good school attendance and are less likely to have disciplinary referrals (Texas Education Agency, 3/9/2009).
- Researchers at the University of Illinois found that after acute bouts of walking students are better able to allocate attentional resources and also results in better performance on academic achievement tests (U of Illinois, 3/31/2009).
- Sacrificing physical education for classroom time does not improve academic performance. In fact, one study showed that a reduction in class time for academics to enable an increase in physical activity leads to consistently higher mathematics scores (*Active Education Fall 2007 Research Brief*).
- The Prince William County (Virginia) Public Schools have also reported dramatic success in using the *Action Based Learning Lab* with first graders in need of intervention and remediation; as cited in *The Kinesthetic Classroom* (Kuczala and Lengel, 2010).

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