

WEBSITE FOR CLASSROOM TEACHERS:

MALLORY'S BRAIN BREAKS

A Project

Presented

to the Faculty of

California State University, Chico

In Partial Fulfillment

of the Requirements of the Degree

Master of Arts

in

Kinesiology

by

© Mallory Susan Russo

Summer 2016

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DEDICATION

I would like to dedicate this project to all kinesthetic learners and classroom teachers. As a kinesthetic learner myself I have seen first-hand the positive benefits physical activity can have on me emotionally, mentally, and physically. My hope is that this tool will reach all those students who need to get up and move and in turn learn more, enjoy school more, and maybe even find their passion.

ACKNOWLEDGEMENTS

Thank you to my awesome Kinesiology professors at California State University, Chico State: Cathrine Himberg, Kevin Patton, and Craig Buschner. I would not have found an avenue to stretch my passion for physical activity without your awesome, inspiring classes and the multitude of opportunities you provided for me. Your support and encouragement has helped me grow in many areas. It is an honor and privilege to have you as part of this project that will hopefully instill that same passion in young students. Thank you for not giving up on me.

Thank you to Rob Lambert for the awesome videotaping and editing of all of my videos. They all turned out perfect. I could not have completed this project without your expertise. You made it fun and enjoyable to tape and re-tape!

Thank you Mom and Dad for encouraging me, believing in me, and supporting me on this amazing journey through undergrad, teaching credential, and now my Master's in Kinesiology. I could not have done any of it without your love, support, and encouragement every step of the way.

Thank you to my husband and son. Jesse, I could not have made it through this process without your unwavering love and support. You helped and inspired me to be the best I could be. Josh, thank you for your help and enthusiasm when taping my breaks. I enjoyed and appreciated having you be part of the process.

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ABSTRACT

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Schools have the ability to help shape students' futures and provided them with ample opportunities to succeed, including improved health and increased physical activity (Bailey & Clyde, 2015). The new Every Student Succeeds Act (ESSA) of 2015 allows for more funding, flexibility, and control to the state and district to have a "well-rounded education" (p. 6) for each student. Physical activity can have a positive impact on students' brains, which in turn can enhance academic performance, executive attention, classroom behavior, attention-to-task, selective attention, concentration, on-task behavior, and alertness (Donnelly & Lambourne, 2011; Janseen, Chinapaw, Rauh, Toussaint, Mechelen, and Verhagen, 2014; Kubesch, Walk, Spitzer, Kammer, Lainburg, Heim, and Hille, 2009; Trost, 2007; Trost, 2009; Trost & van der Mars, 2009; Trudeau & Shephard, 2009). The focus of this project was to create and design a website for classroom teachers, K-6, to implement throughout their curricular school day.

This project helps address the importance and need for physical activity throughout the day and how it affects students emotional, mental, and physical well-being (Barr-Anderson, AuYoung, Whitt-Glover, Glenn, & Yancey, 2011; NASPE, 2011). Brain breaks is one way to implement physical activity into the school day. They are most beneficial when children sit longer than thirty minutes or when transitioning from subject matter to subject matter (Jensen, 2000). The content of the website was the creation of videos to encourage the use of brain breaks for elementary age children. This electronic tool consists of sixteen videos to help students think, move, and engage (Ma, Sures, & Gurd, 2015). The videos utilize an instructor leading the movements and giving explicit instructions on how to perform each move correctly. The videos and scripts offer guided brain breaks and explicit instructions. It can be accessed by using this link <http://BrainBreakswmallory.wix.com/hibb>. The website allows elementary teachers to implement brain breaks seamlessly throughout their school day.

CHAPTER I

INTRODUCTION

Project Overview

A child's health is an important focus and concern for all educators. Caring educators do their best to create a meaningful, safe and well-balanced learning environment for each child. Schools have the ability to help shape students' futures and provide them with ample opportunities to succeed, including opportunities for improved health and increased physical activity (Bailey & Clyde, 2015). No Child Left Behind Act of 2001 (NCLB) placed an emphasis on academic achievement at the expense of physical education and physical activity for children (Trost & van der Mars, 2010). With the new Every Student Succeeds Act (ESSA), beginning in December 2015 there is federal support for educating the whole child. Every Student Succeeds Act replaces No Child Left Behind Act. The goal of this new law is to allow more funding, flexibility, and control to help states and school districts have a "well-rounded education" (p. 6) for each student. The Every Student Succeeds Act includes physical and health education in the broader public school curriculum presenting a well-rounded education. Every Student Succeeds Act encourages funding for school health and physical education programs; that is, ESSA levels the playing field by including physical education and health with other academics (Society of Health and Physical Educators America 2016; United States Department of Education, 2015).

According to the United States Department of Education (2015) educating the whole child means developing students who are emotionally and physically healthy (National Association of Sport and Physical Education, 2011; Shepard, Pintabo & Bean, 2011). When educating the whole child, teachers are balancing the needs of every unique individual in their class. Active participation is one important aspect of educating the whole child and focuses on engaging the students emotionally and physically throughout the school day. Physical activity is one way to reach students and allow them to participate and improve their confidence in basic movement skills without the competition from peers (Ma, Sures, & Gurd, 2015). Additionally, since students look up to their teachers and peers, when teachers participate actively, students are more likely to be encouraged and have an increased participation in the activity (Howie, Schatz, & Pate, 2015). Short activity breaks are a way to incorporate physical activity in the classroom throughout the day and allow teachers to engage along with students.

It is known that a healthier child makes a better student: “Ask a parent what is important...they would wish for good health for their children and their loved ones” (Masurier & Corbin, 2006, p. 50). Physical activity and quality physical education both play an important role in the health of a student. It is important to acknowledge that there is a difference between physical education and physical activity; individuals require both for optimal health and brain function. Planned physical activity brings many health benefits that have proven vital for students in an educational setting (CDC, 2011). Planned physical activity means time allotted for children to get up and move, increasing their heart rate and oxygen flow to their brain. Physical activity allows students to have structured or unstructured play putting into practice movements and skills obtained from

quality physical education. Physical activity during the school day happens in a variety of settings: before school recess, morning recess, lunch recess, after school recess, breaks throughout the day, after school sports or activities. Physical activity allows students to gain increased movement time throughout the day.

Quality physical education, in comparison, happens in a controlled setting during the school day. Quality physical education teaches an individual to be competent in a variety of motor skills and movement patterns; apply knowledge of concepts, principles, and tactics related to movement and performance; demonstrate the knowledge and skills to achieve and maintain a health-enhancing level of physical activity and fitness; exhibit responsible personal and social behavior that respects self and others; and helps an individual recognize the value of physical activity for health, enjoyment, challenge, self-expression and/or social interaction (SHAPE, 2013). Quality physical education promotes lifelong physical fitness, provides unique opportunities for activity, teaches self-management as well as motor skills, and promotes learning (CDC, 2011; Masurier & Corbin, 2006).

Physical education also consists of a qualified teacher leading students through movements and skills and teaching them the appropriate way to move while performing various activities in a structured setting on a regular basis. It is recommended that children ages 6-17 years receive sixty minutes or more of moderate to vigorous intensity activity at least three days per week (CDC, 2011). Quality physical education classes are a prime scenario to provide the allotted time for students to reach these recommended amounts of aerobic activity. Educating students to become physically

literate, however, takes instructional time and thus a portion of the 60 minutes needs to happen outside physical education with physical activity throughout the school day.

Physical activity can be incorporated in the classroom. Brain breaks are opportunities to bring physical activity to children throughout the day with short bursts of activity (Barr-Anderson, AuYoung, Castelli & Ward, 2012; Trost & van der Mars, 2010; Weiss, & Weiss-Bjornstal, 2009; Whit-Glover, Glenn, & Yancey, 2011). Brain breaks provide an opportunity for students to get up out of their seat and have a movement break in a structured environment. These breaks allow students to get their heart rates up, increasing the flow of oxygen to their brain and perform movements where they are moving from high to low and crossing their mid-line. Brain breaks are not free play, but encourage students to move in a prescribed, free or structured way. Brain breaks can be implemented whenever a teacher feels the need, whether it is before a lesson, in the middle of a long sedentary lesson, or as a transition from one subject matter to another. The amount and occurrence of breaks can vary depending on the day or schedule. Consistency in when breaks are implemented could lead to consistency for students who thrive on routines. Parsonson (2012) discusses that one important classroom behavior management strategy is having predictable activities and events that are established in a daily routine. McMullen, Kulinna, and Cothran (2014) also shared that when students knew the protocol and knew what to expect the physical activity break was implemented with ease. Maeda and Murata (2004) explained that students enjoyed, appreciated and expected having a break after a lesson to allow them time to refocus and get some exercise in for the day. Brain breaks are an educational tool that constitutes the focus of this project. It is important to emphasize that brain breaks should add to, and should not

replace physical education class or long periods of physical activity, such as recess because they serve different purposes. Recess is another important physical activity break needed throughout the school day. Physical activity in many forms plays an important role in the school day for children and their development. Recess provides an unstructured time for students to run around, play freely, create and build friendships, and practice the movements and skills learned in physical education class (Castelli & Ward, 2012).

In the United States most of the school day is designed for cognitive learning. Exercise provides the link between our brain and learning. In their book, *SPARK*, Ratey and Hagerman (2008) discuss the impact exercise has on the brain and how it functions. They explain that when we exercise we spark our neurons to activate, which causes movement in our brain, allowing all our neurons and synaptic connections to be stimulated and activated. This activity causes the brain to be awakened creating new brain connections, sharpening our focus, and allowing for more learning opportunities and more memory retention. Physical activity and planned exercise plays a huge factor in our brain function.

Children and teachers need breaks throughout the day. Stylianou, Kulinna, and Naiman's (2015) article titled, "...because there's nobody who can just sit that long..." (p. 1) examines teachers' attempts to implement physical activity and considers teachers' perceptions of classroom-based physical activity and related management issues. One teacher said that when her students 'look lethargic' or are 'jiggling and looking around', she would stop and say "ok, get up" and they would perform a CBPA (classroom-based physical activity). Another insight teachers found when incorporating

CBPA was students actually asking for them or saying “I’m frustrated, I’m tired, can we do a physical activity break?” (p. 11). Many of the responses indicate that teachers struggled to fit another thing into their busy schedules. Teachers are continually asked to add something else into their schedules which means they have to plan ahead and learn a new method before implementing it with their students (Stylianou, Kulinna, & Naiman, 2015). This project will encourage teachers to incorporate Mallory’s Brain Breaks throughout their day without having to learn new curriculum. To utilize these resources teachers will just need to click on the link to the website and then follow along.

During brain breaks students have the opportunity to get up out of their seats and move. The brain breaks in this project will be geared toward high intensity motions that will cross the mid-line of the body, moving your arms and legs across the center of your body, hand/eye coordination, moving from high to low and side to side, and will involve partners. These movements were selected based on research results of aerobic activity on students’ health and brain, along with research results on stimulating the brain when crossing the mid-line (Ratey & Hagerman, 2008). Crossing the midline is an integral skill related to bilateral coordination such as hand-eye-coordination. Having good bilateral integration is a crucial aspect when students are performing daily tasks. Working with a partner adds another complex dynamic to classroom interactions and students’ social needs and is a beneficial component for optimizing brain function and learning (Berg, 2010; Ratey & Hagerman, 2008). The goal is to get students moving quickly and to engage their brains in an enjoyable, active way.

Purpose

The purpose of this project was to design a website for classroom teachers. The content of the website was the creation of videos to encourage the use of brain breaks for elementary age children. This electronic tool consisted of sixteen videos to help students think, move, and engage (Ma, Sures, & Gurd, 2015). The videos and scripts offer explicit instructions and feature the website designer. Brain breaks are most beneficial when children sit longer than thirty minutes or when transitioning from subject matter to subject matter (Jensen, 2000).

The purpose of this project is to create a practical tool for teachers to use in their classrooms to implement breaks for physical activity throughout the school day. The tool consists of a website that has sixteen short videos that directly lead students, giving them opportunities to get up out of their seats, move, and engage (Ma, Sures, & Gurd, 2015). The videos utilize an instructor leading the movements and giving explicit instructions on how to perform each move correctly. The classroom teacher does not have to learn the breaks ahead of time and can engage along with the students for their own break. This practical tool is most beneficial when implemented consistently throughout the day on a daily basis. Ideally brain breaks are needed when students have been sitting longer than thirty minutes or when transitioning from subject matter to subject matter (Jensen, 2000).

Scope of the Project

This tool consists of a website comprising sixteen short videos demonstrating instructor-led brain breaks of varying lengths, 1-2 minutes and 3-5 minutes. The videos

range from crossing the mid-line, spatial movement from low to high and side to side, counting while moving, and various other movement concepts (Graham, Holt/Hale, & Parker, 2010). The videos consist of just one instructor on the screen with few visual distractions, and instructions are easy to follow. The instructor is the designer of this project and an elementary school teacher in Northern California. The website includes brief summaries of what the video presents, what is needed to perform the brain break, and problem solving tips to ensure smooth implementation. The home page includes research on why brain breaks are beneficial when used throughout the day. Additionally, a testimonial page will allow a place for comments from teachers who have tried the breaks.

Significance

Several studies reveal how implementing breaks throughout the day can have a positive outcome on students' fitness, minimizing time wasted on disruptions in the classroom, and improving academic performance (Castelli, Glowacki, Barcelona, Calvert, & Hwang, 2015; Katz, Cushman, Reynolds, Njike, Treu, Walker, Smith, & Katz, 2010; Kibbe, Hackett, Hurley, McFarland, Schubert, Schultz, Harris, 2011). Katz et al. (2010) encourages "Activity Bursts in the Classroom" in the classroom whenever there is "down time" (p. 2). The activity bursts varied in duration and how the activity bursts were performed throughout the day. Teachers were trained in how to perform the activity burst including three components: a warm-up, a core activity, strength or aerobic activities, and a cool down.

Students' retention can be enhanced when physical activity is incorporated into an academic lesson. Castelli et al. (2015) states that students who had physically active lessons received better retention of the information than students who received lessons in a seated, inactive manner. Further, this study reports that after a one ten-minute "Energizer," a physical activity break, students showed a higher frequency of on-task behavior (p. 3).

Based on the research, brain breaks are a positive way for students to release energy and obtain more knowledge. Another study was done on "FUNtervals" lasting fewer than five minutes (p. 50). These are quick activities that increase students' physical activity and fitness levels, and also improve the classroom environment (Ma, Sures, & Gurd, 2015). CDC (2015) gave a weekly health tip that was to take a break about every hour, stating that breaks five minutes or less can have several positive health benefits. In a systematic review of literature done on integration of short bouts of physical activity in 23 published articles, more than half of the studies found that short, structured physical activity breaks led to improved: academic achievement, concentration and time-on-task behavior (Barr-Anderson, AuYoung, Whitt-Glover, Glenn, & Yancey, 2011). The other articles reported no effect when physical activity was implemented regarding academic-related outcomes. Articles that researched short bouts of exercise consisting of at least 3 minutes and up to 20 minutes in length were selected. Articles that studied breaks longer than 20 minutes were excluded. Barr-Anderson et al. (2011) states that the U.S. Preventive Service Task Force found strong evidence supporting the effectiveness of short activity bursts, usually 10 minutes or less, into the regular routine of a day. The hope of this project is that it can be used to enhance students' concentration, encourage

their cooperative skills, and improve their self-esteem, attitude, and attentiveness. These potential positive outcomes may result in a school day where fewer students will be described by teachers as being “off-task,” “disruptive,” and “antsy or fidgety.”

Shepherd, Pintado, and Bean (2011) conducted a review of physical education and academic achievement stating, “healthy children learn better.” There are five ways that physical activity affects a child at school. First, regular exercise can alleviate stress, anxiety and depression, and boost self-esteem. Imbalance in these areas can have negative effects on school performance. Second, physical activity levels can affect classroom behavior by decreasing disruptive behaviors. Third, when endurance fitness was implemented students’ reading and mathematics scores have shown to increase. Fourth, interaction with adults in students’ lives doing something ‘fun,’ like physical activity, can result in a higher level of school satisfaction and connectedness. Fifth, studies have shown increased physical activity may affect cognitive and motor skill development. Finally, research shows connections between physical activity participation and our brain function (Shepard, Pintabo, & Bean, 2011). Short bursts of physical activity, such as brain breaks, implemented throughout the school day can enhance the classroom learning environment. Brain Breaks with Mallory allows the teacher and student to participate in short physical activity bursts.

Limitations

This project was created to provide a resource for elementary school teachers to implement brain breaks throughout their academic day by a certificated instructor with a physical education supplement. The project does not provide a specific curriculum it is

merely a series of videos to follow with some additional tools on the website. Despite a significant increase in the number of brain break research studies, currently no consensus exists on the optimal frequency and duration of such breaks. Another limitation of this project is the current research on the topic of brain breaks under five-minutes and their effect on academic and behavioral aspects during the school day. However, the limitations in the existing research and literature also provide an opportunity for future projects to fill a need in current research.

Delimitations

The project creation of the website, Brain Breaks with Mallory, is designed for a K-6 school environment and has not yet been tested at each grade level. The brain breaks were designed for teachers to use during long lessons, transitions between lessons, and other situations where students will benefit from guided movement; the ability of the teacher to effectively manage the transition is beyond the scope of the project.

Definition of Terms

Brain Breaks

Physical activity breaks throughout the school day that have students up out of their seats and moving from high to low, crossing their mid-line, and ranging from one to five minutes.

Brain-Derived Neurotrophic Factor (BDNF)

A protein produced inside nerve cells when they are active. It serves as Miracle-Gro for the brain, fertilizing brain cells to keep them functioning and growing, as well as spurring the growth of new neurons (Ratey & Hagerman, 2008).

Cognitive Function

Activities that lead to knowledge such as, reasoning, memory, attention, and language (medical-dictionary.thefreedictionary.com, 2016).

Dopamine

A neurotransmitter that is vital to movement, attention, cognition, motivation and pleasure, and addiction (Ratey & Hagerman, 2008).

Executive Function

The ability to manage oneself, self-regulation, and one's resources in order to achieve a goal (medical-dictionary.thefreedictionary.com, 2016).

Exercise

A subcategory of physical activity that is planned, structured, repetitive, and purposive in the sense that the improvement or maintenance of one or more components of physical fitness is the objective. The primary purpose of improving or maintaining physical fitness, physical performance, or health (CDC, 2015).

Fibroblast Growth Factor (FGF-2)

A protein that is produced and released in the body and the brain when tissues are stressed. Also helps create more blood vessels and other tissues. Helps initiate the process of stem-cell division that is necessary for neurogenesis, encourages long-term potentiation (LTP) and the formation of memories (Ratey & Hagerman, 2008).

Hippocampus

Gathers incoming stimuli from throughout the brain, cross-references the new information with stored information, and bundles it together as a memory that is then sent to the prefrontal cortex for processing (Ratey & Hagerman, 2008).

Insulin-Like Growth Factor (IGF-1)

A hormone that is produced mainly in the liver and works closely with human growth hormone and insulin to stimulate cell growth and counteract natural cell deterioration (Ratey & Hagerman, 2008).

Long-Term Potentiation (LTP)

The cellular mechanism for learning and memory that requires the strengthening of brain cells' ability, or potential, to send a signal across the synaptic gap (Ratey & Hagerman, 2008).

Moderate Physical Activity

Intensity of physical activity that corresponds to 50-69 percent of an individual's maximal heart rate. Examples include brisk walking and slow bike riding (CDC, 2006).

Neurons

A specialized cell transmitting nerve impulses (Merriam-Webster, 2015).

Neurotransmitters

A chemical substance that transmits nerve impulses across a synapse (Merriam-Webster, 2015).

Norepinephrine

A neurotransmitter that affects arousal, alertness, attention, and mood. It signals active sympathetic nervous system and sharpen the senses (Ratey & Hagerman, 2008).

Physical Activity

Activity in which the body's large muscles move in a rhythmic manner for a sustained period of time. Aerobic activity, also called endurance activity, improves cardiorespiratory fitness (CDC, 2015).

Physical Education

A specific time taught by a credentialed physical education teacher. Students learn a variety of motor skills and movement patterns; how to apply knowledge of concepts, principles, strategies and tactics relate to movement and performance; demonstrate knowledge and skills to achieve and maintain a health-enhancing level of physical activity and fitness; exhibit responsible personal and social behavior that respects elf and others; and recognizes the value of physical activity for health, enjoyment, challenge, self-expression and/or social interaction (SHAPE, 2013).

Prefrontal Cortex

The region of the cortex located at the very front of the brain. It oversees the qualities that make us most human. It is the CEO of most brain functions, some are, planning, sequencing, rehearsing, evaluating, and understanding. It is also home of working memory, which is crucial to decision making (Ratey & Hagerman, 2008).

Selective Attention

The capacity for or process of reacting to certain stimuli selectively when several occur simultaneously (medical-dictionary.thefreedictionary.com, 2016).

Serotonin

A neurotransmitter vital to mood, anxiousness, impulsivity, learning, and self-esteem (Ratey & Hagerman, 2008).

Synapses

The junction of the axon and dendrite of two adjacent neurons. In the axon, electrical impulses are translated into chemical messengers – neurotransmitters - to carry instructions across the synaptic gap. At the dendrite, the neurotransmitter's signal is concerted back into an electrical impulse, which prompts the receiving neuron to carry out a task (Ratey & Hagerman, 2008).

Synaptic Connections

The connection between two neurons (Ratey & Hagerman, 2008).

Vascular Endothelial Growth Factor (VEGF)

An important signaling protein produced and release in the body when tissues are taxed and there is not enough blood flow to fuel the demand. It is produced in the brain and is involved in cementing memories (Ratey & Hagerman, 2008).

Vigorous Physical Activity

Intensity of physical activity that corresponds to approximately 70 percent or more of an individual's maximal heart rate. Examples include running, aerobic dance, singles tennis, swimming laps, and competitive basketball (CDC, 2006).

CHAPTER II

REVIEW OF LITERATURE

Introduction

Physical activity can be beneficial for a student's physical, mental, and emotional state (Barr-Anderson, AuYoung, Whitt-Glover, Glenn, & Yancey, 2011; NASPE, 2011). The new law, Every Student Succeeds Act (United States Department of Education (ED), 2015) supports having a "well-rounded education" which involves physical education classes and more physical activity in the school curriculum (p. 6). Movement can impact students' brain function, academic achievement, peer interaction, mood, life-long physical fitness, motor skills, and provide necessary breaks throughout the school day (Barr-Anderson et al., 2011; Berg, 2010; CDC 2011; Ma, Sures, & Gurd, 2015; Masurier & Corbin, 2006; NASPE, 2011; Ratey & Hagerman, 2008; ED, 2015). This project provides a practical tool for teachers to help incorporate physical activity breaks throughout the school day.

This review of literature will discuss relevant research that has been published relating to educating the whole child. The focus is on how exercise impacts the brain and consequently students' attention and focus in the classroom, as well as academic achievement. This project will address how to integrate physical activity into the classroom. Students come to school to learn life-long skills. Physical activity includes many crucial life-long skills that have to be taught in order for students to acquire

knowledge and interest to put into practice. Physical activity benefits students' fine-motor skills such as writing (holding a pencil), using scissors, hand/eye coordination, and gross-motor skills such as, walking, balancing, jumping, running, and skipping. All these movements are necessary in a school environment, in order to keep students focused, attentive and motivated. These can also be tools that will create the foundation that adults need to perform aerobic activities to maintain a healthy lifestyle (Barr-Anderson et al., 2011; Centers for Disease Control and Prevention, 2011). Research supports the need for physical activity breaks throughout the school day.

Educating the Whole Child

In building the case for educating the whole child, The Association for Supervision and Curriculum Development (Association for Supervision and Curriculum Development (ASCD), 2012) describes what a successful learner is and defines how to measure success. The ASCD 2012 report, "Making the Case of Educating the Whole Child," states that 66% of students reported being bored in class. Students need to be engaged and motivated in order to learn. The report also concluded that physical activity is beneficial for any age and can improve the health and quality of life. ASCD (2012) states that improved health can improve school attendance in adolescents. Studies also show that absenteeism can be reversed by increasing access to health services and increasing physical activity in the school day (Basch, 2010; CDC, 2011). Health and wellness are as important as academics to students' and school success. Educating the whole child means students must be healthy, safe, engaged, supported, and challenged (ASCD, 2012; CDC, 2011).

Trost and van der Mars (2010) conducted a meta-analysis of 40 studies and looked at how participating in regular physical activity affects cognition. One study involved 287 fourth and fifth graders in British Columbia and the effects of daily classroom physical activity on academic performance. Students increased their activity by 50 more minutes per week. Their standardized test scores in mathematics, reading, and language arts were equivalent to those of students who did not receive 50 additional minutes of physical activity. Another study looked at 500 Virginia elementary schools and the effect of decreasing time for physical education and the impact on academic performance. The results showed that reducing or eliminating time for physical education did not increase academic achievement. In North Carolina researchers evaluated the effects of a classroom-based program that gave students 10-minute breaks daily of organized physical activity for 12 weeks. The results showed that student's on-task behavior increased by 20 percent. These findings concluded that regular physical activity significantly improves multiple categories of cognitive function in children and adolescents. Even when physical activity was reduced students' performance did not increase. There were improvements in perceptual skills, IQ, verbal and mathematical proficiency, concentration, memory, test scores, and academic readiness. (Trost & van der Mars, 2010, p. 62).

Barr-Anderson et al. (2011) completed a systematic review of literature on integrating short bouts of physical activity into an organizational routine. Studies that implemented physical activity breaks consisting of at least three minutes and no longer than ten minutes were included. Results were gathered from self-reported questionnaires, pedometers, teacher reported, direct observation, or accelerometers. There were twenty-

three school-based articles included in this systematic review. One intervention consisted of jumping for three minutes throughout the day when a break was needed. This intervention lasted a full school year and was done in six Dutch elementary schools with 510 students. Another intervention was called Happy 10, which consisted of ten minutes of physical activity in the classroom daily, lasting for eight months in a Chinese elementary setting. Animal Trackers was a ten-minute physical activity break performed daily for ten weeks in U.S. preschools. Promoting Lifestyle Activity for Youth (PLAY) was fifteen minutes of physical activity during the school day for 12 weeks in U.S. elementary schools. All of these interventions had a positive change in physical activity time throughout the day for students. The studies in this review concluded that short, structured physical activity breaks significantly influence students' academic achievement, cognitive performance, and on-task behavior, and many of the studies found a positive effect on academic achievement, cognitive performance and on-task-behavior (Barr-Anderson et al., 2011).

Exercise is the link between our brain and learning. The scope of this paper is not to discuss and describe all the complex connections between the systems of the brain, but rather focus on the specific ways exercise affects the brain.

Learning and the Brain

Hillman, Erickson, and Kramer (2008) reviewed several meta-analyses, which showed that in all of the studies physical activity had a positive effect on cognition. Physical activity is crucial during adolescent years, when children's brains are still developing and maturing. Exercise can encourage, improve and/or maintain a child's

cognitive health and function that will have a positive effect into a child's adulthood. Physical activity helps cortical development, which promotes lasting brain structure durability and function.

When we “exercise we are improving learning on three levels: first, it optimizes your mind-set to improve alertness, attention, and motivation; second, it prepares and encourages nerve cells to bind to one another, which is the cellular basis for logging in new information; and third, it spurs the development of new nerve cells from stem cells in the hippocampus” (Ratey & Hagerman, 2008, p. 53). According to Ratey and Hagerman (2008), “exercise influences learning by improving the brain's potential to log in and process new information” (p. 35). When a student hears a word, the brain sends a glutamate signal between synapses. The more the word is repeated and practiced, the more signaling, causing the synapse to swell creating a stronger connection between neurons (Ratey & Hagerman, 2008). This process is called long-term potentiation (LTP).

Trudeau and Shephard (2009) stated that the hippocampal long-term potentiation is the most credible physiological explanation for learning and memory. Physical activity favors the hippocampal long-term potentiation, which increases synaptic efficacy following an increase of synaptic traffic. This sparks the brain to wake up creating a positive environment for learning.

Exercise and the Brain

When we exercise our muscles send signals to our brain that stimulate significant neurotransmitters, which then ignite our neurons, making them connect better and creating more of them. In order to learn a task/activity/subject we need attention,

focus, and motivation. Physical activity helps balance important neurotransmitters like serotonin, dopamine, and norepinephrine. As more cells are created and there is better connections between them, the neurotransmitters flow in a nice balance that creates the best environment needed to acquire new information and retain it, as long term potentiation, the mechanism that “binds” cells and makes memories stick, is enhanced by physical activity as well (Ratey & Hagerman, 2008).

“Exercise spawns neurons and the stimulation of environmental enrichment help those cells survive” (Ratey & Hagerman, 2008, p. 49). Exercise triggers the brain to increase the function of more neurons by releasing appropriate amounts of our three neurotransmitters: serotonin, norepinephrine, and dopamine (Berg, 2010; Koch, Hasbrouck, 2013; Martini, Timmons, & Tallitsch, 2009; Sattelmair & Ratey, 2009; Ratey & Hagerman, 2008). Serotonin acts like a policeman and controls mood, impulsivity, anger, and aggression. Norepinephrine influences attention, perception, motivation, and arousal. Dopamine is the “satisfaction” neurotransmitter (Trudeau & Shephard, 2009; Ratey & Hagerman, 2008). These neurotransmitters play a key role in regulating brain chemistry and behavior. Consequently, when neurotransmitters are out of balance a person may act out differently because the brain is not fully working. Exercise helps keep these neurotransmitters balanced and can even enhance the connection between neurons, allowing the brain to fully work (Ratey & Hagerman, 2008, p. 37). Berg (2010) found that exercised lab animals demonstrate increased BDNF (brain-derived neuro-trophic factor) after learning a maze task faster than animals living in a standard cage (p. 25). Ratey and Hagerman (2008) say that going for a run is like taking Prozac and Ritalin. Prozac raises serotonin and Ritalin prevents cells from reabsorbing norepinephrine and

dopamine. Similarly, the effect of exercise activates these natural motivators in the brain elevating and balancing our neurotransmitters. This is why exercise can have a positive effect in the classroom. Giving students breaks and opportunities to move allows their brain opportunities to balance out and trigger the necessary information processing and storage needed when learning.

Further, Ratey and Hagerman (2008) discuss how movement is a good stimulator for releasing the body's natural motivators: noradrenaline and dopamine. When these are released they allow a student to wake up and increase energy levels, which in turn helps improve information storage and retrieval. Also, exercise brings the simple but important benefit of making children feel good.

In addition to releasing neurotransmitters exercise releases the hormones IGF-1 (insulin-like growth factor), VEGF (vascular endothelial growth factor), and FGF-2 (fibro-blast growth factor). These hormones create a direct link from the body to the brain. Our muscles release IGF-1 when there is a need for fuel to power learning. When you exercise your muscles release IGF-1, which is also released in your brain activating learning, more specifically long-term memory. When FGF-2 is released in the brain during exercise, it affects our long-term potentiation and helps with tissue growth. All these hormones are essential to helping our bodies to function (Berg, 2010; Trudeau & Shephard, 2009; Ratey & Hagerman, 2008).

When we exercise, the activity triggers the input of movement to the hippocampus causing it to release BDNF. BDNF acts like "MiracleGro" which in turn creates new cells. BDNF is found in the hippocampus, the region of the brain that builds and maintains our cells. It also acts like a way station, sorting through all the information,

grouping together information, and then sending it back up as a guideline for new pattern of connections. This is a very important protein ingredient in sprouting new dendrites (neuron synaptic connections), which are needed for learning (Berg, 2010; Trudeau & Shephard, 2009). “BDNF is a crucial biological link between thoughts, emotions, and movement” (Ratey & Hagerman, 2008, p. 40). More exercise means more release of BDNF, which means more opportunities for learning (Berg, 2010; Sattelmair & Ratey, 2009).

The phrase “use it or lose it” can apply when exercise engages the brain, the branches of the brain increasing with use and decreasing with disuse (Ratey & Hagerman, 2008, p. 47). The brain is made up of many complex systems that all work together; it is constantly being re-wired, making new, stronger connections as neurons are stimulated more and more. When we exercise, causing our muscles to contract, VEGF, IGF-1 and FGF-2, neurotropic growth proteins are awakened. VEGF helps transfer the proteins into the blood-brain barrier. IGF-1 triggers a need of increased BDNF (brain-derived neurotropic factor) and the “MiracleGro,” is activated. BDNF is in the hippocampus, which links learning and memory, as this awakens new brain cells and improves our capacity and rate of learning. When these neurons are awakened and used with repetition and practice, our synapses and dendrites grow stronger and “bushier.” Improving the connection between neurons makes stronger bonds, increasing our long-term-potential, LTP, (memory) with the help of FGF-2 a tissue-growing agent. With the release of our neurotransmitters, serotonin, dopamine, and norepinephrine the connections are made stronger and more effective (Berg, 2010; Martini, Timmons, & Tallitsch, 2009; Trudeau & Shepard, 2009; Ratey & Hagerman, 2008).

Attention and Focus in the Classroom

Moving, stretching, and walking can increase heart rate, circulation, enhance learning, and allow more oxygen flow to the key parts of our brain (Jensen, 2000).

Taking a break from instruction in the classroom and moving around allows for the body to learn a new spatial reference in the room, which helps the body build a relationship with the scenery giving the learner a new awareness. Jensen (2000) states that short movement breaks are ideal for the human brain, which is designed to learn short bursts of information followed by time to process the information. When information is continually given without any processing time our brain does not retain or allow the information to settle and stick. Taking brief movement breaks allows time for students to process academic information. Jensen (2000) says, “You can pour all the water you want from a jug into a glass but the glass can only hold so much” (p. 34).

Several studies reviewed the effects that physical activity had on students’ executive attention, classroom behavior, attention-to-task, selective attention, concentration, on-task behavior, and alertness (Donnelly & Lambourne, 2011; Janseen, Chinapaw, Rauh, Toussaint, Mechelen, and Verhagen, 2014; Kubesch, Walk, Spitzer, Kammer, Lainburg, Heim, and Hille, 2009; Trost, 2007; Trost, 2009; Trost & van der Mars, 2009; Trudeau & Shephard, 2009). With bouts of physical activity, the effects can raise energy levels and improve the ability to focus (Berg, 2010, p. 25).

Selective attention can increase when short physical activity breaks are implemented. Janssen et al. (2014) did a study on 10-11 year olds and how different physical activity intensities affect selective attention. Selective attention was observed when students were given an assignment on how quickly they could match ‘like’ pictures.

The physical activity breaks lasted 15 minutes and were implemented randomly throughout the day. There were four different experimental breaks. The first experimental break consisted of having students continue with their cognitive tasks resulting in ‘no break.’ The second experimental break was considered a ‘passive break’ while a story was read aloud. The third experimental break included a physical activity break consisting of moderate intensity in a physical education classroom. The fourth experimental break involved vigorous intensity physical activity in a physical education classroom. The results showed that the strongest effect on students’ selective attention was after a moderate intensity physical activity break. Janssen (2014) concludes that the prime level for attention in students is after moderate intensity physical activity.

Kubesch et al. (2009) did a study on how a 30-minute physical education program can improve students’ executive attention versus a five-minute movement break. Students were part of two different exercise programs. One program consisted of a 30-minute aerobic exercise session. The control group listened to a 30-minute audio book with a five-minute movement break. The results were that a single 30-minute physical education program leads to an improvement of on-task attention in the face of distraction. Kubesch et al. (2014) stated that a five-minute movement break is too short to impact on-task attention but that a 30-minute endurance exercise based physical education program can improve on-task attention. In contrast, there are several studies that have seen a positive impact with short bouts of physical activity throughout the school day (Barr-Anderson et al., 2011; Katz et al., 2010; Maeda & Murata, 2004; McMullen, Kulinna & Cothran, 2014).

Ma, Mare, and Gurd (2014) conducted a study where “FUNtervals,” a high intensity 4-minute interval activity, were implemented to see the effects on off-task behavior (p. 1333). When academics followed a physical activity break of high intensity, on-task behavior was observed. There was a decrease in fidgeting, drawing, restlessness, gazing off, not making eye contact with the speaker, and putting head down on the table (Trost, 2007).

Trost and van der Mars (2010) reported a study done in North Carolina on the effects of a 10-minute break of organized physical activity on on-task behavior. Researchers observed the students 30 minutes prior to the break and 30 minutes after. They found an increase in on-task behavior by 8 percent among students who tended to be less focused in class (Trost, 2007). The organized physical activity breaks improved on-task behavior overall by 20 percent. Trost and van der Mars (2010) conclude that decreasing or eliminating physical education or physical activity for more time in academic subjects does not lead to improved academic performance. Increasing physical education or physical activity will not impede students’ academic achievement, but could make positive contributions to academic achievement. Finally, they concluded that regular physical activity is correlated with higher levels of academic performance and benefits our general cognitive functioning.

Mahar (2011) conducted a review of literature on the effects of short bouts of physical activity on attention-to-task in elementary children. One study looked at physically active classroom lessons and the impact on on-task behavior with third grade students. The results showed that classroom based physical activity was effective for increasing students’ physical activity levels and improving student on-task behavior. A

study was done by Mahar et al. (2006) on the effects of “Energizers” and on-task behavior (p. S63). The activity took approximately 10 minutes to perform and integrated academic content. Students wore pedometers to track the number of steps taken throughout the day. Students who received “Energizers” took more steps, which in turn affected their behavior in class leading to less off-task behavior and more on-task behavior (p. S63). Teachers were reluctant to implement the breaks due to not having enough time in a day but were motivated when they observed the positive impact physical activity can have on behavior in the classroom.

A study by Trudeau and Shephard (2009) showed students’ concentration increased immediately following 15 minutes of stretching and walking. Students’ computational skills improved after 20 to 40 minutes of walking in the afternoon. Both forms of exercise show the improved benefits of students participating in physical activity prior to learning.

Physical activity plays a key part in the function of the classroom (Jensen, 2000). Research supports that incorporating breaks throughout the day has a positive impact on students’ classroom behavior, on-task attention, alertness, and concentration (Donnelly & Lambourne, 2011; Janseen, Chinapaw, Rauh, Toussaint, Mechelen, and Verhagen, 2014; Kubesch, Walk, Spitzer, Kammer, Lainburg, Heim, and Hille, 2009; Trost, 2007; Trost, 2009; Trost & van der Mars, 2009; Trudeau & Shephard, 2009). Brain breaks can be a tool to implement physical activity to target these necessary behaviors when in a learning environment.

Academic Achievement

This section will discuss the impact physical activity has on students' academic achievement. Trost (2007) studied fourth and fifth graders in California. He reported that students' standardized achievement tests were not negatively affected when physical education time was doubled or even tripled and several students with added physical education performed better than students in the control group who received no additional physical education time. A Canadian study examined 546 elementary students' academic performance. The students received one additional hour per day of physical education. As a result the students in grades 2nd through 6th who received additional physical education earned better grades in French, mathematics, English, and science, than the students who only received the standard one period per week of physical education (Trost & van der Mars, 2010, p. 61). Trost and van der Mars (2010) conclude that:

Decreasing (or eliminating) the time allotted for physical education in favor of traditional academic subjects does not lead to improved academic performance. Increasing the number of minutes students spend per week in physical education will not impede their academic achievement. Increasing the amount of time students spend in physical education may make small positive contributions to academic achievement, particularly for girls. Regular physical activity and physical fitness are associated with higher levels of academic performance. Physical activity is beneficial to general cognitive functioning (p. 63).

Multiple studies have found that students enrolled in physical education did not perform worse academically than students who received additional academic instruction in the classroom (Ahamed, MacDonald, Reed, Naylor, Liu-Ambrose, and McKay 2007; Carlson et al., 2008; Coe, Pivarnik, Womack, Reeves, and Malina, 2006; Hillman, Erickson, and Kramer, 2008; Trost, 2007; Trost, 2009; Trudeau & Shephard, 2009). Further, Trudeau and Shephard (2009) stated that physical activity at the primary

level could help with healthy development. Including physical activity into the daily schedule can help students without jeopardizing their academic performance (Kibbe, Hackett, Hurley, McFarland, Schubert, Schultz, & Harris, 2011; Trudeau & Shephard, 2009).

Trost (2007) published a study done in British Columbia with fourth and fifth grade students and their participation in daily ten-minute classroom activity breaks in addition to their regular weekly scheduled 80-minute physical education class. The study gathered data on how the students with activity breaks performed on a standardized math, reading and language arts test. The students receiving an additional 50 minutes per week of physical activity had the same test scores as students who just received the physical education class. This study provided evidence that time taken out of the day for physical activity did not affect students' academic scores. Trost (2007) continued with an additional fourteen studies that involved 58,000 students and provided evidence that physical activity is associated with improved academic performance.

Hillman et al. (2008) suggests that there is evidence of the relationship between fitness training and improvements in various aspects of cognition across a broad range of ages. No empirical evidence exists that elimination of non- academic programs, such as physical education, is related to higher academic achievement. Children are young and their brains are still developing and undergoing tremendous change. "Physical activity during childhood might encourage optimal cortical development, promoting lasting changes in brain structure and function" (p. 61).

Similarly, Action Schools! British Columbia (AS! BC) Model is a comprehensive school health framework to increase physical activity in elementary

schools (Ahamed et al., 2006). AS! BC provides 15 additional minutes of classroom physical activity each day. These activities include skipping, chair aerobics, hip hop dancing, playground circuits, and resistance exercises. Teachers were provided with a bin, which contained appropriate equipment to perform the activity breaks. This study concluded that after adding additional minutes of daily physical activity, children were able to maintain the same level of academic performance.

Additionally, Carlson et al. (2008) examined kindergarten through fifth grade and how physical education class affected academic achievement. Girls that participated in physical education 70- 300 minutes per week showed small academic benefits for mathematics and reading versus girls who received 0-35 minutes per week. There was no correlation with boys. These results support the findings in other studies showing that time spent in physical education did not harm academic achievement and that it could have a small but positive effect on achievement.

Coe et al. (2006) hypothesized that students enrolled in physical education would have better academic achievement than students who were not enrolled. Coe et al. (2006) reported results from the Trois Rivieres study in Canada that students who did receive one hour of physical education class per day in addition to their already existing physical education class (which was one day a week for 40 minutes) exemplified better academic performance than students who only received the one day a week of 40 minutes of physical education (Trudeau & Shephard, 2008). Coe et al. (2006) did not see improved academic achievement but there was not decreased academic performance either. The authors of this study conclude that added physical education class does not negatively affect academic performance.

Additionally, Donnelly and Lambourne (2011) discuss how students who are fit perform better on attentional tasks: planning, organization, abstract problem solving, working memory, and motor control. Physical activity can be a simple intervention to address “fitness, fatness, and academic achievement”. Donnelly and Lambourne (2011) performed a three-year cluster randomized controlled trial with 24 elementary schools to correlate changes in fitness and fatness with changes in academic achievement. The schools received PAAC (Physical Activity Across the Curriculum), which promoted 90-minutes per week of moderate to vigorous physical activity lessons. The physical activity lessons incorporated physical activity movements and varied in different academic areas including math, language arts, geography, history, spelling, science, and health. Lessons consisted of students getting out of their seats and running to the area of the room that was the correct answer to the problem. Another example would be students hopping and skipping across the room and counting laps then multiplying the number of laps to generate math problems. Students would create shapes with their bodies during a geometry lesson. All lessons were designed to work with existing academic lessons, no additional cost, and no additional preparation time on the teacher’s behalf. The main outcome was a change in students BMI (body mass index) from baseline to three years, which was influenced by PAAC lessons. There were also significant improvements in students’ academic achievement in composition, reading, math, and spelling. The findings in this section support the correlation of physical activity to students’ academic achievement.

Integrating Physical Activity

Castelli and Ward (2012) contend, “The ways that physical activity can be provided during the school day are limited only by one’s imagination” (p. 23).

Applications of physical activity can range from a five-minute break up to an hour of structured physical activity breaks. Several studies have presented the positive benefits of integrating structured physical activity throughout the school day. These positive benefits include that it does not negatively affect students’ grades; but rather improves academic performance; is a positive instructional technique for reducing off-task behavior; increases reading and mathematical achievements; and reduces downtime while increasing teaching time (Castelli, Hillman, Buck and Erwin, 2007; Castelli & Ward, 2012; Katz et al., 2010; Trost, 2009; Wadsworth, Robinson, Beckham & Webster, 2011).

Wadsworth et al. (2011) discusses the importance of planned physical activity versus free play for kids. Planned physical activity can help children develop the necessary gross motor skills needed for healthy physical development such as skipping, balancing, grape-vining, throwing and catching a ball, being able to crawl and run without having to focus on the movements. Another key element discussed is moderate to vigorous physical activity. When activity is planned, students are more likely to spend more time in moderate to vigorous physical activity than in unplanned breaks. Moderate to vigorous physical activity increases heart rate and respiration, which gets the blood and oxygen flowing throughout students’ brains and bodies (Wadsworth et al., 2011).

A few studies have considered the duration of breaks in the classroom in terms of relative educational benefits. Bailey and Clyde (2015) examined the use of “Energizers”, 10-20 minute classroom-based physical activity sessions in K to 4th grade

(p. 2). Teachers had a 2-hour training prior to implementation and then implemented the “Energizer” from a detailed script verbatim (p. 2). “Energizers” were implemented twice a day during the intervention phase (p. 2). Prior to instruction or following instruction the breaks were performed. These “Energizers” did not replace daily physical education or recess (Bailey & Clyde, 2015, p. 2). Feedback on implementing the breaks from the teachers revealed that they strongly agreed or agreed that “Energizers” were enjoyable and did not adversely affect academic learning (p. 2). Students’ ability to pay attention increased and the teachers planned to continue implementing “Energizers” (p. 2). Students felt more physically fit, attentive, and more excited about school. The overall feeling of implementing the “Energizers” was that it was relatively easy and teachers strongly disagreed, or disagreed with the statement that ““Energizers’ breaks negatively affected instructional time” (Bailey & Clyde, 2015, p. 2).

Howie, Schaltz, and Russel (2015) attempted to determine the optimal dose of breaks and how it impacted students’ cognitive function with 9-12 year olds. This is the first study done on what the dose of physical activity should be to reap the benefits in the classroom. These breaks were called Brain BITES (Better Ideas Through Exercise). The breaks aimed to maintain moderate to vigorous aerobic activity. The breaks consisted of 5-minute, 10-minute, and 20-minute breaks. They found that a bout of physical activity shorter than five minutes had no impact on mathematical performance. However bouts of 10-minutes and 20-minutes did positively affect students’ math scores. Researchers also noted that physical activity provides positive health benefits and does not negatively affect students’ cognitive or academic performance (Howie et al., 2015).

Researchers conducted another study focused on “FUNtervals” (p. 50). “FUNtervals” are short five-minute breaks that are high intensity interval training (Ma, Sures, & Gurd, 2015, p. 50). Each break consists of 20 seconds of exercise consisting of big and fast movements and 10 seconds of rest, repeated eight times for a total of four minutes (Tabata et al., 1996). “FUNtervals” are to be done with an engaging storyline for students to follow while working out, thereby integrating concepts of narrative and story structure with physical activity (p. 50). Teachers are to participate with as much speed and enthusiasm as possible, and create a story, and implement exercise as a way to act out the story. Teaching Tips and sample “FUNterval” activities are supplied to guide teachers in implementing the exercises (p. 50). As stated in an article asserting benefits of “FUNtervals”, “Quick activities to help break up long periods of instruction and increase students’ physical activity and fitness levels, and even improve the classroom environment” (Ma et al., p. 52, 2015).

TAKE10! is another way to integrate physical activity with academic concepts into elementary classrooms (Kibbe, Hackett, Hurley, McFarland, Schubert, Schultz, & Harris, 2011). In TAKE10! you may see students doing invisible jump rope as they do multiplication, or singing and performing two-part muscle contraction movements to better understand how two words become a contracted word (Kibbe et al., 2011). Investigators reported improvement in different measures of academic performance in reading, math, and spelling. They noted there was significant improvement in the scores from baseline to three years of intervention. Findings suggest that classroom based physical activity is feasible for elementary teachers and has a positive impact on students’ health. Findings supported physical activity levels of moderate intensity range for the

whole duration of the session, noting also that students' body mass index (BMI) was positively impacted throughout the study, and students had an increased attraction to physical activity in the classroom. Overall there was an improved classroom environment and less disciplinary intervention (Kibbe et al., 2011).

Research shows that having short bursts of activity throughout the day led by a teacher can replace the time wasted in calming and getting students' attention (Castelli et al., 2015; Coe et al., 2006; Mahar, 2011). Katz et al. (2010) argue that short bursts of structured activity allow students to be re-directed in a positive way without reducing teaching time or requiring special equipment (Katz et al., 2010). Additionally, too much sitting can have a negative effect on students' brain and body, including poor breathing, strained spinal column and lower back nerves, poor eyesight and overall body fatigue (Jensen, 2000). Jensen (2000) stands by students using their bodies to learn in order to increase circulation, receive a break from learning, and generate their natural motivators. Increased circulation allows for more oxygen to the key areas of the brain. Taking a break also allows the eyes to relax momentarily preventing tension and eyestrain. Taking a break from learning allows time for our brain to process information. Further, having students up and moving can be a great transition tool from one subject or assignment to the next. Research has also shown that physical activity breaks can "replace the time teachers take to settle students down with a structured activity for students to gain movement and a positive break" (Katz et al., 2010).

Getting Energized and Recharged (GEAR) was a program implemented in Hawaii in an elementary school. Teachers were trained to see how the activities were performed in one to two workshops after school. The goal of the activities were for the

breaks to be short due to the need for academic time throughout the day. Teachers reported using them twice a week, daily, or even two to three times per day. The breaks were five minutes long consisting of moving to music, dancing, stretching or following along to a children's aerobic video (FIT Kids in the Classroom). Teachers responded positively and said they would definitely be using them the following year (Maeda & Murata, 2004).

Incorporating planned physical activity into the school day can be done through numerous ways (Castelli & Ward, 2012; Wadsworth et al., 2011). These planned physical activity breaks can range from five minutes to twenty minutes (Bailey & Clyde, 2015; Ma, Sures, & Gurd, 2015; Howie, Schaltz, & Russel, 2015). Physical activity breaks are a great tool during transitions from subject matter to subject matter or to break up long periods of sitting (Katz et al., 2010; Jensen, 2000). Implementing physical activity breaks in the classroom can be a practical tool to improve focus, attention, motivation, and potentially boost learning.

Teachers' Perceptions

Classroom teachers face many barriers implementing physical activity breaks including time constraints, competing curricular demands, and assessment pressures (McMullen, Kulinna, & Cothran, 2014; Stylianou, Kulinna, & Naiman, 2015). A teacher's willingness to participate is based on training supplied with the program, a supportive environment, pupil buy-in, pupil outcomes, the teacher's experience, the teacher's own educational philosophy, and ease of implementation (McMullen, Kulinna, & Cothran, 2014; Stylianou, Kulinna, & Naiman, 2015). When deciding to implement

physical activity into the classroom, teachers' areas of concerns were: chaos created by the break, space for students to implement breaks, ease of break implementation, academic content connections to the break, transition from break back to academics, and the overall enjoyment of the break (McMullen, Kulinna, & Cothran, 2014).

Cothran, Kulinna, and Garn (2010) studied classroom teachers and physical activity integration. Teachers' willingness to engage was related to the desire to meet the need of the whole student and not just their academic needs. Teachers voiced their struggle for implementation into already tight schedules, especially in middle school where the teachers only see students for a short amount of time once a day. Time and scheduling were the most negative aspect of implementing physical activity.

Physical activity breaks do not require a qualified physical education teacher. With the reduction of physical education classes, recess time being cut, and more pressure on testing, many teachers feel even more pressure to take out movement breaks and physical activity opportunities to allow more time for core academics. (Beaulieu, Butterfield, & Pratt, 2009; ED, 2015; Stylianou, Kulinna, & Naiman, 2015; Trost & Mars, 2010). Schools are the ideal setting to help foster healthy development and maintenance of healthy habits (Donnelly & Lambourne, 2011; Janseen, Chinapaw, Rauh, Toussaint, van Mechelen, & Verhagen, 2014; Kibbe et al., 2011; Maeda & Murata, 2004; Trost, 2007).

When presenting a new idea to teachers, there is an experimental learning process that occurs. Therefore, when change is presented to teachers, positive student learning outcomes need to be at the core. However, there are conflicting views on whether physical activity plays a vital role and contributes to other academic

requirements (Stylianou, Kulinna, & Naiman, 2015). With the implementation of Every Student Succeeds Act, health and physical activity will be encouraged to be incorporated into the daily schedule of schools (ED, 2015). The Every Student Succeeds Act brings to light that health and physical education have vital roles in a student's well-rounded education (ED, 2015).

Teachers' perceptions and differences influence the way they teach (Cothran, Kulinna, Garn, 2010). What a teacher feels is most important is what gets brought to the forefront and implemented in the classroom. When there were changes in funding for schools, the responsibility of physical education and physical activity was put on the classroom teacher to incorporate into the daily routine. But classroom teachers are not generally trained to teach quality physical education or physical activity (Cothran, Kulinna, Garn, 2010). Removing physical education, taught by a specialist, and physical activity from the daily routine left teachers without a key aspect in providing students with a "well rounded education" (ED, 2015; SHAPE, p. 6, 2016). But now with Every Student Succeeds Act and the increased research on how physical activity impacts students, schools and teachers have the opportunity to bring quality physical education and physical activity back into the classroom where research proves its necessity (ED, 2015; Trost & van der Mars, 2010).

Conclusion

This review of the literature shows the imperative need for educating the whole child and it is shown that this requires physical activity throughout the day to generate effective brain function and healthy students. Physical activity allows increased

connections in the brain between neurons, helping process and retain information. This plays an important role in our long-term potentiation, which is crucial to learning.

Movement can also impact the classroom environment in a positive manner allowing for improved attention to task, classroom behavior, concentration, and alertness. The research tells us that when students are more engaged, tuned in, and offered movement breaks, their academic achievement improves. This project may be one of the solutions for integrating physical activity during the school day for students and teachers.

CHAPTER III

METHODOLOGY

Introduction

Brain breaks are one way to get students involved in physical activity, peer interaction, and to transition from subject to subject. Brain breaks have been proposed as one way to address this need by providing students with a short positive boost (Kibbe et al., 2011). Brain Breaks with Mallory is a tool developed for classroom teachers who wish to effectively implement physical activity breaks throughout the day. Brain Breaks with Mallory is a resource which includes a website with physical activity videos along with written transcripts and helpful teaching tips when implementing the breaks. This chapter will discuss the process and creation of the website and the videos that encompass this project along with what sparked the idea behind this project.

Creating a Website with Brain Breaks

A website is an efficient and current way to reach teachers. Teachers are continually turning to the Internet for professional learning and to gather classroom resources (Beach & Willows, 2014). The accessibility of Internet is a huge contributing factor to the increase usage in the classroom. “Internet is quickly becoming the source for media-based instruction, with streaming and downloading of content surging” (Grunwald, 2011, p. 1). Digital media can also empower students to be more engaged,

promote creativity and differentiate instruction. Ninety-seven percent of K-12 teachers use digital media for classroom instruction. Many teachers reported using digital media every day. Seventy-six percent of teachers stream or download from the Internet. The perceived benefits of using video content in the classroom showed that 66 percent of teachers said it helps increase student motivation. Fifty-eight percent of teachers value interactive lessons. The cost of videos tends to be a barrier with school budget cuts, so teachers are looking into other ways to obtain free or financially feasible educational resources. Teachers are joining online professional communities to connect, collaborate, and share resources with other teachers (Grunwald, 2011). Teachers from all over are able to use the Internet and search for brain breaks. Mallory's Brain Breaks' website will appear and provide information on breaks, 16 instructor led brain breaks, and a testimonial page that will allow teachers to share and gain knowledge of how implementation of brain breaks works in various classrooms.

The videos on the website are led by a California multiple subject K-6 credentialed teacher with a physical education supplement authorized by the Commission on Teacher Credentialing, along with a personal training certification and group exercise certification. For teachers who are not trained in quality physical education or activity, this is a tool that can be implemented to provide breaks to their students throughout the day.

Existing Resources

There are some resources for schools and teachers to incorporate into their classroom similar to brain breaks that are available for purchase. Additionally, there are

YouTube and other videos of students in class ‘performing’ breaks. The main concern with these resources is that they require teachers to learn the breaks ahead of time, or create the activities themselves. An additional limitation is that the quality of many of the YouTube videos is not always good, and they are often not easy to follow. To address these limitations, high quality videos were created for this project to enhance the potential that teachers will have a positive experience.

Sharing My Experience as a Teacher

As an elementary teacher I have had the opportunity of being in the classroom for the past four years. Over the years I have experimented with what motivates, energizes, and captures my students’ attention and positively impacts the classroom environment. Throughout the school day I noticed there seemed to be long periods of time where students were sitting, fidgeting, laying their head on their desk, distracted by something other than the lesson, and giving blank stares when asked a question. When this happened it was obvious they needed a break from what was being presented. The breaks started out as just stretching, jumping a little, shaking out their legs and arms. When the breaks were more frequent and regular there were positive improvements. Breaks started to be more complex and varying in duration. When the procedures were set students were able to perform the break and then get back to being on-task, concentrated, motivated, and overall enjoying school more especially when they knew there were scheduled opportunities for breaks that were engaging and enjoyable. The movements were created from my personal training certification, group exercise certification, and Kinesiology classes through California State University, Chico.

I wanted to create something so every classroom can have an opportunity to move whether the teacher is trained, credentialed, or has a strong passion for it. I completed an action research project through a California State University, Chico credential course with third graders. The question was: Will Brain Breaks improve students' focus during math in a positive way? The goal was to help students increase time on task and increase opportunities for learning. I recorded their math assessment scores for a semester without any brain breaks and gave them an exit ticket that asked how well they focused, felt, and what they learned after the lesson. The average score of the math tests with no brain breaks was 58.2%. One math lesson lasted one hour and 45 minutes. Then I did a semester of implementing one-to-two brain breaks throughout the math time and also recorded their math assessments and collected the same exit ticket. There was instant improvement in students' scores but also students' attitudes during math: their focus, their overall engagement, and their ability to recall what was taught during a particular lesson were all dramatically increased. The average of their math assessment when brain breaks were implemented was 82.43%. When they were given structured movement breaks they were overall more positive. They knew that if they focused and worked hard there would be a fun movement break where they could be silly, move about, and refocus. In addition they knew once the brain break was done it was time to get back to work. After seeing the positive benefits of brain breaks in my classroom, I wanted to create a project for other classrooms that provided access to and allows their students the opportunity to have physical activity movement throughout the day. This led me to developing a practical tool for teachers to use in their classroom and the website is called Brain Breaks with Mallory.

Creating a Website

After reviewing a few free “build your own” websites, Wix.com was selected to create the website: “Brain Breaks with Mallory.” A website was chosen as the mode of dissemination because of its accessibility and the fact that teachers frequently utilize websites as sources of teaching information and materials (Grunwald, 2011). Once completed, the website link will be shared with school districts and through related websites such as www.supportREALteachers.org enabling the brain break videos to reach teachers and students in many schools.

The website is accessible by following the URL link:

<http://BrainBreakswmallory.wix.com/hibb>. It can also be found by simply using any search engine and typing in Brain Breaks with Mallory. The home page contains different tabs along the top that can be pressed: “to learn more about me and why I chose to create this website,” three tabs that lead to the brain breaks, broken down by different time segments, and a testimonial tab. Under the 1-2 minutes tab, thirteen different brain breaks from which to choose are available. Once a break is selected, a video of the break along with a short description of the break is available. The 3-5 minutes have three different brain breaks. These time segments were selected based on the likelihood of implementation in the classroom. In order to fulfill academic requirements short breaks are accessible and beneficial to allow students that quick opportunity to get up out of their seats and move. The breaks are also designed in such a format that the break can be repeated or another break added to create longer variations as class time and focus allows. The testimonial page allows interested teachers to review other teachers’ feedback on how implementing brain breaks looks and works in their classroom.

Creating Videos

The brain breaks were created from my teaching experiences in elementary classroom, my personal training and group exercise certifications, and Kinesiology courses at California State University, Chico and then implemented in a variety of elementary classrooms. After an initial implementation, I evaluated if more cues were needed to help with instructing the students. Students' opinions on the break were also solicited and taken into account. The brain break was then implemented a second time to see if the added instructions and corrected cues were beneficial. The revision process continued as it was deemed that students could smoothly perform the break.

The first attempt at videotaping was done on my own without any professional filming equipment. After shooting a few videos and presenting them to my committee, I realized I wanted more of a "polished" product. I wanted graphics in the beginning of the video and throughout, along with music; and realized I was inexperienced to do this. I decided to hire a professional to videotape the breaks. We met and filmed the breaks, he was then able to edit and add the finishing touches to the selected videos. These videos were then shared with my committee. If necessary changes to the video were identified, I then re-taped to ensure the best quality of the brain break was produced. The goal for the end product is for each video to be explicit, engaging, and easy to follow. As the instructor, I ensured that I slowly and concisely explained the steps to perform the break and engaged in the brain break for the entire video.

Brain Breaks

I chose to create brain breaks to give students a short and quick opportunity for active movement during core academics. After reviewing the literature, I was inspired and reassured about the necessity and positive impact a physical activity break can have on a student. The brain breaks I created require no additional materials other than enough space for the students to move so they are not touching another peer. The brain breaks are broken into different lengths of time. This allows the teacher to choose quick breaks ranging from 1-2 minutes or 3-5 minutes. These brain breaks are not to replace quality physical education, physical activity opportunities or recess. They are to be an addition to create a positive environment in the classroom when needed.

The brain breaks focus on a multitude of movements, some that increase their heart rate, others having them reach and stretch across the mid-line of their body, or moving high, low, or side-to-side. Incorporating multiple steps into a brain break will stimulate the child's brain, releasing all the positive endorphins needed when retaining information, giving their brain a positive active break and re-charging getting them ready to take on another academic task (Jensen, 2000; Maeda & Murata, 2004; Ratey & Hagerman, 2008).

Conclusion

An instructional resource for classroom teachers who wish to effectively implement physical activity breaks for students throughout the day was developed. The methods used in the creation of this project included designing a website, creating videos and field testing videos, and designing transcripts and professional filming to ensure a

quality product. Instructional materials were research based and were either adapted to be most relevant for classroom teachers or created specifically for the purpose of this project. The format of the project was organized by an elementary school teacher with a personal training and group exercise certification and backed by recent research on the positive impacts physical activity has on students. The project and associated resources was designed to be housed on a website so they may be easily found and utilized by interested classroom teachers.

CHAPTER IV

SUMMARY AND RECOMMENDATIONS

Summary

With the help of Every Student Succeeds Act, quality physical education and physical activity is back in the educational game, and teachers need practical ways to implement physical activity throughout the school day and independent of physical education class (ED, 2015). This project was designed to be that practical tool for elementary school teachers in grades kindergarten to sixth grade to use in their classroom.

Research has shown the positive outcomes physical activity can have on a child when implemented into the daily schedule. Educating the whole child has come to the forefront of the federal and state government with the new Every Students Succeeds Act that was passed in December 2015. This Act funds and supports the inclusion of physical education and physical activity with core academic subjects ensuring the education of the whole child (ASCD, 2011; ED, 2015; NASPE, 2011). Students' emotional, physical, and academic well-being is what schools are striving to do each and every day (CDC, 2011; ED, 2015; Ma, Lucy, & Gurd, 2014; Mahar, 2011; ED, 2015). Studies have shown positive outcomes when physical activity is implemented in schools (Castelli & Ward, 2012; Katz et al., 2010; Ma, Sures, & Gurd, 2015). Physical activity improves student's focus, attention, mood, health, academic achievement, and most importantly their brain function (Castelli et al., 2015; Howie, Schaltz, & Pate, 2015;

Jensen, 2000; Ratey & Hagerman, 2008; Trost, 2009; Trudeau & Shephard, 2009). The classroom environment is improved when students are given breaks throughout the day resulting in more learning (Jensen, 2000; Ma, Sures, & Gurd, 2015; Stylianou, Kulinna, & Naiman, 2015). Integrating physical activity into the school day can be done in numerous ways including through online videos like Brain Breaks with Mallory (Bailey DiPerna, 2015; Jensen, 2000; Mahar, 2011).

The creation of brain break videos, Brain Breaks with Mallory, transpired through several stages. The first stage was videotaping and editing on my own with no experience and by myself with a camera on a tripod. After a few takes I realized I was not obtaining the video outcome I had envisioned. I was able to find a local videographer who was able to videotape and edit the videos. The videographer was able to meet with me and develop a plan for adding in graphics, music, and having quality sound in each video. After videotaping most of the breaks the edited videos were sent to me. I went through each video and checked for timing, clearness, fluidity, energy, setting, and overall appearance. There were a few videos I wanted to change the movements and address the distractions in the background. I re-taped a couple videos and added new videos in the second round of taping. The strengths of creating the videos was that I was able to do it locally, that the lighting in the videos looked great, that the music and graphics added to the videos created a complete and professional looking video. One weaknesses of taping the videos initially was taking time trying to film and edit on my own with no professional knowledge or equipment.

If I had the opportunity to start this brain break project over I would add more repetition of the break and several sets of the break creating a longer brain break. I would

add additional breaks that were longer in duration giving teachers a resource to use on rainy day recesses or when longer periods of time need to be filled. A strength of the short brain breaks is that they can easily be repeated and strung together if a teacher would like a longer session of brain breaks. The short breaks are also a tool a student can easily learn and implement into their lives inside and outside of the school environment.

Recommendations

The review of literature showed the benefits activity breaks can make in a student's school day. The literature focused on breaks of longer durations and there was less research outcomes on the academic benefits of activity breaks. Further research is needed on brain breaks shorter than five minutes and the impact on students' focus, attention, motivation, and academic performance, as well as the emotional, physical, and mental well-being. Another area for further research would be on the frequency of breaks throughout the day and the impact in the learning environment. Empirical studies measuring the impact of short activity breaks under five minutes, would increase our knowledge of their effects. Suggestions for research foci: are frequency of brain breaks, consistency in daily or subject routine, comparisons between grades using breaks versus not using breaks, studies on the impact of brain breaks by grade level, and behavioral and academic outcomes resulting from utilizing brain breaks.

Data collection and research on how students receive Mallory's Brain Breaks would be one tool that could help identify the impact short breaks have on the K-6 classroom setting. This project of brain breaks could be used as a way to research the impact short breaks have on students. This project would be a manageable tool for

teachers to implement allowing researchers to collect data on students' perceptions, academic scores, and overall classroom environment. Teachers would not have to be trained in order to use this project nor would they have to learn the breaks ahead of time.

Promoting

Upon completion, I plan to send the website link to teachers in my current school district as an instructional resource. In addition, I plan to share the project with my previous school district, as well as contacting other interested schools and school districts. I would like to continue working with the Kinesiology department at California State University, Chico, in promoting Mallory's Brain Breaks at teaching conferences. Finally, the project videos will also be accessible via a link on SupportREALteachers.org, a website that has thousands of teacher users worldwide.

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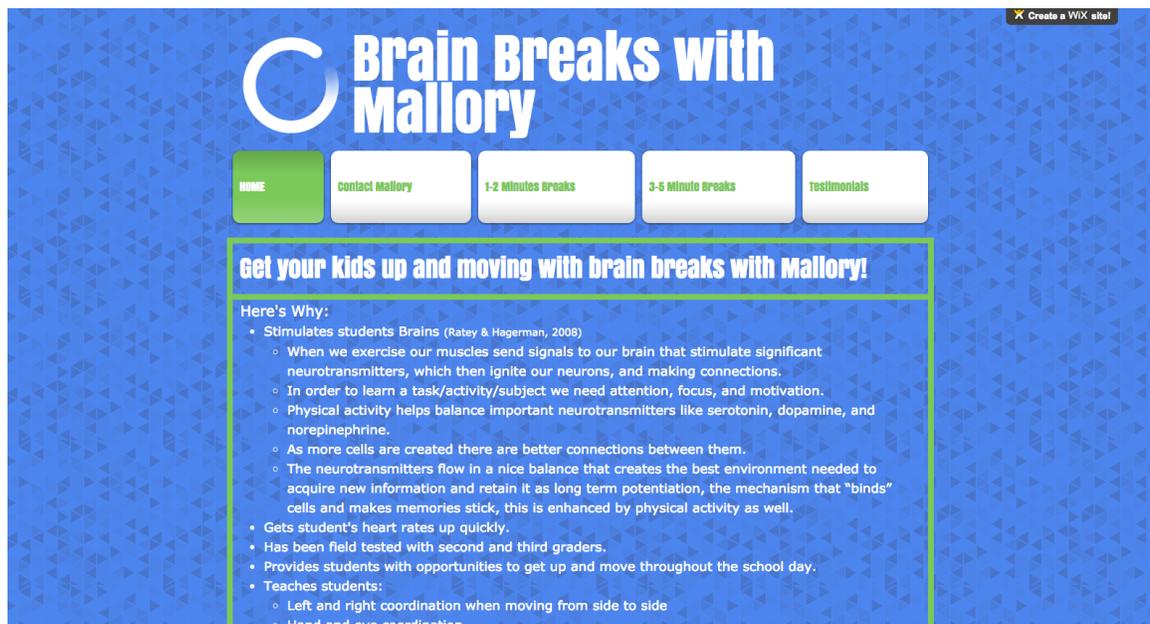
Woods, A. M., Graber, K., & Daym, D. (2012). Children's recess physical activity: Movement patterns and preferences. *Journal of Teaching in Physical Education*, 31, 146-162.

APPENDIX A

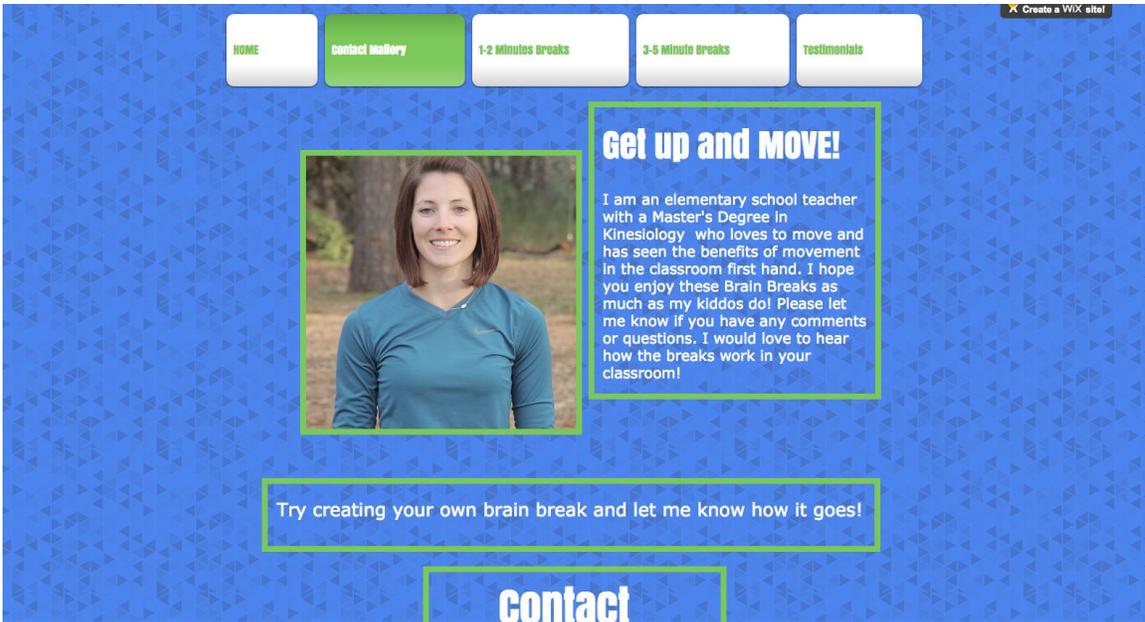
APPENDIX A

SCREEN SHOTS AND SCRIPTS OF BRAIN BREAKS

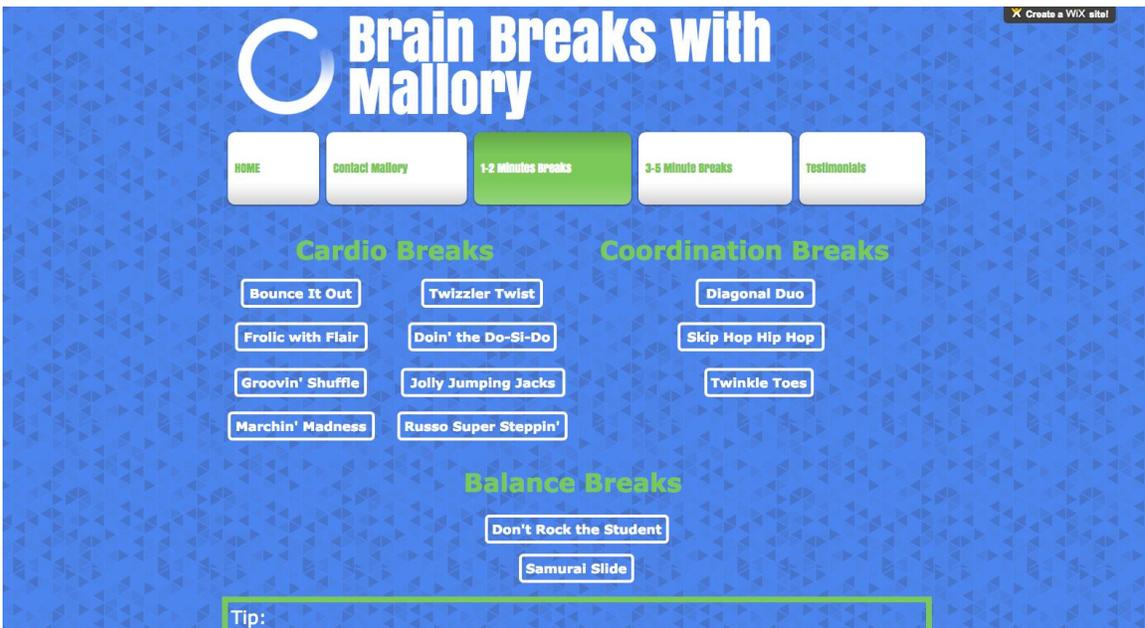
Below are screen shots of the website along with explicit step-by-step directions for performing each break. Breaks can be played more than once and can be combined to make longer breaks.



Home Page



Contact Mallory



1-2 Minutes Breaks



Bounce It Out

Needs: Space

Targets:

- Increase students' heart rate
- Coordination with feet moving from wide stance to crossing in front of the body

Procedures:

- Stand with feet wide
- Bounce wide twice
- Cross legs and bounce twice
- Repeat 6 times
- Four bounces wide
- Four bounces with cross legs
- Repeat 3 times
- Single bounce wide, then cross legs for one bounce

- Repeat 3 times
- Double up bounces – two wide/two cross bounces
- Repeat 3 times
- Single bounces - single bounce wide/cross
- Repeat 3 times
- Freeze- take a deep breath in and exhale as arms come up over head and then down

Common Problems and Fixes:

- If students struggle crossing their legs you can just have them bounce with their feet together in the middle.

Suggestions:

- The break can be done again after freezing and taking a deep breath.
 - Repeat sequence as many times as needed.



Frolic with Flair

Needs: Space

Targets:

- Increase students' heart rate

Procedure:

- Touch the ground and jump to the sky
- Jump like a frog as high as you can
- Touch the ground and reach for the sky
- Repeat 10 times
- Shake out your legs
- Take a deep breath in and exhale
- Touch the ground and reach for the sky
- Repeat 10 times
- Shake out your legs

- Take a deep breath in and exhale

Common Problems and Fixes:

- If students start to move around the classroom then remind them that this is activity is done in one place not moving around.
- Students may not bend their legs and go all the way down to the ground.
- Encourage students to give it their all and see how high they can get by bending their legs, touching the ground and then exploding up.

Ideas:

- To challenge your students have them count by various increments while jumping.



Don't Rock the Student

Needs: Space

Targets:

- Balancing on one foot

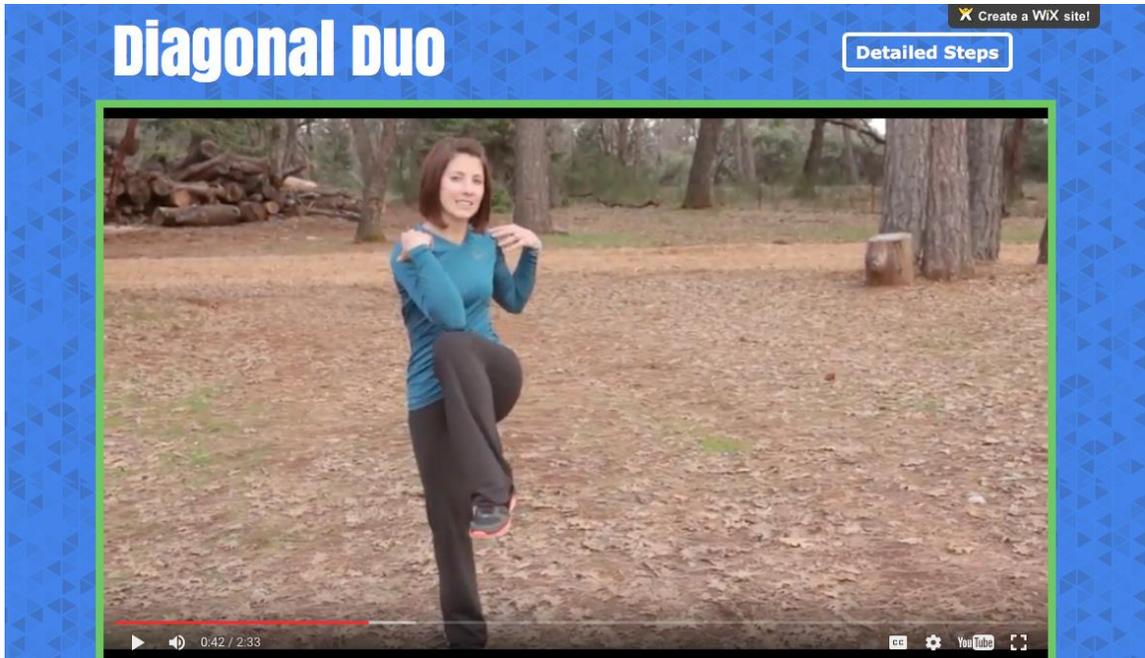
Procedures:

- Stand on one foot and bring the other knee up so its parallel with the ground
- Extend leg out front
- Bring leg back in
- Extend leg to the side, bring arms out to help balance
- Bring knee back in
- Leg extends out back (like superman or superwoman)
- Shake out your legs
- Repeat on the other side

- Start on your first leg and extend one leg out, leaving it out extend to the side and hold, without bringing your leg in extend it back, then bring it forward to a bent knee position
- Repeat on both sides
- Deep breath in and exhale

Common problems and fixes:

- If students dramatically fall down then encourage and challenge them to stay on their feet. Let them know that when they fall down they are not getting the most out of the brain break.
- If students seem wobbly have them find a spot on the ground or the wall that doesn't move to help them balance.
- Don't have students use each other to balance, this could result in students falling down and being silly. Encourage them to work on their own.



Diagonal Duo

Need: Space

Targets:

- Crossing the midline of the body

Procedures

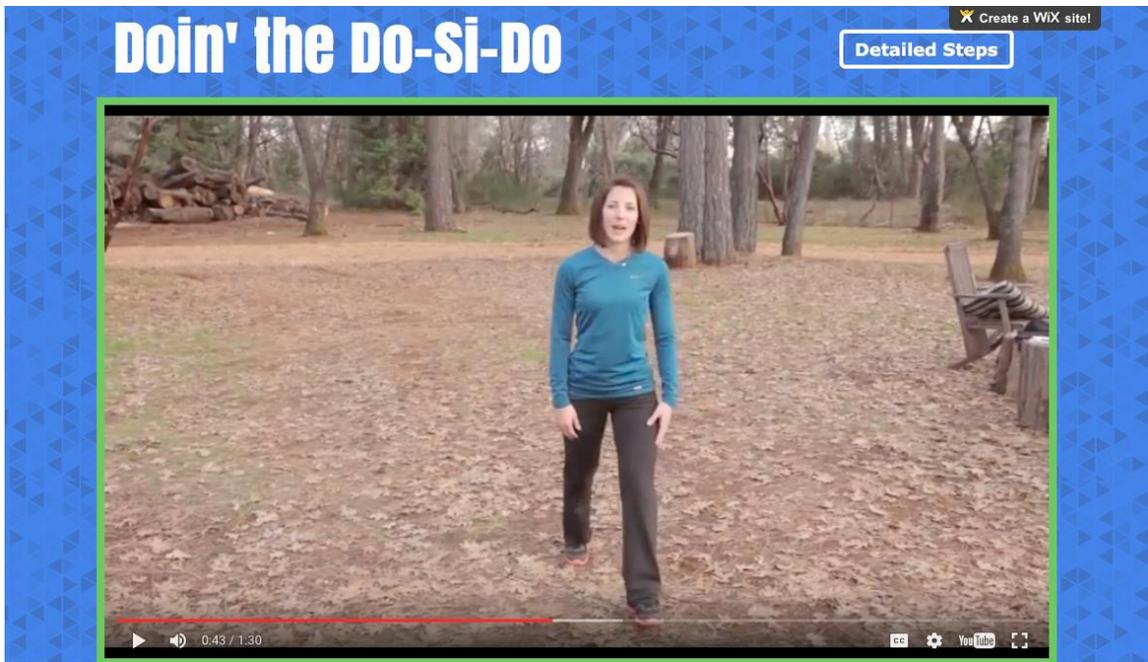
- Elbow to opposite knee – crossing your body – both sides
- Bringing knee to your elbow
- Repeat for 10 touches on each side
- Pick up pace a little
- Hand to opposite heel behind your back
- Repeat 5 times each side
- Bring all together
- Elbow to knee both sides then right to hand to heel both sides
- Repeat 10 times

Common problems and fixes:

- If students struggle getting their opposite elbow to knee then continue to re-enforce that the elbow goes across their body then touches the knee.
- The more times the sequence/break is practiced the more fluid students will become at getting their elbow to the opposite knee.

Ideas:

- Do a mini lesson on slowly having them move their elbow to the opposite knee as extra practice.
- Count by 2's as you do elbow to knee and hand to heel.
- Count by 3's as you do elbow to knee and hand to heel.



Doin' the Do-Si-Do

Needs: Space

Targets:

- Coordination of moving in the shape of a square
- Moving from right to left
- Increase students' heart rate

Procedures:

- Making a square with the feet
- Step to the right, back, left, front
- Repeat 2 times slow, then speed up
- Picture a square on the ground
- Speed up with a clap at each point of the square
 - Step right clap, step back clap, step left clap, step forward clap

Common problems and fixes:

- Students may need more re-enforcement of knowing which direction is left and right.
- Making sure there is enough space for students to step side to side and forward and back making a square.

Ideas:

- Reverse the direction of making a square.
- Once both directions are mastered in making a square, mix up the sequence and challenge the students to pay attention as you direct them one direction then the other.
 - Example: Have students make a square stepping right at first. Then when they get back to the start have them step to the left and do a square the other direction.
 - Mix the directions up to challenge the students.



Jolly Jumping Jacks

Needs: Space

Targets:

- Increase students' heart rate

Procedures:

- Basic jumping jack – repeat 3 times
- Freeze jumping jack wide and add two bounces with feet wide then two bounces with feet in – repeat 5 times
- Squat jump – jump feet wide into a squat – repeat 4 times
- Crisscross jack – feet jump wide, when they come in cross in the middle – repeat 5 times
- Jack Sequence
 - Two of each kind
 - Basic jack

- Squat jack
 - Double-bounce jack
 - Crisscross jack
- Repeat sequence twice
- Mix up the order of Jacks
 - Basic
 - Crisscross
 - Squat
 - Double up
- Take a deep breath in and exhale

Common problems and fixes:

- If students do not complete a full jumping jack, hands going all the way up and then all the way down to their sides, they will not get the full benefit.
- If students try to go too fast and don't follow along with the different styles of jumping jacks they will also not receive the full benefit of the break.
- Encourage students to stay with the instructor and complete full jumping jacks in every variation.



Marchin' Madness

Needs: Space

Targets:

- Increase students' heart rate

Procedures:

- March in place bringing knees up high for 5 counts
- Bring knees wide and march wide for 5 counts
 - Swinging your arms
- Bring knees in and march in front for 5 counts
- Wide knees – 5 counts
- Front knees – 5 counts
- Kick your bottom with your feet add a bounce for 5 counts
- Back to march in front for 5 counts
- March wide – 5 counts

- Kick bottom – 5 counts
- Speed up
- March turns to a jog with high knees – 10 counts
- Run with knees wide – 10 counts
- Kick bottom – 10 counts
- Repeat three times
- Deep breath in and exhale

Common problems and fixes:

- Reinforce to students that they are to stay in place and not move around the classroom.
- Reinforce to students they are not to kick their bottoms hard.
- Encourage students to get their knees up as high as they can, all the way to their belly button.
- Remind your students to breathe through the whole break.



Samurai Slide

Needs: Space

Targets:

- Core strength and balancing in a lunge position
- Leg strength when holding lunge

Procedures:

- Feet together
- Step forward into a lunge alternating sides
- Repeat 3 on each side
- Step forward into a lunge and hold down
 - Swing both arms to your side and alternate sides
 - Repeat 3 times each side
 - Step back
- Switch legs – lunge forward and hold

- Swing both arms to your side and alternate sides
- Repeat 3 times each side
- Step back
- Repeat sequence on both side three times
- Add on
- Stepping backwards into a lunge, as you bring your leg back up lift your knee in front
- Alternating sides twice
- Add arms back in
 - Step back into a lunge swing arms side to side for 4 counts and lift knee
 - Switch legs and repeat
- Deep breath in and exhale

Common problems and fixes:

- Encourage the students to take nice size step and then bend both legs, so that legs make a 90 degree angle.
- Students should be able to see their toes over their knee.
- Students might take too small of step forward and then will not have a 90 degree angle with both legs and they will not be able to see their toes.
- Students' front leg should be bent and their thigh should be a flat surface.
- Students may try to take a very large step and will then not be able to bend their legs and will fall down.



Skip Hop Hip Hop

Needs: Space

Targets:

- Learning to skip

Procedures:

- Lift right knee hop
- Lift left knee hop
- Alternating sides - 5 times each side
- Continuous motion – skip
- Bring in arms
- Skip in place – 10 times each side
- Increase height off the ground
- Take a deep breath in and exhale

Common problems and fixes:

- Have students concentrate on holding one knee up and then adding a little hop.
- Students may want to rush through the steps and will then not get the full benefit and learn the accurate way to skip.
- Once they have mastered lifting their knee, adding a hop, and going continuously from leg to leg, re-enforce that students should not move around the classroom.



Twinkle Toes

Needs: Space

Targets:

- Increase students' heart rate
- Works on left and right sides
- Targets student's motor skills when tapping heels out in front and toes behind them.

Procedures:

- Tap heel in front
- Alternating heel to heel
- Bring in arm movement as you bounce heel to heel – 20 taps each side
- Transition to tapping your toe back behind your body
- Alternating sides using arms in a swinging motion – 20 taps each side
- Repeat twice going from heels to toes taps

- Sequence alternating from heels to toes
 - Heel heel
 - Toe toe
 - Speed up alternating – 10 times each side
- Heel/Toe sequence
 - Same leg - go heel to toe then switch legs
 - Other leg heel to toe
 - Repeat switching from side to side 20 taps each side
- Heels in front for 5 counts
- Toes for 5 counts
- Alternating heel heel then toe toe – 3 times each side
- Same leg heel toe switch legs heel toe
- Take a deep breath in and exhale

Common problems and fixes:

- Students may try to go faster than the instructor and then not listen to the different sequences.
- Students may struggle with knowing their left and right foot.
- Students may need extra practice tapping their heels out in front and tapping their toes behind them.

Ideas:

- When students have mastered heel taps and toe taps have students count by various increments to challenge them while keeping a sequence of heel heel, toe toe.



Russo Super Steppin'

Needs: Space

Targets:

- Increase students' heart rate
- Moving from left to right

Procedures:

- Feet together
- Two steps right
- Two steps left
- Two steps forward
- Two steps back
- Repeat three times
- Add hops instead of steps
- Repeat twice

- Add in a knee after hops
 - Right two hops and knee
 - Left two hops knee
 - Knees as you walk forward and back
 - Repeat twice
- Deep breath in and exhale

Common problems and fixes:

- Students may not know their left or right and will then not be going in the same direction causing them to bump into each other.



Twizzler Twist

Needs: Space

Targets:

- Increase students' heart rate

Procedures:

- Feet together
- Twist body down and touch the ground
- Twist up and reach for the sky
- Repeat 5 times
- Add on
 - Twist down and when you twist up you are going to jump in the air
 - Repeat 5 times
- Add on
 - Twist down touch, twist up and star jump

- Star jump – legs and arms wide in a star shape
 - Repeat 5 times
- Take a deep breath in and exhale

Common problems and fixes:

- Make sure students twist all the way down to the ground and then twist all the way up with a jump.



Groovin' Shuffle

Needs: Space

Targets:

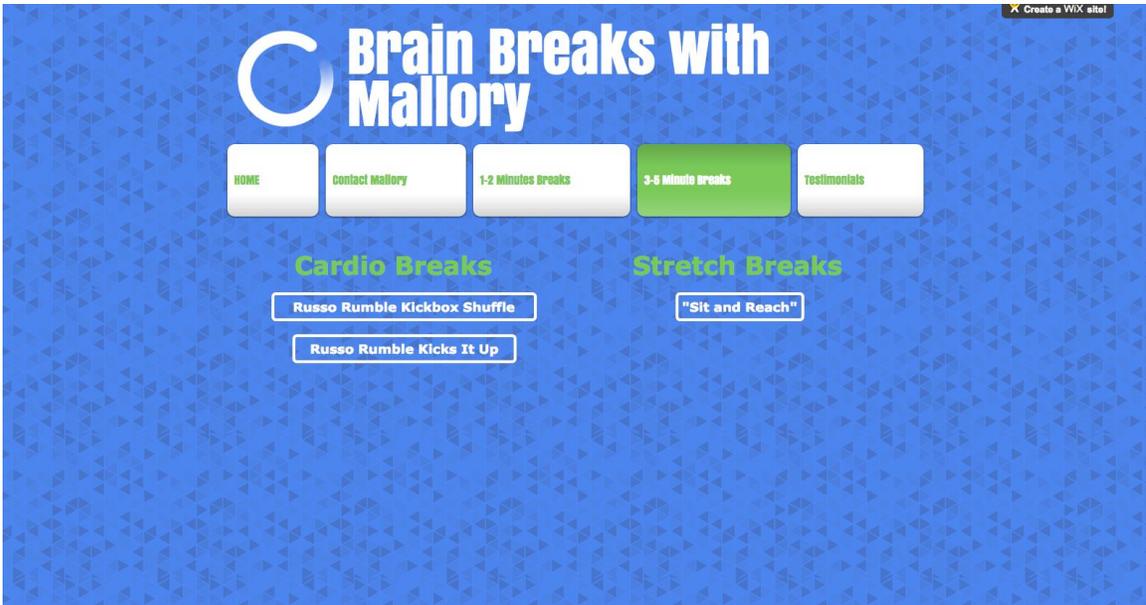
- Increase students' heart rate
- Coordination of moving side to side with various movements

Procedures

- Two steps right jumping jack
- Two steps left jumping jack
- Speed up to doing two side hops with two jumping jack both ways
- Repeat twice
- Add two jumping jacks, touch the ground and jump, two steps to the side
- Two jumping jacks, touch the ground and jump
- Speed up for 5 times
- Take a deep breath in and exhale

Common problems and fixes:

- Students will need space in order to move from side to side.
- Make sure students are not bumping into desks, chairs, or other students.
- Have students stay with the instructor so that the break flows nicely together and students are going the same direction.



3-5 Minute Breaks

Russo Rumble Kickbox shuffle

Create a WIX site!

Detailed Steps



Russo Rumble Kickbox Shuffle

Needs: Space

Targets:

- Basic Kickboxing moves
- Increase students' heart rate

Procedures:

- Ready stance – soft knees, arms up
- Jab in front alternating arms quick pace for 10 counts
- Cross punch alternating quickly for 10 counts
- Hook – arms come out in front to make a 90 degree angle
 - Alternating arms quick page for 10 counts
- Upper cut – arm come up right under your chin (don't hit your chin)
 - Alternating sides for 10 counts

- Sequence:
 - Jab in front for 4 counts
 - Cross punch for 4 counts
 - Hook for 4 counts
 - Upper cut 4 counts
- Kicks - knee to extend leg – touch down between every kick
 - Front kick – 4 counts
 - Right leg for 4 counts
 - Left leg for 4 counts
 - Right side for 4 counts
 - Left side kick 4 counts
 - Back right kick 4 counts
 - Back left kick 4 counts
- Sequence faster 4 counts with every move not stopping
- Deep breath in and exhale

Common problems and fixes:

- Remind students you are not to touch any student.
- Remind students these kickboxing moves are to not be practiced outside of the classroom.
- Students need space so that they do not touch each other or kick desks and chairs.



Russo Rumble Kicks It Up

Needs:

Space for students to take two-three steps, not in arm or kicking distance of other students

Targets:

- Increase students' heart rate
- Hand and foot coordination

Procedure:

- Students will need to find a space where they are not in arm distance of any peers or desks and are able to move side to side
- Knees slightly bent and ready to move, students will form fists with their hands
- Movements:
 - Jabs: forward punches
 - Crossing jabs: crossing across their body punches
 - Hooks: arm makes a 90 degree angle and comes across their face

- Upper cuts: hand comes from hip up under their chin
- Front kicks: kicking their legs directly in front of their bodies; back kicks; side kicks
- Scissor run: keeping their legs straight and switching their feet from front to back in a scissor motion
- Jumping jacks
- Quick feet
- High knees
- Follow the instructor for different combinations

Common problems and fixes:

- There should be a discussion before the brain break about not touching other peers during video and that moves are only performed during the break time.
- Remind students to keep their own personal space.



“Sit and Reach”

Needs: Space

Targets:

- Leg strength when sitting in a squat

Procedures:

- Feet wider than your hips
- Sit back into a chair and stay there
- Reach your arm up over head and alternate arms
- Repeat 8 times each side
- Cross your body with your arm – 8 counts
- Staying in the squat
- Reach low – opposite hand to knee – 8 counts
- Come up and shake out legs
- Repeat sequence

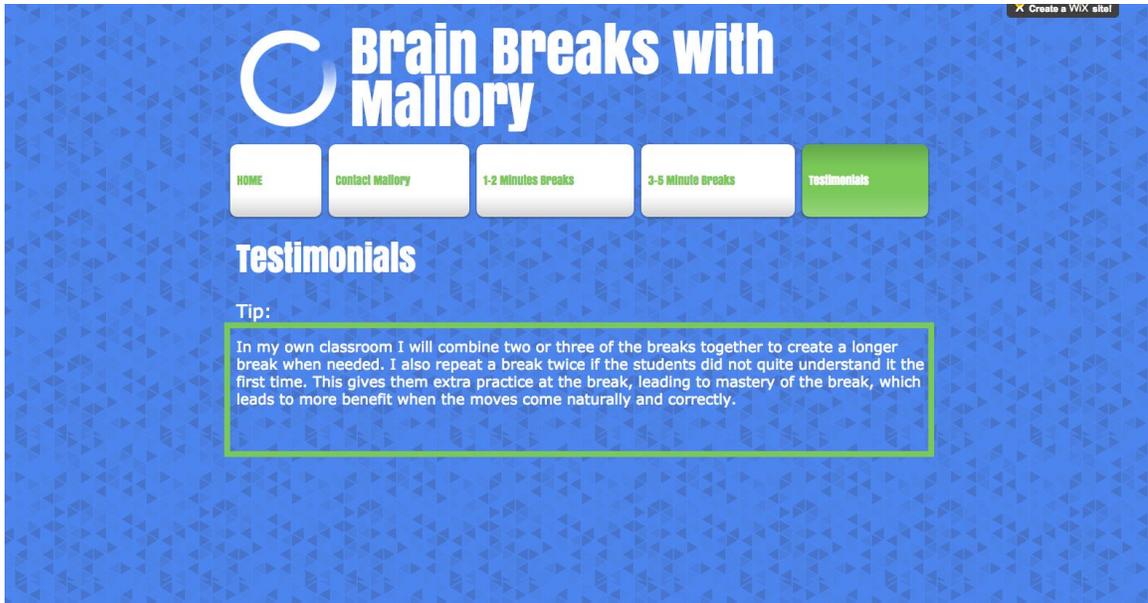
- Take a deep breath in and exhale
- Repeat sequence one more time
- Hold squat for one extra second and release
- Take a deep breath in and exhale

Common problems and fixes:

- Encourage students to sit way back into an imaginary chair so that their knees are not over their toes.

Challenge:

- Add counting as students reach up in various increments



Testimonials

Please feel free to comment on how breaks are implemented. I would love to have feedback. Please share any breaks your students have created on their own.