

# Activating *the* Modern Classroom



Julian A. Reed

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and Jennifer Weaver-Spencer



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## *Like Riding a Bike . . .*

### *Reconnecting Young Learners to Active, Engaged Education*

**I**magine being taught how to ride a bicycle. Instead of learning on an actual bike, however, you're taught with descriptions and diagrams. All while sitting at a desk. Quietly.

For some students, the descriptions are sufficient. For others, the pictures make sense. But for many, the idea of gripping handlebars and balancing on a seat while imagining you're spinning your feet won't really click until they get up and get on a bike.

Few people would advocate teaching aspiring cyclists this way. Fewer still would advocate teaching this way if the goal was to inspire young people to fall in love with the joys of riding a bike. And yet, the more advanced we've become culturally and technologically, the more we've removed active, contextualized learning from elementary schools.

Modern education is, sadly, more sedentary than ever. Kids are moving less and students with learning differences and challenges are struggling more and more. That trend isn't entirely new. Nor is the contrasting premise—the idea that movement enhances learning—wholly original. The



opposite is actually true: active learning is an old, old idea that mainstream education has seemingly forgotten. Until recently.

Movement in classrooms (or lack thereof) is finally getting more attention from academics, educators, and parents. In fact, it was attention from an academic and a former teacher, both of whom are parents to young learners, that inspired this book and a web-based active learning platform called Walkabouts.

Several years ago, two dads struck up a conversation about the state of education and the challenges a growing number of students were having connecting with fundamental material. One of those dads was a professor: Dr. Julian Reed, a leading researcher and author about the impact of movement on the brain. The other was Matt Ferebee, a former educator who now leads an award-winning design firm—and the father of a little boy struggling with dyslexia.

We came together, two dads on a mission, to address what we talked about during that first conversation. How can more teachers reach all students? With all sorts of learning styles? We knew there was a better way—a way that didn't add burdens or stress to teachers' already heavy load. So we set out to reconnect learners and classrooms to more active education. Our platform was inspired by years of research, but our commitment and passion were fueled by something even more powerful: the chance to help kids just like our own so they could learn more effectively and actively. More than just a company or product, we wanted to be part of a significant shift. Think of it as a movement—about movement.

Our simple tool, which lets teachers create short, standards-aligned lessons using an online dashboard, has confirmed the critical need for new kinds of supplemental educational materials. It has also confirmed the growing numbers of teachers and administrators across the country who believe exactly what we do: active students learn and behave better. That movement not only unlocks valuable context and improves recall, it also reduces behavioral issues—not to mention the healthier, lifelong patterns integrated activity establishes in young students.

This book is intended to offer a clear, concise snapshot of the fundamental insights, ideas, and research behind Walkabouts. Just as importantly, it lays out the commitment we share to helping students of all learning styles move more and perform better. We're not just trying to sell a web-based platform, we're trying to sell an idea. Fortunately, it's not such a radical idea. It's not foreign or even that difficult or time consuming. Just like riding a bike, all each of us has to do is remember learning with our hands

and bodies. Understanding by doing. That's exactly what we mean by "activating the modern classroom."

We invite you to join us as we get up out of our desks and out of our comfort zones to take a stand, literally, for education.

—**Matt Ferebee** and **Dr. Julian Reed**

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## *What Does Current Brain Research Tell Us About Movement?*

**B**rain research consistently shows that active kids learn better. Examples include:

- Brain research shows a link between movement and enhanced cognition in children.<sup>1</sup> According to Merriam-Webster, cognition is conscious mental activities including thinking, understanding, learning, and remembering.
- Brain research suggests that increasing movement time in schools may support academic performance while also improving the health of children.<sup>2</sup>
- Evidence from leading scientists reveals strong associations between the cerebellum and memory, spatial perception, language attention, emotion, nonverbal cues, and decision-making ability among children who are active while learning in the classroom.<sup>3</sup>

The bottom line: active kids achieve more, have increased focus, and are healthier.

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## **Physical Activity Helps People Remember**

When we move, the brain has time to digest new information. Our brains are designed to learn only a small amount of new information at one time.<sup>4</sup> Because children need time to process new information, we suggest physical activity breaks.

“PHYSICAL ACTIVITY HAS A POSITIVE IMPACT ON THE CENTRAL AND PERIPHERAL NERVOUS SYSTEMS, AND IN PARTICULAR, ON THE DEVELOPING BRAINS OF CHILDREN.”

Physical activity has a positive impact on the central and peripheral nervous systems, and in particular, on the developing brains of children.<sup>5</sup> The brain is activated during physical activity by increasing blood flow to essential areas that stimulate learning.<sup>6</sup> Regular physical activity has been found to promote structural changes in the hippocampus region of the brain. The hippocampus is an area important for memory.<sup>7</sup>

Regular physical activity has also been found to increase neurons, dendrites, and synapses that are essential structural elements located throughout the central and peripheral nervous systems.<sup>8</sup> Research on the brain and brain plasticity shows that physical activity positively impacts the brain and brain development.<sup>9</sup> According

to Merriam-Webster, plasticity is the capacity for continuous alteration of the brain and nervous system in response to experiences.

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## **How Is Physical Activity Linked to Improved Academic Performance?**

More than 30 years ago, researchers found a positive correlation between physical activity and school performance. Unfortunately, despite this research, most elementary school children remain sedentary throughout the school day.<sup>10</sup>

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## What Benefits Can Students Gain if They Move As They Learn?

<b>Academic Achievement</b>	Physically active and fit children tend to have better academic achievement. <sup>11</sup>
<b>Engagement</b>	Physical activity stimulates the release of epinephrine and norepinephrine (adrenalin), enabling children to become alert and ready to learn. <sup>12</sup>
<b>Focus and Concentration</b>	Physical activity improves concentration and reading and math performance with the strongest relationship between activity and concentration. <sup>13</sup>

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## What the Research Says

- Eleven studies between 1967 and 2006 found that regular participation in physical activity is associated with improved academic performance.<sup>14</sup>
- Eight health studies involving population-representative samples of children and adolescents observed statistically significant positive correlations between physical activity participation and academic performance.<sup>15</sup>
- A 2010 study suggests that integrating movement in the classroom three days per week for an average of 90 minutes total per week can enhance fluid intelligence and academic achievement scores of elementary-age children.<sup>16</sup>
- A 2013 study posits that providing 45 minutes of daily physical education can increase cognitive ability while enhancing fitness and decreasing the prevalence of overweight and obese youth.<sup>17</sup>

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## How Is a Lack of Physical Fitness Linked to Poor Academic Performance?

There are many positive results when students are physically active. Are there negative effects when students are inactive?

- Being an overweight child has been reported to be associated with poor IQ test performance.<sup>18</sup>
- Overweight third grade students have significantly lower math and reading test scores in comparison to those of non-overweight children in third grade.<sup>19</sup>

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### **Does More Time in School-Based Physical Education (PE) Hurt Students' Academic Performance?**

- Studies consistently show that more time in PE and other school-based physical activity programs does not adversely affect academic performance.<sup>20</sup>
- PE does not negatively impact academic performance, and regular exercise may improve students' concentration and cognitive functioning.<sup>21</sup>

## *What Are Activity Breaks?*

**A**ctivity breaks are physical activities that get students moving during the school day. Depending on the class, school, and teacher, activity breaks may last anywhere from 3 to 20 minutes. Activity breaks should not be used as a substitute for PE or recess. They are a way to incorporate additional physical activity into the school day. Younger students often need to “get the wiggles out.” Activity breaks can keep students on task and help them grasp new concepts.

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### **What Are the Benefits of Activity Breaks During the School Day?**

- Activity breaks during the school day can improve cognitive performance and concentration.<sup>22</sup>
- Classroom behavior is often improved following activity breaks.<sup>23</sup>
- Activity breaks help students to remain active and contribute to healthy lifestyles.

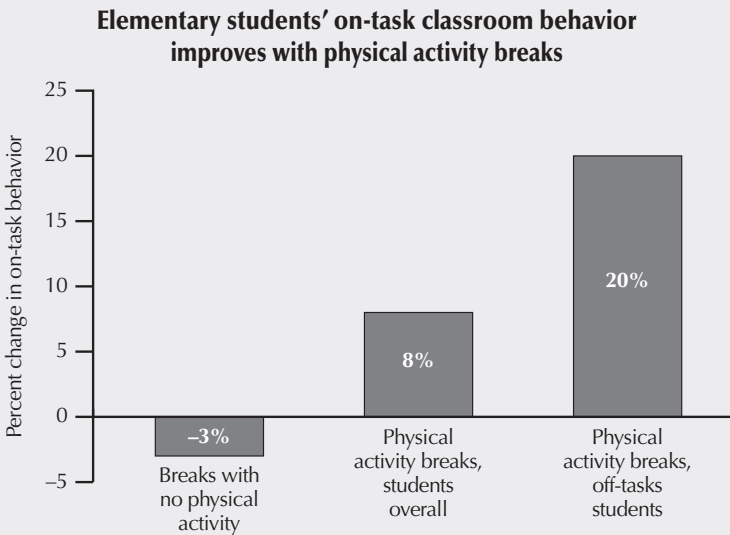


## What Do Activity Breaks Look Like?

Activity breaks can take many different forms. Teachers can get students out of their seats and dancing, doing jumping jacks, running in place—just about any physical activity will work.

### Effects of Daily Activity Breaks

A 12-week research project conducted in eastern NC in 2006 evaluated the effects of providing elementary students with a daily 10-minute activity break. Among 243 students in kindergarten through fourth grade, a daily activity break increased on-task behavior significantly, by an average of 8%. Among the least on-task students, activity breaks improved on-task behavior by 20%.<sup>24</sup>



Jarrett, O. S., Maxwell, D. M., Dickerson, C., Hoge, P., Davies, G., & Yetley, A. (1998). Impact of recess on classroom behavior: Group effects and individual differences. *The Journal of Educational Research* 92, 121–126.<sup>25</sup>

## More Research on the Importance of Activity Breaks

- Strong associations between the cerebellum and memory, spatial perception, language attention, emotion, nonverbal

cues, and the decision-making abilities of students have also been found.<sup>26</sup>

- Research suggests that increased blood flow as a result of movement enhances the cerebellum by promoting specific cognitive functions.<sup>27</sup>
- Physical activity improves spatial learning. When the brain encounters a space, it makes a map of that space based not only on the physical surroundings but also on the basis of the body's association with the particular space.<sup>28</sup>
- Physical activity enables the brain to develop new maps, even if the movement space is not new. This process serves to create additional unique learning opportunities through space.<sup>29</sup>
- Too much information sent to the hippocampus region of the brain prevents the integration of information and newly learned content.<sup>30</sup>
- Movement has been shown to increase brain-derived neurotropic factor that engages learning and cognition and which, ironically, is regulated by physical activity.<sup>31</sup>

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## *What Is an Integrated Curriculum?*

In order to incorporate more movement into the school day, teachers can use an integrated curriculum. Integrated curriculum is when two or more subject areas are combined<sup>32</sup> in one lesson so students learn the content simultaneously. Integrating physical activity enhances lessons for many reasons that are detailed in this book.

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### **Why Is Integrating Movement and Content in Core Subject Areas Important?**

In addition to the academic benefits of integrating movement and core content in the classroom, this integration also provides important health benefits for students. Integrating movement into classroom lessons can be beneficial for schools that are increasingly filled with sedentary and overweight children.<sup>33</sup>

“INTEGRATED CURRICULUM IS WHEN TWO OR MORE SUBJECT AREAS ARE COMBINED IN ONE LESSON.”

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### **What Are the Benefits of Activities that Integrate Movement and Content in Core Subject Areas?**

- When physical activity is included as part of classroom activities, the interaction between the child and the content is more complete because the whole child is actively involved.<sup>34</sup>
- Using physical activity to teach core content not only increases movement time for children and helps to prevent obesity, but it also enhances knowledge retention and brain changes.<sup>35</sup>
- Integrated curriculum allows students to better grasp material from other content areas through basic movements.<sup>36</sup>
- Researchers have found that when children expend energy through physical activity, their time on task increases, and there is significantly less fidgeting in comparison to school days without scheduled activity breaks.<sup>37</sup>
- When regular physical activity is integrated with traditional elementary school curricula, improved concentration, reading and mathematics performance, and academic achievement have been documented.<sup>38</sup>
- Providing movement opportunities throughout the school day helps teachers become better educators while students remain on task and enjoy learning.<sup>39</sup>

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### **What Do Integrated Lessons Look Like?**

Lessons that integrate physical activity and core content areas engage students by getting them up and out of their seats and make lessons active and more fun. According to “Education Has Some New Moves” by Mike Foley published in the *Greenville News* (2009), active learning can take many forms. Teachers can:

- Teach spelling by having students move their bodies to form letters or write giant letters in the air with their fingers.
- Let students demonstrate how Earth moves in a 24-hour rotation and revolves around the sun by having students pretend they are Earth and circle and spin around a flashlight (the sun) in a partially darkened classroom.
- Teach students to take their pulses after doing physical exercise.

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## *Helping Kinesthetic Learners*

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### **What Are Learning Styles?**

Learning styles are the ways people process information.<sup>40</sup> Students' preferred learning styles have a significant influence on both their behavior and their learning.<sup>41</sup> Information that is accessed when students use their preferred learning styles shows an increase in students' levels of comprehension, motivation, and metacognition.<sup>42</sup>

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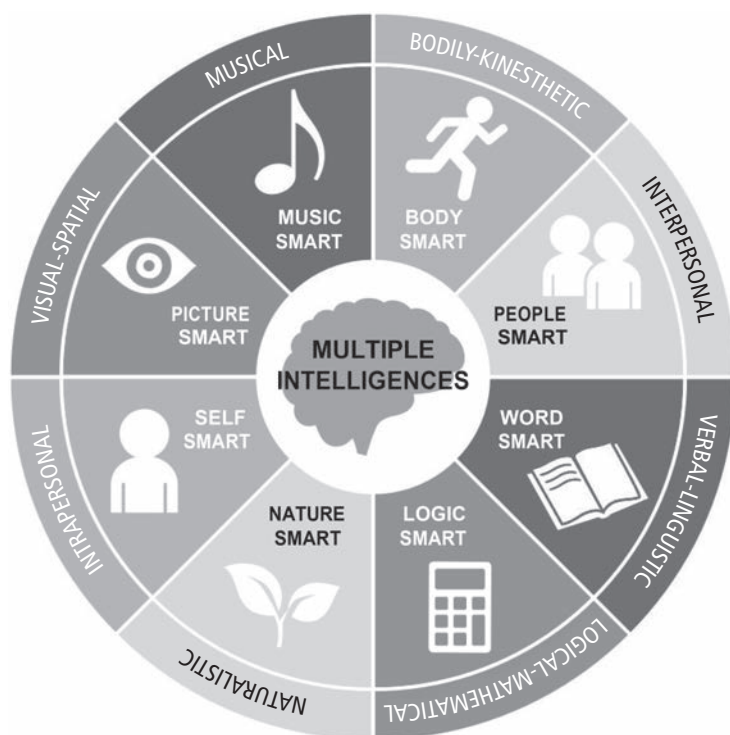
### **What Are Multiple Intelligences?**

Howard Gardner's Theory of Multiple Intelligences states that people have several relatively separate and different intellectual capacities.<sup>43</sup> Gardner identified eight intelligences:<sup>44</sup>

- Musical—rhythmic and harmonic
- Visual—spatial
- Verbal—linguistic



- Logical—mathematical
- Bodily—kinesthetic
- Interpersonal
- Intrapersonal
- Naturalistic



## Why Is Recognizing Students' Learning Styles and Matching Instructional Strategies to Those Styles Important?

Differentiated instruction tailors education based on the needs of students. Using multisensory lessons helps teachers cater to many different learning styles in one lesson. In subjects including reading and math, increased levels of achievement have been linked with matching instructional strategies to individual learning styles.<sup>45</sup>

The kinesthetic learning style is often the most neglected learning style in the classroom.<sup>46</sup> In many classrooms, movement is not encouraged and

often results in punitive treatment.<sup>47</sup> This can have a negative impact on kinesthetic learners. Experts understand that humans must move in order to learn.<sup>48</sup> This is especially true for kinesthetic learners. For kinesthetic learners, movement is learning.<sup>49</sup>

“... EVERY MOVEMENT IS A SENSORY-MOTOR EVENT, LINKED TO THE ULTIMATE UNDERSTANDING OF OUR PHYSICAL WORLD, THE WORLD FROM WHICH NEW LEARNING DERIVES.”

—CARLA HANNAFORD, NEUROPHYSIOLOGIST, 1995

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### Who Are Kinesthetic Learners?

- Kinesthetic learners, or people with the bodily-kinesthetic intelligence, have the capacity to use their whole bodies to express themselves. They are interested in learning through creative movement and often do well when they can move and are not required to stand still.<sup>50</sup>
- Kinesthetic learners often prefer to create or solve problems by moving their bodies. Many children with strong kinesthetic intelligence learn by moving.<sup>51</sup>
- Children who prefer the kinesthetic learning style need to move in order to appropriately interpret their sensory stimuli. Yet, most schools in the United States continue to require children to be seated throughout the school day.<sup>52</sup>

**What Behaviors Are Typical for Kinesthetic Learners?**

Kinesthetic Learners <sup>53</sup>	
Move around a lot	Touch people they are talking to
Enjoy physical activities	Take frequent breaks when studying
Move their hands when they talk	Enjoy touching things
Solve problems by physically working through them	Tap their pencils or feet while doing schoolwork
Express their feelings physically (hugging, hitting, etc.)	Have difficulty sitting still for extended periods of time
Excel in athletics and the performing arts	Are often considered hyperactive

*Source:* Adapted from “Helping Kinesthetic Learners Succeed”

## *What Is ADHD, and Who Is Diagnosed With It?*

**T**he National Institute of Mental Health lists symptoms of ADHD as difficulty staying focused and paying attention, difficulty controlling behavior, and hyperactivity or over-activity.<sup>54</sup>

- Approximately 11% of children ages 4 to 17 were diagnosed with ADHD as of 2011.<sup>55</sup>
- The percentage of children with a diagnosis of ADHD increased from 2003–2011 (from 7.8% in 2003 to 9.5% in 2007 and to 11.0% in 2011).<sup>56</sup>
- Boys (13.2%) are more likely than girls (5.6%) to be diagnosed with ADHD.<sup>57</sup>

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### **How Can Movement Help Children with ADD and ADHD?**

Using movement as a tool to enhance learning has been found to decrease behavioral episodes of children with ADD and ADHD.<sup>58</sup> Some ADD and

ADHD can be treated with non-pharmacologic agents such as physical activity.<sup>59</sup> Perhaps teaching the elementary curriculum with specific emphasis on fundamental movements could decrease the symptoms associated with ADD and ADHD.<sup>60</sup>

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### **What Does a 2015 Study Show About the Link Between Attention Disorders (ADD and ADHD) and Movement?<sup>61</sup>**

According to a 2015 study by the MIND Institute at the University of California–Davis, physical activity seems to allow children with ADHD to focus on what they are doing.

In children with a diagnosis of ADHD, the 2015 study found:

- Children who moved more intensely showed better cognitive performance.
- The accuracy of children’s performance on tests significantly improved when they were moving.
- Hyperactivity in children with ADHD may help them think.

“[TEACHERS] SHOULD SEEK ACTIVITIES THAT ARE NOT DISRUPTIVE THAT ALLOW THEIR STUDENTS WITH ADHD TO USE MOVEMENT, BECAUSE IT ASSISTS THEM WITH THINKING.”

—ARTHUR HARTANTO, STUDY COORDINATOR, 2015

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### **How Are Kinesthetic Learning and ADD and ADHD Diagnoses Connected?**

Many children seen at the National Reading Diagnostics Institute in Naperville, Illinois had previously received a diagnosis of ADD or ADHD. In-depth reading evaluation often showed that rather than having ADD or ADHD, these children were kinesthetic learners who needed to engage in gross motor activity to learn best. After they were given the opportunity to learn

through methods involving movement, their ADHD-like behavior often disappeared.<sup>62</sup> Kinesthetic learners require body movement and action for optimal results. They need to move around, use their muscles, or explore.<sup>63</sup>

“WHEN A CHILD EXHIBITS BEHAVIORS ASSOCIATED WITH ADHD, CONSEQUENCES MAY INCLUDE DIFFICULTIES WITH ACADEMICS AND WITH FORMING RELATIONSHIPS WITH HIS OR HER PEERS IF APPROPRIATE INSTRUCTIONAL METHODOLOGIES AND INTERVENTIONS ARE NOT IMPLEMENTED.”<sup>64</sup>

—U.S. DEPARTMENT OF EDUCATION

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## *Technology in the Classroom*

**T**he phrase *technology in the classroom* may bring to mind students prepping for a standardized test. You may imagine students wearing headphones and sitting in front of a row of computers. However, the integration of technology into the classroom environment can look very different and can provide numerous benefits.

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### **Blended Learning**

Many teachers opt for a blended learning atmosphere in the classroom. According to Wikipedia, “Blended learning is a formal education program in which a student learns at least in part through delivery of content and instruction via digital and online media with some element of student control over time, place, path, or pace.” According to “Technology in the Classroom: The Benefits of Blended Learning” by Timothy Huneycutt, there are several benefits of blended learning. Using technology in the classroom “can keep students focused for longer periods of time” and “makes



students more excited to learn” (<http://www.nms.org/News-and-Views/Blog/2013/October-2013/Technology-in-the-Classroom-The-Benefits-of-Blende.aspx>).

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## **Benefits of Using Technology in the Classroom**

“Effects of Technology on Classrooms and Students” reports, “The most common—and in fact, nearly universal—teacher-reported effect [of technology use] on students was an increase in motivation. Teachers and students are sometimes surprised at the level of technology-based accomplishment displayed by students who have shown much less initiative or facility with more conventional academic tasks.” (<https://www2.ed.gov/pubs/EdReformStudies/EdTech/effectsstudents.html>)

The reasons teachers integrate technology into daily lessons vary. A 2013 PBS LearningMedia survey conducted 503 web-based interviews with U.S. teachers of students in prekindergarten through 12th grade. According to the survey, “Three-quarters of teachers surveyed link educational technology to a growing list of benefits saying technology enables them to reinforce and expand on content (74%), to motivate students to learn (74%), and to respond to a variety of learning styles (73%). Seven in 10 teachers (69%) surveyed said educational technology allows them to ‘do much more than ever before’ for their students.” In addition, “more than two-thirds (68%) of teachers expressed a desire for more classroom technology and this number is even greater in low-income schools (75%)” (<http://www.pbs.org/about/blogs/news/pbs-survey-finds-teachers-are-embracing-digital-resources-to-propel-student-learning/>).

A 2014 Educause survey conducted by Eden Dahlstrom, D. Christopher Brooks, and Jacqueline Bichsel collected responses from 75,306 undergraduate students at 213 institutions. Among the survey’s key findings:

- “More students than ever have experienced a digital learning environment. The majority say they learn best with a blend of online and face-to-face work.”
- In addition, “Technology is embedded into students’ lives, and students are generally inclined to use and to have favorable attitudes toward technology.” (<https://library.educause.edu/resources/2014/10/2014-student-and-faculty-technology-research-studies>)

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## Integrating Technology Into Daily Lessons

The ways teachers can integrate technology into daily lessons are seemingly endless. Students can:

- Use technology including Google docs to complete individual and collaborative projects and reports.
- Use tablets, computers, and phones to play learning games/apps.
- Use computers to prep for standardized tests.
- Run classroom Twitter, Instagram, and Snapchat accounts.
- Access content through digital textbooks.
- Use educational software or web-based lessons to learn new concepts and to reinforce previously taught content.

When deciding what types of technology to bring into the classroom, teachers may ask themselves many questions, including:

- What technology will reach my students?
- What access to technology (computer, Internet) do my students have at home?
- What are the pros and cons of using a particular technology in the classroom?
- What technology does my school provide for my classroom?
- What technology can I access for free?
- What technology is available through grants or crowd-funding opportunities?

The following web-based programs provide free and paid content.

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### **BrainPOP** ([www.brainpop.com](http://www.brainpop.com))

BrainPOP is a website that provides free and paid access to animated movies, learning games, interactive quizzes, primary source activities, and more. BrainPOP covers subject areas including science, math, social studies, English language arts, technology, engineering, arts, music, health, and reading. BrainPOP content is mapped to Common Core and aligned to academic standards. In addition, BrainPOP is available in several languages. Homeschool parents, teachers, schools, and districts can access some content at no cost and can purchase web-based access to all of BrainPOP's content. This content, however, does not integrate movement into the lessons.

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***GoNoodle ([www.gonoodle.com](http://www.gonoodle.com))***

GoNoodle is a website that provides free and paid access to hundreds of interactive and core subject-aligned videos and games. GoNoodle makes it easy for teachers to integrate movement in the classroom with content that gets kids running, jumping, dancing, and more. Parents and teachers can access some content at no cost and can purchase web-based access to all of GoNoodle's content. With GoNoodle Plus (the paid version), students can move purposefully while practicing core subjects, and teachers can access customizable videos and games and reporting on minutes of physical activity.

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***Walkabouts by ActivEd ([www.getwalkabouts.com](http://www.getwalkabouts.com))***

Walkabouts are supplemental web-based lessons for prekindergarten through 2nd grade students that focus on math, language arts, and reading. The characters Jax and Gia lead students through standards-based, movement-rich lessons that are designed based on active learning research. Walkabouts not only bring technology into the classroom, they also integrate movement with technology. ActivEd believes that effective use of technology involves students engaging with their content.

When students take part in Walkabouts, they are up and out of their seats performing integrated activities that focus on both physical activity and the core subject areas of math, language arts, and reading.

**Movements students engage in during Walkabouts include:**

- running in place
- jumping jacks
- high knees
- fast feet
- skipping
- hopping
- jumping
- stretching
- touching toes
- stomping
- squatting
- lunging

**Features of Walkabouts**

- Walkabouts use movement to reinforce core concepts in math, language arts, and reading.
- Walkabouts get students up and out of their seats.
- Walkabouts allow students to move while they complete activities.
- Teachers can assess students as they complete activities and email parents about student progress directly from the Walkabouts platform.
- Teachers can print and assign Walkabouts' supplemental PDF worksheets (that include a movement component) for additional skill practice.
- Teachers can assign Walkabouts for students to complete at home.

**Benefits of Walkabouts**

- Walkabouts provide health benefits by allowing students to move more often during the school day.
- Walkabouts help teachers, schools, and districts address childhood obesity with increased physical activity.
- Walkabouts promote brain health through movement.
- Walkabouts help reduce behavior management and discipline issues in the classroom.
- Walkabouts help increase on-task behavior.
- Walkabouts allow all students, including kinesthetic learners and students with ADHD, to move as they learn.

Get a free trial to get your students moving and learning. <http://info.actedinc.com/move-to-learn>

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## *Creative Movement in the Classroom and School*

**C**reative teachers often incorporate movement into their lessons to engage students and meet the needs of kinesthetic learners and students with ADHD.

The following teachers and writers contributed creative movement activities.

- **Suzannah Evans**, kindergarten teacher and former infant–prekindergarten, PE, and special education teacher, Colorado
- **Jennifer Stith**, freelance writer and former Grades 1–4 and special education teacher, North Carolina
- **Kelly Gunzenhauser**, prekindergarten teacher and freelance writer, North Carolina
- **Jennifer Geck**, freelance writer and former first grade teacher, North Carolina
- **Jennifer Shriver**, first grade teacher, Greenville, South Carolina

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## Language Arts and Literacy

- **Letter Movements:** Do a unique movement activity when introducing or studying each letter of the alphabet. For example, play basketball for b, stomp grapes for g, do jumping jacks for j, do planks for p, etc. (Suzannah Evans)
- **Beginning Writing:** Have students draw lines, squiggles, loops, mountains, circles, and other pre-writing symbols in the air.
- **Letter Writing:** Have students write each uppercase and/or lowercase letter in the air.
- **Letter Ribbon Writing:** Tape or glue ribbons to the ends of dowels or unsharpened pencils. Have students use the ribbon to write letters in the air. (Jennifer Stith)
- **Letter Writing:** Have students draw uppercase and/or lowercase letters in sand or flour. (Suzannah Evans)
- **Whole Body Letters:** Call out a letter and have students make the letter with their bodies. They can stand up or lie on the floor. (Suzannah Evans)
- **Jump Rope Letters:** Give each student two jump ropes. Call out a letter and have students use the jump ropes to form the letter. To make it more challenging, allow students to use only one hand or only their feet. (Jennifer Stith)
- **Recite the Alphabet:** Have students choose a motion and recite the alphabet while doing the motion. Motions can include running, walking, marching, skipping, lunging, or hopping.
- **Repeated Words, Repeated Movements:** Choose a book that repeats a word often. Have students listen for the word and reach both hands up to the sky (or clap or other movement) when they hear the word as you read the story. (Jennifer Stith)
- **Sight Word Targets:** Write sight words on index cards and tape the cards to a wall or scatter them on the floor. Have students say a sight word they are aiming for and throw a soft ball (or knotted socks) at the word. If they hit the word, they collect the card. If they miss the word, they say it again and spell it. (Jennifer Stith)
- **Vowel Sound Movements:** Say or write on the board a series of one-syllable words with long or short vowels. Have students stretch up for long vowels and squat for short vowels.
- **Vowel Sounds Sorting:** Designate a location in the room for each vowel sound (corner of classroom or under a classroom table). Give each student a CVC (or other) word such as bus. Shout, “Short Sort” (or “Long Sort”) and have students move quickly

to the location for their vowel. This could work for consonant sounds as well. (Jennifer Stith)

- **Syllables:** Write a series of words on the board that have different numbers of syllables. If desired, say the words aloud. Have students lunge and say each syllable in the word.
- **Ball Toss Spelling:** Practice spelling words by tossing a ball back and forth between two students. Each time the ball is caught, a letter is called. If the ball drops, students have to begin spelling the word again. For each word completed, have students change the type of ball they are throwing or change the distance between them by taking a step back. (Jennifer Stith)
- **Move and Spell:** Practice spelling words by saying letter names and moving to show how the letter shapes look when they are written on handwriting paper. If the letter is an ascender like b, k, or l, reach up. If the letter touches the midline like a, c, or e, put hands on hips. If the letter is a descender like j, p, or g, squat down low. For example, the word pole would be squat, hands on hips, reach up, hands on hips. (Jennifer Shriver)
- **Whole Body Spelling:** Practice spelling by having small groups spell words with their bodies (sight words, spelling words, word family words, rhyming words, opposites, vocabulary words, etc.). Each child in the group should form a letter with his or her body. The class should “read” each word.
- **Sideways Spelling:** When spelling a word, have students hop and spell each sound. For example, for the word chill, students should hop in place for c and h (for the ch sound), hop to the right for i, hop to the right for l, and hop in place for the final l (for ll). (Jennifer Geck)
- **CVC Word Slide:** Have students practice stretching out/blending letter sounds to make words. Provide paper plates and have each student place a paper plate under each foot. Put three letters to make a CVC word about one foot apart in front of a child. For example, use the word hat. Have student start to the left of the first letter in the word. Have the child say the initial letter sound /h/ as her right foot slides to the h. Bring the left foot over to meet the right. Have the child say the middle sound /a/ as her right foot slides to the a. Bring the left foot over to meet the right. Have the child say the ending sound /t/ as her right foot slides to the t. Bring the left foot over to meet the right. (Jennifer Stith)
- **Punctuation:** Write a sentence on the board. Have students look at the sentence and squat for a period, move one arm quickly in



a comma shape for a comma, wiggle for a question mark, jump twice for a colon, and jump up and then squat for an exclamation mark.

- **Verb Charades:** Pair or group students. Have one student choose an action word and act it out. Have the other student(s) guess the verb. Then, students should switch roles. (Jennifer Stith)
- **Hoop Sentences:** Stand three large hoops around the classroom (students may need to hold the hoops upright for classmates). Write several words on index cards in each of the following categories: subjects, verbs, and prepositional phrases. Place a pile of cards from one category beside each hoop. Have students crawl through each hoop and take a card. After each student has collected three cards, they should return to their seats and put their cards in order to make a silly sentence. For example, The frog cooks under the rock. (Jennifer Stith)

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## Math

- **Number Writing:** Have students draw numbers in the air.
- **Number/Shape Ribbon Writing:** Tape or glue ribbons to the ends of dowels or unsharpened pencils. Have students use the ribbon to write numbers or draw shapes in the air. (Jennifer Stith)
- **Number Writing:** Have students draw each number in sand or flour. (Suzannah Evans)
- **Jump Rope Numbers:** Give each student two jump ropes. Call out a number and have students use the jump ropes to form the number. To make it more challenging, allow students to use only one hand or only their feet. (Jennifer Stith)
- **Counting:** Have students count to 10, 20, 100, or more by running, walking, or lunging, and counting each step.
- **Chalk Skip Counting:** Practice skip counting using a form of hopscotch. Write the numbers being counted in a vertical line using chalk. Have students count/say each number as they hop on the number. Alternatively, write all of the numbers in a sequence and have students hop only on the numbers to skip count by 2s, 3s, 5s, etc. (Jennifer Stith)
- **Jump Rope Shapes:** Give each student two jump ropes. Call out a shape and have students use the jump ropes to form the shape. To make it more challenging, allow students to use only one hand or only their feet. (Jennifer Stith)

- **Building Shapes:** Have students build large shapes on the floor with foam pool noodles, wooden blocks, or foam balance beam pieces. Then, let students sit inside each shape. (Suzannah Evans)
- **Shape Riddles:** Use chalk or tape to create large 2D shapes. Call out a shape riddle and have students run, skip, stomp, or march to the shape they think is the answer. Create multiple versions of each shape to avoid crowding. (Jennifer Stith)
- **2D Shape Dance:** Teach students the basic two-step dance. Use chalk or tape to create large 2D shapes. Play music, and have each student travel the lines of the shape while doing the two-step dance. Stop the music and change shapes. (Jennifer Stith)
- **Pattern Match:** Draw a pattern on the board. Have students use different movements to copy the pattern. For example, an AB pattern shown could be written as JSJS where J = jump and S = squat. Other motions could include stomp, turn in a circle, raise arms, touch toes, run in place, etc. (Jennifer Stith)
- **Number Sorting:** Designate a location in the room for each number (corner of classroom or under a classroom table) 0 to 9. Give each student a math problem with an answer 0 to 9. Shout, “Number Sort” and have students move quickly to the location for their number. This could work for addition, subtraction, multiplication, or division and for larger numbers as well. (Jennifer Stith)
- **Points of Contact:** Group students in pairs. This partner game requires students to cooperate, problem solve, and count. Students should hold hands or link arms and work together so they have a certain number of contact points with the floor. For example: Two points of contact would require each student to stand on one foot. Five points of contact would require both students to stand on two feet and one student to touch the floor with one hand. The game gets harder as the numbers get higher. (Suzannah Evans)
- **Skip Counting:** Have students skip count by 5s or 10s by flashing the correct number of fingers while skipping, hopping, or jumping.
- **Math Facts:** Have students run, walk, march, or lunge as they say math facts. Math facts can include addition facts, subtraction facts, multiplication facts, or division facts.
- **Math Facts Relay:** Divide the class into two teams. (Make sure each team includes students who know math facts and students who are fast runners.) Have an assistant stand at the other end of the racecourse. Students should run to the assistant, draw a flash card, solve the math problem, and run back to tag the next team member. (Kelly Gunzenhauser)

- **Bowling for Sums:** Program plastic cups with desired numbers (numbers under 10, groups of tens, etc.) depending on the skill being reinforced. Stack the cups or place them in a bowling pin configuration. Have students roll a ball toward the cups. Have students add together the numbers on the cups that are left standing. (Alternatively, the numbers on the cups that are knocked down should be added together to get a sum). (Jennifer Stith)
- **Telling Time:** Call out a time. Have students use their own arms and hands to show the time. The right arm should be used as the hour hand and the left arm should be used as the minute hand. (Jennifer Stith)
- **Measurement Scavenger Hunt:** Measure a few objects in the classroom. Give students the measurements (for example: 25 inches wide, 60 inches tall, 20 feet long) without telling them what objects they correspond to. For example, measure the length of the room, the width of the white board, or the height of the windowsill. Have students measure things in the room until they find objects whose length, width, height, or area (for older students) correspond to each measurement. (Kelly Gunzenhauser)
- **Hopscotch Math:** Draw a traditional hopscotch path (outside) with chalk or create a path (inside) with masking tape. Fill the path with numbers 1 to 10 or 1 to 20. Have students jump on the numbers in the following ways: in numerical order; odd numbers only; even numbers only; jump on and add the first and second numbers, jump on and add the second and third numbers, and so on. Another option is to fill the hopscotch path with fractions and fraction pictures or fractions in increasing size and have students jump to find the matching pairs or jump to show the order.
- **Sideways Math:** When completing an addition fact, have students jump to the side and back to center as they count. For example, for the problem  $4 + 5 = 9$ , students should count and jump four times to the left, then count on and jump five times to the right. (Jennifer Geck)
- **Greater Than, Less Than, Equal To:** Write numbers on the left and right side of the board. Have students decide which number is the largest. Students should make alligator arms (v-shaped arms) that open toward the larger number. If the numbers are the same, students should stack their arms to make an equal sign. Then, if desired, write the correct symbol on the board, and have the class read each problem aloud.

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## Social Studies

*Note:* The following activities are adapted from *Active Education: Lessons for Integrating Physical Activity with Language Arts, Math, Science and Social Studies* by Dr. Julian Reed (Nova Science Publishers, Inc., 2009).

- **Movement to Music:** Play music from different cultures of the world for students. Have children learn traditional or modern movements to the music that represent the culture of the country. Teach a movement that is considered American such as the Electric Slide. Then, teach a movement from a different country and discuss the differences.
- **Cardinal Directions:** Teach students the four cardinal directions (north, south, east, and west). Place students in the center of the classroom and have them point to the varying cardinal directions. Have the class move as a group (hop, march, slide, etc.) to the north, then move back to the center. Repeat with a different movement pattern to a different direction.
- **Directional Awareness:** Have students move (crawl, dance, skip, etc.) toward the location of a particular region in the United States or world. For example, if you say California, students should move west.
- **Geography Movement:** Place maps of countries, states, continents, etc., in different parts of the classroom. Ask students to identify places by moving to (wiggling, walking like a robot, doing knee lifts) the place to show their answer.
- **Movement Timeline:** Write the events in a timeline, stages in a procedure, steps in a process, etc., on poster board and place them on the floor. Have a small group work to put the steps in order.

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## Science

*Note:* The following activities are adapted from *Active Education: Lessons for Integrating Physical Activity with Language Arts, Math, Science and Social Studies* by Dr. Julian Reed (Nova Science Publishers, Inc., 2009).

- **Fun with Orbits:** Assign each student a planet and the sun. Have students get in order and orbit around the sun using a specific movement for each planet. Each planet should have a different movement (for example: hop, skip, run, jump, etc.) so the planets can be distinguished. Students should keep the correct order as they orbit.

- **Water Cycle:** Review the water cycle with the class. Then, have students act out each part of the water cycle. For example, students can wiggle their fingers and move repeatedly from standing to squatting to indicate rain.
- **Healthy Heart:** Present information about the body and the role of the heart to students. Have students take their radial or carotid pulse while at rest. Then, after 30 seconds of jogging in place, have students check their pulse again. Compare the numbers and discuss why their heart and respiration rates changed following jogging.
- **Multisensory Learning:** Discuss how learning is multisensory and how our bodies rely on our senses. Create large cards symbolizing each of the senses and display them around the room. Have students work in small groups. Create a group of cards for each small group that includes each sense (for example: ringing doorbell, baking cookies, eating an apple, etc.). Students should read the cards and move (hop, skip, jump, do knee lifts, etc.) to the corresponding sense card.
- **Move Like an Atom:** Review the role of atoms from the scientific perspective. Have students pretend they are atoms and ask them to move like an atom. Ask students to show how close together they would need to be if they were a solid (answer = very close). Ask students to show how close atoms in a liquid (answer = farther apart) or a gas (answer = spread out all over the room) would be.
- **Hopscotch Food Chain:** Create hopscotch boards with varying animals in the food chain. Have students act as a predator and hop on the animals they would prey on starting from the predator highest in the food chain and ending with the prey lowest in the food chain.

## *Creative Movement During the School Day*

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### **Classroom Setup**

- **Learning Stations:** Instead of having children work at their desks, set up stations. Create several stations around the room. If needed, push four desks together and remove the chairs. At each station, have students complete a different activity. Activities may include math problems, a reading comprehension exercise, tangrams, a grammar exercise, an experiment, a series of physical exercises, an art activity, a simple craft, etc. All activities should take about the same amount of time to complete. Assign students to groups for each station. Have students walk, skip, hop, dance, etc., from desk to desk and station to station and complete the activity at each station. (Kelly Gunzenhauser)

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### Start and End Each Day with Movement

- **Dance Party Dismissal:** End every Friday (or every day!) with a dance party. Let students dance down the hall to the bus lot, car rider line, or front door of the school. (Jennifer Geck)

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### Ways to Walk Down the Hall (as a Class)/Ways to Line Up/Waiting in Line

- **Waiting in Line:** If your class is restless when waiting in line, have them stand beside a wall and push the wall. This activates large muscle groups and can calm restless behavior. (Kelly Gunzenhauser)
- **Secret Agent:** Have students pretend they are spies and tiptoe down the hall silently. (Suzannah Evans)
- **Marshmallow Feet:** Have students pretend they have at least three jumbo marshmallows under their feet as they walk down the hall. (Suzannah Evans)
- **Invisible Child:** Have students pretend they are invisible. Students should imagine they can't be seen or heard and can't make eye contact with anyone. (Suzanne Evans)

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### Transitions Between Activities

- **Spider Web Group Assignments:** Assign group work with yarn spider webs. Line up a few desks in the back of the room. Place a notebook containing a group assignment on each desk. Tie or tape one end of a roll of yarn to a notebook, then run the yarn all around the classroom: over desks, around chairs, etc. Repeat using a different color of yarn for each notebook. Assign students to groups and give each group a loose end of yarn. When the groups unravel the yarn and find their notebooks, students can begin their group work. (Kelly Gunzenhauser)
- **Transition Movements:** When students need to get in line, move to stations, gather materials, etc., have them move like animals. Students can:

Gallop like a horse.	Soar like an eagle.
Hop like a frog.	Flutter like a butterfly.
Swim like a fish.	Crawl like an insect.
Slither like a snake.	Buzz like a bee.
Fly like a bird.	Scurry like a mouse.

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## At-Desk Activity Breaks

### *Movements to Do While in a Chair*

- Swim with arms.
- Move legs and feet to pretend to ride a bike.
- Lift knees.
- Pretend to paddle a canoe.
- Pretend to run in place.
- Do heel touches.
- Do toe touches.
- Stand and do chair squats.

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## Ways to Energize Students with Movement

- Swim with arms.
- Do jumping jacks.
- Hop on one foot, then the other.
- Move arms in a circle.
- Dance to lively music.
- Do knee lifts.
- Run in place.
- Do heel taps.
- Do toe taps.
- Twist at the waist.
- Squat.
- Touch toes.
- Do windmills. Start with arms above head and bend at the waist while touching opposite hands to feet.

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## Ways to Calm Students with Movement

- **Mindful Moments:** Have students close their eyes, and focus on their breathing. Play a chime at decreasing volume. Have students raise a hand when they can't hear the chime anymore. (Suzannah Evans)
- **Yoga Poses**
  - Downward facing dog
  - Child's pose
  - Tabletop pose
  - Cobra pose



- **Deep Breathing:** Take a deep breath, hold it for three seconds, and exhale. Repeat three times.
- **Shoulder Roll:** Roll shoulders forward, then backward.
- **Neck Rolls**
  - Drop chin to chest slowly and roll neck to one side, then the other. Then, bend head to back and roll neck slowly to one side, then the other.
  - Tilt head slowly to one side, then the other.
  - Turn head slowly to one side, then the other.
- **Soothing Sounds:** Play a soothing sound such as a rain stick, chime, bell, or soft music. Have students move slowly during the sounds. Note: Some phones have these sounds as ringtones. The sounds may also be available through a sleep sounds app.
- **Stretches**
  - Stretch from side to side in with rainbow arms.
  - Lunge slowly from side to side.
  - Alternate pointing toes and stretching legs in front of the body.
  - Start with arms above head. Stretch arms. Slowly bend at the waist to touch toes. Return to standing by slowly rolling the spine and then neck.
  - Move arms slowly in large circles.

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## Endnotes

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1. Reed, J. A. (2009). *Active education: Lessons for integrating physical activity with language arts, science and social studies*. New York, NY: Nova Science Publishers, Inc., 11.
2. Reed, J. A. (2009). *Active education: Lessons for integrating physical activity with language arts, science and social studies*. New York, NY: Nova Science Publishers, Inc., ix.
3. Ibid.
4. Jensen, E. (2000). Moving with the brain in mind. *Educational Leadership*, 58(3), 34–37.
5. Reed, J. A. (2009). *Active education: Lessons for integrating physical activity with language arts, science and social studies*. New York, NY: Nova Science Publishers, Inc., 11.
6. Blakemore, C. L. (2003). Movement is essential to learning. *Journal of Physical Education, Recreation and Dance*, 74, 22–24, 41.
7. Jensen, E. (2000). Moving with the brain in mind. *Educational Leadership*, 58(3), 34–37.
8. Cotman, C. W., and Engesser-Cesar, C. (2002). Exercise enhances and protects brain function. *Exercise and Sport Sciences Reviews*, 30(2), 75–79.
9. Hannaford, C. (1995). *Smart moves: Why learning is not all in your head*. Arlington, VA: Great Ocean Publishers.
10. Jensen, E. (2000). Moving with the brain in mind. *Educational Leadership*, 58(3), 34–37.
11. Gabbard, C., and Barton, J. (1979). Effect of physical activity on mathematical computation among young children. *Journal of Psychology*, 103, 287–288.
12. Ibid.

13. Trost, S. G. (2007). *Physical education, physical activity and academic performance*. Active Living Research and the Robert Wood Johnson Foundation.
14. Hannaford, C. (1995). *Smart moves: Why learning is not all in your head*. Arlington, VA: Great Ocean Publishers.
15. Jensen, E. (2000). Moving with the brain in mind. *Educational Leadership*, 58(3), 34–37.
16. Taras, H. (2005). Physical activity and student performance at school. *Journal of School Health*, 75(6), 214–219.
17. Taras, H. (2005). Physical activity and student performance at school. *Journal of School Health*, 75(6), 214–219.
18. Trost, S. G. (2007). *Physical education, physical activity and academic performance*. Active Living Research and the Robert Wood Johnson Foundation.
19. Ibid.
20. Reed, J. A., Einstein, G., Hahn, E., Hooker, S. P., Gross, V. R., and Kravitz, J. (2010). Examining the impact of integrating physical activity on fluid intelligence and academic performance in an elementary school setting: A preliminary investigation. *Journal of Physical Activity and Health*, 7, 343–351.
21. Reed, J. A., Maslow, A. L., Long, S., and Hughey, M. (2013). Examining the Impact of 45 minutes of daily physical education on cognitive ability, fairness performance, and body composition of African American youth. *Journal of Physical Activity and Health*, 10, 185–197.
22. Campos, A. L., Sigulem, D. M., Moraes, D. E., Escrivao, A. M., and Fisberg, M. (1996). Intelligence quotient of obese children and adolescents by the Wechsler scale. *Revista de Saude Publica*, 30(1), 85–90.
23. Li, W. (1995). A study of intelligence and personality in children with simple obesity. *International Journal of Obesity and Related Metabolic Disorders*, 19, 355–357.
24. Maeda, J. K., and Murata, N. M. (2004). Collaborating with classroom teachers to increase daily physical activity: The GEAR program. *Journal of Physical Education, Recreation and Dance*, 75, 42–46.
25. Trost, S. G. (2007). *Physical education, physical activity and academic performance*. Active Living Research and the Robert Wood Johnson Foundation.
26. Ibid.
27. Ibid.
28. Ibid.
29. Ibid.
30. Jarrett, O. S., Maxwell, D. M., Dickerson, C., Hoge, P., Davies, G., and Yetley, A. (1998). Impact of recess on classroom behavior: Group effects and individual differences. *The Journal of Educational Research* 92, 121–126.
31. Blakemore, C. L. (2003). Movement is essential to learning. *Journal of Physical Education, Recreation and Dance*, 74, 22–24, 41.
32. Jensen, E. (2000). Moving with the brain in mind. *Educational Leadership*, 58(3), 34–37.
33. Blakemore, C. L. (2003). Movement is essential to learning. *Journal of Physical Education, Recreation and Dance*, 74, 22–24, 41.
34. Diamond, A. (2000). Close interrelation of motor development and cognitive development of the cerebellum and prefrontal cortex. *Child Development*, 71, 44–56.

35. Jensen, E. (2000). Moving with the brain in mind. *Educational Leadership*, 58(3), 34–37.
36. Jensen, E. (2000). Moving with the brain in mind. *Educational Leadership*, 58(3), 34–37.
37. Ibid.
38. Ibid.
39. Cotman, C. W., and Engesser-Cesar, C. (2002). Exercise enhances and protects brain function. *Exercise and Sport Sciences Reviews*, 30(2), 75–79.
40. Hannaford, C. (1995). *Smart moves: Why learning is not all in your head*. Arlington, VA: Great Ocean Publishers.
41. Jensen, E. (2000). Moving with the brain in mind. *Educational Leadership*, 58(3), 34–37.
42. Werner, P. (1999). The future of the integrated curriculum in physical education: Guarded optimism. *Teaching Elementary Physical Education*, November, 11–13.
43. Foley, M. (2009) Education has some new moves. *Greenville News*.
44. Dennison, P. E. (2006). *Brain gym and me*. Ventura, CA: Edu-Kinetics, Inc.
45. Stevens-Smith, D. A. (1999). Physical education in the classroom . . . you've got to be kidding! *Teaching Elementary Physical Education*, January, 18–20.
46. Werner, P., and Burton, E. (1979). *Learning through movement*. St. Louis, MO: Mosby.
47. Reed, J. A. (2009). *Active education: Lessons for integrating physical activity with language arts, science and social studies*. New York, NY: Nova Science Publishers, Inc., 7.
48. Dennison, P. E. (2006). *Brain gym and me*. Ventura, CA: Edu-Kinetics, Inc.
49. Stevens-Smith, D. A. (1999). Physical education in the classroom . . . you've got to be kidding! *Teaching Elementary Physical Education*, January, 18–20.
50. Jarrett, O. S., Maxwell, D. M., Dickerson, C., Hoge, P., Davies, G., and Yetley, A. (1998). Impact of recess on classroom behavior: Group effects and individual differences. *The Journal of Educational Research*, 92, 121–126.
51. Reed, J. A. (2009). *Active education: Lessons for integrating physical activity with language arts, science and social studies*. New York, NY: Nova Science Publishers, Inc., ix.
52. Reed, J. A. (2009). *Active education: Lessons for integrating physical activity with language arts, science and social studies*. New York, NY: Nova Science Publishers, Inc., 8.
53. DeCecco, J. P. (1968). *The psychology of learning and instruction*. Englewood Cliffs, NJ: Prentice-Hall.
54. Teach.com. (2015). *Learning styles*. Retrieved from <http://teach.com/what/teachers-teach/learning-styles>
55. Ibid.
56. Gardner, H. (2015). *Multiple intelligences*. Retrieved from <http://multipleintelligencesoasis.org/>
57. Ibid.
58. Dunn, R., Beaudry, J. S., and Klavis, A. (1989). Survey of research on learning styles. *Educational Leadership*, 16(6), 50–58.

59. Dunn, R., & Dunn, K. (1975). Learning styles, teaching styles. *National Association of Secondary School Principals Bulletin*, 59, 38–49.
60. Dennison, P. E. (2006). *Brain gym and me*. Ventura, CA: Edu-Kinetics, Inc.
61. Pettifor, B. (1999). *Physical education methods for classroom teachers*. Champaign, IL: Human Kinetics.
62. Dennison, P. E. (2006). *Brain gym and me*. Ventura, CA: Edu-Kinetics, Inc.
63. Mohnsen, B. S. (1997). *Teaching middle school physical education*. Champaign, IL: Human Kinetics.
64. Dennison, P. E. (2006). *Brain gym and me*. Ventura, CA: Edu-Kinetics, Inc.

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