

Introduction to *The Math and Movement Training Manual for Physical Educators*

When I first learned about Math and Movement, I was attending the Tennessee Association for Health, Physical Education, Recreation, and Dance (TAHPERD) annual conference. At the time, I was searching for a program that would provide my physical education program with effective cross-curricular activities. I found my answer in Math and Movement. Although this program was originally designed for classroom use, when I saw it, I knew its techniques and practices would fit perfectly into the physical education classroom. After using the program extensively in my P.E. classroom, I began to adapt the movements and techniques to align with the Physical Education Standards and Outcomes. This manual is the result of that work. My hope is that you can find techniques and activities that you can use to teach and practice physical education skills, while simultaneously engaging students in effective and fun math practice!

I also feel that, as physical educators, it is our job to take the lead on using movement to enhance learning. By using Math and Movement and other movement-based learning practices, we can set an example for our colleagues in the classroom, and hopefully inspire them to begin or continue using these practices too. Imagine the benefits for our students if every teacher adopted these practices in their teaching!

I hope that you and your students will enjoy these activities!

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April 2014

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Background and Research of Math and Movement

As physical educators, we are well aware of the benefits of movement. We also have the support of many researchers on this topic. According to Carla Hannaford, PhD, author of *Smart Moves: Why Learning is Not All in Your Head* (Great River Books, 2nd Edition 2007), “The more closely we consider the elaborate interplay of brain and body, the more clearly one compelling theme emerges: Movement is essential to learning...Movement awakens and activates our mental capacities. Movement integrates and anchors new information and experience into our neural networks. Moving while learning increases learning.”

Researcher and educational developer Eric Jensen writes, “Research suggests that physical activity benefits learning. Movement increases heart rate and circulation, enhances spatial learning, provides a break from learning, allows cognitive maturation, stimulates the release of beneficial chemicals, counteracts excessive sitting and affirms the value of implicit learning.” (*Moving With the Brain in Mind, Educational Leadership, v58 n3 p. 34-37 Nov 2000*).

There have also been several studies done specifically using the Math and Movement program:

The Math and Movement Pilot Study, conducted at Northeast Elementary School, Ithaca, New York found that in a classroom of first graders, after 18 hours, Math and Movement improved skip counting and multiplication skills, and increased math confidence. First graders improved their skip counting ability by more than 550%!
(<http://www.mathandmovement.com/pdfs/pilotstudy.pdf#original>)

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Another similar Math and Movement study conducted in a second grade class, found a 50% increase in skip-counting knowledge in just four weeks.. The students were engaged and had fun, and every student showed an increase in knowledge when tested.

(<http://www.mathandmovement.com/pdfs/pilotstudy.pdf#original>)

Finally, in my own study, I pre-tested 4th and 5th grade students with a 36-problem multiplication test for 6's, giving them a minute to complete as many as they could. Following the pre-test, I engaged students in Active Math Movements for 6's, including one Whisper/Loud Movement for 6's and one Skip Counting Movement for 6's. I then had each student jump through the Skip Counting by 6's Mat three times. I did this at the beginning of three classes (over a week and a half time period), then post-tested students. Every student improved and each class exceeded my expectations. My 4th grade class improved by 48% and my 5th grade class improved by 40% in just three classes!

Using this Manual

It was my goal to create this manual with the main focus being on teaching the Physical Standards*, Objectives*, Outcomes* and Critical Elements* created by AAHPERD © in 2013, while incorporating the Math and Movement principles and practices. There are two sections to this manual: Active Math Movements and Activity Guides.

The Active Math Movements take physical education skills and Critical Elements, and put them into usable Skip Counting and Whisper/Loud Movements. These movements are designed to enhance students' abilities to perform physical education skills while skip counting.

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The Activity Guides are designed for teachers to use as actual lesson plans. Since physical education classes vary from school to school, including the amount of time per class, and the number of classes per week, the Activity Guides can be adapted to fit your individual class and school needs. In each individual lesson guide, you will find the Physical Education Standards and Outcomes that the activity is designed to aid in teaching, and the Common Core Standard that the Math and Movement technique and mats allow practice for. Each lesson plan follows this format:

- I. Standards and Objectives
- II. Background Information/Prior Knowledge
- III. Warm-up/Introduction
- IV. Activity
- V. Closure

You will also find a list of all needed materials, along with teacher tips, adaptation ideas, and a section of assessments that can be used alone or with the lessons.

* The National Standards and Grade-Level Outcomes for K-12 Physical Education and the Critical Elements are used under license from AAHPERD. © AAHPERD 2013. All Rights Reserved.