

## Math and Movement Research Pilot Study

The National Math Foundation is pleased to partner with universities and colleges around the country to independently evaluate and assess the programs we endorse. Currently we are piloting independent assessments of both daily physical activity/movement and math skills with University of Tennessee-Chattanooga (Chattanooga, TN) and Syracuse University (Syracuse, NY) in schools and classrooms using the Math & Movement program. For more information, or to participate, please contact us at [info@nationalmathfoundation.org](mailto:info@nationalmathfoundation.org).

**Background:** Math skills in elementary students are fundamental to success in higher levels of learning, and often predictive of success in college. However, math skills tend to lag behind other educational outcomes for many students, particularly those in lower income communities.

At the same time, levels of daily physical activity (PA) drop precipitously after elementary school, and most adolescents and adults in the US do not meet the recommended amounts of weekly PA.

The Math and Movement (M&M) program was developed in large part to help students use repetitive physical activities to enhance learning basic mathematical skills, thereby addressing two critical shortcomings. To date, anecdotal evidence suggests increased math outcomes when students participate in the M&M program. Further, there appears to be a concomitant increase in PA during the program intervention, yet it is unknown if this increase is sustained after the program is complete. If this pilot study can document increases in both math outcomes and physical activity, the results will be used to support grant funding opportunities for program expansion.

**Purpose:** To assess both movement/physical activity and math outcomes in a group of elementary schools students participating in a Math and Movement (M&M) cohort. This will be done with three rounds of testing in each school selected, with baseline, immediate follow-up, and one month follow testing.

**Methods:** Elementary school classes from at least two different public schools (NY, TN) will agree to participate in delivering the M&M curriculum. The students in each class will initially receive baseline math testing (pre-test) and an objective assessment of physical activity (PA) over 5 consecutive days. Next, the selected teachers will deliver the M&M curriculum over a 2-week period, during which PA is again measured, for at least 3 consecutive days, to assess movement during the actual intervention. Within one week of the M&M intervention conclusion, the students will take a math post-test and be

reassessed for PA. One month following the M&M conclusion, students will take the math assessment for the third and final time, and also have their PA assessed again.

Math outcomes will be designed by a team of University faculty with expertise in Math Education, and will be written specific for the grade of each classroom.

Objective measurement of PA will be done with Actigraph accelerometers, which are worn on the hip, attached to the belt, similar to a generic pedometer or step counter.

If possible, each of the intervention schools will be matched with a control school of similar SES, and in a geographically similar location.

**Analysis:** Each intervention classroom will be compared to itself (baseline v. immediate follow-up v. one month follow-up) and to its control, if available. None of the intervention classrooms will be compared to any of the other intervention classrooms.