

# The Mighty Multiplication Project

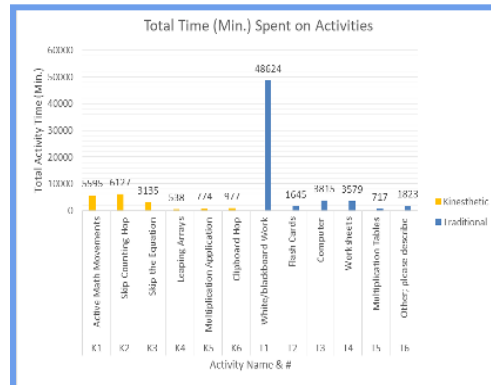
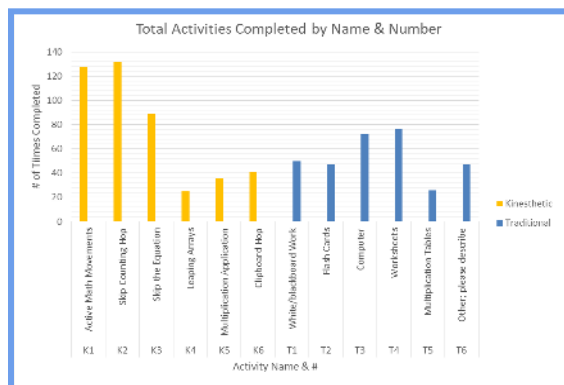
In-House Research Study conducted by the NMF Research Team

<b>Research Team:</b>	Kirby Schoephoerster (MA), Mustafa Al-bayati, Al Ashir Intisar, and Anh Phan
<b>Study Purpose:</b>	To assess the factors underlying the impact of physical activity on multiplication fluency, student math attitudes, and teacher math attitudes
<b>Participants:</b>	492 3rd-5th grade students from 19 schools across 8 states were included in the study. This sample was representative of the grantee population of the National Math Foundation’s kinesthetic interventions.
<b>Testing Dates:</b>	Spring 2023
<b>Methodology:</b>	Students completed a pre and post test at the beginning and end of the 8-week intervention to assess their multiplication fluency and changes in math attitudes. Teachers were assessed via pre and post project surveys conducted before synchronous training and again after the student post-test data was collected. Teachers were responsible for gathering student data, and were thus granted multiple data-collection resources.
<b>Full Report:</b>	To be added on the NMF website soon! <a href="https://nationalmathfoundation.org/data/">https://nationalmathfoundation.org/data/</a>

## Results

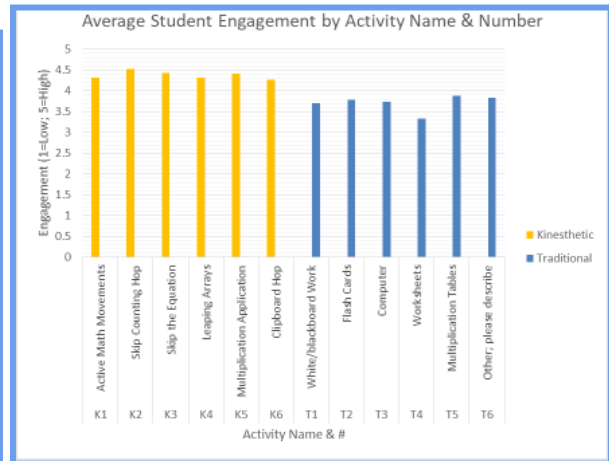
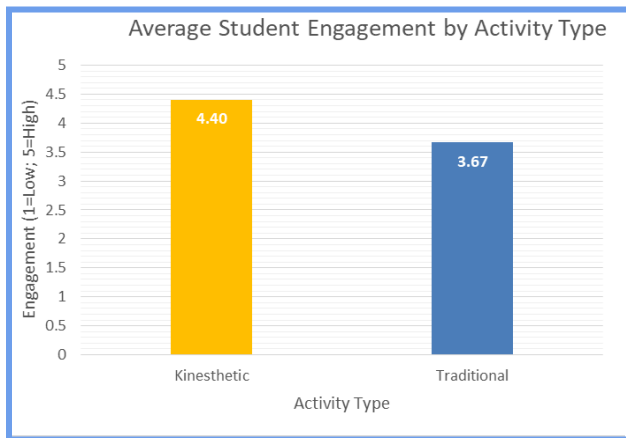
### 1 The MMP improved multiplication fluency, but effect size mediated by individual teacher

Kinesthetic activity participants demonstrated **statistically significant improvement** in math learning outcomes compared to the traditional activity participants. These findings are consistent with those of the pilot project. There was a correlation between the **frequency** of kinesthetic activities utilized and the **extent** of learning improvement. Multiplication fluency increased in tandem with the **time** afforded to activities (both kinesthetic and traditional).



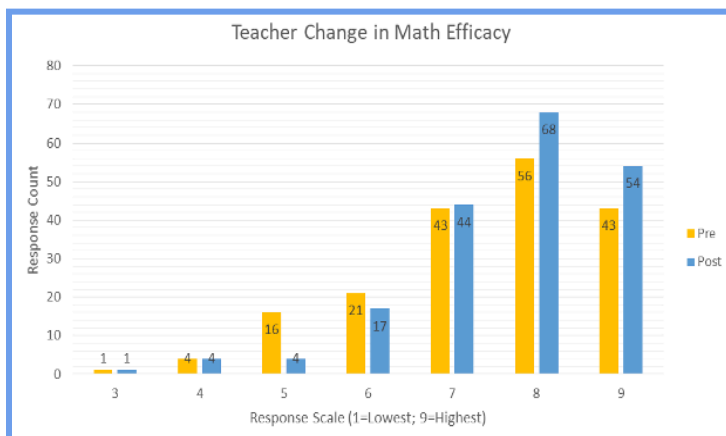
## 2 It is unclear whether the Mighty Multiplication Project improved student “math attitudes”

There was a discernible shift in self-efficacy scores from pre-intervention to post-intervention, but it is likely that the disparities in self-efficacy scores arose by some unknown factor. However, variations in pre-intervention and post-intervention self-efficacy scores extend to the **individual teacher level**, without exhibiting any discernible trend. Across the 8 week intervention period, kinesthetic activities saw **greater levels of student engagement** compared to traditional activities. The ANOVA test concluded that there was a highly significant relationship between the *types* of activities and the level of student engagement.



## 3 The Mighty Multiplication Project had a positive effect on teacher “math attitudes”

The average score of the responses **increased** from pre- to post-intervention, however there was no significant statistical difference found across all questions. However, two questions were found to have a statistically significant difference: whether teachers spend time using kinesthetic activities in the classroom, and whether teachers can give appropriate challenges to capable students. Overall, there was a **positive correlation** between *average weekly time* spent on kinesthetic activities and teacher self-efficacy scores. The more *time* that teachers spent doing kinesthetic activities, the **higher** they themselves scored on (1) their ability to help students who were struggling conceptually with multiplication and (2) their own multiplication ability.



### INTEREST FORM



<https://nationalmathfoundation.org/mighty-multiplication-project/>

**WEBSITE:** nationalmathfoundation.org

**EMAIL:** info@nationalmathfoundation.org