

# The Effects of taking Structured Movement Breaks on the Algebra Achievement of Gifted Fifth Graders

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**Abstract.** Students experiencing mental fatigue while pursuing high levels of achievement may refocus attention, gain cognitive benefits, and increase achievement by taking breaks from class work. In this quantitative study, two types of breaks, sedentary versus structured movement, were compared to determine whether one demonstrated greater efficacy for increasing algebra achievement of gifted fifth graders. Daily ten-minute breaks were taken during math class across a six-week period. All students participated in three-week periods of each break type with achievement being analyzed through weekly quizzes. When algebra achievement data associated with structured movement breaks were compared to the data associated with sedentary breaks, results indicated that nine of eleven students made their greatest individual growth during the structured movement break treatment.

## 1. Introduction

In response to the high achievement demands of the No Child Left Behind Act (NCLB) [1], schools have increased instructional time in reading/language arts and mathematics. The effort to improve every student’s academic performance to the greatest degree possible often results in student mental fatigue. Studies show, however, that students can benefit mentally [2] and academically [3] from taking movement breaks, even if it results in less instructional time. A class of gifted fifth graders learning algebra participated in a study in which they took two types of breaks during class to see how the breaks affected achievement.

## 2. Experiment, Results, Discussion, and Significance

For six weeks the students participated in a 10-minute break at the beginning of their math enrichment class where they studied above grade-level algebra. During the first three weeks of the study, the daily break consisted of quiet, sedentary activities. During the final three weeks of the study, the ten-minute break consisted of the class participating in a teacher-led classroom physical activity program called *Energizers* [4]. Following each ten-minute break, class resumed for 20 minutes of instruction and practice. Achievement was measured weekly through quizzes that were identical to items from a pre-test.

The results of this study indicated that a program of structured movement breaks may be more efficacious in learning algebra than sedentary breaks. The first summative test was given after three weeks and was compared to identical items #1-5 from the pre-test. Two of the eleven students had their largest range of scores, and thus their greatest growth, during this sedentary break treatment.

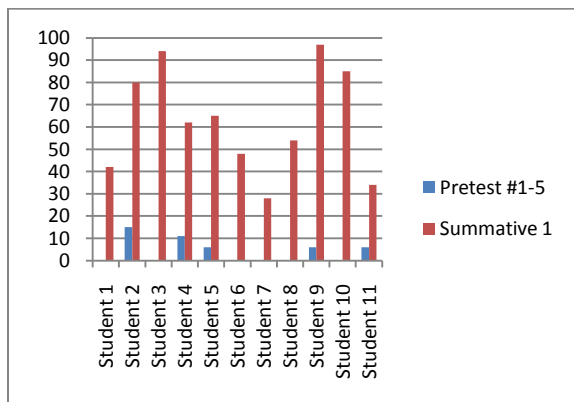


Figure 1. Individual growth between pre-test and summative test #1 following sedentary breaks.

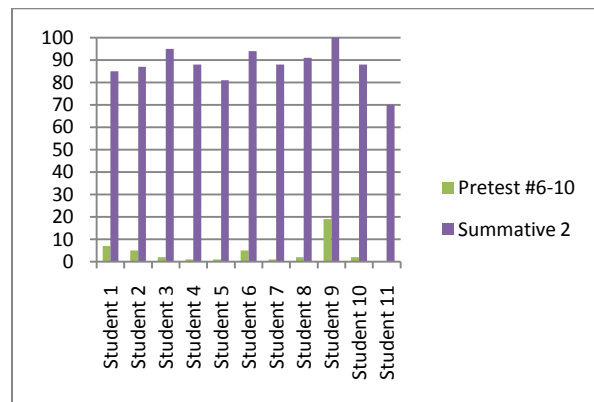


Figure 2. Individual growth between pre-test and summative test #2 following *Energizer* breaks.

Likewise the second summative test was given after the sixth week and compared to identical items #6-10 from the pre-test. These scores indicated that nine of the eleven students made their greatest gains during weeks 4 through 6 when they participated in the structured movement breaks.

When all quizzes and summative tests were considered, the class mean during the sedentary break treatment was 76%, and the class mean during the movement break treatment was 80%, indicating that structured movement breaks may assist some students in learning.

In addition, the steadily improving algebra test scores of the students lend credence to the conclusions from research that physical activity can restore concentration and focus which may lead to greater time on task, improved behavior and increased learning speed [5].

### **3. Conclusion**

It seems counterintuitive to believe that giving children breaks from schoolwork may actually increase their ability to learn, and giving them breaks for movement may be especially valuable. While no single type of break will work for everyone, there is clear evidence that taking time for movement breaks will not compromise the students' academic performance [6]. The results from this study showed that structured movement breaks may even help students excel.

### **References**

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