

# **INDEPENDENT GEOFITNESS STUDY**

## **MAIZE MIDDLE SCHOOL, KS AND EMPORIA STATE UNIVERSITY, KS - MARCH 2008**

### **INTRODUCTION**

#### **Purpose**

The purpose of the study was to determine if there is a difference in the average number of steps students take in a geofitness unit and two other physical education units at the middle school level. In addition, the sub-purpose of this study was to determine if geofitness mat activities improve cardiovascular fitness in middle school students.

#### **Hypothesis**

1. There will be a difference in the number of steps students take in a geofitness unit and a dance unit at the middle school level.
2. There will be a difference in the number of steps students take in a geofitness unit and a fencing unit at the middle school level.
3. There will be a difference in cardiovascular fitness as a result of participating in a geofitness unit at the middle school level.

### **PROCEDURES**

#### **Participants**

The participants of this study were sixth grade students in a Midwest middle school (N=50). This study took place during regular physical education class time. The students met every day for physical education for 45 minutes per class. The units that were selected included dance, fencing and geofitness mat activities. All of these units were taught by the same two physical education instructors. Each unit spanned three weeks for a total of 25 days of activities per unit. All of the units were part of the approved physical education curriculum.

#### **Procedures**

All participants were asked to wear a Walk4Life™ pedometer during all three physical education units. Students were trained in the use and proper positioning of the pedometer prior to these units. When the students entered the physical education classroom, they immediately changed into their activity clothes and came out into the gymnasium. As they entered the gymnasium, they picked up the pedometer that was assigned to them. Each pedometer was numbered and each student was assigned to a particular number. Once the students picked up their pedometer, they correctly positioned it on their activity clothes and began a four minute jogging warm-up. After the initial 4 minute warm-up, students engage in the various activities associated with each unit. Typically the lesson would consist of a warm-up, an introduction or review of one or two skills, practice of those skills and then closure and cool-down. At the end of each class, students came over the one of the two instructors and showed him or her, the number of steps they had taken during that class period. The instructors recorded these steps every day for all three units.

The mean number of steps was then calculated for each student in order to determine the average number of steps for each student for each unit. The mean number of steps was compared for all students across units.

In addition, students were given a cardiovascular fitness test at the beginning and the end of the geofitness unit. This unit lasted three weeks. The Fitnessgram Pacer test was used to assess the students' cardiovascular fitness. The PACER is a multistage test adapted from the 20-meter shuttle run test published by Leger and Lambert (1982) and revised in 1988 (Leger et al.). It involves running back and forth across a 20-meter course in time to music played from a tape or CD. Beeps on the sound track indicate when a person should reach the ends of the course. The test begins at a slow pace, and each minute the pace increases. A participant continues running until the pace can no longer be maintained. The number of times the students completes each 20-meter run is counted. This number was recorded for each student on the pre-test and the post-test.

## RESULTS

The purpose of this study was to determine if there is a difference in the average number of steps students take in a geofitness unit and two other physical education units at the middle school level. In addition, the sub-purpose of this study was to determine if geofitness mat activities improve cardiovascular fitness in middle school students.

1. There will be a difference in the number of steps students take in a geofitness unit and a dance unit at the middle school level.
2. There will be a difference in the number of steps students take in a geofitness unit and a fencing unit at the middle school level.
3. There will be a difference in cardiovascular fitness as a result of participating in a geofitness unit at the middle school level.

An one way analysis of variance was used to determine if there was any difference between males and females on steps, pacer or body fat index. Results indicated that there was no difference between males and females on the number of steps during the geofitness unit ( $F=.036$ ,  $p=.851$ ); fencing unit ( $F=.038$ ,  $p=.845$ ); and the dance unit ( $F=2.088$ ,  $p=.155$ ). In addition, there was no differences between males and females on the pacer pretest ( $F=.003$ ,  $p=.960$ ); pacer posttest ( $F=.191$ ,  $p=.664$ ) and BMI ( $F=.388$ ,  $p=.536$ ). Since males and females did not differ from each other on any of these factors, the data were not separated to test the hypotheses.

A paired samples t-test was used to analyze all the data. All data were analyzed at the  $p < .05$  level of significance. Table 1 contains the means and standard deviations for all students on steps and pacer test. Hypothesis #1 was that there will be a difference in the number of steps students take in a geofitness unit and a dance unit at the middle school level. A significant difference was found between the average number of steps students took during the geofitness unit and the dance unit ( $t=-5.797$ ,  $p=.000$ ). Hypothesis #2 was that there will be a difference in the number of steps students take in a geofitness unit and a fencing unit at the middle school level. A significant difference was found between the average number of steps students took during the geofitness unit and the fencing unit ( $t=-5.615$ ,  $p=.000$ ). However, there was no difference between the average number of steps students took during the dance unit and the fencing unit ( $t=1.352$ ,  $p=.184$ ). Hypothesis #3 was that there will be a difference in cardiovascular fitness as a result of participating in a geofitness unit at the middle school level. A significant difference was found between the fitness level of students prior to the geofitness unit and after the geofitness unit ( $t= -3.343$ ,  $p=.002$ ).

**Table 1: Means and standard deviations for steps and pacer pre/post test**

Factor	Mean	Standard Deviation
Geofitness Unit	2222.67	781.65
Dancing Unit	1648	537.839
Fencing Unit	1521	462
Pacer Pretest	35.02	14.18
Pacer Post-test	39.54	14.18

## Discussion

The results of this study support the use of geofitness mat activities to improve fitness and to increase physical activity of middle school students during physical education classes. The students took significantly more steps during the geofitness unit than the fencing or dance units. In addition, the students cardiovascular fitness level improved from pre-test to post-test, indicating that geofitness mat activities were a good means to stress the cardiovascular system.