Retention of Academic Skills Over the Summer Months in Alternative and Traditional Calendar Schools

Christy Nofsinger
Western Kentucky University

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RETENTION OF ACADEMIC SKILLS OVER THE SUMMER MONTHS IN
ALTERNATIVE AND TRADITIONAL CALENDAR SCHOOLS

A Thesis
Presented to
the Faculty of the Department of Psychology
Western Kentucky University
Bowling Green, Kentucky

In Partial Fulfillment
of the Requirements for the Degree
Specialist in Education

by
Christy Ann Ozier Nofsinger
May 1999
RETENTION OF ACADEMIC SKILLS OVER THE SUMMER MONTHS IN
ALTERNATIVE AND TRADITIONAL CALENDAR SCHOOLS

Date Recommended 2-17-99

Director of Thesis

Dean, Graduate Studies and Research Date
Acknowledgments

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Abstract

Alternative calendar schools are increasingly popular alternatives to the traditional nine-month school year and a three-month summer vacation. One purported advantage of a shorter summer vacation is the greater retention of academic material because there is less time to "forget" what was learned. While alternative calendar schools appear to be increasing in number, little research has been conducted to actually measure academic differences in these schools. The purpose of this research was to systematically compare the retention of academic skills of students in traditional and alternative calendar schools over the summer months. Three county-wide school districts participated in this study. One of the school districts used a variation of an alternative school calendar and the other two used a traditional calendar year. A total of 749 students in the first, third, and fifth grades of all the schools were administered Curriculum-Based Measurement (CBM) probes in mid-May, and the same probes were administered to the same students (now in second, fourth, and sixth grades) at the end of August. CBM
probes were used to assess the content areas of mathematics, spelling, written expression, and reading. Retention of academic skills in the traditional and the alternative calendar schools depended upon students’ grade level and academic subject. The most striking differences between traditional and alternative calendar schools were found at the first grade level.
Literature Review

History of the Alternative Calendar

Despite the popular belief that alternative calendar schooling is a new concept, it actually dates back to the Colonial times. As described by Worsnop (1996), schools in urban areas often were in operation year-round during the early and mid 1700s and 1800s. School days lasted from six to seven hours each day and schools were in operation eleven months a year in some states in the United States. In the rural areas, however, schools were open depending on the demands of the families. For instance, older children attended school only during the winter months when they were not as essential to their families' farms. In the summer months, younger children attended school while their older counterparts labored on the farm.

Eventually, the influence of rural society on the school calendar spread until the traditional American school calendar was established. “By 1890, 20 to 60 days had been lopped off in [many United States] cities; by 1900, the 180-day school year, extending over a nine-month period of five-day weeks, had become firmly established across the nation” (Worsnop, 1996, p. 444). Thus, the traditional school calendar had been established to accommodate a rural society where children were needed to help on the farm during the summer months.
Force on Restructuring Time and Learning, 1995).

During the 1970s, California paved the way for the alternative school calendar, which later was adopted by other states. By the 1985-86 school year, 411 public school buildings in the United States had adopted renditions of alternative calendar schedules. By 1990, the number had grown to 859 school buildings and 152 school districts in 22 states. At that point, an excess of 700,000 students were enrolled in school buildings operating on specific alternative calendar schedules (The National Association for Year-Round Education, 1998). Alternative calendar schedules continue to grow in popularity. Currently, over 2,500 school buildings now operate on an alternative calendar schedule (The National Association for Year-Round Education, 1998).

Variations in Alternative Calendars

The patterns of alternative calendar education are numerous and are specific to each individual school district (The National Association for Year-Round Education, 1998; Winters, 1994). The type of calendar adopted depends upon many factors conducive to particular school districts. While many kinds of schedules are possible, the two most common patterns of alternative calendar education are the 45/15 and the 60/20 schedules. Simply stated, both of the preceding schedules represents first the number of days that students, teachers, and staff are required to attend school. The second number represents the number of days of vacation between each session of school days. The total number of mandated instruction days is usually kept to 180 days.
As an illustration of the 45/15 plan, the total group (single-track) of students and teachers are in the classroom for 45 days (nine weeks) before they take a 15 day vacation (three weeks) or intercession. While in intersession, students usually have the option to attend remedial or enriched curricular activities. To account for the usual 180 total days of school, this plan is repeated four times a school year. The remaining days of the calendar year are appropriated to local, state, national, and winter holidays as well as spring vacation. The typical “summer vacation” is considered an intersession during the rotation; thus, it is three weeks long.

General Advantages and Disadvantages of Alternative Calendar Education

The rapid rise in alternative calendars has many supporters (Hart, 1989). Many believe that a better system of education for students could be developed than the traditional school calendar that was developed to fit the needs of an agrarian society. The reported advantages of alternative calendar education over traditional calendar schools are varied and range from financial considerations to decreased absenteeism.

Financial considerations. One advantage of alternative calendar education over the traditional calendar school is that alternative calendar education helps alleviate the problem of overcrowding that some school districts might face. In the case of an overwhelming number of students, school districts may modify the above mentioned single track plans in preference of a multi-track plan using the same format of classroom and intersession days. While attending school
following this plan, tracks of students, and often teachers, attend school on a rotating basis. While one track of students and teachers is attending school, the other track is on intersession. The number of tracks will depend on the number of students in one’s district. Each track has its own 45/15 schedule and, as with the single-track plan, intersessions in this multi-track plan are superb times for students to receive remedial or enrichment opportunities.

Rather than spending finances on the building of new classrooms and school structures to accommodate for an overwhelming number of students, existing schools can be used more efficiently and to the maximum by the use of some type of alternative, multi-track education schedule. Ballinger (1988) wrote:

All new buildings cost money to build, of course, but they also cost money to operate and maintain each year they are in use. A secondary school costing $20 million to build will require at least another $20 million to service the bond debt, to repair and maintain, and to operate over a period of 30 years. That total of $40 million or more--for one building--is forever lost to the more important instructional considerations of materials and supplies, field trips, instructional aides, and adequate salaries for the professional involved in the education of the nation’s young. (p. 61)

Reduced absenteeism. Yet another advantage of alternative calendar education is that of reduced absenteeism on the part of both the students and teachers. At the elementary and high school levels, schools that have adopted an alternative calendar schedule have seen rises in student and teacher attendance
(Quinlan, George, & Emmett, 1987). The reason for the improved attendance was associated with the more frequent vacation periods. Teachers seemed to have less need to use their sick leave for days of rest and recuperation. Furthermore, students seemed more eager to return to school following a short vacation period.

**Miscellaneous advantages.** Further advantages of alternative calendar education include more favorable views of vacation time and tourism and increased leisure options throughout the whole year rather than just in the summer months (Worsnop, 1996). For instance, Ballinger, Kirschenbaum, and Poinbeauf (1987) state that the 45/15 plan offers a consistent pacing of instruction, reduces learning loss, costs approximately the same as the traditional calendar, provides for a vacation in each season of the year, and allows flexible time for substituting if a teacher wants to work a longer contract year.

**Disadvantages.** Alternative calendar education does lend itself to disadvantages as well. Financial resources may be depleted because of having to operate air conditioning units in the school buildings during the hottest months of the year. Also, increased transportation expenses are needed, especially when a school district is operating on a multi-track alternative calendar schedule and the buses are needed for many additional days of school. Scheduling of classes and actual implementation are also major concerns when one attempts to alter the existing school calendar, especially when adhering to a multi-track plan (Peltier, 1991). Doyle and Finn (1985) suggest that problems such as scheduling can be handled sufficiently with the aid of computers.
Families with more than one child in a school system may have difficulties if their children are not on the same schedules. Tracking students either by their last name or by the location of their home can help solve family scheduling conflicts. Furthermore, administrators, teachers, and staff may succumb to increased work hours and perhaps burnout and loss of effectiveness in their duties while on an alternative calendar schedule. Administrators, teachers, and staff may also not always know exactly who is supposed to be on the school grounds; thus better communication is often needed with students and faculty (Peltier, 1991).

Academic Skill Retention Issues

The primary question in the minds of many researchers and others when comparing alternative calendar schools and traditional schools regards the amount of retention or loss of academic skills in students attending those schools. Two issues will be addressed: the loss of academic skills over the summer months in traditional calendar schools and the standardized assessment of skill retention in alternative calendar schools.

Loss of skills over the traditional summer. Various studies have examined the impact of a long summer vacation on the retention of academic skills. Schneider (1981) found that retention of reading achievement varied by grade level. Age-appropriate levels of the Gates-MacGinitie Reading Test were given to second, third, fourth, fifth, and sixth grade students. The findings indicated that third and fourth grade students showed a group mean gain in reading following the summer break from school. All three other grades showed a group regression
following the summer break with the regression at the fifth and sixth grade levels being significant.

In a meta-analytic review of 13 recent studies measuring the impact of summer vacation on student achievement as assessed by a standardized testing procedure, Cooper, Nye, Charlton, Lindsay, and Greathouse (1996) reported relatively the same conclusions. On average, summer vacation was 131 days for the studies included in the analysis. Thus, the schools that made up the samples for the meta-analysis were traditional calendar schools. The meta-analysis was conducted by the use of two different metrics. The first, a \( d \)-index, was obtained by the calculation of a standardized mean difference. This difference was calculated by subtracting each sample’s average achievement score assessed prior to the summer break from each sample’s average achievement score assessed following the summer break. This difference in scores was then divided by the average of the two associated standard deviations. The use of this method provided the researchers information regarding each sample’s change in achievement scores relative to the sample’s own performance in the spring, regardless of the metric used in each original study. The second metric used in the meta-analysis was the Difference in Grade-Level Equivalents (DGLE). By the use of this method, Cooper et al. (1996) were able to assess each sample’s change in achievement scores in relation to national norms.

Findings using both metrics indicated that the average student’s Fall score was one tenth of a standard deviation below where it had been in the Spring \( (d- \)
index = -.09) and that the DGLE was also -.09, indicating a loss of academic skills of about one month. When examining the effects of the summer break on specific subject matter, Cooper et al. (1996) found greater academic gains in reading achievement and language rather than in the area of math. Reading achievement was found to be related to grade level as well. As grade level goes up, the effect of summer vacation changes from positive to increasingly more negative (d-index = +.04 in grade 1 to -.12 in grade 4 to -.21 in grade 8).

Standardized assessments of academic skill retention. Prior to 1985, alternative calendar education was not associated with academic advantages. However, recent reports do suggest that alternative calendar education does have its advantages. In November of 1994, the National Association for Year-Round Education published A Review of Recent Studies Relating to the Achievement of Students Enrolled in Year-Round Education Programs. The author of this publication (Winters, 1994) states that learning is difficult to measure since many factors individual to the student must be considered. However, at the date of this publication Winters remarked:

... the standardized test is, at present, the most reliable way to collect data for the purpose of answering the question: How are the scores of children reflecting their learning progress relative to the curriculum? It is for this reason that the present review has focused on [standardized] test results as the variable of choice. (p. 3)
The 1994 review of research included seven school districts that were involved in the implementation of either a 45/10 or a 45/15 single-track alternative calendar plan. The achievement of students in each alternative calendar school district was compared with a similar school district operating on a traditional calendar. Achievement was measured by the administration of one or more standardized tests. "However, standardized [does] not always [mean] nationally-scored, commercially-published, norm-referenced instruments" (Winters, 1994, p. iii).

For each of the seven alternative calendar school districts that were involved in this study, favorable results were found in support of the alternative calendar school calendar. Two elementary schools and one high school found statistically significant differences between the traditional calendar and their alternative calendar, thus suggesting that students in schools that are operating under nine week instruction blocks followed by two to three week vacation blocks were higher achievers in reading and in math. Additionally, the high school reported significant results in all areas tested on the Comprehensive Test of Basic Skills.

Kneese (1996) conducted a meta-analytical review of studies from 1982 to 1996 that compared alternative calendar education with the traditional school calendar and used student achievement as a dependent variable. Thirteen studies met the meta-analysis criteria. Effect sizes were used to assess the magnitude of the difference between the experimental and control means. In each of the studies
examined, the alternative calendar was the experimental group while the traditional school calendar was the control group. Therefore, positive effect sizes were ones that favored alternative calendar education; negative effect sizes were ones that favored the traditional school calendar. About half of the studies yielded positive effect sizes (n=7) and half yielded negative effect sizes (n=6). Weighted effect sizes provided the overall average result of the studies. The weighted effect size was +.12 for studies that reported NCE mean scores and +.15 for studies reporting mean scaled scores. When the studies were analyzed by the type of alternative calendar used, single track schools had a weighted effect size of +.33 while multi-track schools had a weighted effect of +.08. Thus, Kneese (1996) concluded that alternative calendars have an overall positive but very small effect on academic achievement.

Alternative Assessment of Academic Skill Retention

Although standardized test batteries have been the most widely used assessment methods of academic skill retention, they may not be sensitive enough to measure small differences in academic skills over short periods of time. An assessment method that is sensitive to a student’s progress rather than merely his or her performance is conceivably a better method of examining the effects of school breaks on a student’s academic skills. Curriculum-Based Measurement (CBM) appears to be a more sensitive and perhaps more reliable way of assessing a change in a student’s academic skills.
Problems with standardized tests. As noted by Winters (1994), there is a plethora of standardized tests that have been used to assess the effects of alternative calendar education. Shinn (1989), however, suggests that these tests are plagued with problems, particularly with the psychometric properties of such tests. Marston (1989) states, "there is great concern about the technical adequacy (i.e., reliability, validity, norms) of [standardized] measures" (p. 19).

Academic skill assessment is frequently concerned with the progress of students. Therefore, periodic assessment across time is a necessity. "Because [standardized] tests are developed as samples of skills and therefore are limited in the numbers of items that sample various skills, the frequent repetition of these measures results in significant bias" (Shapiro, 1996, p. 10). Thus, the use of these measures repeatedly at frequent intervals compromises their integrity. Shapiro (1996) goes on to note that standardized tests were not designed as a measurement tool to assess student academic progress. Small changes in student behavior cannot be assessed by standardized tests. Because standardized tests were designed to sample a large array of skills that may not necessarily relate to what is actually being taught in the classroom, day-to-day academic gains may not be reflected on the test items. The usefulness of these standardized measures for evaluating academic progress may be severely restricted by these limitations.

CBM as a more sensitive measure. Curriculum-Based Measurement is believed to provide a more sensitive measure of academic skill progress than standardized tests. Curriculum-Based Measurement "is primarily designed as a
progress-monitoring system... [and] employs repeated and frequent administration of skill probes taken from the curriculum in which [a student] is being instructed” (Shapiro, 1996, p. 17). Jenkins, Deno, and Mirkin (1979) suggest that the CBM alternative provides a means of looking at the improvement of students’ achievement over time. Rather than using a system designed to develop intervention strategies, such as curriculum-based assessment, students’ progress can be documented with the use of curriculum-based measurement. By using CBM, assessors can make valid and reliable conclusions regarding the performance level and progress of each student participating. A number of studies have demonstrated the validity and reliability of CBM; the interested reader is referred to Marston (1989) for a summary of those studies.

**CBM and curricula sampling.** It has recently been documented in a number of studies that CBM probes need not be sampled from a student’s own curriculum in order for it to be a valid measurement tool of academic progress. Fuchs, Fuchs, Hamlett, and Ferguson (1992) examined whether teachers could use CBM as a generic assessment measure to document student achievement and growth. In their study, 22 teachers used CBM probes to assess reading progress with 41 students. Rather than using reading probes from the students’ own curriculum, students were asked to read age-appropriate generic reading passages. Findings indicated that teachers used the student performance information to affect student achievement outcomes, compared to control teachers, even though CBM was not conducted using the students’ reading series in which instruction
occurred. Thus, a student’s own curriculum need not be sampled for CBM to be a useful assessment of a student’s progress.

Further evidence in support of the use of CBM probes drawn from a curriculum other than a student’s own can be found in research conducted by Bradley-Klug, Shapiro, Lutz, and DuPaul (1998). In their study, second and fifth grade students were being instructed through the use of a literature-based curriculum. To assess their progress in the area of reading over time, and to compare the effects of different reading curricula, a literature-based reading probe and a basal reading probe were administered to each student. Results indicated that both probe types were sensitive to students’ progress over time.

Generic CBM measures have been found to be appropriate for spelling as well. Fuchs, Allinder, Hamlett, and Fuchs (1990) found, when exploring four spelling curricula, that similar spelling words were found across curricula. Thus, Fuchs and Deno (1994) “see no reason to believe that student performance should differ or that psychoeducational decisions should vary simply because the teacher samples spelling words from one curriculum as opposed to another” (p. 18).

To demonstrate the usefulness of CBM at measuring small changes in academic performance over short periods of time, Allinder and Fuchs (1994) conducted a study that included 128 students. Prior to a three week winter school break, each student was asked to complete CBM probes in math. Following the winter break, students were again asked to complete CBM probes in math. Results indicated that students’ levels of performance did not regress following
the winter break in school. In using such an approach to analyze the test results, the researchers were better able to assess progress levels in math following a short three-week winter break. Standardized tests, on the other hand, would not have been able to track progress over such a short time period.

**Purpose of Present Study**

The purpose of the current study is to assess whether academic skill retention over the summer months differs among students enrolled in alternative calendar schools versus students enrolled in traditional calendar schools. Previous research examining academic skill retention issues between alternative and traditional calendar schools resulted in mixed findings (Kneese, 1996). Furthermore, previous research examined academic skill changes using standardized tests, which may not be sensitive measures of changes in academic skills. The present study will evaluate the retention of academic skills in traditional and alternative calendar schools using CBM procedures which are more sensitive to small changes in academic skills. Skill retention of academic material will be assessed in the areas of mathematics, spelling, written expression, and reading and will be assessed across three grade levels of elementary students to evaluate possible differences across academic subjects and grade levels.

The primary research question of this study is to determine what differences exist in the retention of academic skills of students in traditional and alternative calendar schools. The overall hypothesis is that students enrolled in a traditional calendar school will experience a decrease in academic skills while
students in an alternative calendar school will retain academic skills at the same level following the summer months. Previous research (e.g., Schneider, 1981; Cooper et al., 1996) has found differences in academic skill retention depending upon grade level and academic subject. Therefore, the data will be further analyzed by academic subject for each grade level.
Method

Participants

Three south-central Kentucky school districts agreed to participate in this study. Of the three school districts selected, two were operating on a traditional calendar concept (a 10 week summer break) while the third was operating on an alternative calendar concept. The alternative calendar concept was based on a 45-10/45-15/45-10 format with an eight week summer break (Simpson County Board of Education, 1996). The calendar, in its first full year of implementation, consisted of 45 days of instruction and then a 10 day break, followed by 45 days of instruction and then a 15 day break, etc.

A total of 850 first, third, and fifth grade students were initially evaluated as participants in this study. Of those students, 39 (4.6%) were excluded from this study because they were not present on the days of the second testing. In addition, 62 (7.3%) students were excluded from this study because they attended summer school. Data from students attending summer school might confound the results due to the extra instruction they received. Therefore, 749 students’ scores (Table 1) were used in the compilation of the data. Of the 749 participants, 498 students (66.5%) attended school operating under a traditional calendar, while 251 students (33.5%) attended school operating under an alternative calendar.
The particular schools used in the study were selected based on “poverty” statistics provided by officials at all three school districts. Poverty statistics are simply the percentage of students in each school on free and reduced lunch. This information was the only indicator that was readily available on students without the intrusiveness of obtaining personal information. The three school buildings used in the alternative calendar school district had 40% of their students receiving free and reduced lunch. Four school buildings were selected from the two traditional calendar districts so the traditional calendar sample also consisted of an average of 40% of students receiving free and reduced lunch. This procedure was followed to obtain comparable groups of students for each calendar type.

Table 1

Number of Participants Per Grade and Per Calendar

<table>
<thead>
<tr>
<th>Grade</th>
<th>Traditional</th>
<th>Alternative</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>158</td>
<td>64</td>
<td>222</td>
</tr>
<tr>
<td>Third</td>
<td>155</td>
<td>97</td>
<td>252</td>
</tr>
<tr>
<td>Fifth</td>
<td>185</td>
<td>90</td>
<td>275</td>
</tr>
<tr>
<td>Total</td>
<td>498</td>
<td>251</td>
<td>749</td>
</tr>
</tbody>
</table>
Materials

Using the methods described by Shinn (1989), CBM probes for each grade level were developed as the assessment tool. Personnel at each participating school were phoned to determine what curricula were being used. Each of the school districts used a different curriculum. Since prior research has shown that sampling from a student’s own curriculum is not necessary for an instructionally useful measurement (e.g., Bradley-Klug et al., 1998; Fuchs & Deno, 1994), CBM probes were selected from age-appropriate curriculum resources not represented in any of the school districts involved in this study. Through that approach, familiarity with a particular curriculum by students at any school district was controlled.

The math probes were taken from a math textbook by Bitter et al. (1987) and were comprised of 30 problems for the first grade students, 30 problems for the third grade students, and 24 problems for the fifth grade students (see Appendix A). All problems were chosen at random from grade-level curricular materials, and all probes for each grade contained both addition and subtraction problems. The problems were retyped on a separate page for each grade level.

The spelling probes were developed by using spelling words from Cook, Esposito, Gabrielson, and Turner (1987) grade-appropriate texts. For grades 1, 3, and 5, spelling words included in the probe were chosen at random (every fourth, eighth, and twelfth word in the review lessons for grade 1; every tenth word in the
review lessons for grades 3 and 5). Each spelling probe contained 17 words (see Appendix A).

For the written expression probes, the following story starters were generated by the experimenters using criteria described by Shinn (1989): (a) for grade 1, “This morning a UFO landed on the playground and...”; (b) for grade 3, “Yesterday a monkey climbed through the window at school and...”; and (c) for grade 5, “This morning a spaceship landed on the playground and...”.

CBM probes for reading were generated by selecting reading passages at random from each of three reading program texts: Ruddell, Dillon, and Spache (1978), Ruddell, Reid, and Monson (1978), and Ruddell, Taylor, and Adams (1978). Each reading passage was selected from the appropriate grade-level series, and all passages were retyped on separate pages exactly as they appeared in the text (see Appendix A).

The experimenters organized all the probes into a packet for each student. Math probes were administered first, followed by spelling (a sheet of paper numbered 1-17), and written expression (a sheet of lined paper). Students were given their reading passages individually. Students were asked to provide their own writing instruments.

Procedure

An informed consent document (see Appendix B) was distributed to all students. Only those students who returned the consent form participated in the study. Using the methods drawn by Shinn (1989), Curriculum-Based
Measurement (CBM) probes with standardized instructions (see Appendix C) were administered to all first, third, and fifth grade students in each of the chosen elementary schools. CBM probes were administered to all students during one week in May 1997 and again in August 1997 when the same students were in second, fourth, and sixth grades. The same CBM probes given in the Spring were administered in the Fall to control for potential differences due to passage or probe selection.

Depending on the availability of space and the preference of teachers, math, spelling, and written expression probes were either given in large (an entire classroom) or small groups. CBM packets were handed to each student and standardized instructions were read aloud by one of nine experimenters. For the math probe, all students were given two minutes to complete as many problems as possible; for the spelling probe, students in all three grades were orally given seventeen words, each at 10 second intervals; and for the written expression probe, students were orally given the story starter, told to think about the story starter for one minute and then told to write about it for three minutes. For the reading probe, each student was one-on-one with an experimenter either in the back of that classroom or brought out into the hallway to read. Students were each asked to read aloud a selected passage for one minute. The student’s reading was tape recorded to enhance scoring accuracy and to obtain inter-rater reliability data.
Upon completion of the administration of all probes at all grade levels and schools, two experimenters scored each probe to reduce errors and check for inter-rater agreement. Recorded scores on the math probe consisted of the number of correct digits (CD); on the spelling probe, the number of correct letter sequences (CLS); on the written expression probe, the number of correct word sequences (CWS); and on the reading probe, the number of words read correctly (WRC). See Appendix D for an explanation of scoring procedures.

Inter-rater agreement on the scoring of the CBM probes was calculated to ensure scoring accuracy. Two persons independently scored each written probe and tape-recorded reading passage. Inter-rater agreement was calculated by dividing the number of scoring agreements per probe by the number of agreements plus disagreements and multiplying by 100 (Hintze, Shapiro, & Lutz, 1994). Inter-rater reliability coefficients above .80 are considered acceptable (Alessi & Kaye, 1983). Inter-rater agreements were calculated for all subjects and were grouped by grade level, calendar type, and academic subject area which resulted in 48 inter-rater reliability coefficients. Forty of the 48 coefficients were between .90 and 1.00 while an additional four were between .80 and .89. Only four coefficients were in the unacceptable range (.67 - .78). This researcher resolved all disagreements by reviewing the individual probes for a third time to determine the actual score.
Results

The traditional calendar group and the alternative calendar group were compared following the initial testing (conducted in the Spring of the school year) to determine whether the students' skills were similar. Table 2 indicates that in 7 of the 12 comparisons, students from the Alternative calendar group had statistically significant higher academic skill scores than students from the traditional calendar schools. Students from the Traditional calendar schools were significantly higher in only one area. Four areas showed no differences between groups.

Table 2

A Comparison of Traditional and Alternative Calendar Group Scores at the Initial Assessment

<table>
<thead>
<tr>
<th>Grade</th>
<th>1</th>
<th>3</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math</td>
<td>Traditional</td>
<td>Alternative</td>
<td>Same</td>
</tr>
<tr>
<td>Spelling</td>
<td>Same</td>
<td>Alternative</td>
<td>Alternative</td>
</tr>
<tr>
<td>Written Expression</td>
<td>Same</td>
<td>Same</td>
<td>Alternative</td>
</tr>
<tr>
<td>Reading</td>
<td>Alternative</td>
<td>Alternative</td>
<td>Alternative</td>
</tr>
</tbody>
</table>

Note. "Traditional" or "Alternative" indicates which group’s score was significantly higher. "Same" indicates no significant differences between groups.

To determine the effects of alternative and traditional school year calendars over the summer months, a comparison was made between the initial
testing (May) and the follow-up testing (conducted at the beginning of the following school year in August) in the areas of math, spelling, reading, and written expression. Overall results indicated that the alternative calendar school year resulted in a greater number of general increases and statistically significant increases in academic scores following the summer vacation from school (see Table 3). The equal number of score increases and decreases for the traditional calendar students would be expected by chance.

Table 3

<table>
<thead>
<tr>
<th></th>
<th>Increases</th>
<th>Decreases</th>
<th>Significant Increases</th>
<th>Significant Decreases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional</td>
<td>6</td>
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<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Alternative</td>
<td>9</td>
<td>3</td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

The overall number of increases and decreases from Spring to Fall only provide limited, general support for the alternative calendar school. The differences between calendars by grade level and academic subject were evaluated more closely by comparing the students’ Spring scores with their Fall scores using matched-sample t tests. The mean scores for all students per calendar type, grade level, and academic subject can be found in Table 4.
<table>
<thead>
<tr>
<th></th>
<th>Grade 1</th>
<th>Grade 3</th>
<th>Grade 5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>May</td>
<td>August</td>
<td>May</td>
</tr>
<tr>
<td>Math (CD)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traditional</td>
<td>19.97</td>
<td>16.89***</td>
<td>23.53</td>
</tr>
<tr>
<td>Alternative</td>
<td>15.06</td>
<td>17.22***</td>
<td>27.64</td>
</tr>
<tr>
<td>Spelling (CLS)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traditional</td>
<td>60.57</td>
<td>57.10***</td>
<td>81.41</td>
</tr>
<tr>
<td>Alternative</td>
<td>63.92</td>
<td>65.36</td>
<td>86.05</td>
</tr>
<tr>
<td>Written Expression (CWS)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traditional</td>
<td>6.92</td>
<td>5.40***</td>
<td>23.83</td>
</tr>
<tr>
<td>Alternative</td>
<td>7.81</td>
<td>8.19</td>
<td>27.81</td>
</tr>
<tr>
<td>Reading (WRC)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traditional</td>
<td>50.95</td>
<td>49.72</td>
<td>89.39</td>
</tr>
<tr>
<td>Alternative</td>
<td>60.28</td>
<td>68.67***</td>
<td>101.39</td>
</tr>
</tbody>
</table>

Note. CD = Correct Digits; CLS = Correct Letter Sequences; CWS = Correct Word Sequences; WRC = Words Read Correctly
*P < .05.  **P < .01  ***P < .001
First grade

First grade students enrolled in the traditional calendar schools experienced a decline in all academic skill areas following the summer months. In three of the four academic areas assessed, the declines in scores were found to be statistically significant. Declines in reading scores were not significant. Students enrolled in the alternative calendar school showed an increase in all academic areas following the summer months. In two of the four academic areas assessed (math & reading), the score increases were statistically significant. Increases in spelling and written expression were not found to be significant.

Third grade

Scores in the areas of spelling and math were relatively unchanged for third grade students following the summer months in both the traditional and alternative calendar schools. Reading scores significantly increased for both groups. Written expression scores decreased in both the traditional and alternative calendar schools; however, the decrease was significant only in the alternative calendar school.

Fifth grade

Fifth-grade students enrolled in both the traditional and alternative calendar schools experienced an increase in math, spelling, and reading following the summer months. Significant increases were found in the alternative calendar students’ math and reading scores. Written expression scores decreased following the summer months in both types of calendars. A significant decrease was found
in the alternative calendar group.
Discussion

One of the primary benefits of changing schools from the traditional calendar school year to an alternative one that shortens the summer vacation and allows for periodic breaks throughout the year is thought to be increased retention of academic skills over the summer months. This study was conducted to determine if students in schools with alternative calendars would retain more academic skills than students in traditional calendar schools over the summer break. Previous studies have examined academic retention issues using standardized achievement tests that were not designed to be a sensitive measure of small changes in academic skills over short time periods. The present study adds to the current literature by examining the retention of academic skills using Curriculum-Based Measurement (CBM) probes. The use of CBM probes provides a more sensitive measure of changes in students’ performance from May to August.

The general results indicated that across grades and four academic areas there were more significant gains and fewer significant declines in academic retention over the summer months in the alternative calendar school than in the traditional calendar school. When the results are analyzed by grade level and
academic subject, a particularly important finding becomes clear. Early primary students enrolled in the alternative calendar school experienced significant academic gains while students enrolled in the traditional calendar schools experienced significant academic declines. Such dramatic gains and declines were not apparent at the middle and upper primary levels. These findings suggest that at an early age, the length of a summer break is an important factor in the ability to retain academic skills. One possible explanation of these results may be that early primary children are not yet reading and writing proficiently and do not practice these skills throughout the summer months as do older children. Therefore, an extended amount of time spent away from a structured learning environment is more detrimental for younger students. With young minds, the continuous pattern of teaching, practice, reteaching, and more practice, until finally the students grasp the information, seems to be crucial in retention.

A second important finding of this study is that there were differences in retention of academic skills depending upon the academic subject area. In third and fifth grades, math and spelling scores showed little changes while reading skills significantly increased in both school calendar types. These results support findings by Schneider (1981), who found that third and fourth grade students showed a group mean gain in reading following the summer break. The current study’s findings were not entirely consistent with research conducted by Cooper et al. (1996), who found that math scores decreased as a result of a longer summer
break from school. Results of the present study did not reveal significant
decreases in math skills for third and fifth grade students. Cooper et al. proposed
that children’s home and community environments provide more opportunities to
practice reading and to learn new words than to practice and learn mathematics.
While this is a plausible explanation, an additional explanation for these findings
is that reading skills may not be as dependent upon instruction to develop as other
academic skills and that children are more likely to engage in reading than other
academic activities on their own.

In spelling, only first grade students in the traditional calendar schools
exhibited regression from May to August. These findings tend to support the
conclusion made by Read (1973) that improvement in spelling may be related
either to maturation or to instruction in reading. Thus, as students get older, their
phonetic skills tend to increase and therefore they become more and more able to
spell words correctly. The amount of practice in spelling also tends to increase.
As would be expected, the current study shows that more correct letter sequences
are written as a result of increasing grade levels.

The trend in the written expression area tended to show a decrease in skills
following the summer months across grade levels for both calendar types. This
finding is likely the result of children not being exposed to writing opportunities
over the summer months. Many children would rather participate in some activity
other than writing if they are not specifically asked to do so. Without practice,
writing skills may be susceptible to decay. This finding has important implications for parents and school personnel planning activities for students over the summer months.

Limitations

It is important to note the limitations of this research. Although poverty statistics were used to match school buildings in the traditional and alternative calendar schools, the specific percentage of students receiving free and reduced lunch in each of the experimental groups is unknown. In addition, students in general education classrooms receiving special education services were not excluded from this study nor were they identified. Thus, it is unknown how similar the two groups were on a variety of demographic variables (SES, gender, etc.). Another limitation of this study is that only single CBM probes were used in all academic areas. CBM, as it was designed, is a progress-monitoring system and is to be conducted repeatedly and frequently to determine whether a student’s particular instruction is appropriate. Obtaining multiple probes would have provided a more valid assessment of academic skills but would have been methodologically difficult.

Future Research

This researcher found some support for alternative calendar schools. Additional research is needed to determine exactly why there was a difference in retention of skills over the summer months. Was it due to a shorter summer
break, the extra week of instruction in the Spring or Fall, or some undefined characteristic of an alternative calendar?

Future research is suggested for the use of similar CBM methodology to evaluate the length of time to “recover” lost skills in the Fall or to evaluate the effects of breaks throughout the school year used by alternative calendar schools. For example, breaks are intended to give some students a chance to “catch up” with course material. Are the breaks helpful in that manner? Additionally, methods of preventing the loss of academic skills in the early primary grades should be investigated. Multiple CBM probes are suggested to provide a more accurate measure of each student’s academic skill level. Future research is also needed longitudinally. As suggested by Kneese (1996), it is possible that more academic skill gains could be seen in upper primary level students enrolled in an alternative calendar program after the program had been in implementation for longer than one year.
References


APPENDIX A

CBM Math, Spelling, and Reading

Probes for All Grade Levels
Math - Grade 1

\[
\begin{array}{cccccc}
2 & 4 & 0 & 3 & 4 \\
+1 & +4 & +2 & -1 & -3 \\

4 & 2 & 2 & 5 & 3 \\
-0 & +3 & -1 & -1 & +4 \\

0 & 1 & 3 & 2 & 6 \\
+7 & +5 & 1 & 2 & +1 \\
+1 & +2 \\

4 & 6 & 7 & 8 & 2 \\
-0 & -4 & -3 & +1 & +6 \\

9 & 3 & 9 & 10 & 20 \\
-4 & +5 & -6 & -1 & +56 \\

32 & 70 & 98 & 59 & 75 \\
+27 & -10 & -36 & -7 & -11 \\
\end{array}
\]
Name: ____________________

SPELLING - Grade 1

1. well______________ 12. went______________

2. is______________ 13. apple______________

3. not______________ 14. good______________

4. nice______________ 15. out______________

5. open______________ 16. cow______________

6. be______________ 17. off______________

7. this______________

8. from______________

9. fly______________

10. one______________

11. she______________
Upside Down Amy

"What are you doing?" Mother said.
"I am looking at the world upside down," Amy said.
"It's fun."
"Very good," said Mother.
"When you stand up, we will go skating."
Amy got on her feet.
"I like skating," she said.
Just then mother had a call.
After the call, Mother said,
"Come here, Amy.
That was my editor.
He needs a story right away.
We cannot go skating until after I write the story."
"I will help you write your story," Amy said.
"I am glad you want to help," Mother said.
"But can you write?"
"No," said Amy.
"So I will go back and stand on my head."
After a time Amy said,
"Mother, what is your story about?"
"A monkey," said Mother.
"This monkey likes to do tricks. He likes to race from tree to tree. He like to jump around. Now I have to think of one other trick for him to do. It has to be a good trick."
Mother worked on the story.
"Is it hard to write a story?"
3   6   3   5   8
+ 0  -3  -2  +7  -0

9   9   24   37   48
+ 6  + 9  + 3  - 17  -43

98  17  69  486  84
+ 3  - 9  + 78  + 481  - 62

$.25  65  126  618  401
+.16  + 53  + 135  + 191  - 182

904  508  $6.24  530  275
- 676  - 429  - 1.83  + 62  - 169

2045  42  $.71  8654  40
+ 1523  23  - 37  - 3201  - 37
+ 41
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<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>beg</td>
</tr>
<tr>
<td>2.</td>
<td>flow</td>
</tr>
<tr>
<td>3.</td>
<td>prize</td>
</tr>
<tr>
<td>4.</td>
<td>balloon</td>
</tr>
<tr>
<td>5.</td>
<td>kick</td>
</tr>
<tr>
<td>6.</td>
<td>though</td>
</tr>
<tr>
<td>7.</td>
<td>save</td>
</tr>
<tr>
<td>8.</td>
<td>today</td>
</tr>
<tr>
<td>9.</td>
<td>field</td>
</tr>
<tr>
<td>10.</td>
<td>own</td>
</tr>
<tr>
<td>11.</td>
<td>mouse</td>
</tr>
<tr>
<td>12.</td>
<td>poor</td>
</tr>
<tr>
<td>13.</td>
<td>cellar</td>
</tr>
<tr>
<td>14.</td>
<td>world</td>
</tr>
<tr>
<td>15.</td>
<td>woods</td>
</tr>
<tr>
<td>16.</td>
<td>join</td>
</tr>
<tr>
<td>17.</td>
<td>shells</td>
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</tbody>
</table>
Pigs and Pirates

Once a long, long time ago, when pirates sailed the seas, three Greek boys lived on an island in the blue Aegean Sea. Their names were Milo, Jason, and Alexander. They earned their daily bread and cheese by tending the pigs of a wealthy prince. Each day the boys sang because they were so happy. Oh, they had work enough, it is true, for the pigs were forever running away. But, still, most of the hours in the long sunny days were free for play, with trees to climb and races to run and the salty sea to swim in.

Once a week, the prince’s ship came sailing in to bring fresh food for the boys. The ship took back two or three of the fattest pigs. On this day, each of the boys was given a shiny silver coin for his work. The boys had found that the pigs were very clever. And so, they spent time each day teaching tricks to three of the cleverest pigs. Milo taught one pig to walk backward on his hind legs. Jason trained the second pig to dance a jig. And Alexander taught the third pig to lie down and play dead.

There was one trick that all the pigs on the island knew. They had learned to run to the sandy side of the island when the boys blew three high notes on their pipes. The pigs had learned this trick very well because every time they ran to answer this pipe call, they found a
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<td>-22</td>
</tr>
<tr>
<td></td>
<td></td>
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</tr>
<tr>
<td>-8</td>
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<td>-245</td>
<td>-642</td>
</tr>
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<tr>
<td>488,307</td>
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<td>9,206</td>
<td>12.4</td>
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<td>+49,318</td>
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<td>+13.8</td>
<td>-4.7</td>
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<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>6.532</td>
<td>$2.13</td>
<td>46,823</td>
<td>3,736</td>
</tr>
<tr>
<td>-2.575</td>
<td>+1.17</td>
<td>-9,847</td>
<td>-1,539</td>
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<td>+14</td>
<td>-79</td>
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</thead>
<tbody>
<tr>
<td>62</td>
<td>300</td>
<td>$6.00</td>
<td>802</td>
</tr>
<tr>
<td>-49</td>
<td>-152</td>
<td>-1.84</td>
<td>-76</td>
</tr>
</tbody>
</table>
Name: ______________________________________

SPELLING - Grade 5

1. luggage ____________ 12. sketch ____________
2. follow ____________ 13. prepaid ____________
3. canoe ____________ 14. allowance ____________
4. doubt ____________ 15. needn’t ____________
5. earring ____________ 16. nightgown __________
6. journey ____________ 17. Northeast ___________
7. lawyer ____________
8. pigeon ____________
9. recent ____________
10. wrinkle ____________
11. stage ____________
Why People Wear Masks

Why do you wear a mask on Halloween?
"To fool people."
"To make others guess who."
"To make others laugh."

Why do actors sometimes wear masks on the stage and on the TV?
"To help them look like and act like a character in the play."

Why do firefighters wear gas masks?
"To protect them when they enter a building filled with smoke."

These then are some of the reasons why people wear masks: (1) for disguise or to hide identity; (2) to transform, or change, a personality, to make one person more like another person, animal, or spirit; (3) to protect a wearer against harm. Some ancient peoples also tried to preserve a personality by placing a mask upon the face of a dead person. This was to help his or her soul travel to the afterlife.

We wear masks at Halloween, or on the stage, or in a parade for fun. But people throughout the world have worn them, and sometimes still wear them, for very serious reasons. These reasons and the masks themselves are interesting. No one knows exactly when or where or why human beings first covered their faces with masks. But we are sure that people have been doing it for a long, long time. Perhaps they first wore masks to disguise themselves.

A picture, found on the walls of the cave near southern France, shows humans wearing animal skins and animal heads. This picture may have been painted 50,000 years ago, and the people may have
APPENDIX B

Informed Consent Document
Informed Consent Document

Project Title: “Retention of Academic Skills in Alternative and Traditional Calendar Schools Over the Summer Months”

Coordinators: Christy O. Nofsinger and Jennifer L. Reece, Western Kentucky University, Department of Psychology

All first-, third-, and fifth-grade students at schools A, B, C, and D are being asked to participate in a project conducted through Western Kentucky University. Schools A, B, C, and D and the university require that you give your signed agreement for your child to participate in this project.

The purpose of this project is to determine whether the alternative school calendar is effective in helping students remember what they learned before the summer break from school. To determine this, students will be asked to complete math, spelling, reading, and written expression exercises. This process will take approximately fifteen to twenty minutes. These exercises will be administered in May and again in August of 1997. The children will be advised that their performance on these exercises will have no impact on their grades in their classes. Therefore, there should be no discomfort or risks to your child.

Children will not receive any special benefits for their participation. However, they will be rewarded by the coordinators for simply returning the signed consent form. Results of these exercises pertaining to specific children will be kept confidential.
Refusal to participate in this study will have no effect on any future services you may be entitled to from your child’s school or from Western Kentucky University. Anyone who agrees to participate in this study is free to withdraw from the study at any time with no penalty.

After reviewing the description of the project presented above, please sign the consent form below, indicating whether or not you consent to your child’s participation in this project. Please return the signed consent form to your child’s teacher. You may keep this description.

I consent for my child, ____________________________, to participate in the study entitled “Retention of Academic Skills in Alternative and Traditional Calendar Schools Over the Summer Months.”

_________________________________________  ____________________________
Signature of Parent  Date

I do not consent for my child, ____________________________, to participate in the study entitled “Retention of Academic Skills in Alternative and Traditional Calendar Schools Over the Summer Months.”

_________________________________________  ____________________________
Signature of Parent  Date
APPENDIX C

Standardized Instructions for the Administration of CBM Probes
MATH

1. Provide the student with the math probe. Place the probe face down on the desk in front of the student. When everyone has a pencil and is ready, have them turn the paper over and put their names at the top. It may be best to have the students turn the paper back over while you give directions.

2. Say these specific directions to the student:

“The sheet on your desk is math facts. All of the problems are addition and subtraction facts. When I say ‘begin,’ start answering the problems. Begin with the first problem and work across the page (demonstrate by pointing). Then go to the next row. If you cannot answer the problem mark an ‘X’ through it and go to the next one. Are there any questions?”

3. Say “Begin” and start timing.

4. At the end of two minutes say, “Stop. Put your pencils down.”

5. Collect the papers.
SPELLING

1. Provide the student with the sheet of paper numbered 1 to 17. Ask them to put their names at the top.

2. Say these directions to the students:

   “I am going to read some words to you. I want you to spell the words on the sheet in front of you. Write the first word on the first line, the second word on the second line, and so on. When I say the next word, write it down, even if you haven’t finished the last one. You will receive credit for each correct letter written. Are there any questions? (Pause). Let’s begin.”

3. Say each word twice. Use homonyms in a sentence.

4. Say a new word every 10 seconds.
WRITTEN EXPRESSION

Materials:
1. Story starter.
2. Lined paper for student responses.
3. Stopwatch

Directions:
1. Select an appropriate story starter.
2. Provide the student with a pencil and a sheet of lined paper.
3. Say these specific directions to the students:

“You are going to write a story. First, I will read a sentence, and then you
will write a story about what happens next. You will have 1 minute to think
about what you will write, and 3 minutes to write your story. Remember to
do your best work. If you don’t know how to spell a word, you should guess.
Are there any questions? (Pause). Put your pencils down and listen.
For the next minute, think about... (insert story starter).”
First grade: “This morning a UFO landed on the playground and ...”
Third grade: “Yesterday a monkey climbed through the window at school and
...”
Fifth grade: “This morning a spaceship landed on the playground and ...”

4. After reading the story starter, begin your stopwatch and allow 1 minute for
the students to “think.” (Monitor students so that they do not begin writing).
After 30 seconds say: “You should be thinking about (insert story starter).”
5. At the end of 1 minute say: “Now begin writing.” Restart your stopwatch.
6. Monitor students’ attention to the task. Encourage students to work only if
they are looking around or talking.
7. After 90 seconds say: “You should be writing about... (insert story
   starter).”
8. At the end of 3 minutes say: “Stop. Put your pencils down.”
9. Collect the papers from the students.
READING

Materials:
1. Unnumbered copy of passage (for student)
2. Numbered copy of passage (for examiner)
3. Stopwatch
4. Tape recorder

Directions:
1. Place unnumbered copy in front of the student.
2. Place the numbered copy in front of you but shielded so the student cannot see what you record.
3. Say these specific directions to the student:
   
   “When I say ‘begin,’ start reading aloud at the top of this page. Read across the page (demonstrate by pointing). Try to read each word. If you come to a word you don’t know, I’ll tell it to you. Be sure to do your best reading. Are there any questions?” (Pause)

4. Say “Begin” and start your stopwatch. If the student fails to say the first word of the passage after 3 seconds, tell them the word and mark it as incorrect.
5. Follow along on your copy. Put a slash (/) through words read incorrectly (according to scoring procedures).
6. If a student stops or struggles with a word for 3 seconds, tell the student the word and mark it as incorrect.
7. At the end of 1 minute, place a bracket (]) after the last word and say, “Stop.”
8. Repeat the procedures for each probe.
APPENDIX D

Scoring Procedures
Math
The number of correct digits (CD) was obtained by counting the number of correctly written digits in the students’ response to each math problem during a 2-minute interval. For example:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>800</td>
</tr>
<tr>
<td>-642</td>
<td>-642</td>
</tr>
<tr>
<td>158 (3 CD)</td>
<td>256 (1 CD)</td>
</tr>
</tbody>
</table>

Spelling
A correct letter sequence (CLS) is a pair of letters (or spaces) correctly sequenced within a word, where a word is dictated every 7 to 10 seconds. For scoring, each CLS is marked with a caret (^). For example:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>^t^o^p^ (4 CLS)</td>
</tr>
<tr>
<td>top</td>
<td>top</td>
</tr>
<tr>
<td></td>
<td>st^o^p^ (3 CLS)</td>
</tr>
</tbody>
</table>

Written Expression
A correct word sequence (CWS) is two adjacent writing units (words and punctuation) that are acceptable within the context of what is written within a three minute interval. A caret (^) is used to mark each unit of the correct writing sequence. There is an implied space at the beginning of the first sentence. For example:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>The sky was blue.</td>
<td>^The^sky^ was^blue^. (5 CWS)</td>
</tr>
<tr>
<td>The sky was blue.</td>
<td>^The^sky waz blew. (2 CWS)</td>
</tr>
</tbody>
</table>

Reading
A word read correctly (WRC) is a word that the student reads correctly from the reading probe in a 1-minute interval.