The Four-day School Week in Montana: A Comprehensive Study 2008-2023

ETHNICITY – GENDER – RECRUITMENT – RETENTION

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INTRODUCTION

This study, focusing on Ethnicity, Gender, and Teacher Recruitment and Retention in school districts that utilize the 4dsw schedule and the 5dsw schedule, is a continuation of previous research: *The Four-day School Week in Montana: A Comprehensive Study 2008-2023* (Allen et al., 2024).

Historically, Montana schools have adhered to the traditional five-day school week (5dsw) schedule. However, in 2005, the Montana legislature passed Senate Bill 170, introducing increased flexibility in school schedules. This bill changed attendance requirements from the traditional 180 pupil instruction day school year, to instead requiring 1,080 minimum aggregate hours of pupil instruction (Montana Code Annotated, 20-1-301). This change allowed schools to explore alternative schedules, leading to ten Montana school districts transitioning to a four-day school week (4dsw) schedule by the conclusion of the 2006-2007 school year (OPI, 2024). Since that time, a total of 152 Montana school districts, comprising 260 individual schools, have adopted a four-day school week schedule (OPI, 2024). With 32 school districts adopting the 4dsw schedule in the 2022/23 and 2023/24 school years (OPI, 2024), the number of Montana school districts transitioning to a 4dsw is rapidly increasing.

In a published report addressing national concerns regarding the allocation of time and the use of the school day for instructional purposes, The National Education Commission on Time and Learning (1994) stated, "Learning in America is a prisoner of time…The degree to which today's American school is controlled by the dynamics of clock and calendar is surprising even to people who understand school operations" (p. 7). Previous to the Allen et al. (2024) study, there was no comprehensive study of the 4dsw schedule beyond student achievement. In 2014, Tharp found, using a census, a disparity in student academic achievement in Montana schools who had adopted a 4dsw schedule compared to achievement in schools retaining the 5dsw schedule. Tharp (2014) also found that in the first two years of implementation, student achievement scores in school districts utilizing the 4dsw schedule are better than the state average achievement scores. However, once the 4dsw schedule becomes part of the culture, the loss of the days of instruction appear to negatively affect student performance (Tharp et al., 2016). The results in Allen et al. (2024) aligned closely with the findings of Tharp (2014).

According to Irving (2023), some policymakers question whether the 4dsw schedule provides the same level of educational quality as a 5dsw schedule. As districts continue to implement the 4dsw schedule, policymakers need to understand the implications for educational quality (Hayward, 2018). Policy decisions regarding school scheduling need to be based on empirical evidence for each of the quality indicators of an effective education.

This study, Phase II of The Four-day School Week in Montana, explored multiple implications of choosing a 4dsw schedule instead of a 5dsw schedule through the following 12 research questions:

1. What is the relationship between student achievement and school size and how does this relate to student achievement in school districts utilizing the 4dsw schedule and those utilizing the 5dsw schedule?
2. What is the difference between graduation rates in large schools and small schools and how does this relate to graduation rates in school districts utilizing the 4dsw schedule and those utilizing the 5dsw schedule?
3. What is the difference in graduation rates between school districts utilizing the 4dsw schedule and those utilizing the 5dsw schedule when disaggregated by ethnicity?
4. What is the difference in reading achievement between students in school districts utilizing the 4dsw schedule and those utilizing the 5dsw schedule when disaggregated by ethnicity?
5. What is the difference in reading achievement between students in school districts utilizing the 4dsw schedule and those utilizing the 5dsw schedule when disaggregated by gender?
6. What is the difference in math achievement between students in school districts utilizing the 4dsw schedule and those utilizing the 5dsw schedule when disaggregated by ethnicity?
7. What is the difference in math achievement between students in school districts utilizing the 4dsw schedule and those utilizing the 5dsw schedule when disaggregated by gender?
8. What is the difference in ACT scores between students in school districts utilizing the 4dsw schedule and those utilizing the 5dsw schedule when disaggregated by ethnicity?
9. What is the difference in ACT scores between students in school districts utilizing the 4dsw schedule and those utilizing the 5dsw schedule when disaggregated by gender?
10. What is the difference in attendance between students in school districts utilizing the 4dsw schedule and those utilizing the 5dsw schedule when disaggregated by ethnicity?
11. What is the difference in attendance between students in school districts utilizing the 4dsw schedule and those utilizing the 5dsw schedule when disaggregated by gender?
12. What is the difference in teacher recruitment and retention between the four-day school week schedule and the five-day school week schedule?

For research questions one through eleven, a census of the population was obtained. A census consists of all data related to the population for the research question. In this case, the population is every student and every school district in the state of Montana. Therefore, data were not analyzed with inferential statistics since the purpose of inferential statistics is to infer findings from a sample to a population. Since a census was obtained, there is no need to sample or infer. Because the statistics are not inferential, no probability (*p* value) was needed or calculated.

There are numerous approaches to the four-day school week schedule within Montana school districts. For the purposes of this study, any school reporting to the Montana Office of Public Instruction (OPI) as using a 4dsw schedule was recognized as following the 4dsw schedule, regardless of specific configuration.

This report is organized by twelve research questions. Each research question is stated, followed by Key Points and Discussion. Following the Discussion, data analysis is depicted in charts, tables, and graphs.

RESEARCH QUESTIONS

Research Question 1 - *What is the relationship between student achievement and school size and how does this relate to student achievement in school districts utilizing the 4dsw schedule and those utilizing the 5dsw schedule?*

Question 1 Key Points

- ✓ **There is no practical relationship between school size and student achievement.**
  - **Less than ½ of a percent of the predictability of student achievement in math can be attributed to school size.**
  - **Less than ½ of a percent of the predictability of student achievement in reading can be attributed to school size.**
  - **Approximately one percent of the predictability of student achievement in ACT can be attributed to school size.**

Question 1 Discussion

The relationship between school size and student achievement was examined in two ways. Data from all school districts were analyzed, followed by data from only school districts utilizing the 5dsw schedule.

A Pearson *r* correlation was used to determine the relationship between student achievement in math and reading with school size for all school districts. School size was identified by Average Number Belonging (ANB). Student achievement was separated by year into two groups, MontCas and SBAC statewide summative assessments. These correlations were all below .10, which indicated there were no practical relationships between student achievement in large and small schools. According to Cohen (1988) correlations below .30 are considered weak. The coefficient of determination (r^2) was less than .01, indicating less than one percent of the predictability of student achievement can be attributed to school size (Figure 1.1).

Figure 1.1

Correlation Between School Size and Student Achievement in Math and Reading for all School Districts

	Math		Reading	
Assessments	MontCas	SBAC	MontCas	SBAC
Correlation (*r*)	0.043	0.071	0.00016900	0.041
Coefficent of Determination (r^2)	0.002	0.005	0.00000003	0.002

Similar to the MontCas and SBAC assessments, a very weak correlation was found between school size and student ACT scores (Figure 1.2). This indicated that school size was not a factor

in student achievement and there was no practical relationship between school and student ACT scores.

Figure 1.2

Correlation Between School Size and Student Achievement in ACT for all School Districts

Assessments	ACT
Correlation (*r*)	0.103
Coefficent of Determination (r^2)	0.011

Because student achievement in school districts that utilize the 4dsw schedule was shown to have generally lower achievement scores (Allen et al., 2024), a relationship was calculated based on ANB for school districts which utilized the 5dsw schedule only. This analysis showed similar findings between the ACT, MontCas, and SBAC assessments (Figure 1.3 and 1.4). This further demonstrated that school size was not a factor in student achievement.

Figure 1.3

Correlation Between School Size and Student Achievement in Math and Reading for School Districts Utilizing the 5dsw Schedule

	Math		**Reading**	
Assessments	MontCas	SBAC	MontCas	SBAC
Correlation (*r*)	0.042	0.078	-0.00350	0.049
Coefficent of Determination (r^2)	0.002	0.006	0.00001	0.002

Figure 1.4

Correlation Between School Size and Student Achievement in the ACT Assessment for School Districts Utilizing the 5dsw Schedule

Assessments	ACT
Correlation (*r*)	0.114
Coefficent of Determination (r^2)	0.013

Research Question 2 - *What is the difference between graduation rates in large schools and small schools and how does this relate to graduation rates in school districts utilizing the 4dsw schedule and those utilizing the 5dsw schedule?*

Question 2 Key Points

- ✓ **Graduation rates are higher in small schools regardless of schedule.**
- ✓ **Most schools that utilize the 4dsw schedule are small schools.**
- ✓ **Graduation rates are higher in school districts that utilize the 5dsw schedule.**

Question 2 Discussion

The difference between graduation rates in large and small schools was identified by calculating the average graduation rate for large and small schools and subtracting one from the other. Large school districts were those with greater than 500 ANB. Conversely, small school districts were those with less than 500 ANB. The average graduation rate for large schools was 85.13%. The small school graduation rate was 88.94% (Figure 2.1).

Figure 2.1

Average Cohort Graduation Rates in Large and Small School Districts

	Large School	Small School
Graduation Rate	85.13%	88.94%

Note. A Cohort is a class of students who attend the same high school and are considered to have entered grade nine in the same year.

Because small school districts have a higher graduation rate than large school districts, one would expect that school districts utilizing the 4dsw schedule, which are almost all small school districts, would have a higher graduation rate. This was not the case. Data indicated that school districts utilizing the 4dsw schedule had a slightly lower graduation rate than those utilizing the 5dsw schedule (Figure 2.2).

Figure 2.2

Average Cohort Graduation Rates in School Districts Utilizing the 5dsw Schedule and Those Utilizing the 4dsw Schedule

	5dsw	4dsw
Graduation Rate	85.46%	84.88%

Note. A Cohort is a class of students who attend the same high school and are considered to have entered grade nine in the same year.

Research Question 3 - *What is the difference in graduation rates between school districts utilizing the 4dsw schedule and those utilizing the 5dsw schedule when disaggregated by ethnicity?*

Question 3 Key Point

- ✓ **The weekly schedule impacts graduation rates differently for each ethnic group.**

Question 3 Discussion

Cohort graduation rates were examined for the years 2011-2023 by ethnicity, as reported by the OPI. These ethnicities are: White, non-Hispanic; Hispanic; African-American; American Indian/Alaska Native; Asian or Asian-American; Native Hawaiian/Pacific Islander; and Multiracial students. Higher graduation rates were achieved in school districts utilizing the 4dsw schedule for White, non-Hispanic; Hispanic; and Multiracial ethnicities. Higher graduation rates were achieved in school district utilizing the 5dsw schedule for African-American; American Indian/Alaska Native; Asian or Asian-American; and Native Hawaiian/Pacific Islander (Figure 3.1).

Figure 3.1

Cohort Graduation Rates by Ethnicity Between School Districts Utilizing the 4dsw Schedule and Those Utilizing the 5dsw Schedule

Schedule	White, non-Hispanic			Hispanic			African-American		
5	95488	108428	88.07%	4318	5408	79.84%	1010	1265	79.84%
4	4408	4841	91.06%	193	235	82.13%	30	39	76.92%
Cohort	Graduate	Count		Graduate	Count		Graduate	Count	
Schedule	**American Indian/Alaska Native**			**Asian or Asian-American**			**Multiracial**		
5	9101	13875	65.59%	1102	1183	93.15%	2199	2673	82.27%
4	627	972	64.51%	28	31	90.32%	321	376	85.37%
Cohort	Graduate	Count		Graduate	Count		Graduate	Count	
Schedule	**Native Hawaiian / Pacific Islander**								
5	251	309	81.23%						
4	7	9	77.78%						
Cohort	Graduate	Count							

Note. A Cohort is a class of students who attend the same high school and are considered to have entered grade nine in the same year. These data included cohort graduates and total cohort student count.

Research Question 4 - *What is the difference in reading achievement between students in school districts utilizing the 4dsw schedule and those utilizing the 5dsw schedule when disaggregated by ethnicity?*

Question 4 Key Points

- ✓ **Caution needs to be taken when interpreting the data due to the small student numbers in some ethnic groups.**
- ✓ **In third grade, five of the seven ethnic groups had a higher percentage of reading proficiency in school districts that utilize the 5dsw schedule.**
  - **The two ethnic groups that had a higher percentage of reading proficiency in school districts that utilize the 4dsw schedule totaled 30 students.**
- ✓ **In fourth grade, five of the seven ethnic groups had a higher percentage of reading proficiency in school districts that utilize the 5dsw schedule.**
  - **The two ethnic groups that had a higher percentage of reading proficiency in school districts that utilize the 4dsw schedule totaled 13 students.**
- ✓ **In fifth grade, six of the seven ethnic groups had a higher percentage of reading proficiency in school districts that utilize the 5dsw schedule.**
  - **The ethnic group that had a higher percentage of reading proficiency in school districts that utilize the 4dsw schedule totaled 24 students.**
- ✓ **In grades six, seven, and eight, all ethnic groups had a higher percentage of reading proficiency in school districts that utilize the 5dsw schedule.**

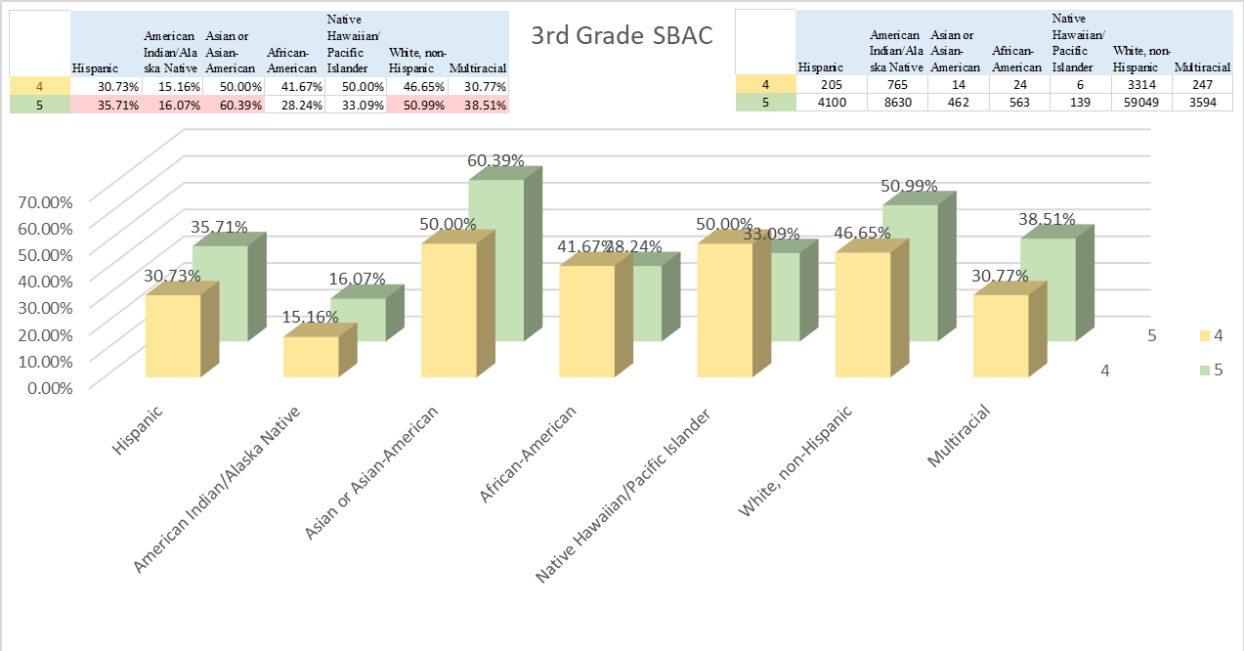
Question 4 Discussion

The school district reporting of MontCas data (2008-2013) regarding ethnicity was inconsistent and therefore MontCas data were not disaggregated by ethnicity. The following discussion is based on SBAC data (2016-2023, excluding 2020).

Overall, third grade students who had taken the SBAC assessment in school districts that utilize the 5dsw schedule had a higher rate of reading proficiency (45.51%) than students in school districts that utilize the 4dsw schedule (39.80%) (Allen et al., 2024). Hispanic students (*N*=205 in the 4dsw), American Indian/Alaska Native students (*N*=765 in the 4dsw), Asian or Asian-American students (*N*=14 in the 4dsw), White, non-Hispanic students (*N*=3314 in the 4dsw), and Multiracial students (*N*=247 in the 4dsw) all showed lower rates of reading proficiency in school districts that utilize the 4dsw schedule (Figure 4.1). Conversely, African-American students (*N*=24 in the 4dsw) and Native Hawaiian/Pacific Islander students (*N*=6 in the 4dsw) showed higher rates of reading proficiency in school districts that utilize the 4dsw schedule. It is important to note the actual number of students in each ethnic group when interpreting the graph (Figure 4.1).

Figure 4.1

Third Grade SBAC Reading Proficiency Disaggregated by Ethnicity



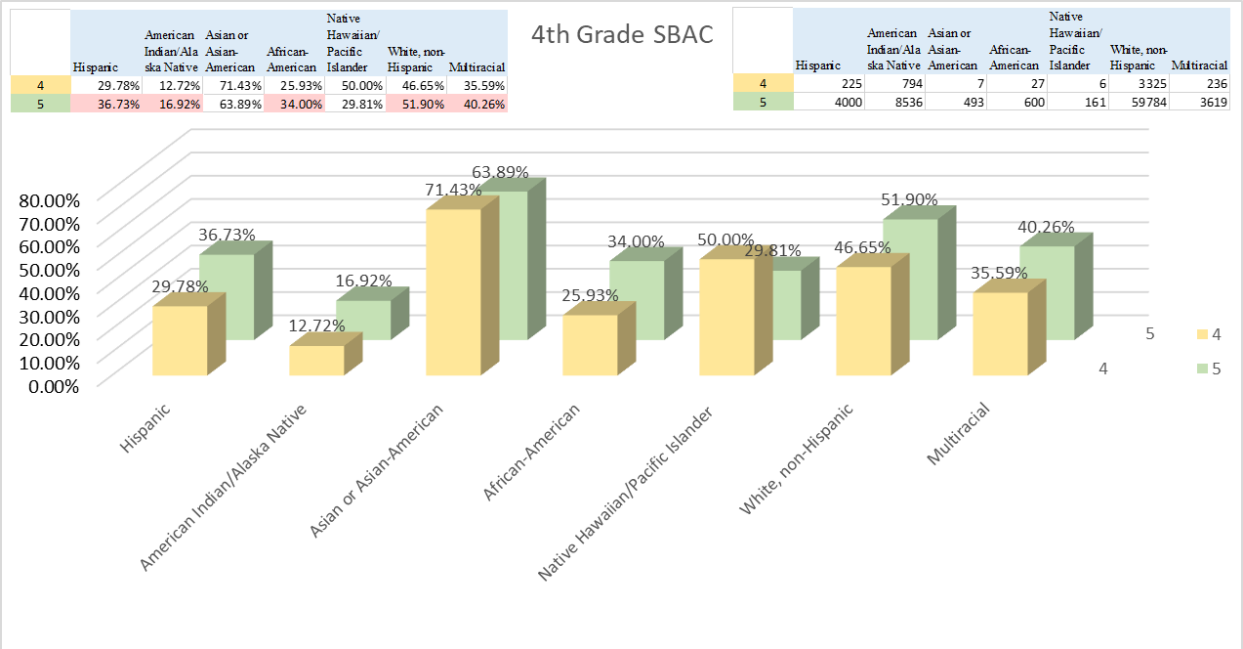
	Hispanic	American Indian/Alaska Native	Asian or Asian-American	African-American	Native Hawaiian/Pacific Islander	White, non-Hispanic	Multiracial
4	30.73%	15.16%	50.00%	41.67%	50.00%	46.65%	30.77%
5	35.71%	16.07%	60.39%	28.24%	33.09%	50.99%	38.51%

	Hispanic	American Indian/Alaska Native	Asian or Asian-American	African-American	Native Hawaiian/Pacific Islander	White, non-Hispanic	Multiracial
4	205	765	14	24	6	3314	247
5	4100	8630	462	563	139	59049	3594

Overall, fourth grade students who had taken the SBAC assessment in school districts that utilize the 5dsw schedule had a higher rate of reading proficiency (46.59%) than students in school districts that utilize the 4dsw schedule (39.35%) (Allen et al., 2024). Hispanic students (*N*=225 in the 4dsw), American Indian/Alaska Native students (*N*=794 in the 4dsw), African-American students (*N*=27 in the 4dsw), White, non-Hispanic students (*N*= 3325 in the 4dsw), and Multiracial students (*N*=236 in the 4dsw) all showed lower rates of reading proficiency in school districts that utilize the 4dsw schedule (Figure 4.2). Conversely, Asian or Asian-American students (*N*=7 in the 4dsw) and Native Hawaiian/Pacific Islander students (*N*=6 in the 4dsw) showed higher rates of reading proficiency in school districts that utilize the 4dsw schedule. It is important to note the actual number of students in each ethnic group when interpreting the graph (Figure 4.2).

Figure 4.2

Fourth Grade SBAC Reading Proficiency Disaggregated by Ethnicity



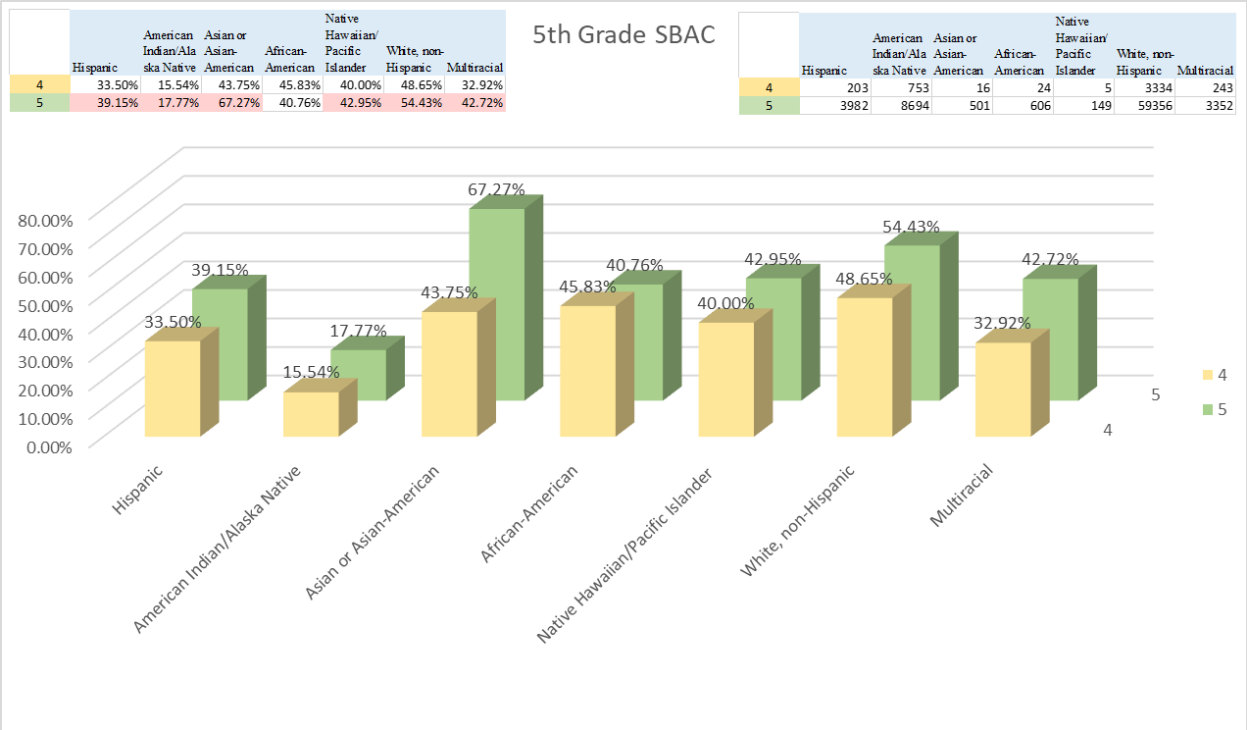
	Hispanic	American Indian/Alaska Native	Asian or Asian-American	African-American	Native Hawaiian/Pacific Islander	White, non-Hispanic	Multiracial
4	29.78%	12.72%	71.43%	25.93%	50.00%	46.65%	35.59%
5	36.73%	16.92%	63.89%	34.00%	29.81%	51.90%	40.26%

	Hispanic	American Indian/Alaska Native	Asian or Asian-American	African-American	Native Hawaiian/Pacific Islander	White, non-Hispanic	Multiracial
4	225	794	7	27	6	3325	236
5	4000	8536	493	600	161	59784	3619

Overall, fifth grade students who had taken the SBAC assessment in school districts that utilize the 5dsw schedule had a higher rate of reading proficiency (48.92%) than students in school districts that utilize the 4dsw schedule (41.66%) (Allen et al., 2024). Hispanic students (*N*=203 in the 4dsw), American Indian/Alaska Native students (*N*=753 in the 4dsw), Asian or Asian-American students (*N*=16 in the 4dsw), Native Hawaiian/Pacific Islander students (*N*=5 in the 4dsw), White, non-Hispanic students (*N*=3334 in the 4dsw), and Multiracial students (*N*=243 in the 4dsw) all showed lower rates of reading proficiency in school districts that utilize the 4dsw schedule (Figure 4.3). Conversely, African-American students (*N*=24 in the 4dsw) showed higher rates of reading proficiency in school districts that utilize the 4dsw schedule. It is important to note the actual number of students in each ethnic group when interpreting the graph (Figure 4.3).

Figure 4.3

Fifth Grade SBAC Reading Proficiency Disaggregated by Ethnicity



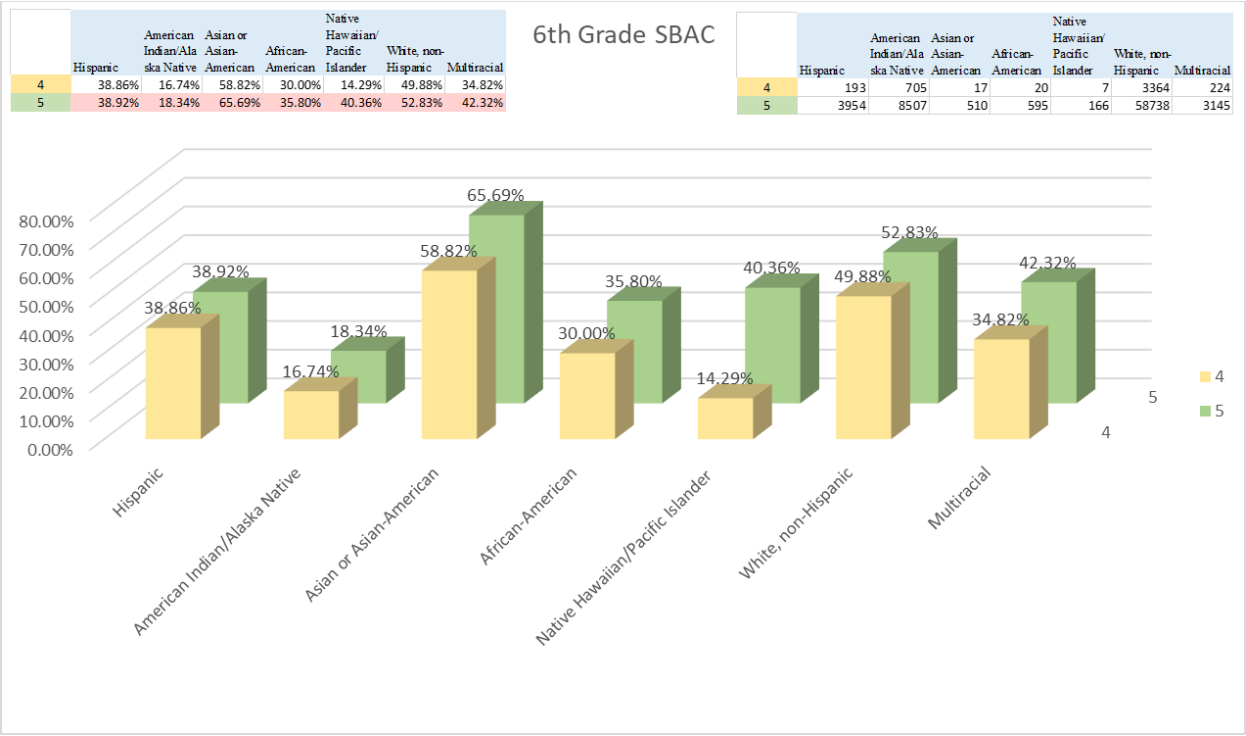
	Hispanic	American Indian/Alaska Native	Asian or Asian-American	African-American	Native Hawaiian/Pacific Islander	White, non-Hispanic	Multiracial
4	33.50%	15.54%	43.75%	45.83%	40.00%	48.65%	32.92%
5	39.15%	17.77%	67.27%	40.76%	42.95%	54.43%	42.72%

	Hispanic	American Indian/Alaska Native	Asian or Asian-American	African-American	Native Hawaiian/Pacific Islander	White, non-Hispanic	Multiracial
4	203	753	16	24	5	3334	243
5	3982	8694	501	606	149	59356	3352

Sixth grade students who had taken the SBAC assessment in school districts that utilize the 5dsw schedule had a higher rate of reading proficiency (47.71%) than students in school districts that utilize the 4dsw schedule (43.40%) (Allen et al., 2024). Hispanic students (*N*=193 in the 4dsw), American Indian/Alaska Native students (*N*=705 in the 4dsw), Asian or Asian-American students (*N*=17 in the 4dsw), African-American students (*N*=20 in the 4dsw), Native Hawaiian/Pacific Islander students (*N*=7 in the 4dsw), White, non-Hispanic students (*N*=3364 in the 4dsw), and Multiracial students (*N*=224 in the 4dsw) all showed lower rates of reading proficiency in school districts that utilize the 4dsw schedule (Figure 4.4). It is important to note the actual number of students in each ethnic group when interpreting the graph (Figure 4.4).

Figure 4.4

Sixth Grade SBAC Reading Proficiency Disaggregated by Ethnicity



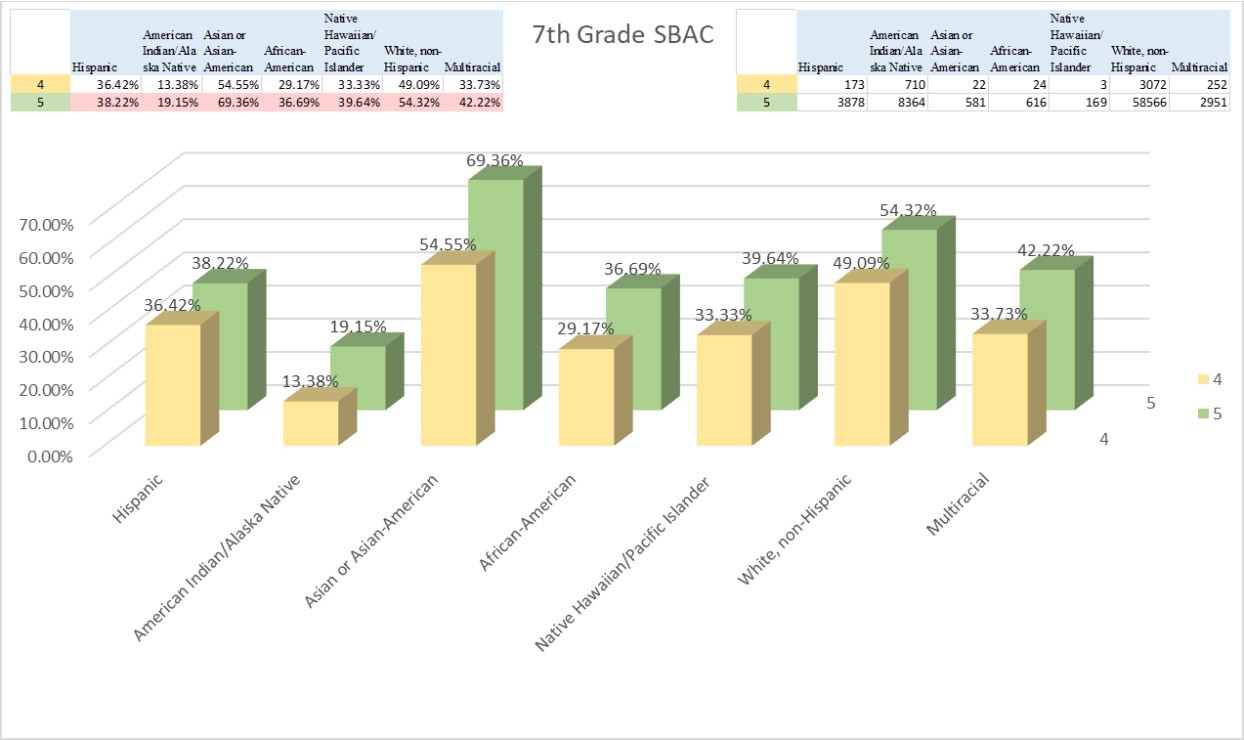
	Hispanic	American Indian/Alaska Native	Asian or Asian-American	African-American	Native Hawaiian/Pacific Islander	White, non-Hispanic	Multiracial
4	38.86%	16.74%	58.82%	30.00%	14.29%	49.88%	34.82%
5	38.92%	18.34%	65.69%	35.80%	40.36%	52.83%	42.32%

	Hispanic	American Indian/Alaska Native	Asian or Asian-American	African-American	Native Hawaiian/Pacific Islander	White, non-Hispanic	Multiracial
4	193	705	17	20	7	3364	224
5	3954	8507	510	595	166	58738	3145

Seventh grade students who had taken the SBAC assessment in school districts that utilize the 5dsw schedule had a higher rate of reading proficiency (49.04%) than students in school districts that utilize the 4dsw schedule (41.61%) (Allen et al., 2024). Hispanic students (*N*=173 in the 4dsw), American Indian/Alaska Native students (*N*=710 in the 4dsw), Asian or Asian-American students (*N*=22 in the 4dsw), African-American students (*N*=24 in the 4dsw), Native Hawaiian/Pacific Islander students (*N*=3 in the 4dsw), White, non-Hispanic students (*N*=3072 in the 4dsw), and Multiracial students (*N*=252 in the 4dsw) all showed lower rates of reading proficiency in school districts that utilize the 4dsw schedule (Figure 4.5). It is important to note the actual number of students in each ethnic group when interpreting the graph (Figure 4.5).

Figure 4.5

Seventh Grade SBAC Reading Proficiency Disaggregated by Ethnicity



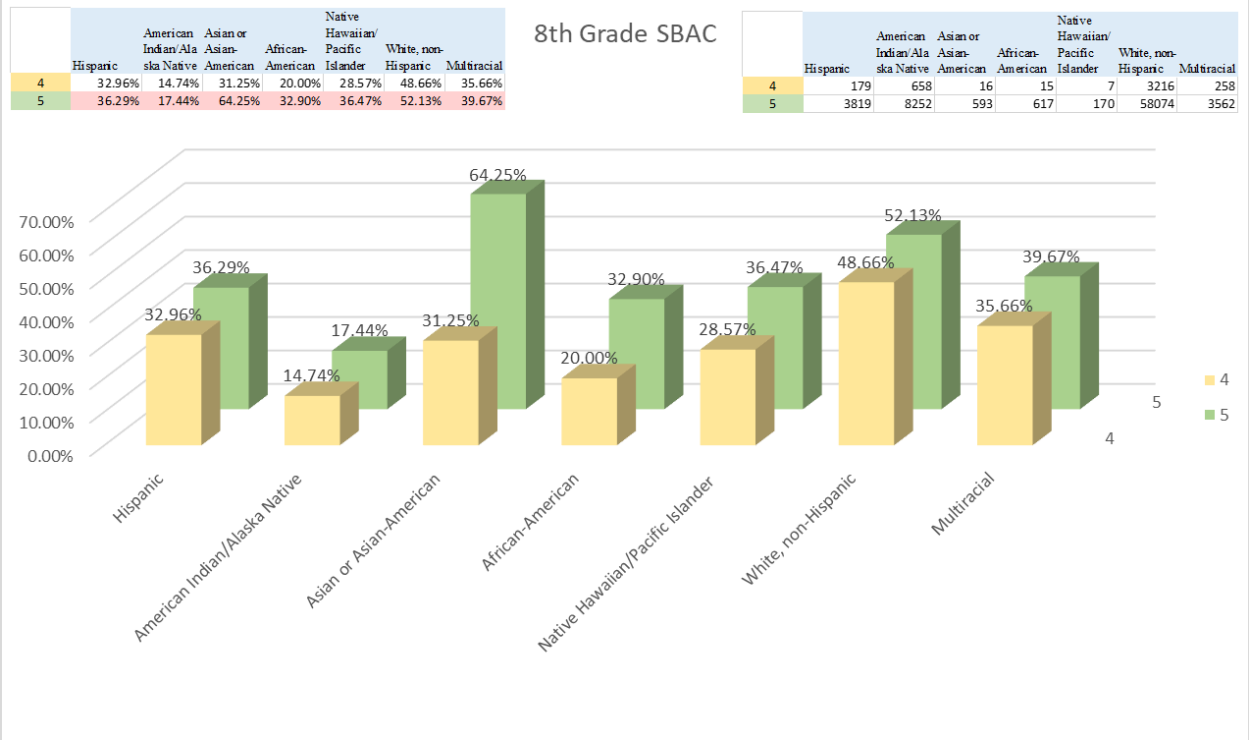
	Hispanic	American Indian/Alaska Native	Asian or Asian-American	African-American	Native Hawaiian/Pacific Islander	White, non-Hispanic	Multiracial
4	36.42%	13.38%	54.55%	29.17%	33.33%	49.09%	33.73%
5	38.22%	19.15%	69.36%	36.69%	39.64%	54.32%	42.22%

	Hispanic	American Indian/Alaska Native	Asian or Asian-American	African-American	Native Hawaiian/Pacific Islander	White, non-Hispanic	Multiracial
4	173	710	22	24	3	3072	252
5	3878	8364	581	616	169	58566	2951

Eighth grade students who had taken the SBAC assessment in school districts that utilize the 5dsw schedule had a higher rate of reading proficiency (46.97%) than students in school districts that utilize the 4dsw schedule (41.92%) (Allen et al., 2024). Hispanic students (*N*=179 in the 4dsw), American Indian/Alaska Native students (*N*=658 in the 4dsw), Asian or Asian-American students (*N*=16 in the 4dsw), African-American students (*N*=15 in the 4dsw), Native Hawaiian/Pacific Islander students (*N*=7 in the 4dsw), White, non-Hispanic students (*N*=3216 in the 4dsw), and Multiracial students (*N*=258 in the 4dsw) all showed lower rates of reading proficiency in school districts that utilize the 4dsw schedule (Figure 4.6). It is important to note the actual number of students in each ethnic group when interpreting the graph (Figure 4.6).

Figure 4.6

Eighth Grade SBAC Reading Proficiency Disaggregated by Ethnicity



	Hispanic	American Indian/Alaska Native	Asian or Asian-American	African-American	Native Hawaiian/Pacific Islander	White, non-Hispanic	Multiracial
4	32.96%	14.74%	31.25%	20.00%	28.57%	48.66%	35.66%
5	36.29%	17.44%	64.25%	32.90%	36.47%	52.13%	39.67%

	Hispanic	American Indian/Alaska Native	Asian or Asian-American	African-American	Native Hawaiian/Pacific Islander	White, non-Hispanic	Multiracial
4	179	658	16	15	7	3216	258
5	3819	8252	593	617	170	58074	3562

Research Question 5 - *What is the difference in reading achievement between students in school districts utilizing the 4dsw schedule and those utilizing the 5dsw schedule when disaggregated by gender?*

Question 5 Key Points

- ✓ **The percentage of students proficient in reading (MontCas and SBAC assessments) was higher for both female and male students in school districts that utilize the 5dsw schedule when compared to female and male students in school districts that utilize the 4dsw schedule.**
  - **The percentage of students proficient in reading (MontCas assessment) was higher for both female and male students in school districts that utilize the 5dsw schedule when compared to female and male students in school districts that utilize the 4dsw schedule.**
  - **The percentage of students proficient in reading (SBAC assessment) was higher for both female and male students in school districts that utilize the 5dsw schedule when compared to female and male students in school districts that utilize the 4dsw schedule.**
- ✓ **For the combined MontCas and SBAC assessments, in five out of six grades, the gap between female and male reading proficiency rates was larger in school districts that utilize the 4dsw schedule.**
- ✓ **When reading scores were disaggregated by gender, year, and grade, the results varied.**

Question 5 Discussion

Overall analysis of reading proficiency for both MontCas and SBAC assessments revealed a consistent trend where students in school districts that utilize the 5dsw schedule had a higher rate of proficiency than students in school districts that utilize the 4dsw schedule (Figure 5.1). Both male and female students performed at a higher rate of proficiency in school districts that utilize the 5dsw schedule. Female students had a higher rate of proficiency than male students in both school districts that utilize the 5dsw schedule and in school districts that utilize the 4dsw schedule.

For third grade, in school districts that utilize the 5dsw schedule, 80.39% of female students were proficient or advanced compared to 60.48% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 66.20% of female students were proficient or advanced compared to 43.56% of male students who were proficient or advanced. The gap between male and female students' rate of reading proficiency in school districts that utilize the 4dsw schedule (22.64%) was larger than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (19.91%) by 2.73% (Figure 5.1).

For fourth grade, in school districts that utilize the 5dsw schedule, 78.72% of female students were proficient or advanced compared to 59.84% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 64.99% of female students were

proficient or advanced compared to 43.55% of male students who were proficient or advanced. The gap between male and female students' rate of reading proficiency in school districts that utilize the 4dsw schedule (21.44%) was larger than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (18.88%) by 2.56% (Figure 5.1).

For fifth grade, in school districts that utilize the 5dsw schedule, 64.66% of female students were proficient or advanced compared to 61.97% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 49.27% of female students were proficient or advanced compared to 45.93% of male students who were proficient or advanced. The gap between male and female students' rate of reading proficiency in school districts that utilize the 4dsw schedule (3.34%) was larger than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (2.69%) by .65% (Figure 5.1).

For sixth grade, in school districts that utilize the 5dsw schedule, 64.10% of female students were proficient or advanced compared to 61.08% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 49.95% of female students were proficient or advanced compared to 45.93% of male students who were proficient or advanced. The gap between male and female students' rate of reading proficiency in school districts that utilize the 4dsw schedule (4.02%) was larger than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (3.02%) by 1.00% (Figure 5.1).

For seventh grade, in school districts that utilize the 5dsw schedule, 64.35% of female students were proficient or advanced compared to 60.63% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 48.06% of female students were proficient or advanced compared to 44.52% of male students who were proficient or advanced. The gap between male and female students' rate of reading proficiency in school districts that utilize the 4dsw schedule (3.54%) was less than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (3.72%) by .18% (Figure 5.1).

For eighth grade, in school districts that utilize the 5dsw schedule, 62.98% of female students were proficient or advanced compared to 58.48% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 47.71% of female students were proficient or advanced compared to 42.24% of male students who were proficient or advanced. The gap between male and female students' rate of reading proficiency in school districts that utilize the 4dsw schedule (5.47%) was larger than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (4.50%) by .97% (Figure 5.1).

Figure 5.1

Reading Proficiency (MontCas and SBAC) Disaggregated by Gender

Overall analysis of reading proficiency for the MontCas assessment again revealed a consistent trend where students in school districts that utilize the 5dsw schedule had a higher rate of proficiency than students in school districts that utilize the 4dsw schedule (Figure 5.2). Both male and female students performed at a higher rate of proficiency in school districts that utilize the 5dsw schedule. Female students had a higher rate of proficiency than male students, both in school districts that utilize the 5dsw schedule, and in school districts that utilize the 4dsw schedule.

For third grade, in school districts that utilize the 5dsw schedule, 85.99% of female students were proficient or advanced compared to 81.26% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 81.92% of female students were proficient or advanced compared to 74.59% of male students who were proficient or advanced. The gap between male and female students' rate of reading proficiency in school districts that

utilize the 4dsw schedule (7.33%) was larger than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (4.73%) by 2.60% (Figure 5.2).

For fourth grade, in school districts that utilize the 5dsw schedule, 83.63% of female students were proficient or advanced compared to 78.96% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 79.23% of female students were proficient or advanced compared to 74.40% of male students who were proficient or advanced. The gap between male and female students' rate of reading proficiency in school districts that utilize the 4dsw schedule (4.83%) was larger than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (4.67%) by .16% (Figure 5.2).

For fifth grade, in school districts that utilize the 5dsw schedule, 87.09% of female students were proficient or advanced compared to 81.72% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 83.93% of female students were proficient or advanced compared to 75.42% of male students who were proficient or advanced. The gap between male and female students' rate of reading proficiency in school districts that utilize the 4dsw schedule (8.51%) was larger than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (5.37%) by 3.14% (Figure 5.2).

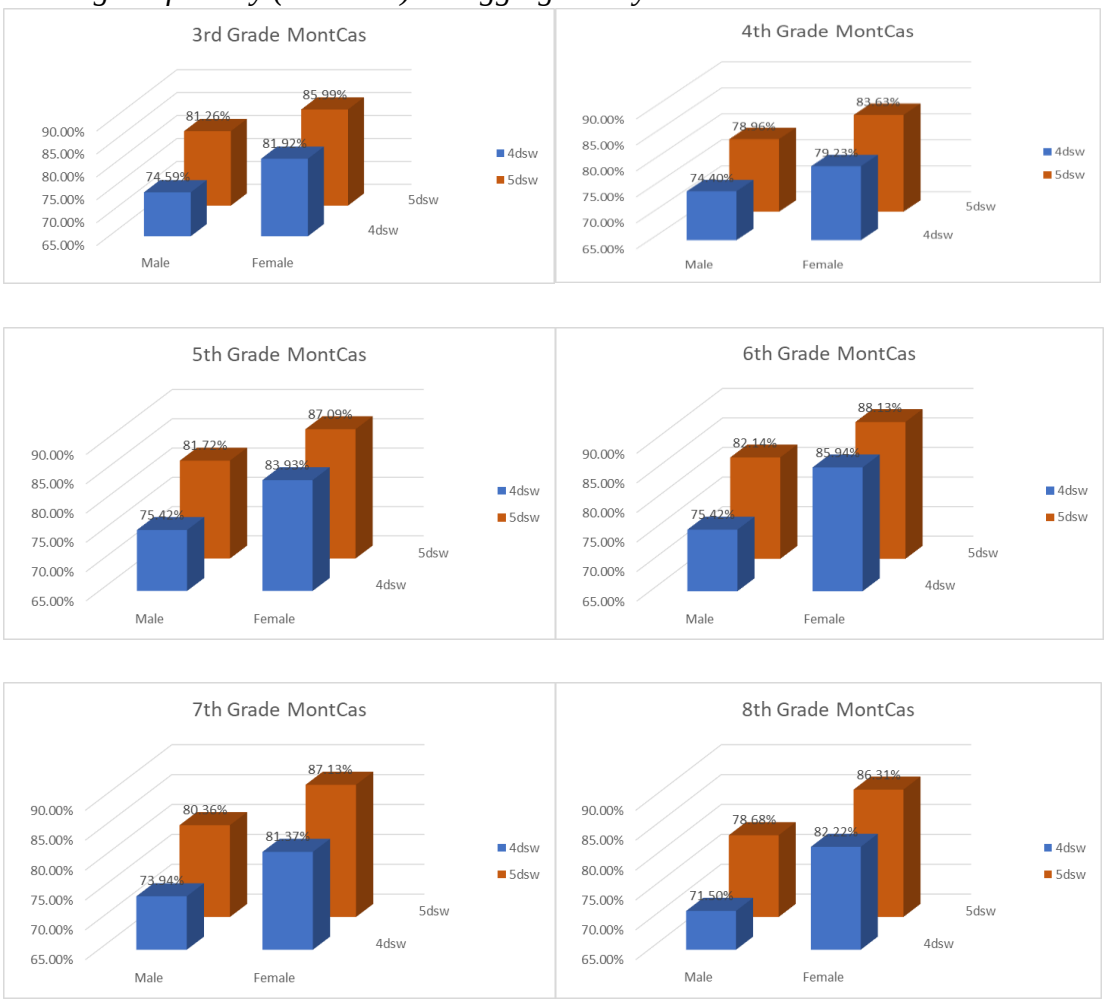
For sixth grade, in school districts that utilize the 5dsw schedule, 88.13% of female students were proficient or advanced compared to 82.14% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 85.94% of female students were proficient or advanced compared to 75.42% of male students who were proficient or advanced. The gap between male and female students' rate of reading proficiency in school districts that utilize the 4dsw schedule (10.52%) was larger than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (5.99%) by 4.53% (Figure 5.2).

For seventh grade, in school districts that utilize the 5dsw schedule, 87.13% of female students were proficient or advanced compared to 80.36% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 81.37% of female students were proficient or advanced compared to 73.94% of male students who were proficient or advanced. The gap between male and female students' rate of reading proficiency in school districts that utilize the 4dsw schedule (7.43%) was larger than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (6.77%) by .66% (Figure 5.2).

For eighth grade, in school districts that utilize the 5dsw schedule, 86.31% of female students were proficient or advanced compared to 78.68% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 82.22% of female students were proficient or advanced compared to 71.50% of male students who were proficient or advanced. The gap between male and female students' rate of reading proficiency in school districts that utilize the 4dsw schedule (10.72%) was larger than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (7.63%) by 3.09% (Figure 5.2).

Figure 5.2

Reading Proficiency (MontCas) Disaggregated by Gender



Overall analysis of reading proficiency for the 68.SBAC assessment continued a consistent trend where students in school districts that utilize the 5dsw schedule had a higher rate of proficiency than students in school districts that utilize the 4dsw schedule (Figure 5.3). Both male and female students performed at a higher rate of proficiency in school districts that utilize the 5dsw schedule. Female students had a higher rate of proficiency than male students both in school districts that utilize the 5dsw schedule and in school districts that utilize the 4dsw schedule.

For third grade, in school districts that utilize the 5dsw schedule, 76.16% of female students were proficient or advanced compared to 42.19% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 59.35% of female students were proficient or advanced compared to 35.51% of male students who were proficient or advanced. The gap between male and female students' rate of reading proficiency in school districts that utilize the 4dsw schedule (23.84%) was less than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (33.97%) by 10.13% (Figure 5.3).

For fourth grade, in school districts that utilize the 5dsw schedule, 75.00% of female students were proficient or advanced compared to 43.33% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 58.77% of female students were proficient or advanced compared to 35.44% of male students who were proficient or advanced. The gap between male and female students' rate of reading proficiency in school districts that utilize the 4dsw schedule (23.33%) was less than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (31.67%) by 8.34% (Figure 5.3).

For fifth grade, in school districts that utilize the 5dsw schedule, 46.25% of female students were proficient or advanced compared to 44.72% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 40.10% of female students were proficient or advanced compared to 38.06% of male students who were proficient or advanced. The gap between male and female students' rate of reading proficiency in school districts that utilize the 4dsw schedule (2.04%) was larger than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (1.53%) by 2.32% (Figure 5.3).

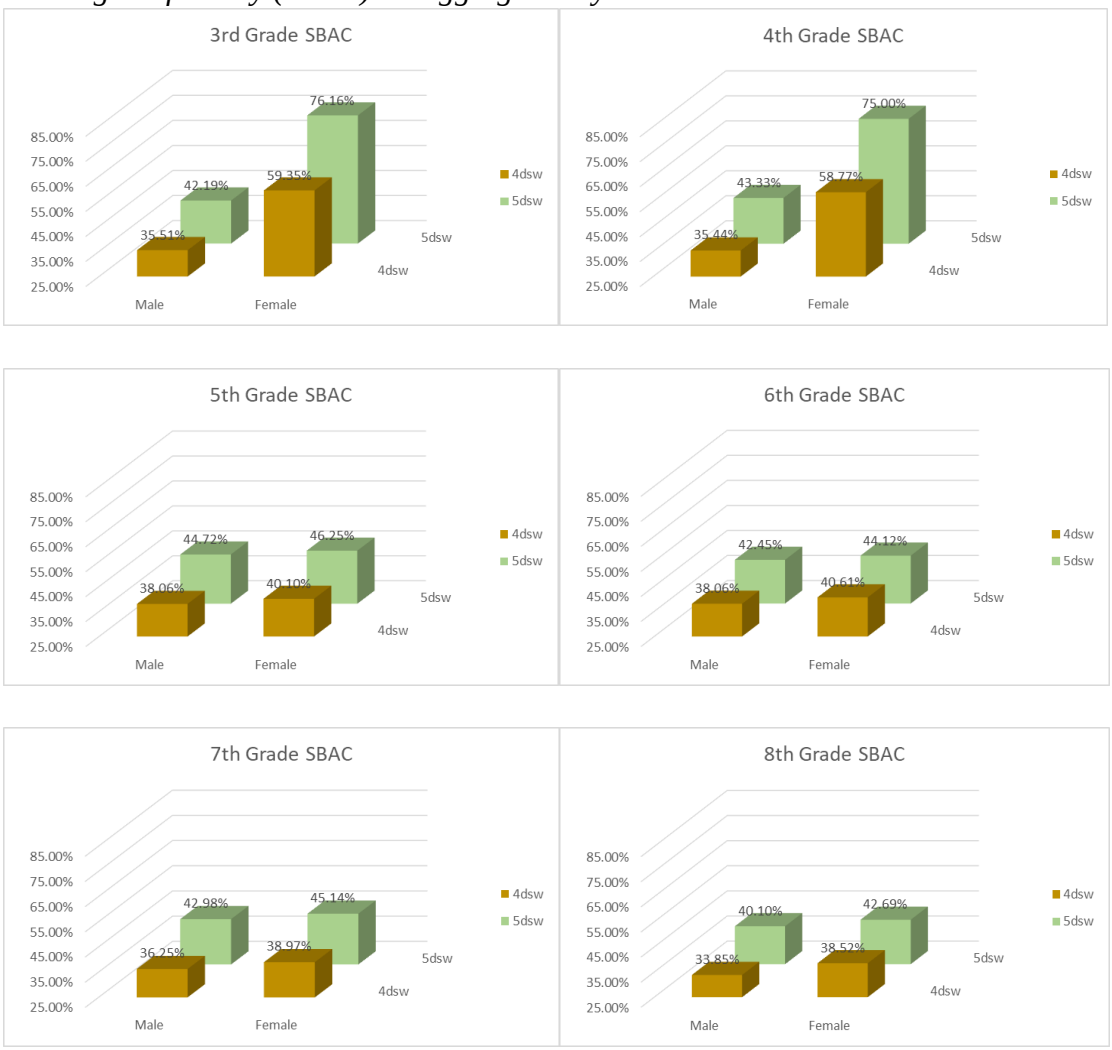
For sixth grade, in school districts that utilize the 5dsw schedule, 44.12% of female students were proficient or advanced compared to 42.45% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 40.61% of female students were proficient or advanced compared to 38.06% of male students who were proficient or advanced. The gap between male and female students' rate of reading proficiency in school districts that utilize the 4dsw schedule (2.55%) was larger than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (1.67%) by .88% (Figure 5.3).

For seventh grade, in school districts that utilize the 5dsw schedule, 45.14% of female students were proficient or advanced compared to 42.98% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 38.97% of female students were proficient or advanced compared to 36.25% of male students who were proficient or advanced. The gap between male and female students' rate of reading proficiency in school districts that utilize the 4dsw schedule (2.72%) was larger than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (2.16%) by .56% (Figure 5.3).

For eighth grade, in school districts that utilize the 5dsw schedule, 42.69% of female students were proficient or advanced compared to 40.10% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 38.52% of female students were proficient or advanced compared to 33.85% of male students who were proficient or advanced. The gap between male and female students' rate of reading proficiency in school districts that utilize the 4dsw schedule (4.67%) was larger than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (2.59%) by 2.08% (Figure 5.3).

Figure 5.3

Reading Proficiency (SBAC) Disaggregated by Gender



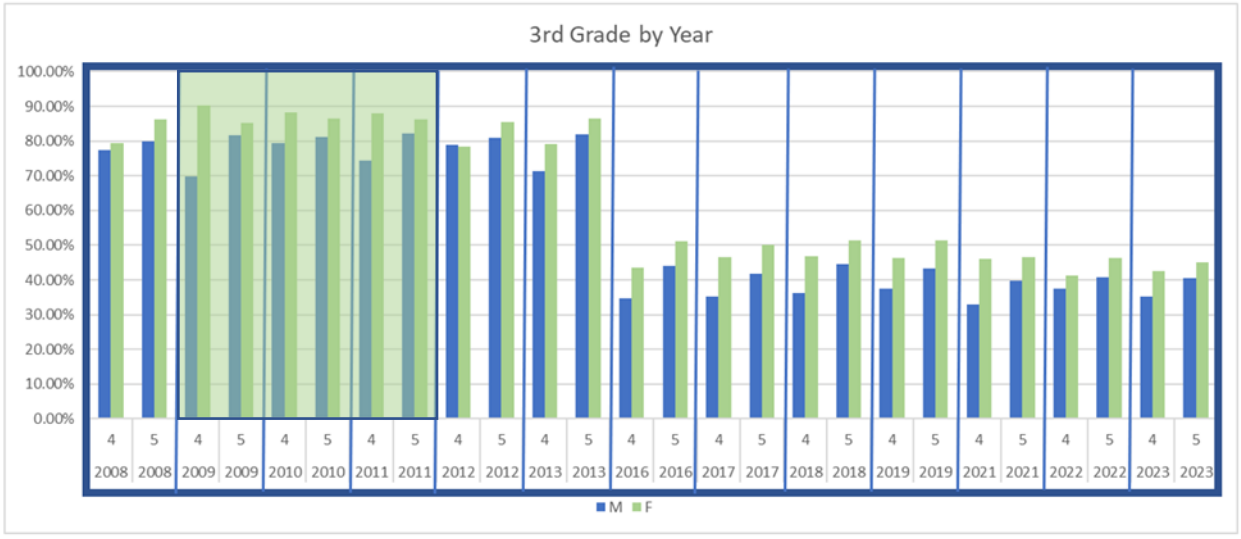
Reading Proficiency (MontCas and SBAC) Disaggregated by Gender and Year

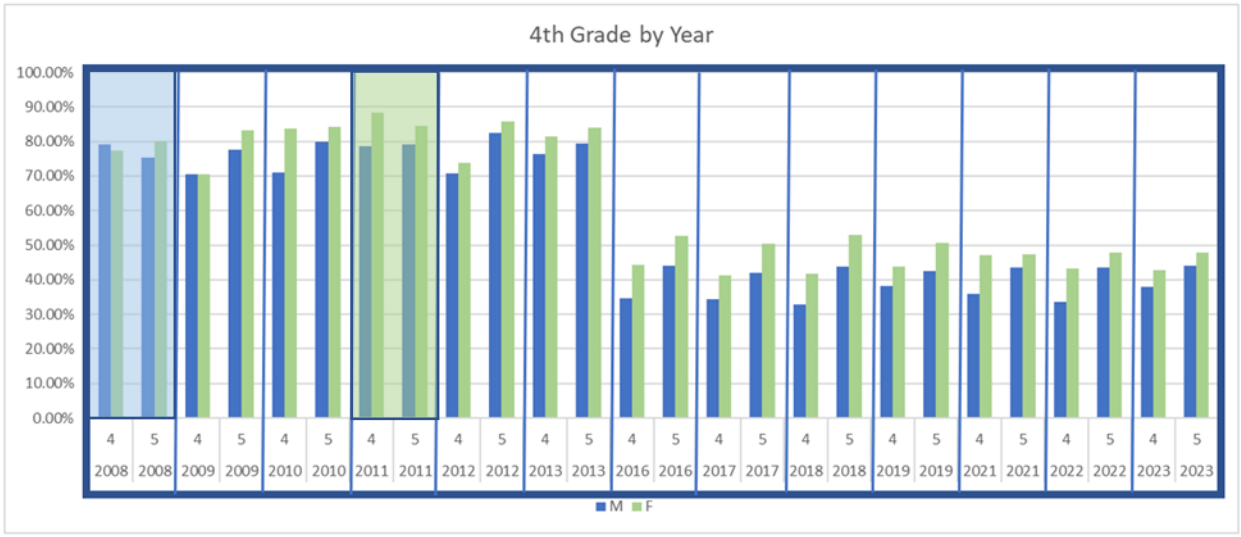
Student Reading achievement data in school districts utilizing the 4dsw schedule and school districts utilizing the 5dsw schedule were disaggregated by gender and compared based on year and grade. Out of seventy-eight combinations of year and grade, the performance in the 4dsw exceeded that of the 5dsw in ten instances for female students and four instances for male students (Figure 5.4). The green highlighted cells indicate instances where female students in school districts utilizing the 4dsw schedule out-performed female students in school districts utilizing the 5dsw schedule. The blue highlighted cells indicate instances where male students in school districts utilizing the 4dsw schedule out-performed male students in school districts utilizing the 5dsw schedule (Figure 5.4). Of the ten instances where female students in school districts that utilize the 4dsw schedule outperformed female students in school districts that utilize the 5dsw schedule, nine instances were in the MontCas assessment. Of the four instances where

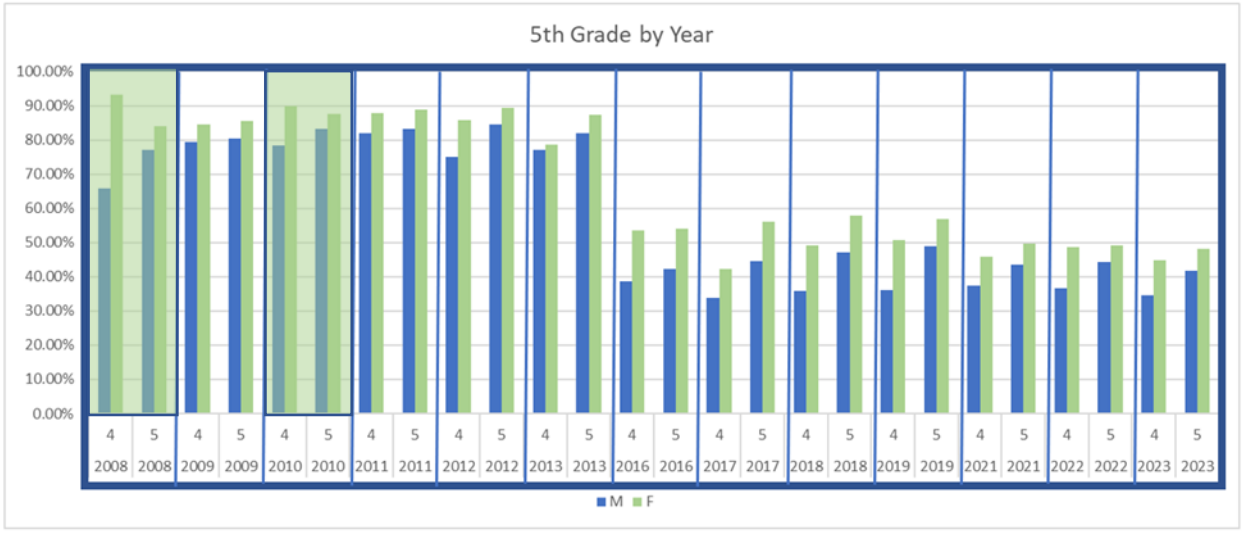
male students in school districts that utilize the 4dsw schedule outperformed male students in school districts that utilize the 5dsw schedule, all instances were in the MontCas assessment.

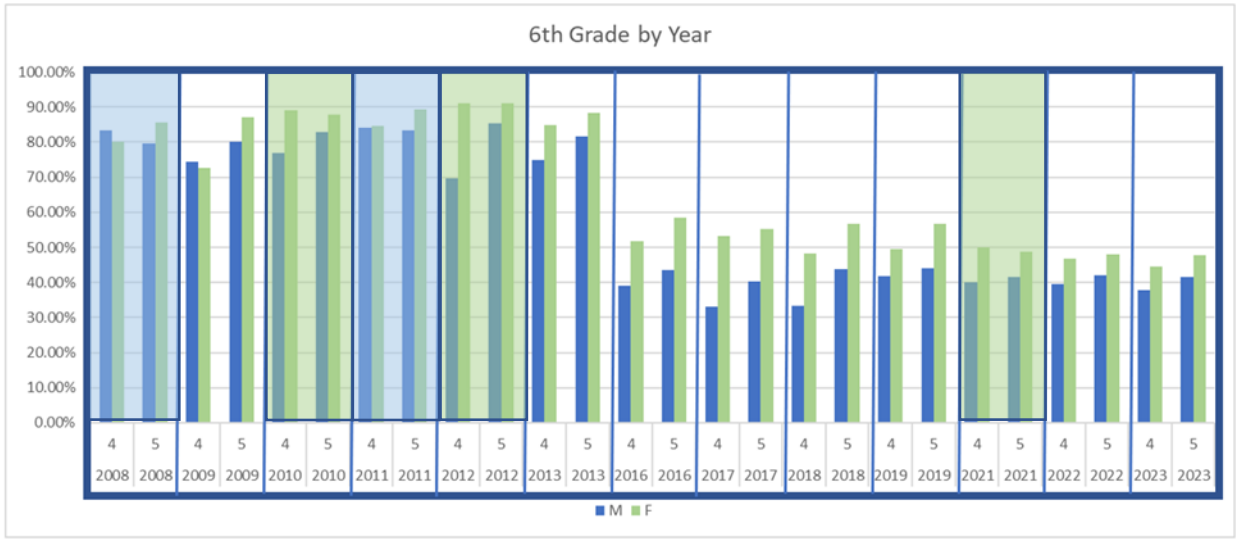
Figure 5.4

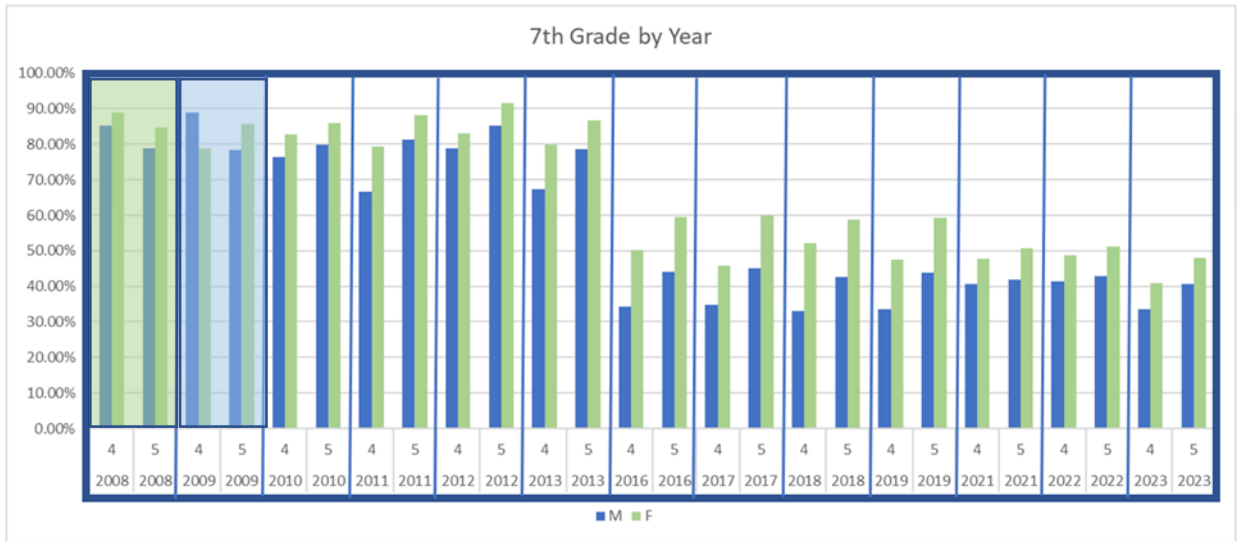
Reading Proficiency (MontCas and SBAC) Disaggregated by Gender and Year

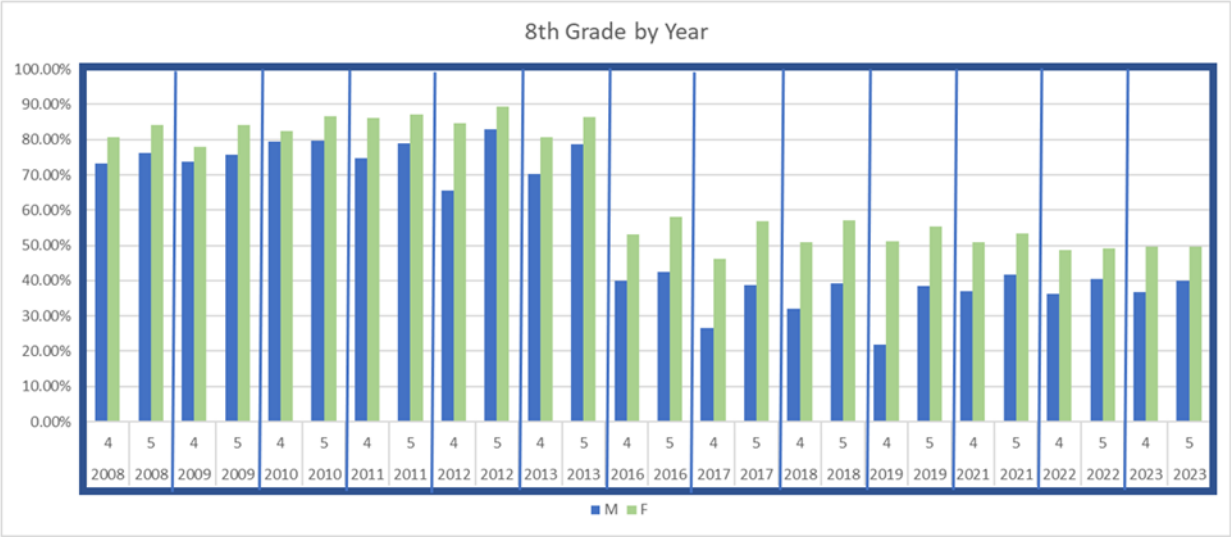





5th Grade by Year
100.00%
90.00%
80.00%
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5
2008 2008 2009 2009 2010 2010 2011 2011 2012 2012 2013 2013 2016 2016 2017 2017 2018 2018 2019 2019 2021 2021 2022 2022 2023 2023
M F


6th Grade by Year
100.00%
90.00%
80.00%
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5
2008 2008 2009 2009 2010 2010 2011 2011 2012 2012 2013 2013 2016 2016 2017 2017 2018 2018 2019 2019 2021 2021 2022 2022 2023 2023
M F


7th Grade by Year
100.00%
90.00%
80.00%
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5
2008 2008 2009 2009 2010 2010 2011 2011 2012 2012 2013 2013 2016 2016 2017 2017 2018 2018 2019 2019 2021 2021 2022 2022 2023 2023
M F



Note. From 2008-2013 the MontCas assessment was utilized. From 2016-2023 the SBAC assessment was utilized.

Research Question 6 - *What is the difference in math achievement between students in school districts utilizing the 4dsw schedule and those utilizing the 5dsw schedule when disaggregated by ethnicity?*

Question 6 Key Points

- ✓ **Caution needs to be taken when interpreting the data due to the small student numbers in some ethnic groups.**
- ✓ **In third grade, six of the seven ethnic groups had a higher percentage of math proficiency in school districts that utilize the 5dsw schedule.**
  - **The ethnic group that had a higher percentage of math proficiency in school districts that utilize the 4dsw schedule totaled 24 students.**
- ✓ **In fourth grade, six of the seven ethnic groups had a higher percentage of math proficiency in school districts that utilize the 5dsw schedule.**
  - **The ethnic group that had a higher percentage of math proficiency in school districts that utilize the 4dsw schedule totaled 27 students.**
- ✓ **In fifth grade, six of the seven ethnic groups had a higher percentage of math proficiency in school districts that utilize the 5dsw schedule.**
  - **The ethnic group that had a higher percentage of math proficiency in school districts that utilize the 4dsw schedule totaled 5 students.**
- ✓ **In sixth grade, six of the seven ethnic groups had a higher percentage of math proficiency in school districts that utilize the 5dsw schedule.**
  - **The ethnic group that had a higher percentage of math proficiency in school districts that utilize the 4dsw schedule totaled 186 students.**
- ✓ **In grades seven and eight, all ethnic groups had a higher percentage of math proficiency in school districts that utilize the 5dsw schedule.**

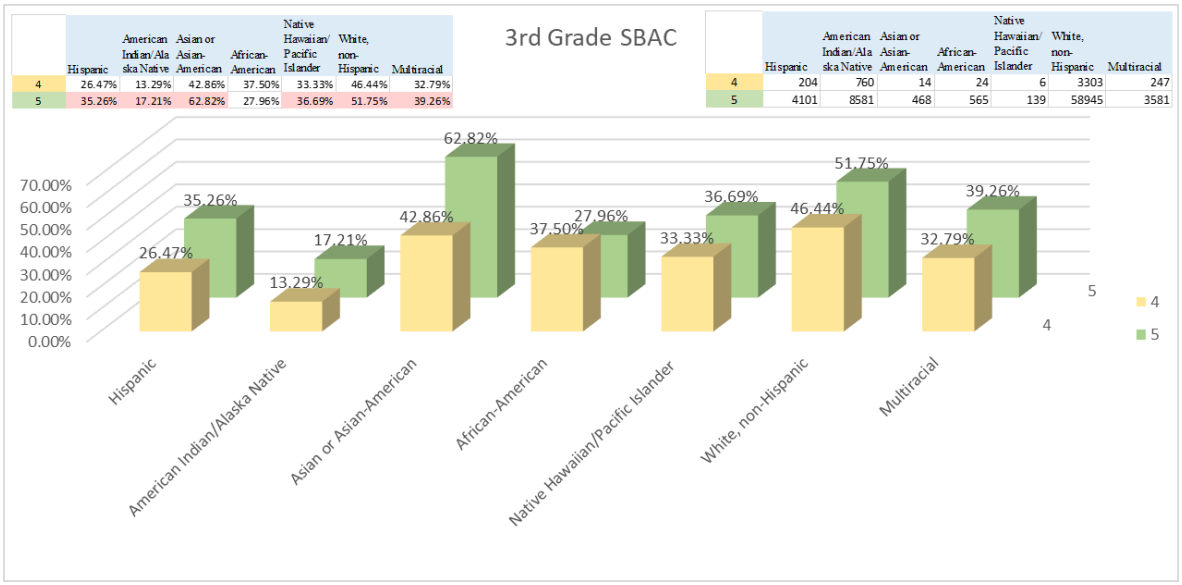
Question 6 Discussion

The school district reporting of MontCas data (2008-2013) regarding ethnicity, was inconsistent and therefore MontCas data were not disaggregated by ethnicity. The following discussion is based on SBAC data (2016-2023, excluding 2020).

Overall, third grade students who had taken the SBAC assessment in school districts that utilize the 5dsw schedule had a higher rate of math proficiency (67.36%) than students in school districts that utilize the 4dsw schedule (55.13%) (Allen et al., 2024). Hispanic students (*N*=204 in the 4dsw), American Indian/Alaska Native students (*N*=760 in the 4dsw), Asian or Asian-American students (*N*=14 in the 4dsw), Native Hawaiian/Pacific Islander students (*N*=6 in the 4dsw), White, non-Hispanic students (*N*=3303 in the 4dsw), and Multiracial students (*N*=247 in the 4dsw) all showed lower rates of reading proficiency in school districts that utilize the 4dsw schedule (Figure 6.1). Conversely, African-American students (*N*=24 in the 4dsw) showed higher rates of reading proficiency in school districts that utilize the 4dsw schedule. It is important to note the actual number of students in each ethnic group when interpreting the graph (Figure 6.1).

Figure 6.1

Third Grade SBAC Math Proficiency Disaggregated by Ethnicity



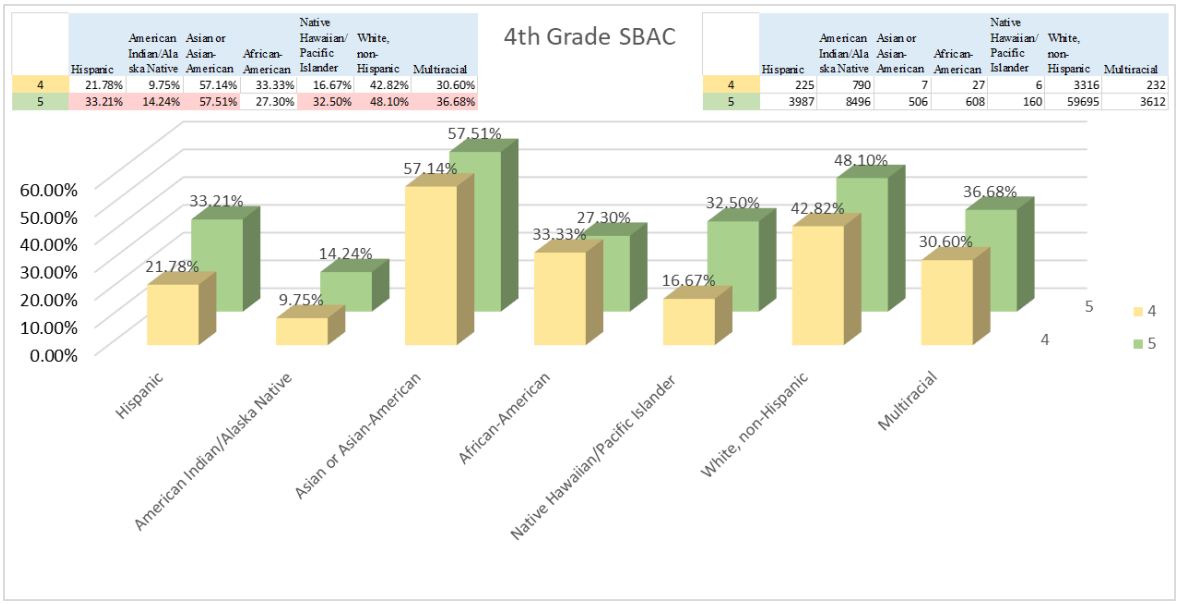
	Hispanic	American Indian/Alaska Native	Asian or Asian-American	African-American	Native Hawaiian/Pacific Islander	White, non-Hispanic	Multiracial
4	26.47%	13.29%	42.86%	37.50%	33.33%	46.44%	32.79%
5	35.26%	17.21%	62.82%	27.96%	36.69%	51.75%	39.26%

	Hispanic	American Indian/Alaska Native	Asian or Asian-American	African-American	Native Hawaiian/Pacific Islander	White, non-Hispanic	Multiracial
4	204	760	14	24	6	3303	247
5	4101	8581	468	565	139	58945	3581

Overall, fourth grade students who had taken the SBAC assessment in school districts that utilize the 5dsw schedule had a higher rate of math proficiency (66.99%) than students in school districts that utilize the 4dsw schedule (59.68%) (Allen et al., 2024). Hispanic students (*N*=225 in the 4dsw), American Indian/Alaska Native students (*N*=790 in the 4dsw), Asian or Asian-American students (*N*=7 in the 4dsw), Native Hawaiian/Pacific Islander students (*N*=6 in the 4dsw), White, non-Hispanic students (*N*= 3316 in the 4dsw), and Multiracial students (*N*=232 in the 4dsw) all showed lower rates of reading proficiency in school districts that utilize the 4dsw schedule (Figure 6.2). Conversely, African-American students (*N*=27 in the 4dsw) showed higher rates of reading proficiency in school districts that utilize the 4dsw schedule. It is important to note the actual number of students in each ethnic group when interpreting the graph (Figure 6.2).

Figure 6.2

Fourth Grade SBAC Math Proficiency Disaggregated by Ethnicity



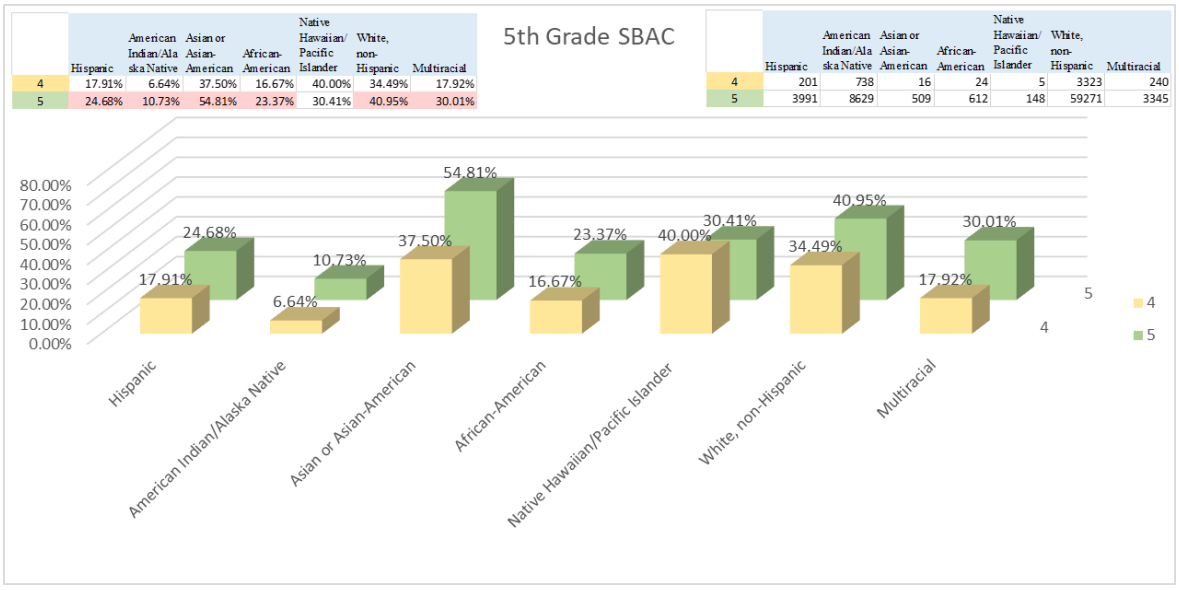
	Hispanic	American Indian/Alaska Native	Asian or Asian-American	African-American	Native Hawaiian/Pacific Islander	White, non-Hispanic	Multiracial
4	21.78%	9.75%	57.14%	33.33%	16.67%	42.82%	30.60%
5	33.21%	14.24%	57.51%	27.30%	32.50%	48.10%	36.68%

	Hispanic	American Indian/Alaska Native	Asian or Asian-American	African-American	Native Hawaiian/Pacific Islander	White, non-Hispanic	Multiracial
4	225	790	7	27	6	3316	232
5	3987	8496	506	608	160	59695	3612

Overall, fifth grade students who had taken the SBAC assessment in school districts that utilize the 5dsw schedule had a higher rate of math proficiency (68.82%) than students in school districts that utilize the 4dsw schedule (59.71%) (Allen et al., 2024). Hispanic students (*N*=201 in the 4dsw), American Indian/Alaska Native students (*N*=738 in the 4dsw), Asian or Asian-American students (*N*=16 in the 4dsw), African-American students (*N*=24 in the 4dsw), White, non-Hispanic students (*N*=3323 in the 4dsw), and Multiracial students (*N*=240 in the 4dsw) all showed lower rates of reading proficiency in school districts that utilize the 4dsw schedule (Figure 6.3). Conversely, Native Hawaiian/Pacific Islander students (*N*=5 in the 4dsw) showed higher rates of reading proficiency in school districts that utilize the 4dsw schedule. It is important to note the actual number of students in each ethnic group when interpreting the graph (Figure 6.3).

Figure 6.3

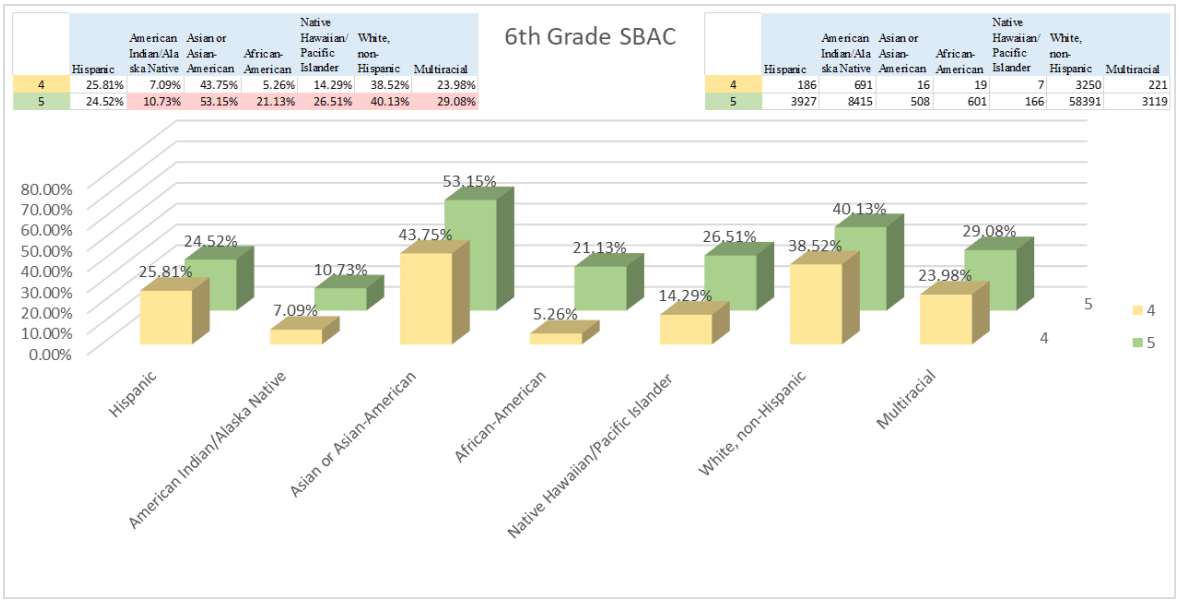
Fifth Grade SBAC Math Proficiency Disaggregated by Ethnicity



Sixth grade students who had taken the SBAC assessment in school districts that utilize the 5dsw schedule had a higher rate of math proficiency (64.79%) than students in school districts that utilize the 4dsw schedule (57.64%) (Allen et al., 2024). American Indian/Alaska Native students (*N*=691 in the 4dsw), Asian or Asian-American students (*N*=16 in the 4dsw), African-American students (*N*=19 in the 4dsw), Native Hawaiian/Pacific Islander students (*N*=7 in the 4dsw), White, non-Hispanic students (*N*=3250 in the 4dsw), and Multiracial students (*N*=221 in the 4dsw) all showed lower rates of reading proficiency in school districts that utilize the 4dsw schedule (Figure 6.4). Conversely, Hispanic students (*N*=186 in the 4dsw) showed higher rates of reading proficiency in school districts that utilize the 4dsw schedule. It is important to note the actual number of students in each ethnic group when interpreting the graph (Figure 6.4).

Figure 6.4

Sixth Grade SBAC Math Proficiency Disaggregated by Ethnicity



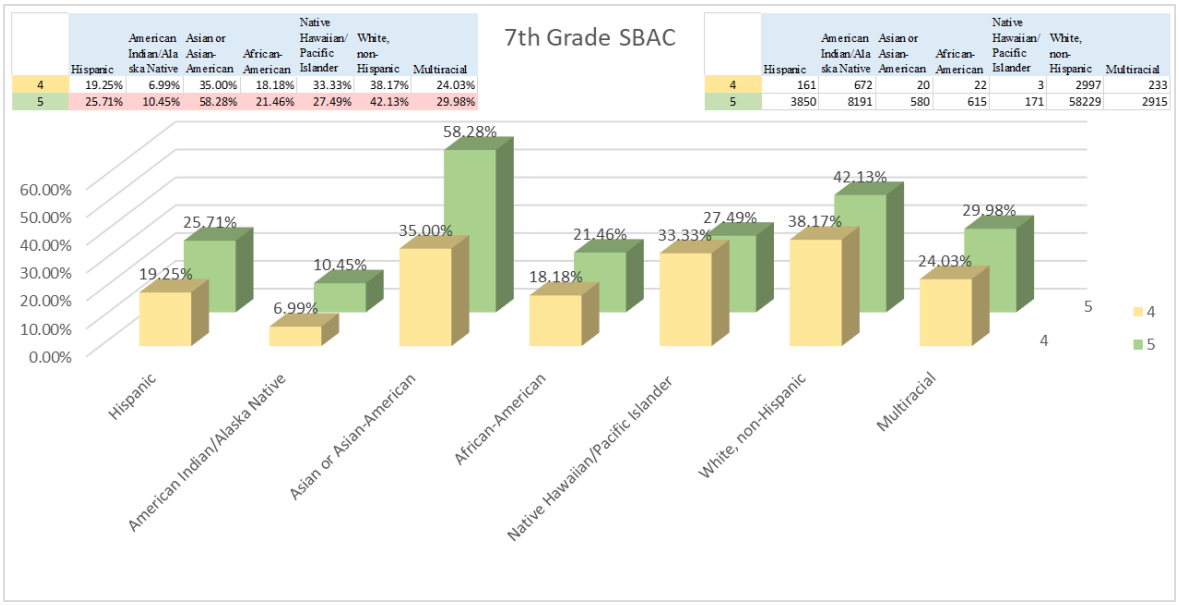
	Hispanic	American Indian/Alaska Native	Asian or Asian-American	African-American	Native Hawaiian/Pacific Islander	White, non-Hispanic	Multiracial
4	25.81%	7.09%	43.75%	5.26%	14.29%	38.52%	23.98%
5	24.52%	10.73%	53.15%	21.13%	26.51%	40.13%	29.08%

	Hispanic	American Indian/Alaska Native	Asian or Asian-American	African-American	Native Hawaiian/Pacific Islander	White, non-Hispanic	Multiracial
4	186	691	16	19	7	3250	221
5	3927	8415	508	601	166	58391	3119

Seventh grade students who had taken the SBAC assessment in school districts that utilize the 5dsw schedule had a higher rate of math proficiency (66.42%) than students in school districts that utilize the 4dsw schedule (57.23%) (Allen et al., 2024). Hispanic students (*N*=161 in the 4dsw), American Indian/Alaska Native students (*N*=672 in the 4dsw), Asian or Asian-American students (*N*=20 in the 4dsw), African-American students (*N*=22 in the 4dsw), Native Hawaiian/Pacific Islander students (*N*=3 in the 4dsw), White, non-Hispanic students (*N*=2997 in the 4dsw), and Multiracial students (*N*=233 in the 4dsw) all showed lower rates of reading proficiency in school districts that utilize the 4dsw schedule (Figure 6.5). It is important to note the actual number of students in each ethnic group when interpreting the graph (Figure 6.5).

Figure 6.5

Seventh Grade SBAC Math Proficiency Disaggregated by Ethnicity



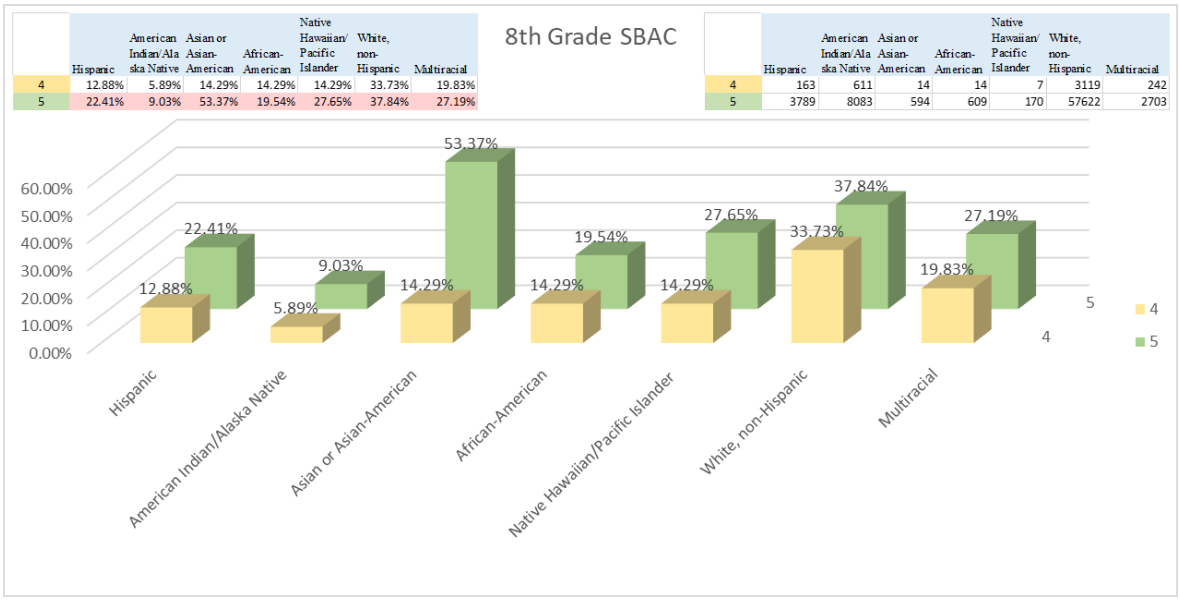
	Hispanic	American Indian/Alaska Native	Asian or Asian-American	African-American	Native Hawaiian/Pacific Islander	White, non-Hispanic	Multiracial
4	19.25%	6.99%	35.00%	18.18%	33.33%	38.17%	24.03%
5	25.71%	10.45%	58.28%	21.46%	27.49%	42.13%	29.98%

	Hispanic	American Indian/Alaska Native	Asian or Asian-American	African-American	Native Hawaiian/Pacific Islander	White, non-Hispanic	Multiracial
4	161	672	20	22	3	2997	233
5	3850	8191	580	615	171	58229	2915

Eighth grade students who had taken the SBAC assessment in school districts that utilize the 5dsw schedule had a higher rate of math proficiency (61.98%) than students in school districts that utilize the 4dsw schedule (52.01%) (Allen et al., 2024). Hispanic students (*N*=163 in the 4dsw), American Indian/Alaska Native students (*N*=611 in the 4dsw), Asian or Asian-American students (*N*=14 in the 4dsw), African-American students (*N*=14 in the 4dsw), Native Hawaiian/Pacific Islander students (*N*=7 in the 4dsw), White, non-Hispanic students (*N*=3119 in the 4dsw), and Multiracial students (*N*=242 in the 4dsw) all showed lower rates of reading proficiency in school districts that utilize the 4dsw schedule (Figure 6.6). It is important to note the actual number of students in each ethnic group when interpreting the graph (Figure 6.6).

Figure 6.6

Eighth Grade SBAC Math Proficiency Disaggregated by Ethnicity



	Hispanic	American Indian/Alaska Native	Asian or Asian-American	African-American	Native Hawaiian/Pacific Islander	White, non-Hispanic	Multiracial
4	12.88%	5.89%	14.29%	14.29%	14.29%	33.73%	19.83%
5	22.41%	9.03%	53.37%	19.54%	27.65%	37.84%	27.19%

	Hispanic	American Indian/Alaska Native	Asian or Asian-American	African-American	Native Hawaiian/Pacific Islander	White, non-Hispanic	Multiracial
4	163	611	14	14	7	3119	242
5	3789	8083	594	609	170	57622	2703

Research Question 7 - *What is the difference in math achievement between students in school districts utilizing the 4dsw schedule and those utilizing the 5dsw schedule when disaggregated by gender?*

Question 7 Key Points

- ✓ **The percentage of students proficient in math (MontCas and SBAC assessments) was higher for both female and male students in school districts that utilize the 5dsw schedule when compared to female and male students in school districts that utilize the 4dsw schedule.**
  - **The percentage of students proficient in math (MontCas assessment) was higher for both female and male students in school districts that utilize the 5dsw schedule when compared to female and male students in school districts that utilize the 4dsw schedule.**
  - **The percentage of students proficient in math (SBAC assessment) was higher for both female and male students in school districts that utilize the 5dsw schedule when compared to female and male students in school districts that utilize the 4dsw schedule in five out of seven grades.**
- ✓ **When math scores were disaggregated by gender, year, and grade, the results varied.**

Question 7 Discussion

Overall analysis of math proficiency for both MontCas and SBAC assessments revealed a consistent trend where students in school districts that utilize the 5dsw schedule had a higher rate of proficiency than students in school districts that utilize the 4dsw schedule (Figure 7.1). Both male and female students (with the exception of females in fifth grade) performed at a higher rate of proficiency in school districts that utilize the 5dsw schedule. Male students had a higher rate of proficiency than female students (with the exception of females in fourth grade) in both school districts that utilize the 5dsw schedule and in school districts that utilize the 4dsw schedule.

For third grade, in school districts that utilize the 5dsw schedule, 54.74% of female students were proficient or advanced compared to 58.97% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 41.95% of female students were proficient or advanced compared to 44.59% of male students who were proficient or advanced. The gap between male and female students' rate of math proficiency in school districts that utilize the 4dsw schedule (2.64%) was less than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (4.23%) by 1.59% (Figure 7.1).

For fourth grade, in school districts that utilize the 5dsw schedule, 52.50% of female students were proficient or advanced compared to 57.94% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 37.24% of female students were proficient or advanced compared to 36.34% of male students who were proficient or advanced. The gap between male and female students' rate of math proficiency in school districts that utilize the 4dsw schedule (.90%) was less than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (5.44%) by 4.54% (Figure 7.1).

For fifth grade, in school districts that utilize the 5dsw schedule, 31.17% of female students were proficient or advanced compared to 55.03% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 35.28% of female students were proficient or advanced compared to 38.17% of male students who were proficient or advanced. The gap between male and female students' rate of math proficiency in school districts that utilize the 4dsw schedule (2.89%) was less than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (18.86%) by 15.97% (Figure 7.1).

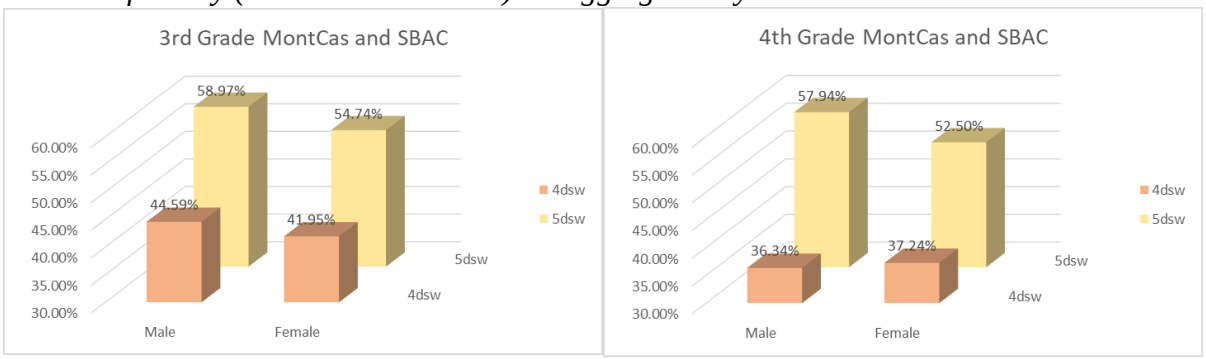
For sixth grade, in school districts that utilize the 5dsw schedule, 48.89% of female students were proficient or advanced compared to 52.69% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 37.09% of female students were proficient or advanced compared to 38.17% of male students who were proficient or advanced. The gap between male and female students' rate of math proficiency in school districts that utilize the 4dsw schedule (1.08%) was less than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (3.80%) by 2.72% (Figure 7.1).

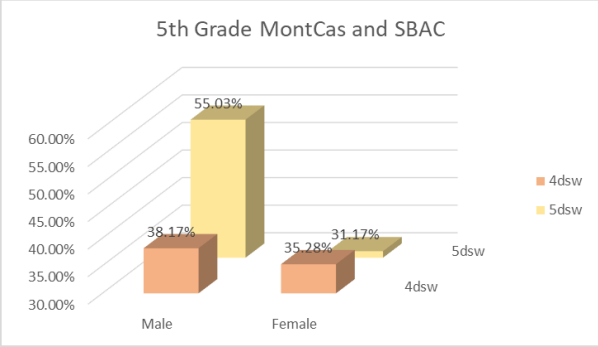
For seventh grade, in school districts that utilize the 5dsw schedule, 50.85% of female students were proficient or advanced compared to 53.87% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 36.61% of female students were proficient or advanced compared to 37.82% of male students who were proficient or advanced. The gap between male and female students' rate of math proficiency in school districts that utilize the 4dsw schedule (1.21%) was less than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (3.02%) by 1.81% (Figure 7.1).

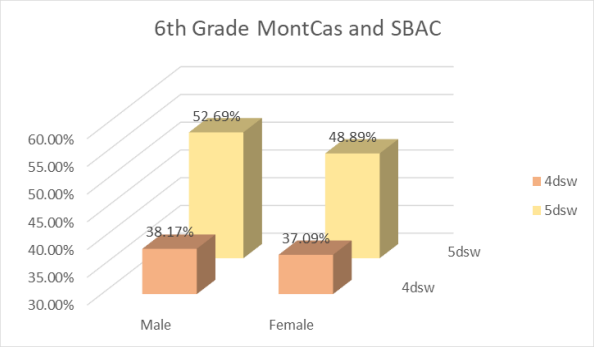
For eighth grade, in school districts that utilize the 5dsw schedule, 47.75% of female students were proficient or advanced compared to 49.65% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 34.29% of female students were proficient or advanced compared to 34.58% of male students who were proficient or advanced. The gap between male and female students' rate of math proficiency in school districts that utilize the 4dsw schedule (.29%) was less than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (1.90%) by 1.61% (Figure 7.1).

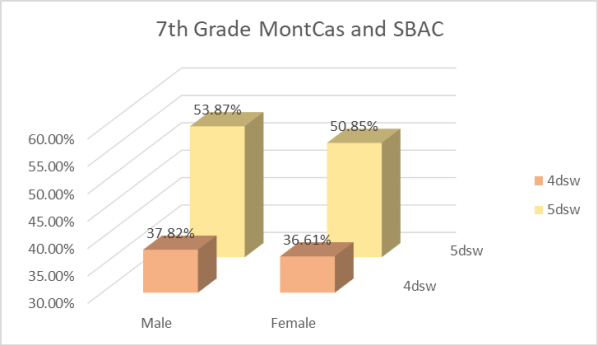
Figure 7.1

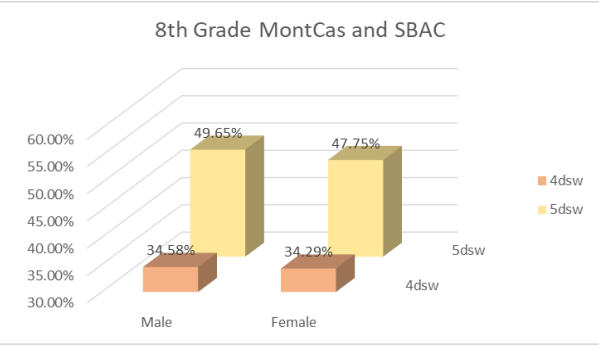
Math Proficiency (MontCas and SBAC) Disaggregated by Gender











Overall analysis of math proficiency for the MontCas assessment again revealed a consistent trend where students in school districts that utilize the 5dsw schedule had a higher rate of proficiency than students in school districts that utilize the 4dsw schedule (Figure 7.2). Both male and female students performed at a higher rate of proficiency in school districts that utilize the 5dsw schedule.

For third grade, in school districts that utilize the 5dsw schedule, 66.75% of female students were proficient or advanced compared to 67.94% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 53.79% of female students were proficient or advanced compared to 56.56% of male students who were proficient or advanced. The gap between male and female students' rate of math proficiency in school districts that utilize the 4dsw schedule (2.77%) was larger than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (1.19%) by 1.58% (Figure 7.2).

For fourth grade, in school districts that utilize the 5dsw schedule, 66.74% of female students were proficient or advanced compared to 67.23% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 60.70% of female students were proficient or advanced compared to 58.66% of male students who were proficient or advanced. The gap between male and female students' rate of math proficiency in school districts that utilize the 4dsw schedule (2.04%) was larger than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (.49%) by 1.55% (Figure 7.2).

For fifth grade, in school districts that utilize the 5dsw schedule, 68.98% of female students were proficient or advanced compared to 68.66% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 59.74% of female students were proficient or advanced compared to 57.48% of male students who were proficient or advanced.

The gap between male and female students' rate of math proficiency in school districts that utilize the 4dsw schedule (2.26%) was larger than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (.32%) by 1.94% (Figure 7.2).

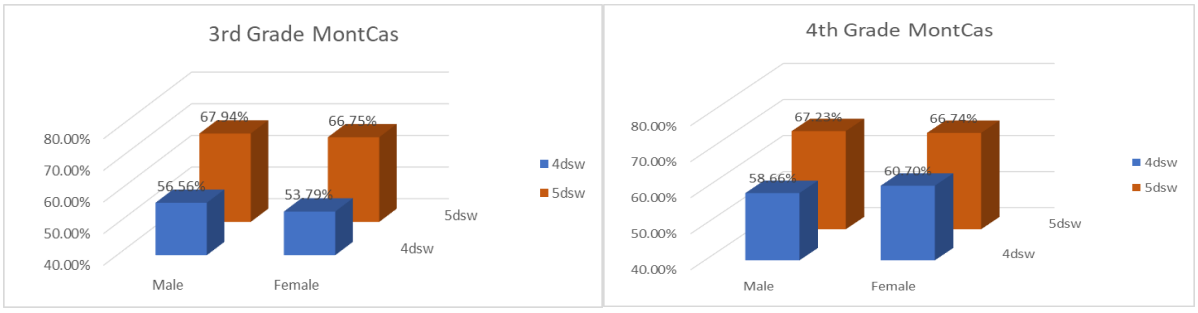
For sixth grade, in school districts that utilize the 5dsw schedule, 64.57% of female students were proficient or advanced compared to 64.99% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 57.81% of female students were proficient or advanced compared to 57.48% of male students who were proficient or advanced. The gap between male and female students' rate of math proficiency in school districts that utilize the 4dsw schedule (.33%) was less than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (.42%) by .09% (Figure 7.2).

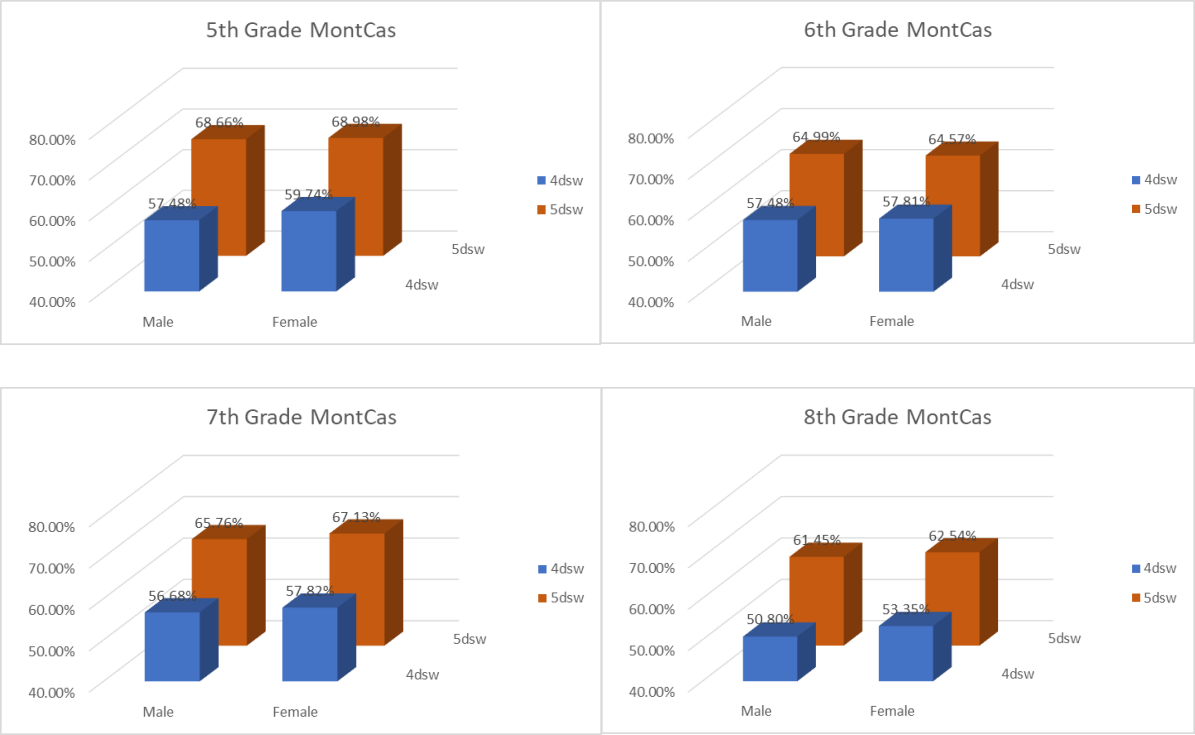
For seventh grade, in school districts that utilize the 5dsw schedule, 67.13% of female students were proficient or advanced compared to 65.76% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 57.82% of female students were proficient or advanced compared to 56.68% of male students who were proficient or advanced. The gap between male and female students' rate of math proficiency in school districts that utilize the 4dsw schedule (1.14%) was less than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (1.37%) by .23% (Figure 7.2).

For eighth grade, in school districts that utilize the 5dsw schedule, 62.54% of female students were proficient or advanced compared to 61.45% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 53.35% of female students were proficient or advanced compared to 50.80% of male students who were proficient or advanced. The gap between male and female students' rate of math proficiency in school districts that utilize the 4dsw schedule (2.55%) was larger than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (1.09%) by 1.46% (Figure 7.2).

Figure 7.2

Math Proficiency (MontCas) Disaggregated by Gender





Overall analysis of math proficiency for the SBAC assessment continued a consistent trend where students in school districts that utilize the 5dsw schedule had a higher rate of proficiency than students in school districts that utilize the 4dsw schedule (Figure 7.3). Both male and female students performed at a higher rate of proficiency in school districts that utilize the 5dsw schedule.

For third grade, in school districts that utilize the 5dsw schedule, 44.40% of female students were proficient or advanced compared to 44.41% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 38.50% of female students were proficient or advanced compared to 40.35% of male students who were proficient or advanced. The gap between male and female students' rate of math proficiency in school districts that utilize the 4dsw schedule (1.85%) was larger than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (.01%) by 1.84% (Figure 7.3).

For fourth grade, in school districts that utilize the 5dsw schedule, 40.34% of female students were proficient or advanced compared to 42.88% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 30.23% of female students were proficient or advanced compared to 26.54% of male students who were proficient or advanced. The gap between male and female students' rate of math proficiency in school districts that utilize the 4dsw schedule (3.69%) was larger than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (2.54%) by 1.15% (Figure 7.3).

For fifth grade, in school districts that utilize the 5dsw schedule, 33.79% of female students were proficient or advanced compared to 33.19% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 28.47% of female students were proficient or advanced compared to 31.16% of male students who were proficient or advanced.

The gap between male and female students' rate of math proficiency in school districts that utilize the 4dsw schedule (2.69%) was larger than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (.60%) by 2.09% (Figure 7.3).

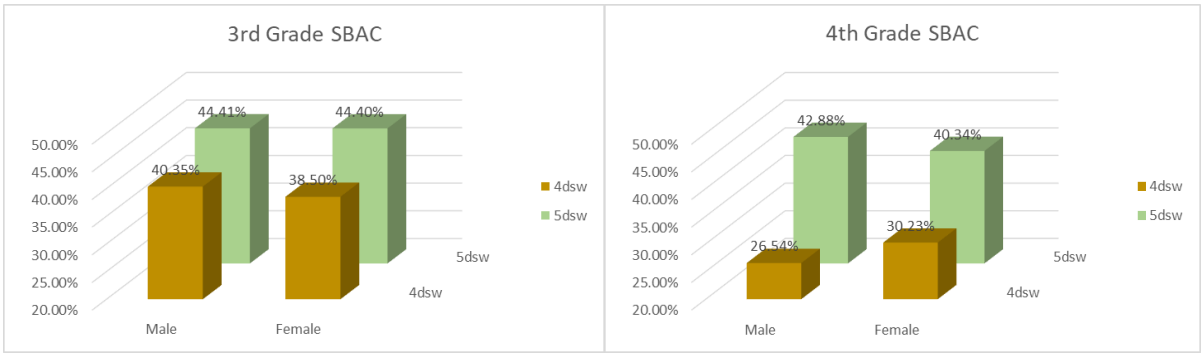
For sixth grade, in school districts that utilize the 5dsw schedule, 35.27% of female students were proficient or advanced compared to 32.47% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 31.65% of female students were proficient or advanced compared to 31.16% of male students who were proficient or advanced. The gap between male and female students' rate of math proficiency in school districts that utilize the 4dsw schedule (.49%) was less than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (2.80%) by 2.31% (Figure 7.3).

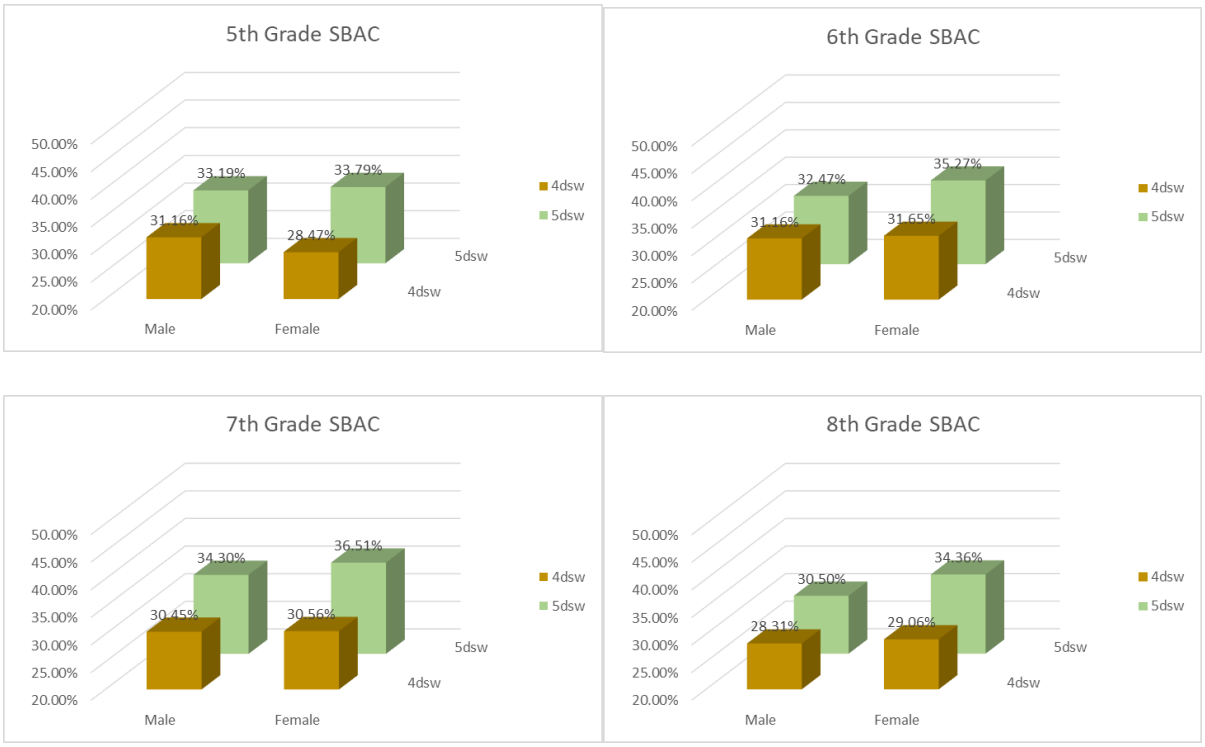
For seventh grade, in school districts that utilize the 5dsw schedule, 36.51% of female students were proficient or advanced compared to 34.30% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 30.56% of female students were proficient or advanced compared to 30.45% of male students who were proficient or advanced. The gap between male and female students' rate of math proficiency in school districts that utilize the 4dsw schedule (.11%) was less than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (2.21%) by 2.10% (Figure 7.3).

For eighth grade, in school districts that utilize the 5dsw schedule, 34.36% of female students were proficient or advanced compared to 30.50% of male students who were proficient or advanced. In school districts that utilize the 4dsw schedule, 29.06% of female students were proficient or advanced compared to 28.31% of male students who were proficient or advanced. The gap between male and female students' rate of math proficiency in school districts that utilize the 4dsw schedule (.75%) was less than the gap between male and female students' rate of proficiency in school districts that utilize the 5dsw schedule (3.86%) by 3.11% (Figure 7.3).

Figure 7.3

Math Proficiency (SBAC) Disaggregated by Gender





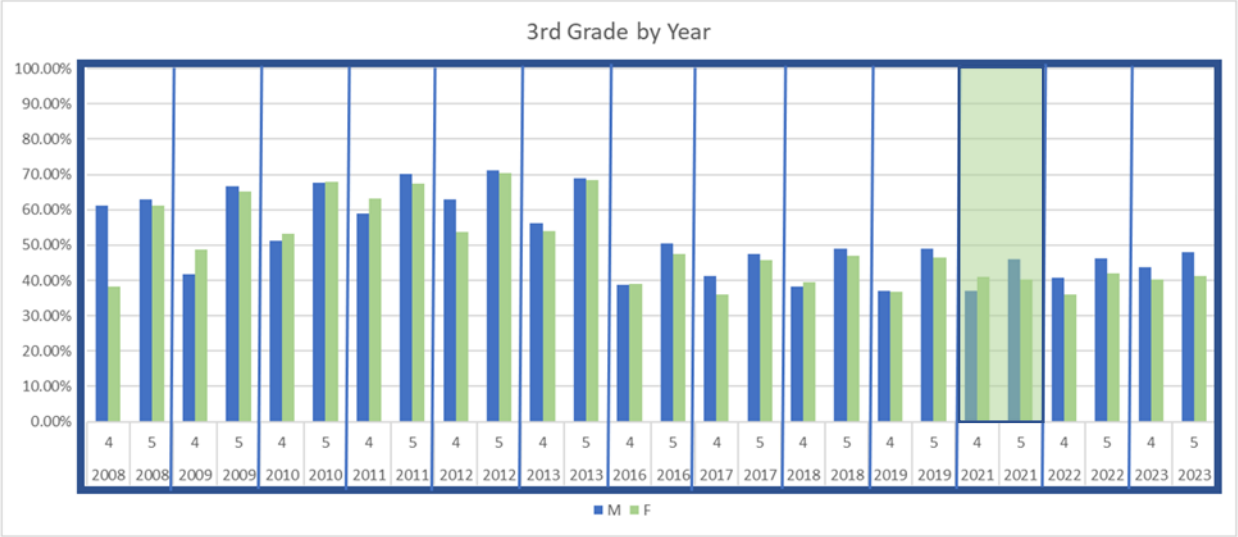
Math Proficiency (MontCas and SBAC) Disaggregated by Gender and Year

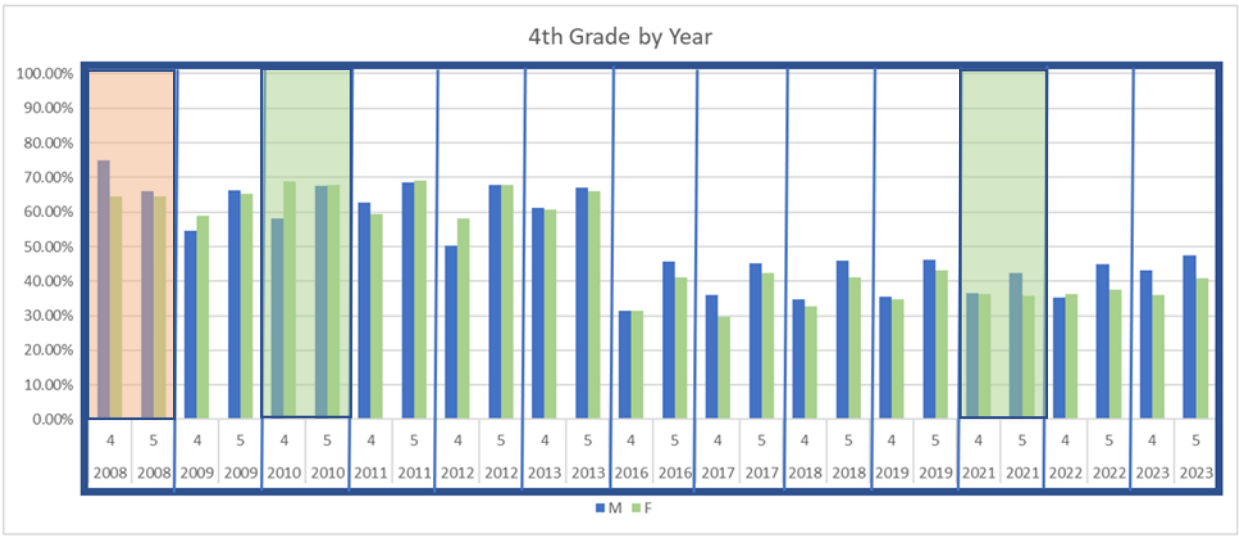
Student math achievement data in school districts utilizing the 4dsw schedule and school districts utilizing the 5dsw schedule were disaggregated by gender and compared based on year and grade. Out of seventy-eight combinations of year and grade, the performance in the 4dsw exceeded that of the 5dsw in eleven instances for female students and seven instances for male students. In four instances, both female and male students in school districts that utilize the 4dsw schedule outperformed students in school districts that utilize the 5dsw schedule (Figure 7.4).

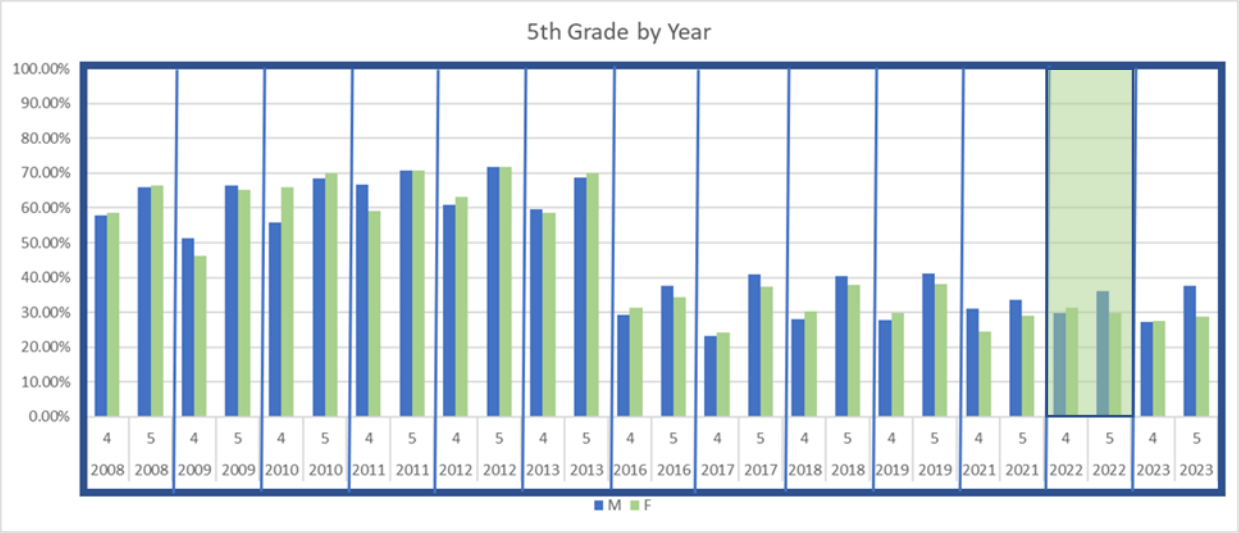
In Figure 7.4, the green highlighted cells indicate instances where female students in school districts utilizing the 4dsw schedule out-performed female students in school districts utilizing the 5dsw schedule. The blue highlighted cells indicate instances where male students in school districts utilizing the 4dsw schedule out-performed male students in school districts utilizing the 5dsw schedule. The orange highlighted cells indicate instances where both female and male students in school districts utilizing the 4dsw schedule out-performed male students in school districts utilizing the 5dsw schedule.

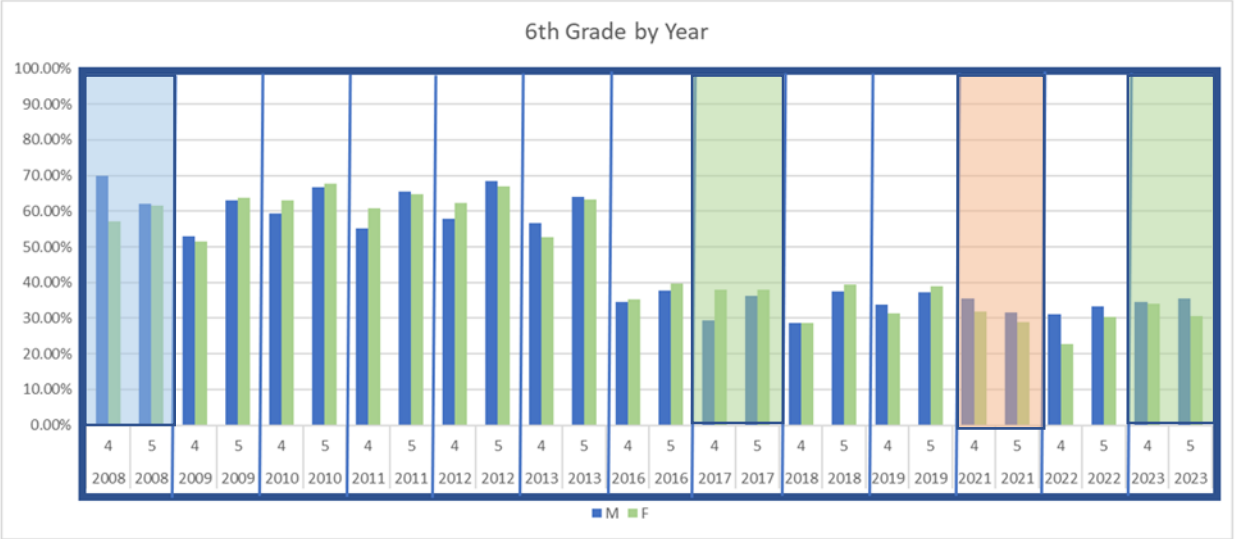
Figure 7.4

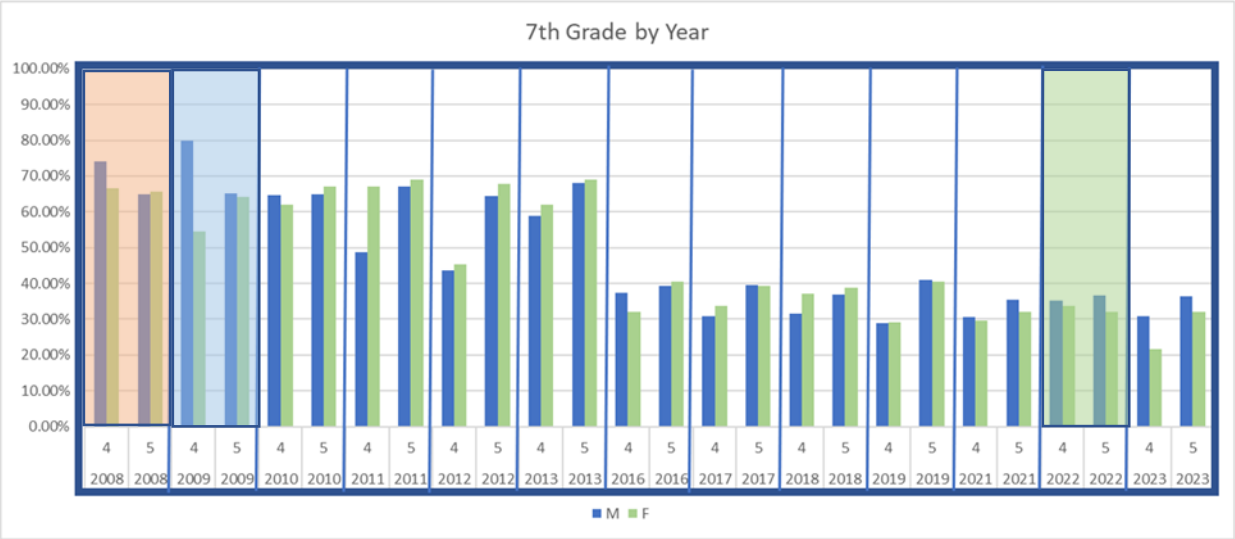
Math Proficiency (MontCas and SBAC) Disaggregated by Gender and Year






5th Grade by Year
100.00%
90.00%
80.00%
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5
2008 2008 2009 2009 2010 2010 2011 2011 2012 2012 2013 2013 2016 2016 2017 2017 2018 2018 2019 2019 2021 2021 2022 2022 2023 2023
M F


6th Grade by Year
100.00%
90.00%
80.00%
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5
2008 2008 2009 2009 2010 2010 2011 2011 2012 2012 2013 2013 2016 2016 2017 2017 2018 2018 2019 2019 2021 2021 2022 2022 2023 2023
M F


7th Grade by Year
100.00%
90.00%
80.00%
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5
2008 2008 2009 2009 2010 2010 2011 2011 2012 2012 2013 2013 2016 2016 2017 2017 2018 2018 2019 2019 2021 2021 2022 2022 2023 2023
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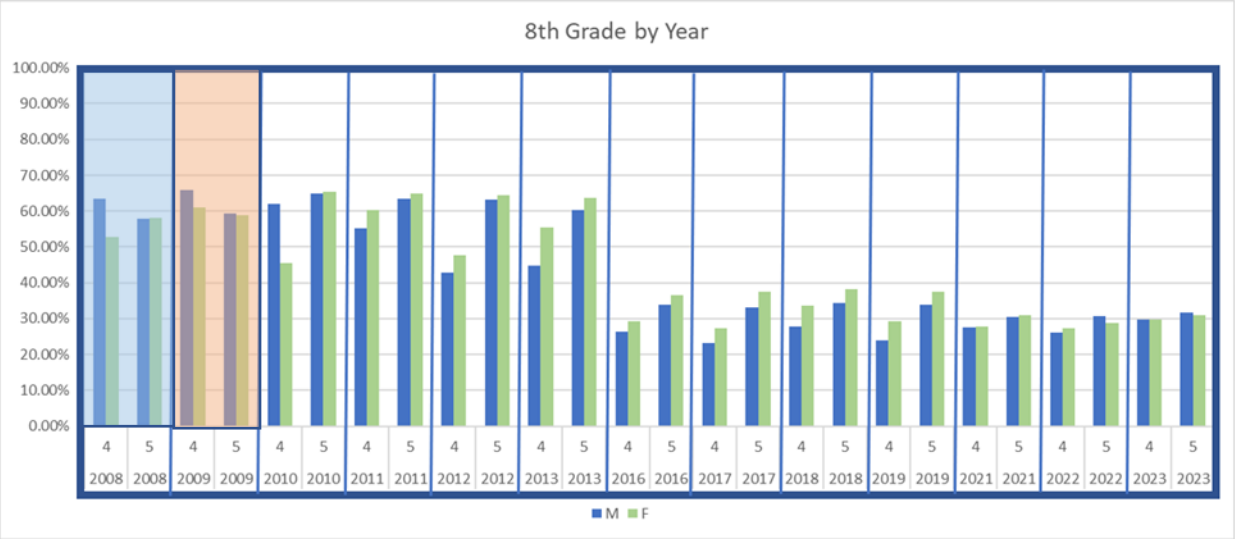

8th Grade by Year
100.00%
90.00%
80.00%
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5
2008 2008 2009 2009 2010 2010 2011 2011 2012 2012 2013 2013 2016 2016 2017 2017 2018 2018 2019 2019 2021 2021 2022 2022 2023 2023
M F

Research Question 8 - *What is the difference in ACT scores between students in school districts utilizing the 4dsw schedule and those utilizing the 5dsw schedule when disaggregated by ethnicity?*

Question 8 Key Points

- ✓ **The ACT data differ from the MontCas and SBAC data because it is reported as mean scores rather than the percentage of proficient and advanced achievement as reported in MontCas and SBAC assessments.**
- ✓ **The ACT assessment is taken in the 11th grade and is a culminating exam for the PK-12 public education program. Students that are categorized as enrolled in school districts that utilize the 4dsw schedule were in the 4dsw schedule when they took the ACT assessment. Because this assessment is cumulative, students may have also experienced a 5dsw schedule for a period of time in their educational career. See Allen et al. (2024) for the longitudinal impact of the 4dsw schedule on ACT scores.**
- ✓ **Caution needs to be taken when interpreting the data due to the small student numbers in some ethnic groups.**
- ✓ **When ACT scores were disaggregated by ethnicity and discipline, the results varied.**

Question 8 Discussion

The ACT assessment was administered to all eleventh-grade students, beginning in 2013. The ACT score consists of five areas: (a) English, (b) Math, (c) Reading, (d) Science, and (e) Composite. The Composite score is the rounded average of English, Math, Reading, and Science. This calculation is performed by the ACT testing service.

The ACT data differ from the MontCas and SBAC data in that it is reported as mean scores rather than the percentage of proficient and advanced achievement as reported in MontCas and SBAC. These mean scores were verified for accuracy as part of the analyses by manually filtering scores for ten high schools with varying enrollments and then comparing these analyses with the formula generated means.

Unlike MontCas and SBAC assessment scores, the ACT assessment scores can be compared nationally, but with caution. In Montana, all eleventh-grade students take the ACT. Not all states require every eleventh-grade student to take the ACT. In those states, students taking the ACT may be students planning to attend college and using their ACT scores in college applications.

A comparison of the English, Math, Reading, Science, and Composite scores for Montana students from 2013-2023 indicated that students in school districts using the 5dsw schedule outperformed students in school districts using the 4dsw schedule in each category. Differences (*D*) in composite ACT scores between school districts that utilize the 5dsw schedule and the 4dsw schedule were evident when desegregated by ethnicity. Native-Hawaiian/Pacific Islander scores were not reported due to small enrollment numbers ($n<10$ in the 4dsw). Composite scores for

American Indian/Alaska Native (*D*=.16%), African-American (*D*=.97%), and White, non-Hispanic (*D*=.38%) were higher for students in school districts that utilize the 5dsw schedule. Composite scores for Hispanic (*D*=.50%), Asian or Asian-American (*D*=.21%), and Multiracial (*D*=.51%) were higher for students in school districts that utilize the 4dsw schedule (Figure 8.1).

Figure 8.1

ACT Scores Disaggregated by Ethnicity

Hispanic

	English	Math	Reading	Science	Composite	N
5dsw	16.34	17.94	18.38	18.08	17.81	3847
4dsw	17.05	18.47	18.52	18.55	18.31	188
Mean Difference	0.70	0.52	0.15	0.47	0.50	

American Indian/Alaska Native

	English	Math	Reading	Science	Composite	N
5dsw	15.13	16.98	17.43	17.10	16.78	7374
4dsw	15.03	16.59	17.09	17.06	16.62	551
Mean Difference	-0.10	-0.39	-0.34	-0.04	-0.16	

Asian or Asian-American

	English	Math	Reading	Science	Composite	N
5dsw	18.25	20.49	19.91	19.72	19.74	916
4dsw	18.11	21.01	19.11	20.51	19.95	41
Mean Difference	-0.15	0.51	-0.80	0.79	0.21	

African-American

	English	Math	Reading	Science	Composite	N
5dsw	15.91	17.01	17.80	17.30	17.15	839
4dsw	14.74	16.41	16.60	16.99	16.18	24
Mean Difference	-1.17	-0.60	-1.20	-0.31	-0.97	

White, non-Hispanic

	English	Math	Reading	Science	Composite	N
5dsw	18.23	19.52	20.20	19.86	19.57	73245
4dsw	17.69	19.25	19.78	19.45	19.19	3925
Mean Difference	-0.54	-0.26	-0.42	-0.41	-0.38	

Multiracial						
	English	Math	Reading	Science	Composite	N
5dsw	16.92	18.35	19.07	18.52	18.35	2125
4dsw	17.64	18.59	19.45	19.23	18.86	298
Mean Difference	0.72	0.23	0.38	0.71	0.51	

Note. The red highlighted cells indicate instances where school districts utilizing the 4dsw schedule had lower ACT scores than school districts utilizing the 5dsw schedule.

For the years 2013-2023, there are 40 data points (Figure 8.2) in which to analyze student ACT scores by discipline (English, Math, Reading, and Science). When disaggregated by ethnicity, Hispanic students had 11 out of 40 (27.50%) instances of higher ACT scores in school districts that utilize the 5dsw schedule. American Indian/Alaska Native students had 17 out of 40 (42.50%) instances of higher ACT scores in school districts that utilize the 5dsw schedule. Asian or Asian-American students had 14 out of 40 (35.00%) instances of higher ACT scores in school districts that utilize the 5dsw schedule. African-American students had 27 out of 40 (67.50%) instances of higher ACT scores in school districts that utilize the 5dsw schedule. White, non-Hispanic students had 36 out of 40 (90.00%) instances of higher ACT scores in school districts that utilize the 5dsw schedule. Multiracial students had 16 out of 40 (40.00%) instances of higher ACT scores in school districts that utilize the 5dsw schedule (Figure 8.2).

The next level of analysis included an examination of discipline areas for each ethnic group. For the discipline of English, in 4 out of 10 years (40%), Hispanic students had higher ACT scores in school districts that utilize the 5dsw schedule. American Indian/Alaska Native students had higher ACT scores in school districts that utilize the 5dsw schedule 4 out of 10 years (40%). Asian or Asian-American students had higher ACT scores in school districts that utilize the 5dsw schedule 3 out of 10 years (30%). African-American students had higher ACT scores in school districts that utilize the 5dsw schedule 9 out of 10 years (90%). White, non-Hispanic students had higher ACT scores in school districts that utilize the 5dsw schedule 10 out of 10 years (100%). Multiracial students had higher ACT scores in school districts that utilize the 5dsw schedule 3 out of 10 years (30%) (Figure 8.2).

For the discipline of Math, in 3 out of 10 years (30%), Hispanic students had higher ACT scores in school districts that utilize the 5dsw schedule. American Indian/Alaska Native students had higher ACT scores in school districts that utilize the 5dsw schedule 6 out of 10 years (60%). Asian or Asian-American students had higher ACT scores in school districts that utilize the 5dsw schedule 3 out of 10 years (30%). African-American students had higher ACT scores in school districts that utilize the 5dsw schedule 6 out of 10 years (60%). White, non-Hispanic students had higher ACT scores in school districts that utilize the 5dsw schedule 8 out of 10 years (80%). Multiracial students had higher ACT scores in school districts that utilize the 5dsw schedule 5 out of 10 years (50%) (Figure 8.2).

For the discipline of Reading, in 3 out of 10 years (30%), Hispanic students had higher ACT scores in school districts that utilize the 5dsw schedule. American Indian/Alaska Native students had higher ACT scores in school districts that utilize the 5dsw schedule 5 out of 10 years (50%). Asian or Asian-American students had higher ACT scores in school districts that utilize the 5dsw schedule 5 out of 10 years (50%). African-American students had higher ACT scores in school districts that utilize the 5dsw schedule 7 out of 10 years (70%). White, non-Hispanic students had higher ACT scores in school districts that utilize the 5dsw schedule 9 out of 10 years (90%). Multiracial students had higher ACT scores in school districts that utilize the 5dsw schedule 6 out of 10 years (60%) (Figure 8.2).

For the discipline of Science, in 1 out of 10 years (10%), Hispanic students had higher ACT scores in school districts that utilize the 5dsw schedule. American Indian/Alaska Native students had higher ACT scores in school districts that utilize the 5dsw schedule 2 out of 10 years (20%). Asian or Asian-American students had higher ACT scores in school districts that utilize the 5dsw schedule 3 out of 10 years (30%). African-American students had higher ACT scores in school districts that utilize the 5dsw schedule 5 out of 10 years (50%). White, non-Hispanic students had higher ACT scores in school districts that utilize the 5dsw schedule 9 out of 10 years (90%). Multiracial students had higher ACT scores in school districts that utilize the 5dsw schedule 2 out of 10 years (20%) (Figure 8.2).

Figure 8.2

ACT Scores Disaggregated by Ethnicity and Year

Hispanic

		Average ACT Scores					Difference Between the 5dsw and 4dsw Schedule				
		English	Math	Reading	Science	Composite	English	Math	Reading	Science	Composite
2013	5dsw	16.74	18.40	18.42	17.49	17.89	1.06	-0.97	0.61	1.06	0.51
2013	4dsw	17.80	17.43	19.03	18.55	18.40					
2014	5dsw	16.35	18.36	18.76	18.25	18.06	2.65	2.23	0.27	0.41	1.19
2014	4dsw	19.00	20.58	19.03	18.67	19.25					
2015	5dsw	16.49	18.37	18.53	18.81	18.18	-3.54	-1.42	-3.84	-3.67	-3.14
2015	4dsw	12.95	16.95	14.68	15.14	15.05					
2016	5dsw	17.06	18.82	19.71	19.13	18.78	-0.47	-0.71	0.87	1.04	0.67
2016	4dsw	16.59	18.10	20.58	20.17	19.44					
2017	5dsw	16.34	18.18	18.98	18.10	18.00	-0.11	0.84	-0.50	0.83	0.28
2017	4dsw	16.23	19.02	18.49	18.92	18.28					
2018	5dsw	16.69	17.88	18.34	18.16	17.95	0.61	0.64	0.33	0.75	0.72
2018	4dsw	17.30	18.52	18.67	18.91	18.67					
2019	5dsw	17.58	18.52	18.95	18.75	18.60	-0.55	0.44	0.57	0.29	0.18
2019	4dsw	17.03	18.96	19.51	19.04	18.79					
2020	5dsw										
2020	4dsw										
2021	5dsw	15.27	16.75	17.19	17.05	16.66	2.13	1.71	-1.02	1.07	0.92
2021	4dsw	17.40	18.46	16.17	18.13	17.58					
2022	5dsw	14.99	16.88	17.19	16.96	16.61	1.19	0.46	0.42	1.40	0.90
2022	4dsw	16.18	17.34	17.62	18.36	17.52					
2023	5dsw	15.91	17.29	17.68	18.07	17.36	4.07	2.02	3.77	1.57	2.73
2023	4dsw	19.97	19.31	21.46	19.64	20.09					

American Indian/Alaska Native

		Average ACT Scores					Difference Between the 5dsw and 4dsw Schedule				
		English	Math	Reading	Science	Composite	English	Math	Reading	Science	Composite
2013	5dsw	15.98	17.88	18.51	17.87	17.65	-0.35	0.07	0.08	0.18	0.13
2013	4dsw	15.63	17.94	18.59	18.05	17.78					
2014	5dsw	14.84	17.18	17.78	16.96	16.84	0.37	-0.04	-1.02	0.06	-0.11
2014	4dsw	15.21	17.14	16.76	17.02	16.74					
2015	5dsw	15.26	17.02	17.71	17.39	16.93	-1.99	-1.98	-1.32	-1.38	-1.59
2015	4dsw	13.27	15.04	16.39	16.01	15.35					
2016	5dsw	15.60	17.49	17.40	17.53	17.15	1.14	0.03	1.22	0.50	0.75
2016	4dsw	16.74	17.52	18.61	18.03	17.90					
2017	5dsw	15.18	17.56	17.64	17.51	17.08	0.49	-0.54	0.18	0.38	0.15
2017	4dsw	15.66	17.02	17.82	17.89	17.23					
2018	5dsw	14.66	16.61	16.82	16.51	16.32	1.94	0.91	1.88	0.65	1.42
2018	4dsw	16.60	17.52	18.70	17.16	17.74					
2019	5dsw	15.01	16.74	17.65	16.96	16.70	-1.01	-0.73	-2.06	-1.49	-1.30
2019	4dsw	14.00	16.01	15.59	15.47	15.40					
2020	5dsw										
2020	4dsw										
2021	5dsw	14.61	16.54	16.93	16.74	16.32	-1.97	-1.39	-2.46	0.18	-1.30
2021	4dsw	12.64	15.15	14.47	16.92	15.02					
2022	5dsw	14.11	15.98	15.92	16.04	15.67	0.24	0.40	-0.20	0.22	0.13
2022	4dsw	14.35	16.37	15.72	16.26	15.80					
2023	5dsw	16.08	16.80	17.97	17.49	17.16	0.10	-0.58	0.31	0.30	0.09
2023	4dsw	16.18	16.21	18.28	17.78	17.25					

Asian or Asian-American

		Average ACT Scores					Difference Between the 5dsw and 4dsw Schedule				
		English	Math	Reading	Science	Composite	English	Math	Reading	Science	Composite
2013	5dsw	20.08	23.02	21.19	20.38	21.30	1.92	1.98	1.31	0.96	1.70
2013	4dsw	22.00	25.00	22.50	21.33	23.00					
2014	5dsw	18.18	21.26	19.79	19.75	19.91	0.82	2.24	4.21	5.75	3.09
2014	4dsw	19.00	23.50	24.00	25.50	23.00					
2015	5dsw	17.96	21.40	20.71	20.40	20.27	-3.29	-2.40	-5.88	-5.90	-4.44
2015	4dsw	14.67	19.00	14.83	14.50	15.83					
2016	5dsw	18.17	20.65	19.89	19.82	19.66					
2016	4dsw										
2017	5dsw	18.70	20.61	20.28	20.33	20.12	1.63	0.39	2.22	1.51	3.55
2017	4dsw	20.33	21.00	22.50	21.83	23.67					
2018	5dsw	16.27	20.24	17.45	19.24	18.46	1.73	2.26	-0.95	-1.24	0.04
2018	4dsw	18.00	22.50	16.50	18.00	18.50					
2019	5dsw	17.56	19.29	18.82	18.65	18.79	-1.06	4.21	-3.07	6.10	1.21
2019	4dsw	16.50	23.50	15.75	24.75	20.00					
2020	5dsw										
2020	4dsw										
2021	5dsw	18.55	19.84	21.08	19.36	19.84	-3.35	-4.84	-5.08	-2.36	-4.04
2021	4dsw	15.20	15.00	16.00	17.00	15.80					
2022	5dsw	18.68	19.94	20.41	20.36	20.03	0.07	1.56	-0.66	2.39	0.72
2022	4dsw	18.75	21.50	19.75	22.75	20.75					
2023	5dsw	18.38	18.69	19.48	18.91	19.05	0.12	-0.62	0.64	0.03	-0.05
2023	4dsw	18.50	18.06	20.13	18.94	19.00					

African-American

		Average ACT Scores					Difference Between the 5dsw and 4dsw Schedule				
		English	Math	Reading	Science	Composite	English	Math	Reading	Science	Composite
2013	5dsw	16.62	17.16	17.72	17.45	17.36	-0.62	-2.16	1.28	2.55	0.64
2013	4dsw	16.00	15.00	19.00	20.00	18.00					
2014	5dsw	17.44	17.80	19.38	17.63	18.16	-0.44	1.20	2.12	1.87	1.34
2014	4dsw	17.00	19.00	21.50	19.50	19.50					
2015	5dsw	16.28	17.73	18.66	18.48	17.90	-4.95	-2.39	-3.66	-1.48	-3.24
2015	4dsw	11.33	15.33	15.00	17.00	14.67					
2016	5dsw	16.57	17.50	19.05	18.28	17.97	-0.90	0.50	-2.05	0.38	-0.81
2016	4dsw	15.67	18.00	17.00	18.67	17.17					
2017	5dsw	15.56	17.19	16.90	16.27	16.71	-0.56	-0.19	-2.90	-2.27	-1.71
2017	4dsw	15.00	17.00	14.00	14.00	15.00					
2018	5dsw	15.08	16.11	16.90	16.11	16.22	2.42	-1.11	-1.40	-0.11	-0.22
2018	4dsw	17.50	15.00	15.50	16.00	16.00					
2019	5dsw	17.11	17.83	18.73	18.78	18.26	-1.11	0.17	-3.73	-2.78	-2.26
2019	4dsw	16.00	18.00	15.00	16.00	16.00					
2020	5dsw										
2020	4dsw										
2021	5dsw	15.43	16.26	17.28	17.38	16.77	-1.55	0.49	0.22	0.87	-0.27
2021	4dsw	13.88	16.75	17.50	18.25	16.50					
2022	5dsw	13.43	15.64	15.72	15.44	15.24	-2.43	-1.64	-0.72	0.56	-1.24
2022	4dsw	11.00	14.00	15.00	16.00	14.00					
2023	5dsw	15.59	16.88	17.70	17.17	16.90	-1.59	-0.88	-1.20	-2.67	-1.90
2023	4dsw	14.00	16.00	16.50	14.50	15.00					

White, non-Hispanic

		Average ACT Scores					Difference Between the 5dsw and 4dsw Schedule				
		English	Math	Reading	Science	Composite	English	Math	Reading	Science	Composite
2013	5dsw	18.97	20.27	20.58	20.07	20.10	-0.05	0.26	0.18	0.13	0.11
2013	4dsw	18.92	20.53	20.76	20.20	20.21					
2014	5dsw	18.30	20.10	20.31	20.05	19.82	-0.66	-1.02	-0.35	-0.22	-0.55
2014	4dsw	17.64	19.08	19.95	19.83	19.27					
2015	5dsw	18.36	20.00	20.27	20.09	19.79	-0.35	-0.48	-0.94	-0.37	-0.36
2015	4dsw	18.00	19.52	19.33	19.72	19.43					
2016	5dsw	18.44	19.92	20.79	20.26	19.98	-0.59	-0.16	-0.21	-0.15	-0.31
2016	4dsw	17.84	19.76	20.59	20.12	19.67					
2017	5dsw	18.30	19.61	20.27	19.67	19.57	-0.85	-0.43	-0.52	-0.69	-0.56
2017	4dsw	17.45	19.18	19.75	18.97	19.01					
2018	5dsw	18.12	19.47	20.17	19.57	19.46	-0.44	-0.18	-0.29	-0.42	-0.33
2018	4dsw	17.69	19.29	19.88	19.16	19.13					
2019	5dsw	18.48	19.52	20.37	20.04	19.74	-0.78	-0.09	-0.45	-0.73	-0.50
2019	4dsw	17.70	19.43	19.92	19.31	19.24					
2020	5dsw										
2020	4dsw										
2021	5dsw	17.55	18.74	19.69	19.57	19.00	-0.39	0.14	-0.43	-0.47	-0.26
2021	4dsw	17.17	18.88	19.26	19.11	18.74					
2022	5dsw	17.33	18.68	19.66	19.53	18.91	-0.61	-0.40	-0.57	-0.51	-0.51
2022	4dsw	16.72	18.28	19.09	19.02	18.41					
2023	5dsw	18.46	18.85	19.90	19.72	19.36	-0.69	-0.26	-0.61	-0.69	-0.55
2023	4dsw	17.77	18.59	19.29	19.03	18.81					

Multiracial

		Average ACT Scores					Difference Between the 5dsw and 4dsw Schedule				
		English	Math	Reading	Science	Composite	English	Math	Reading	Science	Composite
2013	5dsw	17.26	18.89	19.38	18.68	18.69	1.30	-0.43	2.22	2.35	1.42
2013	4dsw	18.57	18.47	21.61	21.03	20.12					
2014	5dsw	16.04	18.40	19.19	18.57	18.21	2.19	-0.36	-0.13	0.92	0.53
2014	4dsw	18.23	18.04	19.05	19.50	18.74					
2015	5dsw	16.65	18.81	18.20	18.06	18.08	1.31	0.58	3.19	1.72	1.64
2015	4dsw	17.96	19.39	21.39	19.79	19.72					
2016	5dsw	16.79	17.91	18.58	18.30	18.04	2.05	2.12	3.32	2.04	2.28
2016	4dsw	18.84	20.03	21.90	20.35	20.32					
2017	5dsw	17.23	18.40	19.20	18.82	18.58	0.30	0.70	-0.31	0.84	0.28
2017	4dsw	17.53	19.11	18.89	19.67	18.86					
2018	5dsw	17.31	18.67	19.13	18.15	18.48	-1.75	-1.13	-1.55	-0.52	-1.26
2018	4dsw	15.55	17.54	17.58	17.63	17.22					
2019	5dsw	17.54	18.90	20.23	19.12	19.07	-1.26	-1.06	-2.43	-2.08	-1.56
2019	4dsw	16.28	17.83	17.79	17.03	17.51					
2020	5dsw										
2020	4dsw										
2021	5dsw	16.37	17.92	19.09	18.83	18.15	1.73	1.63	-0.60	0.33	0.77
2021	4dsw	18.10	19.55	18.49	19.16	18.92					
2022	5dsw	15.74	17.07	18.15	17.55	17.22	2.68	1.21	0.83	1.21	1.53
2022	4dsw	18.42	18.28	18.99	18.76	18.75					
2023	5dsw	18.23	18.56	19.57	19.15	18.99	-1.31	-0.93	-0.76	0.26	-0.54
2023	4dsw	16.93	17.63	18.80	19.41	18.46					

Note. The red highlighted cells indicate instances where school districts utilizing the 4dsw schedule had lower ACT scores than school districts utilizing the 5dsw schedule.

Research Question 9 - *What is the difference in ACT scores between students in school districts utilizing the 4dsw schedule and those utilizing the 5dsw schedule when disaggregated by gender?*

Question 9 Key Points

- ✓ **The ACT data differ from the MontCas and SBAC data in that it is reported as mean scores rather than the percentage of proficient and advanced achievement as reported in MontCas and SBAC.**
- ✓ **Students take their ACT assessment in the eleventh grade. However, learning in preparation for this assessment accumulates from kindergarten. Students in this study who are identified as being in a school district that utilizes the 4dsw schedule may not have spent all of their years in a district that utilized a 4dsw schedule. Because of this, caution is required in interpreting ACT data. To fully understand the longitudinal impact of the 4dsw schedule on ACT scores, see Allen et al. (2024).**
- ✓ **Female students had higher average ACT scores in all disciplines and in the *Composite* score in school districts that utilize the 5dsw schedule.**
- ✓ **Male students had higher average ACT scores in *English, Reading* and in the *Composite* score in school districts that utilize the 5dsw schedule and higher ACT scores in *Science* and *Math* in school districts that utilize the 4dsw schedule.**

Question 9 Discussion

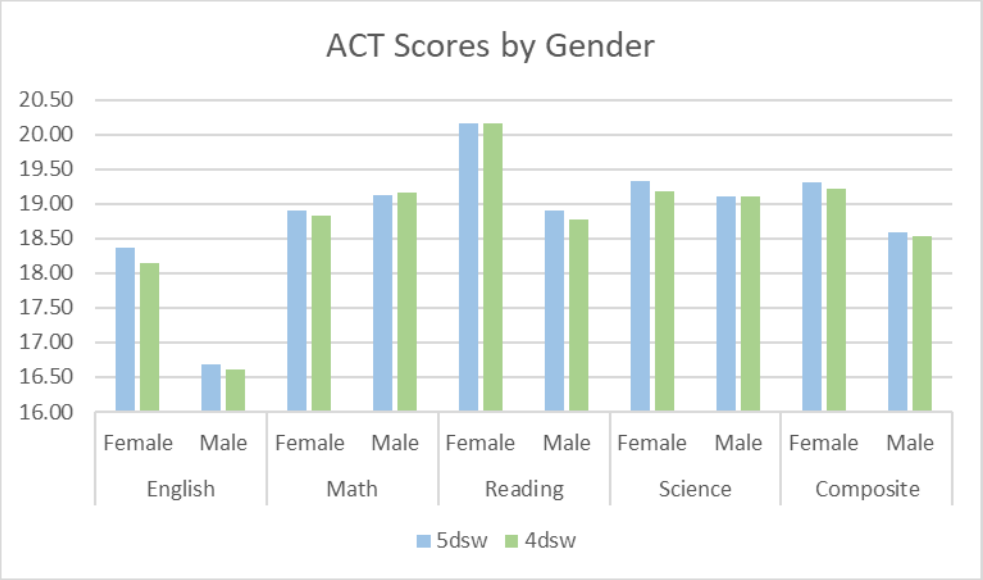
Overall, students in school districts that utilize the 5dsw schedule showed higher ACT scores than students in school districts that utilize the 4dsw schedule (Allen et al., 2024). When disaggregated by gender, both female and male students in school districts that utilize the 5dsw schedule had higher Composite ACT scores compared to students in school districts that utilize the 4dsw schedule. This is also true in the disciplines of English and Reading. In Math and Science, female students in school districts that utilize the 5dsw schedule demonstrated higher ACT scores than female students in school districts that utilize the 4dsw schedule. This is not true of male students who demonstrated higher ACT scores in Math and Science in school districts that utilize the 4dsw schedule (Figure 9.1).

Figure 9.1

ACT Scores Disaggregated by Gender

ACT by Gender

	English		Math		Reading		Science		Composite	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
5dsw	18.36	16.69	18.90	19.12	20.17	18.91	19.33	19.09	19.32	18.58
4dsw	18.14	16.61	18.82	19.16	20.16	18.77	19.17	19.10	19.22	18.54
Mean Differnce	-0.22	-0.08	-0.08	0.04	-0.01	-0.14	-0.16	0.01	-0.10	-0.04



For the years 2013-2023, there are 40 data points in which to analyze student ACT scores by discipline (English, Math, Reading, and Science). When disaggregated by gender, Female students had 27 out of 40 (67.50%) instances of higher ACT scores in school districts that utilize the 5dsw schedule. Male students had 23 out of 40 (57.50%) instances of higher ACT scores in school districts that utilize the 5dsw schedule (Figure 9.2).

The next level of analysis included an examination of discipline areas for each ethnic group. For the discipline of English, in 8 out of 10 years (80%), Female students had higher ACT scores in school districts that utilize the 5dsw schedule. Male students had higher ACT scores in school districts that utilize the 5dsw schedule 6 out of 10 years (60%) (Figure 9.2).

For the discipline of Math, in 7 out of 10 years (70%), Female students had higher ACT scores in school districts that utilize the 5dsw schedule. Male students had higher ACT scores in school districts that utilize the 5dsw schedule 6 out of 10 years (60%) (Figure 9.2).

For the discipline of Reading, in 6 out of 10 years (60%), Female students had higher ACT scores in school districts that utilize the 5dsw schedule. Male students had higher ACT scores in school districts that utilize the 5dsw schedule 8 out of 10 years (80%) (Figure 9.2).

For the discipline of Science, in 6 out of 10 years (60%), Female students had higher ACT scores in school districts that utilize the 5dsw schedule. Male students had higher ACT scores in school districts that utilize the 5dsw schedule 5 out of 10 years (50%) (Figure 9.2).

Figure 9.2

ACT Scores Disaggregated by Gender and Year

FEMALE

		Average ACT Scores					Difference Between the 5dsw and 4dsw Schedule				
		English	Math	Reading	Science	Composite	English	Math	Reading	Science	Composite
2013	5dsw	18.98	19.93	20.42	19.55	19.84	0.97	0.47	1.16	0.75	0.84
	4dsw	19.95	20.40	21.58	20.30	20.68					
2014	5dsw	18.47	19.52	20.70	19.67	19.73	-0.74	-0.87	-0.64	-0.61	-0.73
	4dsw	17.73	18.65	20.06	19.06	19.00					
2015	5dsw	18.49	19.60	20.58	19.78	19.72	-0.75	-0.28	-0.90	-0.35	-0.52
	4dsw	17.75	19.31	19.68	19.44	19.20					
2016	5dsw	18.67	19.29	20.65	19.63	19.68	-0.18	-0.52	-0.02	-0.64	-0.38
	4dsw	18.49	18.77	20.62	18.99	19.30					
2017	5dsw	18.37	18.86	20.16	19.10	19.26	-0.39	-0.12	-0.35	-0.10	-0.20
	4dsw	17.98	18.74	19.81	18.99	19.05					
2018	5dsw	18.50	18.86	20.14	19.36	19.38	-0.09	-0.05	0.45	-0.45	-0.02
	4dsw	18.41	18.81	20.60	18.91	19.36					
2019	5dsw	18.48	18.90	20.29	19.49	19.42	-0.69	-0.07	-0.44	-0.69	-0.42
	4dsw	17.79	18.84	19.85	18.80	19.00					
2020	5dsw										
	4dsw										
2021	5dsw	17.79	18.09	19.66	19.06	18.77	-0.42	0.39	-0.04	0.02	0.00
	4dsw	17.37	18.49	19.61	19.09	18.77					
2022	5dsw	17.40	17.83	19.21	18.61	18.39	0.13	0.32	0.38	0.23	0.28
	4dsw	17.53	18.14	19.60	18.84	18.67					
2023	5dsw	18.47	18.14	19.85	19.03	18.99	-0.01	-0.07	0.30	0.27	0.14
	4dsw	18.46	18.07	20.15	19.30	19.13					

MALE

		Average ACT Scores					Difference Between the 5dsw and 4dsw Schedule				
		English	Math	Reading	Science	Composite	English	Math	Reading	Science	Composite
2013	5dsw	17.74	19.89	19.57	19.50	19.30	-0.18	0.08	-0.17	0.19	-0.03
	4dsw	17.56	19.98	19.40	19.69	19.27					
2014	5dsw	16.72	19.69	18.78	19.27	18.74	0.01	-0.43	0.06	0.26	-0.01
	4dsw	16.73	19.27	18.84	19.53	18.73					
2015	5dsw	17.15	19.56	18.94	19.51	18.92	-0.04	-0.58	-0.36	-0.83	-0.48
	4dsw	17.11	18.98	18.58	18.68	18.44					
2016	5dsw	16.97	19.40	19.53	19.58	18.98	-0.62	0.13	-0.03	0.40	-0.02
	4dsw	16.34	19.53	19.50	19.97	18.96					
2017	5dsw	16.71	19.13	19.09	18.92	18.58	-0.06	0.15	-0.11	-0.15	0.01
	4dsw	16.65	19.28	18.97	18.77	18.59					
2018	5dsw	16.49	18.99	18.84	18.71	18.39	-0.28	-0.20	-0.56	-0.31	-0.37
	4dsw	16.21	18.79	18.28	18.40	18.02					
2019	5dsw	16.96	19.05	19.12	19.23	18.73	0.02	0.56	-0.06	-0.11	0.08
	4dsw	16.98	19.61	19.06	19.12	18.81					
2020	5dsw										
	4dsw										
2021	5dsw	15.87	18.26	18.27	18.44	17.83	0.52	0.36	0.35	0.27	0.40
	4dsw	16.39	18.63	18.61	18.71	18.23					
2022	5dsw	15.61	18.14	18.03	18.72	17.74	-0.10	0.21	-0.34	0.32	0.02
	4dsw	15.51	18.35	17.69	19.05	17.76					
2023	5dsw	17.07	18.63	18.64	18.98	18.46	0.03	-0.02	-0.28	-0.34	-0.17
	4dsw	17.10	18.60	18.35	18.65	18.29					

Note. The red highlighted cells indicate instances where school districts utilizing the 4dsw schedule had lower ACT scores than school districts utilizing the 5dsw schedule.

Research Question 10 - *What is the difference in attendance between students in school districts utilizing the 4dsw schedule and those utilizing the 5dsw schedule when disaggregated by ethnicity?*

Question 10 Key Points

- ✓ **Attendance rates were slightly higher for students in school districts that utilize the 5dsw schedule (Allen et al., 2024).**
- ✓ **When attendance rates were disaggregated by ethnicity, the results varied.**

Question 10 Discussion

Because of the disparity in school district sizes, calculating total *Days Present* and total *Days Enrolled* at the student level was the most accurate way of accounting for attendance, as opposed to school district attendance percentages. The days present for all students attending the school districts utilizing the 4dsw and 5dsw schedules were summed. The days enrolled were then summed for the school districts utilizing the 4dsw and 5dsw schedules. The total percent of days enrolled was calculated based on all students in both schedules by ethnicity. A comparison of attendance percentages in these schedules was made.

Attendance rates for all ethnicities were slightly higher for students in school districts that utilize the 5dsw schedule (Allen et al., 2024). Differences (*D*) in attendance rates between school districts that utilize the 5dsw schedule and the 4dsw schedule were evident when desegregated by ethnicity. Hispanic (*D*=1.14%), American Indian/Alaska Native (*D*=.23%), Asian or Asian-American (*D*=.88%), African-American (*D*=.11%), and Multiracial (*D*=.22%) students in school districts that utilize the 5dsw schedule had a slightly higher attendance rate. Native-Hawaiian/Pacific Islander (*D*=1.07%), and White non-Hispanic (*D*=.23%) students in school districts that utilize the 4dsw schedule had a slightly higher attendance rate. Overall, there was little difference in attendance rates between students in school districts that utilize the 5dsw schedule and students in districts that utilize the 4dsw schedule (Figure 10.1).

Figure 10.1

Attendance Rates in School Districts That Utilize the 5dsw Schedule and the 4dsw Schedule Disaggregated by Ethnicity

Hispanic					
	Schedule	Days Present	Days Enrolled	Percentage	
	5dsw	6,121,758.65	6,663,019.40	91.88%	-1.14%
	4dsw	225,480.94	248,499.50	90.74%	
2013	5dsw	320029.12	343307.00	93.22%	2.09%
2013	4dsw	1764.16	1851.00	95.31%	
2014	5dsw	392687.51	417146.50	94.14%	-4.39%
2014	4dsw	9002.96	10032.00	89.74%	
2015	5dsw	532926.78	569172.50	93.63%	-1.84%
2015	4dsw	14477.07	15771.00	91.80%	
2016	5dsw	553216.96	594931.00	92.99%	-1.72%
2016	4dsw	18774.29	20570.00	91.27%	
2017	5dsw	577691.10	622704.00	92.77%	-1.41%
2017	4dsw	18315.22	20047.00	91.36%	
2018	5dsw	605559.57	656208.50	92.28%	-2.67%
2018	4dsw	20270.70	22620.00	89.61%	
2019	5dsw	610226.49	665957.90	91.63%	-1.41%
2019	4dsw	20802.37	23056.00	90.23%	
2020	5dsw	573842.50	610772.50	93.95%	-0.96%
2020	4dsw	19159.48	20602.00	93.00%	
2021	5dsw	628506.22	691553.00	90.88%	1.32%
2021	4dsw	31373.09	34025.00	92.21%	
2022	5dsw	643521.37	726237.50	88.61%	0.73%
2022	4dsw	33155.78	37111.00	89.34%	
2023	5dsw	683551.03	765029.00	89.35%	0.31%
2023	4dsw	38385.82	42814.50	89.66%	

American Indian/Alaska Native					
	Schedule	Days Present	Days Enrolled	Percentage	
	5dsw	12,057,409.51	13,901,826.36	86.73%	-0.23%
	4dsw	847,083.18	979,233.50	86.50%	
2013	5dsw	746197.88	830980.50	89.80%	-0.66%
2013	4dsw	14263.42	16001.00	89.14%	
2014	5dsw	828586.07	927885.00	89.30%	-2.96%
2014	4dsw	68946.26	79852.00	86.34%	
2015	5dsw	1193745.62	1342672.00	88.91%	-1.71%
2015	4dsw	81821.53	93833.00	87.20%	
2016	5dsw	1248768.43	1405906.50	88.82%	-1.93%
2016	4dsw	71366.37	82133.00	86.89%	
2017	5dsw	1222540.26	1387020.50	88.14%	0.40%
2017	4dsw	81965.05	92570.00	88.54%	
2018	5dsw	1180657.44	1341825.00	87.99%	-2.20%
2018	4dsw	79819.04	93043.00	85.79%	
2019	5dsw	1211407.56	1421235.86	85.24%	0.48%
2019	4dsw	80471.77	93879.00	85.72%	
2020	5dsw	1142810.97	1298577.00	88.00%	2.98%
2020	4dsw	82637.92	90829.00	90.98%	
2021	5dsw	1180719.37	1388074.50	85.06%	2.05%
2021	4dsw	87306.59	100221.50	87.11%	
2022	5dsw	1059466.54	1305324.00	81.17%	1.59%
2022	4dsw	85384.51	103178.50	82.75%	
2023	5dsw	1042509.37	1252325.50	83.25%	1.35%
2023	4dsw	113100.72	133693.50	84.60%	

Asian or Asian-American					
	Schedule	Days Present	Days Enrolled	Percentage	
	5dsw	991,634.53	1,042,580.50	95.11%	-0.88%
	4dsw	20,548.12	21,806.00	94.23%	
2013	5dsw	74607.87	77968.00	95.69%	1.25%
2013	4dsw	876.32	904.00	96.94%	
2014	5dsw	76372.42	79732.00	95.79%	-1.71%
2014	4dsw	1185.35	1260.00	94.08%	
2015	5dsw	105234.66	109834.00	95.81%	0.90%
2015	4dsw	1723.42	1782.00	96.71%	
2016	5dsw	111965.17	116768.00	95.89%	-0.69%
2016	4dsw	1852.61	1946.00	95.20%	
2017	5dsw	105829.93	110346.50	95.91%	-2.04%
2017	4dsw	2601.99	2772.00	93.87%	
2018	5dsw	97713.91	102577.50	95.26%	-2.12%
2018	4dsw	1541.49	1655.00	93.14%	
2019	5dsw	93024.06	98085.00	94.84%	0.43%
2019	4dsw	1098.42	1153.00	95.27%	
2020	5dsw	69011.04	72417.50	95.30%	2.27%
2020	4dsw	632.20	648.00	97.56%	
2021	5dsw	88050.63	92423.00	95.27%	-0.91%
2021	4dsw	2814.64	2983.00	94.36%	
2022	5dsw	87018.43	93361.00	93.21%	-2.03%
2022	4dsw	2714.38	2977.00	91.18%	
2023	5dsw	82806.41	89068.00	92.97%	1.16%
2023	4dsw	3507.30	3726.00	94.13%	

African-American					
	Schedule	Days Present	Days Enrolled	Percentage	
	5dsw	1,083,240.61	1,164,762.00	93.00%	-0.11%
	4dsw	25,158.29	27,083.00	92.89%	
2013	5dsw	96325.89	102638.00	93.85%	1.19%
2013	4dsw	431.50	454.00	95.04%	
2014	5dsw	104167.78	110148.00	94.57%	-4.82%
2014	4dsw	622.84	694.00	89.75%	
2015	5dsw	120981.38	127992.50	94.52%	0.54%
2015	4dsw	1288.11	1355.00	95.06%	
2016	5dsw	116858.24	124300.00	94.01%	0.62%
2016	4dsw	2705.60	2859.00	94.63%	
2017	5dsw	115585.65	123658.00	93.47%	-1.01%
2017	4dsw	2545.46	2753.00	92.46%	
2018	5dsw	109036.24	117286.00	92.97%	1.71%
2018	4dsw	2300.59	2430.00	94.67%	
2019	5dsw	97420.03	105681.00	92.18%	0.27%
2019	4dsw	2637.73	2853.00	92.45%	
2020	5dsw	69846.71	74980.00	93.15%	0.84%
2020	4dsw	2061.22	2193.00	93.99%	
2021	5dsw	90552.74	98251.50	92.16%	1.07%
2021	4dsw	4119.02	4418.00	93.23%	
2022	5dsw	83736.86	92894.00	90.14%	1.30%
2022	4dsw	2840.31	3106.00	91.45%	
2023	5dsw	78729.09	86933.00	90.56%	0.31%
2023	4dsw	3605.91	3968.00	90.87%	

Native Hawaiian/Pacific Islander					
	Schedule	Days Present	Days Enrolled	Percentage	
	5dsw	274,691.55	298,453.00	92.04%	1.07%
	4dsw	5,708.23	6,131.00	93.10%	
2013	5dsw	20739.89	22081.00	93.93%	
2013	4dsw	0.00	0.00		
2014	5dsw	23191.07	24657.00	94.05%	-0.49%
2014	4dsw	409.82	438.00	93.57%	
2015	5dsw	29037.35	31136.00	93.26%	3.00%
2015	4dsw	846.12	879.00	96.26%	
2016	5dsw	27673.88	29630.50	93.40%	-1.16%
2016	4dsw	598.63	649.00	92.24%	
2017	5dsw	27483.07	29627.00	92.76%	-3.00%
2017	4dsw	941.63	1049.00	89.76%	
2018	5dsw	28450.43	30859.00	92.19%	3.71%
2018	4dsw	588.86	614.00	95.91%	
2019	5dsw	26958.98	29268.00	92.11%	2.99%
2019	4dsw	500.24	526.00	95.10%	
2020	5dsw	22622.41	24493.50	92.36%	1.36%
2020	4dsw	80.60	86.00	93.72%	
2021	5dsw	23836.22	26386.50	90.33%	4.00%
2021	4dsw	425.43	451.00	94.33%	
2022	5dsw	23194.89	26137.00	88.74%	3.31%
2022	4dsw	586.35	637.00	92.05%	
2023	5dsw	21503.36	24177.50	88.94%	2.15%
2023	4dsw	730.55	802.00	91.09%	

White, non-Hispanic					
	Schedule	Days Present	Days Enrolled	Percentage	
	5dsw	98,674,397.13	105,708,555.01	93.35%	0.23%
	4dsw	4,053,997.59	4,332,330.00	93.58%	
2013	5dsw	6279189.48	6661950.80	94.25%	1.21%
2013	4dsw	65440.80	68551.00	95.46%	
2014	5dsw	7509534.96	7943583.50	94.54%	-0.30%
2014	4dsw	152342.43	161664.00	94.23%	
2015	5dsw	9562371.37	10163431.50	94.09%	-0.38%
2015	4dsw	316614.77	337889.50	93.70%	
2016	5dsw	9750325.75	10369547.50	94.03%	0.23%
2016	4dsw	391184.83	415025.50	94.26%	
2017	5dsw	9865552.37	10524369.00	93.74%	0.41%
2017	4dsw	351597.96	373452.00	94.15%	
2018	5dsw	9850318.97	10523980.00	93.60%	0.21%
2018	4dsw	347322.22	370261.00	93.80%	
2019	5dsw	9727370.80	10444406.41	93.13%	0.52%
2019	4dsw	363104.46	387717.00	93.65%	
2020	5dsw	8260956.48	8733595.00	94.59%	0.44%
2020	4dsw	324491.56	341462.00	95.03%	
2021	5dsw	9379653.34	10072900.80	93.12%	0.80%
2021	4dsw	530611.80	564991.50	93.92%	
2022	5dsw	9287180.33	10210043.50	90.96%	1.37%
2022	4dsw	553307.59	599272.00	92.33%	
2023	5dsw	9201943.28	10060747.00	91.46%	0.94%
2023	4dsw	657979.17	712044.50	92.41%	

Multiracial					
	Schedule	Days Present	Days Enrolled	Percentage	
	5dsw	4,544,475.96	4,945,597.00	91.89%	-0.22%
	4dsw	306,891.20	334,768.00	91.67%	
2013	5dsw	168184.28	179797.00	93.54%	3.61%
2013	4dsw	1228.98	1265.00	97.15%	
2014	5dsw	194685.11	206588.00	94.24%	-3.37%
2014	4dsw	15349.16	16891.00	90.87%	
2015	5dsw	313899.39	334702.50	93.78%	-2.07%
2015	4dsw	28644.90	31234.00	91.71%	
2016	5dsw	353646.38	379397.00	93.21%	-0.79%
2016	4dsw	29997.99	32458.00	92.42%	
2017	5dsw	419847.38	452525.50	92.78%	-0.08%
2017	4dsw	29391.47	31706.00	92.70%	
2018	5dsw	465958.06	504056.50	92.44%	-0.52%
2018	4dsw	28979.78	31526.00	91.92%	
2019	5dsw	505936.62	551137.50	91.80%	-0.53%
2019	4dsw	30137.69	33022.00	91.27%	
2020	5dsw	481333.16	510599.50	94.27%	-0.67%
2020	4dsw	29495.71	31513.00	93.60%	
2021	5dsw	524802.22	575748.50	91.15%	1.52%
2021	4dsw	34239.45	36948.00	92.67%	
2022	5dsw	549157.39	616533.00	89.07%	0.73%
2022	4dsw	38197.84	42535.00	89.80%	
2023	5dsw	567025.97	634512.00	89.36%	0.91%
2023	4dsw	41228.23	45670.00	90.27%	

Note. The red highlighted cells indicate instances where school districts utilizing the 4dsw schedule had a lower attendance rate than school districts utilizing the 5dsw schedule.

Research Question 11 - *What is the difference in attendance between students in school districts utilizing the 4dsw schedule and those utilizing the 5dsw schedule when disaggregated by gender?*

Question 11 Key Points

- ✓ **The differences between attendance rates for students in school districts that utilize the 4dsw schedule and in school districts that utilize the 5dsw schedule are very small for both genders (*D*=.28% for Females and *D*=.43% for Males).**
- ✓ **Prior to the COVID 19 Pandemic (2008-2019), attendance rates for students in school districts that utilize the 5dsw schedule were slightly higher than attendance rates for students in school districts that utilize the 4dsw schedule.**
- ✓ **During and following the COVID 19 Pandemic (2020-2023), attendance rates for students in school districts that utilize the 4dsw schedule were slightly higher than attendance rates for students in school districts that utilize the 5dsw schedule.**

Question 11 Discussion

Calculating total *Days Present* and total *Days Enrolled* at the student level was the most accurate way of accounting for attendance, as opposed to school district attendance percentages, because of the disparity in school district sizes. The days present for all students attending the school districts utilizing the 4dsw and 5dsw schedules were summed. The days enrolled were then summed for the school districts utilizing the 4dsw and 5dsw schedules. The total percent of days enrolled was calculated based on all students in both schedules by gender. A comparison of attendance percentages in these schedules was made.

Attendance rates for both genders were slightly higher for students in school districts that utilize the 5dsw schedule (Allen et al., 2024). Differences (*D*) in attendance rates between school districts that utilize the 5dsw schedule and the 4dsw schedule were evident when desegregated by gender. Female (*D*=.28%), and male (*D*=.43%) students in school districts that utilize the 5dsw schedule had a slightly higher attendance rate (Figure 11.1).

Figure 11.1

Attendance Rates in School Districts That Utilize the 5dsw Schedule and the 4dsw Schedule Disaggregated by Gender

Female						Male					
	Schedule	Days Present	Days Enrolled	Percentage			Schedule	Days Present	Days Enrolled	Percentage	
	5	60,227,054.58	65,118,476.23	92.49%	-0.28%		5	63,520,778.93	68,606,561.04	92.59%	-0.43%
	4	2,671,688.49	2,897,395.50	92.21%			4	2,813,179.06	3,052,455.50	92.16%	
2013	5	3747804.59	4001687.50	93.66%	0.83%	2013	5	3957469.82	4217034.80	93.84%	0.39%
2013	4	42001.52	44454.00	94.48%		2013	4	42003.66	44572.00	94.24%	
2014	5	4434404.60	4718597.00	93.98%	-2.60%	2014	5	4694820.32	4991143.00	94.06%	-2.40%
2014	4	125326.88	137152.50	91.38%		2014	4	122531.94	133678.50	91.66%	
2015	5	5771962.19	6173573.00	93.49%	-1.30%	2015	5	6086234.36	6505368.00	93.56%	-1.22%
2015	4	220248.23	238897.50	92.19%		2015	4	225167.69	243846.00	92.34%	
2016	5	5907921.65	6326316.60	93.39%	-0.46%	2016	5	6254533.16	6694163.90	93.43%	-0.45%
2016	4	253019.35	272287.50	92.92%		2016	4	263460.97	283353.00	92.98%	
2017	5	5981909.51	6429260.50	93.04%	-0.14%	2017	5	6352620.25	6820990.00	93.13%	-0.15%
2017	4	237372.87	255512.00	92.90%		2017	4	249985.91	268837.00	92.99%	
2018	5	6000794.18	6457808.00	92.92%	-0.82%	2018	5	6336900.44	6818984.50	92.93%	-0.86%
2018	4	234833.00	254971.50	92.10%		2018	4	245989.68	267177.50	92.07%	
2019	5	5993547.64	6499099.33	92.22%	0.05%	2019	5	6278796.90	6816672.34	92.11%	-0.40%
2019	4	246499.62	267148.00	92.27%		2019	4	252253.06	275058.00	91.71%	
2020	5	5168882.12	5513866.50	93.74%	0.39%	2020	5	5451641.81	5811671.50	93.81%	0.25%
2020	4	219807.28	233504.00	94.13%		2020	4	238751.41	253829.00	94.06%	
2021	5	5821060.53	6324398.30	92.04%	0.83%	2021	5	6095060.21	6620939.50	92.06%	0.79%
2021	4	336929.62	362810.50	92.87%		2021	4	353960.40	381227.50	92.85%	
2022	5	5718390.69	6381387.50	89.61%	1.22%	2022	5	6014885.12	6689142.50	89.92%	0.84%
2022	4	345637.90	380522.50	90.83%		2022	4	370548.86	408294.00	90.76%	
2023	5	5680376.88	6292482.00	90.27%	0.81%	2023	5	5997816.54	6620451.00	90.60%	0.46%
2023	4	410012.22	450135.50	91.09%		2023	4	448525.48	492583.00	91.06%	

Note. The red highlighted cells indicate instances where school districts utilizing the 4dsw schedule had a lower attendance rate than school districts utilizing the 5dsw schedule.

Research Question 12 - *What is the difference in teacher recruitment and retention between the four-day school week schedule and the five-day school week schedule?*

Question 12 Key Points

- ✓ **From the limited sample obtained, the analysis of the survey data revealed that 83.17% of new teachers indicated a preference for the 4dsw schedule. Because of the limited sample, caution should be used in generalizing this finding to all new teachers.**
- ✓ **Teacher retention (2015-2023) is higher (Range = 6.58% to 18.98%) in school districts that utilize the 5dsw schedule when compared to school districts that utilize the 4dsw schedule.**

Teacher Recruitment

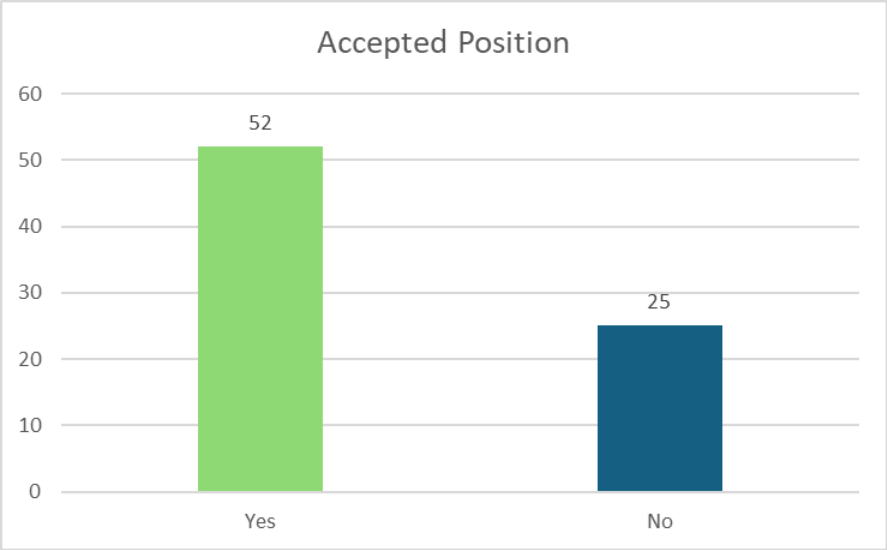
An electronic survey was sent to Montana Professional Education Preparation Program (EPP) completers for the academic years 2023 and 2024. Each EPP administrator was contacted and requested to send a standard invitation containing the survey electronic link to each completer from their institution for the two years under review. Not all EPPs distributed the survey to their completers even though it was anonymous for both the EPP and the participant. Of the 240 surveys that were distributed, 85 surveys were completed (35.42%). Not every participant answered every question.

The survey (Appendix C) was designed in two sections. The first section pertained to completers who have signed an employment contract for the 2024-2025 school year. The second section pertained to completers who had not signed an employment contract for the 2024-2025 school year. Each group of completers responded to multiple-choice questions concerning the 4dsw schedule and their employment decision.

The survey opened with a general question asking the participants if they had accepted a teaching contract in the 2024-2025 school year. Of the 77 participants responding to this question, 52 (67.53%) responded *yes* and 25 (32.47%) responded *no* (Figure 12.1). Depending on participants' response to question number one, they were directed to the appropriate section of the survey (Appendix C).

Figure 12.1

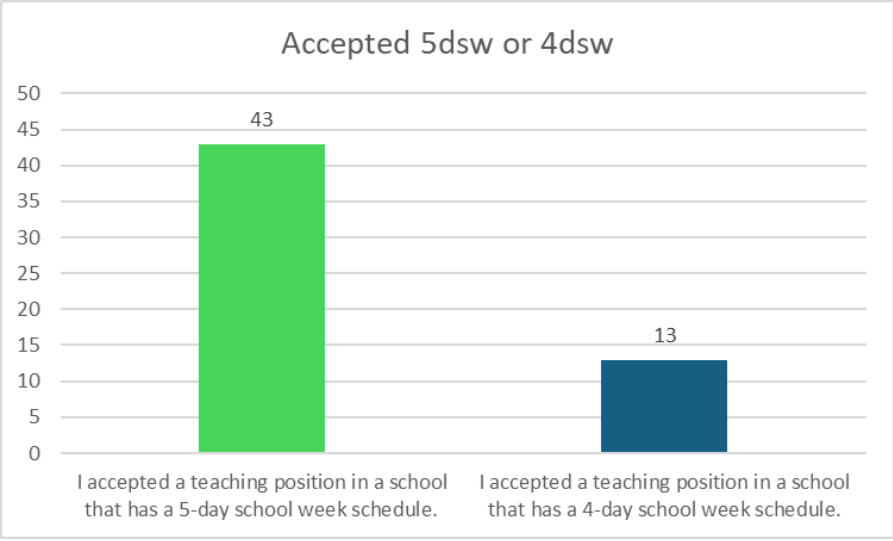
Opening Survey Question Reponses



Survey question number one asked the participants who had accepted a position for the 2024-2025 school year, if the position was in a school district that utilizes the 5dsw schedule or in a school district that utilizes the 4dsw schedule. Of the 56 participants who had accepted a teaching position, 43 (76.79%) responded *5dsw* and 13 (23.21%) responded *4dsw* (Figure 12.2).

Figure 12.2

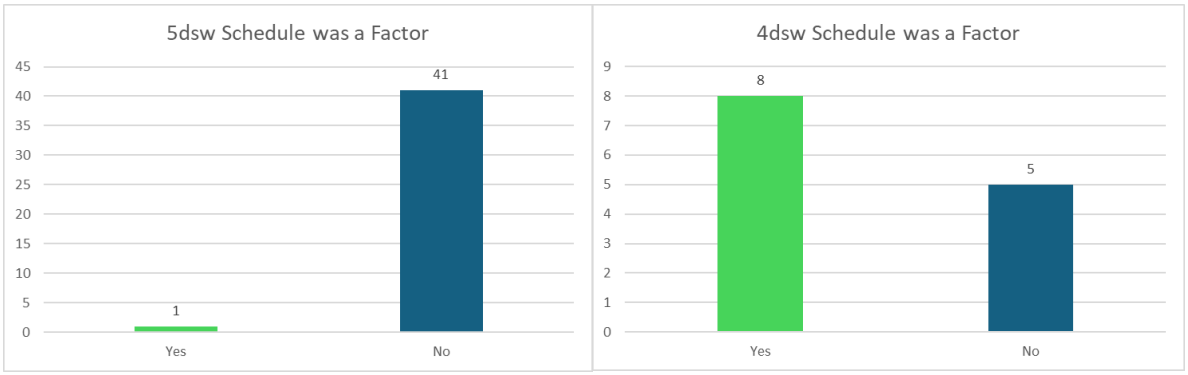
Survey Question Number One Responses



Survey question number two asked the participants who had accepted a position for the 2024-2025 school year, if the number of school days per week was a factor in their decision to accept the position. Of the 42 participants who had accepted a teaching position in a school district that utilizes the 5dsw schedule, 1 (2.38%) responded *yes* and 41 (97.62%) responded *no.* Of the 13 participants who had accepted a teaching position in a school district that utilizes the 4dsw schedule, 8 (61.54%) responded *yes* and 5 (38.46%) responded *no* (Figure 12.3).

Figure 12.3

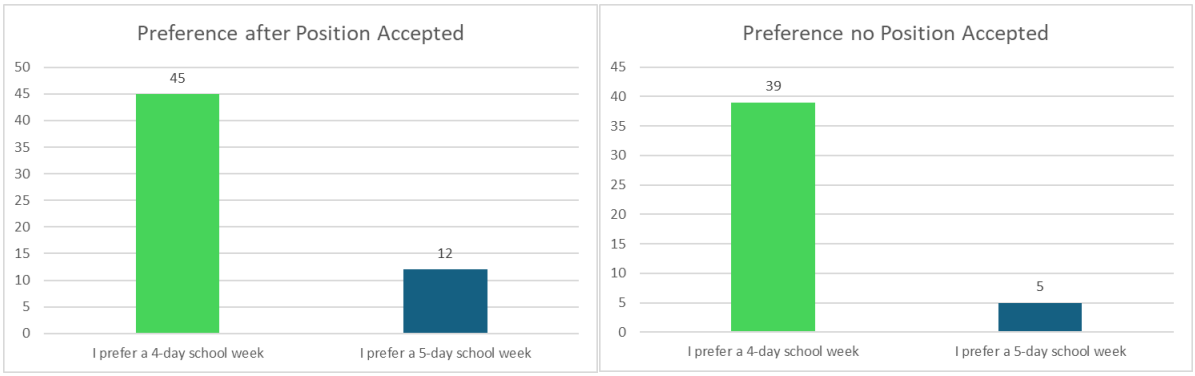
School Schedule as a Factor in Decision to Accept a Teaching Position



Survey question three and question *b* asked the participants if they were offered a teaching contract from two districts with similar salaries, which schedule (5dsw or 4dsw) they would prefer. Among the 101 participants, 84 (83.17%) responded *they prefer a 4dsw schedule* and 17 (16.83%) responded *they prefer a 5dsw schedule.* Of the 57 participants who had accepted a teaching contract, 45 (78.95%) responded *they prefer a 4dsw schedule* and 12 (21.05%) responded *they prefer a 5dsw schedule.* Of the 44 participants who had not accepted a teaching contract, 39 (88.64%) responded *they prefer a 4dsw schedule* and 5 (11.36%) responded *they prefer a 5dsw schedule* (Figure 12.4).

Figure 12.4

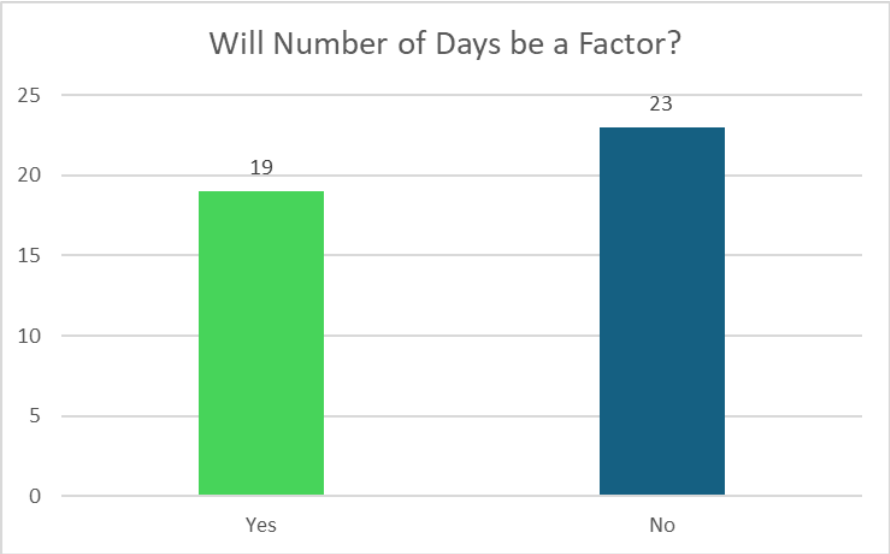
New Teacher School Schedule Preference



Survey question *a* asked the participants who had <u>not</u> accepted a teaching contract for the 2024-2025 school year if the number of school days per week will be a factor in their employment decision. Of the 42 participants who had not accepted a teaching contract, 19 (45.24%) responded *yes* and 23 (54.76%) responded *no* (Figure 12.5).

Figure 12.5

Survey Question Number Eight Reponses



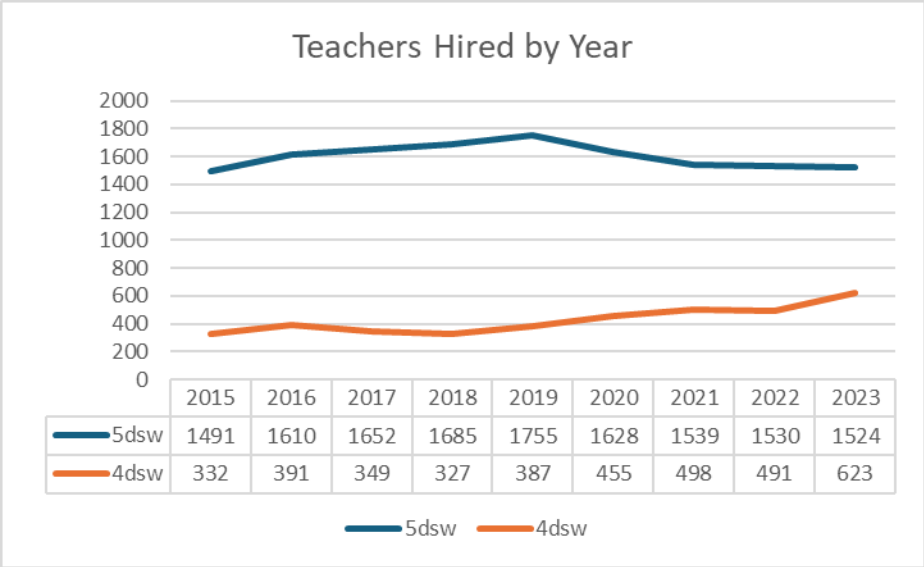
Teacher Retention

The Montana OPI provided annual Terms of Employment, Accreditation, and Master Schedule (TEAMS) Report data for the years 2014-2023. From this dataset, data were organized and analyzed, providing a holistic view of teacher retention in Montana Public Schools for the years 2015-2023. Data from 2014 were used to determine teacher retention in 2015. These data involved 2,637,865 individual cells.

School districts that utilize the 4dsw schedule hired teachers at an increasing rate compared to school districts that utilize the 5dsw schedule. Between the years 2015 and 2023 there was an increase of 291 teachers hired (87.65%) into school districts utilizing 4dsw schedule compared to an increase of 33 teachers hired (2.21%) into school districts that utilize the 5dsw schedule (Figure 12.6). In 2015, 76 school districts utilized the 4dsw schedule, whereas in 2023, 131 school districts utilized the 4dsw schedule.

Figure 12.6

Teachers Hired by Year in School Districts That Utilize the 4dsw Schedule and 5dsw Schedule

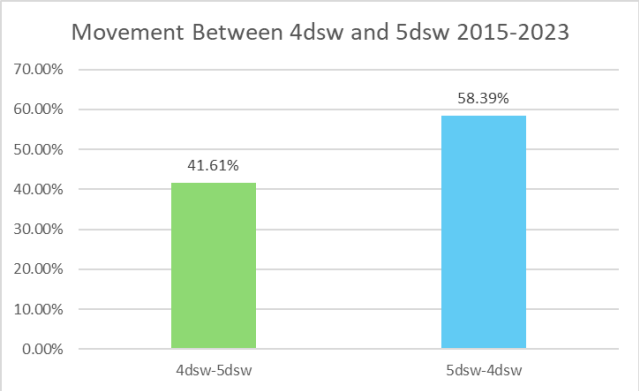


Teacher movement between school districts that utilize the 4dsw schedule and school districts that utilize the 5dsw schedule, and vice versa, were analyzed for each year between 2015-2023. The movement between schools utilizing these differing schedules has increased.

During the years 2014-2023, there were 1269 teachers who moved to school district that utilized a different schedule. Of the 1269 teachers, 528 (41.61%) moved from school districts that utilize the 4dsw schedule to school districts that utilize the 5dsw schedule. Of the 1269 teachers, 741 (58.39%) moved from school districts that utilize the 5dsw schedule to school districts that utilize the 4dsw schedule (Figure 12.7).

Figure 12.7

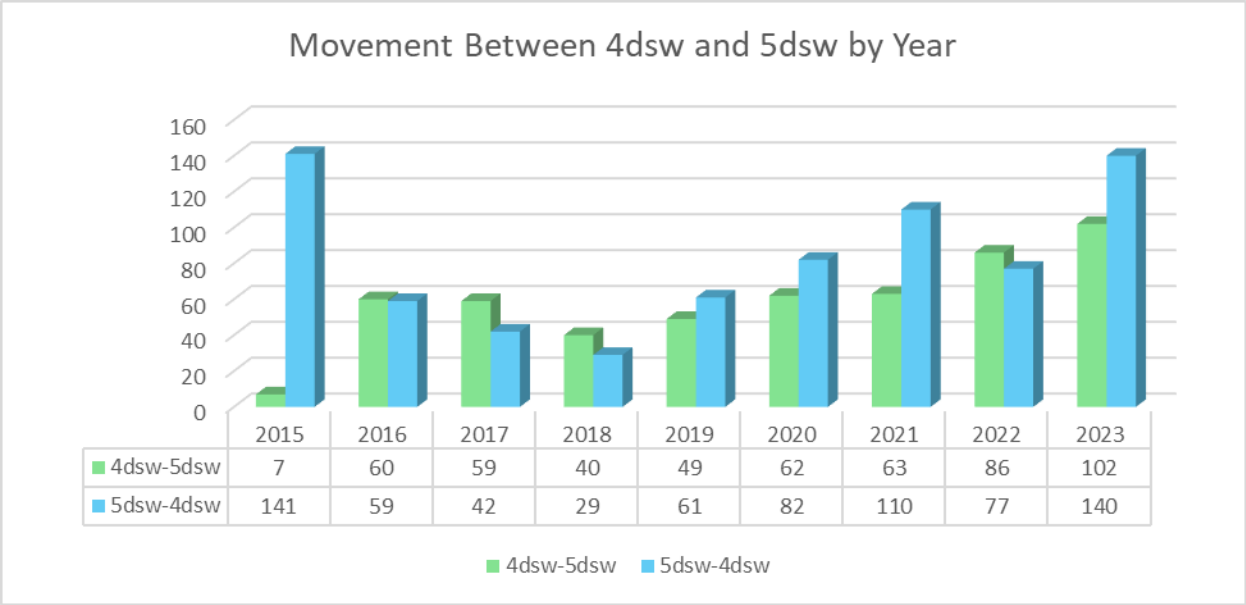
Overall Teacher Movement Between School Districts That Utilize the 4dsw Schedule and 5dsw Schedule



For the years 2015-2023, the rate of teacher movement between school districts that utilize the 4dsw schedule and school districts that utilize the 5dsw schedule, and vice versa, varied by year. In the years 2015, 2019, 2020, 2021, and 2023, more teachers moved from school districts that utilize the 5dsw schedule to school districts that utilize the 4dsw schedule than those who moved from school districts that utilize the 4dsw schedule to school districts that utilize the 5dsw schedule. Conversely, in the years 2016, 2017, 2018, and 2022, more teachers moved from school districts that utilize the 4dsw schedule to school districts that utilize the 5dsw schedule than those who moved from school districts that utilize the 5dsw schedule to school districts that utilize the 4dsw schedule (Figure 12.8).

Figure 12.8

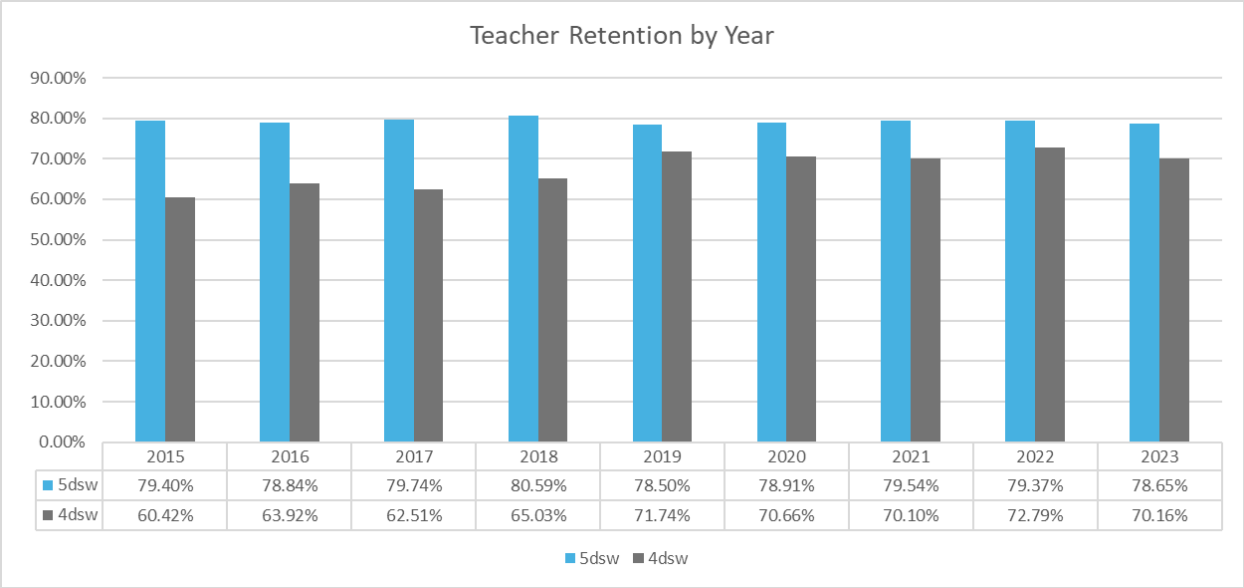
Teacher Movement Between School Districts That Utilize the 4dsw Schedule and the 5dsw Schedule by Year



For the years 2015-2023, teacher retention in school districts that utilize the 5dsw schedule was higher than teacher retention in school districts that utilize the 4dsw schedule. The differences in retention rate range from 18.98% in 2015 to 6.58% in 2022 (Figure 12.9).

Figure 12.9

Teacher Retention Rate in School Districts That Utilize the 4dsw Schedule or the 5dsw Schedule by Year



A confounding variable when studying teacher retention is district size. Large school districts in Montana have a higher rate of teacher retention than small school districts. The differences in retention rate between large and small school districts range from 16.74% in 2021 to 20.05% in 2016 (Figure 12.10).

Figure 12.10

Teacher Retention in Large and Small School Districts

Retention Large and Small Districts									
		2015	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
Large		5932	6108	6285	6278	6187	6233	6365	6412	6245
Small		4060	4167	4343	4356	4254	4303	4373	4394	4298
Large	N	6855	7045	7179	7084	7128	7192	7423	7442	7312
Small	N	5970	6252	6393	6339	6341	6369	6337	6395	6396
Large		86.54%	86.70%	87.55%	88.62%	86.80%	86.67%	85.75%	86.16%	85.41%
Small		68.01%	66.65%	67.93%	68.72%	67.09%	67.56%	69.01%	68.71%	67.20%

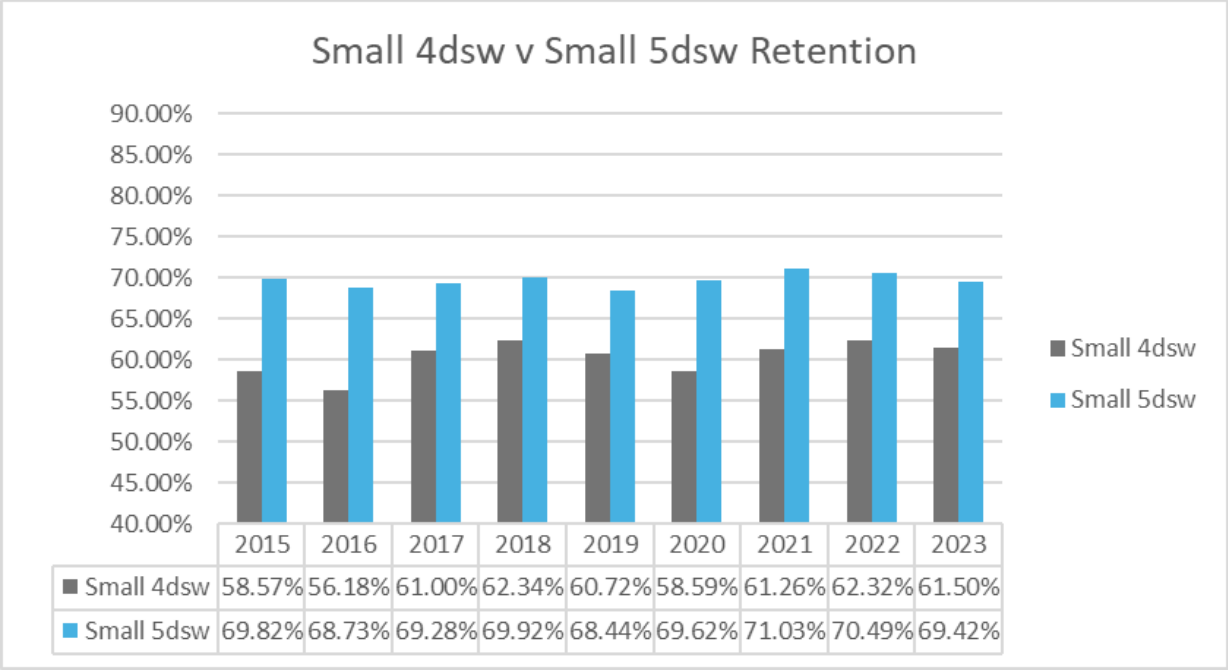
Note. Large school districts were those with greater than 500 ANB. Conversely, small school districts were those with less than 500 ANB.

To address the confounding variable of school size, large school districts were removed from the data set. The teacher retention rates of small school districts that utilize the 4dsw schedule were compared with teacher retention rates for school districts that utilize the 5dsw

schedule. For the years 2015-2023, teacher retention rates in small school districts that utilize the 5dsw schedule were higher than teacher retention rates in school districts that utilize the 4dsw schedule. The differences in retention rate range from 7.59% in 2018 to 12.55% in 2016 (Figure 12.11).

Figure 12.11

Teacher Retention Rate in Small School Districts That Utilize the 4dsw Schedule or the 5dsw Schedule by Year



	2015	2016	2017	2018	2019	2020	2021	2022	2023
Small 4dsw	58.57%	56.18%	61.00%	62.34%	60.72%	58.59%	61.26%	62.32%	61.50%
Small 5dsw	69.82%	68.73%	69.28%	69.92%	68.44%	69.62%	71.03%	70.49%	69.42%

Overall, in Montana, 72.04% of teachers are female and 27.96% are male during the years 2015-2023. In school districts that utilize the 4dsw schedule, the distribution is similar with 71.70% female teachers and 28.30% male teachers. Likewise, in school districts that utilize the 5dsw schedule, the distribution is similar with 72.20% female teachers and 27.80% male teachers (Figure 12.12).

Figure 12.12

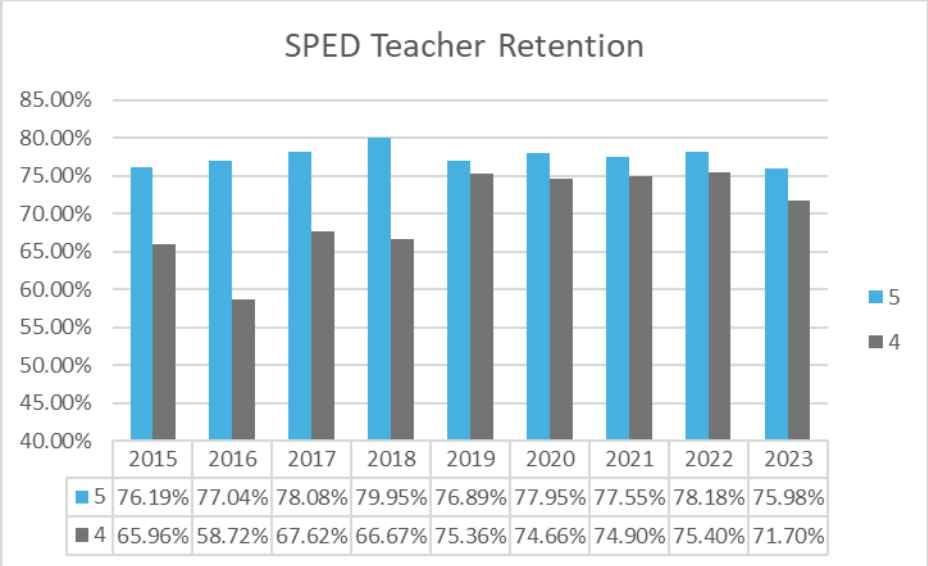
Teacher Gender Distribution in School Districts That Utilize the 4dsw Schedule, and in School Districts That Utilize the 5dsw Schedule

		Gender									
		2015	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	
N	F	9079	9418	9680	9642	9739	9852	10021	10045	9705	72.04%
N	M	3659	3822	3851	3792	3789	3763	3775	3765	3621	27.96%
4dsw	F	747	946	827	798	1353	1426	1620	1734	1887	71.70%
4dsw	M	300	459	341	336	513	529	622	668	707	28.30%
5dsw	F	8179	8304	8690	8685	8226	8267	8245	8156	7663	72.20%
5dsw	M	3278	3280	3423	3367	3183	3154	3087	3028	2850	27.80%

For the years 2015-2023, Special Education (SPED) teacher retention rates in school districts that utilize the 5dsw schedule were higher than SPED teacher retention rates in school districts that utilize the 4dsw schedule. The differences in retention rate range from 1.53% in 2019 to 18.32% in 2016 (Figure 12.13).

Figure 12.13

Special Education Teacher Retention Rates in School Districts That Utilize the 4dsw Schedule and the 5dsw Schedule



	2015	2016	2017	2018	2019	2020	2021	2022	2023
5	76.19%	77.04%	78.08%	79.95%	76.89%	77.95%	77.55%	78.18%	75.98%
4	65.96%	58.72%	67.62%	66.67%	75.36%	74.66%	74.90%	75.40%	71.70%

CONCLUSIONS AND RECOMMENDATIONS

Irving (2023) noted that policymakers have raised concerns about whether the 4dsw delivers the same educational quality as the traditional 5dsw. With an increasing number of school districts adopting the 4dsw schedule, these concerns are paramount in Montana's educational spectrum. It is crucial for both local and state policymakers to understand the impact of the 4dsw schedule on educational outcomes. Policy decisions regarding school schedules should be informed by empirical evidence, guided by the research questions in Allen et al. (2024) and the research questions addressed in this study.

The longitudinal analysis in this study, covering the period from 2008 to 2023, focused on Ethnicity, Gender, and Teacher Recruitment and Retention, revealed troubling trends for Montana's education system. Data from this focused study continued to indicate that the 4dsw schedule has not been advantageous for the vast majority of students in the state.

While many school districts are choosing the 4dsw schedule in order to attract teachers, and new teachers have indicated a preference for the 4dsw schedule, school districts that utilize the 4dsw schedule have experienced notably lower teacher retention rates. Teachers are attracted to the 4dsw schedule, but they are not being retained at the same rate as teachers in schools utilizing the 5dsw schedule.

While the issues originate at the local level, addressing them will require action at the state level. The authors of this study continue to recommend the revision of 20-1-301 MCA to mandate 180 school days.

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Appendix A

Reading Proficiency Desegregated by Gender and Year

3rd Grade						
		Male	%	Female	%	M-F
2008	4	77.42%	-2.38%	79.41%	-6.72%	-1.99%
2008	5	79.80%		86.13%		-6.33%
2009	4	69.77%	-11.94%	90.24%	5.00%	-20.48%
2009	5	81.71%		85.24%		-3.53%
2010	4	79.49%	-1.73%	88.31%	1.91%	-8.82%
2010	5	81.22%		86.40%		-5.18%
2011	4	74.36%	-7.79%	88.10%	1.75%	-13.74%
2011	5	82.15%		86.35%		-4.20%
2012	4	78.79%	-2.16%	78.43%	-7.05%	0.36%
2012	5	80.95%		85.48%		-4.53%
2013	4	71.26%	-10.65%	79.07%	-7.33%	-7.81%
2013	5	81.90%		86.40%		-4.50%
2016	4	34.71%	-9.24%	43.46%	-7.61%	-8.75%
2016	5	43.95%		51.08%		-7.12%
2017	4	35.16%	-6.69%	46.46%	-3.66%	-11.29%
2017	5	41.86%		50.12%		-8.26%
2018	4	36.23%	-8.38%	46.77%	-4.58%	-10.54%
2018	5	44.61%		51.35%		-6.75%
2019	4	37.40%	-5.89%	46.31%	-5.13%	-8.91%
2019	5	43.29%		51.45%		-8.15%
2021	4	32.97%	-6.76%	46.15%	-0.46%	-13.19%
2021	5	39.73%		46.62%		-6.89%
2022	4	37.41%	-3.48%	41.21%	-5.21%	-3.80%
2022	5	40.88%		46.42%		-5.53%
2023	4	35.16%	-5.37%	42.58%	-2.49%	-7.42%
2023	5	40.53%		45.07%		-4.54%

4th Grade						
		Male	%	Female	%	M-F
2008	4	79.17%	3.81%	77.42%	-2.64%	1.75%
2008	5	75.35%		80.06%		-4.71%
2009	4	70.45%	-7.14%	70.59%	-12.59%	-0.13%
2009	5	77.59%		83.18%		-5.59%
2010	4	70.93%	-9.07%	83.61%	-0.71%	-12.68%
2010	5	80.00%		84.32%		-4.32%
2011	4	78.72%	-0.46%	88.41%	3.97%	-9.68%
2011	5	79.18%		84.44%		-5.25%
2012	4	70.80%	-11.59%	73.84%	-11.99%	-3.03%
2012	5	82.39%		85.83%		-3.44%
2013	4	76.23%	-3.05%	81.40%	-2.59%	-5.18%
2013	5	79.28%		83.99%		-4.71%
2016	4	34.64%	-9.45%	44.31%	-8.29%	-9.67%
2016	5	44.10%		52.60%		-8.51%
2017	4	34.33%	-7.66%	41.18%	-9.17%	-6.84%
2017	5	41.99%		50.35%		-8.36%
2018	4	32.73%	-10.92%	41.77%	-11.09%	-9.03%
2018	5	43.65%		52.85%		-9.20%
2019	4	38.21%	-4.20%	43.80%	-6.76%	-5.58%
2019	5	42.41%		50.55%		-8.14%
2021	4	35.88%	-7.75%	47.14%	-0.20%	-11.26%
2021	5	43.63%		47.34%		-3.72%
2022	4	33.49%	-10.02%	43.19%	-4.60%	-9.70%
2022	5	43.52%		47.80%		-4.28%
2023	4	38.03%	-6.09%	42.76%	-5.19%	-4.72%
2023	5	44.13%		47.94%		-3.82%

5th Grade						
		Male	%	Female	%	M-F
2008	4	65.79%	-11.29%	93.10%	9.17%	-27.31%
2008	5	77.08%		83.93%		-6.85%
2009	4	79.49%	-0.84%	84.62%	-0.96%	-5.13%
2009	5	80.33%		85.58%		-5.25%
2010	4	78.48%	-4.73%	89.77%	2.13%	-11.29%
2010	5	83.21%		87.64%		-4.43%
2011	4	82.05%	-1.29%	87.95%	-0.89%	-5.90%
2011	5	83.35%		88.84%		-5.50%
2012	4	75.16%	-9.30%	85.71%	-3.65%	-10.56%
2012	5	84.45%		89.36%		-4.91%
2013	4	77.08%	-4.95%	78.68%	-8.51%	-1.60%
2013	5	82.03%		87.19%		-5.16%
2016	4	38.58%	-3.61%	53.61%	-0.49%	-15.04%
2016	5	42.19%		54.10%		-11.92%
2017	4	33.91%	-10.66%	42.25%	-13.88%	-8.34%
2017	5	44.57%		56.13%		-11.56%
2018	4	35.84%	-11.23%	49.11%	-8.76%	-13.27%
2018	5	47.07%		57.87%		-10.80%
2019	4	36.11%	-12.76%	50.57%	-6.30%	-14.46%
2019	5	48.87%		56.88%		-8.01%
2021	4	37.39%	-6.15%	45.71%	-4.04%	-8.32%
2021	5	43.54%		49.76%		-6.21%
2022	4	36.68%	-7.70%	48.56%	-0.68%	-11.88%
2022	5	44.39%		49.25%		-4.86%
2023	4	34.46%	-7.23%	44.76%	-3.30%	-10.29%
2023	5	41.69%		48.06%		-6.37%

6th Grade						
		Male	%	Female	%	M-F
2008	4	83.33%	3.68%	80.00%	-5.61%	3.33%
2008	5	79.66%		85.61%		-5.96%
2009	4	74.51%	-5.69%	72.73%	-14.24%	1.78%
2009	5	80.20%		86.97%		-6.77%
2010	4	76.81%	-5.97%	89.04%	1.29%	-12.23%
2010	5	82.78%		87.75%		-4.97%
2011	4	84.21%	0.75%	84.52%	-4.77%	-0.31%
2011	5	83.46%		89.29%		-5.83%
2012	4	69.66%	-15.57%	91.10%	0.13%	-21.44%
2012	5	85.22%		90.97%		-5.75%
2013	4	74.89%	-6.73%	84.88%	-3.46%	-9.99%
2013	5	81.62%		88.34%		-6.72%
2016	4	39.17%	-4.45%	51.70%	-6.72%	-12.53%
2016	5	43.61%		58.42%		-14.80%
2017	4	33.19%	-7.21%	53.33%	-1.85%	-20.15%
2017	5	40.39%		55.19%		-14.79%
2018	4	33.21%	-10.52%	48.22%	-8.43%	-15.01%
2018	5	43.73%		56.65%		-12.92%
2019	4	41.72%	-2.26%	49.47%	-7.37%	-7.75%
2019	5	43.99%		56.84%		-12.86%
2021	4	39.94%	-1.69%	50.00%	1.22%	-10.06%
2021	5	41.63%		48.78%		-7.14%
2022	4	39.45%	-2.59%	46.80%	-1.20%	-7.35%
2022	5	42.05%		48.00%		-5.95%
2023	4	37.80%	-3.71%	44.56%	-3.22%	-6.76%
2023	5	41.51%		47.78%		-6.27%

7th Grade							8th Grade						
		Male	%	Female	%	M-F			Male	%	Female	%	M-F
2008	4	85.19%	**6.25%**	88.89%	**4.17%**	-3.70%	2008	4	73.17%	**-2.95%**	80.56%	**-3.70%**	-7.38%
2008	5	78.93%		84.72%		-5.78%	2008	5	76.12%		84.26%		-8.14%
2009	4	88.89%	**10.52%**	78.79%	**-7.01%**	10.10%	2009	4	73.68%	**-1.97%**	78.05%	**-6.08%**	-4.36%
2009	5	78.37%		85.80%		-7.42%	2009	5	75.66%		84.13%		-8.47%
2010	4	76.47%	**-3.31%**	82.76%	**-3.27%**	-6.29%	2010	4	79.31%	**-0.46%**	82.35%	**-4.20%**	-3.04%
2010	5	79.78%		86.03%		-6.24%	2010	5	79.77%		86.56%		-6.78%
2011	4	66.67%	**-14.51%**	79.45%	**-8.66%**	-12.79%	2011	4	74.71%	**-4.32%**	86.21%	**-0.96%**	-11.49%
2011	5	81.18%		88.11%		-6.93%	2011	5	79.04%		87.17%		-8.13%
2012	4	78.75%	**-6.54%**	83.02%	**-8.57%**	-4.27%	2012	4	65.41%	**-17.43%**	84.62%	**-4.81%**	-19.20%
2012	5	85.29%		91.59%		-6.30%	2012	5	82.84%		89.42%		-6.58%
2013	4	67.45%	**-11.06%**	79.91%	**-6.75%**	-12.46%	2013	4	70.12%	**-8.67%**	80.77%	**-5.71%**	-10.64%
2013	5	78.51%		86.66%		-8.15%	2013	5	78.79%		86.48%		-7.69%
2016	4	34.24%	**-9.74%**	50.21%	**-9.31%**	-15.97%	2016	4	39.85%	**-2.50%**	53.05%	**-4.97%**	-13.20%
2016	5	43.98%		59.52%		-15.54%	2016	5	42.35%		58.02%		-15.67%
2017	4	34.82%	**-10.15%**	45.76%	**-14.32%**	-10.94%	2017	4	26.64%	**-11.97%**	46.15%	**-10.57%**	-19.51%
2017	5	44.97%		60.08%		-15.11%	2017	5	38.61%		56.73%		-18.12%
2018	4	33.02%	**-9.59%**	52.21%	**-6.45%**	-19.19%	2018	4	31.93%	**-7.28%**	51.00%	**-6.06%**	-19.07%
2018	5	42.62%		58.66%		-16.04%	2018	5	39.21%		57.06%		-17.85%
2019	4	33.58%	**-10.26%**	47.58%	**-11.72%**	-14.00%	2019	4	21.93%	**-16.49%**	51.18%	**-4.24%**	-29.25%
2019	5	43.84%		59.30%		-15.46%	2019	5	38.42%		55.42%		-17.00%
2021	4	40.67%	**-1.24%**	47.84%	**-2.90%**	-7.17%	2021	4	37.10%	**-4.53%**	50.99%	**-2.33%**	-13.89%
2021	5	41.91%		50.74%		-8.83%	2021	5	41.63%		53.32%		-11.69%
2022	4	41.30%	**-1.44%**	48.79%	**-2.34%**	-7.49%	2022	4	36.15%	**-4.42%**	48.58%	**-0.58%**	-12.43%
2022	5	42.74%		51.14%		-8.39%	2022	5	40.58%		49.16%		-8.58%
2023	4	33.48%	**-7.15%**	40.87%	**-7.04%**	-7.39%	2023	4	36.62%	**-3.38%**	49.66%	**-0.10%**	-13.04%
2023	5	40.64%		47.91%		-7.27%	2023	5	40.01%		49.75%		-9.75%

Note. The Male and Female columns represent the percent of students proficient. The Percent (%) columns represent the difference between students in school districts that utilize the 5dsw schedule and students in school districts that utilize the 4dsw schedule. The M-F column represents the percentage difference when female students are subtracted from male students. A negative number indicates an instance where females outperformed males. The red color denotes instances where students in school districts that utilize the 5dsw schedule had a higher level of proficiency than students in school districts that utilize the 4dsw schedule. The yellow color in column M-F denotes instances where female students outperformed male students in Reading.

Appendix B

Math Proficiency Desegregated by Gender and Year

3rd Grade						
		Male	%	Female	%	M-F
2008	4	61.29%	-1.73%	38.24%	-22.83%	23.06%
2008	5	63.02%		61.06%		1.96%
2009	4	41.86%	-24.92%	48.78%	-16.50%	-6.92%
2009	5	66.78%		65.28%		1.51%
2010	4	51.28%	-16.40%	53.25%	-14.65%	-1.96%
2010	5	67.68%		67.90%		-0.22%
2011	4	58.97%	-11.12%	63.10%	-4.34%	-4.12%
2011	5	70.09%		67.43%		2.66%
2012	4	62.88%	-8.37%	53.59%	-16.70%	9.28%
2012	5	71.25%		70.30%		0.95%
2013	4	56.28%	-12.70%	53.88%	-14.55%	2.40%
2013	5	68.98%		68.42%		0.55%
2016	4	38.83%	-11.75%	39.01%	-8.38%	-0.17%
2016	5	50.59%		47.39%		3.20%
2017	4	41.24%	-6.18%	36.08%	-9.68%	5.16%
2017	5	47.42%		45.76%		1.66%
2018	4	38.17%	-10.70%	39.62%	-7.24%	-1.45%
2018	5	48.87%		46.86%		2.01%
2019	4	37.05%	-12.02%	36.73%	-9.78%	0.32%
2019	5	49.07%		46.52%		2.55%
2021	4	36.94%	-8.99%	40.90%	0.76%	-3.95%
2021	5	45.93%		40.13%		5.80%
2022	4	40.73%	-5.57%	36.05%	-5.85%	4.68%
2022	5	46.30%		41.90%		4.40%
2023	4	43.67%	-4.26%	40.13%	-1.19%	3.54%
2023	5	47.94%		41.32%		6.61%

4th Grade						
		Male	%	Female	%	M-F
2008	4	75.00%	8.90%	64.52%	0.02%	10.48%
2008	5	66.10%		64.49%		1.60%
2009	4	54.55%	-11.73%	58.82%	-6.43%	-4.28%
2009	5	66.28%		65.26%		1.02%
2010	4	58.14%	-9.50%	68.85%	1.00%	-10.71%
2010	5	67.64%		67.86%		-0.21%
2011	4	62.77%	-5.88%	59.42%	-9.60%	3.35%
2011	5	68.64%		69.02%		-0.38%
2012	4	50.36%	-17.40%	58.14%	-9.56%	-7.77%
2012	5	67.76%		67.70%		0.06%
2013	4	61.07%	-5.85%	60.74%	-5.30%	0.32%
2013	5	66.92%		66.05%		0.87%
2016	4	31.48%	-14.29%	31.37%	-9.80%	0.10%
2016	5	45.76%		41.17%		4.59%
2017	4	36.09%	-8.94%	29.67%	-12.68%	6.42%
2017	5	45.03%		42.35%		2.68%
2018	4	34.64%	-11.34%	32.66%	-8.50%	1.98%
2018	5	45.99%		41.16%		4.83%
2019	4	35.51%	-10.68%	34.80%	-8.19%	0.71%
2019	5	46.19%		42.99%		3.20%
2021	4	36.42%	-5.90%	36.26%	0.65%	0.15%
2021	5	42.31%		35.62%		6.70%
2022	4	35.32%	-9.49%	36.32%	-1.15%	-0.99%
2022	5	44.81%		37.46%		7.34%
2023	4	43.10%	-4.45%	35.90%	-4.93%	7.21%
2023	5	47.55%		40.83%		6.72%

5th Grade						
		Male	%	Female	%	M-F
2008	4	57.89%	-7.93%	58.62%	-7.91%	-0.73%
2008	5	65.82%		66.53%		-0.70%
2009	4	51.28%	-15.20%	46.15%	-18.93%	5.13%
2009	5	66.48%		65.08%		1.40%
2010	4	55.70%	-12.87%	65.91%	-3.97%	-10.21%
2010	5	68.56%		69.88%		-1.32%
2011	4	66.67%	-4.08%	59.04%	-11.60%	7.63%
2011	5	70.74%		70.63%		0.11%
2012	4	60.87%	-10.87%	63.03%	-8.72%	-2.16%
2012	5	71.74%		71.75%		-0.01%
2013	4	59.58%	-9.15%	58.53%	-11.38%	1.06%
2013	5	68.74%		69.90%		-1.17%
2016	4	29.21%	-8.49%	31.30%	-2.94%	-2.08%
2016	5	37.70%		34.24%		3.46%
2017	4	23.18%	-17.82%	24.23%	-13.17%	-1.05%
2017	5	41.00%		37.40%		3.60%
2018	4	28.08%	-12.40%	30.25%	-7.59%	-2.17%
2018	5	40.48%		37.83%		2.65%
2019	4	27.72%	-13.53%	29.89%	-8.24%	-2.17%
2019	5	41.25%		38.12%		3.13%
2021	4	31.16%	-2.38%	24.36%	-4.65%	6.80%
2021	5	33.54%		29.01%		4.53%
2022	4	29.72%	-6.42%	31.25%	1.42%	-1.53%
2022	5	36.14%		29.83%		6.31%
2023	4	27.16%	-10.48%	27.59%	-1.25%	-0.44%
2023	5	37.63%		28.84%		8.79%

6th Grade						
		Male	%	Female	%	M-F
2008	4	70.00%	7.86%	57.14%	-4.37%	12.86%
2008	5	62.14%		61.52%		0.62%
2009	4	52.94%	-10.10%	51.52%	-12.13%	1.43%
2009	5	63.05%		63.65%		-0.60%
2010	4	59.42%	-7.35%	63.01%	-4.66%	-3.59%
2010	5	66.77%		67.67%		-0.90%
2011	4	55.26%	-10.34%	60.71%	-4.00%	-5.45%
2011	5	65.60%		64.72%		0.88%
2012	4	57.93%	-10.49%	62.33%	-4.69%	-4.40%
2012	5	68.42%		67.02%		1.40%
2013	4	56.71%	-7.34%	52.68%	-10.47%	4.03%
2013	5	64.05%		63.15%		0.90%
2016	4	34.44%	-3.16%	35.15%	-4.56%	-0.71%
2016	5	37.60%		39.71%		-2.11%
2017	4	29.26%	-7.05%	37.94%	0.08%	-8.69%
2017	5	36.30%		37.87%		-1.56%
2018	4	28.73%	-8.77%	28.57%	-10.94%	0.16%
2018	5	37.50%		39.51%		-2.01%
2019	4	33.68%	-3.60%	31.34%	-7.51%	2.34%
2019	5	37.28%		38.85%		-1.57%
2021	4	35.60%	4.14%	31.92%	2.93%	3.68%
2021	5	31.46%		28.99%		2.47%
2022	4	31.08%	-2.29%	22.73%	-7.67%	8.35%
2022	5	33.37%		30.40%		2.97%
2023	4	34.44%	-1.04%	33.96%	3.47%	0.47%
2023	5	35.48%		30.49%		4.99%

7th Grade						
		Male	%	Female	%	M-F
2008	4	74.07%	**9.18%**	66.67%	**1.05%**	7.41%
2008	5	64.90%		65.61%		-0.72%
2009	4	80.00%	**14.81%**	54.55%	**-9.61%**	25.45%
2009	5	65.19%		64.16%		1.04%
2010	4	64.71%	**-0.27%**	62.07%	**-5.00%**	2.64%
2010	5	64.97%		67.07%		-2.10%
2011	4	48.81%	**-18.19%**	67.12%	**-1.99%**	-18.31%
2011	5	67.00%		69.12%		-2.12%
2012	4	43.75%	**-20.78%**	45.28%	**-22.59%**	-1.53%
2012	5	64.53%		67.87%		-3.35%
2013	4	58.96%	**-8.98%**	62.10%	**-7.01%**	-3.14%
2013	5	67.94%		69.11%		-1.16%
2016	4	37.35%	**-2.02%**	31.93%	**-8.52%**	5.42%
2016	5	39.37%		40.46%		-1.09%
2017	4	30.74%	**-8.81%**	33.70%	**-5.65%**	-2.97%
2017	5	39.55%		39.35%		0.20%
2018	4	31.55%	**-5.26%**	37.17%	**-1.53%**	-5.61%
2018	5	36.82%		38.70%		-1.88%
2019	4	29.00%	**-12.06%**	29.03%	**-11.53%**	-0.04%
2019	5	41.05%		40.56%		0.49%
2021	4	30.59%	**-4.85%**	29.71%	**-2.41%**	0.88%
2021	5	35.44%		32.12%		3.32%
2022	4	35.16%	**-1.44%**	33.69%	**1.72%**	1.46%
2022	5	36.60%		31.97%		4.63%
2023	4	30.82%	**-5.64%**	21.70%	**-10.25%**	9.12%
2023	5	36.46%		31.95%		4.51%

8th Grade						
		Male	%	Female	%	M-F
2008	4	63.41%	**5.60%**	52.78%	**-5.40%**	10.64%
2008	5	57.81%		58.17%		-0.36%
2009	4	65.79%	**6.55%**	60.98%	**2.17%**	4.81%
2009	5	59.24%		58.81%		0.43%
2010	4	62.07%	**-2.79%**	45.59%	**-19.75%**	16.48%
2010	5	64.86%		65.34%		-0.48%
2011	4	55.17%	**-8.22%**	60.34%	**-4.58%**	-5.17%
2011	5	63.39%		64.93%		-1.54%
2012	4	42.86%	**-20.39%**	47.69%	**-16.81%**	-4.84%
2012	5	63.25%		64.51%		-1.26%
2013	4	44.81%	**-15.38%**	55.56%	**-8.17%**	-10.74%
2013	5	60.20%		63.73%		-3.54%
2016	4	26.36%	**-7.49%**	29.14%	**-7.45%**	-2.78%
2016	5	33.85%		36.58%		-2.74%
2017	4	23.27%	**-9.81%**	27.35%	**-10.20%**	-4.09%
2017	5	33.07%		37.55%		-4.48%
2018	4	27.73%	**-6.66%**	33.62%	**-4.57%**	-5.89%
2018	5	34.39%		38.18%		-3.79%
2019	4	23.79%	**-9.94%**	29.20%	**-8.19%**	-5.41%
2019	5	33.73%		37.39%		-3.66%
2021	4	27.42%	**-3.11%**	27.78%	**-3.07%**	-0.36%
2021	5	30.53%		30.84%		-0.31%
2022	4	26.15%	**-4.50%**	27.30%	**-1.42%**	-1.15%
2022	5	30.65%		28.72%		1.93%
2023	4	29.65%	**-2.09%**	29.66%	**-1.22%**	-0.01%
2023	5	31.74%		30.87%		0.87%

Note. The Male and Female columns represent the percent of students proficient. The Percent (%) columns represent the difference between students in school districts that utilize the 5dsw schedule and students in school districts that utilize the 4dsw schedule. The M-F column represents the percentage difference when female students are subtracted from male students. A negative number indicates an instance where females outperformed males. The red color denotes instances where students in school districts that utilize the 5dsw schedule had a higher level of proficiency than students in school districts that utilize the 4dsw schedule. The yellow color in column M-F denotes instances where female students outperformed male students in Math.

Appendix C

Teacher Preparation Program Completer Survey

Have you signed an employment contract for the 2024-2025 school year?

- ☐ Yes (if yes then answer 1, 2, & 3)
- ☐ No (if no then answer a & b)

1. Which statement best describes you?

- ☐ I accepted a teaching position in a school that has a 5-day school week.
- ☐ I accepted a teaching position in a school that has a 4-day school week.

2. Was the number of school days per week a factor in your decision to accept the position?

- ☐ Yes
- ☐ No

3. If you were offered a teaching contract from two districts with similar salaries, which statement would best describe your choice?
   I prefer a 5-day school week.
   I prefer a 4-day school week.

a. If you have not accepted a position, will the number of school days per week be a factor in your employment decision?
   Yes
   No

b. If you were offered a teaching contract from two districts with similar salaries, which statement would best describe your choice?
   I prefer a 5-day school week.
   I prefer a 4-day school week.