



Analysis of Student Learning:

Effect of Student Location Within a Classroom, and Gender on Student Learning

Abstract:

In order to better examine how effective my teaching strategies have been during my student experience at Willmar Senior High School, I conducted an analysis of student learning in my ninth grade Accelerated Physical Science class. The physical nature of the classroom is prohibitive of easy circulation among the students, particularly those in the back of the room. For this reason I conducted an investigation that collected and processed data that would indicate if a student's location relative to the front of the classroom would influence their learning. I also gathered data on whether the gender of the student influenced their learning being that I am a male teaching a stereotypically male dominant subject, science. I believed that a student's gender would not play a significant role in influencing learning, but I did hypothesize that students' performance would decrease with greater distance from the front of the room. By conducting a pre- and post- examination, I was able to gather data to test my hypothesis. Females and males showed average score improvements of 3.9 pts and 4.3 pts respectively, while the front two rows displayed an average score improvement of 4.6 pts compared to 3.6 pts from the back row. These data support my hypothesis.

Introduction:

I have been student teaching at the Willmar Senior High School for approximately six weeks now. I have been with my current set of students for approximately four weeks. The class that was used for my analysis of students learning (ASL) was my first block, ninth grade Accelerated Physical Science class. The class is composed of thirty-three students, seventeen males and sixteen females. The grade book software was used to assign students their seats by generating a randomly assigned seating chart. The students were seated at tables of two that were arranged into three rows of eight and one row of nine, as shown in diagram #1 below.

Diagram #1: SEATING CHART & STUDENT IDENTIFICATION

	1D (f)	2D (m)	3D (f)	4D (f)	5D (m)	6D (f)	7D (m)	8D (m)
	1C (f)	2C (f)	3C (f)	4C (m)	5C (m)	6C (f)	7C (f)	8C (m)
1B (m)	2B (m)	3B (m)	4B (m)	5B (m)	6B (m)	7B (m)	8B (m)	9B (f)
	1A (f)	2A (f)	3A (f)	4A (f)	5A (f)	6A (f)	7A (m)	8A (m)

FRONT/BOARD

Letter in () indicates gender

Diagram #1 shows the view from the front of the classroom. The diagram also identifies each student with respect to location. Each row is assigned a letter, starting with 'A' in the front and ending with 'D' in the back. Within each row, every student is numbered from right to left, and given a letter to indicate location (ex- 3A is the 3rd student in row A). The first sub group I wanted to study was based on these rows. By dividing the class into the front two rows, 'A' and 'B', and the back two rows, 'C' and 'D', I was able to investigate the effect location had on student learning. These rows were placed rather close together, and were confined on either side by the wall on the right and the lab area on the left. The thirty-third student had to be placed on an extra table on the left that further restricted my ability to move amongst the students. The physical setting of the room, and the fact that the board, which is very instrumental to many of my lessons, is located at the front of the room, inhibited my movement throughout the room. These factors combined to allow me to have much more interaction with the students in the front of the classroom than those in the back. This was a factor when asking the class questions as a whole and when trying to answer individual student questions. I felt that the relationship that was being developed with the students in the first two rows appeared to be progressing very well, and at a much a must faster rate than what was being developed with those in the back of the class. I had an inclination that this could be an issue as I began to work my way into the full time teacher role.

Diagram #1 also displays what gender each student was. Gender became the second sub group for my investigation. When observing males vs. females, gender alone was used; it was observed independent of location and other variables. Because science has a stigma as being a male dominated subject, and my being a male, I felt that it would be interesting to test this idea within my science classroom. There were sixteen females and seventeen males represented in this class, which made for very even test groups and eliminated another variable that would be created if the class was dominated by one gender. It should also be noted that the number of males, ten in the front two rows and seven in the back two rows compared to seven and nine females in the front and back, is slightly concentrated in the front of the room. This should be a relatively accurate test of my ability to successfully teach to both genders.

Methods and Procedures:

In order to test my ability to effectively teach, I presented the class with a pre-test. The pre-test was administered prior to covering any material for the chapter. This pre-test provided me with information on the prior knowledge that the class had on the information in the chapter

that we were to cover. This also provided me with a baseline for which to gauge their proficiency with the information that they would gain through my teaching. I then administered a post-test that I could compare with the pre-test. Both tests were the same. They each had fifteen questions, and were made up of the same questions and answers, in order to eliminate introducing any variables that would skew what I was testing. The questions that were chosen were all multiple choice or multiple-choice questions, to, again, avoid any ambiguity in the scoring. The questions were selected and written to represent similar questions that they would see on the actual test. The questions were chosen to represent all of the material that I would teach in the chapter.

I administered the test via a CPS, “clicker” administered test. This technology allowed students to electronically submit their answers by entering their letter or numerical based answers into their clickers. The clickers send the information to software on the teacher’s computer, which would then calculate each student’s score. This software eliminated the need to correct the tests by hand, and even calculated percentages and class averages for me. Each student placed their correct answers on their physical tests, in case there was any sort of problem with the answers on the computer. This technology provided a great deal of assistance when I calculated the results.

Data Analysis:

In order to analyze the data, I divided it into my sub groups and the entire class. I calculated each group’s average score for each test and the average percentage for each test. I then averaged the score and percentage difference found between the two tests by subtracting the post-test from pre-test. This information was then graphed to provide a visual representation of the data. This simple graphical and numerical analysis provided me with information that could be interpreted against my hypothesis.

Results:

I identified student by assigning each row a letter and numbering each student in the row, as described above in Diagram #1 in the introduction. I also identified each student as male and female by placing a ‘m’ or ‘f’ next to the student’s ID number. This easy identification would prove useful in when dividing and analyzing the data. To begin analyzing the data I looked at the class as a whole. In order to analyze and quantify the data, I averaged the scores and percentages of all the tests. I then found the difference for the scores and percentages for both tests. This last calculation was done to find the student’s improvement on their scores, which would also reflect their learning. Chart 1.1 displays each student’s raw scores and percentages on both tests. It also displays the calculated score and percentage differences. A negative score and percentage would

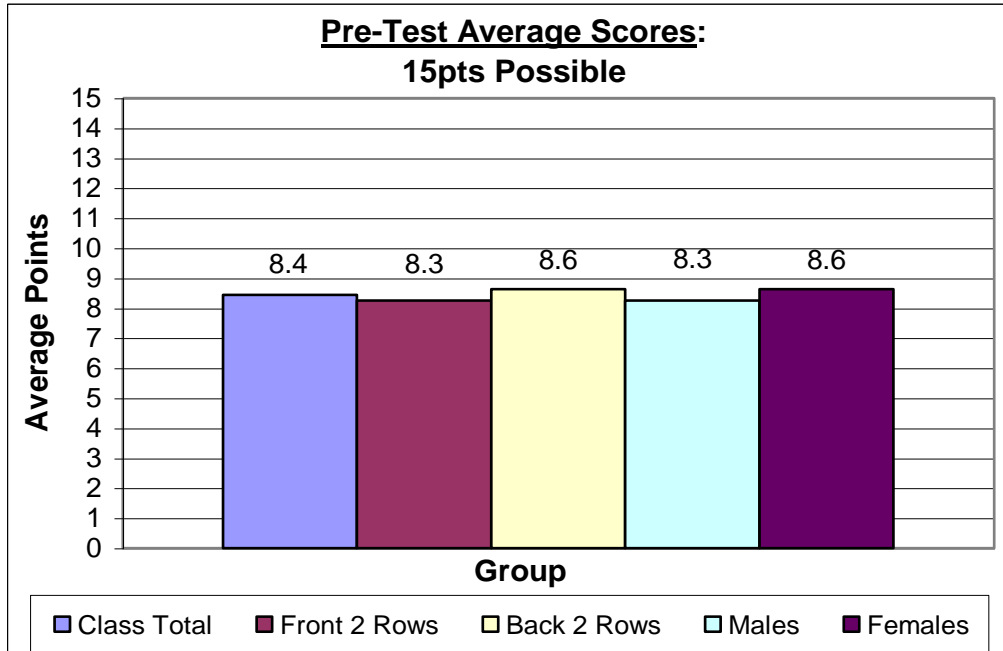
indicate a decrease in score on the post-test. The yellow row on the bottom of the chart is the calculated average score and percentage for each test and difference.

Chart 1.1: CLASS TOTALS

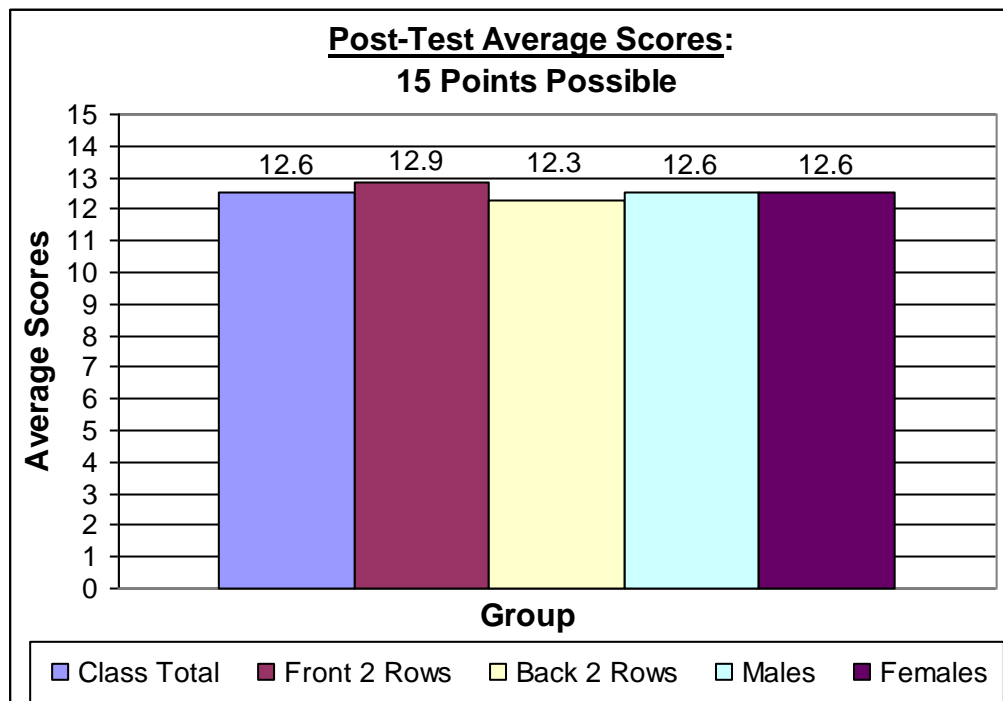
STUDENT & GENDER	PRE-TEST SCORE	PRE-TEST PERCENTAGE	POST-TEST SCORE	POST-TEST PERCENTAGE	SCORE DIFFERENCE	PERCENTAGE DIFFERENCE
1A (f)	7	46.7	12	80.0	5	33.3
2A (f)	7	46.7	13	86.7	6	40.0
3A (f)	9	60.0	13	86.7	4	26.7
4A (f)	7	46.7	12	80.0	5	33.3
5A (f)	9	60.0	14	93.3	5	33.3
6A (f)	8	53.3	13	86.7	5	33.4
7A (m)	9	60.0	13	86.7	4	26.7
8A (m)	10	66.7	13	86.7	3	20.0
1B (m)	7	46.7	12	80.0	5	33.3
2B (m)	9	60.0	14	93.3	5	33.3
3B (m)	9	60.0	12	80.0	3	20.0
4B (m)	10	66.7	14	93.3	4	26.6
5B (m)	7	46.7	13	86.7	6	40.0
6B (m)	5	33.3	12	80.0	7	46.7
7B (m)	9	60.0	14	93.3	5	33.3
8B (m)	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA
9B (f)	10	66.7	12	80.0	2	13.3
1C (f)	13	86.7	13	86.7	0	0.0
2C (f)	11	73.3	13	86.7	2	13.4
3C (f)	11	73.3	12	80.0	1	6.7
4C (m)	11	73.3	14	93.3	3	20.0
5C (m)	6	40.0	11	73.3	5	33.3
6C (f)	9	60.0	13	86.7	4	26.7
7C (f)	10	66.7	13	86.7	3	20.0
8C (m)	6	40.0	11	73.3	5	33.3
1D (f)	5	33.3	11	73.3	6	40.0
2D (m)	8	53.3	13	86.7	5	33.4
3D (f)	8	53.3	12	80.0	4	26.7
4D (f)	5	33.3	12	80.0	7	46.7
5D (m)	10	66.7	11	73.3	1	6.6
6D (f)	9	60.0	13	86.7	4	26.7
7D (m)	8	53.3	12	80.0	4	26.7
8D (m)	8	53.3	12	80.0	4	26.7
CLASS AVERAGE:	8.4	56.3	12.6	83.8	4.1	27.5
TOTAL POSSIBLE:	15 pts	100%	15 pts	100%		

Graphs 1.1 and 1.2 exhibit the average score each group on the pre-test and the post-test respectively. There were a total of fifteen points possible on both tests. The average score is posted above its' representative bar graph.

Graph 1.1

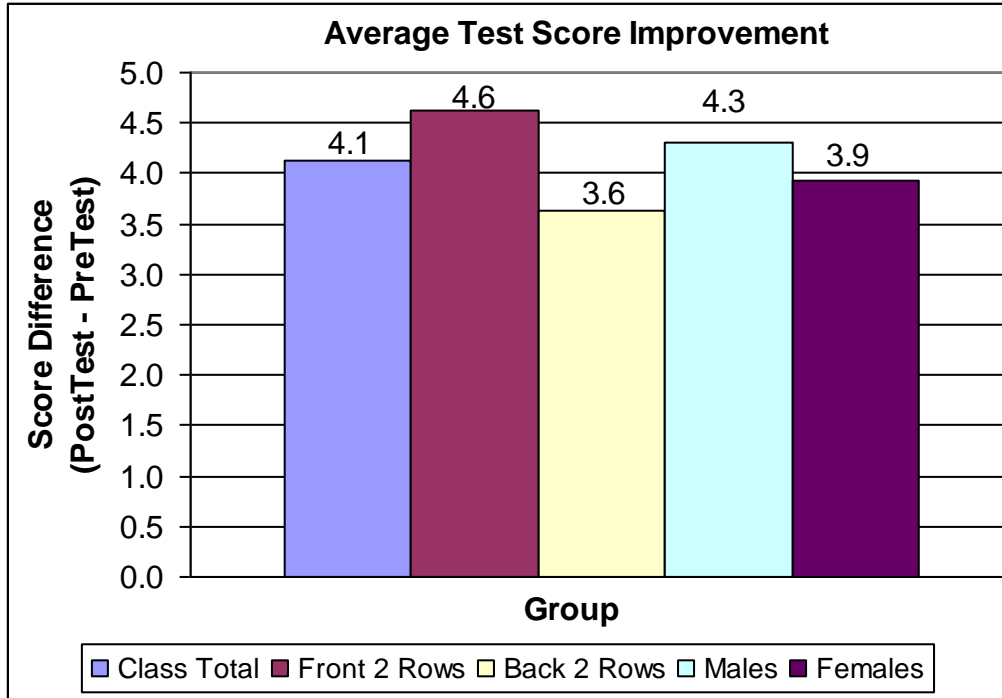


Graph 1.2



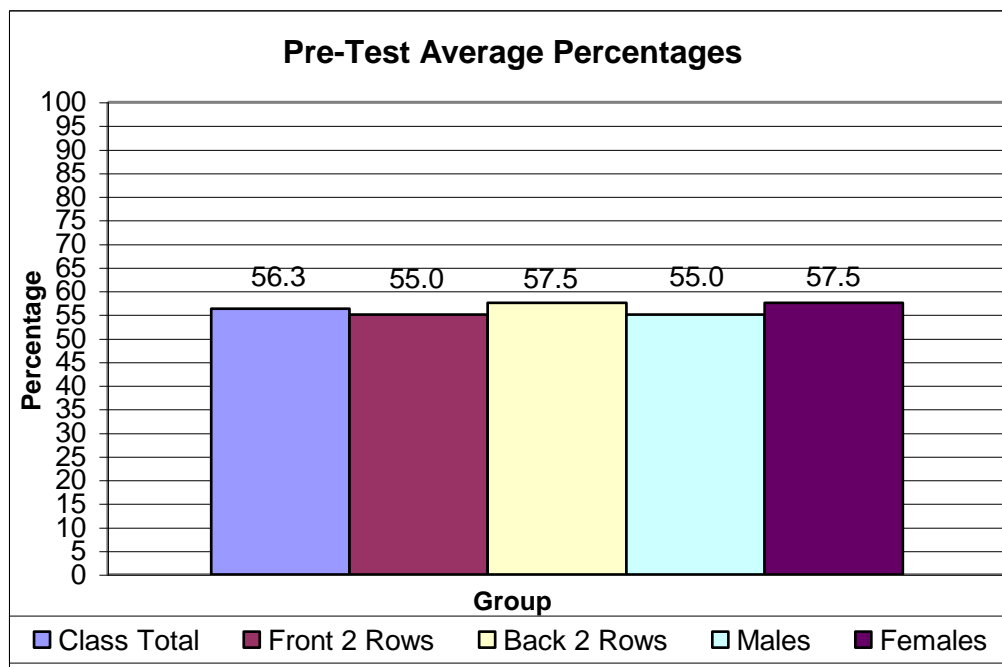
Graph 1.3 exhibits the average difference of scores per group. This graph provides a quantitative view of the improvement that each group made in comparison with each other.

Graph 1.3

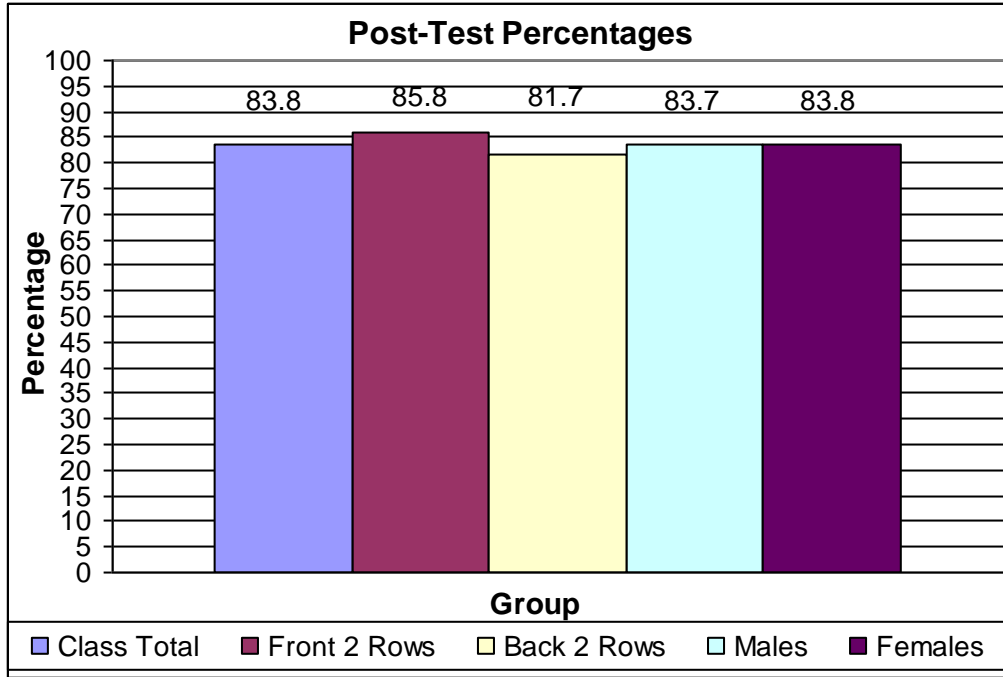


Graphs 2.1-2.3 display the average percentages from the pre-test and post-test, as well as the average percentage increase respectively. The percentages are out of 100%, where 100% would represent a score of fifteen. The percent difference is the increase in percentage from the pre-test to the post-test.

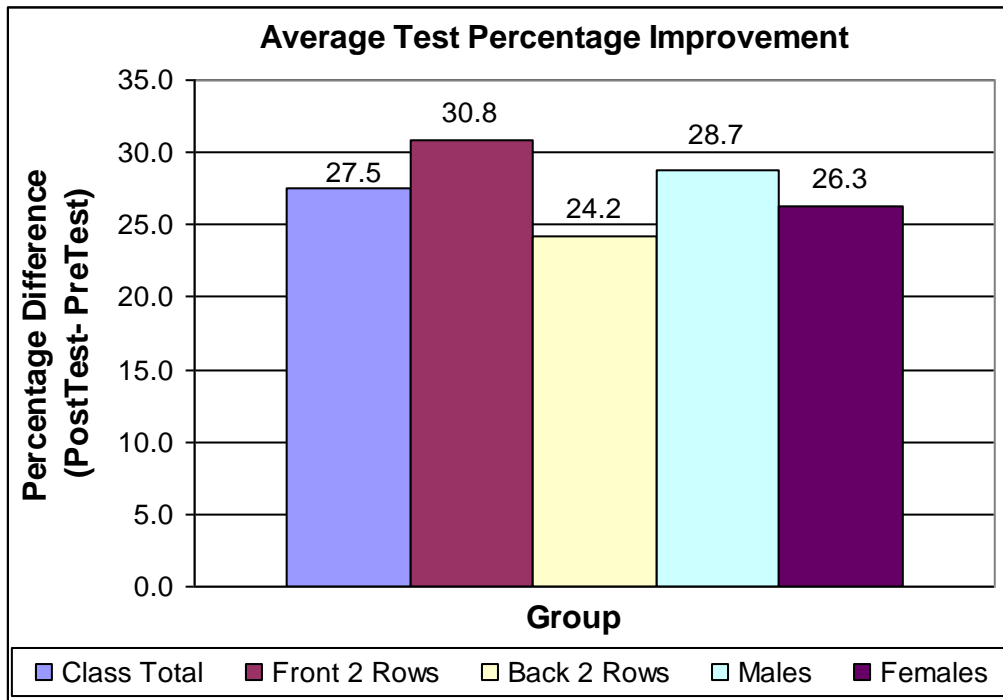
Graph 2.1



Graph 2.2



Graph 2.3



Conclusions & Discussion:

By analyzing these data support my hypothesis that students' performance as distance from the front of the room increased. Graphs 1.1. and 2.1 show that the back two rows of the class actually performed better than the front two rows did on the pre-test, but then failed to

outperform the front two rows on the post test as shown on graphs 1.2 and 1.3. This disparity is most easily observed in graphs 1.3 and 2.3, where it can easily be seen that the front two rows showed considerably greater improvement over the back two rows.

These showed an inconclusive result as to whether my hypothesis that gender would not play a role in student learning. While graphs 1.3 and 2.3 display that male showed greater improvement than females, this information is slightly misleading. The males performed at a lower level than the females did on the pre-test, as shown in graphs 1.1 and 2.1, but both groups performed at almost identical levels on the post-test; observed in graphs 1.2 and 2.2. This information translates into a greater improvement for the males, but the disparity between the two groups is not as pronounced as it with the previous subgroup. While the males showed a slightly greater amount of improvement than the females, I conclude that this information is inconclusive.

As a whole, I feel that the class did very well. Graph 1.3 exhibits that the class showed an average improvement of over four points on a fifteen-point test, which is an improvement of over twenty-seven percent (graph 2.3). There was not one student who showed a decrease in test score, and student 1C (chart 1.1) was the only one to show zero improvement at all, but this student scored a 13/15 both times. This information helps to affirm the belief that the class successfully learned the material. I would not say that every student became expertly proficient with it, but there was no shortage of improvement.

It is somewhat disconcerting, however, that the back half of the class showed less improvement than the front of the class. I began to sense that this would be an issue during instruction, so I always made it a point to circulate to the back of the room while students were working individually in hopes that I could create more one-on-one interaction with students back there. I tried to utilize frequent formative assessment to gauge student learning. I employed tactics as elementary as simple questioning during discussion to clicker based review questions. These formative assessments did little to address the issue of my disconnect with the back of the room however. When I asked questions during discussion many of the students remained quiet or drowned out by more eager students nearer the front. Clicker review questions are great tool to accurately assess how the class is doing as a whole. The process is anonymous for the students because other students won't know whom is keying in what answers, but allows the teacher to look at each student's performance individually if needed. This also, however, did little to alleviate the problem with me being able to more closely interact with the students in the back of the classroom. I always made an attempt to circulate to rear of the class during work time for

problems, and I almost always would be able to help the students back there. When doing these review questions with the class I always worked through the problem on the board after everyone had keyed in their answers, to ensure that everyone was clear on the process of finding the correct answer. One final strategy that I used to reach out to students who may have been struggling was to make myself available before and after school. I repeatedly told the students that I was at the school from 7:30 a.m. to at least 4:00 p.m. most days. This was somewhat successful in the fact that I had several students come for extra help after school on a couple of separate occasions. As expected, the students came in for extra help improved their performance. I know that these are not options for all students in class, but it proved a useful strategy for several students.

I found that many of the students that struggled were ones that would not ask questions. I tried to encourage students to ask questions, and if they were not comfortable asking questions in front of the entire class they could ask me one-on-one. This was met with limited success, so I also took to asking these students how they were doing and if they had any questions. I even mentioned to parents at conferences. Since I have taken these steps I have seen improvements in this category.

I have conceded to the fact the classroom in which I have been placed is going to make it near impossible to teach the rear of the room as effectively as the front of the room, so after hearing some very worthwhile advice, I have decided to bring the back of the class to the front of the class. Following this unit I flipped the back row with the front row and second row with the third row. Since doing this I have noticed drastic improvements in the participation level out the students who were formerly in the back of the room. I can feel myself building a closer relationship with these students, and since this relationship is already there with the students whom I moved back there seems to be very little drop off in their participation. I feel that this is a simple, yet very effective solution to this situation. I am finding that as my relationship with students continues to build, their willingness to ask questions and approach me is growing as well. Many of the quieter students have asked me questions, or are becoming more open when I check on them individually.

I also have started to experiment with the use of a wireless template that accompanies the InterWrite Board. This device is somewhat difficult to master, yet it does allow for more mobility within the classroom while doing presentations or working problems on the board. This device allows for greater mobility, but the current room is very restrictive in itself. The close wall on the right side of the class and the lab space on the left restrict movement along the

perimeter, but the prime issue is the tables. Because the rows are made of tables, there are no walkways in between students as there would be with desks. This, however, is not an issue that I can address during my time student teacher, but it definitely something that I will keep in mind when I have a classroom of my own. The other issue is that fact that there are thirty-three students in this class. This is a relatively large number, especially for the size of the room itself, but large class sizes are likely going to be the norm rather than the exception when teaching.

One final adjustment that I will begin to use is during my questioning. I like to keep my classroom a rather open forum when answering questions, provided things don't get out of hand. Using this method of questioning can greatly reduce the amount of participation from the more quiet population of students, and it can also perpetuate into a situation where one or two students answers every question. I began to notice some of this happening, so I plan to begin employing another tool that is linked to the InterWrite Board's software. This tool allows me to truly randomly select a student to answer a question because the computer randomly does it for you. I feel that the environment in my class is now one that almost all students would feel comfortable answering a question if called on. It would very important that I continue to make a safe environment by allowing students to pass on answering if they don't feel comfortable, but this is tool that can get more students involved without having to make selections myself. I also plan to start calling on students to report answers, but I feel like I will try to alert students ahead of time or only call on them if I know that they have the correct answer. I hope that would help to reduce the anxiety that can be associated with answering questions in class.

In summary I feel that I have learned a lot by teaching this unit, and by conducting this study. The data showed me that the class as whole made significant improvements through my instruction. On the other hand, it also showed me that some weaknesses that must be addressed though continually adjusting my teaching strategy. I have tried to continually adjust my teaching as I saw needs arising, for example I have pushed test dates back because I felt that the class was not ready or recognizing why students are struggling and utilizing the "I do it, we do it, you it" strategy to help alleviate these problems, and I will continue to make these adjustments. I feel that the adjustments that I have already discussed will pay dividends as I continue to teach the rest of the semester, and I know that there will be more adjustments to be made.

Pre-Test

Name _____

Multiple Choice

Circle the choice that best answers the question & enter the letter into your clicker.

1. A passenger in the rear seat of a car moving at a steady speed is at rest relative which of the following?
 - a. The side of the road
 - b. A pedestrian on the corner ahead
 - c. the front seat of the car
 - d. the wheels of the car
2. Which distance can be most accurately measured with a ruler?
 - a. The length of a river
 - b. The width of book
 - c. the distance between two cities
 - d. size of an object under a microscope
3. A ball is rolled uphill a distance of 3 meters before it slows, stops, and begins to roll back down the hill. It rolls downhill 6 meters before coming to a rest against a tree. What is the magnitude of the ball's displacement?
 - a. 3 meters
 - b. 6 meters
 - c. 9 meters
 - d. 18 meters
4. What is the most appropriate SI unit to express the speed of a cyclist in the last leg of a 10km race?
 - a. km/s
 - b. km/h
 - c. m/s
 - d. cm/h
5. Speed is the ratio of the distance an object moves in relation to what?
 - a. the amount of time need to travel the distance
 - b. the direction the object moves
 - c. the displacement of the object
 - d. the motion of the object
6. The slope of a line on a distance-time graph represents what?
 - a. Distance
 - b. Time
 - c. speed
 - d. displacement
7. Vector addition is used when motion involves what?
 - a. More than one direction
 - b. More than one velocity
 - c. more than one speed
 - d. all of the above
8. What is the rate which velocity changes called?
 - a. Speed
 - b. Vectors
 - c. acceleration
 - d. motion
9. The slope of a speed-time graph represents what?
 - a. Direction
 - b. Acceleration
 - c. velocity
 - d. speed
10. An object that is accelerating may be doing what?
 - a. Slowing down
 - b. Gaining speed
 - c. changing direction
 - d. all of the above

Matching

Select the choice from the word bank that best completes the statement & enter the number of your choice into your clicker. Choices will only be used once.

11. The direction and length of a straight line from the starting point to the ending point of an object's motion is known as _____.
12. Displacement and velocity are examples of _____, because they have both magnitude and direction.
13. The difference between speed and velocity is that velocity indicates the _____ of motion and speed does not.
14. A moving object does not _____ if its velocity remains constant.
15. _____ is how fast a velocity is changing at a specific instant.

Word Bank

1. accelerate
2. displacement
3. speed
4. direction
5. motion
6. vectors

Multiple Choice

Circle the choice that best answers the question & enter the letter into your clicker.

16. A passenger in the rear seat of a car moving at a steady speed is at rest relative which of the following?
- The side of the road
 - A pedestrian on the corner ahead
 - the front seat of the car**
 - the wheels of the car
17. Which distance can be most accurately measured with a ruler?
- The length of a river
 - The width of book**
 - the distance between two cities
 - size of an object under a microscope
18. A ball is rolled uphill a distance of 3 meters before it slows, stops, and begins to roll back down the hill. It rolls downhill 6 meters before coming to a rest against a tree. What is the magnitude of the ball's displacement?
- 3 meters**
 - 6 meters
 - 9 meters
 - 18 meters
19. What is the most appropriate SI unit to express the speed of a cyclist in the last leg of a 10km race?
- km/s
 - km/h**
 - m/s
 - cm/h
20. Speed is the ratio of the distance an object moves in relation to what?
- the amount of time need to travel the distance**
 - the direction the object moves
 - the displacement of the object
 - the motion of the object
21. The slope of a line on a distance-time graph represents what?
- Distance
 - Time
 - speed**
 - displacement
22. Vector addition is used when motion involves what?
- More than one direction
 - More than one velocity
 - more than one speed
 - all of the above**
23. What is the rate which velocity changes called?
- Speed
 - Vectors
 - acceleration**
 - motion
24. The slope of a speed-time graph represents what?
- Direction
 - Acceleration**
 - velocity
 - speed
25. An object that is accelerating may be doing what?
- Slowing down
 - Gaining speed
 - changing direction
 - all of the above**

Matching

Select the choice from the word bank that best completes the statement & enter the number of your choice into your clicker. Choices will only be used once.

26. The direction and length of a straight line from the starting point to the ending point of an object's motion is known as 2. DISPLACEMENT.
27. Displacement and velocity are examples of 6. VECTORS, because they have both magnitude and direction.
28. The difference between speed and velocity is that velocity indicates the 4. DIRECTION of motion and speed does not.
29. A moving object does not 1. ACCELERATE if its velocity remains constant.
30. 5. INSTANTANEOUS ACCELERATION is how fast a velocity is changing at a specific instant.

Word Bank

7. accelerate
8. displacement
9. speed
10. direction
11. Instantaneous acceleration
12. vectors

Multiple Choice

Circle the choice that best answers the question & enter the letter into your clicker.

31. Which distance can be most accurately measured with a ruler?
- a. The length of a river
 - b. The distance between two cities
 - c. **The width of book**
 - d. size of an object under a microscope
32. A ball is rolled uphill a distance of 3 meters before it slows, stops, and begins to roll back down the hill. It rolls downhill 6 meters before coming to a rest against a tree. What is the magnitude of the ball's displacement?
- a. 9 meters
 - b. 6 meters
 - c. 18 meters
 - d. **3 meters**
33. The slope of a speed-time graph represents what?
- a. Direction
 - b. Speed
 - c. velocity
 - d. Acceleration
34. What is the most appropriate SI unit to express the speed of a cyclist in the last leg of a 10km race?
- a. km/h
 - b. m/s
 - c. km/s
 - d. cm/h
35. Speed is the ratio of the distance an object moves in relation to what?
- a. the direction the object moves
 - b. the motion of the object
 - c. the amount of time need to travel the distance
 - d. the displacement of the object
36. The slope of a line on a distance-time graph represents what?
- a. Distance
 - b. Displacement
 - c. speed
 - d. Time
37. Vector addition is used when motion involves what?
- a. More than one speed
 - b. More than one velocity
 - c. More than one direction
 - d. all of the above
38. What is the rate which velocity changes called?
- a. Vectors
 - b. Speed
 - c. motion
 - d. acceleration
39. A passenger in the rear seat of a car moving at a steady speed is at rest relative which of the following?
- a. the wheels of the car
 - b. A pedestrian on the corner ahead
 - c. the front seat of the car
 - d. The side of the road
40. An object that is accelerating may be doing what?
- a. Gaining speed
 - b. Slowing down
 - c. changing direction
 - d. all of the above

Matching

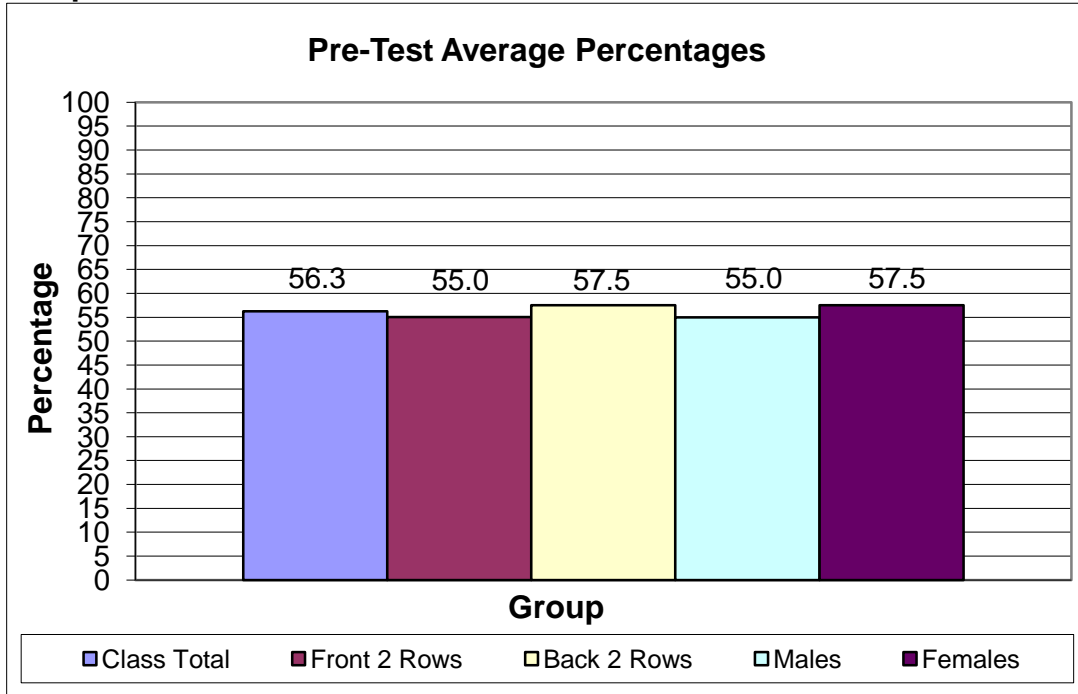
Select the choice from the word bank that best completes the statement & enter the number of your choice into your clicker. Choices will only be used once.

41. The difference between speed and velocity is that velocity indicates the _____ of motion and speed does not.
42. The direction and length of a straight line from the starting point to the ending point of an object's motion is known as _____.
43. _____ is how fast a velocity is changing at a specific instant.
44. Displacement and velocity are examples of _____, because they have both magnitude and direction.
45. A moving object does not _____ if its velocity remains constant.

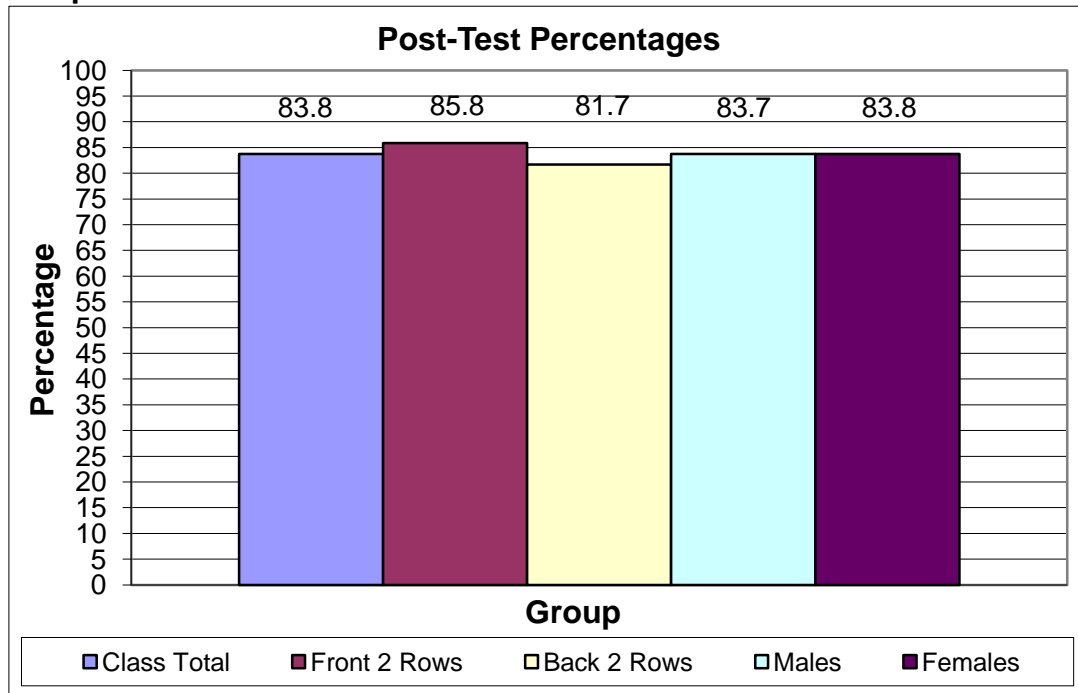
Word Bank

13. displacement
14. vectors
15. accelerate
16. motion
17. speed
18. direction

Graph 2.1:



Graph 2.2:



Graph 2.3:



Average Test Percentage Improvement

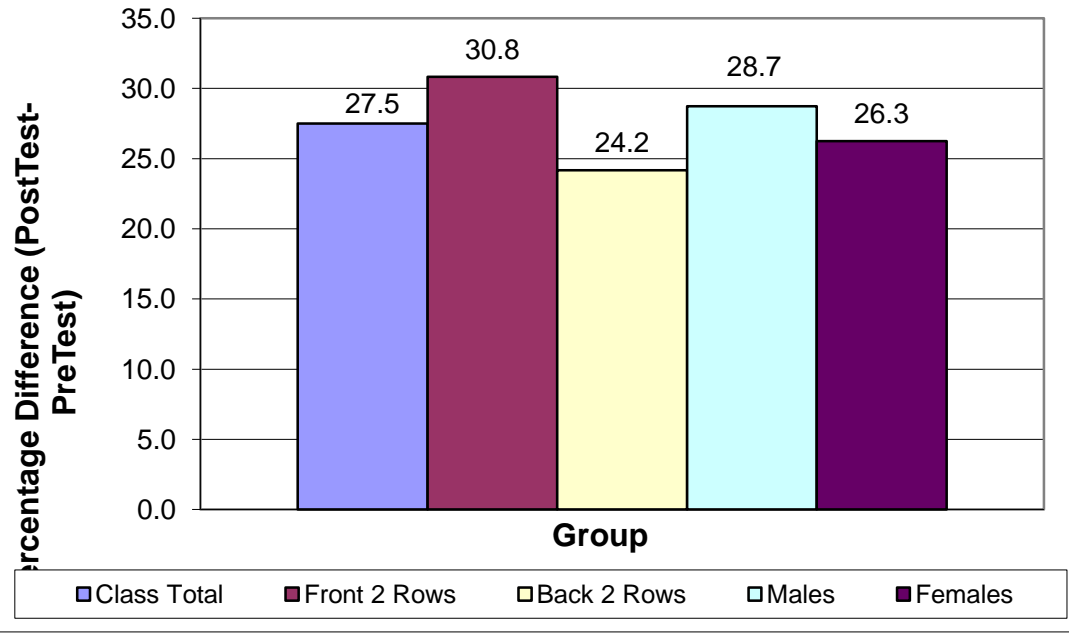


Diagram #1:

SEATING CHART & STUDENT IDENTIFICATION

	1D (f)	2D (m)	3D (f)	4D (f)	5D (m)	6D (f)	7D (m)	8D (m)
	1C (f)	2C (f)	3C (f)	4C (m)	5C (m)	6C (f)	7C (f)	8C (m)
1B (m)	2B (m)	3B (m)	4B (m)	5B (m)	6B (m)	7B (m)	8B (m)	9B (f)
	1A (f)	2A (f)	3A (f)	4A (f)	5A (f)	6A (f)	7A (m)	8A (m)

FRONT/BOARD

Letter in () indicates gender

Chart 1.1: CLASS TOTALS

<u>STUDENT & GENDER</u>	<u>PRE-TEST SCORE</u>	<u>PRE-TEST PERCENTAGE</u>	<u>POST-TEST SCORE</u>	<u>POST-TEST PERCENTAGE</u>	<u>SCORE DIFFERENCE</u>	<u>PERCENTAGE DIFFERENCE</u>
1A (f)	7	46.7	12	80.0	5	33.3
2A (f)	7	46.7	13	86.7	6	40.0
3A (f)	9	60.0	13	86.7	4	26.7
4A (f)	7	46.7	12	80.0	5	33.3
5A (f)	9	60.0	14	93.3	5	33.3
6A (f)	8	53.3	13	86.7	5	33.4
7A (m)	9	60.0	13	86.7	4	26.7
8A (m)	10	66.7	13	86.7	3	20.0
1B (m)	7	46.7	12	80.0	5	33.3
2B (m)	9	60.0	14	93.3	5	33.3
3B (m)	9	60.0	12	80.0	3	20.0
4B (m)	10	66.7	14	93.3	4	26.6
5B (m)	7	46.7	13	86.7	6	40.0
6B (m)	5	33.3	12	80.0	7	46.7
7B (m)	9	60.0	14	93.3	5	33.3
8B (m)	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA
9B (f)	10	66.7	12	80.0	2	13.3
1C (f)	13	86.7	13	86.7	0	0.0
2C (f)	11	73.3	13	86.7	2	13.4
3C (f)	11	73.3	12	80.0	1	6.7
4C (m)	11	73.3	14	93.3	3	20.0
5C (m)	6	40.0	11	73.3	5	33.3
6C (f)	9	60.0	13	86.7	4	26.7
7C (f)	10	66.7	13	86.7	3	20.0
8C (m)	6	40.0	11	73.3	5	33.3
1D (f)	5	33.3	11	73.3	6	40.0
2D (m)	8	53.3	13	86.7	5	33.4
3D (f)	8	53.3	12	80.0	4	26.7
4D (f)	5	33.3	12	80.0	7	46.7
5D (m)	10	66.7	11	73.3	1	6.6
6D (f)	9	60.0	13	86.7	4	26.7
7D (m)	8	53.3	12	80.0	4	26.7
8D (m)	8	53.3	12	80.0	4	26.7
<u>CLASS AVERAGE:</u>	8.4	56.3	12.6	83.8	4.1	27.5
<u>TOTAL POSSIBLE:</u>	15 pts	100%	15 pts	100%		

SUB GROUP #1: FRONT vs BACK OF ROOM

Chart 2.1: FRONT TWO ROWS

<u>STUDENT & GENDER</u>	<u>PRE-TEST SCORE</u>	<u>PRE-TEST PERCENTAGE</u>	<u>POST-TEST SCORE</u>	<u>POST-TEST PERCENTAGE</u>	<u>SCORE DIFFERENCE</u>	<u>PERCENTAGE DIFFERENCE</u>
1A (f)	7	46.7	12	80.0	5	33.3
2A (f)	7	46.7	13	86.7	6	40.0
3A (f)	9	60.0	13	86.7	4	26.7
4A (f)	7	46.7	12	80.0	5	33.3
5A (f)	9	60.0	14	93.3	5	33.3
6A (f)	8	53.3	13	86.7	5	33.4
7A (m)	9	60.0	13	86.7	4	26.7
8A (m)	10	66.7	13	86.7	3	20.0
1B (m)	7	46.7	12	80.0	5	33.3
2B (m)	9	60.0	14	93.3	5	33.3
3B (m)	9	60.0	12	80.0	3	20.0
4B (m)	10	66.7	14	93.3	4	26.6
5B (m)	7	46.7	13	86.7	6	40.0
6B (m)	5	33.3	12	80.0	7	46.7
7B (m)	9	60.0	14	93.3	5	33.3
8B (m)	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA
9B (f)	10	66.7	12	80.0	2	13.3
AVERAGE:	8.3	55.0	12.9	85.8	4.6	30.8
TOTAL POSSIBLE:	15 pts	100%	15 pts	100%		

Chart 2.2: BACK TWO ROWS

<u>STUDENT & GENDER</u>	<u>PRE-TEST SCORE</u>	<u>PRE-TEST PERCENTAGE</u>	<u>POST-TEST SCORE</u>	<u>POST-TEST PERCENTAGE</u>	<u>SCORE DIFFERENCE</u>	<u>PERCENTAGE DIFFERENCE</u>
1C (f)	13	86.7	13	86.7	0	0.0
2C (f)	11	73.3	13	86.7	2	13.4
3C (f)	11	73.3	12	80.0	1	6.7
4C (m)	11	73.3	14	93.3	3	20.0
5C (m)	6	40.0	11	73.3	5	33.3
6C (f)	9	60.0	13	86.7	4	26.7
7C (f)	10	66.7	13	86.7	3	20.0
8C (m)	6	40.0	11	73.3	5	33.3
1D (f)	5	33.3	11	73.3	6	40.0
2D (m)	8	53.3	13	86.7	5	33.4
3D (f)	8	53.3	12	80.0	4	26.7
4D (f)	5	33.3	12	80.0	7	46.7
5D (m)	10	66.7	11	73.3	1	6.6
6D (f)	9	60.0	13	86.7	4	26.7
7D (m)	8	53.3	12	80.0	4	26.7
8D (m)	8	53.3	12	80.0	4	26.7
AVERAGE:	8.6	57.5	12.3	81.7	3.6	24.2
TOTAL POSSIBLE:	15 pts	100%	15 pts	100%		

SUB GROUP #2: MALES vs FEMALES

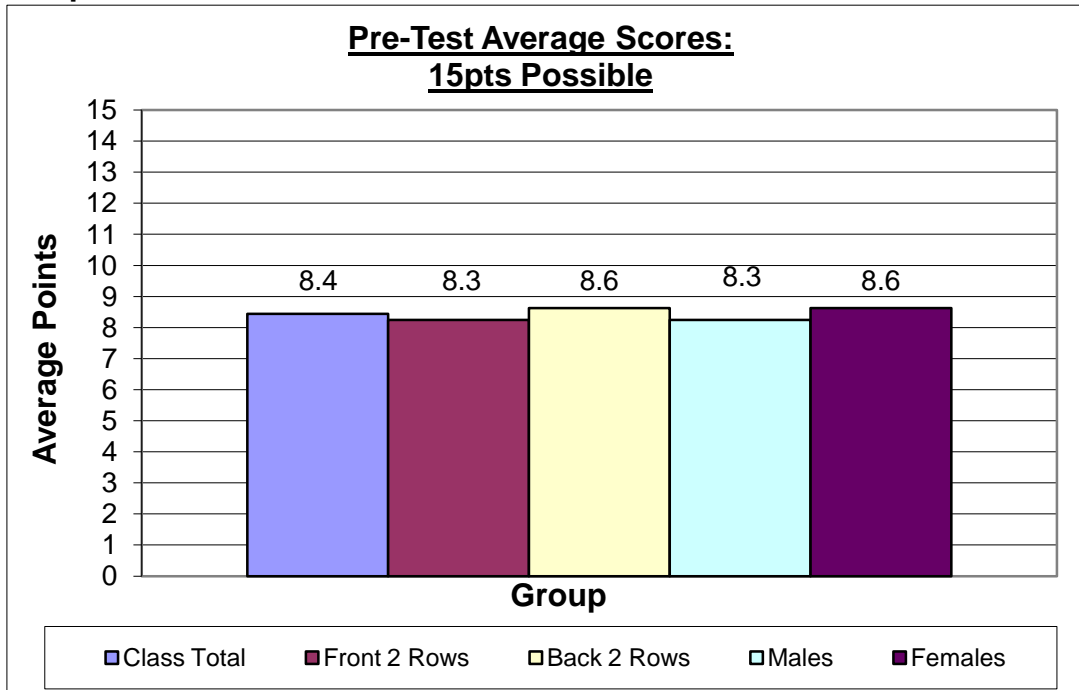
Chart 3.1: MALES

<u>STUDENT</u>	<u>PRE-TEST SCORE</u>	<u>PRE-TEST PERCENTAGE</u>	<u>POST-TEST SCORE</u>	<u>POST-TEST PERCENTAGE</u>	<u>DIFFERENC E</u>	<u>PERCENTAGE DIFFERENCE</u>
7A (m)	9	60.0	13	86.7	4	26.7
8A (m)	10	66.7	13	86.7	3	20.0
1B (m)	7	46.7	12	80.0	5	33.3
2B (m)	9	60.0	14	93.3	5	33.3
3B (m)	9	60.0	12	80.0	3	20.0
4B (m)	10	66.7	14	93.3	4	26.6
5B (m)	7	46.7	13	86.7	6	40.0
6B (m)	5	33.3	12	80.0	7	46.7
7B (m)	9	60.0	14	93.3	5	33.3
8B (m)	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA
4C (m)	11	73.3	14	93.3	3	20.0
5C (m)	6	40.0	11	73.3	5	33.3
8C (m)	6	40.0	11	73.3	5	33.3
2D (m)	8	53.3	13	86.7	5	33.4
5D (m)	10	66.7	11	73.3	1	6.6
7D (m)	8	53.3	12	80.0	4	26.7
8D (m)	8	53.3	12	80.0	4	26.7
AVERAGE:	8.3	55.0	12.6	83.7	4.3	28.7
TOTAL POSSIBLE:	15 pts	100%	15 pts	100%		

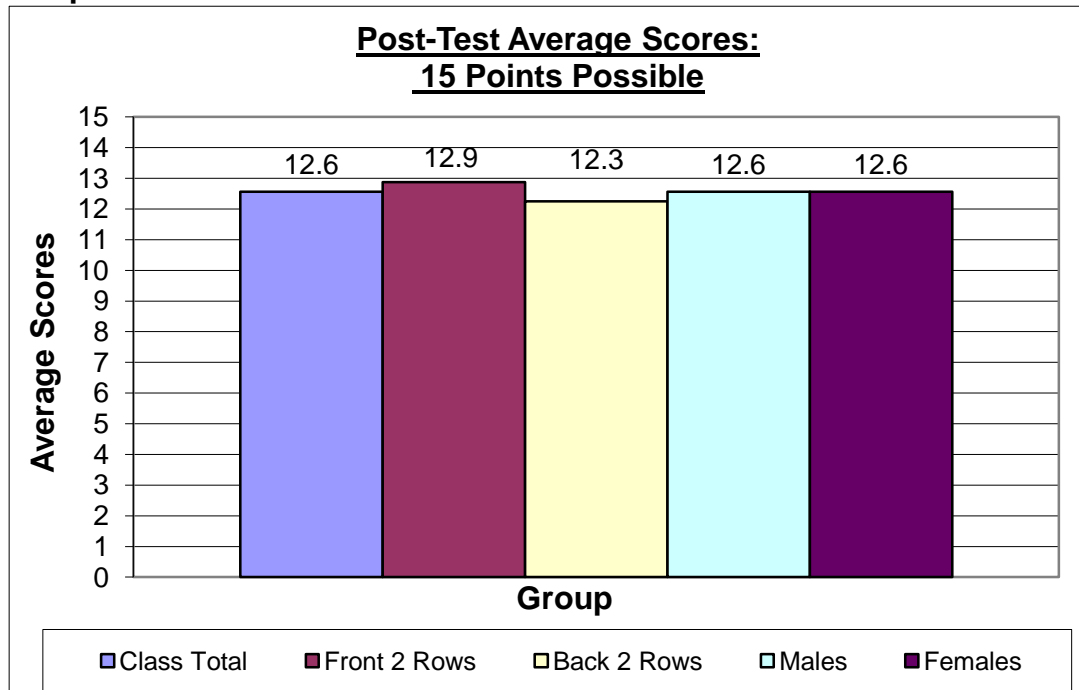
Chart 3.2: FEMALES

<u>STUDENT</u>	<u>PRE-TEST SCORE</u>	<u>PRE-TEST PERCENTAGE</u>	<u>POST-TEST SCORE</u>	<u>POST-TEST PERCENTAGE</u>	<u>DIFFERENC E</u>	<u>PERCENTAGE DIFFERENCE</u>
1A (f)	7	46.7	12	80.0	5	33.3
2A (f)	7	46.7	13	86.7	6	40.0
3A (f)	9	60.0	13	86.7	4	26.7
4A (f)	7	46.7	12	80.0	5	33.3
5A (f)	9	60.0	14	93.3	5	33.3
6A (f)	8	53.3	13	86.7	5	33.4
9B (f)	10	66.7	12	80.0	2	13.3
1C (f)	13	86.7	13	86.7	0	0.0
2C (f)	11	73.3	13	86.7	2	13.4
3C (f)	11	73.3	12	80.0	1	6.7
6C (f)	9	60.0	13	86.7	4	26.7
7C (f)	10	66.7	13	86.7	3	20.0
1D (f)	5	33.3	11	73.3	6	40.0
3D (f)	8	53.3	12	80.0	4	26.7
4D (f)	5	33.3	12	80.0	7	46.7
6D (f)	9	60.0	13	86.7	4	26.7
AVERAGE:	8.6	57.5	12.6	83.8	3.9	26.3
TOTAL POSSIBLE:	15 pts	100%	15 pts	100%		

Graph 1.1:



Graph 1.2:



Graph 1.3:



Average Test Score Improvement

