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MASSACHUSETTS COMPREHENSION ASSESSMENT SYSTEM ANALYSIS

An Interactive Qualifying Project Report
submitted to the Faculty of
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by

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1 Introduction

The Massachusetts Comprehension Assessment Test (MCAS) is geared towards testing the capabilities of high school students in the subjects of Mathematics, English, Science and Social studies. So far, only the math and English tests are approved and in use. The Board of Education enforces the Massachusetts Education Reform Law of 1993, stating that the MCAS Test must be passed in order for a student to receive their diploma upon graduation (1). The State of Massachusetts has always made education a priority, and in trying to improve public education, the Massachusetts Education Reform Law of 1993 was put in effect. There are many tests to measure skill, aptitude and ability, such as the SAT and ACT, but Massachusetts has chosen the MCAS Test as a tool of comparison among students and public schools across the state board on achievement knowledge mandated to be covered in state guidelines for each subject.

Since the law has become a requirement for graduation, there has been much concern through out the state as to whether or not it is a reasonable standard for all students. Many issues have arisen about the fairness involving native language, ethnicity, social class, gender, course curriculum, vocational education, and learning styles. The scoring differences of students with varying ethnicities are a focal point to many citizens in diverse cities such as Worcester. Another large concern is involving which public school the students attend, as Vocational Technical School students seem less equipped for the MCAS Test. There are other factors that affect these two crucial points, which also need to be considered in understanding the overall issues. Social classes, gender,

course curriculum, and learning styles all link together to help make a difference in the scoring of ethnic racial, minorities and Vocational School students.

The first goal of this project is to decide whether or not ethnicity is a factor in performance on the MCAS Test and hence justified as a requirement for graduation or socially biased. The other goal of this project is to decide if the type of school the student attends or the program of studies they take will make a difference in their performance on the MCAS Test, be it a vocational, college preparation, or honors program in a regular secondary school. The smaller goals to achieve these two main goals are analyzing the social classes, gender, course curriculum, and learning styles of the students. These will be linked together in order to create the foundation for our hypothesis testing.

The goal of this report is aimed toward any individual concerned with the MCAS Test and its impact on the students of Massachusetts. Students that fit into any category that is found to be at a disadvantage in terms of average score of the percentage passing could benefit greatly from these results. They help explain why, partly to justify the lower scores and partly to help others like them to succeed in the future. Our advisor, Professor Wilkes, will benefit from this project as well. He takes a particular interest in the MCAS Test and its effects on education overall. Its impact on the future of Massachusetts interests him greatly. The concerned parents, students, and teachers involved in this issue will all benefit from educating themselves on this subject, and perhaps justify their ideas and actions in term of the causes of the problems created by the test. Those aiming to help the underprivileged students will find evidence in this project to help them argue their case for state aid to achieve better success getting accommodation in the future.

In order to analyze the data necessary for the project, the SPSS program was used. Learning to use this program was worth the time it cost us initially. It enabled us to compare statistics and come to conclusions relatively quickly. The Excel program was also used and it proved to be more awkwardly limited and error prone. SPSS is a superior program to Excel and was therefore always used despite the need to come to WPI computer facilities to access it. Outside resources were also used to conduct the project. These resources included, but were not limited to, journals, web sites, newspapers, textbooks, testing manuals, as well as information supplied orally by our advisor, John Wilkes.

The results of our investigation of purposes of the MCAS Test, its affects on the students taking it, and the rationale of making it a graduating requirement proved to be quite revealing. We will use these findings to argue for or against prevailing theories about the fairness of the MCAS Test overall, and especially to minority groups.

2 Overview

Since the establishment of public education in the Commonwealth of Massachusetts, high school diplomas have been given to capable students based upon local standards. The Massachusetts' Education Reform Law of 1993 began the system of distributing a test in an effort to test the school systems and hold back anyone that was not prepared to graduate based on state criteria. This test is the Massachusetts Comprehension Assessment System (MCAS Test). In January 2000 it was decided that 10th grade students must receive a grade of "Needs Improvement" or higher in both the English Language Arts and Mathematics portions of the MCAS to graduate from high school. This year is the first time that students will be denied a diploma if unable to pass, which is causing much debate throughout the state. As 20% did not pass it the first time, at the end of tenth grade, they will get 3 more chances before their normal graduate date

The goal of the MCAS Test is to measure the student's skill and knowledge in Mathematics, English, Science, and Social Studies. The State Board of Education developed on his developing Curriculum Frameworks and corresponding tests in each subject. The scores are to give founders an idea of each school's progress and capabilities, holding the schools responsible for the knowledge that students are receiving and retaining. With the combination of the MCAS and the Curriculum Frameworks, it is assumed that the academic achievements in all students will improve. (1) In the Commissioner's Foreword of the release of the Spring 2002 Test Items, David P. Driscoll, the Commissioner of Education thanked his colleagues by closing a letter with: "Thank you for your support as we work together to strengthen education for our students

in Massachusetts. (1) The goal of the MCAS Test has been presented as a road to improving success of the students in the commonwealth.

The test was originally given in grades 4, 8, and 10. Now as more students are being tested it looks like one or another subject will be tested each year and math will be in 4th and 8th grade schedule, by English probably 3rd and 7th. All will be tested in 10th grade. If the student is unable to pass the test at that time, he or she is allowed to take the test twice a year until their graduation date in an effort to pass. Diplomas are not awarded to those who can not pass the MCAS Test but a certificate of attendance may go to all those who passed all other requirements at the local level. The validity of this test is being questioned on several levels. Teachers, parents, and students all have differing views of the new law, and its future is uncertain at this point. It is uncertain that the MCAS Test is really helping to improve the knowledge level of material by the student. A lot of pressure is being placed on the teachers to prepare the students, and parents are losing faith in the school systems that can't get everyone who seriously tries and does their honest best to pass this basic test. Change has never been something that is easy to handle, and the MCAS Test is no exception. Luckily, more districts are progressing towards high rates of success, rather than deteriorating over time (9).

Due to the growing influence of business interests controlling industry in America, there is more concentration on vocationally relevant general education in universities, which rely on secondary school systems to prepare students to complete these courses of study. Business interests want to know what a high school diploma means in terms of literacy and numeric. The MCAS Test sets a minimum standard for this. To help strengthen the schools, the MCAS is being advocated in a way to hold up a

standard for schools to strive toward. If so, the critics ask, why punish individual students for the failures of the institution? Perhaps this test's having consequences will help, but there are several reasonable arguments that the test is not worth the harm it may do to the state. There is even the consideration that this decision may widen the already considerable income gap between those who never attended college, and those that attended them, and graduated (8). Now people who later want to progress in their career as through education can apply to college. However, people without a high school diploma will effectively lose that option.

The schools had a few years of practice before the students actually needed to pass the MCAS Test. The test runs of the standardized items allowed the students, parents, faculty, and even the state get a better understanding of exactly where the students stood with regard to the proposed standards and the testing process. Scores have risen dramatically compared to the practice test runs since the test became obligatory. In some schools, up to thirty percent of the students skipped (9) the test days when it didn't affect their graduation status. Since the first significant testing, scores have increased on average, sometimes greatly. Certainly the percentage failing has dropped markedly from the practice administrations. There is the possibility that the average scores should not represent the entire student body, because not all students actually took the test before 2003. There is no data for students that did not attend school on test days. There is also the chance that the students may not have actually put effort into the test taking process before it affected them directly. Some critics believe that possibly the scores have improved because teachers are now "teaching to the test" rather than teaching the traditional subjects. This hinders the educational experience, and is teaching the students

information to simply pass the MCAS Test. This is especially for those who did no pass the first time and have the 10th grade curriculum again the next year, not to learn subjects that could be critical to academic survival after graduation. Material not covered in high school may be expected of these students later in college, and they are only being hurt by not receiving this education now (9). In science there is some debate about whether students who wait until college to experience "real" science are not better off, in math they cumulate nature of the material is more evidence and everyone seems to agree that an early start is advantageous.

Fortunately, "the new year started with good news about the MCAS Test," (2) which was good news to the citizens of Massachusetts. The Telegram and Gazette stated that: "The 10th grade scores, which reflect the performance of this year's juniors, were the most anticipated results" (2). These were also impressive. This group of students will be the first group required to pass the MCAS Test in Mathematics and English to earn their diploma. Based on previous test results, it is feared that a large number of students will not be able to reach the score of 220 needed to pass the exam. The same source stated, "The results, however, showed that a majority of 10th graders in nearly every district in the state passed both English and Math portion of the test" (2). "Well over 80 percent of the students in Auburn, Marlboro, Millbury, Shrewsbury and West Boylston, for example, passed both the English and Math portions of the exams. In Shrewsbury, the passing rate in English was 96 percent, and 94 percent in Math" (2). This paper goes on so say "It was later stated by another source that the school officials are trying to maintain that those last rates were a couple of percentage points higher in both Math and

English." (3)

In Worcester, 48 percent of the class of 2003 passed both tests, but 66 percent of the 10th graders passed each English and Math. Hence most of those not passing had only one test to retake, either English or Math. Overall results showed that 93 percent all 10th graders in the state scored at least 216 on the English test, while 91 percent scored at least 216 on the Math test. According to the Superintendent James A. Cardonio, the 10th -grade results mean that the vast majority of the students either succeeded their first try, or came within striking distance. The students that did not pass the test will have four more opportunities to retake the test (3).

Mr. Christopher H. Martes, executive director of the Massachusetts Association of Superintendents, said, however, "that there is still work to be done" (4). "He notes that students, with limited English proficiency, special education students and minority students still have a way to go". But he said too, "that those groups have raised their performance levels, but their failure rates are still too high" (4). Unfortunately, Worcester Vocational students are showing some negatives progress. Instead of raising their performance levels, they are dropping from 76 percent to 51 percent in English and from 85 percent to 55 percent in Math (5). According to Martes, "we need to work more closely with the students that failed the test," because "the most significant work is still ahead of us" (5).

Unfortunately, the declining rates of success of minority students on the MCAS Test went beyond the problem of Vocational schools. The MCAS scores of 2000 showed a gap between urban and suburban schools (9). The more wealthy towns were scoring higher, and the less wealthy were scoring much lower overall (9). Even last spring's

MCAS results were disappointing; "results were a lot lower for minority pupils" (10). For the tenth grade, only 59 percent of the minority students received a proficient or higher in the English portion of the test, and only a 44 percent in the Math portion. Schools in areas like Worcester and Boston with a larger range of ethnicities are more vulnerable to such setbacks. Some public schools with high ethnic variance, such as Boston, are somehow improving (9). Otis has managed to improve their scores immensely, despite the fact that 93 percent of the student body speaks English as their second language (9). Yet, the scores have been decreasing for three consecutive years, and "minority students across the state failed the test in alarming numbers" (9). The tenth-grade students in 2000 scored lower on the MCAS Test than they had as eighth graders (9).

Regrettably, Latino and African-American students are "behind white students in every category for the test and for every grade" (11). As eighth-graders, the class of 2003 had shocking results. In English 8 percent of white students failed, while 39 percent of Latino students and 28 percent of African-American students failed (11). The tenth grade students in 2000 scored poorly as well. 45 percent of the white students failed the Math portion of the MCAS Test, while 85 percent of the Latino students and 80 percent of the African-American students failed (11). These differences are astounding; however they come as no shock to the Latino public (11). The Latino and African-American leaders think that the new law regarding MCAS testing is unfair to minorities overall. Reasons for this are that statistically these minorities aren't as well off economically, and this results in lower funding for the public schools where they are citizens. Another huge disadvantage is that many of these students do not speak English as their first language at home, obviously a setback in the learning process (11). Not only is this holding them

back, but many Latino and African-American students never take courses in Algebra II, a subject that is crucial to success in taking the MCAS test (11).

To gradually increase the MCAS scores and their fairness between social groups, a new accountability system has been formed to release indexes to base scores on. The schools must reach an index of 100 by 2014 to be up to par. Currently, the baseline index is 70.7 for English and 53.0 in Math for all schools (10). If the schools can't reach these indexes in time, there will be state and district sanctions to penalize them (10).

Lately, in interviews with top education officials in all 50 states, there was much criticism of the proposition plan proposed by President Bush. This was because his plan ignores the development comprehension standard already implemented in recent years. The White House Education Adviser, Sandy Kress, said that the "federal program would only enhance the robust assessment system states have developed, and that annual testing had provided the most impressive results, particularly with low-income and minority children often failed by public schools" (6). Kress also stated that, "knowing where a child is year to year is absolutely indispensable to making progress for them" (6). "We need to be more serious about letting kids fall between the cracks" (6) and we need to know more about where our kids are every year and what kind of improvements they are making. But California Superintendent of Public Instruction, Delaine Eastin, said that "just testing is not magic. The magic is in a powerful curriculum, and giving teachers the time and the training" to work effectively with the students (6).

The money needed for those standardized tests is increasing day by day, especially in the last five years. Ted Stilwill, Director of Iowa's Education Department, said "if we need to spend an inordinate amount of our resources on testing, then it

diminishes our ability to improve teaching" (6). He later adds that "it is not a question of shouting louder at teachers so that they work harder; they need better tools" (6).

In Massachusetts alone, there are forty-one communities that already support granting diplomas to students that fulfill all regular high-school graduation standards but are still incapable of passing the MCAS Test (7). However, these school districts fear the loss of state funding. Defying the state-enforced MCAS law would result in cuts in funding, and perhaps a total loss. Members on the school committees are eagerly awaiting news as to the actual rules on funding and the possible outcomes depending on their actions (7).

These alternative diplomas are being proposed in several different variations. These alternatives would put some weight on MCAS scores but not allow them to be the sole or deciding factor. There is the thought of a "Certificate of Completion" to those that are unable to pass the MCAS Test but are able to fulfill all other local graduation requirements (7). Upon receiving this Certificate, the student would have to go to a community college before entering a four-year college. These recipients would not technically be high-school graduates, and there is a possibility they may not be able to enter the military or a community college, much less receive a Federal College loans. Jonathan King stated, "It's not the same as a diploma" (7). State Education Commissioner, David P. Driscoll, has another idea, to grant a "Certificate of Attainment" for those that are unable to pass the MCAS Test but are able to fulfill all local graduation requirements (8). This Certificate would help students find employment, acceptance to the military, and get them into community colleges. "A Certificate demonstrates that a potential worker is committed and persistent" (8) even if he never received an actual

diploma. The Boston Private Industry Council has promised that efforts will be made to accept all students with this Certificate into a program to find jobs and to help them pass the MCAS Test later, while on the job. This Certificate would only be granted if the students received MCAS tutoring, had taken the MCAS every year, and met other local graduation requirements including a high school attendance level (8).

There is much controversy about the Certificate of Attainment. Many worry that it is nearly making the MCAS a requirement, not really allowing students a way around it. Others are concerned that the Certificate undermines the MCAS and its purpose. Another group worries that this Certificate will create a 2-tier educational system. These groups are all looking for a way to offer MCAS help at local community colleges to help students finally pass the MCAS Test, using funds designated for the MCAS program (8). Hopefully a common ground for all groups will be found.

Higher education is a key ingredient to career success these days. The MCAS test has been implemented with the goal of ensuring that public schools are preparing their students well enough to prosper in the current job market according the defined requirements. It is an effort to show that the public schools are being held accountable and are all up to par and able to prepare our students. That the students have been responding well to the resources available to them is what their personal scores are supposed to mean. If the overall rate of failure at a school is high the state is empowered to come in and take it over.

There are several variables, which we will be researching during the MCAS study to better understand the test itself as well as its affects on the academic

community. The data available will be analyzed to see what the differences are between male and female. Ethnicity will be analyzed, along with social class differences. The overall course curriculum may affect the MCAS scores. This will help to see whether or not the MCAS Test really is a good way to measure the achievements of a student in regard to basic school curriculum. Learning style is also very important to student performance, and this will be looked at as well, using Myers-Briggs Type Indicator results.

Data collected from the MCAS test from Worcester's graduation classes of 2002 and 2003 will be studied to understand the differences between all of the different variables that will be analyzed. PSAT, Myers-Briggs Type Indicator (MBTI), and SAT are other methods that have been used in the past, but we will mainly be focusing on the MCAS and the MBTI for our study.

The MCAS Test is a test prepared to examine the status of the public schools of Massachusetts, by the testing of its students. There is a direct and explained explanation for the goals of this test given in the beginning of the MCAS Test itself. This explanation is shown in Figure 2.1.

Document Purpose and Structure

Purpose

The purpose of this document is to share with educators and the public all of the test items on which the spring 2002 MCAS student results are based. Release of these items is intended to provide additional information regarding the kinds of knowledge and skills that students are expected to demonstrate on MCAS tests. Local educators will be able to use this information to identify strengths and weaknesses in their curriculum and instruction, and to guide the changes necessary to more effectively meet their students' needs.

This document is also intended to be used by school and district personnel as a companion document to the school- and district-level *Test Item Analysis Reports*. Each school receives a fall 2002 *Test Item Analysis Report* for each content area at each grade level tested (e.g., grade 10 Mathematics). Each report lists, for the school receiving the report, the names of all enrolled students in that grade, and shows how each student answered each common item in that content area. The report identifies each item as multiple-choice, open-response, short-answer, or writing prompt, and identifies the item's MCAS reporting category. Item numbers and MCAS reporting categories in this document correlate directly to the "Item Numbers" in the *Test Item Analysis Reports*.

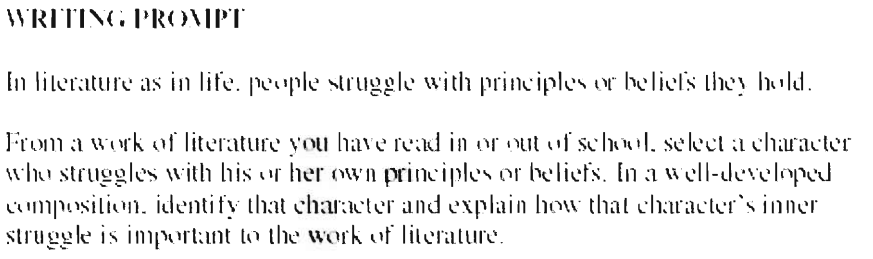
In addition, this document will assist school and district personnel in interpreting and using the results reported on the *Subject Area Subscore* pages of the fall 2002 *School* and *District Reports*. The *Subject Area Subscore* pages report student results through MCAS reporting categories specific to each content area, and represent the only instance in which MCAS results from both common and matrix-sampled items are combined and reported.

Figure 2.1: MCAS Test Explanation

The actual MCAS Test given to tenth-graders is divided into two main sections: the English and Mathematics sections. Each of these sections has different areas to cover and different ways in which to analyze the student knowledge of these areas. The types of questions vary in an effort to understand the student's knowledge better, and to be sure that the student is fully capable of proving their understanding of the subjects at hand.

There are various English questions for the tenth grade students to test their abilities to use language and literature. The English portion begins with a writing

prompt to get the student to write a composition on the given topic, as shown in Figure 2.2. A few examples of these testing questions are given below, varying in style. Figure 2.3 shows three multiple-choice questions, which follow a short story that asks the reader to analyze the story and the themes within it. The answers to these questions help to analyze the capabilities of the student in reading and comprehending short stories. After this short story there was also an open-ended question to be answered. This question is shown in Figure 2.4.



WRITING PROMPT

In literature as in life, people struggle with principles or beliefs they hold.

From a work of literature you have read in or out of school, select a character who struggles with his or her own principles or beliefs. In a well-developed composition, identify that character and explain how that character's inner struggle is important to the work of literature.

Figure 2.2: Writing Prompt (1)

The English portion of the MCAS Test also has short poems, short essays, lengthy reading sections that are addressed with questions in the same manner. Each piece of literature is followed by a questions section containing questions of the multiple-choice type or open-ended, or sometimes both. There is also the use of dictionary reading questions, as given in Figure 2.5. There are a total of 40 questions in the English portion of the MCAS Test.

The second portion of the MCAS Test is the Mathematics area. This section identifies five major areas: Number Sense and operations; Patterns, Relations, and Algebra; Geometry; Measurement; Data Analysis, Statistics, and Probability. There are different questions geared towards each of these five sections. Figures 2.6 through 2.10 show examples of each of these five areas, respectively.

1. Turning pages until he gets to the "Help Wanted Unskilled" section suggests the narrator

   A. has few job qualifications.

   B. is a high school dropout.

   C. was fired from his last job.

   D. is not interested in working.

2. In paragraph 1, the narrator's repetition of "Easy job. Good wages." emphasizes that he was

   A. aware of what was about to happen to him.

   B. daydreaming about his job experience.

   C. convinced he had found the perfect job.

   D. trying to persuade himself to go to work.

3. The workers could not use a penknife or a safety razor to scrape the bottles because

   A. the foreman was concerned about the workers' well-being.

   B. it would slow down the process of scraping labels.

   C. the surface of the bottles could be damaged.

   D. it would prevent the labels from coming off in one piece.

Figure 2.3 (1)

9. How does the meaning of the **expression**, "Easy job. Good wages." change for the author from the beginning of the story to the end? Use information from the story to support your answer.

Figure 2.4 (1)

This is a dictionary entry for the word *mercurial*.

mer•cu•ri•al (mer kyoor e el) *adj.*
1. Myth. Having to do with the Roman god Mercury. 2. Astron. Having to do with the planet Mercury. 3. Characterized by shrewdness, swiftness, etc., shown by the god Mercury. 4. Having a temperament that is changeable. [ME. of the planet Mercury < Lat. *mercurialis*].
—**mer cu ri al ly** *adv.*

40 According to the entry, from which language did *mercurial* originate?

A. French

B. Old Greek

C. Latin

D. Middle English

Figure 2.5 (1)

2 Darlene went to the hardware store to purchase 581 feet of rope. The rope costs $0.61 per yard. Which is **closest** to the amount of money Darlene needs to purchase the rope?

A. $100.00

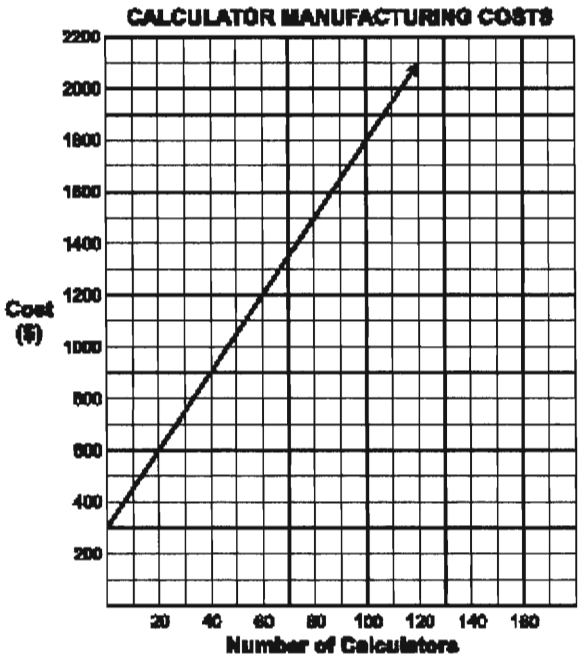
B. $120.00

C. $360.00

D. $1080.00

Figure 2.6 (1)

5 The graph below models the cost of manufacturing calculators.



Which equation shows the relationship between the number of calculators, n, and the total cost, C?

A. $C = 300 + n$

B. $C = 300 + 0.08n$

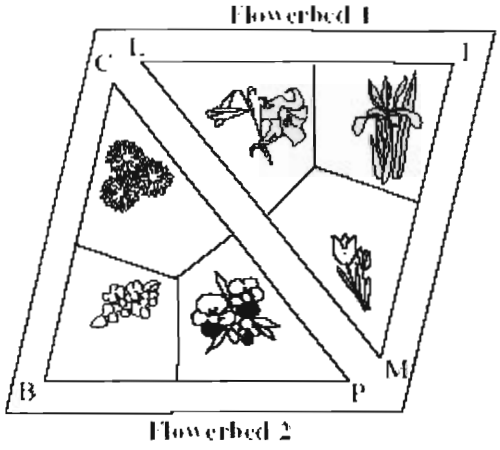
C. $C = 300 + 12.5n$

D. $C = 300 + 15n$

Figure 2.7 (1)

9 A landscape artist is designing two triangular flowerbeds so that:

- $\triangle LIM \cong \triangle PBC$.
- $\triangle LIM$ encloses Flowerbed 1.
- $\triangle PBC$ encloses Flowerbed 2.
- The measure of $\angle C$ is 50° and the measure of $\angle B$ is 75°.



What is the measure of $\angle I$?

A. 50°

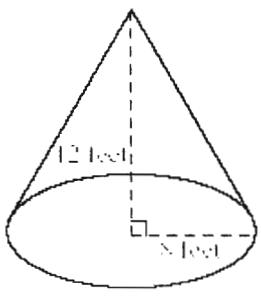
B. 55°

C. 75°

D. 105°

Figure 2.8 (1)

1 The cone shown below has a radius of 8 feet and a height of 12 feet.



What is the volume of the cone?

A. 32π cubic feet

B. 256π cubic feet

C. 374π cubic feet

D. 768π cubic feet

Figure 2.9 (1)

6 Lani had a box that contained

- 1 blue marble;
- 1 green marble;
- 1 purple marble;
- 1 yellow marble; and
- 2 red marbles.

Lani removed one marble without looking, and she recorded the result. She placed the marble back in the box and repeated the procedure one more time. What is the probability that Lani removed a red marble followed by a blue marble?

A. $\frac{1}{36}$

B. $\frac{1}{18}$

C. $\frac{1}{3}$

D. $\frac{1}{2}$

Figure 2.10 (1)

There are also sections that are not multiple-choice, such as the open-response questions. There is a multiple-choice question shown in Figure 2.11, along with an example of a short-answer question in Figure 2.12. These sections are again followed by more multiple-choice questions of the same style. There are a total of 42 items in the Mathematics portion of the MCAS Test.

17 Casey placed six identical cards in a box. Each card was marked with one integer using each of the integers 0, 1, 2, 3, 4, and 5 once. Casey drew two cards at random, one at a time, without replacing the first card.

a. Make a list, chart, or diagram of the possible outcomes when choosing two cards in this manner.

b. What is the probability that the sum of the integers on the two cards is greater than 9?

c. Based on your response to part a., what is the most frequently occurring sum of the integers? What is the probability that this sum will occur?

Figure 2.11 (1)

18 What is the simplest form of the expression $\frac{2x^4y^2}{x^2y^2}$, $x \neq 0, y \neq 0$?

Figure 2.12 (1)

The learning styles measure known as the Myers-Briggs Type Indicator, MBTI, is a simple way to classify a person's learning style. There is a set of questions, each question targeted at one of four scales (12). Each of these four scales consists of two opposite characteristics; the score will be more towards the choice that describes the individual best. When the scores for each scale have been tallied, a certain "psychological type" is allotted, explaining the individual by one of 16 learning styles. This group of "psychological types" was formed by the psychologist Carl Jung (12).

According to the below table (Table 2.1), the Extraverted types are on the left side, while the Introverted types are on the right. The opposites are listed next to each other for ease of evaluation. These types may not always suit the individual perfectly, as some variance is expected but 85% of the time a person agrees that at least three of the four dimensions is a good fit for them. A high score in one side of the spectrum does not guarantee a difference in score for another spectrum; this is simply an indicator of how one's mind organizes mental processes (12). The results are not to be understood as either positive or negative, as it measures one's preferences rather than one's cognitive abilities. When teaching students in classes, it is often helpful to understand how they learn to better educate them. Course organization can improve the ability to learn for many students, if their learning styles are taken into consideration. For example, some types prefer a more structured text or class than others. These learning styles also explain differences in test performance, as will be evident when MCAS scores are analyzed using the MBTI's sensing- intuition dimensions.

E: Extraversion	**I: Introversion**
When extroverting, I am...	When introverting, I am...
Oriented to the outer world	Oriented to the inner world
Focusing on people and things	Focusing on ideas, inner impressions
Active	Reflective
Using trial and error with confidence	Considering deeply before acting
Scanning the environment for stimulation	Finding stimulation inwardly
S: Sensing Perception	**N: Intuitive Perception**
When using my sensing I am...	When using my intuition I am...
Perceiving with the five senses	Perceiving with memory and associations
Attending to practical and factual details	Seeing patterns and meanings
In touch with the physical realities	Seeing possibilities
Attending to the present moment	Projecting possibilities for the future
Confining attention to what is said and done	Imagining; "reading between the lines"
Seeing "little things" in everyday life	Looking for the big picture
Attending to step-by-step experience	Having hunches; "ideas out of nowhere"
Letting "the eyes tell the mind"	Letting "the mind tell the eyes"
T: Thinking Judgment	**F: Feeling Judgment**
When reasoning with thinking, I am...	When reasoning with feeling, I am...
Using logical analysis	Applying personal priorities
Using objective and impersonal criteria	Weighing human values and motives, my
Drawing cause and effect relationships	own and others
Being firm-minded	Appreciating
Prizing logical order	Valuing warmth in relationships
Being skeptical	Prizing harmony; trusting
J: Judgment	**P: Perception**
When I take a judging attitude, I am...	When I take a perceiving attitude, I am...
Using thinking or feeling judgment outwardly	Using sensing or intuitive perception
Deciding and planning	outwardly
Organizing and scheduling	Taking in information
Controlling and regulating	Adapting and changing
Goal oriented	Curious and interested
Wanting closure, even when data are	Open-minded
incomplete	Resisting closure to obtain more data

Table 2.1: MBTI Type Explanation (13)

3 Methodology

There are two main goals of this project, and each was achieved through our joint efforts. The first goal was to assess the degree to which ethnicity affects the MCAS scores in Worcester Public High School students and try to figure out why that was the case. It was in all the newspapers that there was a relationship between ethnicity and the rates of passing. The other goal was to assess the degree to which the High School in Worcester the student attends also affects their MCAS scores. We were especially concerned about the Vocational-Technical School students, but proposals to allow students to leave schools that had poor standards, and the tendency of different social classes and ethnic groups to concentrate in different High Schools made this our important practical question for Worcester. These two issues were likely to be the focus of debate about just how fair or unfair the MCAS Test is for many students in the state of Massachusetts. This social issue is especially likely to be in the news since the passing of the MCAS became necessary to all graduating public High School students in the state of Massachusetts for the Class of 2003. If the test is unfair for many students consideration should be given to altering the law if one cannot help the students get the extra help that they will need to succeed despite their difficulties with the test.

In order to complete the project, several tasks need to be carried out. There is the obtaining of data, analyzing of data, and finally the summarizing of the findings into interpreted results. All of this must be finished in order to conclude the project. An overall weekly forecast was conducted to be sure that the project was on track and that

nothing would be forgotten. The proposed tasks were carefully planned out and followed accordingly.

The task of obtaining the data was conducted through Professor John Wilkes, the advisor for the project. The data was given in SPSS files to cover all of the High School students in the target group. These data consisted of students' names, genders, ethnicities, social class, course curriculum, MCAS scores, and learning styles. Each of these categories was listed separately yet existing in the same data set to draw links between each. There was also information on the MCAS Test and the MBTI Test collected to better understand the actual findings and how they linked to one another.

The next task was to analyze all of the given data and search for data, which was not already obtained. Each category was statistically studied to explain variations and help prove the hypotheses. These categories were also cross-examined to find similarities between different groups to see if there were actual correlations. The SPSS program is used to find these statistics, form graphs, and help summarize the findings.

Finally, each different graph and statistic finding were analyzed and written up to explain the association to the hypotheses and to other possibilities. A background of the MCAS Test and the MBTI were also given in order to better understand the entire project. An overall project description and goals were also given to help describe the project and help the reader understand the overall process of completing the project.

Each step was crucial and necessary to the following steps, supporting each other in order to come to a final conclusion. To better equip the reader with and understanding

of the actual project and hypotheses, the paper must be fully read and understood as the group intended. It is assumed that all necessary information was explained sufficiently to educate the reader.

In order to conduct such a study, much data and equipment was necessary. The type of equipment needed to conduct this IQP consists of the analysis of the data collected from the Worcester High Schools from the class of 2003. This data contains the results of the latest MCAS Test available, which were obtained through WPI resources. The data consisted of a database of MCAS Test and MBTI Test results, among other topics. Hundreds of cases were included in the data collected from the Worcester Public Schools. To analyze this data, a computer with 150 RAMS available and 2.0 GHZ of speed was needed, which opened the data quickly. Two computers with sufficient RAM were used to read the data, in both the Excel and SPSS programs. There is also a version of Excel that is available to support these data collected, which served as a back up system. Charts are used to show the variability between students, which helps to either prove or disprove the hypotheses. At the same time, histograms will be necessary to make correlation between groups, such as social class, MBTI results, gender, course curriculum, and ethnicity. The data and conclusions will be written up in a report consisting of several chapters. Many diagrams and charts will be used to summarize the data and to conclude all of the research. To do this, plenty of memory was used on CD's and on computers, both at home and at school. Basic materials such as paper, pens, pencils, notebooks, and such were also utilized.

The data needed for the project are the SPSS files supplied by Professor John Wilkes. These include data containing, but not limited to, students' names, genders, ethnicities, social class, course curriculum, MCAS scores, and learning styles. The data has already been collected for other projects; we are just utilizing it as well. The only other data we use is information from the actual MCAS and MBTI booklets and descriptions.

The data that will be used is collected from the results of the Massachusetts Comprehension Assessment Test. The purpose of the test is collecting information from 10-grade student in the areas of Math, English and Social Science. The results have been stored in a SPSS file, a program that is accessible through networked Worcester Polytechnic Institute computers. The Software is capable of handling the large amount of data collected. The results of the MCAS Test from the Worcester Public High School students of the class of 2003 are available at Worcester Polytechnic Institute. The SPSS program is similar to the Excel program but has many capabilities that surpass those of Excel, such as graphs and frequency information. Similar software has been used at other universities and it is expected to be popular in the industry before long.

Through the first two parts of the project, much research was conducted. There were efforts taken to better understand all variables, the MCAS Test, the MBTI test, and the project overall. We also needed to work on obtaining the data, and understanding how to use it. Professor Wilkes needed to sit with us several times in order to help us understand how to use the program, which was difficult for us, as we were just being introduced to it. The beginning of the project moved rather slowly, as we had to wait for

most of our data from other projects or was simply unable to obtain it. When we finally received the data, we worked hard to analyze it and apply it to our project.

Before the third part of the project, we were able to begin writing up background information, which was all we could do before we had the data. After obtaining the data, we formed tables and began writing about what we found. We finished a different chapter of the paper almost every week towards the end, and worked on editing each week as well in order to get the best quality paper possible. The last week was spent finishing up work and editing the paper overall.

The team was working together on all sections. There was a sharing of each section occasionally but usually it is written together or pieces are placed together by the team. Each individual carried out research in each topic. However, the entire project varied in the focus, with Victor focusing on Social Class issues and Dawn focusing on Course Curriculum, or which High School they attended. Each teammate did more research on their own topic yet helped the other to find data, analyze findings, and to come to a conclusion. All efforts began in the same way and ended in the same way, as the project was essentially two but treated as one. Each different subcategory studied was supporting each of the two main hypotheses, giving even more support to the goal of the project. Towards the end of the project, Victor only attended the meetings with the advisor, as Dawn had a schedule that did not align well with Professor Wilkes' schedule. The group met at least once a week through the project, working together to complete each section. Together the different chapters were proofread and adapted to better fit the intentions of the paper.

4 Findings

SPSS, Excel, and Microsoft Word were the programs used for the statistical analysis of the data collected from the City of Worcester's experience with the 8th and 10th Grades MCAS in the areas of English and Mathematics. Some data on an experimental History Test was available for the 10th graders, and some experimental data on Science were available for the 8th graders, but neither test was "official" or reported in the news. Hence, we restricted our analysis to English and Math. The experimental History and Science test had numeric scores but no officially "passing" or "failing" grades had been determined for them as of yet. After the data available in the MCAS, transcripts and MBTI databases were combined; we concentrated our study on the MCAS and Ethnicity questions, with the following results. The major goal of this project was to analyze the given standardize test data in relation to the effect of ethnicity on the scores. Given ethnic clusters in the four different high schools, and especially the Vocational High School was also of interest.

4.1 The Major Ethnic Groups

The five major ethnic groups which were distinguished were: Asian, African American (Black), Hispanics, Whites, and a group which did not identify with any of these four when given the option on the test (M) which we assume means "Mixed". All those ethnic groups combined to 2139 cases in all. The break down by race for grade 8th is shown in Table 4.1, and displayed in Figure 4.1. The results for the Class of 2003 in 10th grade are shown in Table 4.2 and summarized in a histogram form in Figure 4.2.

The Excel tables that we are working with will be showing a total of 2139 student analyzed for 8th grade and 1196 students for the 10th grade, due to these problems and lapses in ethnic coding. We dropped these cases rather than have a "mixed and other" column.

Distribution of Main Ethnic Groups WPS 8th Grade, Class 2003		
	Percentages	Cases
Asian	7%	151
African American	10%	218
Hispanic	25%	542
Missing	10%	226
White	48%	1002
		N=2139

Table 4.1: Distribution of Main Ethnic Groups; WPS 8th Grade, Class of 2003

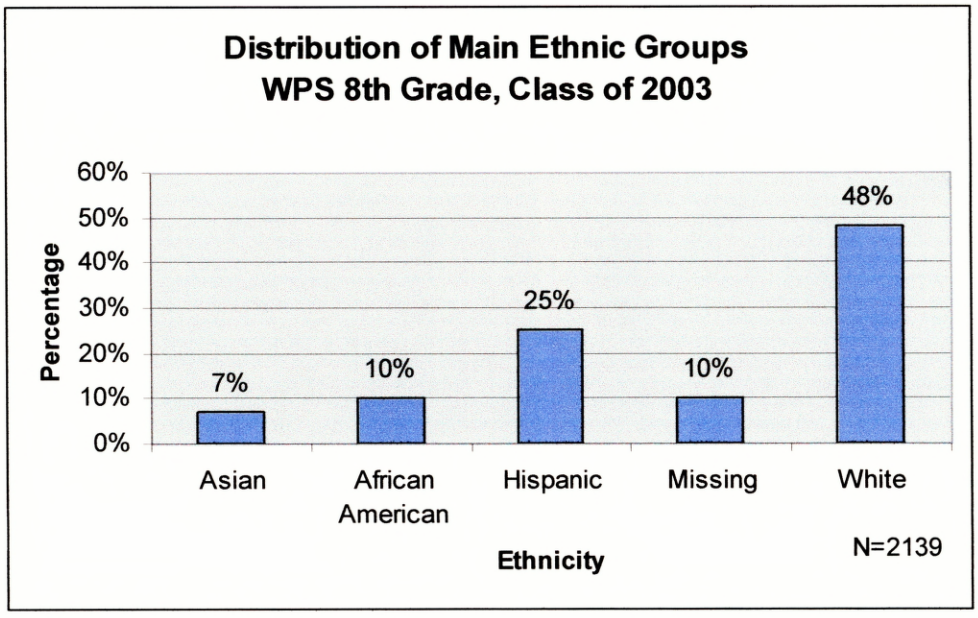


Figure 4.1: Distribution of Main Ethnic Groups, WPS 8th Grade, Class of 2003

Distribution of Main Ethnic Groups WPS 10th Grade, Class of 2003		
Ethnicity	Percentage	Cases
Asian	10%	117
African American	11%	130
Hispanic	25%	296
Missing	6%	74
White	48%	579
		N=1196

Table 4.2: Distribution of Main Ethnic Groups, WPS 10th Grade, Class of 2003

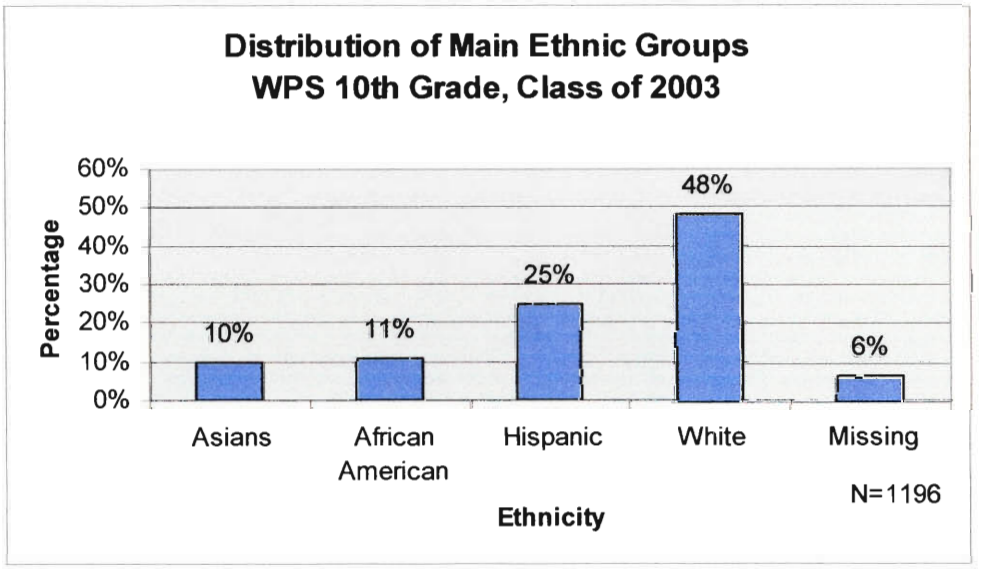


Figure 4.2: Distribution of Main Ethnic Groups, WPS 10th Grade, Class of 2003

Unfortunately, this means that we have to base our study on only 56 % of the students, due to missing data. In this case it was clearly not going to be possible to drop the missing data from the analysis without raising questions about its representation. There might be something systematic in the pattern of those refusing to report.

Hence, it would be necessary to use the 8th grade codes for those still in the system as 10th graders, and add in the 10th grade reports for those who were newcomers to the system where they existed. If this were not done, one could not be sure the 8th and

10th grade Hispanics represented the same basic student group, two years later. Since some students leave the system for Private schools, or simply leave the area, some data loss is to be expected, but 800 cases is too severe a loss to accept due to difference in coding and data collection if it can be avoided.

4.2 Distribution of Main Ethnic Groups by School, 10th Grade

For the Worcester Public High Schools, there were 2135 given students who took the 10th grades MCAS. 264 of these students attend Burncoat Senior High, making up 12.3% of the students in Worcester. 366 attended Doherty Memorial High, which is 17.1% of the students. 10 were from G. Stanley School, being .5% of the students. 229 were from North High school, being 10.7% of the students. 266 students attended South High Community School, being 12.4% of the students. 31 attended University Park, making up 1.4% of the total high school population. The Accelerating Learning Laboratory amounted to 2.4% that was 52 cases. 218 students attended the Worcester Vocational High School, being 10.2% of the total Worcester High School students. Student that we do not know at what school they attended totaled 703 cases, that is 32.9% of the total for missing data. These numbers are summarized in Table 4.3, however G. Stanley, University Park, and Accelerated Learning Lab are listed together as "Other" due to their low numbers, along with the missing data (32.9%), making it easier to focus on the schools with greater populations. Figure 4.3 shows these statistics in a histogram, again using "Other" as a variable to represent these three schools.

Distribution of Populations by School WPS 10th Grade, Class of 2003		
School	Percentages	Cases
Burncoat	12%	264
Doherty	17%	366
North	11%	229
South	12%	266
Vocational	11%	218
Other	37%	892
		N=2135

Table 4.3: Distribution of Populations by School;
WPS 10th Grade, Class of 2003

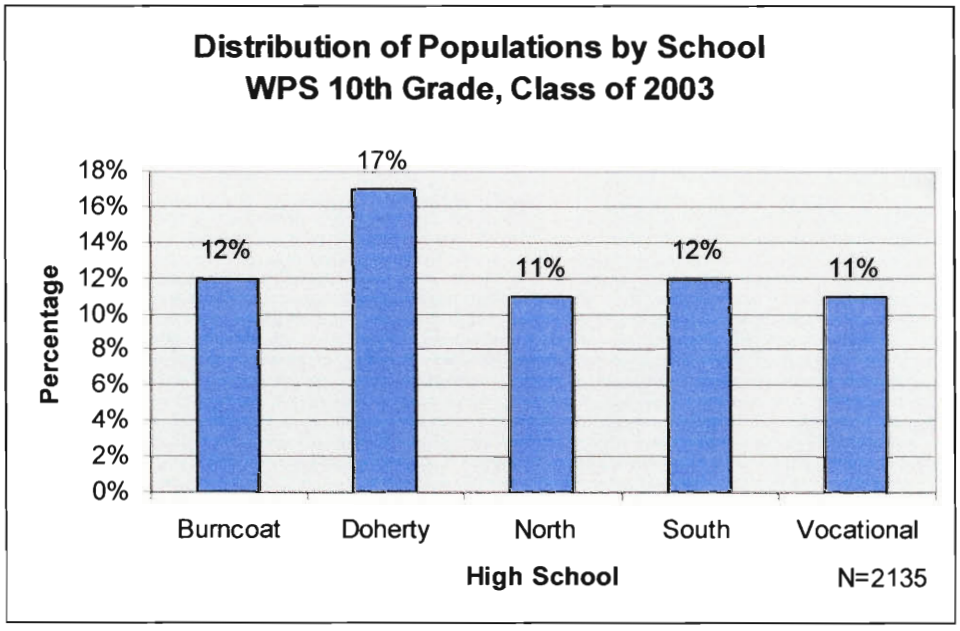


Figure 4.3: Distribution of Populations by School;
WPS 10th Grade, Class of 2003

In the 8th grade data set we found Asian 54 cases, Black 73 cases, Hispanic 131 cases, Whites 433 cases and 56 Not Defined. This table was all "College Preparation" level students, which included all of the major ethnic groups. No one scored "Advanced" on the MCAS from this student category. A few students scored at the Proficient level on the MCAS, coming from the College Preparation level courses this is pretty good, but not as good as would be expected.

Distribution of Ethnicity by MCAS Score: Mathematics 10th Grade College Prep, Class of 2003					
	Asian	Black	Hispanic	White	Missing
Advanced	0%	0%	0%	0%	0%
Proficient	10%	7%	19%	8%	21%
Need Improvement	60%	57%	43%	66%	64%
Failed	30%	36%	38%	26%	15%
					N=747

Table 4.4: Distribution Ethnicity by MCAS Score: Mathematics; 10th Grade College Prep, Class of 2003

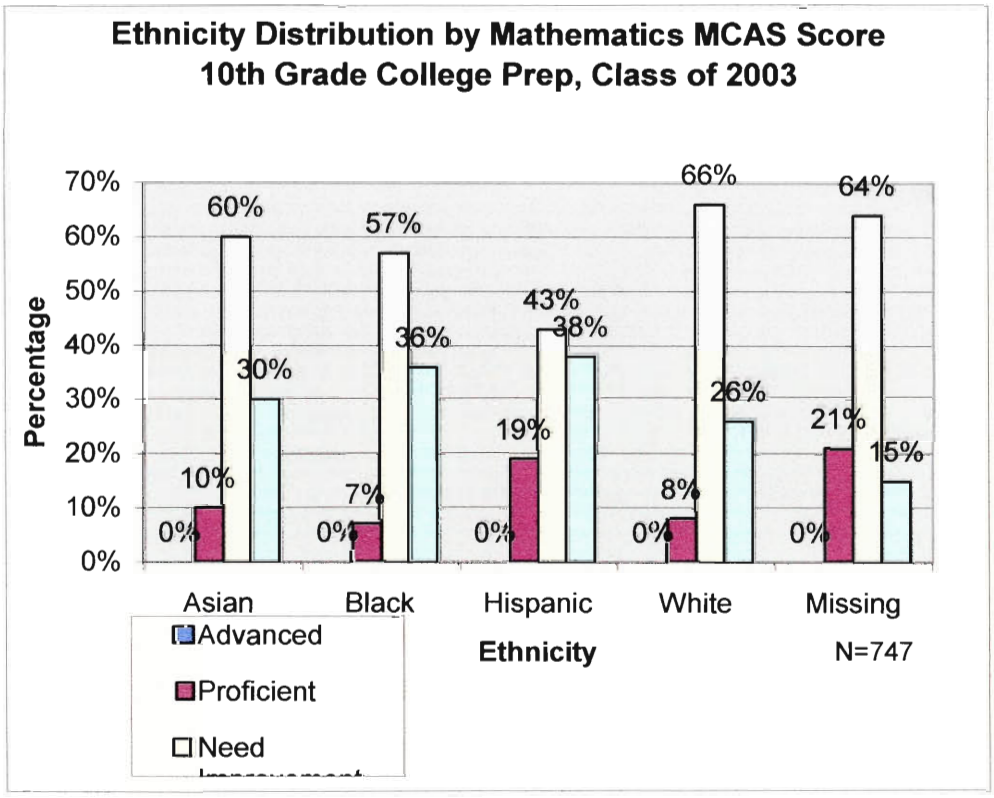


Figure 4.4: Distribution Ethnicity by MCAS Score: Mathematics; 10th Grade College Prep, Class of 2003

Distribution of Ethnicity by MCAS Score: English 10th Grade College Prep, Class of 2003					
	Asian	Black	Hispanic	White	Missing
Advanced	0%	0%	0%	0%	7%
Proficient	20%	0%	5%	8%	7%
Need Improvement	70%	39%	49%	53%	43%
Failed	10%	61%	46%	39%	43%
					N=747

Table 4.5: Distribution of Ethnicity by MCAS Score: English; 10th Grade College Prep, Class of 2003

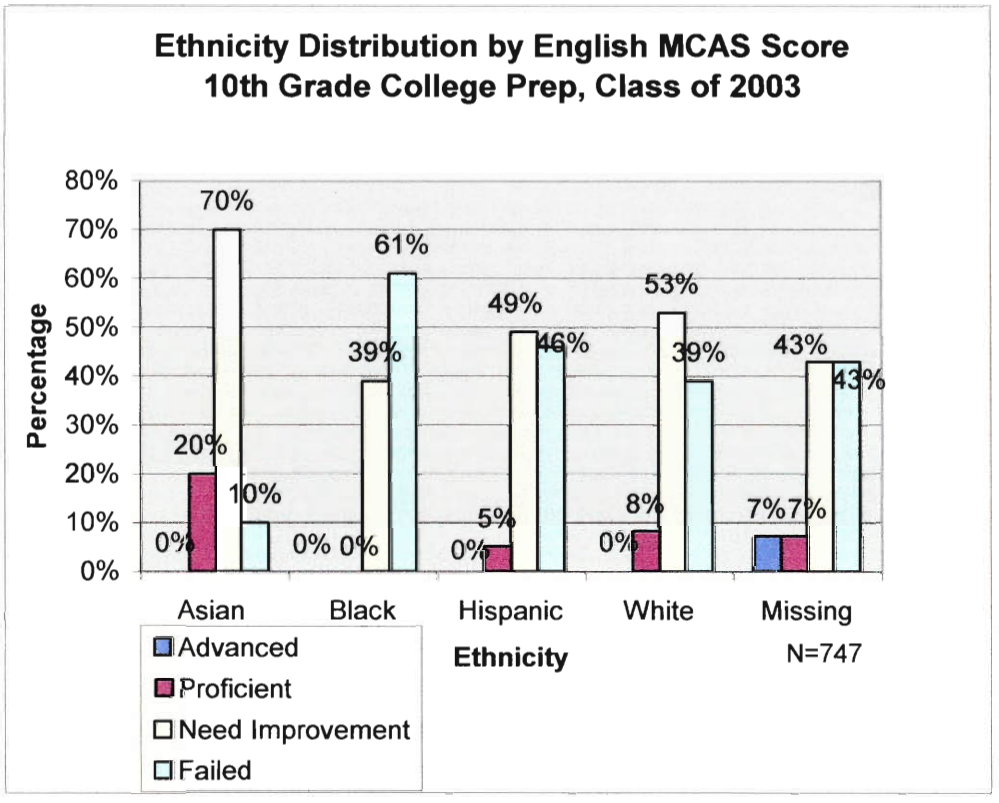


Figure 4.5: Distribution of Ethnicity by MCAS Score: English; 10th Grade College Prep, Class of 2003

The White students managed this feat. Most of the students passed the MCAS but scored "Needs Improvement" if they came from the College Preparation track. 60% Asians, 57% of the Blacks, 43% of the Hispanics, 64% of the Mixed, and 66% of the Whites passed but barely. We also have the 1 in 3 students that failed the MCAS from the

group that took all College Preparation courses in 10th grade. Clearly the White's better overall performance is because proportionally more of them are taking Honor and AP courses that improve their odds of passing the test.

4.3 Distribution of MCAS Scores, 8th Grade

The next analysis is of the Social Studies portion of the 8th grade test.

Distribution of MCAS Scores: Social Science WPS 8th Grade, Class of 2003		
	Percentage	Cases
Advanced	2%	48
Proficient	10%	211
Needs Improvement	14%	294
Failed	50%	1051
Missing	24%	535
		N=2139

Table 4.6: Distribution of MCAS Scores: Social Science; WPS 8th Grade, Class of 2003

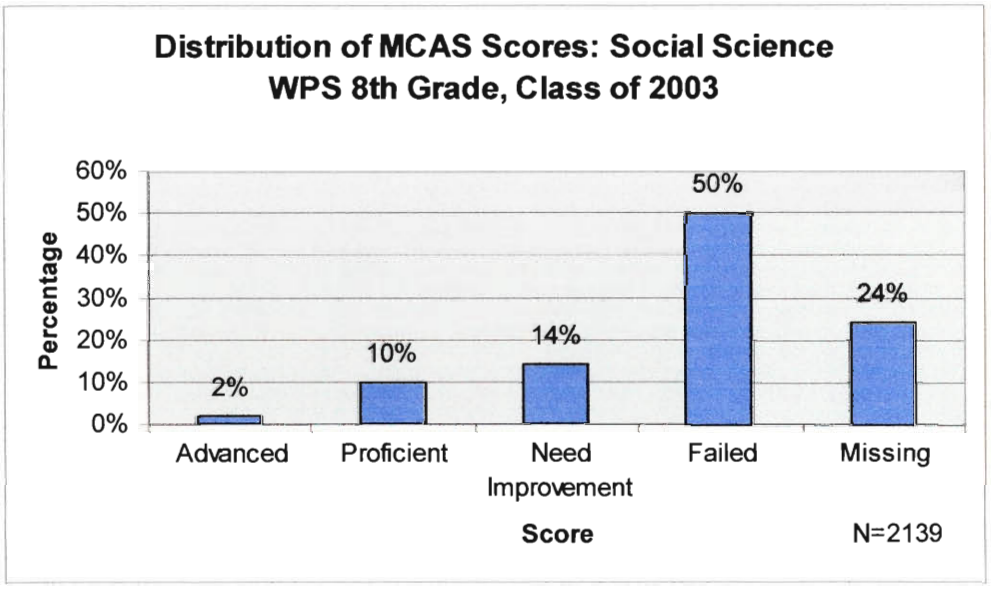


Figure 4.6: Distribution of MCAS Scores: Social Science; WPS 8th Grade, Class of 2003

After this was the Mathematics portion of the eight graders:

Distribution of Mathematics MCAS Scores WPS 8th Grade, Class of 2003		
	Percentage	Cases
Advanced	5%	111
Proficient	25%	526
Need Improvement	11%	232
Failed	22%	459
Missing	37%	811
		N=2139

Table 4.7: Distribution of MCAS Scores: Mathematics;
WPS 8th Grade, Class of 2003

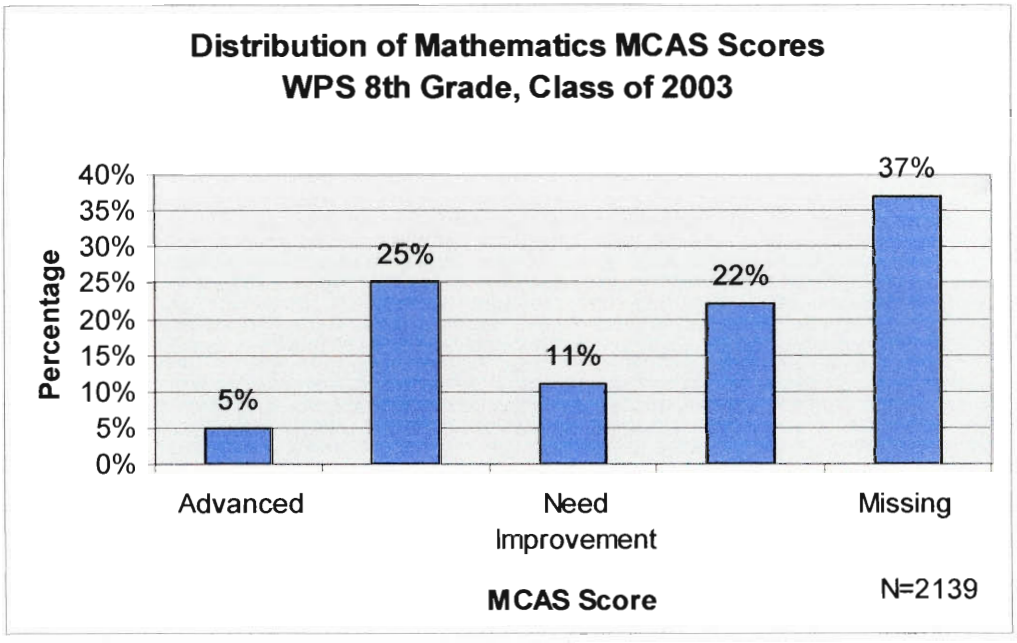


Figure 4.7: Distribution of MCAS Scores: Mathematics;
WPS 8th Grade, Class of 2003

The final portion for the eight graders was the English portion.

Distribution of MCAS Score: English WPS 8th Grade, Class of 2003		
	Percentages	Cases
Advanced	7%	114
Proficient	24%	520
Need Improvement	29%	622
Failed	20%	433
Missing	20%	450
		N=2139

Table 4.8: Distribution of MCAS Scores: English;
WPS 8th Grade, Class of 2003

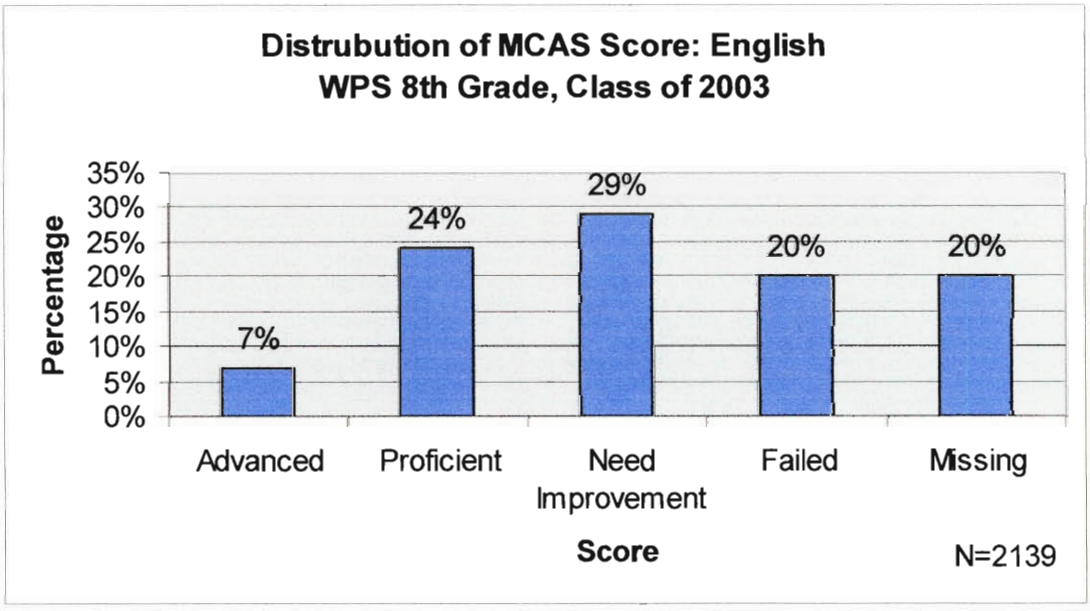


Figure 4.8: Distribution of MCAS Scores: English;
WPS 8th Grade, Class of 2003

4.4 Distribution of MCAS Scores by Ethnicity, 10th Grade

4.4.1 English MCAS Scores

To better explain the results of the MCAS Test for the 10th Graders, the English and Math portions are split up and shown in tables and graphs. To show the overall results, the scores for the tenth grade students were as follows. There were again 2139 cases overall. The English results:

Distribution of MCAS Score: English WPS 10th Grade, Class of 2003		
	Percentage	Cases
Advanced	3%	64
Proficient	15%	321
Need Improvement	23%	492
Failed	20%	428
Missing	39%	834
		N=2139

Table 4.9: Distribution of MCAS Scores: English; WPS 10th Grade, Class of 2003

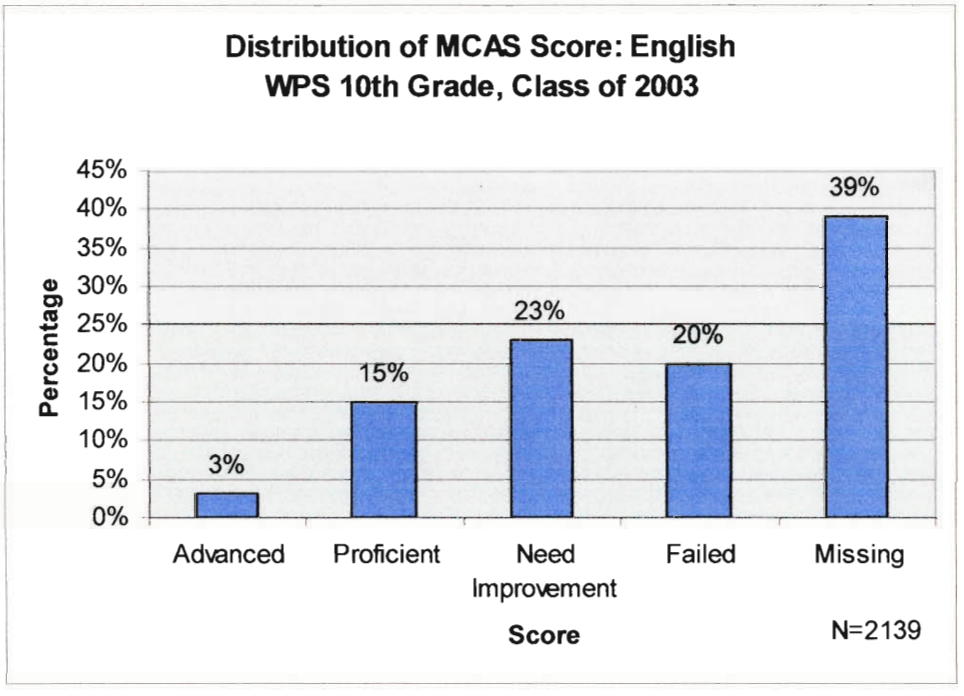


Figure 4.9: Distribution of MCAS Scores: English; WPS 10th Grade, Class of 2003

When analyzing the MCAS Test by gender and by race, we found some interesting results. These results are discussed in the following section. Out of our data set there were a total of 105 Asian cases. There were 55 Asian female cases in the data.

Distribution of MCAS Score by Gender: English Asian Students of WPS 10th Grade, Class of 2003				
	Percentage		Cases	
	Male	Female	Male	Female
Advanced	6%	4%	2	5
Proficient	10%	12%	17	5
Needs Improvement	50%	53%	29	25
Failed	34%	31%	7	15
Total	100%	100%	55	50
				N=105

Table 4.10: Distribution of MCAS Score by Gender: English;
Asian Students of WPS 10th Grade, Class of 2003

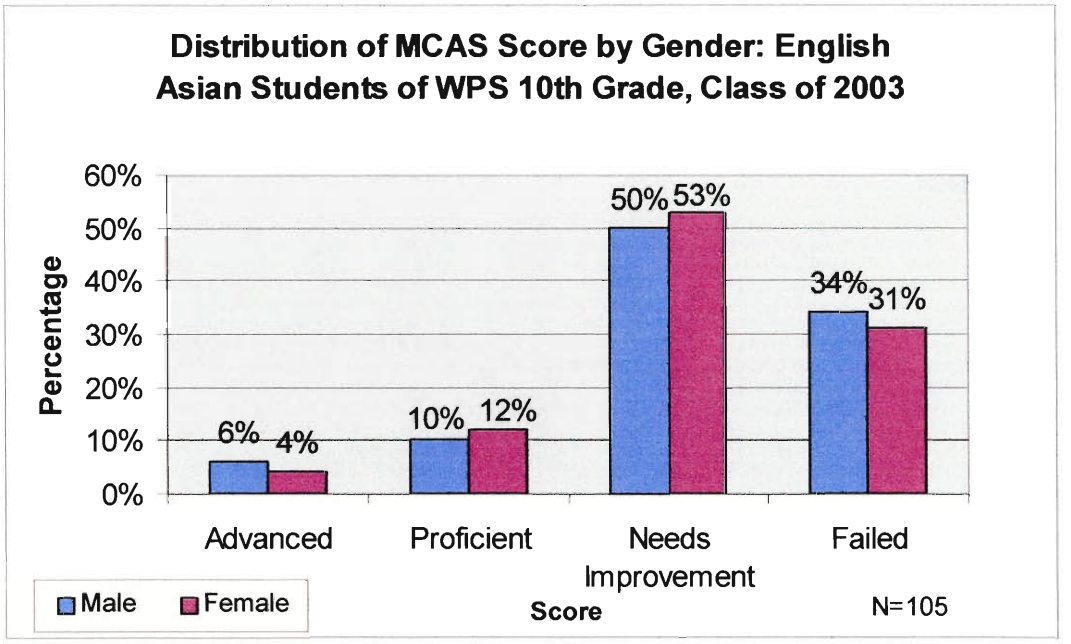


Figure 4.10: Distribution of MCAS Score by Gender: English;
Asian Students of WPS 10th Grade, Class of 2003

For the African American cases in our data set, there were also some interesting results.

Distribution of MCAS Score by Gender: English African American Students of WPS 10th Grade, Class of 2003				
	Percentage		Cases	
	Male	Female	Male	Female
Advanced	3%	1%	2	1
Proficient	10%	27%	6	19
Need Improvement	43%	40%	27	29
Failed	44%	32%	28	23
Total	100%	100%	63	72
				N=135

Table 4.11: Distribution of MCAS Score by Gender: English;
African American Students of WPS 10th Grade, Class of 2003

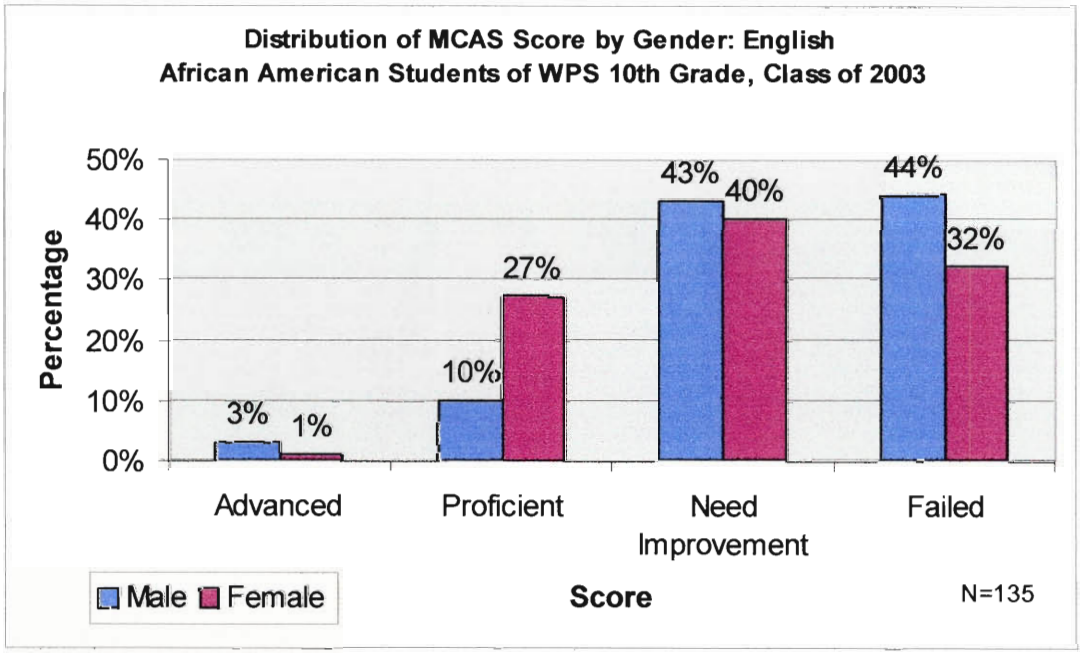


Figure 4.11: Distribution of MCAS Score by Gender: English;
African American Students of WPS 10th Grade, Class of 2003

Another race and gender difference of interest was that of the Hispanic students.

Distribution of MCAS Score by Gender: English Hispanic Students of WPS 10th Grade, Class of 2003				
	Percentage		Cases	
	Male	Female	Male	Female
Advanced	1%	1%	1	2
Proficient	10%	12%	13	16
Need Improvement	25%	41%	32	57
Failed	64%	46%	82	65
Total	100%	100%	128	140
				N=268

Table 4.12: Distribution of MCAS Score by Gender: English;
Hispanic Students of WPS 10th Grade, Class of 2003

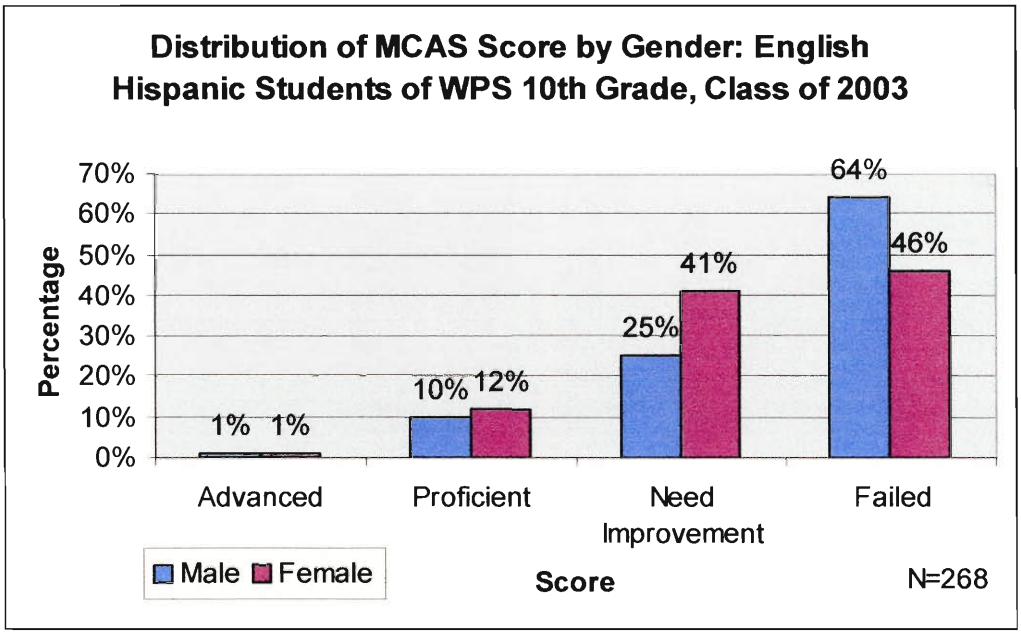


Figure 4.12: Distribution of MCAS Score by Gender: English;
Hispanic Students of WPS 10th Grade, Class of 2003

The largest data set of a single race was that of the White, with a total of 643 cases.

Distribution of MCAS Score by Gender: English White Students of WPS 10th Grade, Class of 2003				
	Percentage		Cases	
	Male	Female	Male	Female
Advanced	6%	10%	18	31
Proficient	31%	39%	99	125
Need Improvement	37%	35%	121	114
Failed	26%	16%	86	49
Total	100%	100%	324	319
				N=643

Table 4.13: Distribution of MCAS Score by Gender: English;
White Students of WPS 10th Grade, Class of 2003

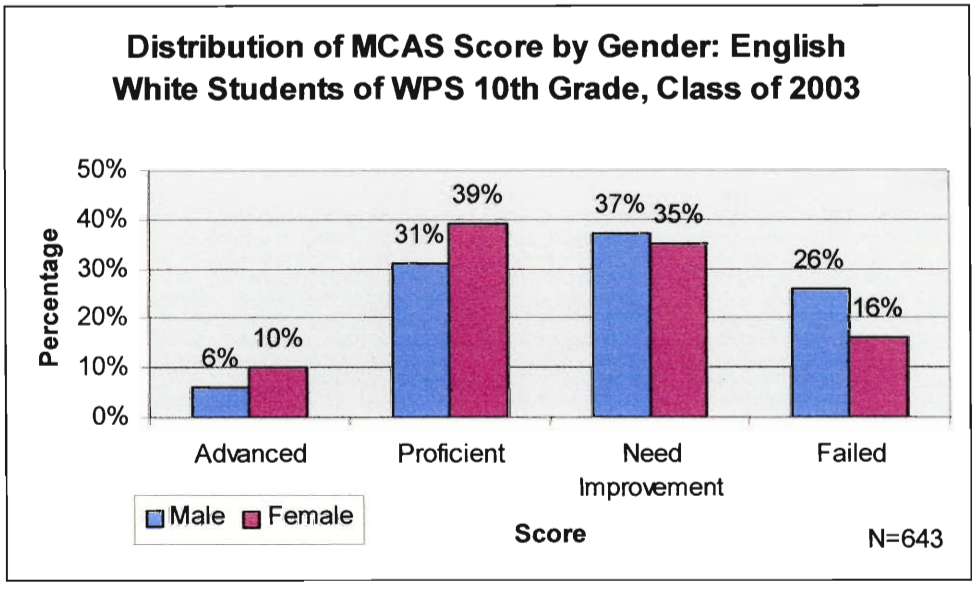


Figure 4.13: Distribution of MCAS Score by Gender: English;
White Students of WPS 10th Grade, Class of 2003

This data set shows that although the White students did not perform perfectly, they performed much better than the other ethnicities by far. The Asian, African American, and Hispanic students showed results dominantly in the Need Improvement

and Failed categories, while the White students showed up more in the Proficient and Need Improvement categories.

4.4.2 Mathematics MCAS Scores

Not only were the gender and race variables taken into consideration when analyzing the MCAS data for the English portion, but for the Mathematics portion as well. The first group analyzed was the Asian group, consisting of a total of 106 cases.

Distribution of MCAS Score by Gender: Mathematics Asian Students of WPS 10th Grade, Class of 2003				
	Percentage		Cases	
	Male	Female	Male	Female
Advanced	18%	11%	9	6
Proficient	18%	13%	9	7
Need Improvement	42%	55%	22	31
Failed	22%	22%	11	11
Total	100%	100%	51	55
				N=106

Table 4.14: Distribution of MCAS Score by Gender: Mathematics; Asian Students of WPS 10th Grade, Class of 2003

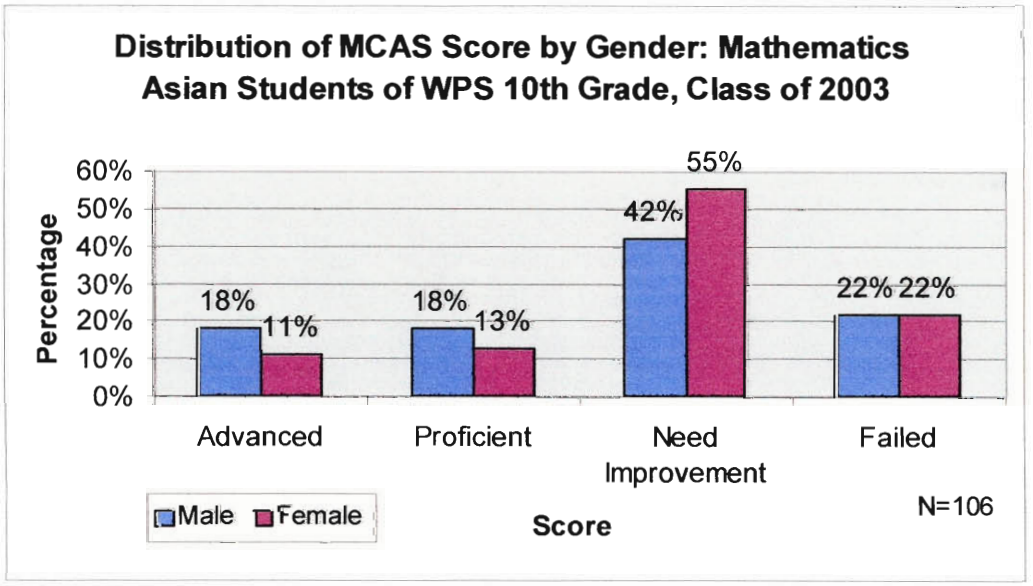


Figure 4.14: Distribution of MCAS Score by Gender: Mathematics; Asian Students of WPS 10th Grade, Class of 2003

The second group was again the African American group, consisting of 136 cases total.

Distribution of MCAS Score by Gender: Mathematics African American Students of WPS 10th Grade, Class of 2003				
	Percentages		Cases	
	Male	Female	Male	Female
Advanced	3%	6%	2	4
Proficient	9%	11%	6	8
Need Improvement	30%	32%	19	23
Failed	58%	51%	37	37
Totals	100%	100%	64	72
				N=136

Table 4.15: Distribution of MCAS Score by Gender: Mathematics;
African American Students of WPS 10th Grade, Class of 2003

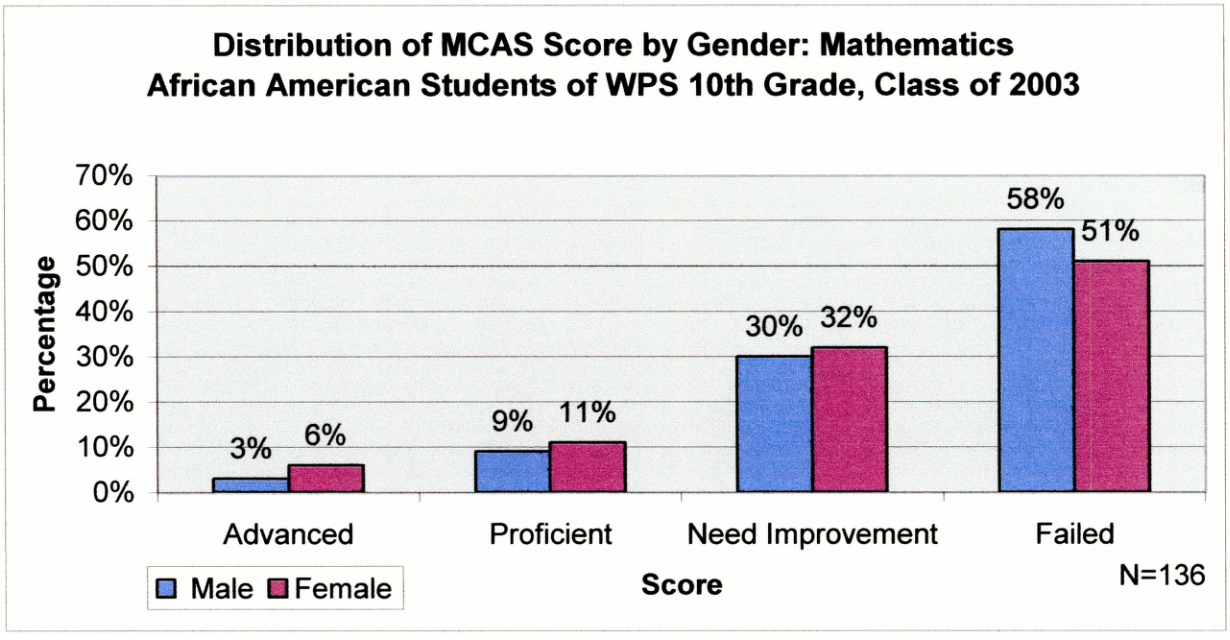


Figure 4.15: Distribution of MCAS Score by Gender: Mathematics;
African American Students of WPS 10th Grade, Class of 2003

The third group was the Hispanic group, consisting of 289 cases total.

Distribution of MCAS Score by Gender: Mathematics Hispanic Students of WPS 10th Grade, Class of 2003				
	Percentages		Cases	
	Male	Female	Male	Female
Advanced	1%	0%	1	0
Proficient	8%	5%	11	8
Need Improvement	27%	42%	39	61
Failed	64%	53%	91	78
Total	100%	100%	142	147
				N=289

Table 4.16: Distribution of MCAS Score by Gender: Mathematics;
Hispanic Students of WPS 10th Grade, Class of 2003

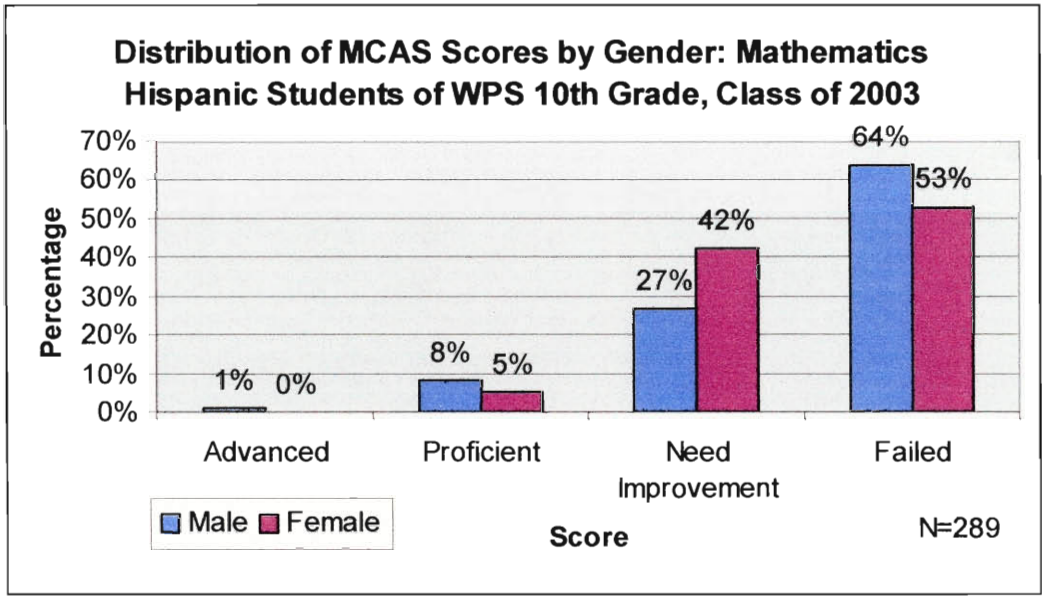


Figure 4.16: Distribution of MCAS Score by Gender: Mathematics;
Hispanic Students of WPS 10th Grade, Class of 2003

The final group examined was the White, with a total of 645 cases. There were 320 females included and a total of 325 male cases.

Distribution of MCAS Score by Gender: Mathematics White Students of WPS 10th Grade, Class of 2003				
	Percentage		Cases	
	Male	Female	Male	Female
Advanced	15%	10%	50	31
Proficient	24%	27%	77	87
Need Improvement	31%	36%	99	116
Failed	30%	27%	99	86
Totals	100%	100%	325	320
				N=645

Table 4.17: Distribution of MCAS Score by Gender: Mathematics;
White Students of WPS 10th Grade, Class of 2003

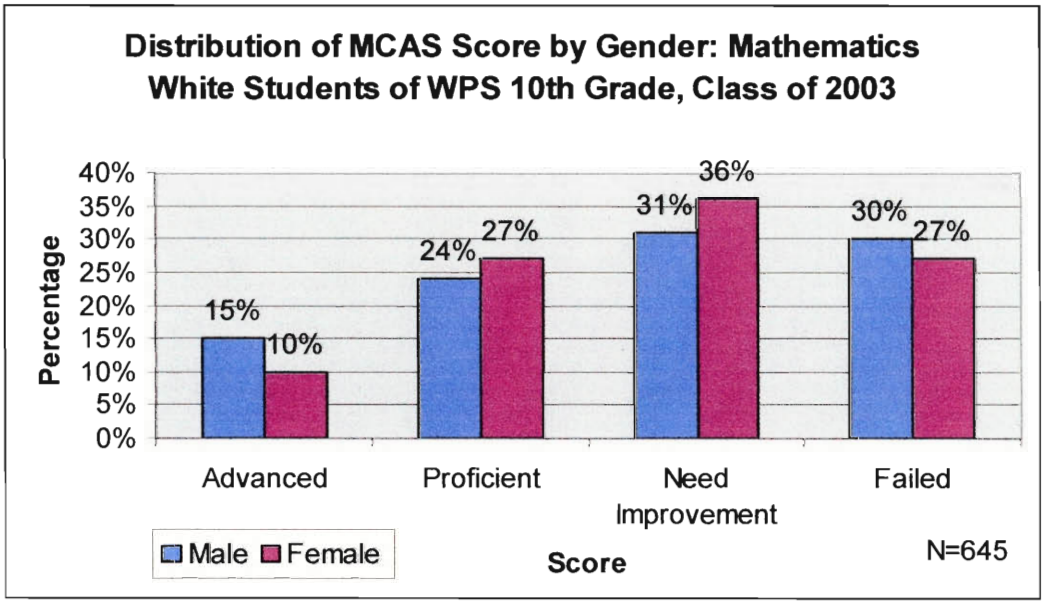


Figure 4.17: Distribution of MCAS Score by Gender: Mathematics;
White Students of WPS 10th Grade, Class of 2003

4.5 Worcester Public Schools by Ethnicity

4.5.1 English MCAS Scores

For an overall analysis of the entire Worcester Public school area, we looked at each school separately. To compare schools to each other and to the average, we broke

down all of the statistics for each school and even found an average. These analyses helped us to understand the variables in different aspects, as will be explained.

After finding the average for the English MCAS scores for Worcester High School Asian students, we found that the results were as follows:

Distribution of MCAS Score by School: English Asian Students of WPS 10th Grade, Class of 2003				
	Advanced	Proficient	Need Improvement	Failed
Burncoat	0%	0%	57%	43%
Doherty	0%	0%	36%	64%
North	3%	19%	49%	29%
South	3%	12%	52%	33%
Voke	0%	33%	0%	67%
				N=95

Table 4.18: Distribution of MCAS Score by School: English;
Asian Students of WPS 10th Grade, Class of 2003

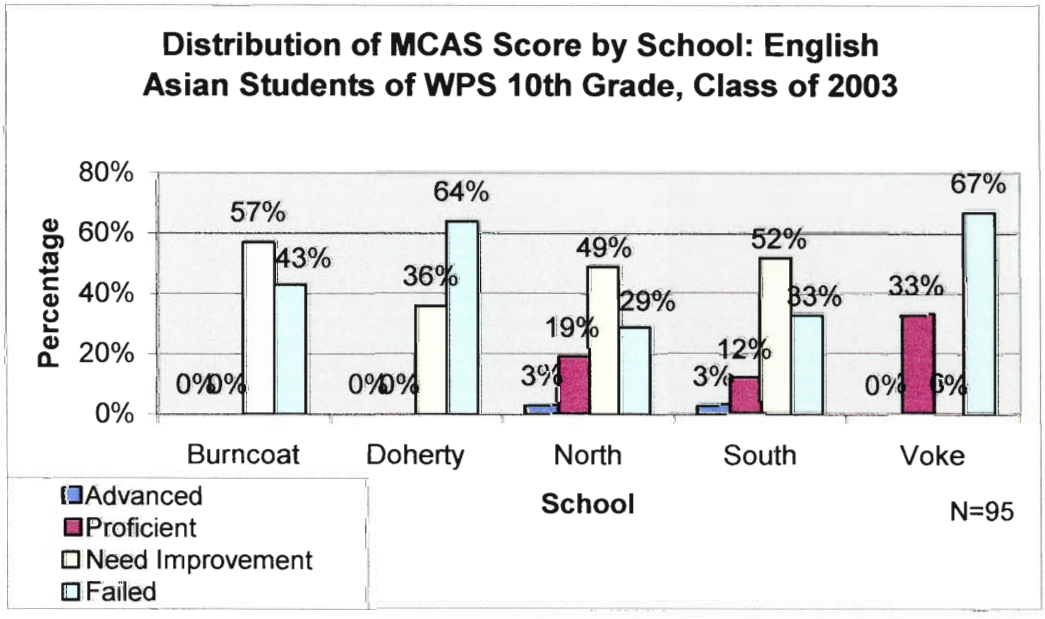


Figure 4.18: Distribution of MCAS Score by School: English;
Asian Students of WPS 10th Grade, Class of 2003

Distribution of MCAS Score by School: English African American Students of WPS 10th Grade, Class of 2003				
	Advanced	Proficient	Need Improvement	Failed
Burncoat	0%	9%	47%	44%
Doherty	0%	16%	32%	52%
North	0%	23%	50%	27%
South	5%	21%	53%	21%
Voke	0%	0%	18%	82%
				N=115

Table 4.19: Distribution of MCAS Score by School: English;
African American Students of WPS 10th Grade, Class of 2003

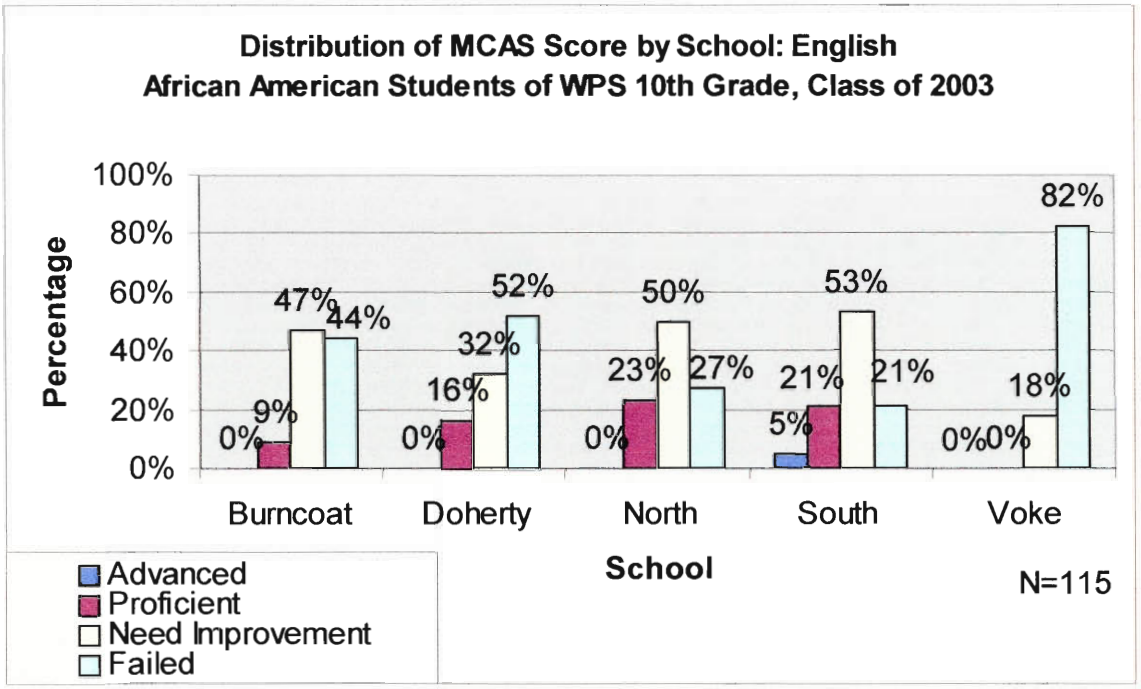


Figure 4.19: Distribution of MCAS Score by School: English;
African American Students of WPS 10th Grade, Class of 2003

Distribution of MCAS Score by School: English Hispanic Students of WPS 10th Grade, Class of 2003				
	Advanced	Proficient	Need Improvement	Failed
Burncoat	0%	9%	25%	66%
Doherty	3%	7%	14%	76%
North	0%	14%	48%	38%
South	0%	6%	34%	60%
Voke	0%	9%	29%	62%
				N=229

Table 4.20: Distribution of MCAS Score by School: English;
Hispanic Students of WPS 10th Grade, Class of 2003

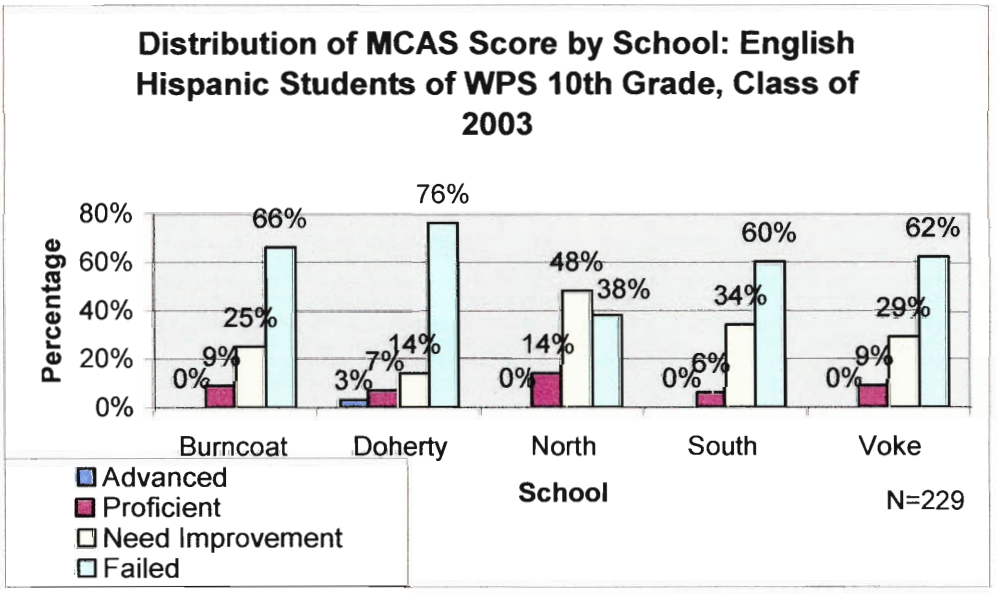


Figure 4.20: Distribution of MCAS Score by School: English;
Hispanic Students of WPS 10th Grade, Class of 2003

Distribution of MCAS Score by School: English White Students of WPS 10th Grade, Class of 2003				
	Advanced	Proficient	Need Improvement	Failed
Burncoat	6%	46%	33%	15%
Doherty	7%	39%	37%	17%
North	4%	29%	45%	22%
South	8%	31%	37%	24%
Voke	0%	6%	44%	50%
				N=502

Table 4.21: Distribution of MCAS Score by School: English; White Students of WPS 10th Grade, Class of 2003

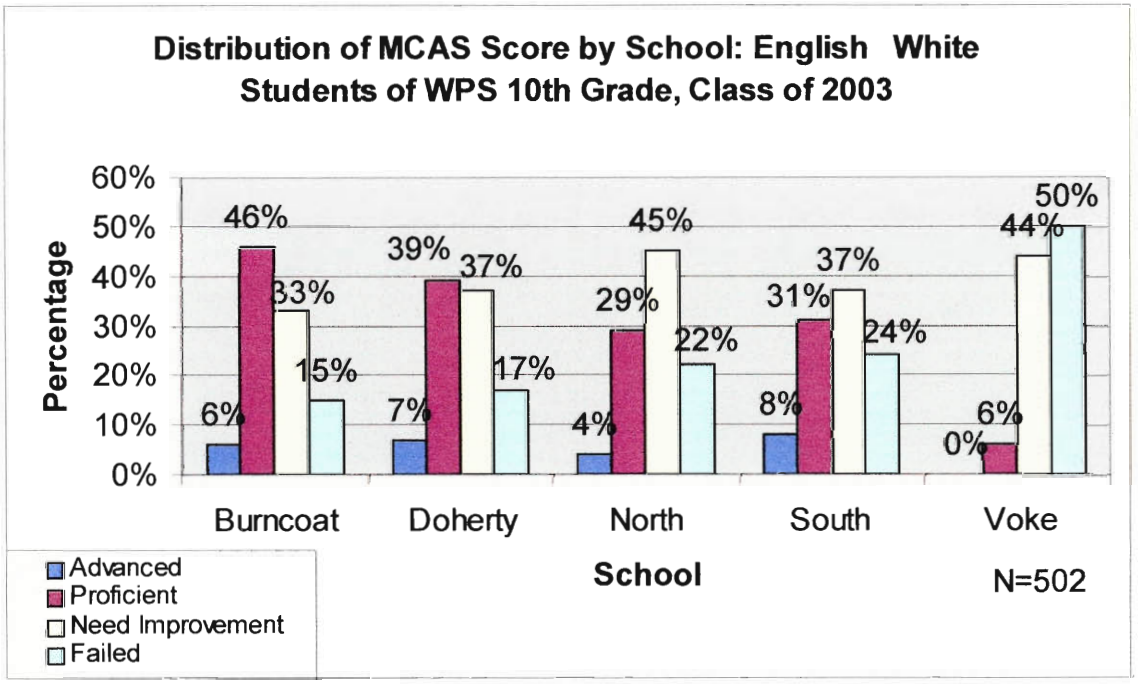


Figure 4.21: Distribution of MCAS Score by School: English; White Students of WPS 10th Grade, Class of 2003

Asian

The number of students placed in Advanced were only a few in North and South and zero percent in the rest of the others schools. The number of students that Failed were more in Vocational School for this ethnic group, with a total of 67%. The school that did a better job was South with 33% Failed, being the less number. The group with the lowest

Needs Improvement was Voke, which had 0%. And the highest number was for Burncoat with a 57%. Burncoat and Doherty showed no students in Proficient and the better result was for Voke with a 33%.

Black

Advanced Placement for this community was just 3% in Doherty and 0% in the rest of the other schools in WPS. The highest number of Failed was for Voke with 82%. South did a better job with 21% of students that Failed. For the group that scored Need Improvement, North and South were almost even with 50% and 53%. For the group that was in Proficient, Voke showed 0%.

Hispanic

This ethnic group showed 3% of students in Advanced in Doherty. The number of students that Failed was 76% for Doherty, followed by Burncoat with 66%, South with 60%, and Voke with 62%. For the Proficient outcomes, North did a better job with 14%, and South school being in last place with 6%.

White

This ethnic group showed Advanced students in most of the schools, Burncoat with 6%, Doherty with 7%, North 4% and South 8%. The number of students that Failed was less than the other ethnic groups, but again being the highest at Voke School with 50% and the lowest Doherty with 17%. The group that scored Need Improvement was

almost similar in most of the WPS with an average of 39%. For the Proficient level,Voke showed a poor result with only 6%, and Burncoat showed 39% Proficient.

4.5.2 Mathematics

For an overall analysis of the entire Worcester Public school area, we looked at each school separately. To compare schools to each other and to the average, we broke down all of the statistics for each school and even found an average. These analyses helped us to understand the variables in different aspects, as will be explained.

After finding the average for the MCAS scores for Worcester high school Asian students in English, we found that the results were as follows:

We carried out this same process for the Mathematics portion of the MCAS Test for the Asian students in the Worcester public schools.

Distribution of MCAS Score by School: Mathematics Asian Students of WPS 10th Grade, Class of 2003				
	Advanced	Proficient	Need Improvement	Failed
Burncoat	0%	29%	57%	14%
Doherty	20%	27%	33%	20%
North	16%	7%	52%	25%
South	5%	52%	13%	30%
Voke	0%	33%	0%	67%
				N=96

Table 4.22: Distribution of MCAS Score by School: Mathematics;
Asian Students of WPS 10th Grade, Class of 2003

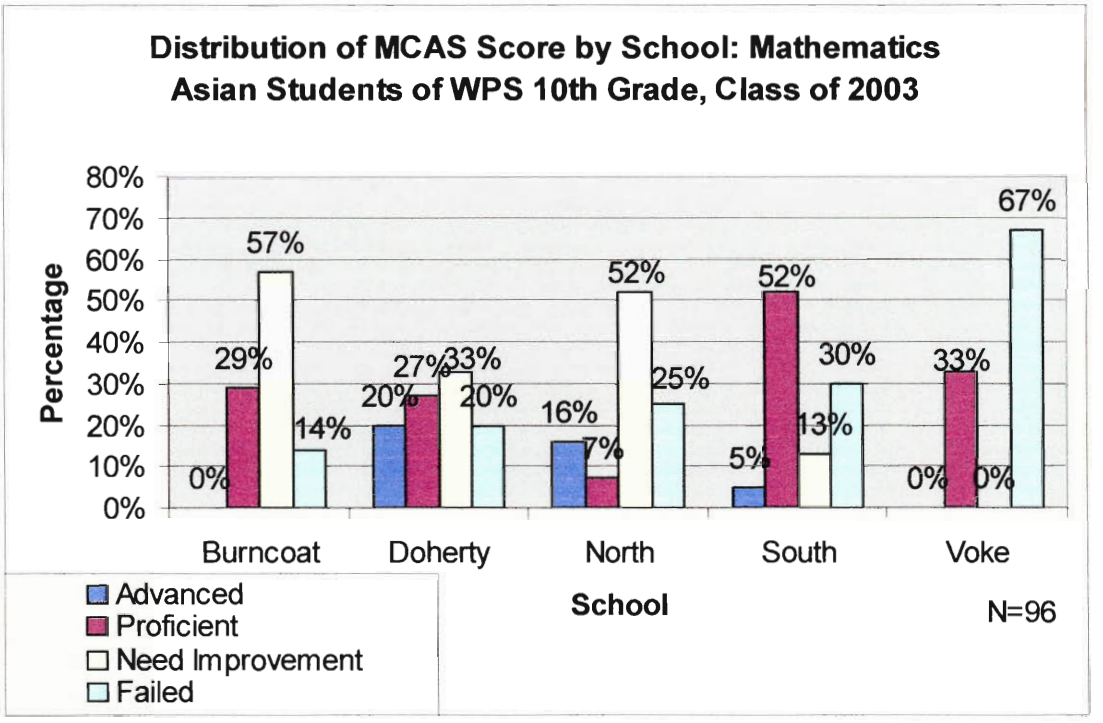


Figure 4.22: Distribution of MCAS Score by School: Mathematics;
Asian Students of WPS 10th Grade, Class of 2003

Distribution of MCAS Score by School: Mathematics African American Students of WPS 10th Grade, Class of 2003				
	Advanced	Proficient	Need Improvement	Failed
Burncoat	3%	9%	24%	64%
Doherty	4%	8%	24%	64%
North	0%	11%	50%	39%
South	5%	16%	26%	53%
Voke	0%	0%	9%	91%
				N=115

Table 4.23: Distribution of MCAS Score by School: Mathematics;
African American Students of WPS 10th Grade, Class of 2003

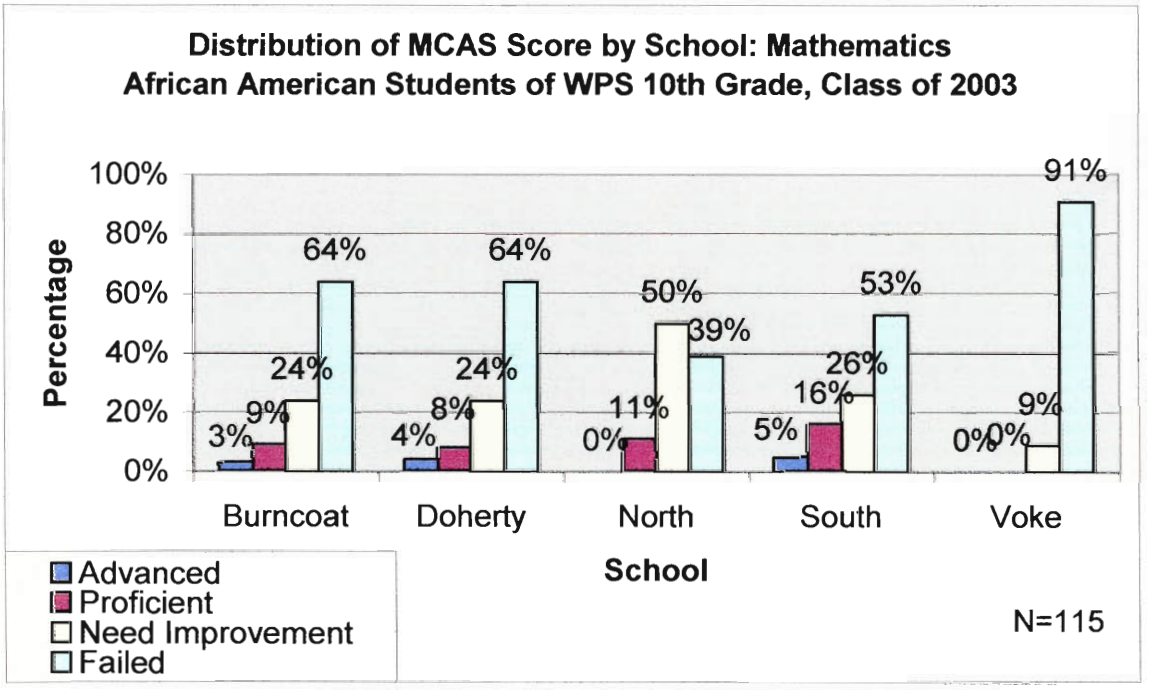


Figure 4.23: Distribution of MCAS Score by School: Mathematics;
African American Students of WPS 10th Grade, Class of 2003

Distribution of MCAS Score by School: Mathematics Hispanic Students of WPS 10th Grade, Class of 2003				
	Advanced	Proficient	Need Improvement	Failed
Burncoat	0%	5%	19%	76%
Doherty	0%	3%	22%	75%
North	0%	7%	38%	55%
South	0%	5%	36%	59%
Voke	0%	4%	39%	57%
				N=251

Table 4.24: Distribution of MCAS Score by School: Mathematics;
Hispanic Students of WPS 10th Grade, Class of 2003

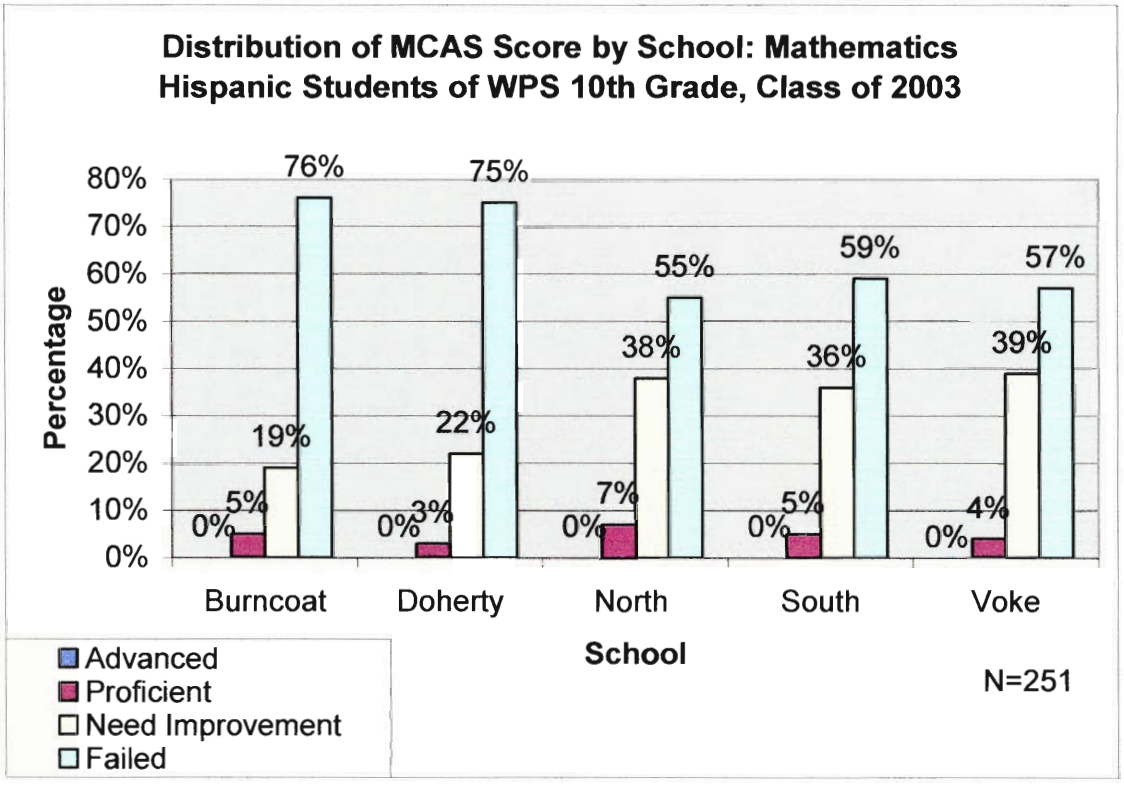


Figure 4.24: Distribution of MCAS Score by School: Mathematics;
Hispanic Students of WPS 10th Grade, Class of 2003

Distribution of MCAS Score by School: Mathematics White Students of WPS 10th Grade, Class of 2003				
	Advanced	Proficient	Need Improvement	Failed
Burncoat	9%	32%	37%	22%
Doherty	16%	27%	36%	21%
North	4%	27%	35%	34%
South	16%	27%	22%	35%
Voke	0%	5%	45%	50%
				N=503

Table 4.25: Distribution of MCAS Score by School: Mathematics;
White Students of WPS 10th Grade, Class of 2003

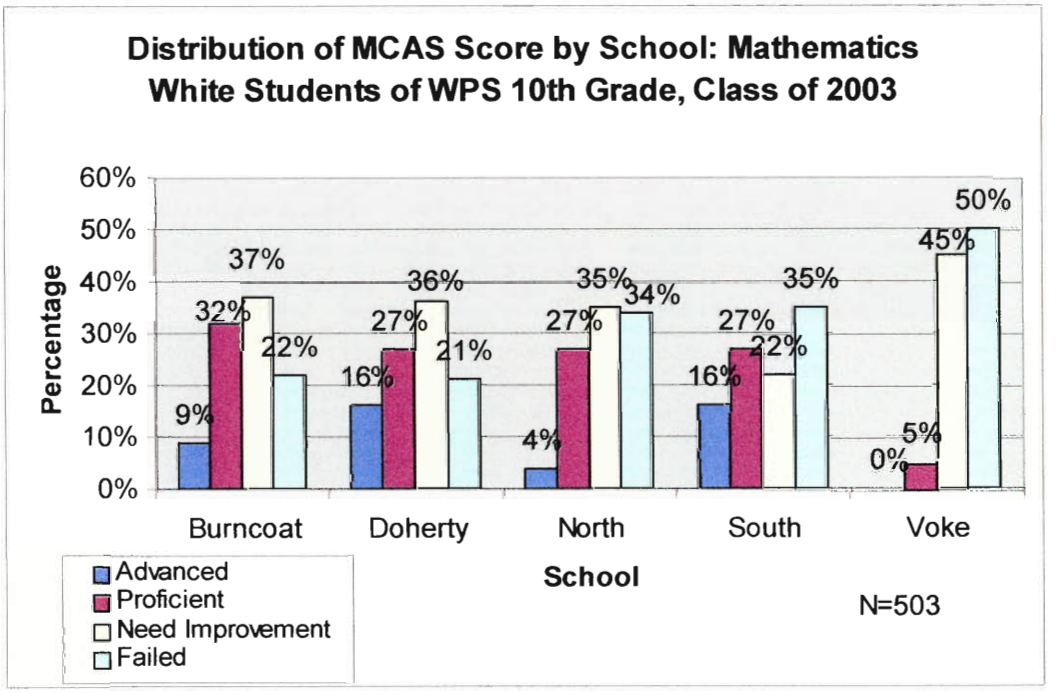


Figure 4.25: Distribution of MCAS Score by School: Mathematics;
White Students of WPS 10th Grade, Class of 2003

Asian

For this group we have Voke school with the highest number of Failed students, being 65%, followed by South H. S. The group in Advanced placement with 20% was in Doherty School. The group of students that scored Need Improvement was a total of 57%

in Burncoat School. And for the students that were placed in Proficient were in South with 52%. The total number of cases was 96.

Hispanic

The school that showed the biggest number of students Failed was Burncoat with 76%, followed by Doherty with 75%. But on the other hand, the school with least amount of students that Failed was North H. S. with 55%. Analyzing the Need Improvement outcomes, we can see a range between 19% for Burncoat and 39% for Voke. For Advanced all the schools showed 0%. The total number of cases was 251.

Black

The highest number of students getting a grade of Failed was in Burncoat, with 64% with similar results in Doherty, with 64% as well. The school that did better with less number of Failed was North with 39%. The outcomes for the students that scored Needs Improvement were 50% for North. Voke scored better with 9% of students that scored Need Improvement. For the Advanced group there were 5% for South H.S. and 3% for Burncoat. For the Proficient outcomes we have South H.S. with 16% and Voke with 0%. The total number of cases was 115.

White

For this group the number of students that failed was 50% for Voke. The school that shows less numbers of Failed was Doherty. For the Need Improvement all schools are showing similar results but still Voke with high percentage, being 45%. For the

Proficient group Voke was at 5%, being the lowest number. For the Advanced placement Burncoat and South showed better results, with 16% for both schools. The total number of cases was 503.

5 Conclusion

The Massachusetts Comprehension Assessment Test (MCAS) is geared towards testing the capabilities of high school students in the subjects of Mathematics, English, Science and Social studies. So far, only the Mathematics and English tests are approved and in use. Since the law has become a requirement for graduation, there has been much concern throughout the state as to whether or not it is a reasonable standard for all students. Many issues have risen about the fairness involving native language, ethnicity, social class, gender, course curriculum, and vocational education.

The scoring differences of students with varying ethnicities are a focal point to many citizens in diverse cities such as Worcester. Another large concern is involving which public school the students attend, as Vocational Technical School students appear to be less equipped for the MCAS Test. There are other factors that affect these two crucial points, which also need to be considered in understanding the overall issues. Social classes, gender, course curriculum, and learning styles all link together to help make a difference in the scoring of various ethnic groups and of Vocational School students.

The first goal of this project was to decide whether or not ethnicity was a factor in the performance on the MCAS Test, and hence justified as a requirement for graduation or socially biased. The other goal of this project was to decide if the type of school the student attends or the program of studies they take will make a difference in their performance on the MCAS Test, be it a vocational, college preparation, or honors program in a regular secondary school. The smaller goals to achieve these two main goals

are analyzing gender. These have been be linked together in order to create the foundation for our hypothesis testing.

The concerns of the parents, students, and teachers involved in this issue will all benefit from educating themselves on this subject, and perhaps justify their ideas and actions in term of the causes of the problems created by the test. Those aiming to help the underprivileged students will find evidence in this project to help them argue their case for state aid to achieve better success getting accommodation in the future.

It enabled us to compare statistics and come to conclusions relatively quickly. The results of our investigation of purposes of the MCAS Test, its affects on the students taking it, and the rationale of making it a graduating requirement proved to be quite revealing. We will use these findings to argue for or against prevailing theories about the fairness of the MCAS Test overall, and especially to minority groups.

After the analysis of the data available and store in SSPS files, we found a very interested result. The minorities have showed similar results to other groups as white in the area of Mathematics. This gives us the indication that language barrier is not really an issue for any ethnic group. But, it is an issue in English, when we see the differences between native speaker and other ethnic groups that have to learn the language to achieve or pass the MCAS Test. But, some schools are not doing a good job even with native speaking in the English part of the MCAS Test. For the gender variable in English we can see a clear results putting females ahead of males in all ethnic groups. In Mathematics, male performance is better than female performance slightly in all ethnics groups. The college preparation level has been found to be a good help to students, as these are the better results for the MCAS Test in both English and Mathematics.

A recurring problem in each data set comparing schools was that the Vocational students were not performing as well as students from other schools. This was for each gender, ethnicity, and subject. This could be explained by the fact that Vocational students only spend half of their school year on academics, where the other half is focused on their specified trade. This gives the Vocational School students a definite disadvantage when taking the MCAS Test. These students are only given half the preparation time of other students, making it unrealistic to expect them to perform similarly.

Improvements have been found in the number of students passing the MCAS Test from the transition from 8th grade to 10th grade in both English and Mathematics. But at the same time there is a decrease in the number of students from 8th grade to 10th grade that had taken the MCAS Test. Perhaps the struggling students, such as some of the minority students or vocational students, leave before the final test is given. Would this mean that the MCAS Test is unfair for certain ethics groups and/or Vocational students? That is an answer that the reader can now provide.

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