0863

THE FIRST YEAR: Student Performance on 10th Grade Benchmark Standards and Subsequent Performance in the First Year of College (2001-02)

Oregon University System
Oregon Department of Education
Oregon Department of Community Colleges
and Workforce Development

March 7, 2003

The First Year: Student Performance on 10th Grade Benchmark Standards and Subsequent Performance in the First Year of College (2001-02)

Study Coordinator:

Christine Tell – Director, Proficiency-based Admissions Standards System (PASS), Oregon University System

Research Team:

Mark Endsley – Coordinator of K-16 Assessment, Oregon University System
Arron Frerichs – Institutional Research Systems Analyst, Oregon University System
Marilyn Kolodziejczyk – OCCURS Director, Department of Community Colleges and Workforce Development
David McDonald – Director of Enrollment Services, Academic Affairs, Oregon University System
Dalton Miller-Jones – Professor, Department of Psychology, Portland State University
Wayne Neuberger – Consultant, K-12 Academic Assessment, Oregon Department of Education
Dave Puckett – Institutional Research Systems Analyst, Oregon University System
Mark Schalock –Associate Professor, Teaching Research, Western Oregon University
Stephen Slater – Coordinator, Office of Assessment and Education, Oregon Department of Education
Anne Stephens – PASS Implementation Coordinator, Oregon University System
Susan Weeks – Chief Information Officer, Oregon University System
Elaine Yandle-Roth – Community College Instruction Specialist, Department of Community Colleges and Workforce Development
Paul Yovanoff – Research Associate, Behavioral Research and Teaching, and Associate Professor, University of Oregon

Media Contacts:

Oregon University System: Diane Saunders, 503-725-5714; cell: 503-807-5539; diane_saunders@ous.edu
Oregon Department of Education: Gene Evans, 503-378-3600 x2237; gene.evans@state.or.us

Institution Contacts:

Oregon University System: Christine Tell, 541-346-5714; christine_tell@ous.edu
Oregon University System: David McDonald, 541-346-5729; david_mcdonald@ous.edu
Oregon Department of Education: Steve Slater, 503-378-3600 x2254; steve.slater@state.or.us
Department of Community Colleges and Workforce Development: Elaine Yandle-Roth, 503-378-8648 x367; elaine.yandle-roth@state.or.us

This study was developed under a grant from the Fund for the Improvement of Postsecondary Education (FIPSE), U.S. Department of Education, Award #P116B011461. However, the contents do not necessarily represent the policy of the Department of Education, and you should not assume endorsement by the Federal Government. www.ed.gov/FIPSE

TABLE OF CONTENTS

Appendix B: Supporting Tables

1.b Math Performance on State Assessment by Quintile and First-Year College GPA at OUS

2.b Math Problem Solving Performance on State Assessment by Quintile and First-Year College GPA at OUS

3.b Reading Performance on State Assessment by Quintile and First-Year College GPA at OUS

4.b Writing Performance on State Assessment by Quintile and First-Year College GPA at OUS

5.b Science Performance on State Assessment by Quintile and First-Year College GPA at OUS

6.b Performance on Composite 10th Grade Benchmark Assessments by Quintile and First-Year College GPA at OUS

7.b Math Performance on State Assessment by Quintile and First-Year Community College GPA

8.b Math Problem Solving Performance on State Assessment by Quintile and First-Year Community College GPA

9.b Reading Performance on State Assessment by Quintile and First-Year Community College GPA

10.b Writing Performance on State Assessment by Quintile and First-Year Community College GPA

11.b Science Performance on State Assessment by Quintile and First-Year Community College GPA

12.b Performance on Composite 10th Grade Benchmarks by Quintile and Community College GPA

13.b Math Performance on State Assessment and First-Year College GPA at OUS

14.b Problem Solving Performance on State Assessment and First-Year College GPA at OUS

15.b Reading Performance on State Assessments and First-Year College GPA at OUS

16.b Science Performance on State Assessment and First-Year College GPA at OUS

17.b Writing Performance on State Assessment and First-Year College GPA at OUS

18.b Pearson Correlation Coefficients for Individual and Composite State Assessments and High School GPA, SAT combined, SAT verbal, SAT math and First-Year GPA

19.b Probability of OUS Freshman GPA by OSA Math Knowledge and Skills Score

20.b Probability of OUS Freshman GPA by OSA Math Problem Solving Score

21.b Probability of OUS Freshman GPA by OSA Reading Score

22.b Probability of OUS Freshman GPA by OSA Writing Score

23.b Probability of OUS Freshman GPA by OSA Science Score

24.b State Assessments Included in the First-Year Study Address 4 of the 10 Required PASS Standards for Admission to OUS

Executive Summary

Introduction

Oregon is entering the second decade of its journey to design and implement a standards-based system that connects student performance K-12 with college entry. The Oregon Educational Act for the 21st Century (1991, revised 1995), created a comprehensive system of academic standards and assessments benchmarked at grades 3, 5, 8 and 10. In 1994, the Oregon State Board of Higher Education adopted a policy to require the development of a Proficiency-based Admission Standards System (PASS) for entry into the state's seven public universities. PASS builds on the 10th grade benchmarks to further develop the knowledge and skills that students need for college success. The goal of PASS is to increase student academic preparation for admission, reduce the need for remediation, and increase the likelihood that students will continue beyond freshman year to complete their degree.

The Joint Boards, a partnership of the Oregon Board of Education (K-12, community colleges) and the Oregon State Board of Higher Education (public universities) adopted the K-16 alignment of standards and assessments, and review progress annually. OUS and community college staff in admissions and advising can consider standards information as a potential factor for initial course placement decisions as well as for university admission and entry into programs. The underlying assumption has been that students' progress in meeting standards at the 10th grade benchmark would pave the way for college entry and success in two- and four-year institutions. However, until fall 2001, data had not been generated to support this assumption because no students had actually completed the entire standards pathway and entered Oregon's colleges and universities.

The freshmen arriving on Oregon University System (OUS) campuses in fall 2001 were admitted on the basis of traditional college entry requirements. The freshmen who entered into OUS universities and the state's community colleges were also the first students to have information about their performance in meeting standards at the 10th grade benchmark. As 10th graders in 1999, their performance was assessed in reading, writing, math, and math problem solving as part of the Certificate of Initial Mastery (CIM).

The First Year studies the performance of these students on 10th grade benchmark standards and subsequent performance in their first year of college.

This study is a collaborative effort conducted by the Chancellor's Office of the Oregon University System (OUS), the Oregon Department of Education (ODE), and the Oregon Department of Community Colleges and Workforce Development (CCWD).

Population Studied

The population of students for this study was identified using 1999-2000 state data provided by the ODE. The students included were those who participated in state assessment while in high school and subsequently enrolled in an OUS institution or Oregon community college in fall 2001 as first-time freshmen (15 or more credit hours). This group includes 6,082 students from

OUS and 12,519 students from Oregon community colleges. For OUS this represents 74% of Oregon residents (8,171) enrolled as first-time freshmen. For Oregon community colleges this represents 71% of Oregon residents (17,720) enrolled as first-time freshmen. Students in Oregon private high schools are not required to take state assessments and were not included in this study.

Study Questions and Findings

Question 1: How does the performance of Oregon high school students assessed on the 10th grade benchmark compare with their subsequent performance in college?

Findings

- Performance at the 10th grade benchmark is closely aligned with students' freshman year college performance two years later. This is true for students at Oregon's seven public universities and 17 community colleges.

- Students who meet or exceed the standard at the 10th grade benchmark levels defined by the Oregon Department of Education are more likely to earn a higher GPA in related college courses. Students who do not meet or nearly meet the standard are less likely to earn a college GPA of "C" or better that will support their continued enrollment beyond freshman year.

Question 2: What is the relationship of 10th grade benchmark assessments, high school GPA, and the SAT I to first-year college performance?

Findings:

- While there is no one perfect predictor of first-year college success, the study found a positive relationship among state assessments, high school GPA, college GPA, and the SAT I.

- Students' performance on the combined 10th grade benchmark assessments (reading, writing, math problem solving, and math knowledge and skills) and the SAT I correlated with first-year college GPA at comparable levels. This is consistent with findings from content analyses of the Oregon 10th grade benchmark standards and assessments conducted by The College Board and American College Testing (ACT). These analyses indicated a positive alignment of the content of these 10th grade benchmarks with the content of later college entry exams like the SAT I and the ACT.

- For the students entering OUS institutions in fall 2001 who were part of this study, high school GPA (HSGPA) correlated with college GPA at a higher level than either the 10th grade benchmark performance or SAT I alone. The range of HSGPA in the current sample is primarily limited to those students who meet the admission requirement for various OUS campuses. Therefore, the high school GPA of OUS students in this study included: 3% below 2.5, 15% at 2.5-3.0, 36% at 3.0-3.5, 41% at 3.5-4.0, and 5% above 4.0. Note: Data were not available from the community colleges on incoming high school students' GPA.

Question #3: What is the value of the state 10th grade benchmark assessment for predicting first-year college performance (college GPA) and persistence beyond freshman year?

Findings:

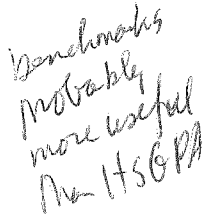
- Each of the four 10th grade benchmark assessments, individually and in combination, proved to be early indicators of overall college GPA at the end of the first year in Oregon's public universities. The probability of a specified range was estimated based on simple logistic regression coefficients. For example, a student scoring "meets" (239) on the 10th grade benchmark assessment in math has a 41% probability of achieving a 3.0 average or higher at the end of the first year of college. A student scoring "exceeds" (249) on the 10th grade benchmark assessment in reading has a 50% probability of achieving a 3.0 average or higher at the end of the first year of college. Similar analyses have not yet been conducted for the community college population.

- There are various reasons why students decide to continue or not continue their college education beyond their freshman year and this study does not assert a causal relationship between 10th grade benchmark performance and enrollment beyond the first year. However, 82% of the students who met or exceeded 10th grade benchmarks completed their first year and began their second year at OUS, as compared to 76% of the general student population of returning freshman. Data on returning students were not available from the community college. Further study is needed with subsequent entering freshman classes to determine the link between this early indicator of college preparation and first-year success and continued enrollment in college.

- *The First Year* study provides baseline data on the performance of students on 10th grade benchmark standards and subsequent performance in their first year of college. Further study is needed to determine the predictive value of the 10th grade assessment in regards to college success.

Conclusions and Recommendations

- The 10th grade benchmark performance can serve as a planning tool for the last two years of high school for teachers, counselors, parents, and students. This early indicator of college academic readiness ensures that a wider range of students will have the opportunity to set clear and achievable goals toward building the knowledge and skills they need for postsecondary education. This information will be particularly valuable for students who may not have considered their college options. Because Oregon's standards and assessments are aligned throughout K-12, this process can begin in middle school as students work toward high school preparation.



- The continued development of a K-16 integrated student data-transfer system would expedite the exchange of information on state standards met. This system would alleviate much of the workload currently experienced by high school teachers and counselors who prepare these records and by college admissions officers and advisors who receive them. This system would be developed through a partnership of the Oregon University System

(OUS), the Oregon Department of Education (ODE), and the Oregon Department of Community Colleges and Workforce Development (CCWD).

- This study also provides colleges with baseline data on student performance in the areas of reading, writing, and math that are considered the foundation for college preparation. Each campus can consider these data in admission and placement decisions to better support students' success in their first year of college. Colleges can then provide feedback to high schools on the success of their graduates in postsecondary education. For example, as a result of *The First Year* study, OUS will provide additional information on standards met to all public Oregon high schools that sent graduates to OUS institutions. The expanded annual performance report, the Class of 2001 Entering Freshman Profile, is produced in aggregate for all Oregon high schools with five or more students in OUS institutions.

- The population of students in *The First Year* study took state assessments in 1999-2000, without any information that these assessments might be linked to college entry. As the performance on standards becomes more closely linked to next steps and advantages when applying to college, it is likely that student motivation to reach higher standards will increase.

- The 10th grade benchmark assessments in this study address 4 of the 10 required English, math, and science standards in the Proficiency-based Admission Standards System (PASS). OUS has worked with ODE since 1994 to maintain the alignment of the K-12 standards and assessments with college entry. OUS admissions officers and faculty now have these baseline data for identifying the next steps for the implementation of PASS. The implications of standards for admissions, placement and entry-level coursework can be determined. Community colleges may use the findings of this study to examine placement procedures.

I. Introduction

Background

Oregon is entering the second decade of its journey to design and implement a standards-based system that connects student performance K-12 with college entry. The Oregon Educational Act for the 21st Century (1991, revised 1995), created a comprehensive system of academic standards and assessments benchmarked at grades 3, 5, 8 and 10. In 1994, the Oregon State Board of Higher Education adopted a policy to require the development of a proficiency-based admission standards system (PASS) for entry into the state's seven public universities.[1] PASS builds on the 10th grade benchmarks to further develop the knowledge and skills that students need for college success. The goal of PASS is to increase student academic preparation for admission, reduce the need for remediation, and increase the likelihood that students will continue beyond freshman year to complete their degree.

The Joint Boards, a partnership of the Oregon Board of Education (K-12, community colleges) and the Oregon State Board of Higher Education (public universities), adopted the K-16 alignment of standards and assessments, and review progress annually. OUS and community college staff in admissions and advising can consider standards information as a potential factor for initial placement decisions as well as for university admission and entry into programs.[2] The underlying assumption has been that students' progress in meeting standards at the 10th grade benchmark would pave the way for college entry and success in two- and four-year institutions. However, until fall 2001, data had not been generated to support this assumption because no students had actually completed the entire standards pathway and entered Oregon's colleges and universities.

The freshmen arriving on Oregon University System (OUS) campuses in fall 2001 were admitted on the basis of traditional college entry requirements.[3] These freshmen who entered into OUS universities and the state's community colleges were also the first students to have information about their performance in meeting standards at the 10th grade benchmark. As 10th graders in 1999, their performance was assessed in reading, writing, math, and math problem solving as part of the Certificate of Initial Mastery (CIM).

The First Year studies the performance of these students on 10th grade benchmark standards and subsequent performance in their initial year of college.

---

[1] Appendix A includes a summary of policy actions by the State Board of Education, State Board of Higher Education, Joint Boards and the Oregon State Legislature; the PASS standards; and current policy options for admission to Oregon University System (OUS) Institutions.

[2] A list of Oregon's public universities and community colleges may be found in Appendix A.

[3] OUS admission requirements included: (1) earning a high school diploma or the equivalent; (2) meeting the high school grade point average required by each campus; and (3) successfully completing 14 high school subject area courses in English, math, science, social science and second languages. In addition, applicants are required to present their scores on either SAT I or ACT assessments. Oregon community colleges have an open admission policy and no minimum requirements for entry.

Context for Study

Oregon's 10th grade benchmark assessments are not required for high school graduation and are considered low stakes for students.

State assessment data are one measure of the state's accountability program and are reported annually by the Oregon Department of Education in aggregate as part of the Oregon Report Card and disaggregated as part of school and district report cards.[4] In a recently released Arizona State University study, Amrein and Berliner defined high stakes as "consequences that are attached to tests beyond the accountability measures that have been in place for years, like publishing school and district test scores in the newspaper" (p.5). The authors further elaborated that high-stakes tests are those "from which results are used to make significant educational decisions about schools, teachers, administrators, and students. High-stakes testing policies have consequences for schools, for teachers, and for students" (p. 1). This national study found that in states with high stakes tests attached to the high school diploma, these policies may create negative, unintended consequences as evidenced by (a) increased dropout rate, (b) decreased high school graduation rate, and (c) increased enrollment in General Education (GED) programs leading to alternative diplomas. [5]

Using Amrein and Berliner's definitions, the relatively "low stakes" nature of Oregon's state assessment is evidenced by data reported in the 2001-02 Oregon Report Card that do not indicate the negative consequences found in states with high-stakes assessments. The dropout rate declined from 6.3% in 1999-00 to 5.3% in 2000-01. The high school graduation rate (including GED certificates) increased from 79.3% in 1995-97 to 82.3% in 1998-2000.

Oregon K-12 standards are aligned with admission standards into the public universities.

The K-12 standards were initially aligned with the OUS Proficiency-based Admission Standards System (PASS) in 1998. The State Board of Education adopted the resulting K-16 framework that same year. Panels comprised of K-12 teachers, college faculty, and curriculum and assessment specialists from ODE and OUS participated in the initial alignment and in subsequent annual reviews of the standards. Faculty members on individual OUS campuses reviewed the related PASS standards and student work for evidence of college entry proficiency. PASS is currently being phased in as an admission option.

The Council of Chief State School Officers (CCSSO) assembled a national standards review team at the request of ODE in July 1996. This review included the OUS PASS standards as a separate document. The team's recommendations for improvement and alignment of the K-12 standards with PASS were addressed. Achieve, Inc. conducted a national review of Oregon's standards in 1999. This organization was created by governors and business leaders to serve as a clearinghouse and resource center on education standards, assessment, and accountability. While

[4] The Oregon Report Card provides state-level results of academic achievement, along with other indicators of student success, annually for distribution to state and federal legislators, public schools, school districts, education service districts, and members of the public.

[5] Oregon was not one of the states included in Amrein and Berliner's study on the impact of high-stakes tests.

commending Oregon's alignment of state assessments and standards in English and math, Achieve, Inc. offered specific recommendations for improving the rigor of mathematics and specifically algebra and geometry. The ODE incorporated these recommendations in the subsequent revision of these standards and the PASS math standards were re-aligned.

In 2001, ODE incorporated further recommendations by the U.S. Department of Education and the state assessment system was approved under Title I of the Elementary and Secondary Education Act. The continuous improvement cycle of the Oregon standards requires that ODE and OUS review the K-16 alignment annually.

In 2002, OUS requested that American College Testing (ACT) and The College Board review the state's 10th grade benchmark standards and the eligible content that served as the basis for the Oregon State Assessment system. The purpose of the review was to determine the alignment of these standards and content with the content of the various national assessments of these organizations. An executive summary of the results of these analyses may be found in Appendix A and the full reports are available at http://www.ous.edu/pass. The OUS considered this review to be critical in light of a national study by Adelman (1999) that found that the rigor of academic content that students acquired in high school was the strongest predictor of college degree attainment.

Purpose of Study

This study examines the usefulness of the information supplied by 10th grade benchmark assessments in predicting student success in the first year of college and persistence beyond freshman year. Indicators of first-year college success include: (1) overall first-year college grade point average (GPA), (2) GPA by subject areas, and (3) persistence beyond the freshman year to fall 2002 enrollment.

The First Year study is a collaborative effort conducted by the Chancellor's Office of the Oregon University System (OUS), the Oregon Department of Education (ODE), and the Oregon Department of Community Colleges and Workforce Development (CCWD).

A broad K-16 partnership was formed to bring together the necessary expertise in this research endeavor. The lead partners include the staff of Institutional Research for OUS, the Office of Assessment for ODE, and data information specialists from the Department of Community Colleges and Workforce Development (CCWD). Faculty members from the University of Oregon, Portland State University, Western Oregon University, Behavioral Research and Teaching (UO), and Teaching Research (WOU) have provided consultation in research design and methodology, access and equity, student performance, large-scale assessment systems, and related areas.

II. Study Design and Methodology

Research Questions

Question #1: How does the performance of Oregon high school students assessed on the 10th grade benchmark compare with their subsequent performance in college?

Question #2: What is the relationship of 10th grade benchmark assessments, high school GPA, and the SAT I to first-year college performance?

Question #3: What is the value of the state 10th grade benchmark assessment for predicting first-year college performance (college GPA) and persistence beyond freshman year?

Description of Study Population

Using 1999-2000 state assessment data provided by the Oregon Department of Education (ODE), researchers from the Office of Institutional Research, OUS and the Oregon Department of Community Colleges and Workforce Development (CCWD) identified students who participated in the state 10th grade benchmark assessments in 1999-2000. The identification of the student population for this study required matching individual records by name, high school, and date of birth with postsecondary enrollment records.[6] Although the resulting group does not include all Oregon public high school students, it was judged by the research team to be a statistically significant group that could be used to provide valid results for this baseline year.

The students who were included participated in state assessment while in high school and subsequently enrolled in an OUS institution or Oregon community college in fall 2001 as first-time freshmen (15 or more credit hours). This group includes 6,082 students from OUS and 12,519 students from Oregon community colleges. For OUS this represents 74% of Oregon residents (8,171) enrolled as first-time freshmen. For Oregon community colleges this represents 71% of Oregon residents (17,720) enrolled as first-time freshmen. Oregon students in private schools are not required to take state assessments so were not included in this study. Table 1 illustrates the number of Oregon resident first-time freshmen with state assessment data.

Table 1: First-Time Freshman Enrollment for 2001 in the First Year Study

	First-time freshman Oregon residents	First-time freshman included in study	Percent of first-time freshman in study
OUS	8,171	6,082	74%
Community Colleges	17,720	12,519*	71%

*First time freshmen (15 or more credit hours) who took one or more of the state 10th grade benchmark assessments in 1999-2000. The preliminary study for community colleges included students taking one or more courses (23,297). The group was modified in the full study to include only those students taking 15 or more credit hours to provide a comparable group to OUS first-time freshmen and resulting in a community college study group of 12,519 students.

[6] Oregon's K-12 and postsecondary systems do not currently have an integrated data system that allows for the transfer of student data to community colleges and public universities. A consistent, unique student identification number or social security number was not available.

Description of State Assessments

The Oregon State Assessment (OSA) system was implemented in 1991. Standardized, criterion-referenced tests in English (reading, writing), math, and science are based on the state's content standards that describe what students should know and be able to do. The assessments use a multiple-choice format that emphasizes knowledge and skill; on-demand written essays and mathematics problem-solving tasks; and work samples.[7] The primary purpose of the OSA is to determine the achievement level of individual students relative to performance standards established by the State Board of Education at each benchmark (grades 3, 5, 8, 10). A description of each of the five state assessments follows.

Mathematics Knowledge and Skills Test

Students receive a scaled score on this multiple-choice test based on the number of questions answered correctly compared to the total number of questions, taking into account the difficulty of the questions. The math knowledge and skills test measures the following Score Reporting Categories: Computations and Estimation, Measurement, Statistics and Probability, Algebraic Relationships, and Geometry.

Mathematics Problem Solving

To meet the state problem-solving standard, students must meet performance standards on classroom work samples and on the mathematics problem-solving test. The state test is an on-demand assessment given under standardized conditions. Students select one of three complex, multi-step problems (one each from statistics and probability, algebraic relationships, and geometry) to solve, showing their work. Each test is scored externally in five areas: conceptual understanding, processes and strategies, verification, communication, and accuracy.

Work samples provide evidence of a student's abilities to solve a variety of tasks from different strands (statistics and probability, algebraic relationships, and geometry). A student may revise a work sample. Work samples are reported at the district level and were not include in this study.

Reading/Literature Knowledge and Skills Test

Students receive a scaled score on this multiple-choice test based on the number of questions answered correctly compared to the total number of questions, taking into account the difficulty of the questions. The assessment includes a variety of types of reading selections. Selections reflect that reading serves three basic purposes:

- Reading for literary experience (literary selections: fiction, drama, poetry)
- Reading for information (information selections: articles, biographies, autobiographies); and
- Reading to perform a task (practical selections: instructions, reference materials)

[7] OSA assessments used in this study included the multiple-choice formats, on-demand written essays, and mathematics problem-solving tasks. Classroom-level work sample data on writing and math problem solving are kept at the district level and were not included in this study.

Writing

Students must meet state performance standards on both the state writing test and classroom work samples to meet the Certificate of Initial Mastery (CIM) writing standard. The state test is an on-demand performance test. It is not a complete portrait of a student's writing abilities. Rather, it is a snapshot of what a student can do with a particular prompt, in a limited time, and without teacher or peer input. The state test is scored externally on a 1-6 scale by two raters. Each set of scores is added together to form a final composite score. Categories for scoring include conventions, ideas and content, organization, and sentence fluency.

The work sample component consists of three writing samples covering a variety of modes. Students may receive feedback and use a variety of resources. The classroom teacher scores writing samples. Together, the state test and work samples demonstrate the breadth and depth of a student's writing abilities. Work samples are reported at the district level and were not include in this study.

Science Knowledge and Skills Test

Students receive a scaled score on this multiple-choice test based on the number of questions answered correctly compared to the total number of questions, taking into account the difficulty of the questions. The science knowledge and skills test measures the following Score Reporting Categories: Physical Science, Life Science, and Earth Science. The science assessment was field-tested in 1999 and is included in this study for information purposes where appropriate.

Table 2 summarizes the characteristics of the five Oregon state assessments.

Table 2: Description of Oregon State Assessments

	Math Knowledge & Skills	Math Problem Solving	Reading Literature	Writing	Science Knowledge & Skills
Multiple-choice format	x		x		x
On-demand performance assessments		x		x	
Classroom-level work samples also required but not included in this study		x		x	
Measured using scaled scores	x		x		x
Measured using composite scores from state scoring guides		x		x	
Required for all 10th graders in 1999	x	x	x	x	
Field tested with 10th graders in 1999					x

Description of Data Sets

Data sets were shared across the K-16 sectors. ODE provided assessment results to the Office of Institutional Research at OUS, for students expected to graduate from high school in the class of 2001. Within this data set, scores in reading/literature and mathematics knowledge and skills are reported on an interval scale, ranging from a low of 150 to a high of 300, with a standard deviation of approximately 10. Standardized scores indicate how many standard deviation units above or below the mean a given score falls. Scores in writing and mathematics problem solving are reported on a composite scale of summed rater scores, ranging between 10 and 60 (writing) and 8 and 46 (math problem solving).

The OUS campuses provide student-related data to Institutional Research on a regular basis. Data sets used in this study on first-year college performance are derived from this and include high school GPA, SAT scores, overall first-year college GPA, GPA by subject areas, and return enrollment in fall 2002. Comparable data sets provided through CCWD on first-year community college performance include overall first-year college GPA and GPA by subject areas. Oregon's community college are open enrollment and do not require the submission of SAT or ACT scores or high school GPA at the time of entry. Data on the return enrollment of community college students identified for study were not available.

Methods of Analysis

Variable Sets

The findings of *The First Year* study are based on descriptive statistics and correlations among the following sets of variables provided by the K-12, community college, and university sectors:

- Oregon academic standards tests taken in the 10th grade, supplemented by a comparatively small number of retests taken in grades 11 and 12 (less than 5%) by students who did not meet performance standards in grade 10 (the highest score was used when multiple test scores in a single subject were available),
- Results from a college entrance admission test (SAT I or ACT) typically taken in grades 11 or 12,
- High school cumulative GPA from transcripts submitted to OUS for admission,
- Performance in freshman year of college as measured by overall college GPA and GPA in various subject areas, and
- Continued enrollment in the second year of college.

Grouping of Scores by Quintiles and State Defined Levels of Performance

To better illustrate the relationship between 10th grade tests and overall freshman year GPA, we initially grouped scores on state tests into fifths, or quintiles (i.e., 1st to 20th percentile, 21st to 40th percentile, etc.), using the distribution of scores from high school students for whom freshman grades were available. We then redistributed these same OUS data according to state defined levels of meeting, exceeding, and not yet meeting benchmarks for the purpose of further comparison of college performance levels. Data from the community college were not included in this benchmark distribution.

Creating Composite Scores and Calculating Correlations

In subsequent analyses, we created composites of academic standards tests across subject areas by converting the original scales to standardized variables (z-scores), summing across subject areas (e.g., reading, math and writing) and re-standardizing the sum. We calculated Pearson correlation coefficients for each pair of variables, including cases in which multiple variables were present.[8]

Further Analysis of Scores to Determine Probability of Various Levels of Performance

Because OUS and community college staff in admissions and advising are interested in how 10th grade benchmark performance could be a factor in initial class placement, we asked the following question. How likely is it that a student will meet acceptable levels of academic performance in their college freshman year, based on incoming performance on the 10th grade benchmark assessments?

To answer this question, the relationship between state 10th grade benchmark tests and freshman GPA were analyzed beyond the observed simple correlation coefficients. Based on benchmark scores, we estimated the probability of a freshman GPA at or above 2.0 and at or above 3.0. Logistic regression was used to regress a three-part college GPA classification (below 2.0, 2.0 through 2.99, and 3.0 to 4.0) onto the state tests. Based on the estimated test-score beta coefficients, we estimated the probability of performing in any one of the three GPA levels. Further analyses were conducted at the 2.5 and 3.5 levels.

Initially, each state test score was analyzed independently. Subsequent analyses treated multiple state test scores in a multivariate model. The resulting "calculator" yields the probability of a college freshman GPA based on the individual student's combined performances on the various state assessments. The research team felt that the use of this model better acknowledges the varying performance levels individual students bring to college entry. An illustration of the model is provided in findings under Question 3.

III. Findings

Question 1: How does the performance of Oregon high school students assessed on the 10th grade benchmark compare with their subsequent performance in college?

[8] The Pearson correlation uses values from –1 to 1 to indicate the relationship between two variables. A value of 0 indicates no relationship between the two variables. A value of 1 is a perfect positive relationship, and a value of -1 is a perfect inverse relationship. Statistical tests for correlations determine whether the two variables are related in some way. Typically, significant correlations range from .1 to .9. A correlation of .1 shows a positive but weak relationship; a correlation of .9 indicates the two variables are almost identical.

Finding 1.1

- Performance at the 10th grade benchmark is closely aligned with students' freshman year college performance two years later. This is true for students at Oregon's 7 public universities and 17 community colleges.

Discussion 1.1

The relationship between 10th grade tests and overall freshman year GPA was initially considered by grouping scores on state tests into fifths, or quintiles (i.e., 1st to 20th percentile, 21st to 40th percentile, etc.), using the distribution of scores from high school students for whom freshman grades were available. Results for community colleges and OUS are discussed for each area assessed by the 10th grade benchmark for math knowledge and skills, math problem solving, reading, and writing. Supplemental information is provided on the science knowledge and skills assessment that was piloted in 1999. Tables referenced are displayed in Appendix B.

Performance of Oregon high school students on 10th grade benchmark assessment in ***Math Knowledge and Skills*** *and subsequent performance in OUS and community colleges*

Math Knowledge and Skills (Appendix B: Table 1b - OUS and Table 7b - Community Colleges)

The tables display the first year college GPAs (overall and related courses) of students relative to their performance on 10th grade benchmark assessment in math knowledge and skills.

- General Trend – The overall first year college GPA and overall math GPA increase as students' scores on the math knowledge and skills assessment increase. As the math courses become more difficult, the number of students in community colleges and OUS taking the course in the lowest quintile decreased. For example, in the calculus classes, only 3 community college students in the 1st quintile enrolled and their average GPA was 1.89. By the 5th quintile, 31 students enrolled and their average GPA was 3.03. In OUS, 31 students in the 1st quintile enrolled in calculus and achieved a GPA of 2.26. By the 5th quintile, 352 students enrolled and achieved a GPA of 3.06. Community college and OUS math courses seem to have a level of prior math background that is needed to be successful. The meets or exceed level of performance on the state 10th grade benchmark assessment puts students in the 3rd, 4th and 5th quintiles in a better position to maintain the C+, B- average that is likely to support students' overall college success. For the purposes of this study, the GPA scale was defined as follows: A=3.5-4.0, B=3.0-3.4, and C=2.0-2.9. The GPA scale varies by OUS and community college campus.

- Below Standard – Community college and OUS students in the first quintile were below the nearly meets level established by the state. These students would be considered low performers on the state assessment.

- Meeting Standard – Students meeting the passing score of 239 fell into the 2nd (OUS) and 4th (community colleges) quintiles, with overall math GPAs of 2.55 (OUS) and 2.70 (community colleges).

- Exceeding Standard – Students in the top quintiles had comparable overall math GPAs of 3.03 (OUS) and 2.93 (community colleges).

Performance of Oregon high school students on 10th grade benchmark assessment in ***Math Problem Solving*** *and subsequent performance in OUS and community colleges*

Math Problem Solving (Appendix B: Table 2b – OUS and Table 8b- Community Colleges)

The tables display the first year college GPAs (overall and related courses) of students relative to their performance on 10th grade benchmark assessment in math problem solving.

- General Trend – An upward trend indicates that higher levels of performance on the state problem-solving assessment are reflected in first-year college GPAs. However, the math problem solving assessment appears to be less discriminating than the math knowledge and skills assessment. Problem solving is a single prompt assessment that was introduced in 1998; by 1999, students may not yet have developed the skills necessary. It should be further examined in subsequent years in light of students' performance on classroom work samples, which allow more opportunities for skill development.

- Below Standard – Students in the lowest quintiles had overall math GPAs of 2.32 (OUS) and 2.17 (community colleges). There was very little difference in the college performance of students who were working toward and those who met the standard.

- Meeting Standard – Students meeting the passing score of 32 (48 possible) fell into the 3rd (OUS) and 4th (community colleges) quintiles, with overall math GPAs of 2.53 (OUS) and 2.6 (community colleges).

- Exceeding Standard – Students in the top quintiles had comparable overall math GPAs of 2.84 (OUS) and 2.87 (community colleges).

Performance of Oregon high school students on 10th grade benchmark assessment in ***Reading and Literature*** *and subsequent performance in OUS and community colleges*

Reading (Appendix B: Table 3b – OUS and Table 9b- Community Colleges)

The tables display the first-year college GPAs (overall and related courses) of students relative to their performance on the 10th grade benchmark assessment in reading and literature.

- General Trend – The reading assessment provides interesting insights into the role of reading in college performance. As is true with the other assessments, an upward trend indicates that higher levels of performance in reading are reflected in first-year college GPAs. However, students in OUS and community colleges performed well on the reading assessment with 78% (OUS) and 64% (community colleges) meeting or exceeding the standard. It is interesting to note that GPAs in reading-intensive courses (science and social sciences) align with trends in performance on the reading assessment.

- Below Standard – Students in the lowest quintiles had overall GPAs of 2.45 (OUS) and 2.63 (community colleges). Community college data suggest slightly better college performance for students in the 2nd quintile who were working toward the standard.

- Meeting Standard – Students meeting the passing score of 239 fell into the 2nd (OUS) and 3rd (community colleges) quintiles, with overall GPAs of 2.65 (OUS) and 2.92 (community colleges).

- Exceeding Standard – Students in the top quintile had comparable overall GPAs of 3.21 (OUS) and 3.24 (community colleges).

Performance of Oregon high school students on 10th grade benchmark assessment in ***Writing*** *and subsequent performance in OUS and community colleges*

Writing (Appendix B: Table 4b – OUS and Table 10b- Community Colleges)

The tables display the first-year college GPAs (overall and related courses) of students relative to their performance on 10th grade benchmark assessment in writing.

- General Trend – As is true with the other assessments, an upward trend indicates that higher levels of performance in writing are reflected in first-year college GPAs. Note that GPAs in writing intensive courses (science and social sciences) align with trends in performance on the writing assessment.

- Below Standard – A score of 40 on the writing assessment indicates a student meets the standard. To "conditionally meet," students must receive a score between 35 and 39 and meet all local writing work sample requirements. A score of 35 defines the break between the 1st and 2nd quintile. This indicates that the majority of students in this study had a reasonable writing ability as measured by the 10th grade benchmark. Students in the lowest quintiles had English Composition GPAs of 2.74 (OUS) and 2.63 (community colleges).

  It is interesting to note that remedial writing was the most frequently taken community college writing course (5,645 out of 12,519 in the study). The number of students who took these courses was equally distributed across the five quintiles. Whether a student takes a remedial writing course is not determined by how well they did on the state writing assessment. Further study on the alignment of state assessments with current placement tests at OUS and the community colleges is needed.

- Meeting Standard – Students meeting the passing score of 40 fell on the border between the 2nd and 3rd quintiles, having overall GPAs of 2.85 (OUS) and 2.94(community colleges).

- Exceeding Standard – Students in the top quintile had comparable English Composition GPAs of 3.3 (OUS) and 3.08 (community colleges) and overall GPAs of 3.15 (OUS) and 3.22 (community colleges).

Note: The science knowledge and skills assessment was field tested in 1999. Assessment results are included in Tables 5b (OUS) and 11b (community colleges) for information purposes.

In summary, Table 6b, Appendix B, displays the first-year college GPA of students relative to their performance on all (composite) 10th grade benchmark assessments. As is true in other areas of the quintile data the general upward trend in state assessment performance is aligned with an upward trend in first year college GPA. The threshold for OUS students earning a 3.0 or better is the 4th quintile. In the analyses for question 3, the probability of students attaining a 3.0 or higher GPA based on their performance on the state assessment is provided.

Finding 1.2:

- Students who meet or exceed the standard at the 10th grade benchmark levels defined by the Oregon Department of Education are more likely to earn a higher GPA in related college courses. Students who do not meet or nearly meet the standard are less likely to earn a college GPA of "C" or better that will support their continued enrollment beyond freshman year.

Discussion 1.2:

Following the analysis by quintile, state assessment data on OUS students were regrouped in the state performance levels of working towards, meets, and exceeds. Data from the community colleges were not included in this benchmark distribution. Again results were consistent with the quintile data. Students' first year college GPA improved as students improved on each of the state assessments (Tables 13b – 17b, Appendix B).

Tables 3 - 6 that follow illustrate the relationship between 10th grade benchmark performance levels and high school GPA, 1st year OUS GPA, GPA in related coursework, retention to 2nd year, and SAT I scores. Without exception, a positive relationship is demonstrated in each of the assessment areas (math, problem solving, reading, and writing) for each indicator measured (e.g., 1st year GPA). Note that first year college GPAs tend to be lower than high school GPAs. This is a consistent trend across all content areas measured by state assessment.

Table 3: GPA (high school, 1st year college, 1st year college math) of OUS Freshman Who Completed Math Test at 10th Grade Benchmark

3a: Math

OUS Measure					
	Not Met*	Meets	Exceeds	No Score**	Non-Oregon
HS GPA	3.21	3.44	3.60	3.16	3.31
1st Year College GPA	2.52	2.87	3.17	2.80	2.82
1st Year Math GPA	2.37	2.65	2.97	2.50	2.63
Returned 2nd Fall	74%	80%	85%	71%	72%
SAT I	917	1067	1215	1047	1073

3b: Numbers of Students

OUS Measure					
	Not Met*	Meets	Exceeds	No Score**	Non-Oregon
HS GPA	2032	2532	1443	1509	2555
1st Year College GPA	2039	2542	1473	1759	2799
1st Year Math GPA	941	2586	154	928	1748
Returned 2nd Fall	2077	2573	1480	1826	2839
SAT I	1932	2492	1448	1393	2839

Table 4: GPA (high school, 1st year college, 1st year college math) of OUS Freshman Who Completed Problem Solving Test at 10th Grade Benchmark

4a: Problem Solving

OUS Measure					
	Not Met*	Meets	Exceeds	No Score**	Non-Oregon
HS GPA	3.28	3.44	3.58	3.18	3.31
1st Year College GPA	2.65	2.89	3.16	2.82	2.82
1st Year Math GPA	2.37	2.65	2.87	2.50	2.63
Returned 2nd Fall	77%	80%	81%	72%	72%
SAT I	987	1075	1147	1050	1073

4b: Numbers of Students

OUS Measure					
	Not Met*	Meets	Exceeds	No Score**	Non-Oregon
HS GPA	1640	3932	244	1700	2555
1st Year College GPA	1661	3961	244	1947	2799
1st Year Math GPA	941	2586	154	928	1748
Returned 2nd Fall	1685	4005	249	2017	2839
SAT I	1589	3861	243	1572	2472

*Not Met includes students scoring at the low and nearly meets levels on state assessment.
**No Score includes students in the study who did not have a score on this particular assessment as well as students from private schools who did not participate in state assessment.

Table 5: GPA (high school, 1st year college, 1st year college Arts & Letters) of OUS Freshman Who Completed Reading Test at 10th Grade Benchmark

5a: Reading

OUS Measure					
	Not Met*	Meets	Exceeds	No Score**	Non-Oregon
HS GPA	3.17	3.38	3.56	3.17	3.31
1st Year College GPA	2.45	2.77	3.14	2.80	2.82
1st Year Arts/Letters GPA	2.36	2.74	3.11	2.64	2.64
Returned 2nd Fall	74%	80%	83%	70%	72%
SAT I	881	1032	1186	1044	1073

5b: Numbers of Students

OUS Measure					
	Not Met*	Meets	Exceeds	No Score**	Non-Oregon
HS GPA	1081	3070	1873	1492	2555
1st Year College GPA	1086	3100	1896	1731	2799
1st Year Arts/Letters GPA	662	2051	1339	1066	1892
Returned 2nd Fall	1107	3133	1916	1800	2839
SAT I	1021	3004	1867	1373	2472

Table 6: GPA (high school, 1st year college, 1st year college writing) of OUS Freshman Who Completed Writing Test at 10th Grade Benchmark

6a: Writing

OUS Measure					
	Not Met*	Meets	Exceeds	No Score**	Non-Oregon
HS GPA	3.25	3.46	3.64	3.18	3.31
1st Year College GPA	2.60	2.91	3.22	2.81	2.82
1st Year Writing GPA	2.81	3.07	3.34	3.03	3.02
Returned 2nd Fall	76%	80%	87%	72%	72%
SAT I	977	1078	1169	1052	1073

6b: Numbers of Students

OUS Measure					
	Not Met*	Meets	Exceeds	No Score**	Non-Oregon
HS GPA	1833	3460	417	1806	2555
1st Year College GPA	1844	3492	423	2054	2799
1st Year Writing GPA	1124	2035	213	884	1633
Returned 2nd Fall	1871	3537	423	2125	2839
SAT I	1761	3405	411	1688	2472

*Not Met includes students scoring at the low and nearly meets levels on state assessment.
**No Score includes students in the study who did not have a score on this particular assessment as well as students from private schools who did not participate in state assessment.

Question 2: What is the relationship of 10th grade benchmark assessment, high school GPA, and the SAT I to first-year college performance?

Findings:

- While there is no single perfect predictor of first-year college success, the study found a positive relationship among state assessments, high school GPA, college GPA, and the SAT I.

- Students' performance on the combined 10th grade benchmark assessments (reading, writing, math problem solving, and math knowledge and skills) and the SAT I correlated with first-year college GPA at comparable levels. This is consistent with findings from content analyses of the Oregon 10th grade benchmark standards and assessments conducted by The College Board and American College Testing (ACT). These analyses indicated a positive alignment of the content of the 10th grade benchmarks with the content of college-entry exams like the SAT I and the ACT.

- For the students entering OUS institutions in fall 2001 who were part of this study, high school GPA correlated with college GPA at a higher level than either the 10th grade benchmark performance or SAT I alone. The range of HSGPA in the current sample is primarily limited to those students who meet the admission requirement for various OUS campuses. Therefore, the entering high school GPA of OUS students who were part of this study included: 3% below 2.5, 15% at 2.5-3.0, 36% at 3.0-3.5, 41% at 3.5-4.0 and 5% above 4.0. Note: Data were not available from the community colleges on incoming high school students' GPA.

Discussion:

Due to the differences in the types of data available for community colleges and OUS institutions, the correlations were carried out with slightly different sets of variables.

Correlations of State Assessments, High School GPA, SAT I and GPA at OUS

Table 18b in Appendix B contains the Pearson correlations of state assessment performance and GPA for first-time OUS freshman students in 2001-02. This analysis included a total of 5,169 students out of the 6,082 OUS students identified for this study who had taken all four state 10th grade benchmark assessments in 1999.

The correlations were performed on the following variables:

- scores on state tests in problem solving, writing, reading, math, and the sums of the test scores after they had been converted to standardized Z-scores
- overall GPA for all courses taken by the students
- high school GPA
- SAT I (combined, verbal, and math)

Although all the correlations in Table 18b are statistically significant at the 0.01 level, a number of correlations are worth examining more closely. For example, how well do the state

assessments, considered individually and collectively, correlate with the SAT I combined, verbal, and math? State performance assessments in writing and math problem solving correlate with the SAT I verbal and math at (.44) and (.33) levels respectively. This is not surprising given that these tests are single-prompt assessments of cognitive skills that the SAT I does not currently measure. The correlation of the state multiple response tests in reading and math with the SAT I verbal (.70) and math (.74) is also not surprising, given similar formats and content tested.

The SAT I does not figure prominently in admission decisions for Oregon students. However, in this initial baseline study, it was considered important to ask how this national test, taken at the 11th and 12th grades, and the composite 10th grade state benchmark assessments correlated with overall first-year college GPA. The correlations are comparable at .374 for the combined state assessments and .381 for the combined SAT.

Further study will examine the relationship between the 10th grade benchmark assessments and the ACT and SAT II subject area tests which are considered by OUS admissions officers as a factor in placement decisions.

As part of this initial study, the correlations of the individual state assessments and composite assessment with first year GPAs in OUS college courses were considered worth examining. The results are contained in Table 7. Specific correlations of particular courses with specific state assessments seem logical – reading assessment with science (.36) and social science (.37). The relatively low correlation of problem solving with math courses (.14) seems reasonable given the nature of this single prompt assessment. The classroom work samples that are a required part of state assessment for math problem solving and writing would provide a fuller picture of 10th grade benchmark performance. Further study is needed to determine the significance of these correlations in light of the two year time lapse between 10th grade and first year college performance.

Table 7: Correlations* of State Assessments with GPA in OUS College Courses

	Math	Reading	Writing	Problem Solving	All Tests
All Courses	.32	.32	.25	.18	.37
Math Courses	.28	.20	.14	.14	.27
Arts and Letters	.25	.25	.21	.15	.30
Foreign Language	.24	.22	.17	.13	.27
Science	.37	.36	.22	.19	.40
Social Studies	.33	.37	.24	.17	.39
Calculus	.26	.24	.17	.08	.28
English Comp	.12	.17	.18	.11	.21

*The Pearson correlation uses values from –1 to 1 to indicate the relationship between two variables. A value of 0 indicates no relationship between the two variables. A value of 1 is a perfect positive relationship, and a value of -1 is a perfect inverse relationship. Statistical tests for correlations determine whether the two variables are related in some way. Typically, significant correlations range from .1 to .9. A correlation of .1 shows a positive but weak relationship; a correlation of .9 indicates the two variables are almost identical.

Correlations of State Assessments and GPA at Community Colleges

For community colleges, the correlations were performed between scores on state tests,[9] the GPA for specific courses taken by the students, and the GPA for all courses taken by the students. The mean, standard deviation, and number of students (N) for each variable used in the correlations are listed in Table 8.

Table 8: Variables Used in Correlations between State Assessments and GPAs at Community Colleges

	Mean	Std. Deviation	N
Mathematics Test	236.93	10.779	10,791
Reading and Literature Test	240.12	9.878	10,887
Writing Test	39.56	5.349	11,232
Math Problem Solving Test	27.75	8.495	11,026
Z- score (SUM all assessments)	.0000000	1.00000000	8,634
GPA All Courses	2.9492	0.65438	16,502
GPA Math Courses	2.5245	1.11467	9,089
GPA Arts and Letters	3.0619	0.95239	8,449
GPA Foreign Language	3.0691	1.03582	1,608
GPA Science Courses	2.6447	1.07340	6,210
GPA Social Science Courses	2.7416	1.02632	9,309
GPA Remedial Math	2.4965	1.12471	6,367
GPA Calculus	2.7741	1.15110	834
GPA English Composition	2.8921	0.97754	8,773
GPA Remedial Writing	2.8457	1.00603	1,416

Table 9 contains correlations of state assessments and GPA in community college courses. Although all the results are statistically significant at the 0.01 level, there are a number of correlations that are worth examining more closely. For example, the correlation between the sum of the state assessments and the overall GPA is .40 indicating a relationship between 10th grade benchmark performance and first year college performance 2 years later.

Another important question is how well do the subject tests correlate with performance in courses taken in the same subject area? The correlation between the state mathematics tests and overall GPA in mathematics courses is .27; the correlation between the state math test and grades in remedial math is .26, and the correlation with grades in calculus is .37. The content of the state assessment is beyond the content taught in remedial mathematics, so it is reasonable that the correlation for calculus is higher than for remedial mathematics. Also, since most students take courses below calculus, it would be expected that the correlation between the state math assessment and grades across all math courses would be lower than for calculus alone. Although the state math assessment correlates positively with grades in math courses, it appears that the state assessment indicates performance better in the higher-level math courses.

[9] The state tests used were mathematics, reading, writing, mathematics problem solving, and the sums of the test scores after they had been converted to standardized Z-scores.

The next highest correlation is between the sum of the test scores and science GPA (.32). The mathematics and reading tests have the best correlation with science GPA, indicating that both math and reading skills contribute to success in science. As is true with OUS results, further study is needed to determine the significance of these correlations in light of the two year time lapse between 10th grade and first year community college performance.

Table 9: Correlations of State Assessments and GPA in Community College Courses

	Math	Reading	Writing	Problem Solving	All Tests
All Courses	.36	.33	.30	.23	.40
Math Courses	.27	.23	.18	.18	.27
Arts and Letters	.18	.19	.18	.09	.21
Foreign Language	.20	.19	.24	.10	.24
Science	.28	.26	.21	.18	.32
Social Studies	.24	.25	.20	.16	.28
Remedial Math	.27	.21	.15	.16	.24
Calculus	.37	.31	.25	.23	.38
English Comp	.22	.24	.26	.16	.29
Remedial Writing	.11	.16	.21	.12	.19

*The Pearson correlation uses values from –1 to 1 to indicate the relationship between two variables. A value of 0 indicates no relationship between the two variables. A value of 1 is a perfect positive relationship, and a value of -1 is a perfect inverse relationship. Statistical tests for correlations determine whether the two variables are related in some way. Typically, significant correlations range from .1 to .9. A correlation of .1 shows a positive but weak relationship; a correlation of .9 indicates the two variables are almost identical.

Question 3: What is the value of the state 10th grade benchmark assessment for predicting first-year college performance (college GPA) and persistence beyond freshman year?

Findings:

- Each of four 10th grade benchmark assessments, individually and in combination, proved to be early indicators of overall college GPA at the end of the first year in Oregon's public universities.

- There are a variety of reasons why students decide to continue or not continue their college education beyond their freshman year and this study does not assert a causal relationship between 10th grade benchmark performance and enrollment beyond the first year. However, 82% of the students who met or exceeded 10th grade benchmarks completed their initial year and began their second year at OUS, as compared to 76% of the general student population of returning freshman. Data on returning students were not available from the community colleges. Further study is needed with subsequent entering freshman classes to determine the link between this early indicator of college preparation and first-year success and continued enrollment in college.

- *The First Year* study provides baseline data on the performance of students on 10th grade benchmark standards and subsequent performance in their first year of college. Further

study is needed to determine the predictive value of the 10th grade assessments in regards to college success.

Discussion

Each of five high school statewide assessment scores[10] demonstrated some positive relationship to first-year college GPA. The probability of a specific freshman first year college GPA, e.g. 2.0, or 3.0 or higher, was estimated based on simple logistic regression coefficients. The results of this estimation is depicted in Tables 19b through 23b in Appendix B. Note that estimations are comparable for math, reading, and writing, while science (piloted in 1999) and math problem solving display the greatest variability.

On the basis of results achieved at the 2.0 and 3.0 levels, further estimations were made at the 2.5 and 3.5 levels. This was very helpful for understanding at a more detailed level how each of the test scores related to freshman academic performance. Table 10 provides estimates of this type.

Table 10: Estimated Probability of College Freshman Overall GPA at OUS in Percentages Related to Scores on 10th Grade Benchmark Assessments

10th Grade Assessments (score)	2.0 or Higher	2.5 or Higher	3.0 or Higher	3.5 or Higher
Math				
Exceeds (249)	88%	75%	59%	25%
Meets (239)	81%	62%	41%	13%
Nearly Meets (229)	72%	46%	25%	6%
Low (219)	60%	31%	11%	3%
Reading				
Exceeds (249)	89%	73%	50%	22%
Meets (239)	80%	56%	29%	9%
Nearly Meets (230)	69%	38%	16%	4%
Low (214)	42%	16%	4%	1%
Problem Solving				
Exceeds (40)	87%	74%	57%	28%
Meets (32)	84%	67%	44%	18%
Nearly Meets (29)	82%	64%	39%	15%
Low (16)	74%	51%	22%	6%
Writing				
Exceeds (50)	92%	81%	65%	37%
Meets (40)	82%	64%	39%	15%
Nearly Meets (35)	74%	53%	27%	8%
Low (20)	42%	23%	7%	1%

[10] Includes the science test that was piloted in 1999 as well as math, reading, writing, math problem solving.

A student scoring meets (239) on the 10th grade benchmark assessment in math has a 41% probability of achieving a (3.0) average or higher at the end of the first year of college. A student scoring exceeds (249) on the 10th grade benchmark assessment in reading has a 50% probability of achieving a (3.0) average or higher at the end of the first year in an OUS institution.

Initially, each state test score was analyzed independently. Subsequent analyses treated multiple state test scores in a multivariate model. Using logistic regression, the necessary parameters for estimating probabilities of specific freshman grade point averages were computed based on the five test scores taken collectively. The resulting "calculator," illustrated in Table 11, yields the probability of a college freshman GPA based on an individual student's performance on the various state assessments.

Table 11: Input 10th grade benchmark scores = estimated probability of first year OUS GPA[11]

Assessment	Score	Probability of Overall First Year OUS Freshman GPA			
Reading	235				
Writing	40	**2.0 or higher**	**2.5 or higher**	**3.0 or higher**	**3.5 or higher**
Math	240				
Science	240	68%	50%	26%	7%
Problem Solving	32				

The example student nearly met the reading standard. She also met the writing, problem solving, math, and science standards. Given that performance at the 10th grade benchmark, our student has a 68% chance of an overall first-year college GPA of 2.0 or higher, a 50% chance of a 2.5 or higher, a 26% chance of a 3.0 or higher, and a 7% chance of a 3.5 or higher.

The use of this model better acknowledges the varying performance levels individual students bring to college. The student in our model would ideally have this information at the 10th grade benchmark, so that she would be able to plan her last two years of high school to build her knowledge and skills needed to prepare for college.

IV. Conclusions and Recommendations

Conclusions and Recommendations

- The 10th grade benchmark performance can serve as a planning tool for the last two years of high school for teachers, counselors, parents, and students. This early indicator of college academic readiness ensures that a wider range of students will have the opportunity to set clear and achievable goals toward building the knowledge and skills they need for postsecondary education. This information will be particularly valuable for students who may not have considered their college options. Because Oregon's standards

[11] First Year GPA "Calculator," developed by Paul Yovanoff, Research Associate, Behavioral Research and Teaching, and Associate Professor, University of Oregon.

and assessments are aligned throughout K-12, this process can begin in middle school as students work toward high school preparation.

- The continued development of a K-16 integrated student data transfer system would expedite the exchange of information on state standards met. This system would alleviate much of the workload currently experienced by high school teachers and counselors who prepare these records and by college admissions officers and advisors who receive them. This system would be developed through a partnership of the Oregon University System (OUS), the Oregon Department of Education (ODE), and the Oregon Department of Community Colleges and Workforce Development (CCWD).

- This study also provides colleges with baseline data on student performance in the areas of reading, writing, and math that are considered the foundation for college preparation. Each campus can consider these data in admission and placement decisions to better support students' success in their first year of college. Colleges can then provide feedback to high schools on the success of their graduates in postsecondary education. For example, as a result of *The First Year* study, OUS will provide additional information on standards met to all public Oregon high schools that sent graduates to OUS institutions. The expanded annual performance report, the Class of 2001 Entering Freshman Profile, is produced in aggregate for all high schools with five or more students in OUS institutions.

- The population of students in *The First Year* study took state assessments in 1999-2000, without any information that these assessments might be linked to college entry. As performance on standards becomes more closely linked to next steps and advantages when applying to college, it is likely that student motivation to reach higher standards will increase.

- The 10th grade benchmark assessments studied address 4 of the 10 required English, math, and science standards in the Proficiency-based Admission Standards System (PASS). OUS has worked with ODE since 1994 to maintain the alignment of the K-12 standards and assessments with college entry. OUS admissions offices and faculty now have these baseline data for identifying the next steps for the implementation of PASS. The implications of standards for admissions, placement, and entry-level coursework can be determined. Community colleges may use the findings of this study to examine placement procedures.

Related Materials for Reference

Adelman, C. (1999). Answers in the tool box: academic intensity, attendance patterns, and bachelor's degree attainment. Washington, DC: Office of Educational Research and Improvement, U.S. Department of Education.

Amrein, A. L., & Berliner, D. C. (2002). An analysis of some unintended and negative consequences of high-stakes testing. Tempe, AZ: Arizona State University Education Policy Studies Laboratory.

Amrein, A. L., & Berliner, D. C. (2002). The impact of high-stakes tests on student academic performance: an analysis of NAEP results in states with high-stakes tests and ACT, SAT, and AP test results in states with high school graduation exams. Tempe, AZ: Arizona State University Education Policy Studies Laboratory.

Burton, N. W., & Ramist, L. (2001). Predicting success in college: SAT studies of classes graduating since 1980 (Research Report No. 2001-2). New York: The College Board.

Geiser, S., & Studley, R. (2001). UC and the SAT: predictive validity and the differential impact of the SAT I and the SAT II at the University of California. CA: University of California Office of the President.

Oregon University System Office of Academic Affairs. (2002). OUS diversity report 2002: an assessment of progress toward enhanced representation of students, faculty, and staff of color. Eugene, OR: author.

Oregon University System Office of Academic Affairs, Oregon Department of Community Colleges and Workforce Development. (2002). Transfer activity in Oregon postsecondary education, 1996-97 to 2000-01. Eugene, OR: author.

Oregon University System Office of Institutional Research Services. (2003). Looking back along the long and winding road: retention, attrition, and graduation of OUS freshman, fall 1987 through fall 1995 cohorts. Eugene, OR: author.

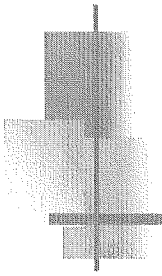
Oregon University System Office of Institutional Research Services. (2002). Where have Oregon's graduates gone: survey of the Oregon high school graduating class of 2001. Eugene, OR: author.

Pavelchek, D., Stern, P., & Olson, D. (2002). Relationship between the WASL and placement tests used by community and technical colleges. Pullman, WA: Washington State University Social & Economic Sciences Research Center.

Reality check 2002. (2003). Public Agenda and Education Week. New York.

Solomon, C., Jerry L., & Lutkus, A. (2001). The nation's report card: state science 2000, report for Oregon. Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics (NCES 2002-453).

The 2001-2002 Oregon report card. (2002). Salem, OR: Oregon Department of Education. www.ode.state.or.us



THE FIRST YEAR: Student Performance on 10th Grade Benchmark Standards and Subsequent Performance in the First Year of College (2001-02)

Appendix A: Background Information

Oregon University System
Oregon Department of Education
Oregon Department of Community
Colleges and Workforce Development

March 7, 2003

Appendix A.1: Chronology of Oregon's Education Policy Actions 1992-2003

- ✓ February 1992 – Oregon State Board of Higher Education identifies the need to respond to the Oregon Education Act for the 21st Century (HB 3565).
- ✓ February 1993 - Board approves policy creating proficiency-based admission (PASS) connected to K-12 school reform.
- ✓ Annually - Board approves admission policy for the next academic year and reviews status of PASS implementation in light of progress in state standards and assessments.
- ✓ February 1994 - Board determines that the development and implementation of PASS must be aligned with anticipated changes in high school curriculum and assessment related to the implementation of Certificates of Initial and Advanced Mastery (CIM and CAM).
- ✓ July 1995 - Passage of SB 2991 by the state legislature requires that the Oregon Department of Education (ODE) establish standards and assessments benchmarked at grades 3, 5, 8 and 10 in six content areas. Oregon University System (OUS) begins alignment of emerging K-12 standards and assessments with PASS.
- ✓ February 1996 and 1997 – Changes in the CIM and CAM implementation timelines are reflected in changes in implementation dates for PASS.
- ✓ February 1997 – OUS policy language on projected implementation refers to PASS as being "expected" rather than "required" of all Oregon residents graduating from a public high school who wish to enter an OUS institution.
- ✓ July 1997 – Passage of SB 919 requires OUS to continue with PASS and ensure alignment with K-12 school reform to articulate expectations for student learning between the education sectors.
- ✓ March 1998 – K-12 Board adopts standards benchmarked at grades 3, 5, 8, 10 and PASS, making Oregon the first state to formally adopt standards aligning K-12 with college admission.
- ✓ June 2001 - Passage of SB 919 by the state legislature changes the second language requirement from 2 years of seat time for all high school graduates to district-determined proficiency levels for all CIM recipients.
- ✓ December – March 2001 – K-12 Board changes graduation requirements so that every student has an education plan to prepare for "next steps," a profile of proficient performance, an extended application of knowledge and skills, and evidence of career related learning. CAM is defined and connected with CIM assessments in six content areas. In response to these changes, OUS begins working with ODE on the next phase of integrating college admission with K-12 reform. This includes a review of student data transfer systems, assessment options, and high school teacher and counselor capacity.
- ✓ January 2002 – A Joint Boards' resolution directs ODE and OUS staff to (1) form a K-16 Technology Implementation Group charged with developing and implementing by June 1, 2003, the plan for a student data transfer mechanism and (2) by June 1, 2002, complete the development of an integrated assessment system for CIM, CAM, PREP, and PASS.
- ✓ February 2002 – Board approves OUS undergraduate admission policy for 2003-04 academic year and projected admission policy through 2004-05. Current admission policy describes options for students to use PASS to meet certain subject-area requirements in fall 2001. All Oregon applicants are expected to include evidence of proficiency beginning fall 2005.
- ✓ June 2002 – OUS begins to conduct research comparing the college academic performance of approximately 6,500 students who have been admitted to OUS institutions with CIM/PASS standards met in English, math and science with that of students admitted by grades.
- ✓ June 4, 2002 – OUS and ODE leaders appear before the House Education Committee to describe their commitment to a K-16 system. The panel expressed the hope for stable funding for all of Oregon's educational institutions and for the legislature to support innovations such as the Oregon Student Record.
- ✓ February 10, 2003 – OUS and ODE present preliminary findings from *The First Year: Student Performance on 10th Grade Benchmark Standards and Subsequent Performance in the First Year of College (2001-02)* to the Joint Boards.

Appendix A.2: The OUS/PASS Standards

ENGLISH
A. Write for Varied Purposes*
B. Read from a Variety of Literary Genres and Periods*
C. Interpret Literary Works*
D. Conduct Inquiry and Research*
E. Analyze Relationships of the Humanities and Human / Social Experience
F. Communicate in Oral, Visual, and Written Forms

MATH
A. Solve Mathematical Problems*
B. Perform Algebraic Operations*
C. Use Geometric Concepts and Models+
D. Use Probability and Statistics to Collect and Study Data+ (Note: C or D required)
E. Use Functions to Understand Mathematical Relationships*
F. Represent, Analyze, and Use Advanced Functions

SCIENCE
A. Know Fundamental Concepts of the Sciences*
B. Design and Conduct Scientific Investigations*
C. Analyze Scientific Knowledge, Theories, and Research
D. Understand, Use, and Investigate a Field of Science

SECOND LANGUAGE
A. Oral / Signed Communication*
B. Reading*
C. Writing*
Note: Standards A-C required at benchmark level IV or higher

VISUAL & PERFORMING ARTS
A. Understand Elements, Principles, and Process in the Arts*
B. Interpret Art from Various Cultures and Historical Periods+
C. Understand the Role of the Arts in Society+
D. Exhibit Skill in One Discipline of the Arts+ (Note: A plus 1 of B, C, or D required)
E. Analyze and Critique Artistic Works

SOCIAL SCIENCE
A. Research and Analyze Issues and Events*
B. Know and Use Geographic Information+
C. Understand Patterns of Human History+
D. Understand United States History+
E. Understand Structures and System of U.S. Government+
F. Analyze Economic Systems+ (Note: A plus any two of B-F required)
G. Examine Aspects of Human Behavior

* Required standards
+ Required standards that have alternate options (such as Math Standards C or D)

Appendix A.3

Optional Transition to Proficiency-based Admission Standards System (PASS), 2004-05, for Oregon Public High School Graduates

The OUS seeks to align its admission processes with changes that are occurring within Oregon high schools. Assuming that the requirements of school-reform legislation and policy are being met by the majority of Oregon high schools, an increasing number of students will be able to demonstrate the ability to function at higher academic levels.

Standard Policy

Current OUS admission policy is expected to remain in effect through the 2004-05 academic year. Students should anticipate continuing to meet subject and grade point requirements and submit required test scores for admission.

Optional Policy

The OUS expects that increasing numbers of applicants from Oregon public high schools applying for freshman admission to fall term 2004 will:

1. Meet the OUS admission requirements in a subject area by meeting all the PASS required standards in that subject (for example, math);

and

2. Meet current subject-area requirements in social studies, second languages, English, math, and science (where not met by PASS) and earn the minimum grade point average as required by each OUS institution;

and

3. Submit SAT I or ACT scores.

In addition, OUS expects that many applicants will include information on PASS standards demonstrated through CIM standards met; state and national tests such as ACT, AP, SAT II, and IB; or collections of evidence rated by PASS-trained teachers. This information is beginning to be used on campuses for scholarships, class or program placements, and determining competitive or borderline admits. The campus-specific advantages that students may earn will be updated annually.

Appendix A.4

Oregon University System Institutions

Eastern Oregon University – La Grande, OR
Oregon Institute of Technology – Klamath Falls, OR
Oregon State University – Corvallis, OR
Portland State University – Portland, OR
Southern Oregon University – Ashland, OR
University of Oregon – Eugene, OR
Western Oregon University – Monmouth, OR
Oregon Health Sciences University – Portland, OR [affiliate]

Oregon's 17 Community Colleges

Blue Mountain Community College - Pendleton, OR
Central Oregon Community Colleges - Bend, OR
Chemeketa Community College - Salem, OR
Clackamas Community College - Oregon City, OR
Clatsop Community College - Astoria, OR
Columbia Gorge Community College - The Dalles, OR
Klamath Community College - Klamath Falls, OR
Lane Community College - Eugene, OR
Linn-Benton Community College - Albany, OR
Mt. Hood Community College - Gresham, OR
Oregon Coast Community College - Newport, OR
Portland Community College - Portland, OR
Rogue Community College - Grants Pass, OR
Southwestern Oregon Community College - Coos Bay, OR
Tillamook Bay Community College - Tillamook, OR
Treasure Valley Community College - Ontario, OR
Umpqua Community College - Roseburg, OR

Appendix A.5

Oregon University System

Oregon *Teaching and Learning to Standards* Compared with ACT's EPAS® Assessments

March 31, 2002

Executive Summary

In March 2002, American College Testing (ACT) completed a study at the request of the Chancellor's Office of the Oregon University System. A comparison was done between the Education Planning and Assessment System (EPAS) Tests at grades 8 (EXPLORE), 10 (PLAN), and 11-12 (ACT) and Oregon's standards. Comparisons were made with Oregon's common curriculum goals, content standards, benchmarks, and eligible content for grades 8 and 10, and also with the Proficiency-based Admission Standards System (PASS) standards and criteria. The ACT analyses were highly consistent with a subsequent OUS study, *The First Year: Student Performance on 10th Grade Benchmark Standards and Subsequent Performance in the First Year of College (2001-02)* Results of the ACT study are summarized below.

English/Language Arts:

The EPAS English and Reading Tests provide direct or indirect measures of many of the standards described in the *Oregon Teaching and Learning to Standards* documents. Specifically, the standards found in Communication and Writing provided a good match to the EXPLORE, PLAN, and ACT Assessment English Tests. The EPAS Reading Tests matched well with Oregon's Standards for Reading and Literature.

Reading

- The EPAS Reading Tests matched exceptionally well with Oregon's reading and literature curriculum areas. Oregon's standards are straightforward and overlap extensively with the EPAS Reading Tests. The best matches can be found in the areas of literal comprehension, inferential comprehension, reading a variety of literary forms, and evaluating how the form of a literary work and the use of literary elements and devices contribute to the overall message and impact. The common curriculum goals that were more difficult to match were those not easily measured on a multiple-choice test (e.g. connecting reading selections to other texts, reading for enjoyment, and understanding how literature is influenced by historical, cultural, social, and biographical factors).

Writing

- Virtually all aspects of Oregon's writing standards overlap with the EPAS English Tests. The only common curriculum goal and content standards not assessed by the EPAS English Tests relate to writing in a variety of modes and forms, using a multi-step writing process, and reflecting on and evaluating one's own writing. Other areas not

addressed by the EPAS English Tests include capitalization, spelling, and correct use of citations. Alignment between the EPAS assessments in English and Oregon's writing benchmarks are considered excellent at grade 8 and good at grade 10 and PASS levels.

Speaking/Communication

- ACT interpreted the communication section as a course of study focusing primarily on learning how to prepare and conduct speeches and presentations. The standards that provided a match were those that described the skills related to the "preparation of speeches." Other communication standards apply directly to oral presentations and are not addressed by the EPAS English Tests. While some of Oregon's communication standards are addressed by EPAS assessments, this area does not show strong alignment.

Mathematics:

There is extensive overlap between the skills and understandings on the EPAS Mathematics Tests and Oregon's mathematics content standards. For the most part, the common curriculum goals that did not provide a match were those that are difficult to measure in a multiple-choice format.

Math Knowledge and Skills (Computations and Estimation, Measurement, Statistics and Probability, Algebraic Relationships, and Geometry)

- EPAS Tests all substantively align with all levels of Oregon standards, down to the level of eligible content. All tests cover the vast majority of standards, and only a few items of eligible content are omitted on any single test.

Mathematical Problem Solving

- Some benchmarks in this area are covered by the EPAS Tests, but none cover all the benchmarks for Oregon standards. The areas of communication and verification are either omitted or assumed. Alignment in this area is partial.

Science:

There was a very good match between the Oregon science standards for grades 8-12 and the EPAS Science Reasoning Tests. The EPAS Science Reasoning Tests are designed to assess students' ability to comprehend, interpret, and use scientific information presented in a variety of ways. The emphasis of the Science Reasoning Tests is on the understanding of the processes of science. As a result, the best direct match was to Oregon's Scientific Inquiry topic area.

Science Knowledge and Skills (Physical Science, Life Science, Earth and Space Science)

- The topic areas of Physical, Life, and Earth and Space Science are only indirect matches to the EPAS Tests. These standards and benchmarks address content areas that serve as stimulus material for assessing the science reasoning skills on the EPAS Science Reasoning Tests. Alignment in this area is partial.

Scientific Inquiry

- There is a good match between the Oregon standards for scientific inquiry and the EPAS Tests. While the tests do not measure student-generated inquiry in the way that Oregon's standards imply, there is significant overlap between the cognitive skills assessed by EPAS Tests and those needed to conduct scientific inquiry in the classroom. The alignment between the EPAS Science Reasoning Test and the cognitive skills measured through scientific inquiry is good.

Contacts for analysis:

Mark Endsley
Coordinator, K-16 Assessment
Office of the Chancellor, OUS
Phone: 541-465-0745

Stacey Ellmore
Senior Consultant
ACT
Phone: 916-631-9200

Appendix A.6

Oregon University System

Oregon State Curriculum Standards
and
Areas of Alignment with the PSAT/NMSQT™, SAT® I and SAT II

Educational Testing Service and The College Board
June 2002

Executive Summary

In June 2002, Educational Testing Service and The College Board completed a study at the request of the Chancellor's Office of the Oregon University System. The findings of The College Board were highly consistent with the correlations established in a subsequent OUS study, *The First Year: Student Performance on 10th Grade Benchmark Standards and Subsequent Performance in the First Year of College (2001-02).* Comparisons of The College Board assessments with Oregon's standards (10th grade benchmark) were made in each of the areas currently tested through Oregon state assessment, as well as in social science and second languages, which are under development at the state level. The alignment compared the PSAT/NMSQT, SAT I, and SAT II to the Oregon state standards and particularly to the 10th grade benchmarks. Results of the College Board study are summarized below.

English/Language Arts:

The PSAT/NMSQT: Verbal and Writing Skills Tests, SAT I: Verbal Test, SAT II: Literature Subject Test, and SAT II: Writing Subject Test together address the Oregon Learning Standards for English Language Arts (10th grade benchmark).

Specifically:

Reading

- The PSAT/NMSQT Verbal and SAT I Verbal assessments align extensively with Oregon's reading benchmarks. While there are a few omissions of content from the Oregon standards, the vast majority of benchmarks and the eligible content, which helps define the benchmarks, are covered by these assessments. The two assessments do not, however, correspond directly to the literature benchmarks in reading. The literature benchmarks are assessed by the SAT II Literature Subject Test.

Writing

- The SAT II Writing assessment aligns with virtually all of Oregon's writing benchmarks. The one omission from the statewide assessment and the SAT II is appropriate use of resources. For Oregon students, this is assessed through the classroom work sample component of state assessment.

Speaking

- None of the assessments directly align with the benchmarks in this area. State assessment is done through local work samples, and data is not currently collected at the state level nor reported from the local district level to the state due to the lack of an integrated data system.

The College Board assessments cover many areas of content related to reading and writing that fall outside of the Oregon benchmarks, requiring more knowledge and/or skill from students.

Mathematics:

The PSAT/NMSQT: Math, SAT I: Math, SAT II: Math Level IC, and SAT II: Math Level IIC Tests together address the Oregon Learning Standards for Mathematics (10th grade benchmark).

Specifically:

Math Knowledge and Skills (Computations and Estimation, Measurement, Statistics and Probability, Algebraic Relationships, and Geometry)

- The PSAT/NMSQT: Math, SAT I: Math, SAT II: Math Level IC, and SAT II: Math Level IIC Tests all substantively assess the benchmarks from Oregon standards. All tests cover the vast majority of content, and only a few items of eligible content, which help define the benchmarks, are omitted on any single test.

Mathematical Problem Solving

- Some benchmarks in this area are covered by the College Board assessments, but none cover all the benchmarks for Oregon standards. The areas of communication and verification are either omitted or assumed by College Board assessments.

Multiple areas of content, especially related to more "advanced" mathematical topics (e.g. trigonometry), fall outside of Oregon benchmarks and are covered by the College Board assessments, requiring more knowledge and/or skill from students.

Science:

The SAT II: Science Subject Tests in Biology (E/M), Chemistry, and Physics together address the Oregon Learning Standards for Science (10th grade benchmark).

Specifically:

Science Knowledge and Skills (Physical Science, Life Science, Earth and Space Science)

- The SAT II: Science Subject Tests in Biology (E/M), Chemistry, and Physics cover nearly all the Oregon science benchmarks and eligible content, which helps define the benchmarks. The exceptions are in the area of earth and space science, where only a few items of eligible content are aligned with the reviewed assessments.

Scientific Inquiry

- While there is some light coverage of topics addressed by the benchmarks for scientific inquiry, there is not a significant alignment between the Oregon standards and the reviewed assessments. Inquiry is not currently required in Oregon, but is scheduled to phase in over the next several years. Work samples will be locally assessed, so data on student performance is not likely to be available immediately.

Because the science assessments for SAT II exams are specialized, the three tests cover extensive content that is well beyond the scope of the Oregon standards' "scientific literacy" approach. The SAT II tests also presume a level of mathematical sophistication not required by Oregon's science standards.

Across all three content areas, the study conducted by Educational Testing Service and The College Board concludes that there is good to excellent alignment comparing Oregon standards (10^{th} grade benchmark) and the PSAT/NMSQT, SAT I, and SAT II Tests. In addition to covering most of the content listed in the Oregon standards, in every subject area these assessments also include knowledge and skills beyond that expected to meet the state standards.

Contacts for analysis:

Mark Endsley
Coordinator, K-16 Assessment
Office of the Chancellor
Oregon University System
Phone: 541-465-0745

Georgia D. Guy
Director, Regional Analysis and Reporting
The College Board
Phone: 678-380-3400

Anne Harvey
Director of Assessment
The College Board
Phone: 212-713-8070

THE FIRST YEAR: Student Performance on 10th Grade Benchmark Standards and Subsequent Performance in the First Year of College (2001-02)

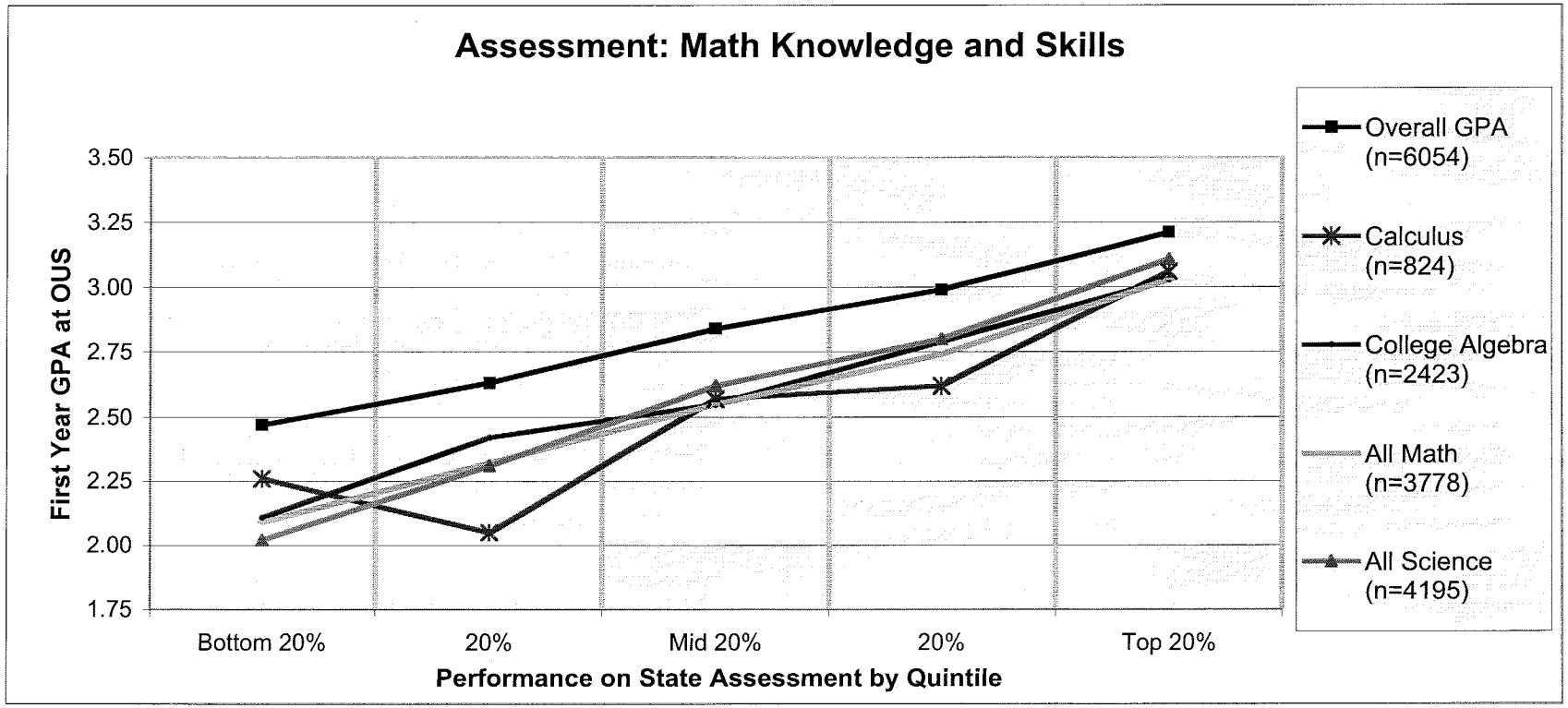
Appendix B: Supporting Tables

Oregon University System
Oregon Department of Education
Oregon Department of Community Colleges
and Workforce Development

March 7, 2003

Math Performance on State Assessment by Quintile and First-Year College GPA at OUS

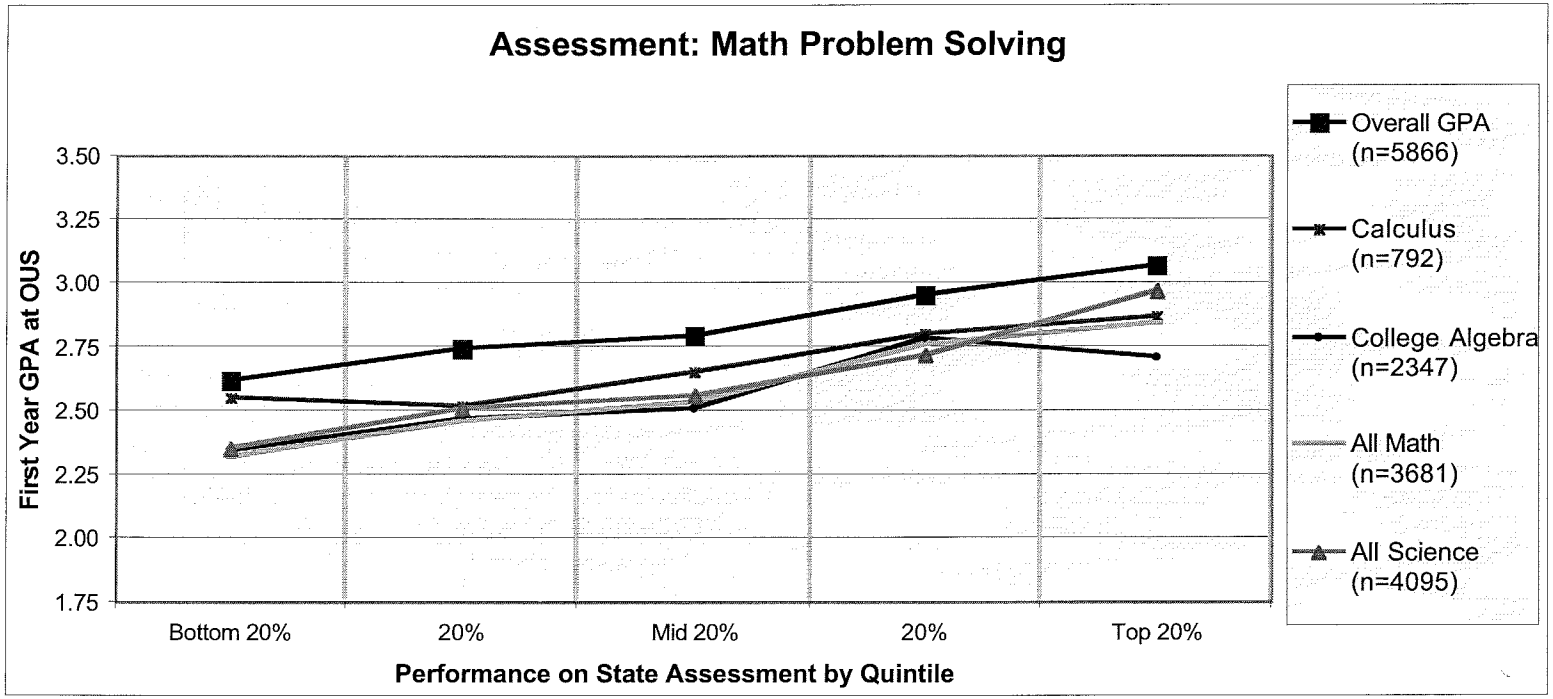
Table 1b



College Subject Area	Math Knowledge and Skills				
	1st Quintile GPA/N	2nd Quintile GPA/N	3rd Quintile GPA/N	4th Quintile GPA/N	5th Quintile GPA/N
Overall GPA	2.47	2.63	2.84	2.99	3.21
	1,250	1,098	1,353	1,235	1,118
Calculus	2.26	2.05	2.57	2.62	3.06
	31	66	147	228	352
College Algebra	2.11	2.42	2.55	2.79	3.03
	426	525	640	520	312
All Math	2.09	2.32	2.55	2.74	3.03
	613	669	851	836	809
All Science	2.02	2.31	2.62	2.8	3.11
	763	760	951	886	835

Problem Solving Performance on State Assessment by Quintile and First-Year College GPA at OUS

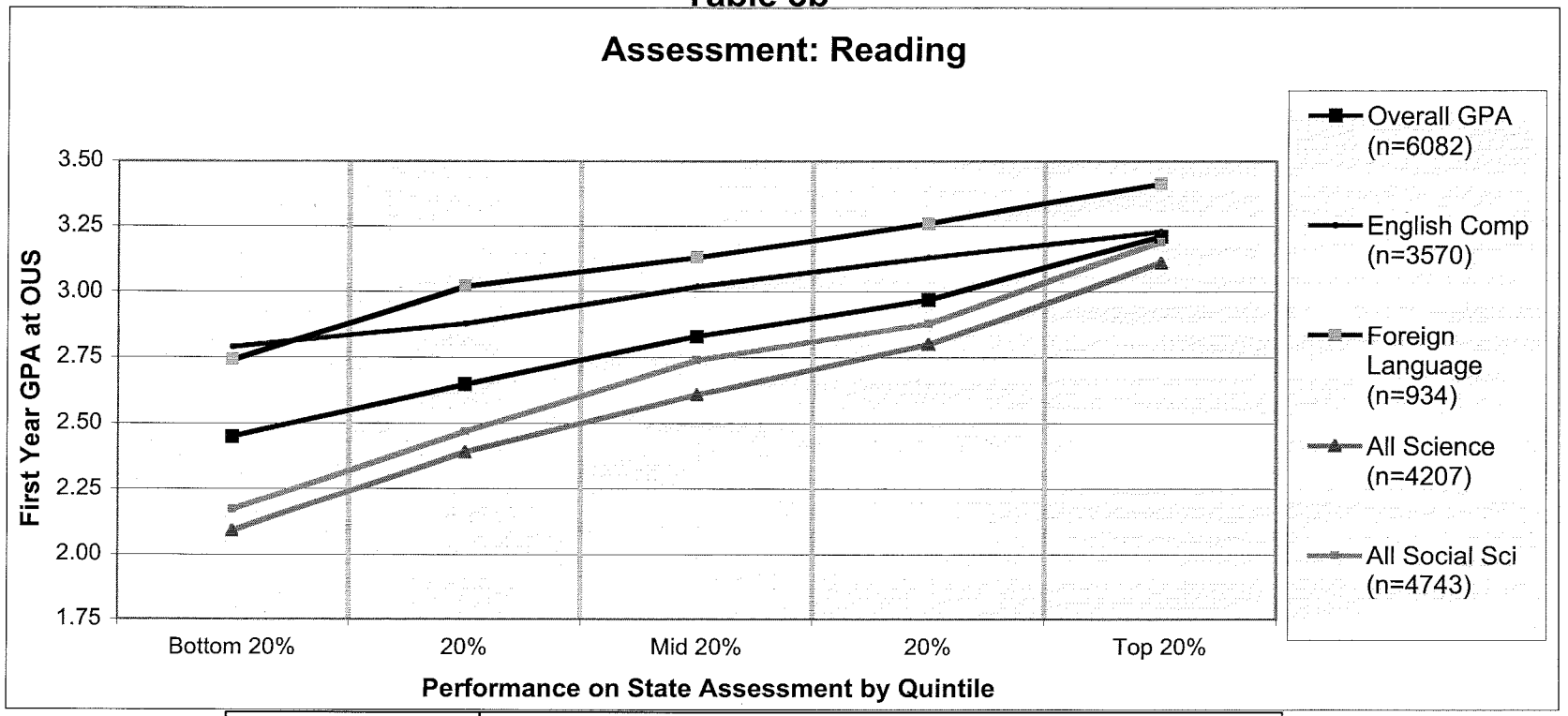
Table 2b



College Subject Area	Problem Solving				
	1st Quintile GPA/N	2nd Quintile GPA/N	3rd Quintile GPA/N	4th Quintile GPA/N	5th Quintile GPA/N
Overall GPA	2.62	2.74	2.79	2.95	3.07
	1,158	1,228	1,317	993	1,170
Calculus	2.55	2.52	2.65	2.8	2.87
	75	154	163	161	239
College Algebra	2.34	2.47	2.51	2.78	2.71
	451	495	560	425	416
All Math	2.32	2.46	2.53	2.76	2.84
	630	760	847	677	767
All Science	2.35	2.51	2.56	2.72	2.97
	767	858	911	719	840

Reading Performance on State Assessment by Quintile and First-Year College GPA at OUS

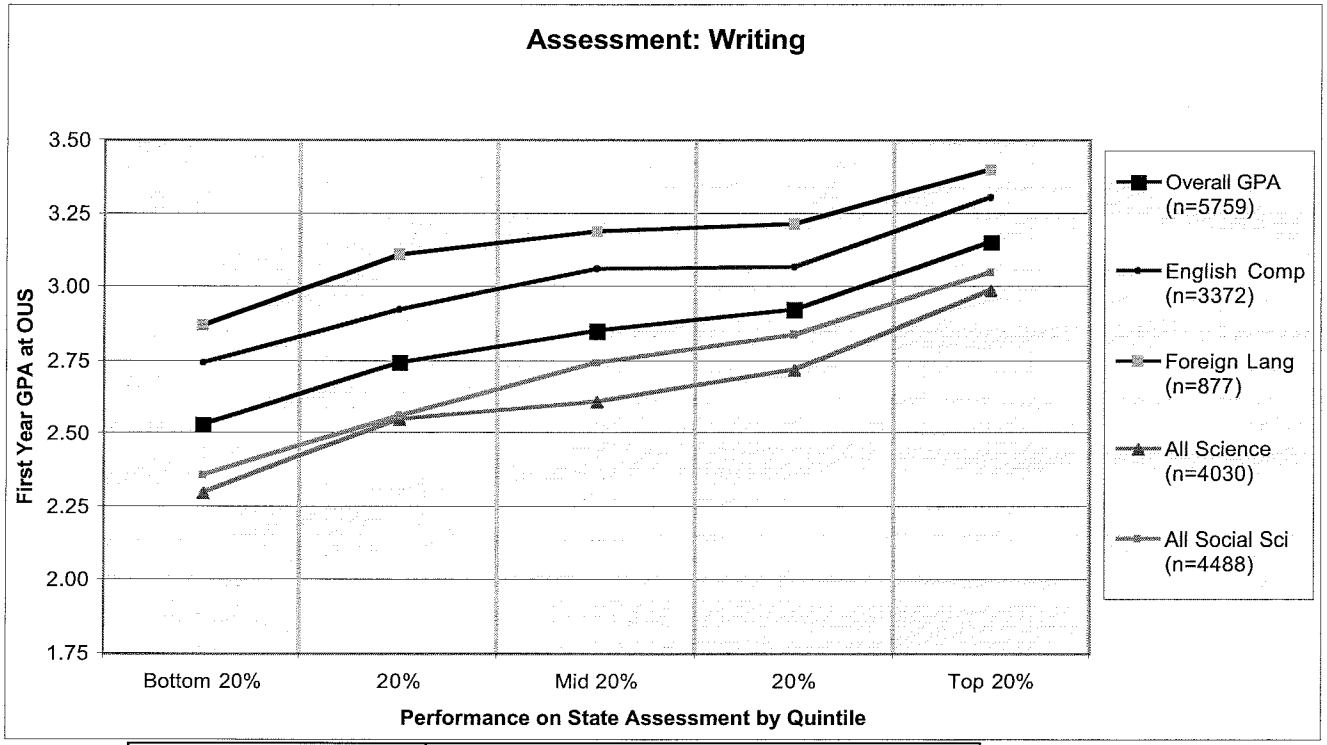
Table 3b



College Subject Area	Reading & Language Test				
	1st Quintile GPA/N	2nd Quintile GPA/N	3rd Quintile GPA/N	4th Quintile GPA/N	5th Quintile GPA/N
Overall GPA	2.45	2.65	2.83	2.97	3.21
	1,086	1,201	1,317	1,348	1,130
English Comp	2.79	2.88	3.02	3.13	3.23
	606	764	807	793	600
Foreign Lang	2.74	3.02	3.13	3.26	3.41
	119	145	189	242	239
All Science	2.09	2.39	2.61	2.8	3.11
	700	854	909	959	785
All Social Science	2.17	2.47	2.74	2.88	3.19
	835	978	1,034	1,038	858

Writing Performance on State Assessment by Quintile and First-Year College GPA at OUS

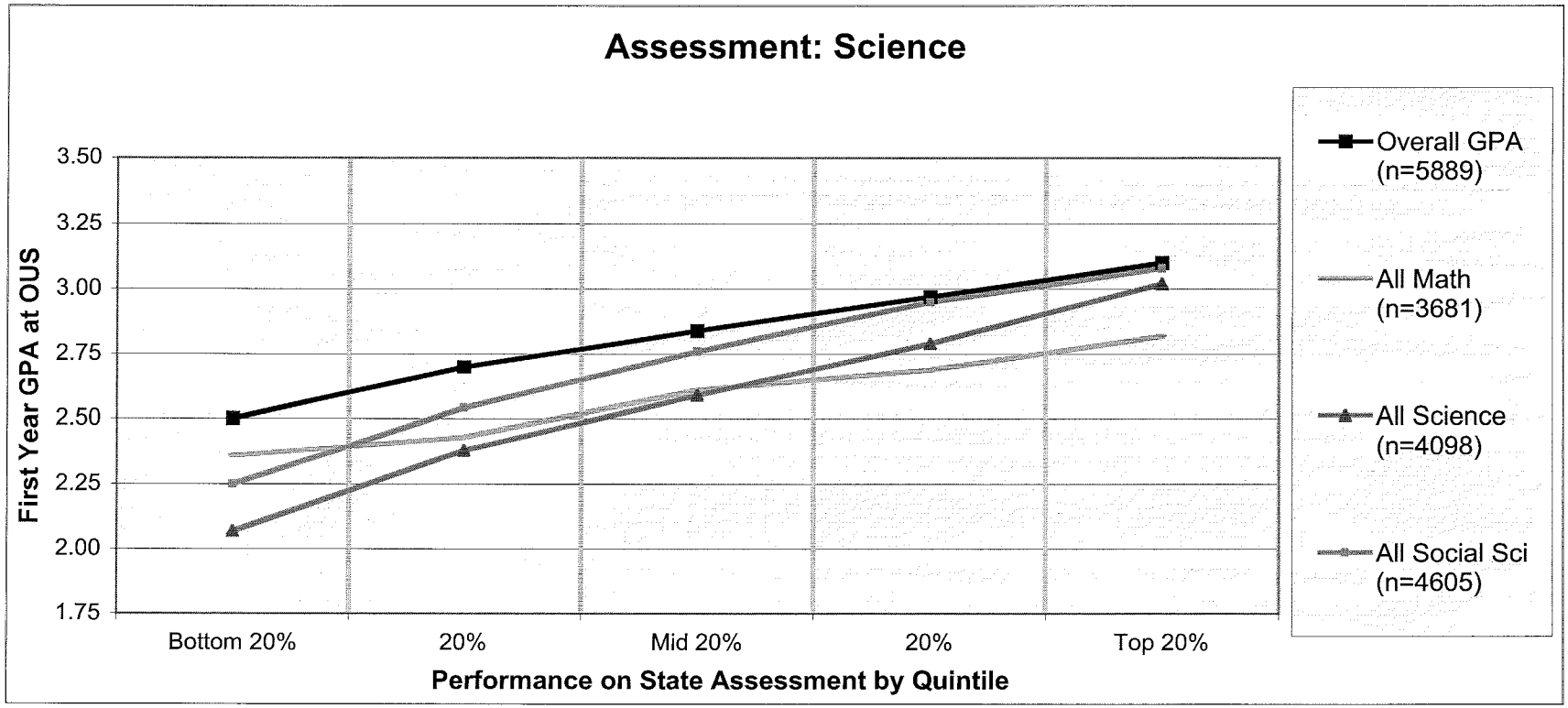
Table 4b



College Subject Area	Writing				
	1st Quintile GPA/N	2nd Quintile GPA/N	3rd Quintile GPA/N	4th Quintile GPA/N	5th Quintile GPA/N
Overall GPA	2.53	2.74	2.85	2.92	3.15
	1,054	1,633	811	1,117	1,144
English Comp	2.74	2.92	3.06	3.07	3.3
	628	1007	473	673	591
Foreign Lang	2.87	3.11	3.19	3.21	3.4
	108	219	107	195	248
All Science	2.3	2.55	2.61	2.72	2.99
	716	1198	576	758	782
All Social Science	2.36	2.56	2.74	2.84	3.05
	795	1287	636	890	880

Science Performance on State Assessment by Quintile and First-Year College GPA at OUS

Table 5b

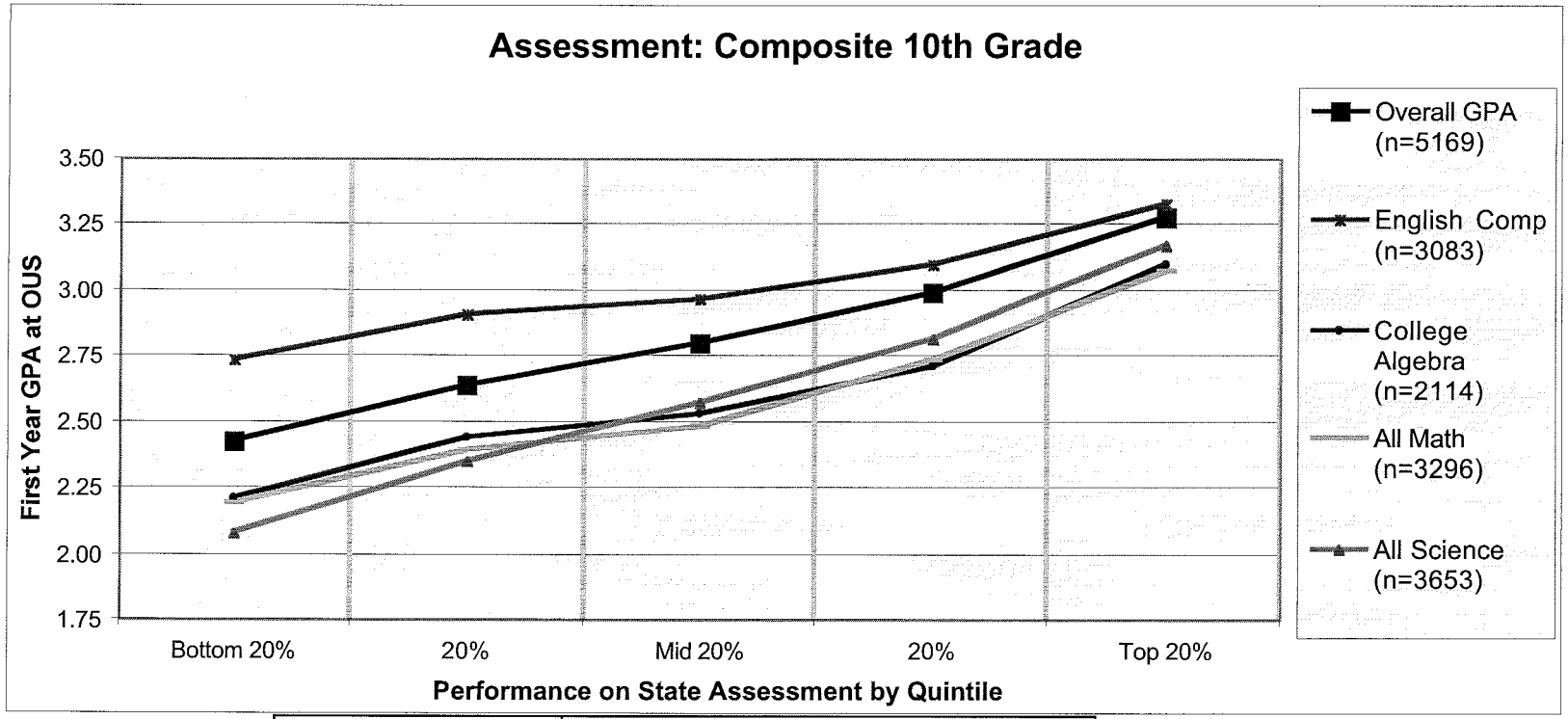


College Subject Area	Science				
	1st Quintile GPA/N	2nd Quintile GPA/N	3rd Quintile GPA/N	4th Quintile GPA/N	5th Quintile GPA/N
Overall GPA	2.5	2.7	2.84	2.97	3.1
	1,157	1,060	1,365	1,024	1,283
All Math	2.36	2.43	2.61	2.69	2.82
	642	619	866	669	885
All Science	2.07	2.38	2.59	2.79	3.02
	744	706	964	717	967
All Social Science	2.25	2.54	2.76	2.95	3.08
	942	874	1,116	787	886

THE FIRST YEAR, March 2003

Performance on Composite 10th Grade Benchmark Assessments by Quintile and First- Year College GPA at OUS (Math Knowledge and Skills, Problem Solving, Reading, and Writing)

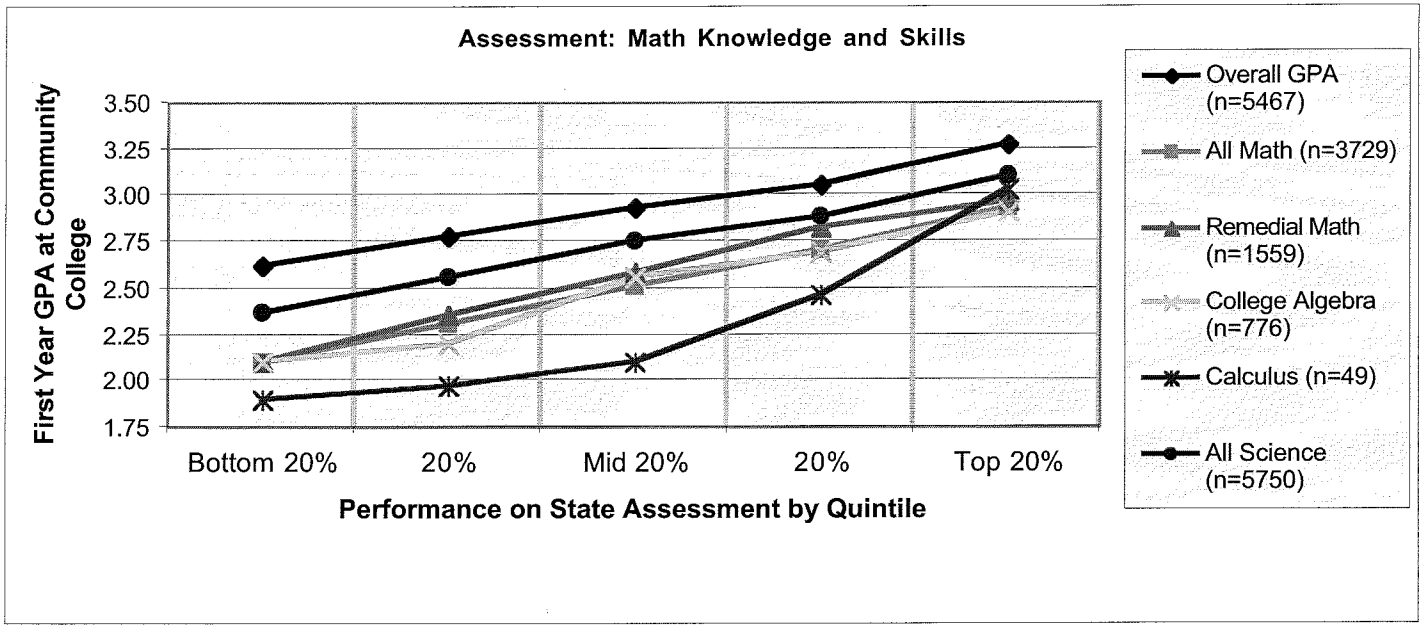
Table 6b



College Subject Area	Composite 10th Grade				
	1st Quintile GPA/N	2nd Quintile GPA/N	3rd Quintile GPA/N	4th Quintile GPA/N	5th Quintile GPA/N
Overall GPA	2.42	2.64	2.8	2.99	3.28
	1,033	1,034	1,034	1,034	1,034
College Algebra	2.21	2.44	2.53	2.71	3.1
	403	484	474	441	312
English Comp	2.74	2.91	2.97	3.1	3.33
	613	618	649	653	550
All Math	2.19	2.39	2.48	2.74	3.07
	563	651	679	721	682
All Science	2.08	2.35	2.57	2.82	3.17
	670	758	730	753	742

Math Performance on State Assessment by Quintile and First-Year Community College GPA

Table 7b

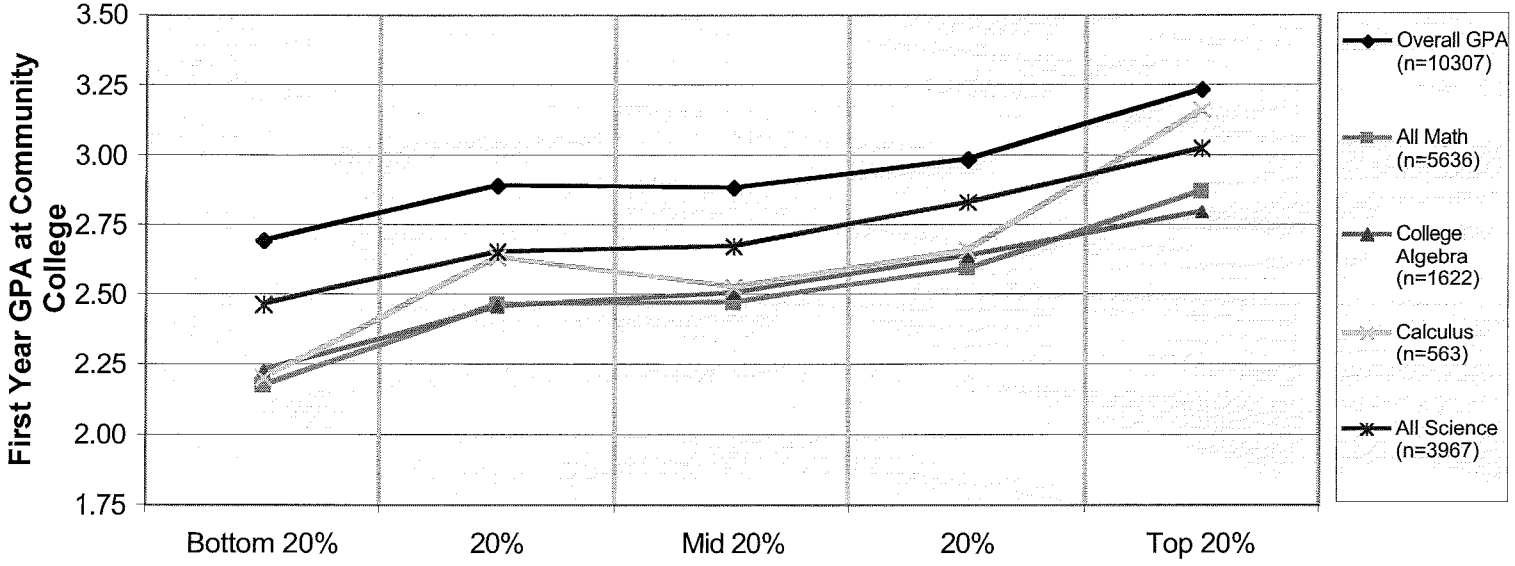


College Subject Area	Math Knowledge and Skills				
	1st Quintile GPA/N	2nd Quintile GPA/N	3rd Quintile GPA/N	4th Quintile GPA/N	5th Quintile GPA/N
Overall GPA	2.61	2.77	2.93	3.05	3.27
	1,107	1,113	1,283	987	977
All Math	2.1	2.3	2.52	2.7	2.93
	1010	922	960	551	286
Remedial Math	2.09	2.35	2.58	2.82	2.97
	156	267	393	391	352
College Algebra	2.1	2.19	2.56	2.69	2.91
	37	81	177	211	270
Calculus	1.89	1.96	2.11	2.46	3.03
	3	1	1	13	31
All Science	2.36	2.56	2.75	2.88	3.1
	1094	1225	1,390	1,100	941

Math Problem Solving Performance on State Assessment by Quintile and First-Year Community College GPA

Table 8b

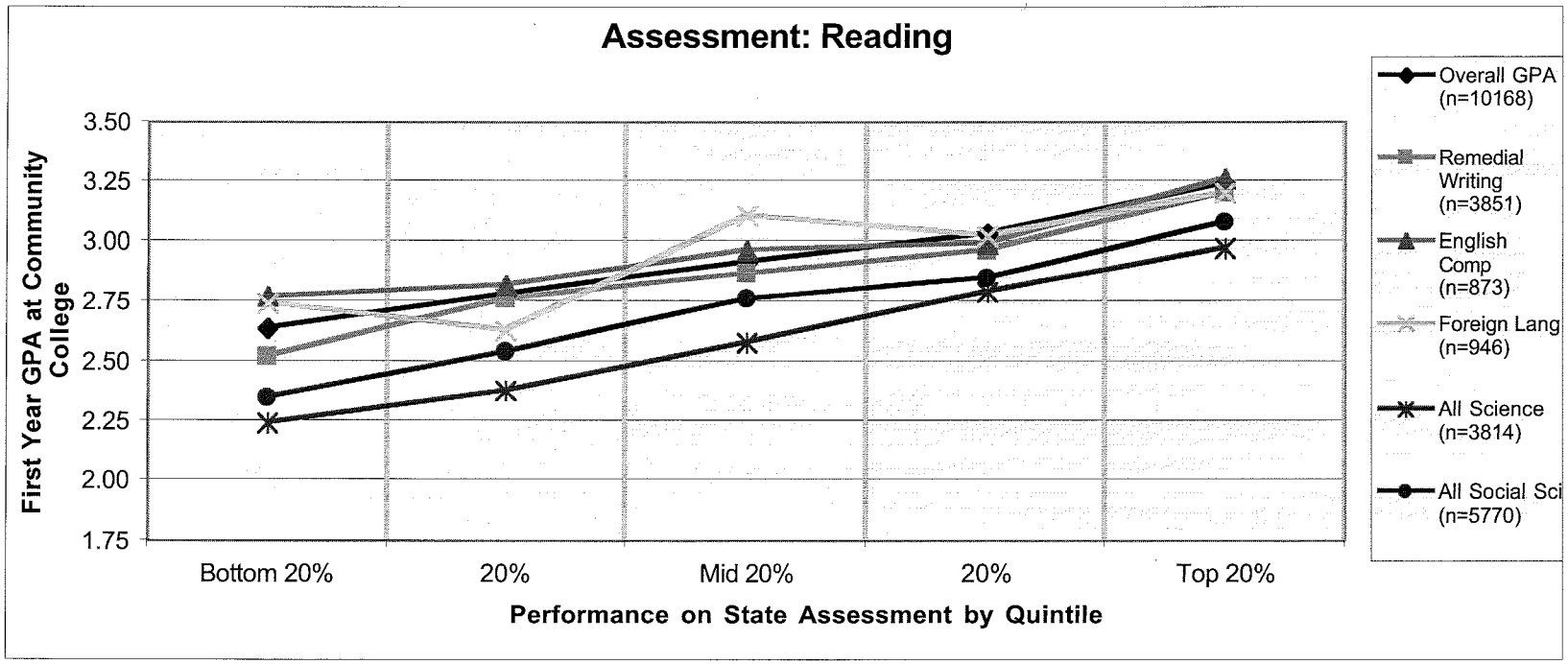
Assessment: Math Problem Solving



College Subject Area	Math Problem Solving				
	1st Quintile GPA/N	2nd Quintile GPA/N	3rd Quintile GPA/N	4th Quintile GPA/N	5th Quintile GPA/N
Overall GPA	2.7	2.89	2.88	2.99	3.24
	1,832	2,136	2,252	2405	1682
All Math	2.17	2.46	2.47	2.6	2.87
	1051	1169	1261	1305	850
College Algebra	2.23	2.46	2.5	2.64	2.79
	197	320	340	454	311
Calculus	2.21	2.64	2.53	2.67	3.16
	30	55	96	148	234
All Science	2.47	2.66	2.68	2.83	3.03
	643	832	877	956	659

Reading Performance on State Assessment by Quintile and First-Year Community College GPA

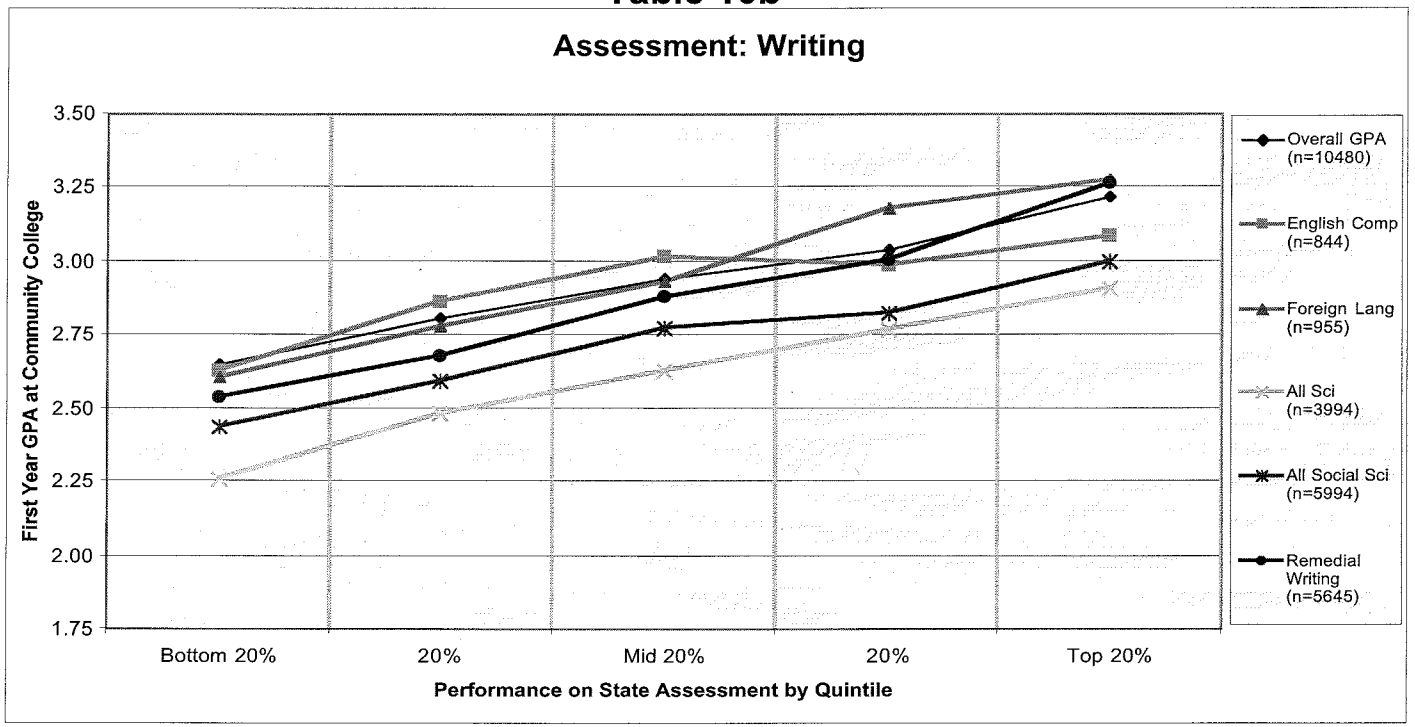
Table 9b



College Subject Area	Reading				
	1st Quintile GPA/N	2nd Quintile GPA/N	3rd Quintile GPA/N	4th Quintile GPA/N	5th Quintile GPA/N
	908	1160	1027	1149	1252
English Comp	2.77	2.81	2.96	2.99	3.26
	356	276	137	76	28
Foreign Lang	2.74	2.63	3.10	3.02	3.20
	126	165	155	212	288
All Science	2.24	2.38	2.57	2.79	2.97
	587	838	755	762	872
All Social Science	2.35	2.54	2.76	2.84	3.07
	934	1283	1143	1222	1188

Writing Performance on State Assessment by Quintile and First-Year Community College GPA

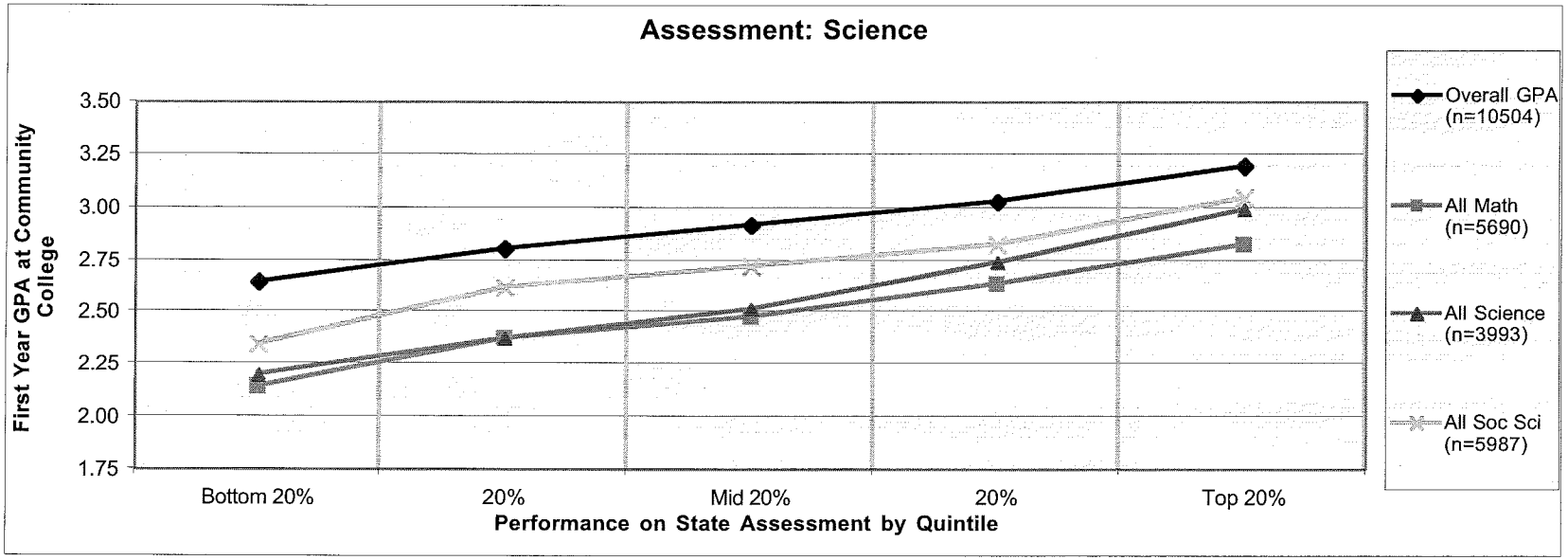
Table 10b



College Subject Area	Writing				
	1st Quintile GPA/N	2nd Quintile GPA/N	3rd Quintile GPA/N	4th Quintile GPA/N	5th Quintile GPA/N
Overall GPA	2.65	2.81	2.94	3.04	3.22
	2,091	2,139	2,143	2,247	1,860
English Comp	2.63	2.86	3.02	2.99	3.08
	365	229	124	89	37
Foreign Lang	2.6	2.78	2.93	3.18	3.28
	144	142	214	239	216
All Science	2.25	2.48	2.63	2.77	2.911
	747	805	818	885	739
All Social Science	2.43	2.59	2.77	2.82	3.00
	1191	1245	1,222	1,310	1026
Remedial Writing	2.54	2.68	2.88	3.00	3.27
	1082	1159	1,158	1,230	1016

Science Performance on State Assessment by Quintile and First-Year Community College GPA

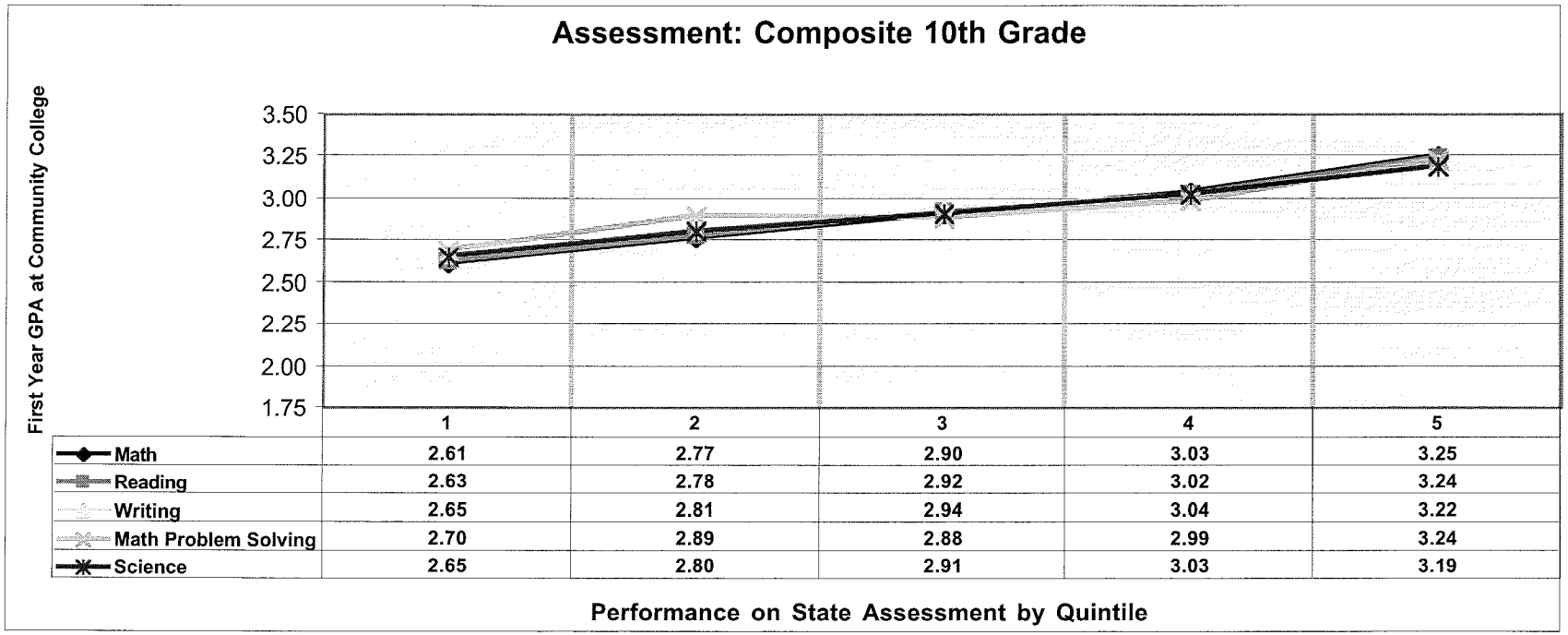
Table 11b



College Subject Area	Science				
	1st Quintile	2nd Quintile	3rd Quintile	4th Quintile	5th Quintile
Overall GPA	2.65	2.80	2.91	3.03	3.19
	1820	1899	2078	2465	2242
All Math	2.14	2.37	2.48	2.63	2.82
	1055	1065	1138	1277	1155
All Science	2.19	2.38	2.51	2.74	2.99
	562	699	769	1030	933
All Social Sci	2.35	2.61	2.72	2.82	3.05
	1014	1132	1252	1452	1137

Performance on 10th Grade Benchmarks and Community College GPA (Math Knowledge and Skills, Problem Solving, Reading, Writing, and Science)

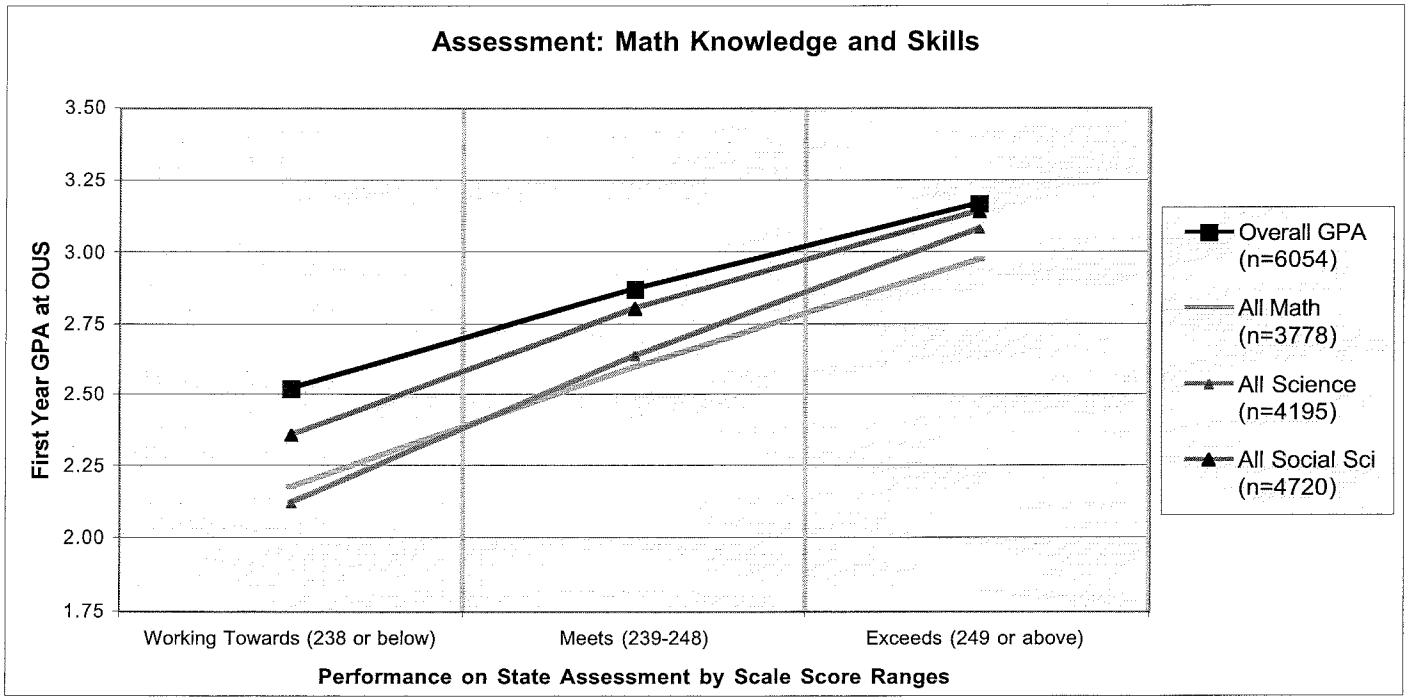
Table 12b



	1	2	3	4	5
Math	2.61	2.77	2.90	3.03	3.25
Reading	2.63	2.78	2.92	3.02	3.24
Writing	2.65	2.81	2.94	3.04	3.22
Math Problem Solving	2.70	2.89	2.88	2.99	3.24
Science	2.65	2.80	2.91	3.03	3.19

Math Performance on State Assessment and First-Year College GPA at OUS

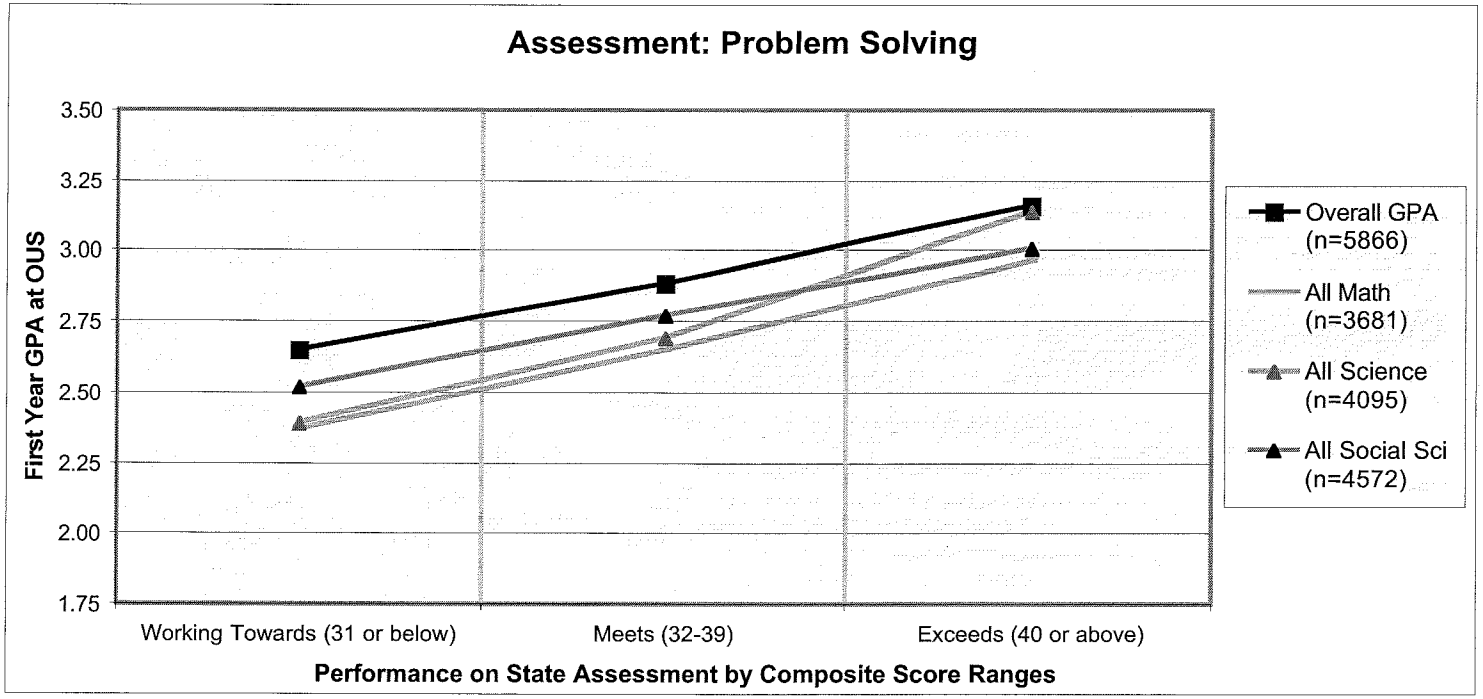
Table 13b



College Subject Area	Math: Knowledge and Skills		
	Working Towards (238 or below) GPA/N	Meets (239-248) GPA/N	Exceeds (249 or above) GPA/N
Overall GPA	2.52	2.87	3.17
	2039	2542	1473
All Math	2.18	2.6	2.97
	1078	1652	1048
All Science	2.12	2.64	3.08
	1313	1789	1093
All Social Science	2.36	2.8	3.14
	1676	2016	1028

Problem Solving Performance on State Assessment and First-Year College GPA at OUS

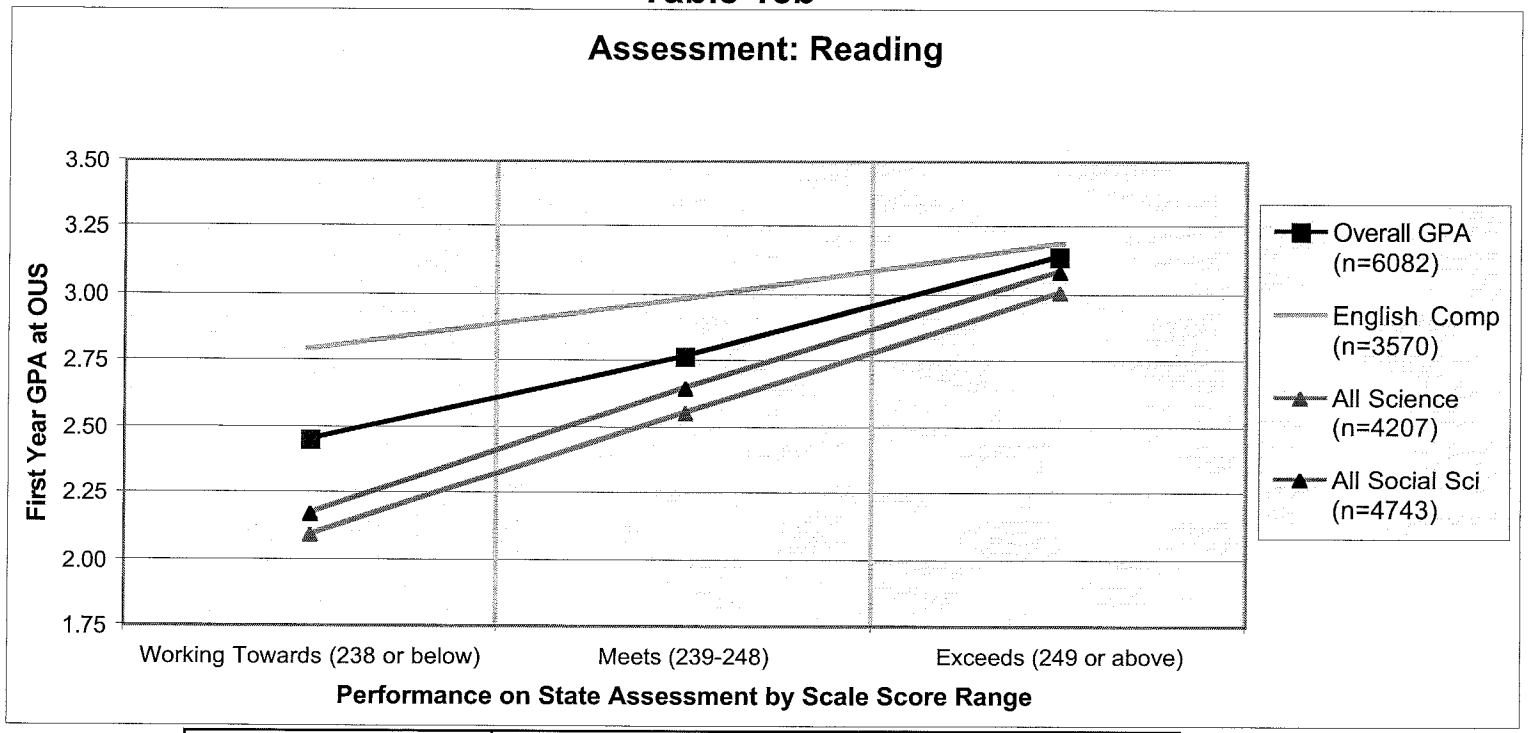
Table 14b



College Subject Area	Problem Solving Test		
	Working Towards (31 or below)	Meets (32-39)	Exceeds (40 or above)
	GPA/N	GPA/N	GPA/N
Overall GPA	2.65	2.89	3.16
	1661	3961	244
All Math	2.37	2.65	2.97
	941	2586	154
All Science	2.39	2.69	3.14
	1108	2814	173
All Social Science	2.52	2.77	3.01
	1331	3065	176

Reading Performance on State Assessment and First-Year College GPA at OUS

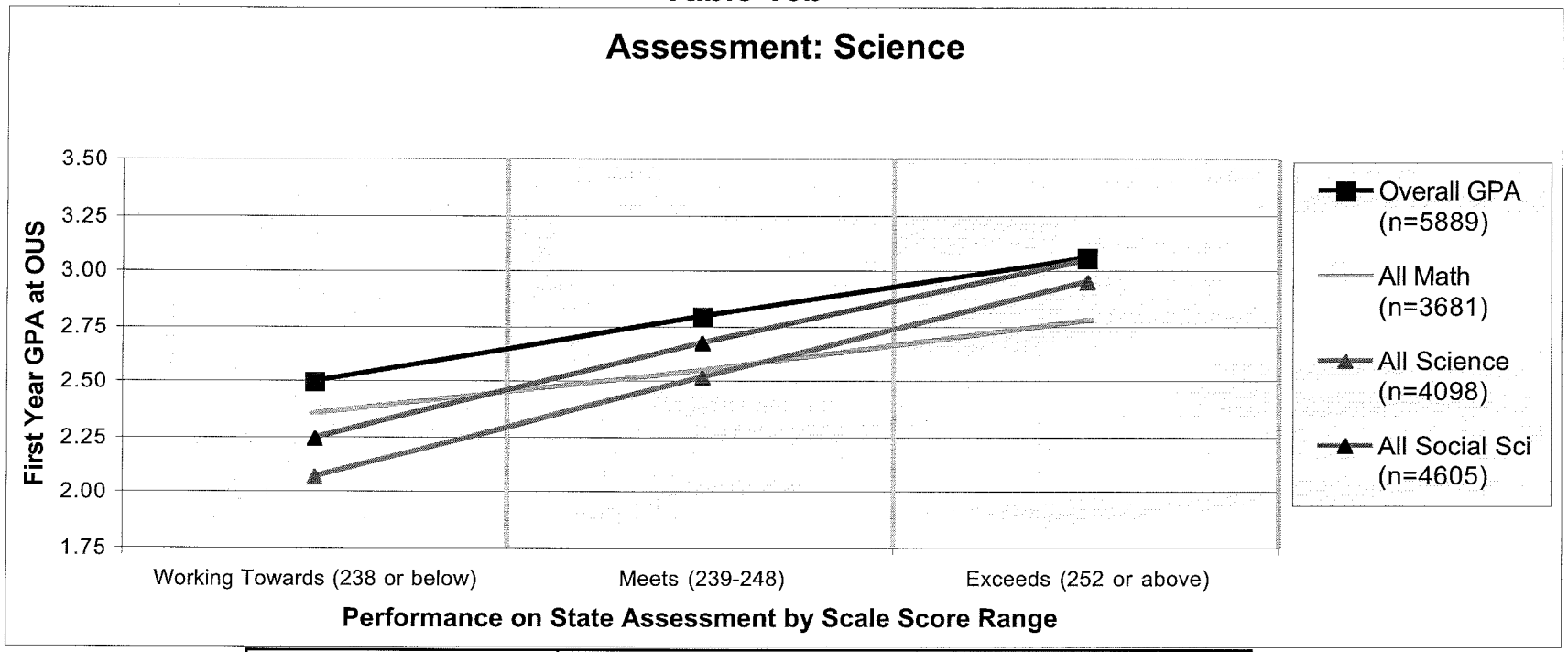
Table 15b



College Subject Area	Reading & Language Test		
	Working Towards (238 or below)	Meets (239-248)	Exceeds (249 or above)
	GPA/N	GPA/N	GPA/N
Overall GPA	2.45	2.77	3.14
	1086	3100	1896
English Comp	2.79	2.98	3.19
	606	1904	1060
All Science	2.09	2.55	3.01
	700	2181	1326
All Social Science	2.17	2.65	3.09
	835	2461	1447

Science Performance on State Assessment and First-Year College GPA at OUS

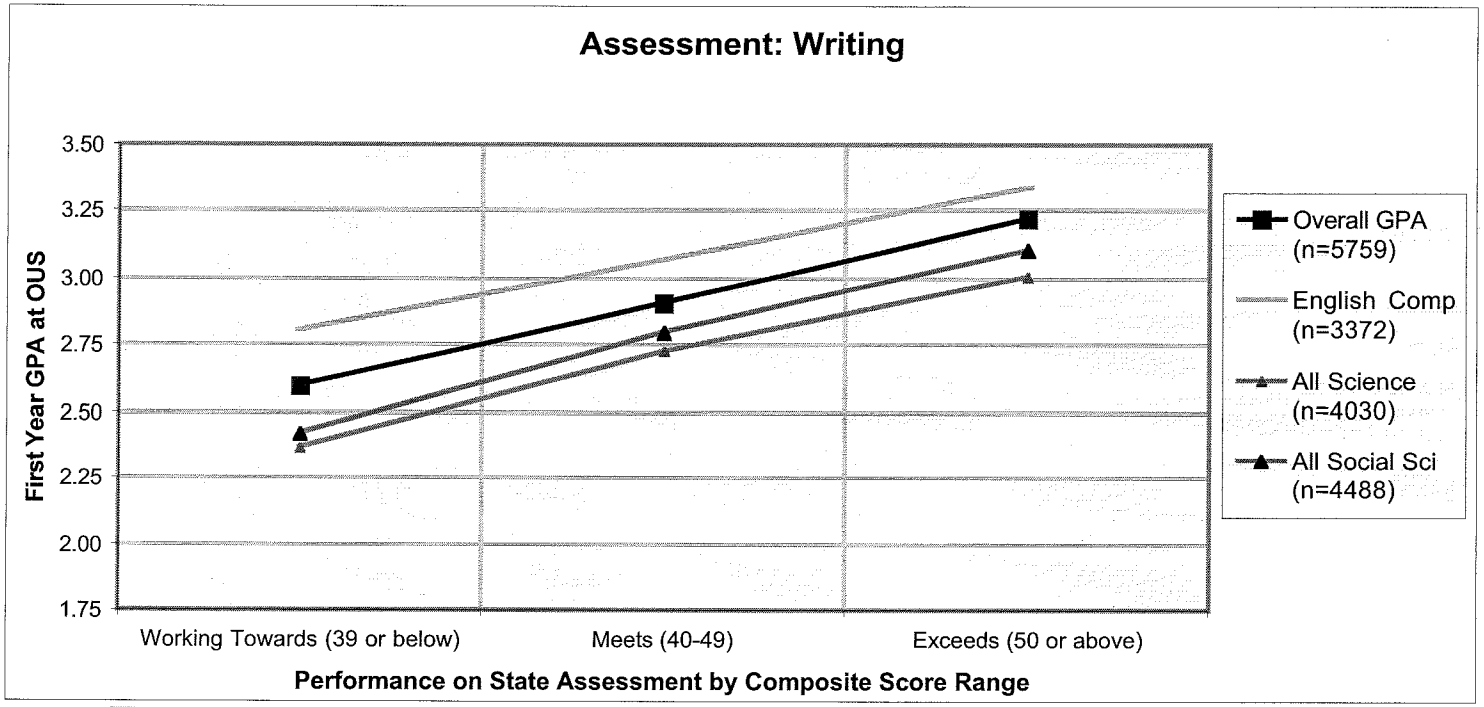
Table 16b



College Subject Area	Assessment: Science		
	Working Towards (238 or below)	Meets (239-248)	Exceeds (252 or above)
	GPA/N	GPA/N	GPA/N
Overall GPA	2.5	2.8	3.06
	1157	2683	2049
All Math	2.36	2.55	2.78
	642	1651	1388
All Science	2.07	2.52	2.95
	744	1839	1515
All Social Science	2.25	2.68	3.05
	942	2196	1467

Writing Performance on State Assessment and First-Year College GPA at OUS

Table 17b



College Subject Area	Assessment: Writing		
	Working Towards (39 or below)	Meets (40-49)	Exceeds (50 or above)
	GPA/N	GPA/N	GPA/N
Overall GPA	2.6	2.91	3.22
	1844	3492	423
English Comp	2.81	3.07	3.34
	1124	2035	213
All Science	2.37	2.73	3.01
	1300	2440	290
All Social Science	2.42	2.8	3.11
	1414	2737	337

Pearson Correlation Coefficients for Individual and Composite State Assessments (problem-solving, writing, reading literature, math knowledge and skills) and High School GPA, SAT Combined, SAT Verbal, SAT Math and First-Year GPA.

Table 18b

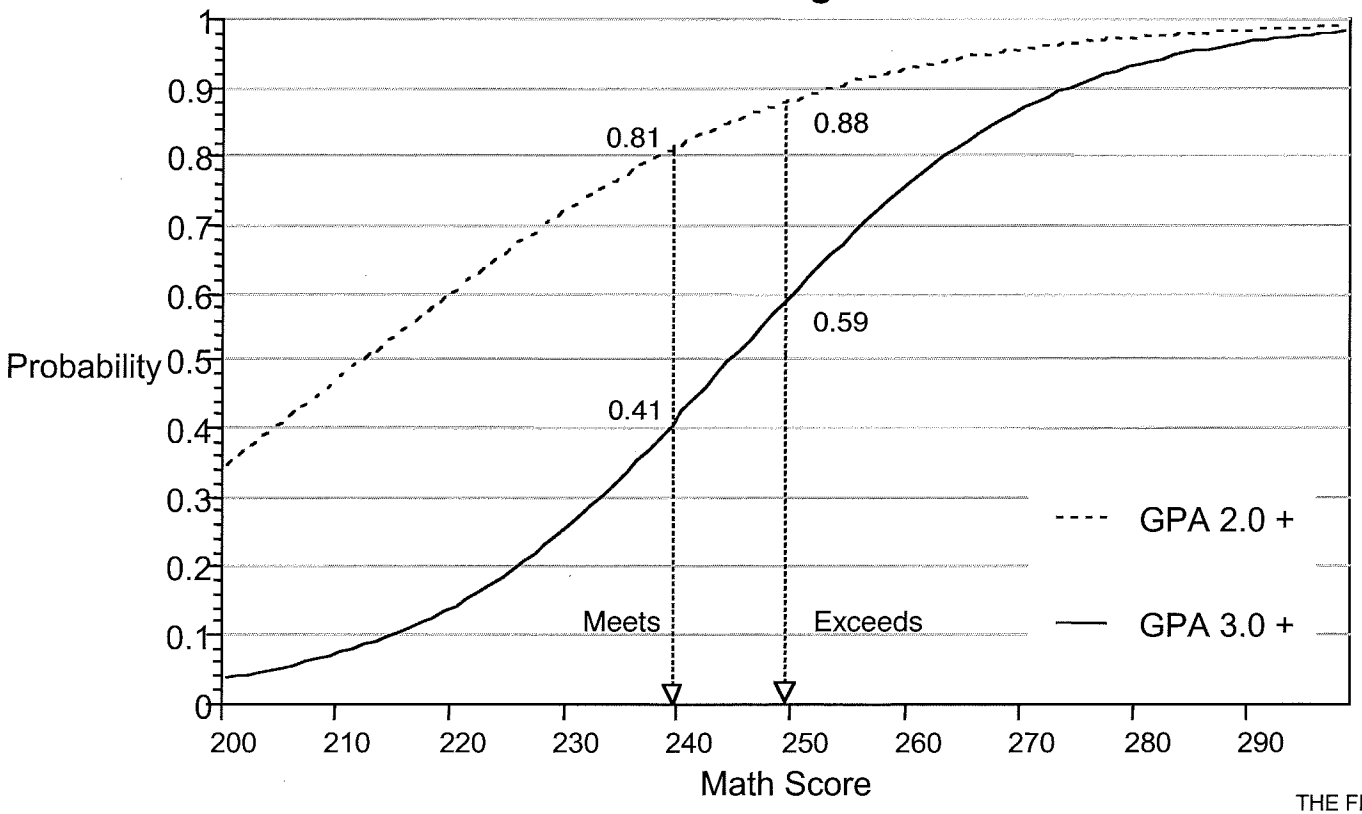
PSWRRLMA Pearson Correlation Coefficients Prob > |r| under H0: Rho=0 Number of Observations										
	ps_z	wr_z	rl_z	ma_z	pswrrlma_z	hsgpa	sat	satv	satm	overall_gpa
pswrrlma_z	0.64355 5169	0.65634 5169	0.77684 5169	0.77064 5169	1 5169	0.46332 5061	0.75009 3488	0.68841 3488	0.66409 3488	0.37488 5169
hsgpa	0.23043 5061	0.32002 5061	0.35678 5061	0.4091 5061	0.46332 5061	1 5061	0.37133 3429	0.29891 3429	0.37328 3429	0.52246 5061
sat	0.32603 3488	0.43009 3488	0.67177 3488	0.71615 3488	0.75009 3488	0.37133 3429	1 3488	0.9088 3488	0.89494 3488	0.38123 3488
satv	0.25876 3488	0.44547 3488	0.70814 3488	0.55204 3488	0.68841 3488	0.29891 3429	0.9088 3488	1 3488	0.62715 3488	0.34848 3488
satm	0.33192 3488	0.3265 3488	0.49678 3488	0.74657 3488	0.66409 3488	0.37328 3429	0.89494 3488	0.62715 3488	1 3488	0.33903 3488
all_gpa	0.17949 5169	0.24625 5169	0.32283 5169	0.31816 5169	0.37488 5169	0.52246 5061	0.38123 3488	0.34848 3488	0.33903 3488	1 5169

*All correlations are statistically significant at the .01 level.

Probability of OUS Freshman GPA by OSA Math Knowledge and Skills Score

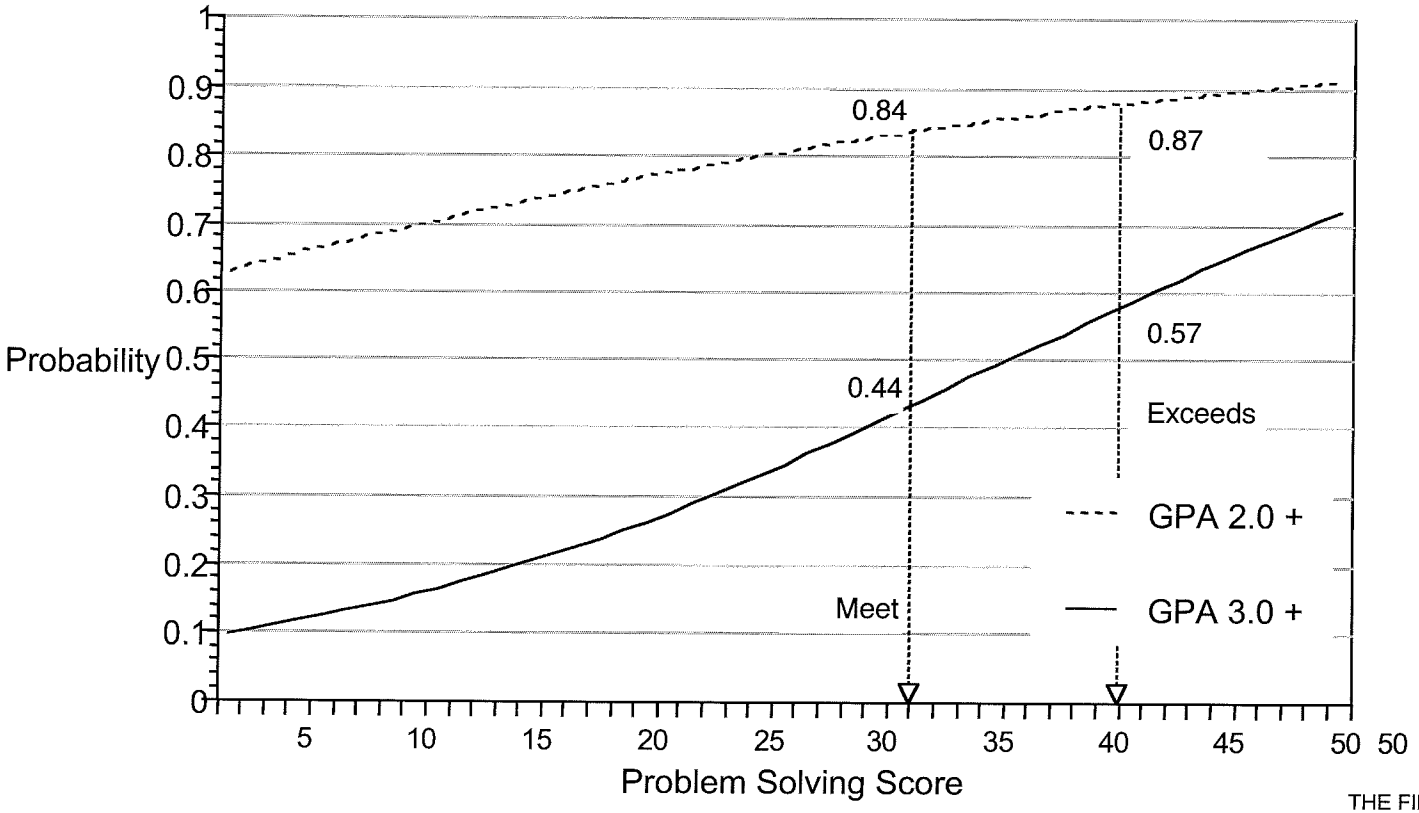
Table 19b

Math: Knowledge and Skills



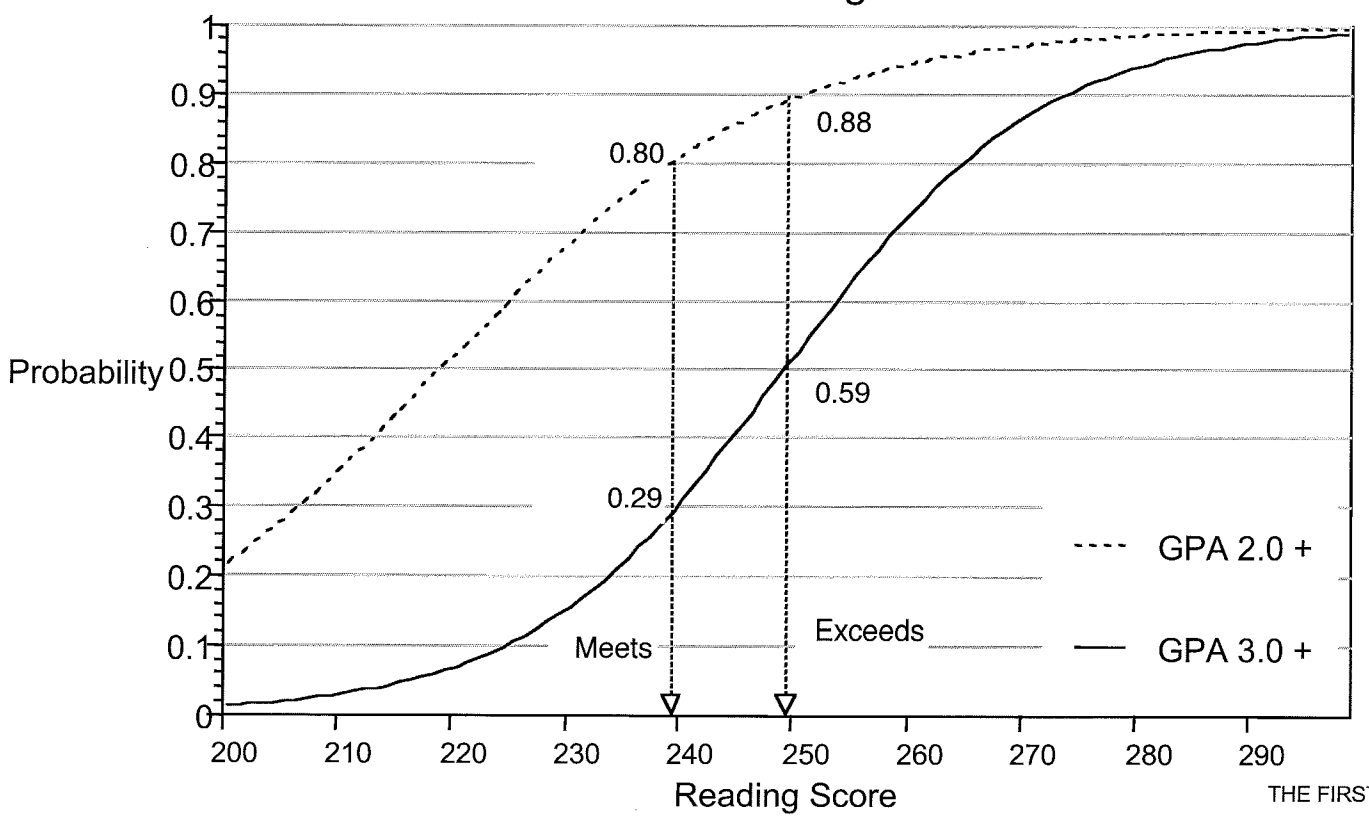
Probability of OUS Freshman GPA by OSA Math Problem Solving Score

Table 20b
Math: Problem Solving



Probability of OUS Freshman GPA by OSA Reading Score

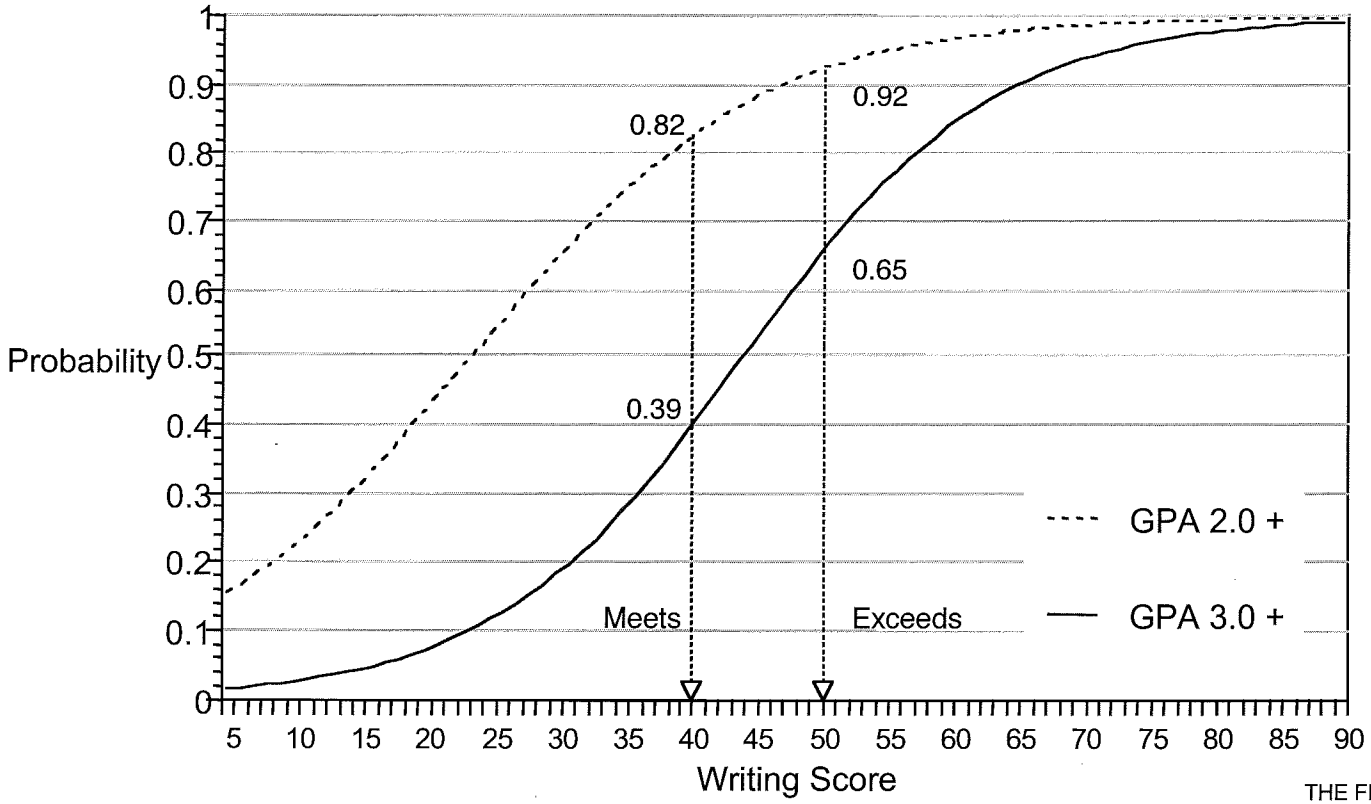
Table 21b



Probability of OUS Freshman GPA by OSA Writing Score

Table 22b

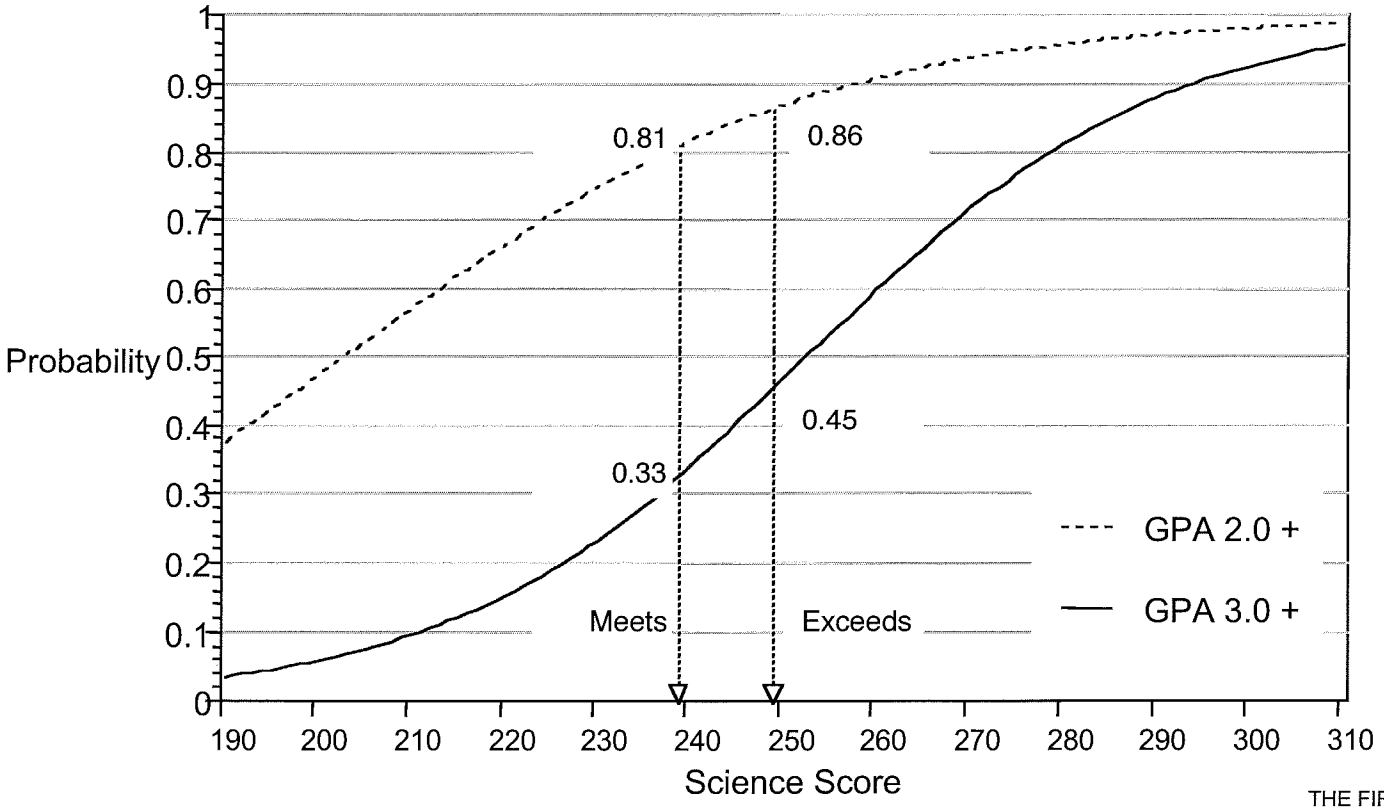
Writing



Probability of OUS Freshman GPA by OSA Science Score

Table 23b

Science



State Assessments Included in the First-Year Study Address 4 of the 10 Required PASS Standards for OUS Admission

Table 24b

State Assessments	The 10 Required PASS Standards
Math Problem Solving	Math Standard A (Solve Mathematical Problems)
Math Knowledge and Skills	Math Standard B (Perform Algebraic Operations)
	Math Standard C (Use Geometric Concepts and Models) or Standard D (Use Probability and Statistics to Collect and Study Data) Math Standard E (Use Functions to Understand Mathematical Relationships)
Reading	All PASS English standards use the 10th grade benchmark in reading as an assumed prerequisite.
Writing	English Standard A (Write for Varied Purposes)
	English Standard C (Interpret Literary Works) English Standard D (Conduct Inquiry and Research)
Science Knowledge and Skills*	Science Standard A (Know Fundamental Concepts of Sciences)
	Science Standard B (Design and Conduct Scientific Investigations)

* Because the Science Knowledge and Skills state assessment was field tested in 1999, it was not used as the First Year study; however, this assessment currently fills the requirement for Science Standard A.