



# College Readiness Metrics

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National Forum

Nov. 2008

# 1. New Metrics for College Readiness

Students are college ready when they have the **knowledge, skills and behaviors** to successfully complete a college course of study without remediation

College readiness should be assessed through multiple measures:

1. **Academic knowledge and skills evidenced by successful completion of a rigorous high school core curriculum** (4 years of mathematics, including algebra II; 4 years of English language arts; 3 or more years of science; 3 or more years of social sciences/history)
2. **Success in college-level courses taken in high school that require in-depth subject-area knowledge, higher-order thinking skills, and strong study and research skills**, e.g., as evidenced by achievement of a grade of 3 or higher on at least one AP examination.
3. **Advanced academic skills, such as reasoning, problem solving, analysis, and writing abilities**, e.g., as demonstrated by successful performance on the SAT (a score of 1180 critical reading and mathematical reasoning corresponds to a 65% probability of a Freshman GPA of B- or higher).
4. **College planning skills demonstrated by an understanding of college and career options and the college admissions and financing process**

## College Readiness

Students are college ready  
to successfully complete

**This definition has 2 options – met or not met.  
We can add value by quantifying courses taken  
and developing a 5 or 10 pt scale for students and  
schools that reflect academic rigor of courses  
taken**

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**Also only 2 options  
– above and below  
1180.**

# College Readiness

Students are college  
to successfully co

**This metric has no measure.  
We can add value by incorporating  
the rigor of courses taken (honors,  
AP, dual enrollment) into the same  
acad. rigor scale.**

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College readiness should be assessed

- 1. Academic knowledge and skill curriculum** (4 years of mathematics, including algebra II; 4 years of English language arts; 3 or more years of science; 3 or more years of social sciences, including U.S. history)
- 2. Success in college-level courses taken in high school** (higher-order thinking skills, and strong study and time management skills demonstrated by higher-order thinking skills, and strong study and time management skills demonstrated by or higher on at least one AP examination.)
- 3. Advanced academic skills, such as reasoning and problem-solving skills** demonstrated by successful performance on a standardized test where advanced reasoning corresponds to a 65% probability of success in college-level work
- 4. College planning skills demonstrated by an understanding of college and career options and the college admissions and financing process**

ool core

**We can provide policy research to  
address this area and incorporate  
study skills, MyRoad, and the CRS  
to provide a comprehensive  
definition.**

higher-  
e of 3

# College Success

- Influential Research has clearly shown that 3 factors account for **academic** success:
  - HS grades
  - HS courses
    - The number of courses (4 vs 3 yrs math)
    - The highest level completed (Calc vs Alg II)
    - The rigor of the courses (honors, AP vs standard)
  - Admissions Tests
  - Studies by Cliff Adelman, EdTrust, NCES and other groups have been widely cited and accepted by policymakers.
  - But...no one has developed a comprehensive set of metrics that report on these 3 metrics for students and schools, YET

# The opportunity

- We have SAT and PSAT benchmark scores
- We have self reported GPA
- And now, we have course level data...

So we can produce a new metric of “academic rigor” that captures:

- The number of courses (4 vs 3 yrs math)
- The highest level completed (Calc vs Alg II)
- The rigor of the courses (honors, AP vs standard)

# Academic Rigor – The purpose!

- We will compute a measure of academic rigor that predicts college success using the number and type of courses taken in academic subjects and the rigor of those courses.
- We will validate this metric with data from the SAT validity study and National Student Clearinghouse
- We will show that when our new metric of academic rigor is added to SAT scores and HSGPA we have significantly more validity in predicting college success for students than ACT can provide.
- We will establish our College Readiness metric (SAT+HSGPA+Academic Rigor) as the national standard. We will give scores to students, schools (subgroups) and states and monitor trends over time
- Beginning in August 2009 we can provide school, state and national data on College Readiness and supplement CB Srs to be a College Readiness press release!

# Academic Rigor Prototype @ your school

| Scale | % at school | % in state | % in US |  | Completed College Core PLUS | Completed College Core | AP / DE Level Score | Honors Level Score |
|-------|-------------|------------|---------|--|-----------------------------|------------------------|---------------------|--------------------|
| 8     | 6           | 5          | 7       |  | Y                           |                        | 3-4                 | 3-4                |
| 7     | 9           | 8          | 9       |  | Y                           |                        | 2-3                 | 2-3                |
| 6     | 25          | 26         | 22      |  | Y                           |                        | 0-2                 | 0-2                |
| 5     | 22          | 20         | 18      |  |                             | Y                      | 3-4                 | 3-4                |
| 4     | 12          | 12         | 7       |  |                             | Y                      | 1-3                 | 2-3                |
| 3     | 16          | 9          | 5       |  |                             | Y                      | 0-2                 | 0-2                |
| 2     | 10          | 13         | 12      |  |                             |                        | NA                  | 2-4                |
| 1     | 0           | 7          | 8       |  |                             |                        | NA                  | 0-2                |
| Mean  | 4.6         | 4.3        | 4.4     |  |                             |                        |                     |                    |

# Computing the Academic Rigor Index

Similar to setting SAT benchmarks we will:

1. Conduct regressions to identify the best combination of predictors for different scaling options (FGPA, persistence)
2. Compute the % of students meeting different benchmarks (x ethnicity, SES, language) to estimate impact
3. Use a policy capturing approach (or standard setting) with external educational experts to determine final levels.

# Academic Rigor – Prototype Scoring

|                                | <b>Core Plus</b>                | <b>Core</b>                       |
|--------------------------------|---------------------------------|-----------------------------------|
| <b>ELA</b>                     | 4+                              | 4+                                |
| <b>Science</b>                 | 3+<br>(Physics, Chem, Bio, Eq.) | 3+ (2 of Physics, Chem, Bio, Eq.) |
| <b>Math</b>                    | 4+ (Pre-Calc)                   | 4+ (Alg II)                       |
| <b>Social Science/ History</b> | 4+                              | 3+                                |
| <b>For. Lang.</b>              | 3+ (same lang)                  | 2 + (same lang)                   |

| <b>AP/DE score</b> | <b>4</b> | <b>3</b> | <b>2</b> | <b>1</b> |
|--------------------|----------|----------|----------|----------|
| Sci-Math           | 2+       | 1+       |          |          |
| Other              | 2+       |          |          |          |
| Total AP           | 4+       | 3+       | 2+       | 1-2      |
| Total AP+DE        | 4+       | 3+       | 3+       | 2+       |

| <b>Honors (includes AP-DE)</b> | <b>4</b> | <b>3</b> | <b>2</b> | <b>1</b> |
|--------------------------------|----------|----------|----------|----------|
| Sci-Math                       | 4+       | 3+       | 1+       |          |
| Other                          | 4+       |          |          |          |
| Total AP, DE, Honors           | 8+       | 6+       | 4+       | 2+       |

# College Readiness

At the end of the day – you can roll out reports that illustrate:

- The number and % of students at each Academic Rigor level
- The number and % of students reaching the SAT benchmark
- The number and % of students reaching an HSGPA benchmark (2.7, 3.0, 3.5)
- The number and % reaching 2 and all 3 benchmarks
- The probability of college success for each of these marks in terms of (completing freshmen year, FGPA of B- or higher, no remedial courses) for individual students, subgroups, schools and states.

| Met Benchmarks  | Your Sch. % | CA % | US % | Prob. College success |
|-----------------|-------------|------|------|-----------------------|
| HSGPA 3.0       | 85          | 82   | 83   | 61                    |
| SAT 1180        | 30          | 26   | 29   | 71                    |
| Acad. Rigor 6-8 | 40          | 39   | 38   | 72                    |
| All Three       | 21          | 16   | 22   | 78                    |

# And the College Board also have courses students have taken

- The number of courses in a content area (4 vs 3 yrs math)
- The highest level completed (Calc vs Alg II)
- The rigor of the courses (honors, AP vs standard)
- The courses taken by grade (Alg I in 9<sup>th</sup> grade...Pre calc in 12<sup>th</sup> grade)

# Academic Success is **NOT** college success

- Need other measures that extend beyond grades, courses and achievement
- Study Skills, Engagement, Self efficacy, meta-cognition.....

# Predictors of College Success

| College Skills         | Content Knowledge Achievement | Non-Cognitive     | Personal Qualities/ Experiences/ Characteristics | School Performance/ Context | Guidance               |
|------------------------|-------------------------------|-------------------|--|-----------------------------|------------------------|
| Verbal Reasoning       | Math                          | Motivation        | Letters  | Grades                      | Career Interests       |
| Math Reasoning         | Language Arts                 | Follow-through    | Essay  | GPA                         | Study Skills           |
| Writing                | Science                       | Communication     | Community Service                                | Weighted GPA                | Interest in Major      |
| Metacognition          | Social Studies/ Humanities    | Conscientiousness | Extra-curricular                                 | Rank                        | Self Efficacy          |
| Creativity             | Foreign Language              | Leadership        | Work Experience                                  | Courses Completed           | Aspirations/           |
| Practical Knowledge    | Language Proficiency          | Other Personality | Literacy in Second Lang                          | Academic Rigor              | Realistic Self-concept |
| Spatial Relations      |                               |                   | Teacher Ratings                                  | AP/Honors Courses           |                        |
| Intellectual Curiosity |                               |                   | Gender   | School Size                 |                        |
|                        |                               |                   | Ethnicity  | School Quality              |                        |
|                        |                               |                   | Residence  |                             |                        |
|                        |                               |                   | Age  |                             |                        |
|                        |                               |                   | Family Education/ Income                         |                             |                        |
|                        |                               |                   | Ability to Pay                                   |                             |                        |
|                        |                               |                   | Ability to Benefit                               |                             |                        |

College Board
  Schools Have
  Not Developed

# **SETTING A TEST SCORE BENCHMARK OF COLLEGE READINESS**

# What is a Benchmark and Who has them?

- A Benchmark is a cut score used to distinguish between groups:
  - AP has benchmarks (3, 4 or 5)
  - Certification and licensure tests have benchmarks (pass/fail)
  - Tests used for NCLB have benchmarks that distinguish different levels of performance (Advanced, Proficient, Basic, Below Basic)

# NAEP and ACT benchmarks

- NAEP – Performance is divided into 4 levels (Advanced, Proficient, Basic and Below Basic).
  - They report the % of students at each level
  - Use scale anchoring to describe what students at each subsequent level can do that exceeds students at the preceding level
- ACT developed benchmarks for COLLEGE READINESS (2 levels – Meets, Does not Meet).

# ACT Benchmarks

## ACT's College Readiness Benchmarks

| College Course or Course Area | Test        | EXPLORE Score | PLAN Score | ACT Score | COMPASS Score | ACT % |
|-------------------------------|-------------|---------------|------------|-----------|---------------|-------|
| English Composition           | English     | 13            | 15         | 18        | 69            | 18%   |
| Social Sciences               | Reading     | 15            | 17         | 21        | 88            | 53%   |
| Algebra                       | Mathematics | 17            | 19         | 22        | 65            | 43%   |
| Biology                       | Science*    | 20            | 21         | 24        | n/a*          | 28%   |

# SAT Benchmarks in Maine

|                        | Math    |    | Reading |    | Writing |    |
|------------------------|---------|----|---------|----|---------|----|
|                        | Score   | %  | Score   | %  | Score   | %  |
| <b>Does Not Meet</b>   | 200-370 | 28 | 200-360 | 24 | 200-340 | 21 |
| <b>Partially Meets</b> | 380-450 | 25 | 370-450 | 32 | 350-440 | 32 |
| <b>Meets</b>           | 460-640 | 42 | 460-610 | 38 | 450-610 | 40 |
| <b>Exceeds</b>         | 650-800 | 5  | 620-800 | 7  | 620-800 | 6  |

# SAT Benchmark Study (2006)

- Based on old SAT V+M
- Class of 1995 (41 institutions, 167,000 freshmen)
- Settled on 65% probability for C (2.0) and B- (2.7)
- Benchmarks = 800 (85%) and 1180 (25%)

Table 1a

Mean FGPA and Percentage of Successful Students by SAT Total Score Intervals

| <i>SAT Total Score Interval</i> | <i>N</i> | <i>Mean FGPA</i> | <i>SD FGPA</i> | <i>% with FGPA ≥ 2.7</i> | <i>% with FGPA ≥ 2.0</i> |
|---------------------------------|----------|------------------|----------------|--------------------------|--------------------------|
| 400-500                         | 21       | 1.76             | .96            | 19                       | 33                       |
| 500-600                         | 166      | 1.91             | .86            | 17                       | 50                       |
| 600-700                         | 727      | 2.02             | .82            | 20                       | 58                       |
| 700-800                         | 2,919    | 2.12             | .75            | 22                       | 64                       |
| 800-900                         | 9,906    | 2.28             | .71            | 28                       | 71                       |
| 900-1000                        | 21,885   | 2.44             | .71            | 39                       | 78                       |
| 1000-1100                       | 33,277   | 2.62             | .72            | 50                       | 83                       |
| 1100-1200                       | 37,671   | 2.82             | .69            | 62                       | 89                       |
| 1200-1300                       | 31,191   | 3.00             | .67            | 73                       | 92                       |
| 1300-1400                       | 18,047   | 3.19             | .62            | 82                       | 95                       |
| 1400-1500                       | 7,866    | 3.36             | .58            | 89                       | 97                       |
| 1500-1600                       | 2,105    | 3.48             | .54            | 92                       | 98                       |

# SAT Benchmarks (REVISED 7-24-07)

(Verbal + Math Combined Score, Capabilities Dataset)

| Predicted Probability greater than or equal to: | Freshman GPA |          |          |         |
|---|--------------|----------|----------|---------|
|   | 2.0 (C)      | 2.3 (C+) | 2.7 (B-) | 3.0 (B) |
| .65   | 800          | 980      | 1180     | 1320    |
| .70   | 860          | 1030     | 1230     | 1360    |
| .75   | 920          | 1090     | 1280     | 1410    |
| .80   | 990          | 1160     | 1340     | 1460    |
| .85   | 1080         | 1230     | 1410     | 1530    |
| .90   | 1190         | 1340     | 1500     | --*     |

\* Benchmark score cannot be determined because there were no cases with predicted probability of .90 or greater.

75% probability of 2.0 (C) or higher and 50% probability of 3.0 (B) or higher = 1200.

65% probability of 2.0 (C) or higher and 50% probability of 3.0 (B) or higher = 1200.

85% probability of 2.0 (C) or higher and 65% probability of 3.0 (B) or higher = 1320.

90% probability of 2.0 (C) or higher and 75% probability of 3.0 (B) or higher = 1410.

**Existing Study (Kobrin 2006) –**

|                        |            |             |
|------------------------|------------|-------------|
|                        | <b>2.0</b> | <b>2.7</b>  |
| <b>.65 probability</b> | <b>800</b> | <b>1180</b> |

# Rules for Benchmarks

- ACT used 75% chance of C or better AND 50% chance of a B (2 condition rule)
- NAEP used a 65% probability of success
- CB had two different benchmarks (using a 65% probability)
- ACT uses a **conjunctive model** – minimum ACT score irrespective of grades, course rigor, other factors.
- Admissions use a **compensatory model** – lower test scores can be offset by higher GPA, etc. (multiple measures)

# Issues to Consider in setting a benchmark

- Q: Should we set separate benchmarks for each test score (CR v M v W) or one combined benchmark using FGPA? A: One using FGPA because it will be much easier to replicate and do special studies for states and colleges (FGPA data is much more readily available than course grades in many systems).
- Q: What probability level of success should be used? A: Defer to expert panel but limit to 50% to 75% probability of GPA or Persistence?
- Q: What level of college success? A: Defer to expert panel but use FGPA. Possibly use 2 levels (College Ready and College Ready PLUS)
- Q: What colleges are we setting benchmarks on? A: A nationally representative set of 4-year institutions. The national benchmarks are most appropriate to use for policy discussions and national comparisons. However, the CB is able to conduct benchmark studies for your state system or institution if you provide us with the data.
- Q. How will you set benchmarks on PSAT? A: We will set the SAT benchmarks and use logistic regression to determine the 10<sup>th</sup> grade PSAT scores that correspond to the SAT benchmarks (as opposed to conducting a 2<sup>nd</sup> standard setting.

# The new SAT / PSAT benchmark study

- Use the new SAT validity data from 118 colleges to generate data for a benchmark study by May. This involves determining a priori the % of students in the sample (and cohort) that would be college ready at each probability level (50%, 60%, 65%...) and each criterion level (C, C+, B-, B...)
- Next, determine likely impact of various benchmarks by comparison to NCES, ACT and examining by college selectivity and for underrepresented students.
- Identify an appropriate panel to make decisions about CR and train them in the decisions that need to be made (Policy experts in CR, K-12 experts, H.Ed experts) (not content experts but readiness experts)
- Bring experts together for a 1-day benchmark setting exercise in DC and ask for recommendations (May).
- Final approval made by the SOT based on the panel's recommendations (June).
- This is the first metric that would be used to define College Readiness (others are required): (a) Academic Rigor, (b) HS grades, (c) [Attitude/Habits/Financial Resources?](#)
- Publication and Dissemination 8/15 (need dissemination & communication plan, need to train regional staff). How do we get attention that ACT has already gained?

# College Readiness Reports

1. Three metrics:
  - SAT benchmark
  - Academic Rigor benchmark
  - HS Grades (GPA adjusted or not adjusted by school)
2. Compensatory Model will provide an overall metric of CR for students, schools, districts and states in 09 (using each metric alone, and combined in model).
  - Three performance levels of CR (not CR, CR, CR Plus).
3. Reporting – Beginning in 09 Release Annual CR report to the Nation (changes in CR growth) with state, district, school reporting.
4. Diagnostic reporting – When students do NOT meet CR standards provide reports why not (and suggestions for improvement) – lack of rigor (SB, AP, PD), low SAT (Exam Readiness, 10<sup>th</sup> grade PN), low college going rates (CollegeEd, 10<sup>th</sup> grade PN, Option C), etc.