

**Help students interested in
STEM majors stand out to
colleges with SAT Subject
Tests™**

**Prepárate Conference
May 2013**

Meet the Presenters



- **Karly Brockett**, Associate Director of Admissions, California Institute of Technology, Pasadena, CA
- **Eliel Gonzalez**, AP Math Teacher, East Longmeadow High School, East Longmeadow, Massachusetts
- **Angela Garcia**, Executive Director, The College Board

Ample opportunity for STEM graduates . . .



The National Science Foundation, predicted largest job growth will be in STEM with emphasis on computer science and engineering.

For Minority College Students, STEM Degrees help improve socio economic status



- Research findings from: The Earnings Benefits of Majoring in STEM Fields Among High Achieving Minority Students
 - Minority college students who major in the STEM fields earn at least 25% more than their peers who study humanities or education
 - Those who took jobs related to their STEM degrees earned at least 50% more than their classmates who majored in humanities or education fields
 - “The premiums for majoring in STEM fields are huge. We need to educate students that if they get a job in a STEM-related occupation they have an even higher earning premium.” lead author [Tatiana Melguizo](#)
 - “Among the high achieving minority students we studied, Latinos not only reported the highest annual earnings overall, but also reported the highest annual earnings among STEM majors,” study co-author [Gregory Wolniak](#),

Citation: Melguizo, Tatiana, and Gregory Wolniak. "The Earnings Benefits of Majoring in STEM Fields Among High Achieving Minority Students." *Research in Higher Education* 53.4 (20112): 383-405. Print.

Source: http://www.usc.edu/uscnews/newsroom/news_release.php?id=2760

But getting the degree is still a challenge



Research from UCLA finds:

“one in three Latino college freshmen at four year institutions have intentions to major in science or engineering” however in 2004 only 22% completed in five years (compared to 33% and 42% of white and Asian American STEM majors, respectively).

Session Objectives



- **Look at key factors considered in the college admissions and enrollment process**
- **Learn how SAT Subject Tests™ in mathematics and in science can help students interested in STEM majors demonstrate their mastery to prospective colleges and universities**
- **Learn how the SAT Subject Tests can benefit Latino and Latina students**
- **Review topics covered and recommended preparation for the SAT Subject Tests in math and science**
- **Have fun!**

Let's play....



The Rules



- Team to go first determined by coin flip.
- Each round, Team A provides as many relevant answers as possible, Team B then has a chance to provide additional answers before final answers are revealed.
- Each team gets 30 seconds to provide answers
- Answers are recorded on flip charts
- Points are awarded for matched answers
- Subsequent round, the order in which teams provide answers is reversed
- Team with the most points at the end wins

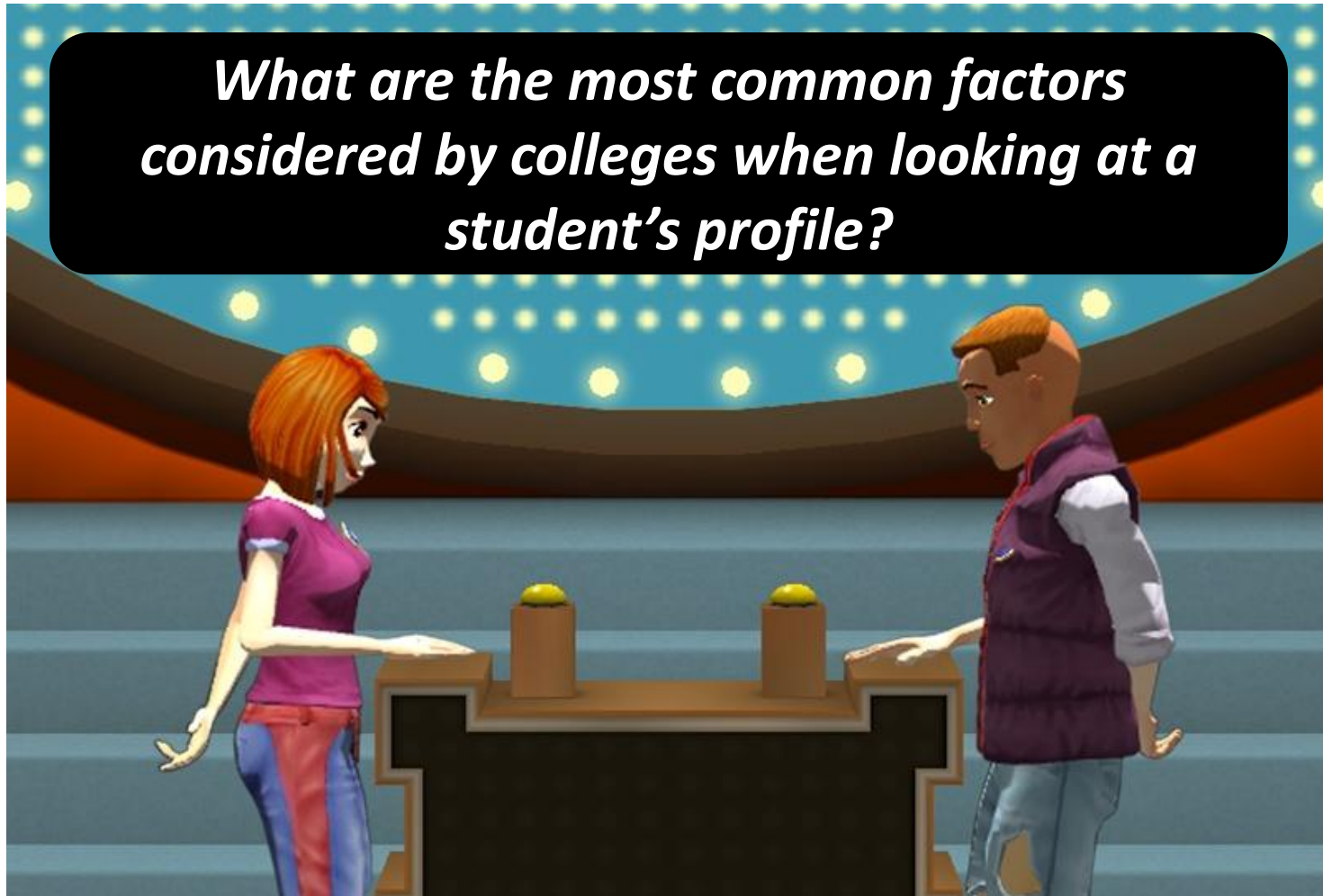
Let's meet the families...



Part One – Admissions Factors



What are the most common factors considered by colleges when looking at a student's profile?



Factors Considered in College Admissions

Primary Factors

(2 points each)

- ✓ **Quality/Rigor of Academic Courses**
- ✓ **Academic Performance/ Grades**
- ✓ **Test Scores (SAT®, SAT Subject Tests, AP®, etc.)**
- ✓ **Special Talents, projects, achievements**

Additional Factors

(1 point each)

- ✓ **Extracurricular Activities**
- ✓ **Personal Statements / Essay(s)**
- ✓ **Letters of Recommendation**
- ✓ **Demonstrated Interest**

The unique role of SAT Subject Tests for minority students

Only universally accepted CEE results that allow students to showcase achievement in specific subject areas & differentiate themselves for college admissions

Eight Subject Tests assess subject knowledge in literature, math, history and the sciences

Math Level 1	US History	Biology E/M	Literature
Math Level 2	World History	Chemistry	
		Physics	

12 language tests; six with a listening component

Spanish	Modern Hebrew	Chinese w/ Listening
French	Latin	Japanese w/ Listening
German	Spanish w/ Listening	Korean w/ Listening
Italian	French w/ Listening	German w/ Listening

Key Facts

- ✓ Students select test(s)
- ✓ One hour in length; take up to three in one sitting
- ✓ Generally given 6 times per year, may vary depending on test
- ✓ Two Fee Waivers available to qualifying students
- ✓ 200-800 score scale

Subject Tests and AP - How do they compare?

Subject Tests

High school level tests that indicate a student's readiness to take college-level courses in specific subject areas

- Assesses knowledge of fundamental concepts and the ability to apply that knowledge
- Primarily used for college admissions
- Indication of interest in specific subjects

AP Exams

College level tests that assess a student's knowledge, skills, and abilities, learned in the corresponding AP courses

- Covers more advanced topics or in greater depth that is more reflective of a college-level course
- Primarily used for college course credit & placement
- Indication of rigor of courses taken in high school

Part Two – SAT Subject Tests and STEM majors



How do SAT Subject Tests help students interested in STEM majors?



How SAT Subject Tests benefit students interested in STEM majors

(2 points each)

- ✓ **Fulfill college admissions requirements**
- ✓ **Follow college recommendations for prospective STEM majors or all applicants**
- ✓ **Demonstrate interest in STEM related majors or programs of study**
- ✓ **Showcase science and math content knowledge to stand out in the college admissions process**
- ✓ **Demonstrate readiness for the rigors of college-level work in STEM courses**
- ✓ **Help identify matches with special programs focused on STEM**

Institutional Policies in Practice

Freshman applicants are required to submit:



MIT



- SAT® or other acceptable CEE and
- 2 SAT Subject Tests™: Mathematics Level 1 or 2 AND a science Subject Test (Biology, Chemistry or Physics)



Caltech

- SAT or other acceptable CEE and
- 2 SAT Subject Tests: Mathematics Level 2 AND a science Subject Test (Biology, Chemistry or Physics)



To be considered for the Dual-Degree Honors Program in Medicine (HPME), students must submit:

- The SAT or other acceptable CEE and
- 2 SAT Subject Tests: Mathematics Level 1 or Level 2 and one science Subject Test (Biology, Chemistry or Physics)

Institutional Policies in Practice

Freshman applicants are required to submit:

Northwestern University



- SAT® or other acceptable CEE and
- “Northwestern **recommends** that all applicants take two SAT Subject Tests™ but **requires** scores from SAT Subject Tests only for applicants to the Honors Program in Medical Education (HPME), the Integrated Science Program (ISP), and applicants who have been home-schooled.”

Subject Test Requirements – Northwestern University	
Honors Program in Medical Education	Chemistry and Math Level 2
Integrated Science Program	Chemistry, Physics and Math Level 2
Home-Schooled Students	Math Level 1 or 2, plus two other SAT Subject Tests of the applicant's choice from different areas (i.e., not two science or two foreign language or two history, etc.)

Institutional Policies in Practice

Univ. of CA - Subject Test policies by campus

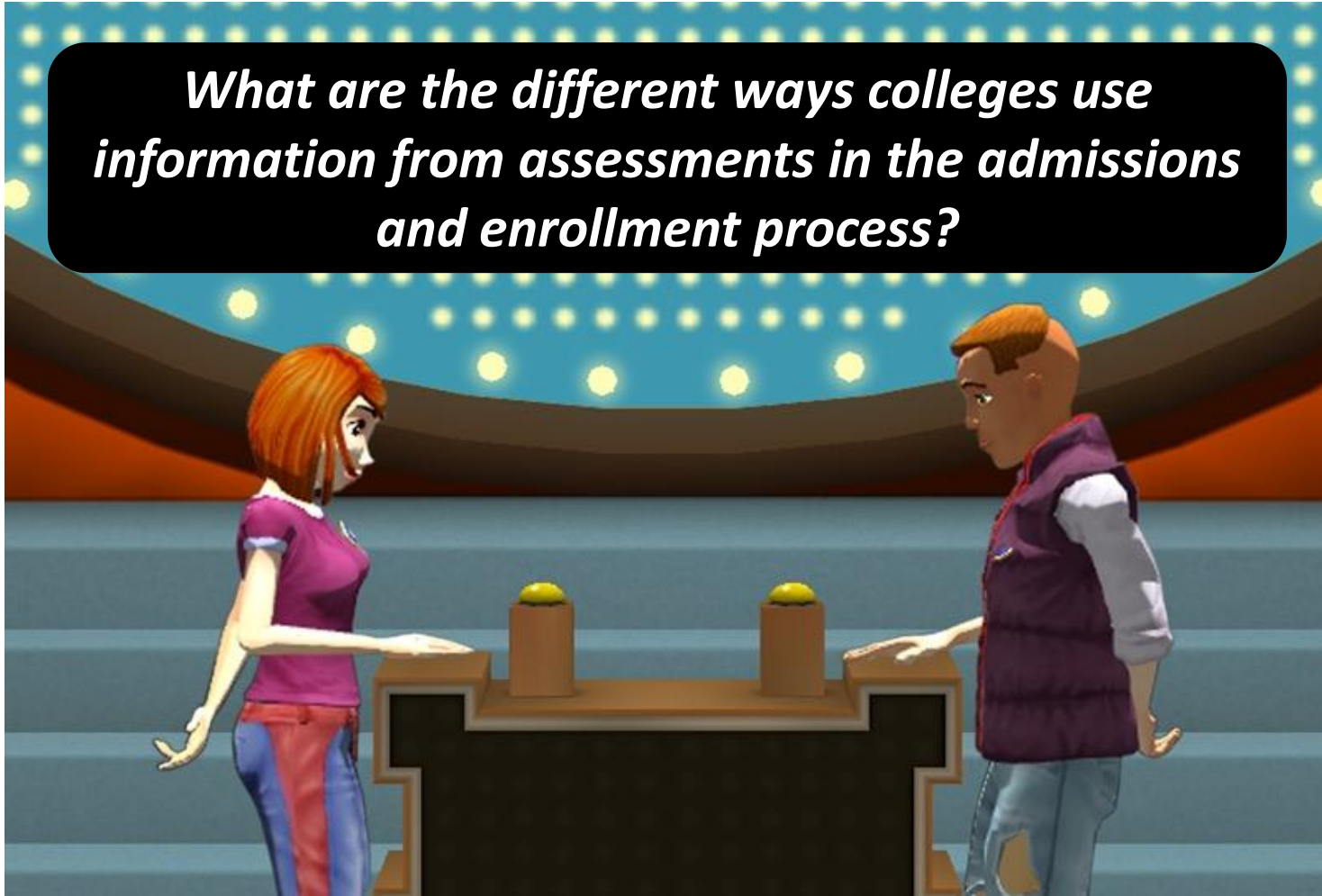


- **University of California at Berkeley**
 - *College of Chemistry and College of Engineering:* Along with looking for evidence of high academic performance in math and science, the presence of SAT Subject Tests, particularly in a science and Math Level 2, is **considered a plus**.
- **University of California at Los Angeles**
 - *Henry Samueli School of Engineering and Applied Science:* Math Level 2 and science tests are **recommended**
- **University of California at Riverside**
 - *College of Natural and Agricultural Sciences and Bourns College of Engineering:* Math Level 2 and Chemistry or Physics are strongly **recommended**.
- **University of California at San Diego**
 - *Jacobs School of Engineering and Division of Biological Sciences:* SAT Subject Tests in Math Level 2 and science **are recommended and considered as value-added achievements** during the application evaluation.
- **University of California at Santa Barbara**
 - *College of Engineering:* Math Level 2 is **recommended**.
 - *College of Creative Studies:* The following Subject Tests are **recommended**:
 - Math Level 2 for math majors and computer science majors
 - Math Level 2 and Physics for physics majors
 - Biology for biology majors
 - Chemistry for biochemistry and chemistry majors

Part Three – Role of Assessments



What are the different ways colleges use information from assessments in the admissions and enrollment process?



Role of Assessments

Admissions

(2 points each)

- ✓ **Search** - Identify prospective students the institution is interested in
- ✓ **Recruit** - Recruit prospective students
- ✓ **Admit** - One of many factors to determine a student's academic readiness for college

Enrollment

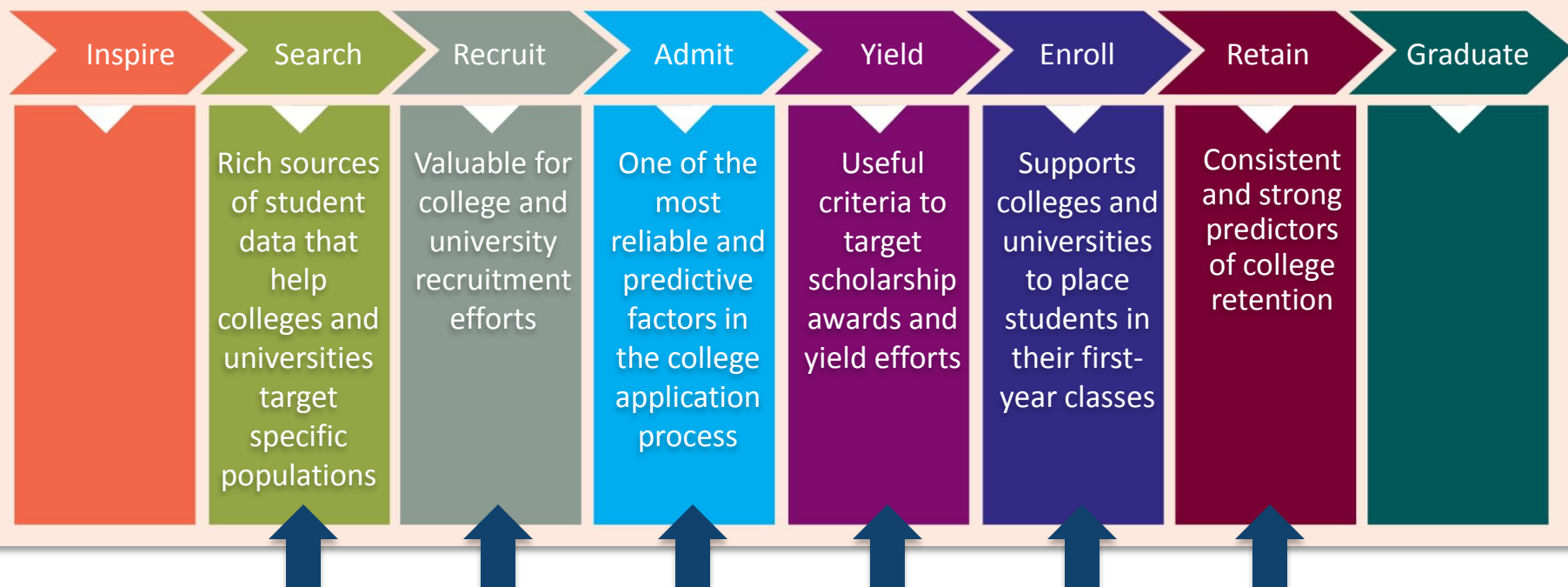
(2 points each)

- ✓ **Yield** - One of many factors used to target scholarship awards and yield efforts
- ✓ **Placement** - Supports placement into first year classes
- ✓ **Retention** - Identify students who may need additional academic support

Role of SAT and SAT Subject Tests

Colleges and universities use the SAT and SAT Subject Tests to support enrollment goals at many steps throughout the journey.

College and University Enrollment Process



The SAT and SAT Subject Tests are used by admission and enrollment officers to impact decisions throughout the enrollment process.

How are Subject Tests used?



College Admissions

(~73 institutions)

- Required or recommended by some colleges for all students or specific programs or majors
- Provides a more holistic picture of a students' academic achievements

College Recruitment

- Identify students with an interest in and ability to be successful in specific majors / programs
- College Board Search (formerly SSS)

College Placement

(~167 institutions)

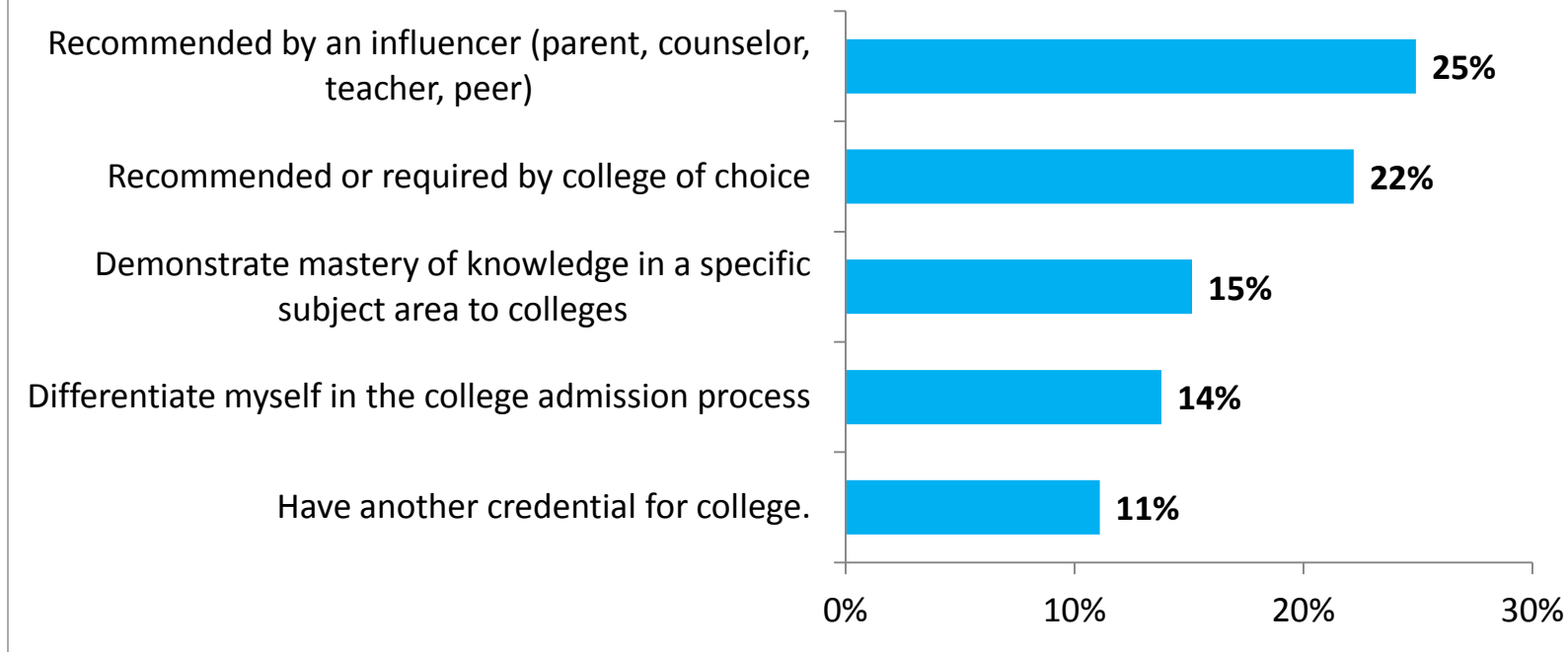
- Help place students into appropriate courses; potentially place out of introductory classes
- Identify students who may benefit from individualized support programs

Other Uses

- May be substituted to gain HS diploma distinction (NYS Regents, CA/NY Seal of Biliteracy)
- Fulfill high school subject requirements for certain universities (e.g., University of California, California State University, University of Arizona, Arizona State University)

Why do students take Subject Tests?

Top Five Reasons Students take Subject Tests

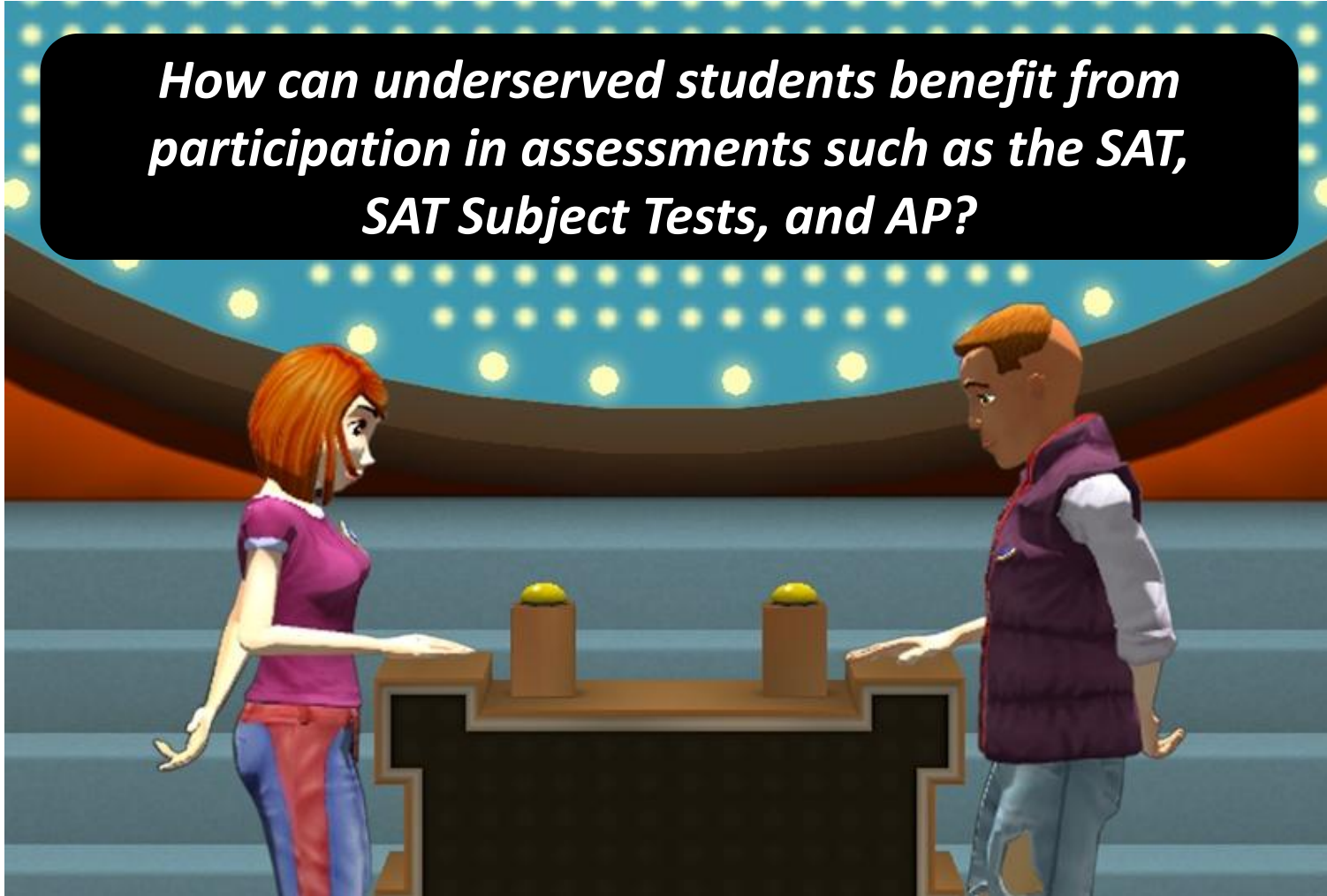


Most students take Subject Tests because a college required or recommended it, someone they trust recommended it, or to demonstrate subject mastery to colleges

Part Four – Serving Underserved Students



How can underserved students benefit from participation in assessments such as the SAT, SAT Subject Tests, and AP?



Serving Underserved Students

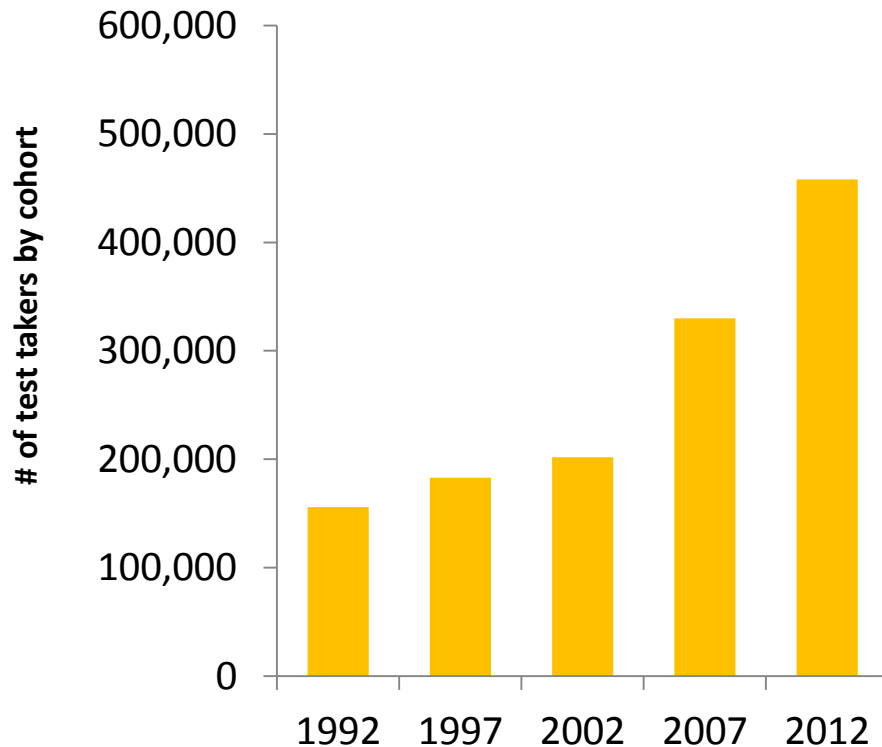


2 points each

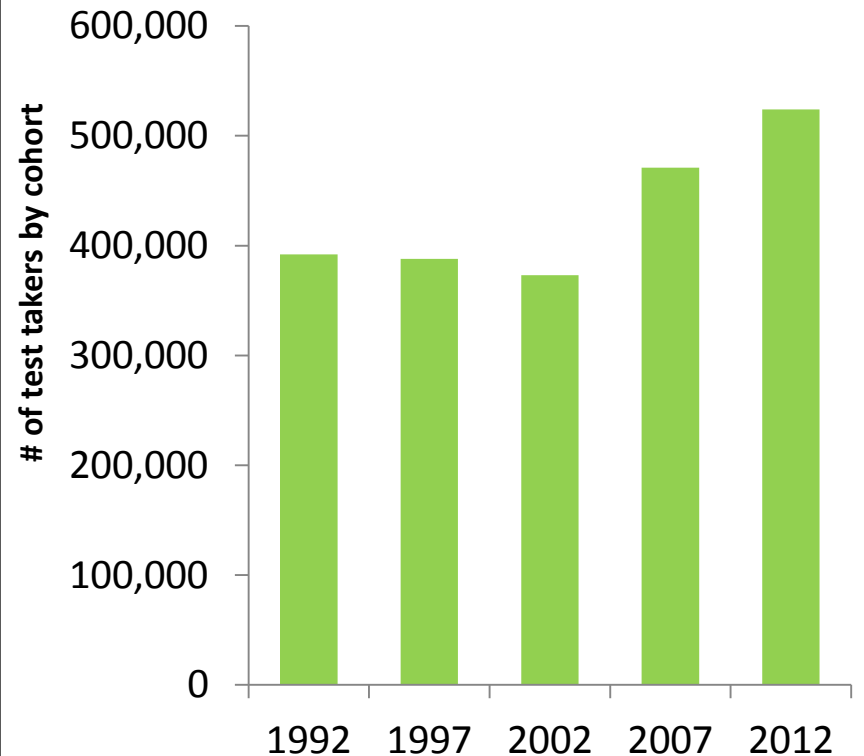
- ✓ **Connect to colleges – opportunity to get on a college’s radar**
- ✓ **Confidence to pursue college**
- ✓ **Early exposure to college level work (AP)**
- ✓ **Validate subject matter knowledge (AP, SAT Subject Tests) to Higher Ed and scholarship providers**
- ✓ **English language learners can demonstrate achievement in subjects less reliant on English mastery, such as Math, Science, Languages (SAT Subject Tests)**
- ✓ **Demonstrate knowledge gained through non-traditional means**

The SAT is Reaching more Underserved Students

Students whose 1st Language is not English

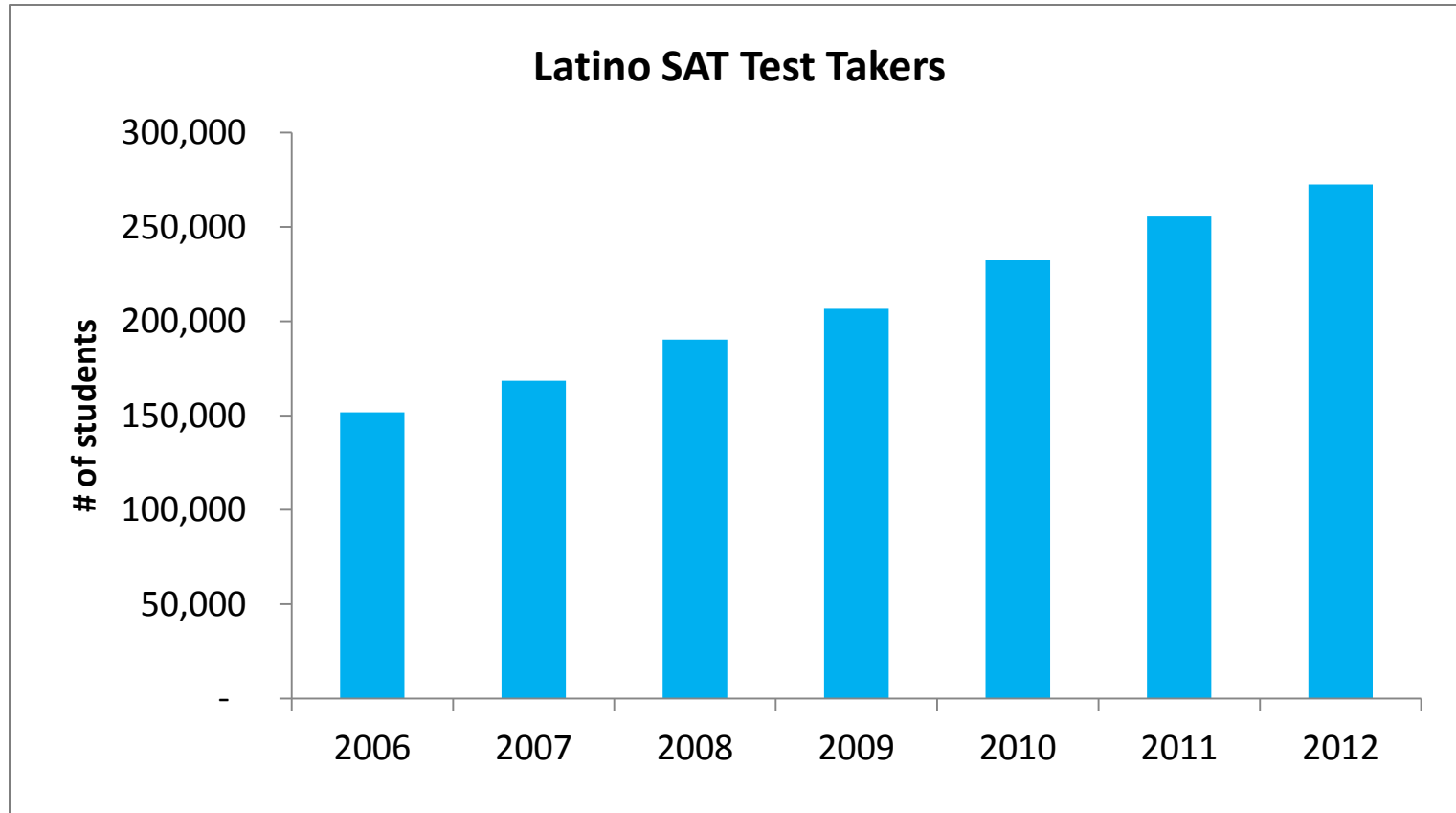


First Generation College-Bound Students



The SAT is serving more ELL and first-generation college-bound students than ever before

Latino SAT Test Takers by Cohort



The number of Latino SAT Test Takers continues to increase

STEM Subject Test Participation among Latino Students



- Latinos currently comprise of 12% of the Subject Test taking population
- In the 5 year period beginning in 2006, Latino STEM Subject Test takers have grown by 60%
- In 2012 78% of Latino Subject Test takers take at least one math or science Subject Tests

Subject Tests Benefit Underserved students



Subject Tests provide underrepresented students an additional opportunity to demonstrate their academic potential

- ✓ **Proportion of students who do not speak English exclusively has nearly doubled since 2007**
 - More than 50% of ESL students scored 100+ points higher on the Subject Tests than on the SAT
 - ESL students (i.e., best language is not English) can demonstrate achievement in subjects less reliant on English language mastery (i.e., Math, Science, Languages)

Part Five – Best Practices for Advising Students

What are some best practices for advising students to do their best on the SAT and SAT Subject Tests?



Best Practices

2 points each

- ✓ **Select challenging high school courses**
- ✓ **Read and write extensively, both in and out of school**
- ✓ **Consider taking PSAT/NMSQT® as a sophomore/junior**
- ✓ **Become familiar with question types, format, directions**
- ✓ **Engage other student influencers (parents, teachers, counselors)**
- ✓ **Timing is important**
 - **Best time to take Subject Tests: shortly after completing corresponding coursework on each subject**
 - **SAT: Take SAT for the first time spring of junior year**
- ✓ **Take advantage of free College Board resources**

Overview of the Mathematics Subject Tests

Skills Assessed

Skill	Level 1	Level 2
Ability to solve routine problems	70-80%	72-84%
Knowledge of fundamental concepts	12-24%	12-24%
Ability to solve non-routine problems	6-12%	4-10%

Assesses knowledge gained from college-preparatory mathematics courses

- **One-hour-long test**
- **50 multiple choice questions each**
- **Mathematics Level 1** — Based on three years of college-preparatory mathematics (two years of algebra and one year of geometry)
- **Mathematics Level 2** — Based on more than three years of college-preparatory mathematics (two years of algebra, one year of geometry and precalculus/trigonometry)

Content Covered


Content	Level 1	Level 2
Algebra and Functions	38-42%	48-52%
Geometry and Measurement	38-42%	28-32%
Plane Euclidean / Measurement	18-22%	-
Coordinate	8-12%	10-14%
Three-dimensional	4-6%	4-6%
Trigonometry	6-8%	12-16%
Number and Operations	10-14%	10-14%
Data Analysis, Statistics and Probability	8-12%	8-12%

Overview of the Science Subject Tests



	Biology E/M	Chemistry	Physics
# of Questions	80	85	85
Special Features	Students can choose either Ecological or Molecular (E or M) for last 20 questions	There are 15 “Relationship Analysis” questions (True/False, then Cause and Effect)	N/A
Recommended Coursework	<ul style="list-style-type: none"> • One-year course in biology at the college-preparatory level • One-year course in algebra • Laboratory experience 	<ul style="list-style-type: none"> • One-year course in chemistry at the college-preparatory level • Math preparation, including simple algebraic relationships • Laboratory experience 	<ul style="list-style-type: none"> • One-year course in physics at the college-preparatory level • Laboratory experience
Calculator Usage	No	No	No
Skills	<ul style="list-style-type: none"> • Knowing fundamental concepts • Applying knowledge • Interpreting/Synthesizing 	<ul style="list-style-type: none"> • Knowing fundamental concepts • Applying knowledge • Interpreting/Synthesizing 	<ul style="list-style-type: none"> • Knowing major concepts • Application of physical principles, mathematical relationships and labs skills to solve problems

Biology Subject Test Content



Topics Covered	Approx. % of E Test	Approx. % of M Test
Cellular and Molecular Biology Cell structure and organization, mitosis, photosynthesis, cellular respiration, enzymes, biosynthesis, biological chemistry	15%	27%
Ecology Energy flow, nutrient cycles, populations, communities, ecosystems, biomes, conservation, biology, biodiversity, effects of human intervention	23%	13%
Genetics Meiosis, Mendelian genetics, inheritance patterns, molecular genetics, population genetics	15%	20%
Organismal Biology Structure, function, and development of organisms (with emphasis on plants and animals), animal behavior	25%	25%
Evolution and Diversity Origin of life, evidence of evolution, patterns of evolution, natural selection, speciation, classification and diversity of organisms	22%	15%

Chemistry Subject Test Content



Topic	% of Test
Structure of Matter Atomic Structure, Molecular Structure, Bonding	25%
States of Matter Gases, Liquids, Solids, Solutions	16%
Reaction Types Acids and Bases, Oxidation-Reduction, Precipitation	14%
Stoichiometry Mole Concept, Chemical Equations	14%
Equilibrium and Reaction Rates Equilibrium Systems, Rates of Reactions	5%
Thermochemistry	6%
Descriptive Chemistry	12%
Laboratory	8%

Physics Subject Test Content



Topic	Percent
Mechanics Kinematics , Dynamics, Energy and Momentum, Circular Motion , Simple harmonic motion , Gravity	40%
Electricity and Magnetism Electric Fields, Forces, and Potentials, Capacitance, Circuit Elements and DC Circuits , Magnetism	20%
Waves and Optics General Wave Properties, Reflection and Refraction, Ray Optics , Physical optics	17%
Heat and Thermodynamics Thermal Properties , Laws of Thermodynamics	8%
Modern Physics Quantum Phenomenon , Atomic, Nuclear & Particle Physics, Relativity	8%
Miscellaneous General (such as history of physics and questions of a general nature that overlap several major topics); Analytical Skills (such as graphical analysis, measurement, and math skills); Contemporary Physics (such as astrophysics, superconductivity, and chaos theory)	7%

Official SAT Tools & Resources

FREE Student Resources for SAT Subject Tests & SAT

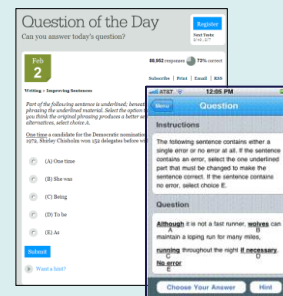
Test Day Information

- Test Day Checklist
- Test Day Simulator
- Important Test Day Information



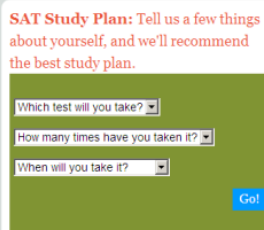
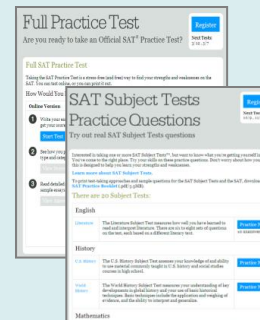
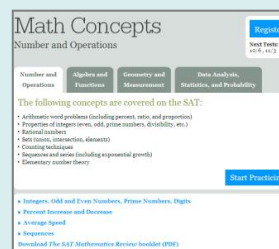
Online Practice

- SAT Subject Test Practice Questions
- SAT Practice Questions
- Full Length Practice Test
- QOTD – email, web, mobile app
- Skills Insight
- Math Review
- Effective Writing Review
- Answers Imagined



Planning Resources

- My SAT Study Plan
- SAT Test Taking Tips and Approaches
- SAT Subject Tests Overview, Topics covered, tips, and approaches
- SAT Essay Overview and Strategies



Print Practice

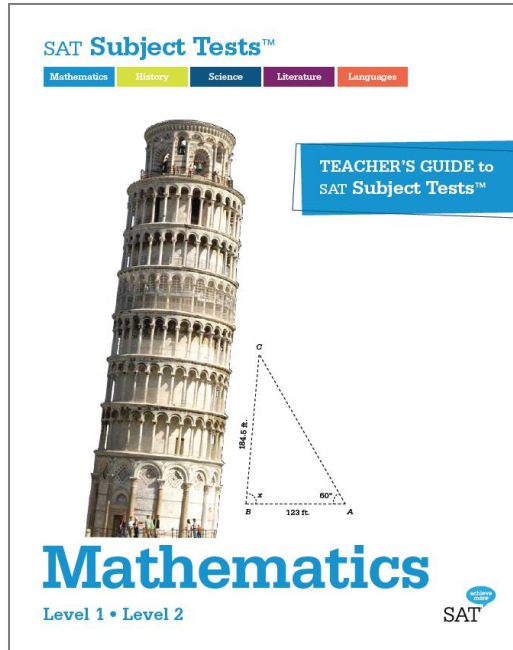
- Getting Ready for the Subject Tests
- Getting Ready for the SAT
- 20 Outstanding Essays
- The SAT Mathematics Review



Teacher's Guides to the SAT Subject Tests

FREE Math and Science guides to enable teachers to better advise and prepare students for the SAT Subject Tests

- Answer questions about SAT Subject Tests
- Help students prepare for the SAT Subject Tests



Contents of Each Guide

Introduction

Overview of
Math & Science Subject
Tests and Topics Covered

Subject Test Questions,
Detailed Answer
Explanations and Tips

Best Practices for
Supporting Students

...and THE WINNING TEAM is...



CONGRATULATIONS!!!

Come see us after the session for your prize

Questions?

