

The Math Mystique: Changing the Expectations for Underrepresented Students to Pursue STEM Fields

NOSCA Spring 2013 Webinar Series

Presenters

Jennifer Dunn

Director

National Office for School Counselor Advocacy

Theodore J. (Ted) Gardella

Executive Director

Advanced Placement Strategy and Product Development

Submitting Online Questions & Comments

- Questions and comments may be submitted at any time during the presentation.

To submit a question:

- Click on the Question Mark icon (?) on the floating toolbar on your Web Session screen (as shown at the right).
- This will open the Q&A window on your computer only.
- Type your question into the small dialog box and click the Send Button.



Webinar's Learning Outcomes:

Participants will:

1. Examine the nation's education and workforce trends.
2. Understand the role of the school counselor in creating the Math Mystique.
3. Learn the skills to utilize school data to identify gaps in academic performance in mathematics.
4. Gain knowledge and skills on early college and career readiness activities, tools and resources developed by the College Board's Advanced Placement Program to work with students, parents/families, and teachers.

“Beliefs and Behaviors” About Mathematics

1. Math was my favorite subject in school?

Yes

No

2. I was told that I was good in math?

True

False

3. I was told that I was a good writer?

True

False

4. I got good grades in the majority of my math courses?

Yes

No

5. I took Algebra I in _____ Grade?

6th Grade

8th Grade

10th Grade

12th Grade

1st Year of College

7th Grade

9th Grade

11th Grade

Never took Algebra I

6. I was encouraged to take rigorous math courses (i.e. Gifted Talented, Honors, AP or IB) in school?

True

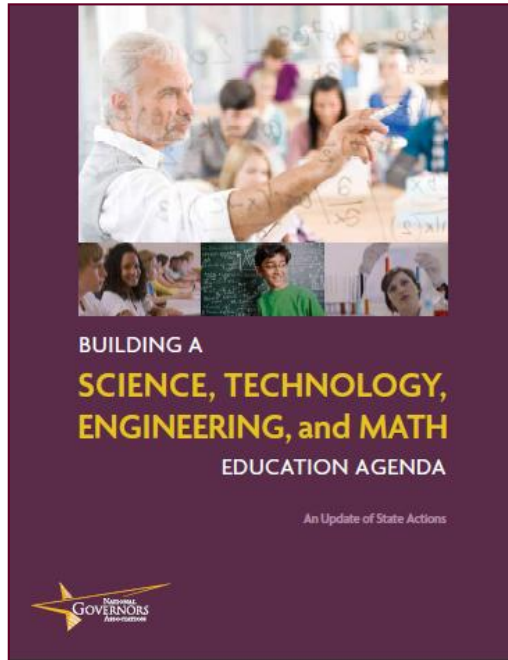
False

7. I majored in a STEM discipline in college?

Yes

No

STEM Goal's



For years governors and education policy leaders have been working to strengthen science, technology, engineering and mathematics (STEM) education throughout the states.

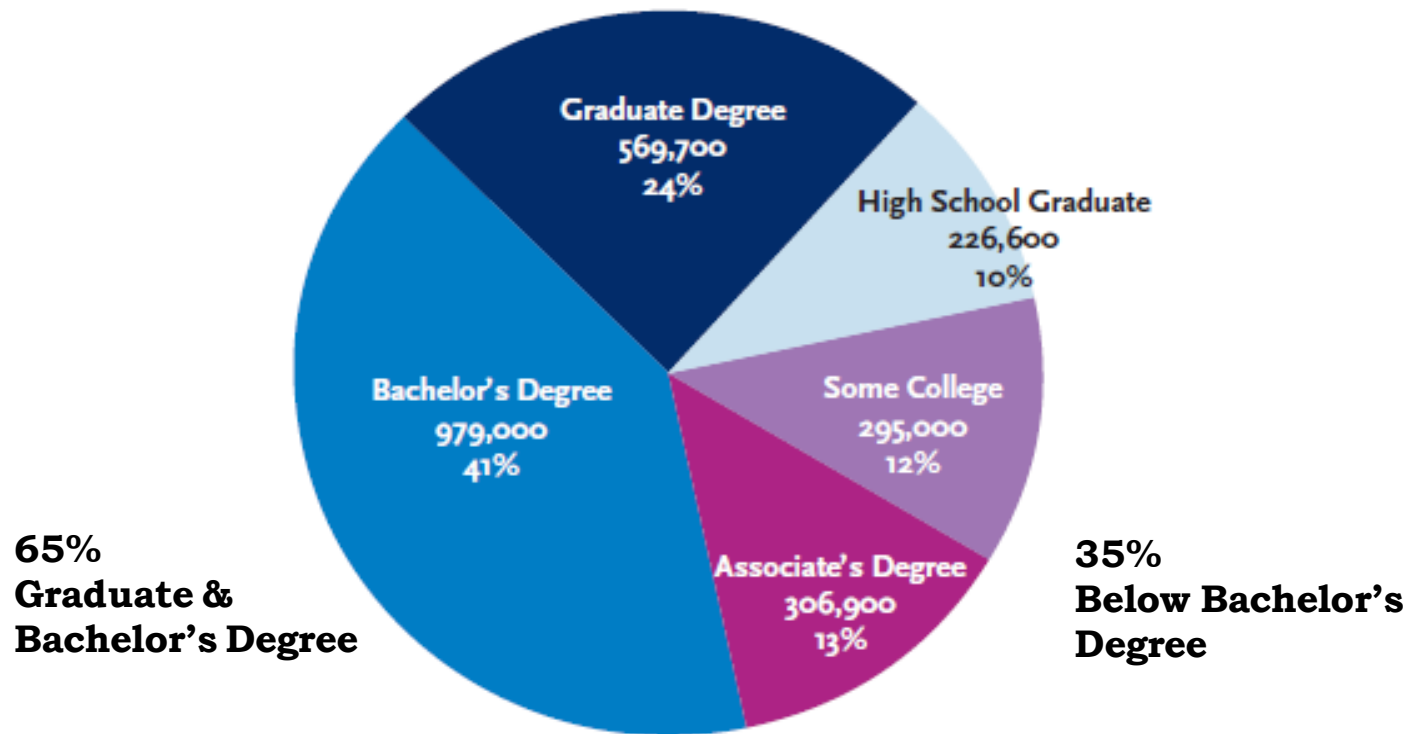
Goals:

- 1) Expand the number of students prepared to enter postsecondary study and pursue careers in the areas of science, technology engineering, and mathematics.
- 2) Boost the proficiency of all students in basic STEM knowledge.

Source: National Governors Association, December 2011

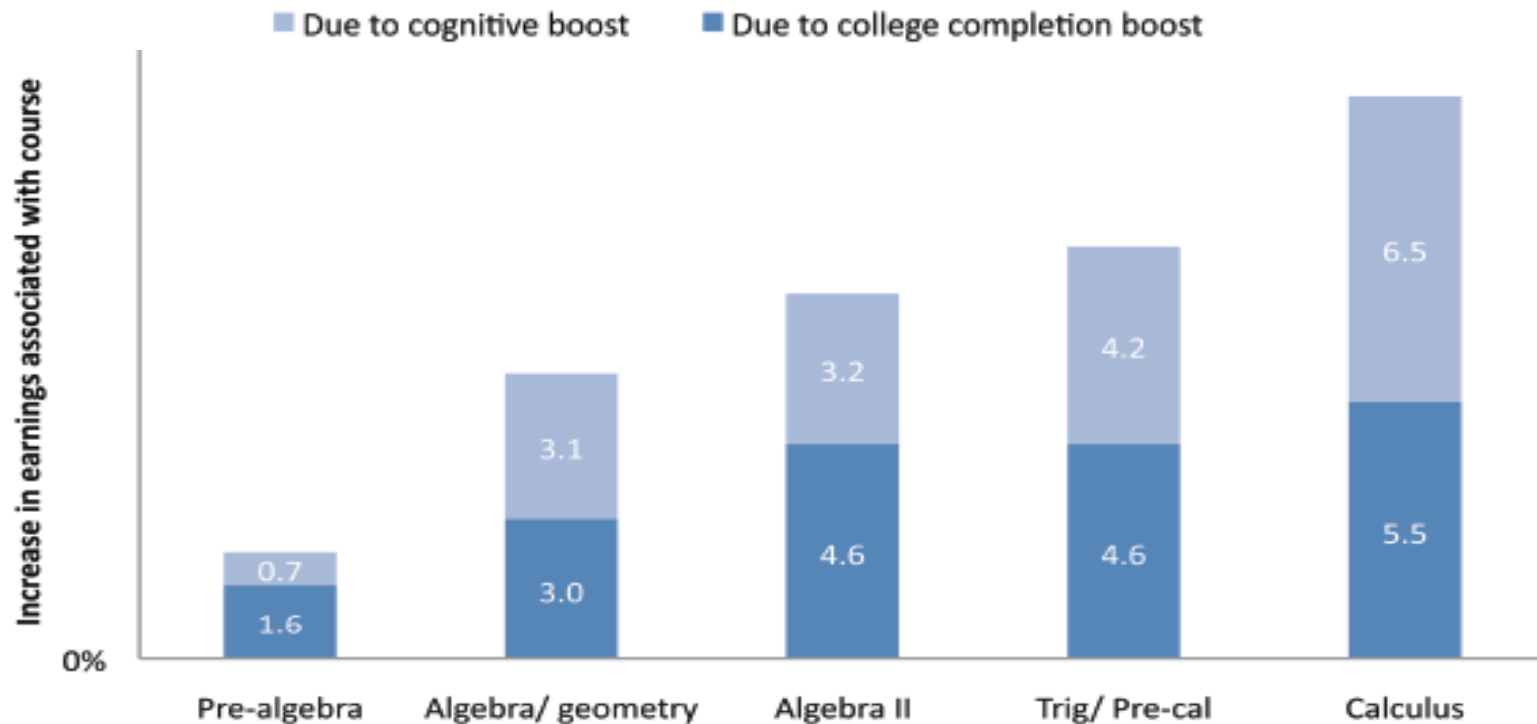
National Education and Workforce Trends

Education Level STEM Jobs Required



Source: STEM Science, Technology, Engineering & Mathematics
by Anthony P. Carnevale, Nicole Smith, & Michelle Melton, 2010

Advanced Math Improves Earnings

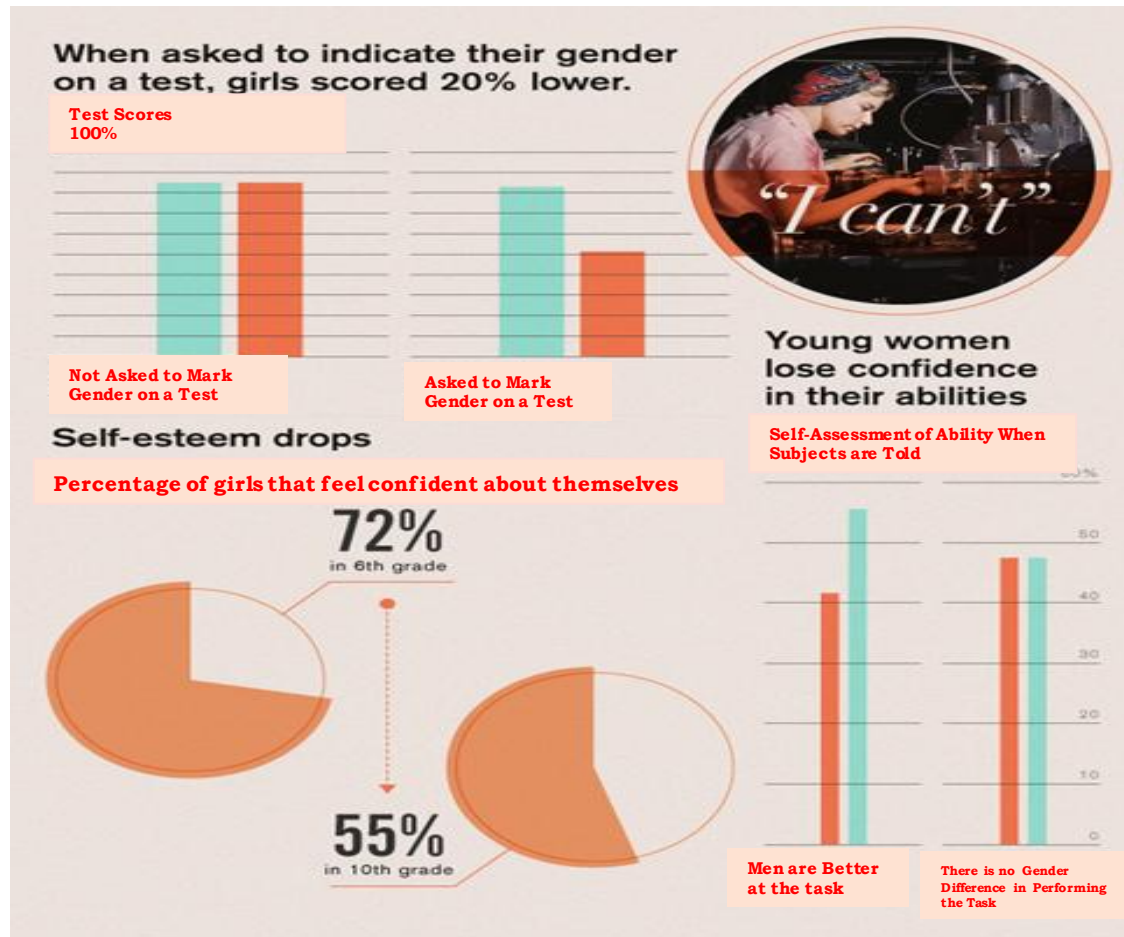


***Opens the door to the most sought after careers in 21st century**

***Skills essential to life**

Source: Defining a 21st Century Education by Craig D Jerald, 2009

Girls Begin to Question their Ability Because of their Gender



Source: engineeringdegree.net

Representation in STEM, by Race/Ethnicity: Minorities are Underrepresented

| | WHITE | AFRICAN-AMERICAN | LATINO | ASIAN | OTHER |
|---|-------|------------------|--------|-------|-------|
| Proportions of workers in STEM occupations by race (%) | 71 | 6 | 6 | 16 | 2 |
| Proportions of workers in all occupations by race (%) | 65 | 12 | 16 | 5 | 2 |

**Source: STEM Science, Technology, Engineering & Mathematics
by Anthony P. Carnevale, Nicole Smith, & Michelle Melton, 2010**



An initiative created to increase the number of traditionally underrepresented minority and female high school students that participate in Advanced Placement[®] (AP) courses in STEM (science, technology, engineering and math) disciplines.

Website: www.collegeboard.org/ap-stem-access-program

The Research: AP and College Success

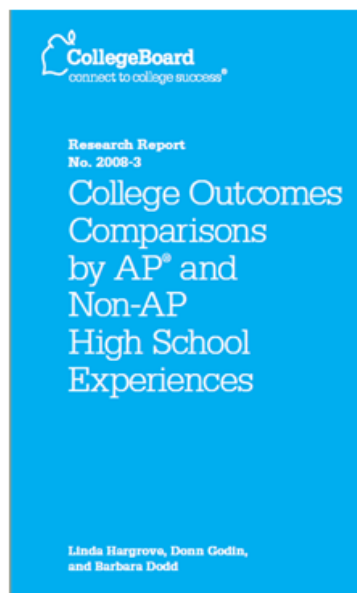
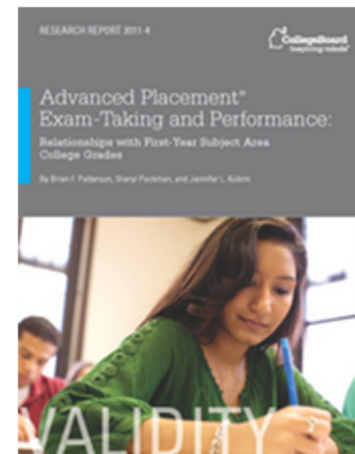


➤ High college GPA

(Hargrove, Godin, & Dodd, 2008, Patterson, Packman, & Kobrin, 2011)

➤ Same or higher performance in intermediate-level college courses

(Morgan & Klaric, 2007)



➤ Higher likelihood of majoring in the subject of their AP course, especially STEM subjects

(Mattern, Shaw, & Ewing, 2011)

➤ Higher four year-bachelor's degree attainment rates

(Hargrove, Godin, & Dodd, 2008)

Advanced Placement Math and Science Courses



Biology

Calculus AB

Calculus BC

Chemistry

Computer Science A

Environmental Science

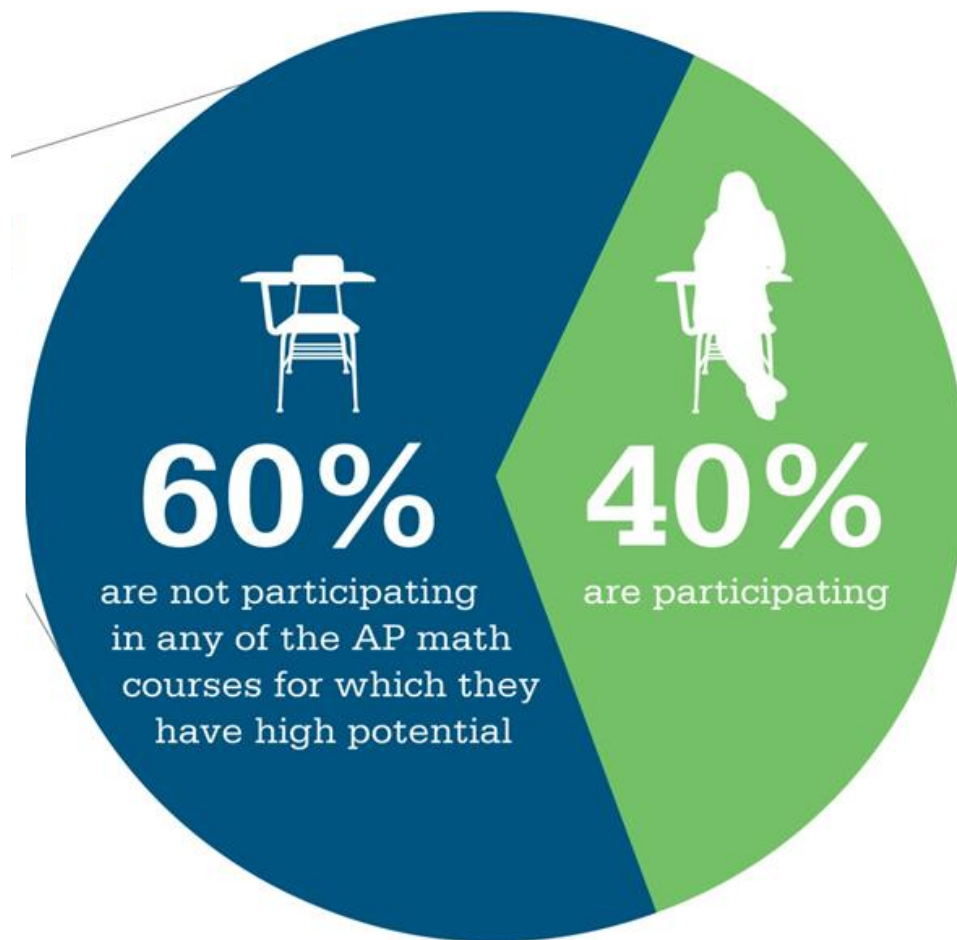
Physics B

Physics C: Electricity and Magnetism

Physics C: Mechanics

Statistics

While participation and success increased compared to the class of 2011, many high school students with potential for success in college-level AP courses still lack access.



The Right to Rigor

Among students with potential for success in AP mathematics courses, only:

6 out of 10

Asian/Asian American/
Pacific Islander students



4 out of 10

white students



3 out of 10

Hispanic/Latino students



3 out of 10

black/African
American students



2 out of 10

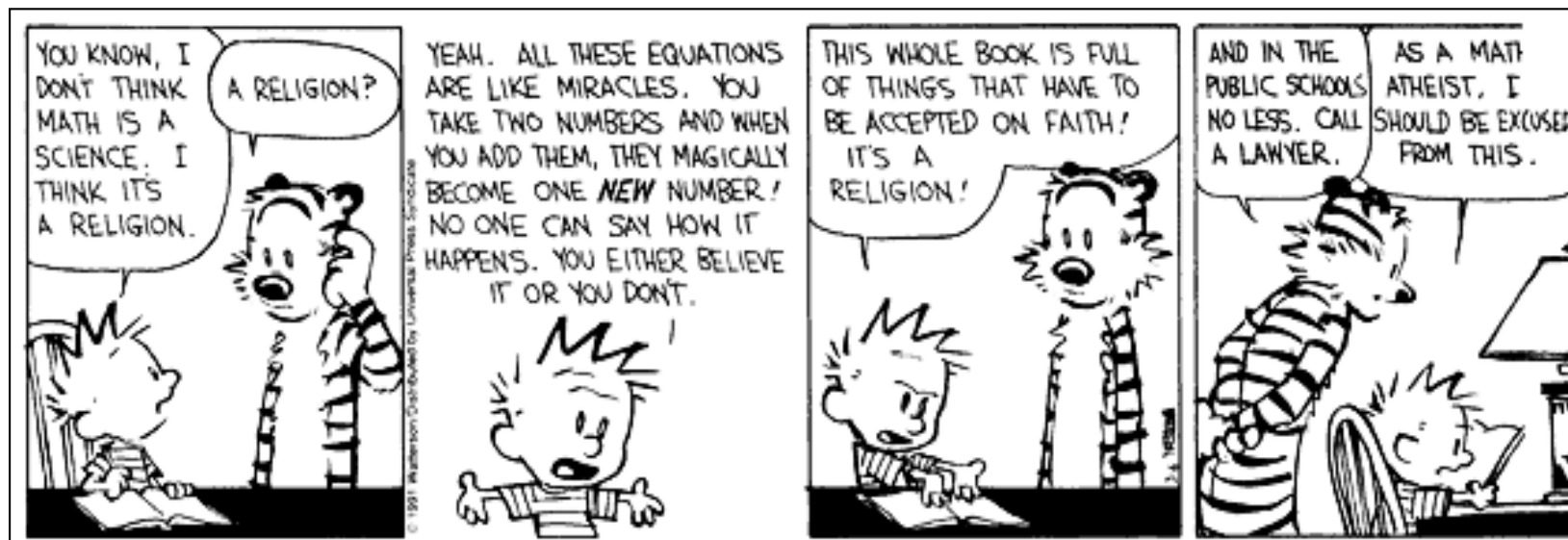
American Indian/
Alaska Native students



...took any such AP math course.

“The Math Mystique”

The Role of the School Counselor in Creating a School Climate that Encourages Mathematics Achievement and Supports Students’ Exploration in STEM Careers.



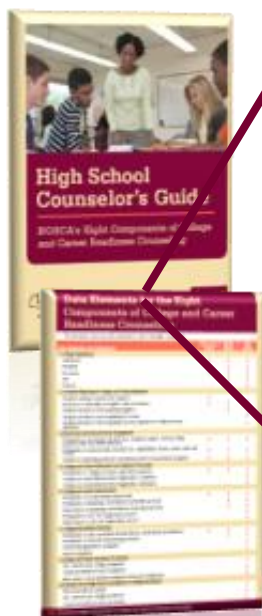
Calvin and Hobbes

Using Data to Focus Your Work on Underrepresented Students

Data Elements for the Eight Components of College and Career Readiness Counseling

The chart below shows key data elements for each of the Eight Components.

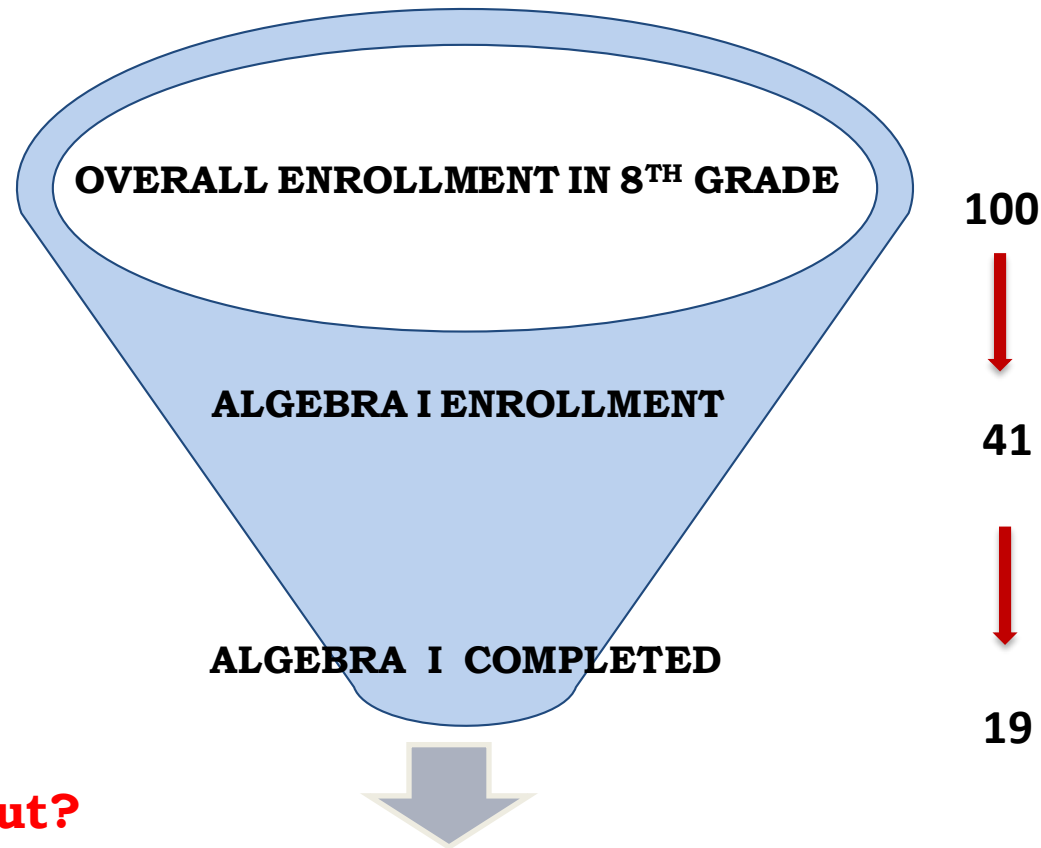
| Data Elements, By Component | Elementary School | Middle School | High School |
|--|-------------------|---------------|-------------|
| 2. Academic Planning for College and Career Readiness | | | |
| Students reading on grade level in grade 3 | • | | |
| Proficiency in state tests for English, math and science | • | • | • |
| Students enrolled in and completing Algebra I | | • | • |
| Students enrolled in and completing AP courses | | | • |
| Students enrolled in and completing courses required for in-state university admission | | | • |



Page 20 HS
Page 16 ES& MS

Source: nosca.collegeboard.org.

Using Data to Promote Students' Access & Success in Mathematics

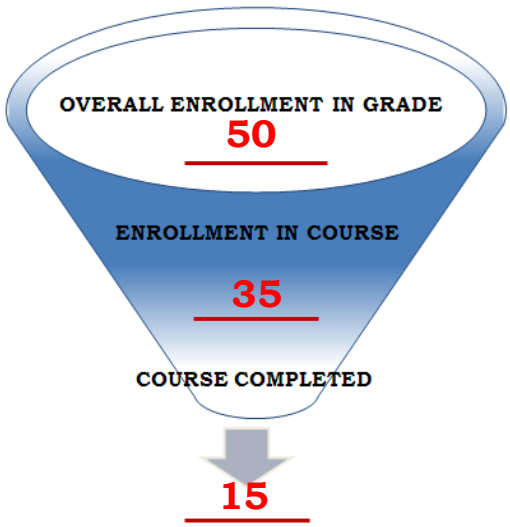


1. Who's left out?

2. Who's not making it through?

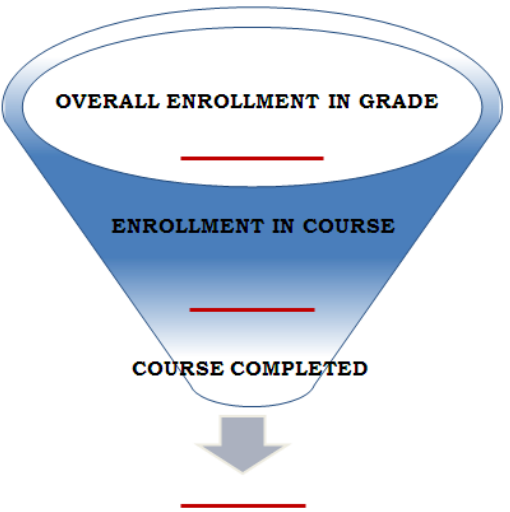
Data Work Sheet
SAMPLE

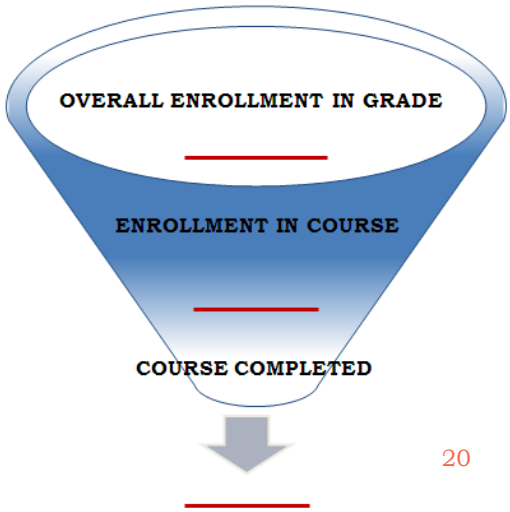
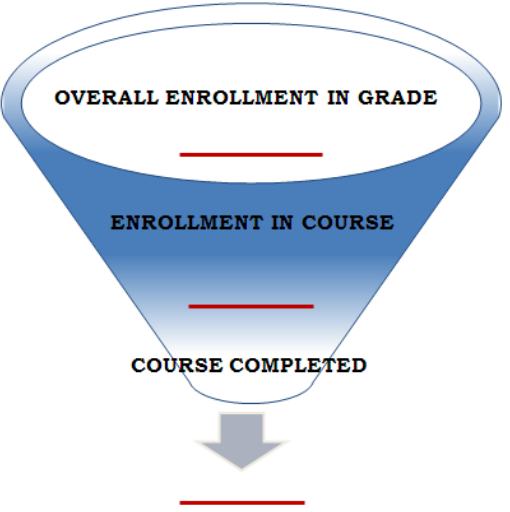
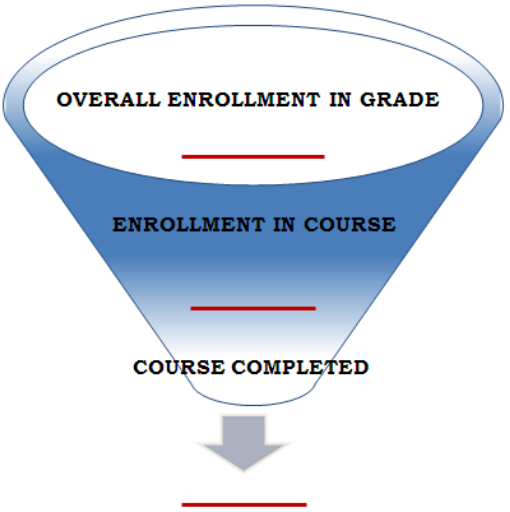
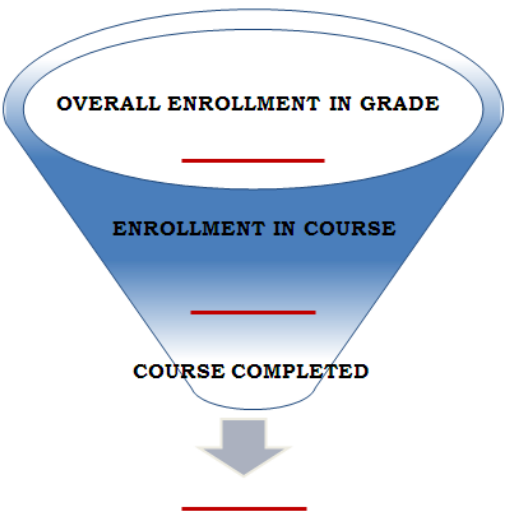
Female Students



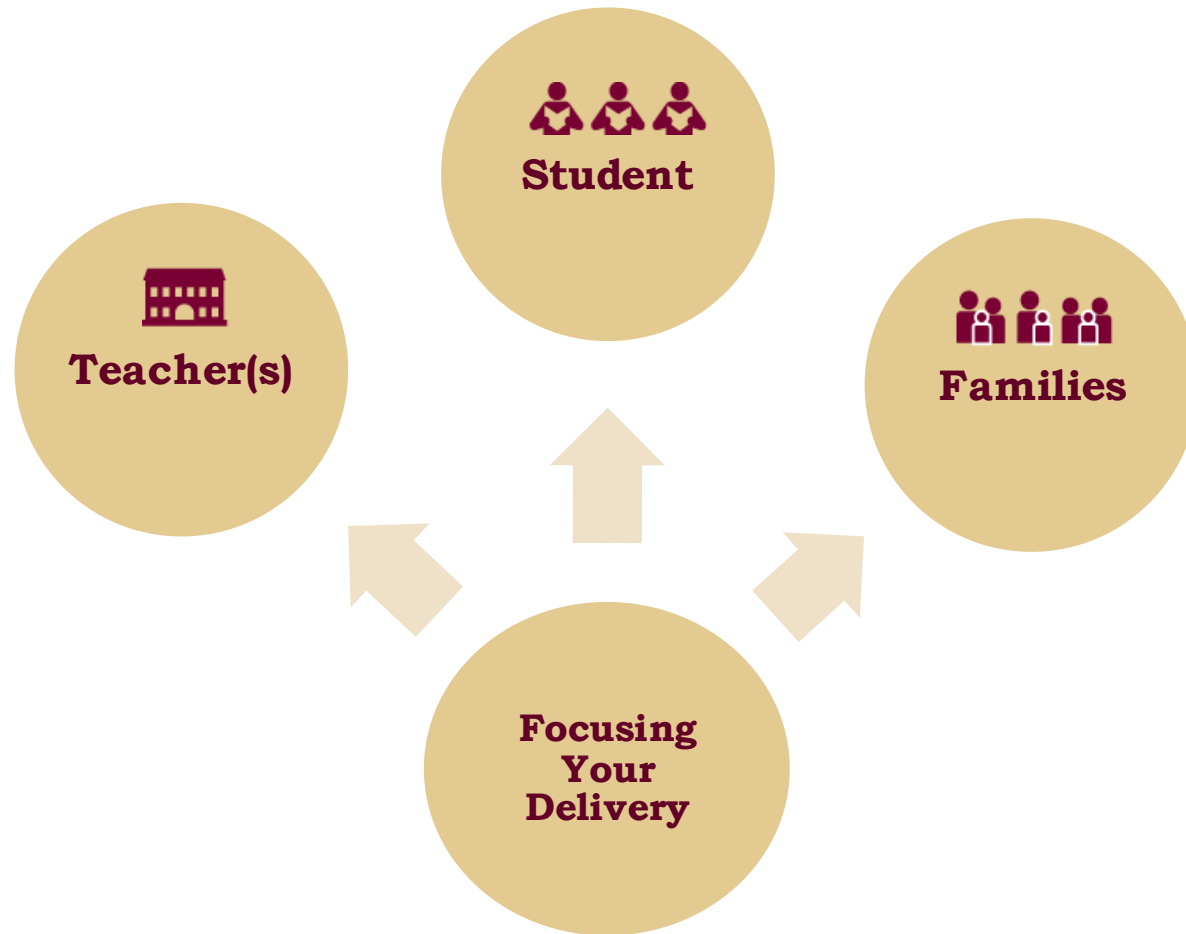
SAMPLE

Latino 9th Graders

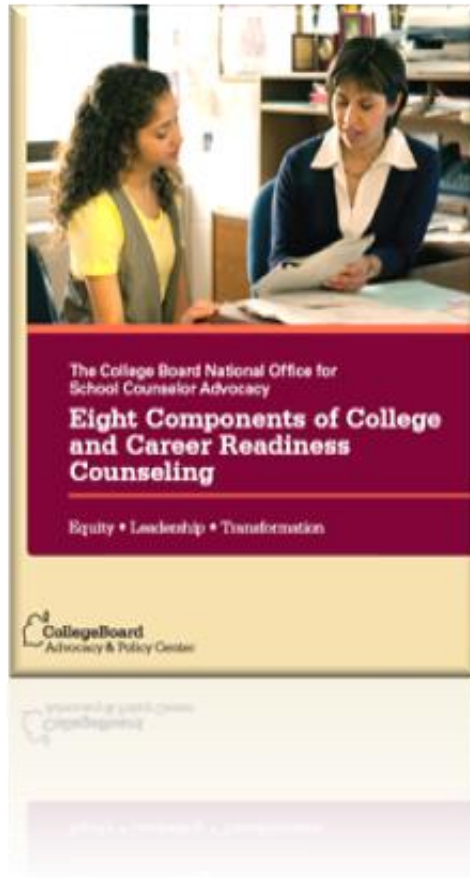




Implementing Activities that Focus on Underrepresented Populations



Focus on Three (3) Components



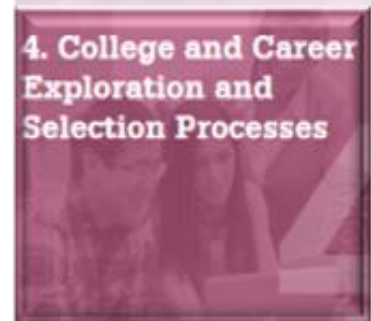
Component #1



Component #2



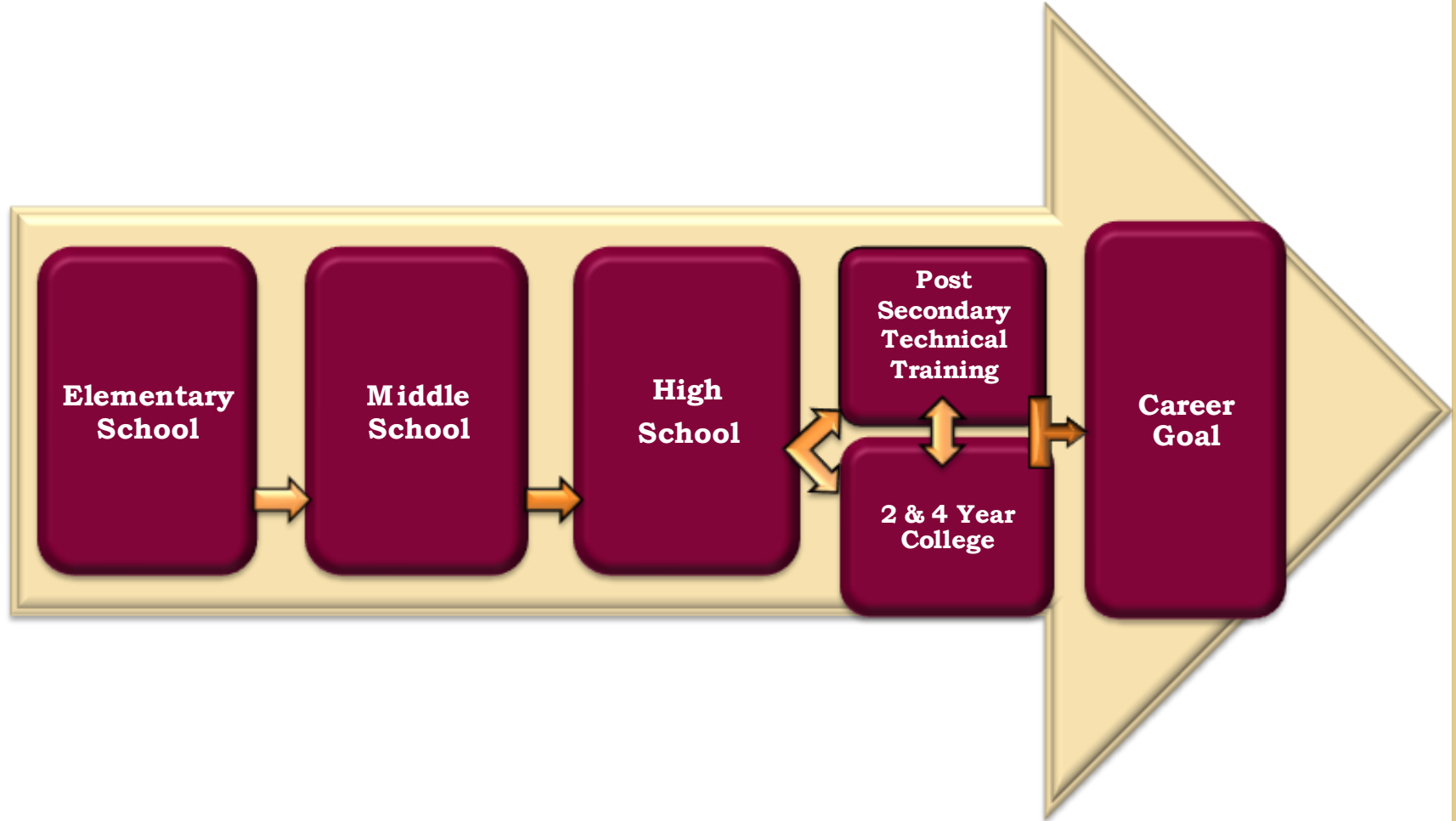
Component #4



3 of the 8 Components of College and Career Readiness Counseling

“Building a Foundation for Success”

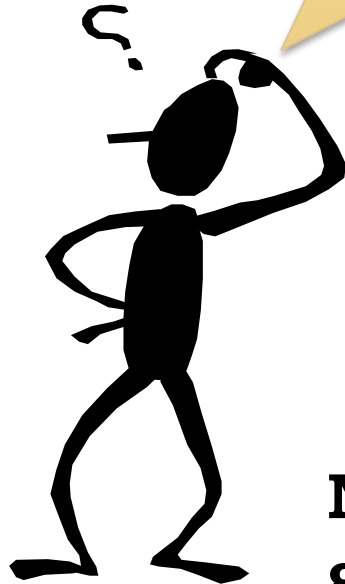
A K-12 Systemic Approach



Component #1

Building Students' Aspirations

**College
Who Me?**



**I got plenty
of time to
get ready?**

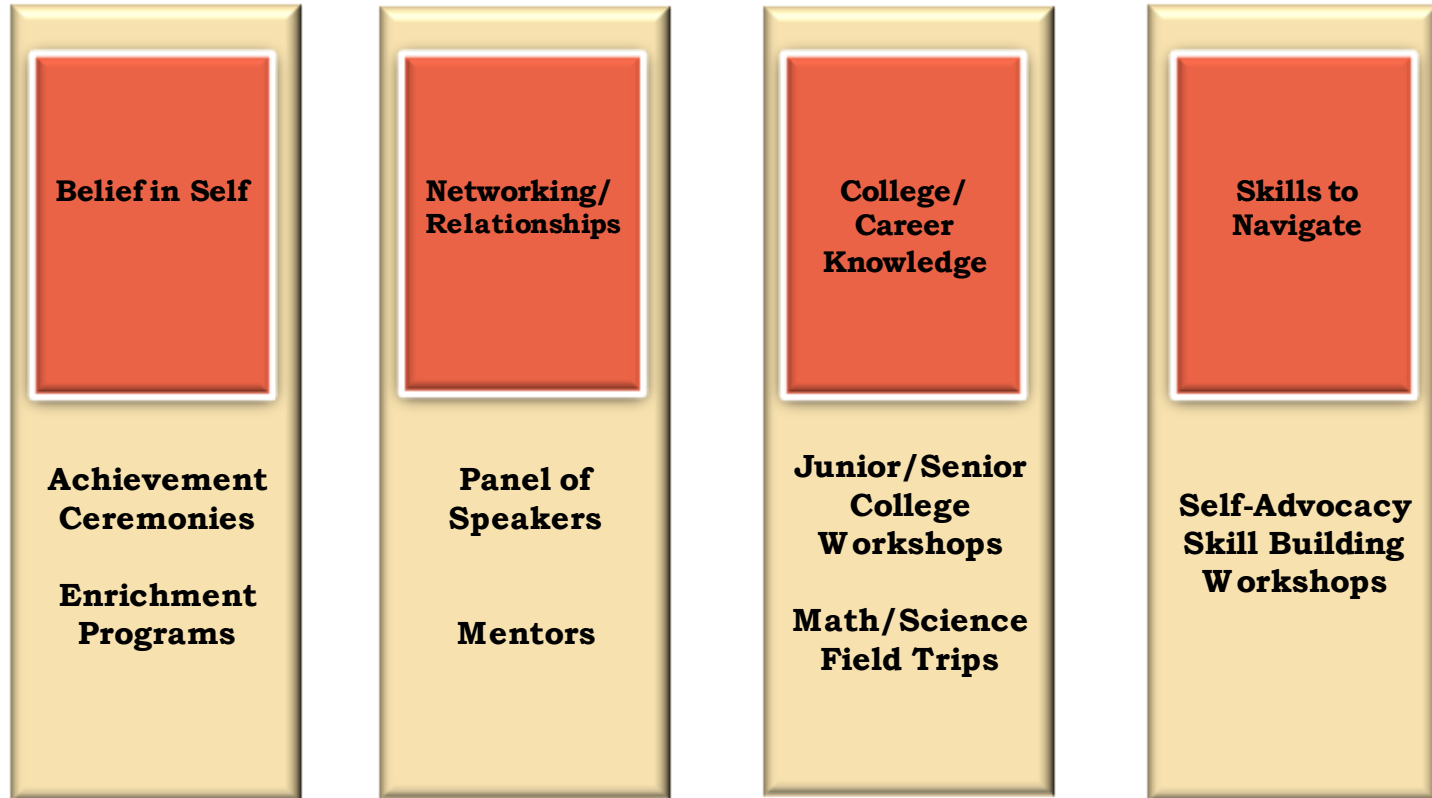
**None of my people
go to college**

**Rigorous Math
Classes?
Don't need it!
I'll be Rich!**

**I won't be using
computers for
what I plan to
do!**



Aspects of Building Students' Aspirations



AP Student Activation Campaign

Student Campaign

AP[®]

Postcards

CURIOSITY CREATIVITY COMMITMENT

It's part of you.

Maybe you didn't know that part of what it takes to take an AP course is something that's already in you.

Believe in yourself. You've got the strength and the determination. You've got the heart, the mind, and the voice. It's in you to tackle AP.

So talk to your counselors and teachers. Let's explore AP and chart a course to your future.

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Envelope

You've shown that you have the potential to succeed in AP.[®] Find out what that means for your future.

The College Board's Advanced Placement Program[®] (AP[®]) involves selling and academically preparing students to pursue college-level studies — with the opportunity to earn college credit and advanced placement — while still in high school.

AP Potential Letters

Visita nuestra nueva página de internet AP[®] para estudiantes

www.collegeboard.org/ap-en español

Estimado Estudiante:

Has sido seleccionado entre miles de estudiantes de escuela secundaria

Los cursos del programa AP pueden ayudarte a empezar a alcanzar tus metas universitarias ahora mismo.

- Te acercas al primer de adelanto de la universidad. El nivel de cursos AP te ha desarrollado a nivel de estudiante universitario.
- Obtienes créditos universitarios y potencialmente un trabajo que te ayude a pagar tus estudios, o a hacer otros proyectos.
- Los cursos AP te ayudan a desarrollar habilidades y conocimientos que te ayudarán a ser exitoso en la universidad.
- Los cursos AP te ayudan a desarrollar habilidades y conocimientos que te ayudarán a ser exitoso en la universidad.

Lo que se necesita para tomar un curso AP, ya está dentro de ti.

Toma hoy el primer paso que te acercará a tus metas.

Visita nuestra nueva página de internet AP[®] para estudiantes.

www.collegeboard.org/ap-en español

Brochure

What it takes to take AP[®]

It's part of you

Think about the challenges you tackle every day. With each one you build greater confidence in your abilities. That's what AP is all about. AP courses may be tough — they bring the college experience to your high school after all — but they also help you develop skills and knowledge that you can use in the real world. Even better, they introduce you to new possibilities — in college majors, in career options and in yourself.

1. The AP Experience

This is your college-level class.

AP is about taking the experience of college studies, taking it AP courses and taking it to the next level. AP courses are designed to challenge you and to help you develop skills and knowledge that you can use in the real world. Even better, they introduce you to new possibilities — in college majors, in career options and in yourself.

2. Why Take AP?

There are many reasons to take AP.

- Get college credit that can save you money and time in college.
- Develop skills and knowledge that you can use in the real world.
- Prepare yourself for the challenges of college.

LET'S TALK ABOUT AP[®]

Interested in learning more about AP courses? This conversation starter can help you talk with a counselor or teacher about what makes sense for you.

What AP course is right for me?

It starts with your interests. Most schools offer a selection of AP courses, so it's important to know your own interests — those that an AP course you haven't thought of that can help you reach your goals.

- Think about what interests you:**
 - Which courses do you enjoy most in school? What subjects do you read about?
 - What college majors are you considering? What careers excite you?
- Ask your counselor or teacher the following questions:**
 - What AP courses does our school offer?
 - Are there AP courses at our school that I think I'd like to take?
 - Are there other courses that can help me succeed in AP or prepare for college and careers?
- Find out how AP works at your school.**
 - Are there any requirements for students to enroll in AP?
 - What is our school's enrollment process?
 - Does our school offer AP courses in our AP classes, and if so, how?
 - What is the cost of taking the AP Exam? Is there assistance with payment?
 - May I speak with a teacher who has taken an AP course?
 - What should I learn with my AP course?
 - What kind of workload should I expect from an AP course at our school?
 - Are there study groups or people who can offer help if I need it?
 - What can I do next to help me prepare for AP?

Learn more at www.collegeboard.org

Conversation Starter

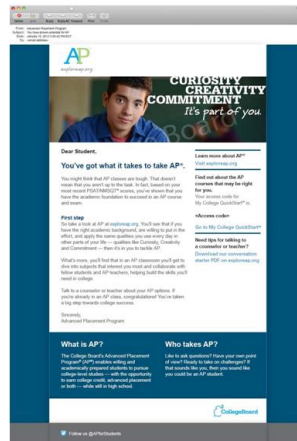
Student Campaign



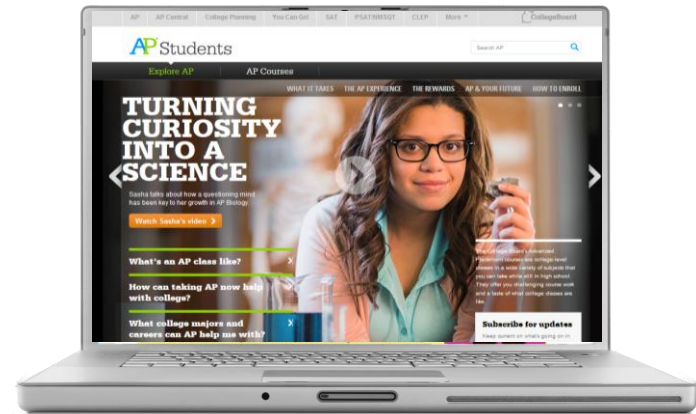
School Posters



Emails



AP Website-Explore AP



Twitter/Facebook/Youtube

<https://twitter.com/APforStudents>



Component #4:

College and Career Exploration

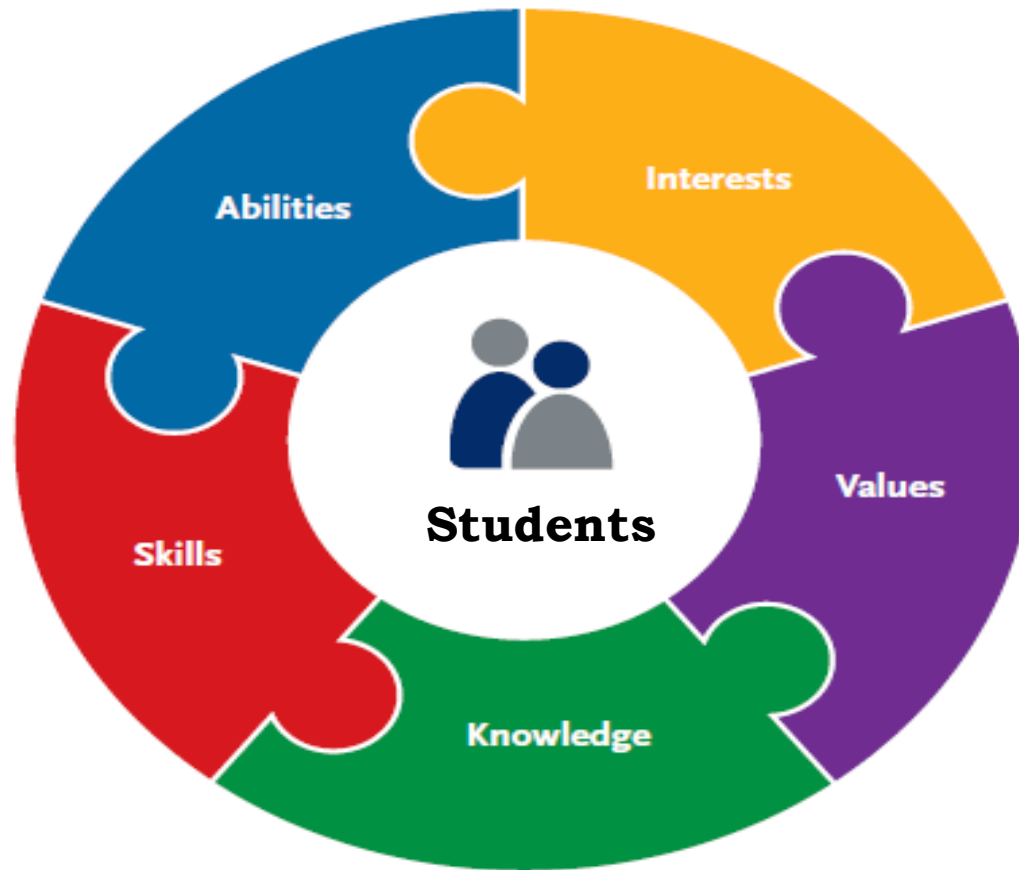


**What must I do to
make my college and
career goals a reality?**

**“If one does not know to which port one is
sailing, no wind is favorable.”**

Seneca

Interest/Values vs Abilities/Skills/Knowledge



Source: STEM Science, Technology, Engineering & Mathematics
by Anthony P. Carnevale, Nicole Smith, & Michelle Melton

The Benefits of Integrating Rigorous Academic Courses and Career Exploration



16 Career Clusters

www.careerclusters.org

Math and Science Related Careers

I, _____ understand that withdrawing from Advance Math & Science courses could  me from reaching my career goals.

Computer Science Careers

Computer Operator
Computer Programmer
Computer Software Engineer
Computer Support Specialist
Database manager
Information System Manager
System Analyst
Website Developer

Business Careers

Accountant
Bank Manger
Bank Teller
Cost Estimator
Financial Manger
Insurance Agent
Loan Officer
Market Researcher
Mortgage Broker
Realtor
Stockbroker

The Skilled Trades

Automotive Technician
Aviation Mechanic
Draftsman
Electrician
Heating and AC Technician
Machinist
Plumber
Surveyor

Math Related Science Careers

Astronomer
Chemist
EKG Technician
Forensic Scientist
Physician
Pharmacist
Optometrist
Zoologist
Meteorologist
Medical Lab Technician

Engineering

Aerospace
Biomedical
Chemical
Civil
Computer
Electrical
Environmental
Industrial
Nuclear

Student Signature

Parent Signature

Lesson Plans

On-line Tool



inspiring minds™

My Personality

My College QuickStart™ Lesson Plan:

• Review the CRA Personality Profile results.
• After you have taken this profile, you will receive your results by clicking on the screen, you can view your Personality and worksheets before class, youring class as part of the into My Plan and begin.

the resultant items, identify articles that interest you.

er to the "Get Connected" because colleges of interest, your profile and sign in.

two main areas on this page, the Search Criteria box. Click Search to Search Results. is prepopulated with a starter job and your preferred major of answer sheet. y of school that most interests go under "filter" in Search checked boxes if you would

according to the

Board, inspiring minds and your feedback of

page 1

inspiring minds™

My College Matches

My College QuickStart™ Lesson Plan:

Name: _____

Grade Level(s) _____

Goal(s) _____

Time Required _____

Materials Needed _____

Before You Begin

1. Log in to My College QuickStart at www.collegeboard.com/quickstart

2. Click on [My Major & Career Matches](#) (the link is on the far right)

3. Click on [Go to MyPlan](#) (the link is on the far right)

4. Click on [Go to MyPlan](#)

5. Click on [Go to MyPlan](#)

6. Click on [Go to MyPlan](#)

7. Follow the on-screen instructions.

8. Choose a major of interest that will appear in the My Major & Career Matches section of My College QuickStart. A list of related majors and careers will also appear here.

* Note: You may also complete the CRA Personality Profile to generate a list of majors. This may take about 40 minutes to complete, but you do not need to complete it all at once.

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page 1

Component #2:

Academic Planning & Development

How do I get students, administrators, teachers and parents and families to understand what it will take to be academically prepared for the 21st Century:

1. Survive in technological society
2. Participate in global community
3. Attain future careers that will allow them to support their families and live a comfortable life.

School Coursework – Academic Planning

Middle School Student

- My career goal is to become a rapper, pro-ball player and a forensic scientist like on CSI

| Career Choices | Skills Needed | School Coursework |
|--------------------|--|--|
| Rapper | | |
| Pro-Ball Player | agility, athletic, critical thinking, math, science/motion, negotiation skills | PE, Dance, Alg I, Geometry, Alg II, Physiology, English, Chemistry, Health |
| Forensic Scientist | | |

School Coursework (Academic Planning)

- Goal Setting
- College/Career Exploration
- 4,5,6 Yr MS/HS Academic Plans
- 2/4 Yr Post Secondary Plans

The Student's Program of Study Should Align with a Postsecondary Career Pathway and/or College Entrance

College Prep Curriculum & Minimum requirements

- English (4 yrs) I, II, III, IV
- Math:(3 yrs) including Alg I, Geometry, Alg II,
- History (3yrs)
- Science (3 yrs) including 2 lab sciences (Biology, Chemistry)
- Foreign Language (2 yrs) same language

More Advance Courses

- Include Honors, AP, IB courses
- 4yrs Math & Science (Trig/Anal, Pre-Calculus, AP Calculus, Physics, AP Physics, AP Chemistry
- AP History

Other Requirements

- Minimum GPA
- Admission
- Test Scores (SAT, ACT)

1. Is there a distinction between your college preparatory courses and advance courses?
2. How do you help parents and families know the difference?

AP Professional Toolkit

A Preview of the Components

- Overview of AP Resources
- Tips for Planning AP Night Informational Events
- Customizable AP Night Power Point Presentations- in English and Spanish
- “The Parent Perspective” parent brochure- in English and Spanish
- Tools from Student Campaign
- Digital Tools & Resources for In-School AP Outreach
 - Email
 - Banner ads for school websites
 - Voicemail scripts

Our Messaging



Flash Drive

WORTH IT!

Tools and Resources

Fee Reduction for Advanced Placement: Exams

<http://professionals.collegeboard.com/testing/waivers/guidelines/ap>

How to Launch a New Advanced Placement Course:

www.collegeboard.org/startapcourse

Advanced Placement Explore Website

www.exploreap.org

Advanced Placement Professional Toolkit

www.collegeboard.org/shareap

Advanced Placement Videos

<http://www.youtube.com/user/collegeboard>

NOSCA's Eight Components of College and Career Readiness

<http://nosca.collegeboard.org/eight-components>

Data Elements for the Eight Components of College and Career Readiness Counseling

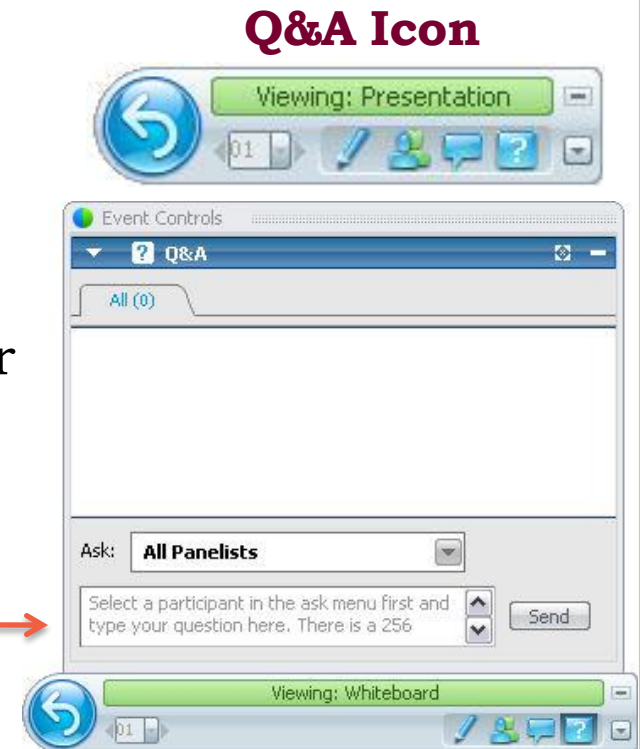
<http://nosca.collegeboard.org/eight-components/high-school-guide>

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Today's Presenters



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Director

National Office for School Counselor Advocacy



Theodore J. (Ted) Gardella

Executive Director

Advanced Placement Strategy and Product Development

NOSCA's "Own the Turf Campaign"

11,500+ Campaign Members



A national advocacy campaign to **galvanize** and **mobilize** school counselors to “own the turf” of college and career readiness counseling and **take the lead** in establishing a college-going culture in their schools, districts, communities and/or states.

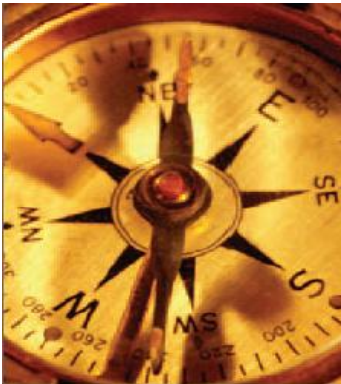
Own the Turf!

Sign Up Today

*Join the 11,500+ Campaign Members
Who Are Part of this National Movement.*

nosca.collegeboard.org

JOIN US IN NEW ORLEANS!



SAVE THE DATE

Join the National Office for School Counselor Advocacy (NOSCA)

Destination Equity 2013:

Charting Bright Futures for All Students

April 12–13, 2013 | Marriott New Orleans | New Orleans, LA

**Join us for NOSCA's 6th Annual
National Conference.**

nosca.collegeboard.org



destinationequity.collegeboard.org

NOSCA's Spring Webinar Series

Strategic and Savvy: School Counselor Action Steps for Equitable College and Career Readiness Outcomes

Wednesday, April 25, 2013, 1–2 p.m. EDT

This webinar will highlight NOSCA's School Counselor Strategic Planning Tool to give school counselors concrete strategies to focus on their students' college and career readiness outcomes. Aligned to school improvement plans, strategic planning is an effective way for school counselors to be strong leaders in building a college-going culture in their schools.

Presenter:

Vivian Lee, **Senior Director, NOSCA, The College Board**

For More Information

Website: nosca.collegeboard.org

Email: nosca@collegeboard.org