

AP and Pre-AP in the 21st Century

AVID National Conference 2011

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Compare these two questions, and discuss your observations with a partner

2006 AP US History Released Exam Question

Which of the following colonies required each community of 50 or more families to provide a teacher of reading and writing?

- A. Pennsylvania
- B. Massachusetts
- C. Virginia
- D. Maryland
- E. Rhode Island

Proposed *New* AP US History Question

By the early twentieth century, the United States had emerged as a world power. Historians have proposed various dates for the beginning of this process, including the three listed below. Choose one of the three dates below or choose one of your own, and write a paragraph explaining why this date best marks the beginning of the United States' emergence as a world power. Write a second paragraph explaining why you did not choose the other dates. Support your argument with appropriate evidence.

1898 (Spanish-American War)

1917 (Entry into the First World War)

1941 (Entry into the Second World War)

What did you find?

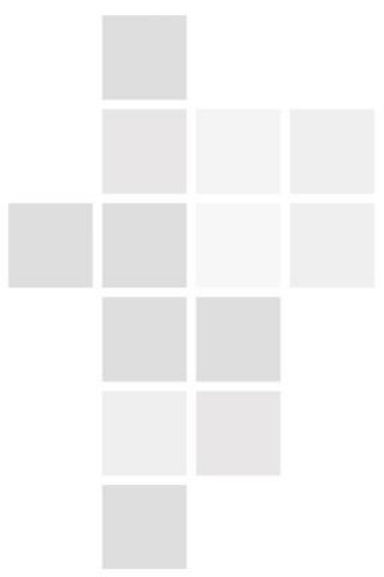
- What skills and knowledge does each question require?
- What implications does each type of question pose for teaching and learning in the AP classroom?
- What implications does the new question type pose for preparing students to succeed in AP?

Topics for today

- The case for AP
- The AP Science Redesign
- AP and 21st Century Skills
- What does all this mean for pre-AP?



The case for AP

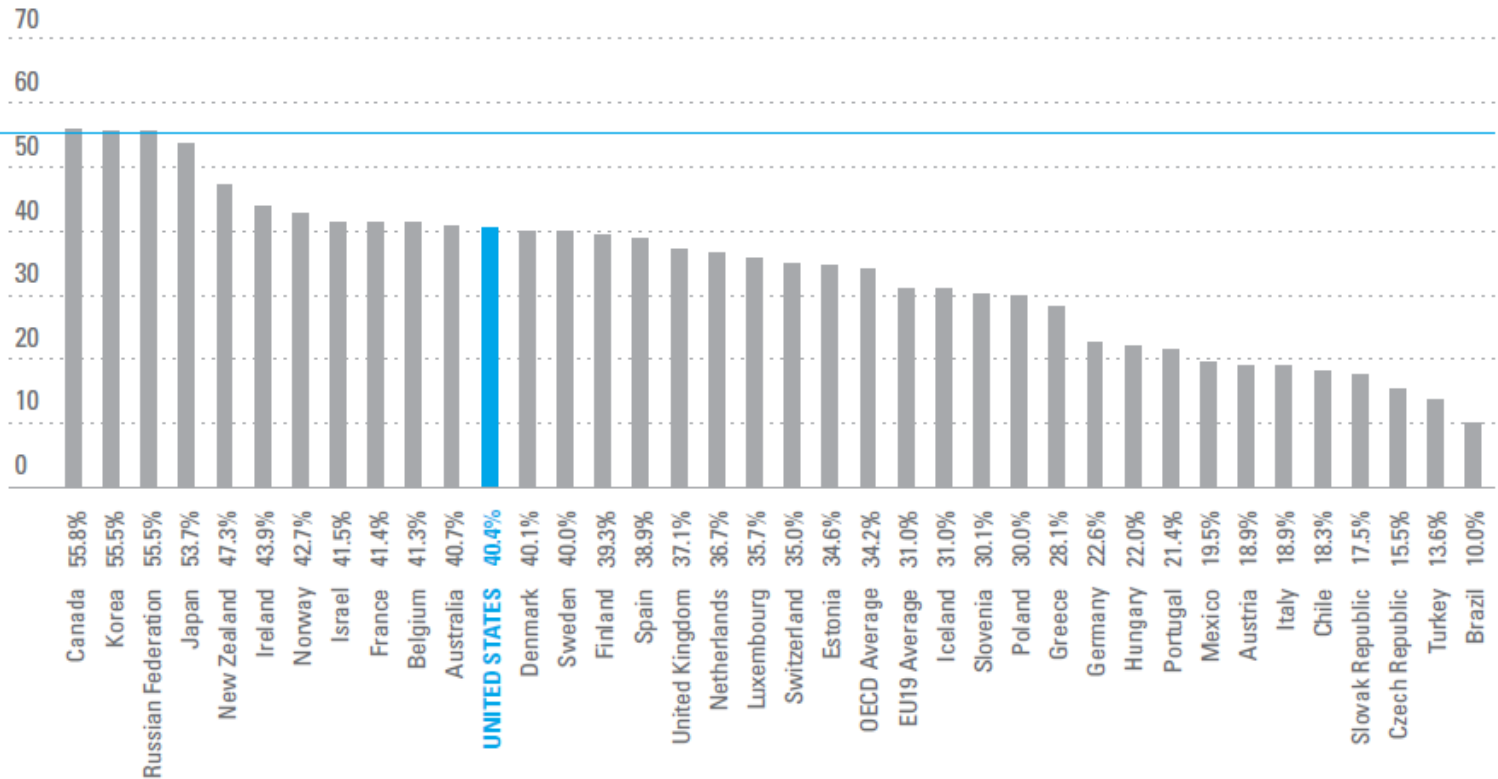


11 countries have higher college degree attainment rates than the United States

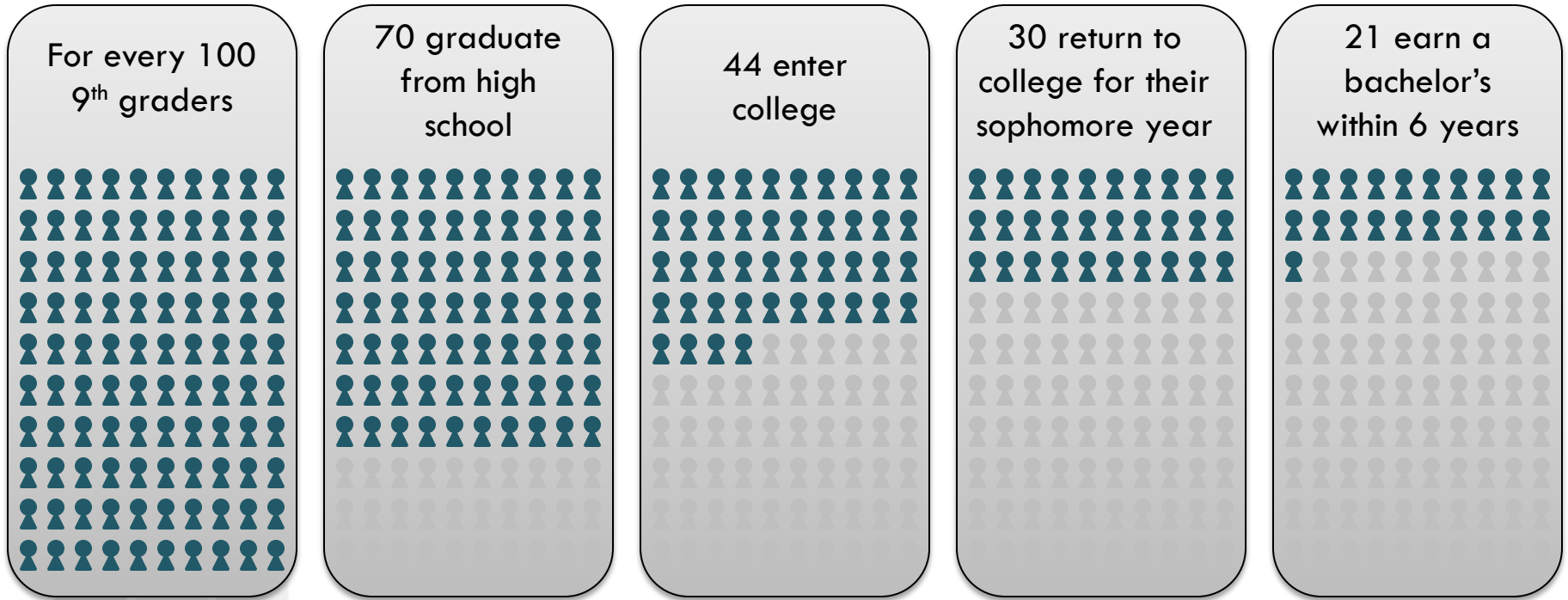
Percentage of 25- to 34-Year-Olds with an Associate Degree or Higher, 2007

Source: Organisation for Economic and Co-operative Development, 2009

11
Countries
↑
United States
↓
24
Countries



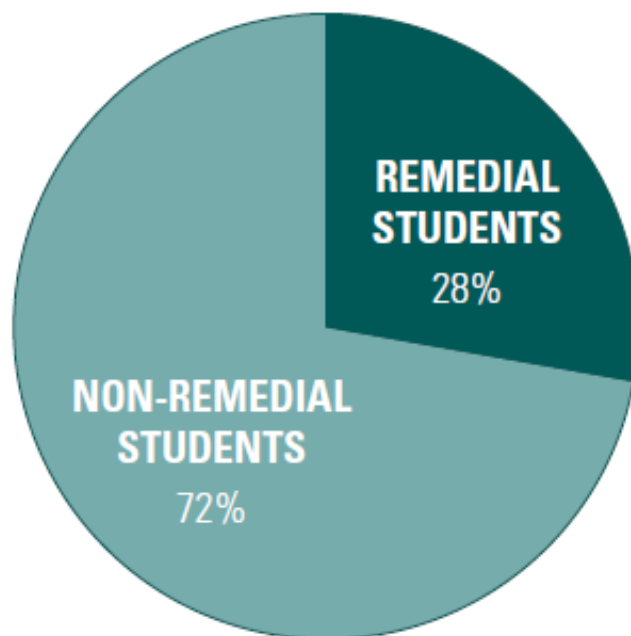
Only 44% of US 9th graders actually enter college



28% of students who enter a college or university as freshmen are in remedial classes

National Percentage of Students in Remedial College Classes, 2000

Source: NCES Postsecondary Education Quick Information System (PEQIS), 2001



David Conley on College Readiness

“What recent research has come to define as “best practices” entry-level college courses [are] quite different from the stereotypical freshman course. These courses require students to engage significantly with the course content and topics and to use key cognitive strategies. . . .

. . . Several studies have found college faculty members nationwide, regardless of the selectivity of the institution, to be in near-universal agreement that most students arrive unprepared for the intellectual demands and expectations of postsecondary faculty.”

David Conley, *College and Career Ready: Helping All Students Succeed Beyond High School*

Quality AP Programs fortify a diversity of high school students for college success

Research among matched student populations consistently demonstrates that high school students who earn scores of 3 or better on an AP Exam have developed content knowledge, skills, and habits of mind that result in:

- higher first-year college GPA
- higher performance in sophomore-level college courses
- higher 4-year bachelor's degree attainment rates

And these findings hold true regardless of ethnicity or socioeconomic status.

Students who take an AP course frequently choose to major in that subject area

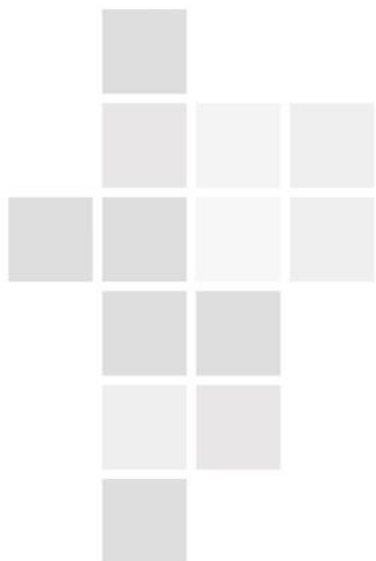
Course	Female Students Who:		African-American Students Who:		Hispanic Students Who:	
	Took AP & Chose Major	Did Not Take AP & Chose Major	Took AP & Chose Major	Did Not Take AP & Chose Major	Took AP & Chose Major	Did Not Take AP & Chose Major
Biology	20%	6%	18%	6%	16%	4%
Chemistry	15%	1%	14%	2%	13%	2%
Physics B	16%	3%	31%	7%	25%	8%
Physics C: E&M	25%	2%	48%	6%	47%	7%

We are making changes to ensure that AP courses reflect “best-practices” first-year college courses

- AP courses that focus on discipline-specific content and skills critical for 21st-century college and career
 - Reduced breadth, increased depth
 - Clear, transparent learning objectives for each course
- AP exams that appropriately assess both content *and* the skills
 - Reliable scores, year-to-year, that are valid measures of student learning
 - Varied assessment types
- Robust and aligned support for teachers



The AP science redesign: A case study



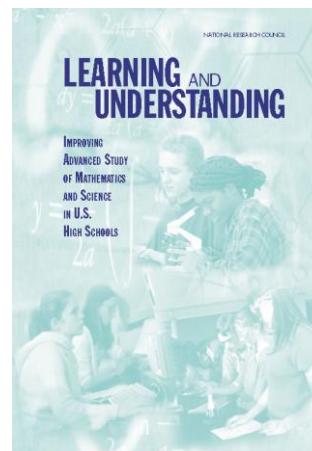
Learning and Understanding (2002)

The National Research Council and National Science Foundation recommended changes to AP and IB science programs.

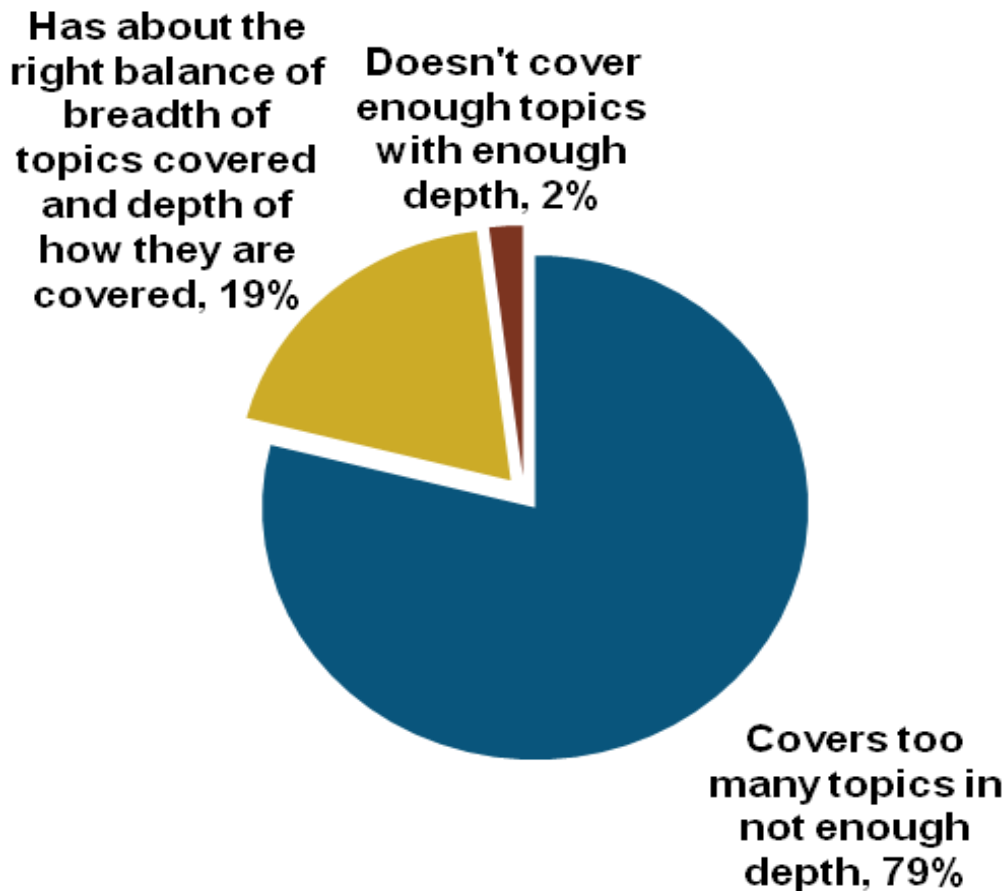
This 2002 NRC Report Recommended:

- The primary goal of AP and IB should be to help students develop a deep understanding of the organizing concepts and principles in Biology
- Curricula should be focused on a reasonable number of concepts that can be studied in depth.

Learning and Understanding: Improving Advanced Study of Mathematics and Science in U.S. High Schools, National Research Council, 2002



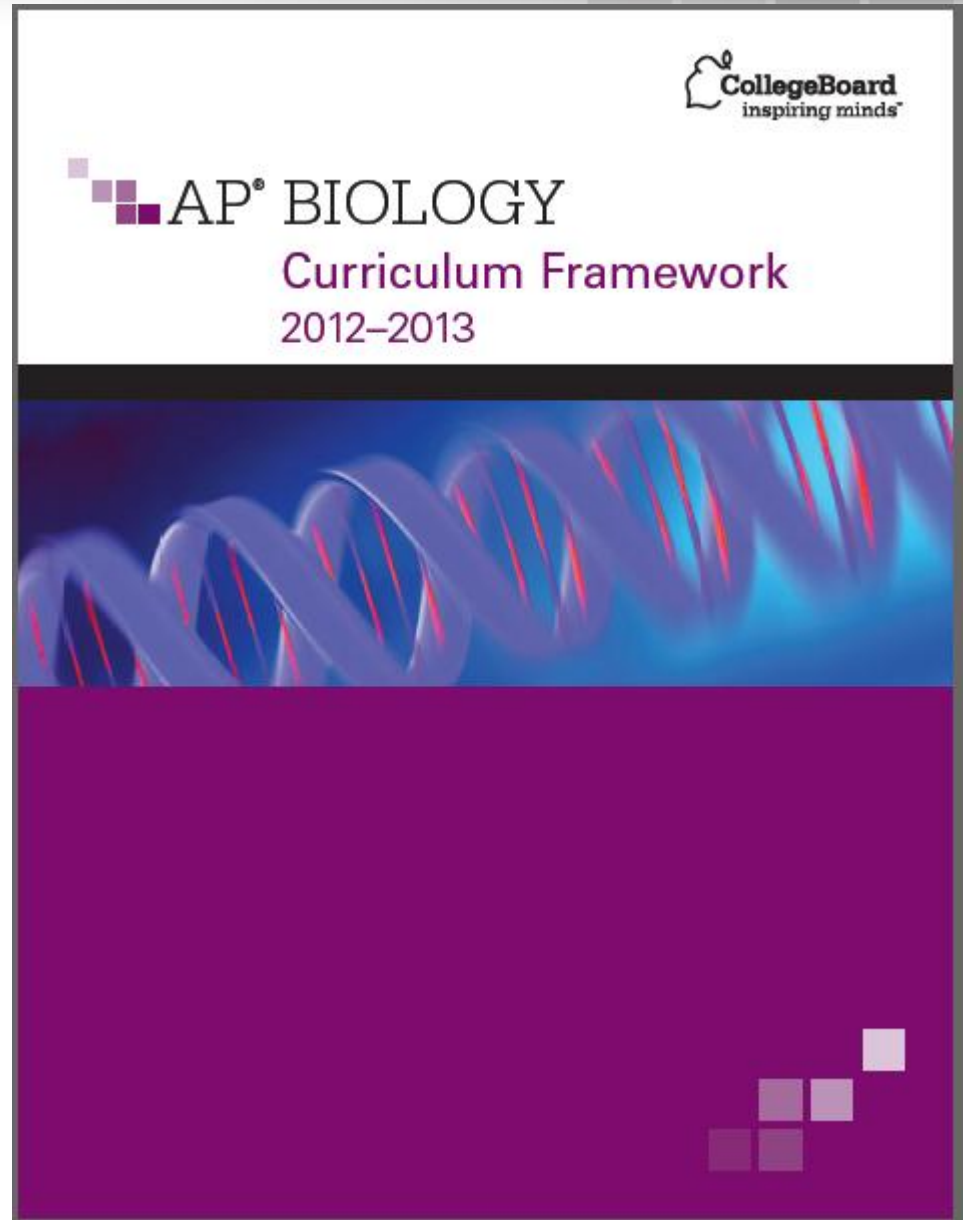
AP science teachers feel that current AP courses force them to sacrifice depth to breadth



Q1300/Q1545 AP Biology Teachers (n=475)

The new AP Biology curriculum, released to the public on February 1, 2011, provides teachers with:

- clarity of focus
- flexibility
- reduced breadth



AP[®] BIOLOGY
Curriculum Framework
2012-2013

Major changes have been made to AP Biology

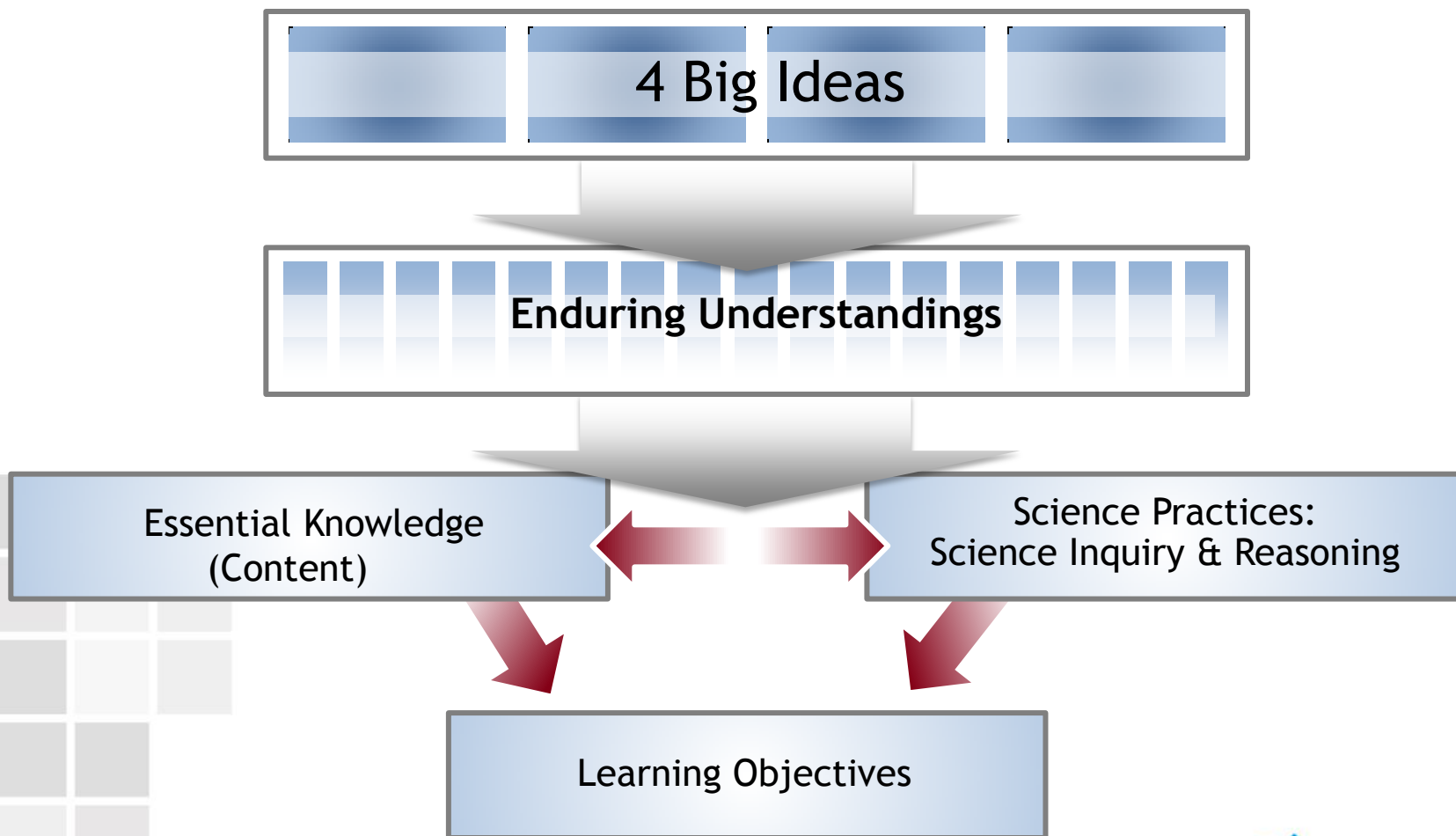


- **New approach:** Essential content + skills + inquiry
- **New structure:** 4 Big Ideas, 17 Enduring Understandings
- **New transparency into exam:** Learning Objectives, Formula List, Usage of Calculators
- **Breadth reduced to make time for deeper learning and inquiry**

The curriculum redesign was informed by Wiggins & McTighe's *Understanding by Design (UbD)* methodology

	<i>Understanding by Design</i>
Stage 1	What should students come away understanding, knowing, and able to do?
Stage 2	What is the evidence of the desired results?
Stage 3	What learning activities and teaching promote understanding, knowledge, skill, student interest, and excellence?

A Domain Model was developed for each AP science course



At the heart of the redesigned AP curricula is the integration of content + skills

Content

**Science
+ Practice**

**Learning
Objective**

Essential Knowledge 1.A.3

Genetic drift is a non-selective process occurring in small populations

Science Practice 1.4

The student can *use representations and models to analyze situations or solve problems* qualitatively and quantitatively.

Learning Objective 1.6

The student is able to use data from mathematical models based on the Hardy-Weinberg equilibrium to analyze genetic drift and effects of selection in the evolution of specific populations.

The Science Practices run through all AP science courses

Science Practices: The student can/is able to . . .

Use representations and models to communicate scientific phenomena and solve scientific problems.

Use mathematics appropriately.

Engage in scientific questioning to extend thinking or to guide investigations within the context of the AP course.

Plan and implement data collection strategies appropriate to a particular scientific question.

Perform data analysis and evaluation of evidence.

Work with scientific explanations and theories.

Connect and relate knowledge across various scales, concepts and representations in and across domains.

Fall 2010 Validation Study: 60 faculty from leading institutions confirmed that the revised AP Biology course:

- ✓ Will successfully prepare students for success in sequent college biology courses
- ✓ Reflects appropriate depth and breadth equivalent to two semesters of college biology study
- ✓ Is highly favorable for granting credit and placement

“The changes to the AP Biology course provide greater emphasis on the type of **scientific inquiry that increases reasoning skills and conceptual understanding**....

...These revisions represent **a major reform in science education** that will enable many more young Americans to experience science as a special “way of knowing” about the world.”

Bruce Alberts, Editor-in-Chief, *Science*

“The scientific community is reacting positively to the changes to the AP Biology exam...

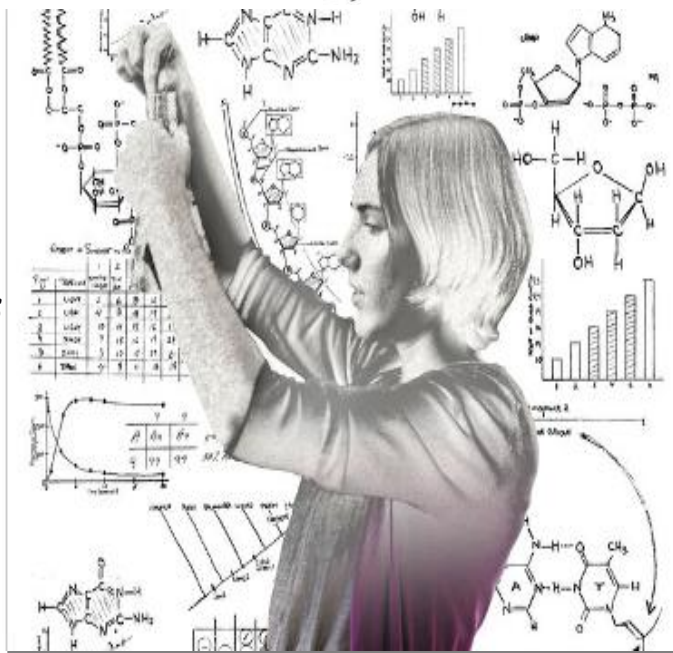
...The changes will **more closely align what goes on during a high school biology course with the current ‘best practices’ for introductory college biology.**”

Steven L’Hernault, Professor and Dept Chair, Emory University

“The College Board took criticisms to heart, and has been **working with hundreds of college professors and high school teachers to develop the new approach.**”

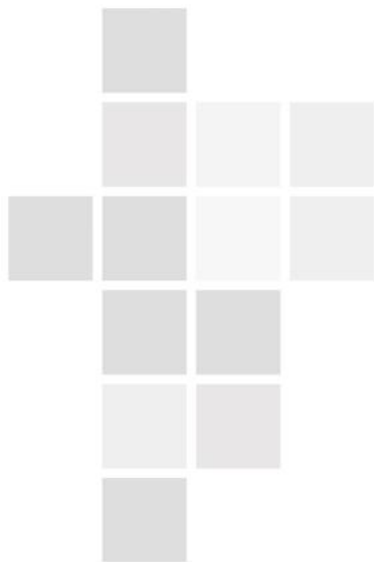
NY Times (Jan 2011)

The New York Times





The redesign and 21st C skills





Partnership for 21st Century Skills

4Cs of Learning and Innovation:

Critical thinking

Communication

Collaboration

Creativity

AP can foster these skills in the context of core knowledge instruction

The *science practices* and *inquiry-based labs* emphasize the 4Cs

Science Practice 1: The student can use representations and models to communicate scientific phenomena and **solve scientific problems**.

Science Practice 3: The student can **engage in scientific questioning** to extend thinking or to guide investigations within the context of the AP course.

Science Practice 4: The student can **plan and implement data collection** strategies appropriate to a particular scientific question.

Inquiry-based Labs: Students **design and conduct their own experiments** based on questions they pose themselves.



AP World Language and Culture courses, launched this fall, incorporate 21st C skills

The “old” AP World Language	The 21 st Century AP World Language
Emphasized learning <i>about</i> the language (memorized)	Students learn to use the language
Focused on isolated language skills	Instruction focuses on integrating skills in the modes of communication
The textbook was the curriculum	Teachers use thematic units and authentic materials
Students learned isolated cultural “factoids”	Students explore relationships between cultural practices, products, and perspectives
Students performed artificial situations from the textbook	Students are given personalized, real-world tasks
Assessment was about finding out what students couldn’t do	Assessment is to find out what students <i>can</i> do with their language skills





The Histories too will include greater emphasis on skills and cognitive strategies

Historical Thinking Skills

Crafting Historical Arguments from Historical Evidence

- Historical argumentation
- Appropriate use of relevant historical evidence

Chronological Reasoning

- Historical causation
- Patterns of continuity and change over time
- Periodization

Comparison and Contextualization

- Comparison
- Contextualization

Historical Interpretation and Synthesis

- Interpretation
- Synthesis

Proposed Course Launch Schedule

2012

- French Language & Culture
- German Language & Culture
- Italian Language & Culture

2013

- Biology
- Latin
- Spanish Literature

2014

- Chemistry
- Spanish Language & Culture

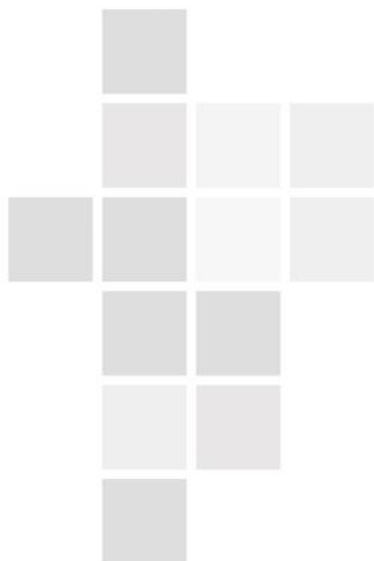
2015

- *US History*
- *Physics B 1*
- *Physics B 2*

To be
confirmed



What do these changes mean for pre-AP?



Activity and Discussion

- Form groups of 2-3, ensuring that your group has a handout with an AP question
- As a group, examine your question(s). Discuss the following:
 - With what skills and preparation must students arrive in AP in order to be prepared by end-of-year for this type of task?
 - How well prepared will students in your school or district be for an AP experience that looks like this?
 - What would you recommend as being “must-haves” for any pre-AP program, going forward, to meet the demands of the new AP?



Questions?

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