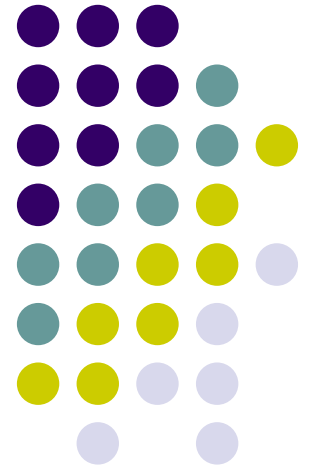


Global Competitiveness

Dr. Cheri Yecke, Ph.D. Chancellor, K-12
Public Schools
January 2007





Historic Milestones

- 1957: Launch of Sputnik
- 1983: Publication of *A Nation at Risk*
- 1995: TIMSS results
- 1999: TIMSS-R results
- 2001: *Road Map for National Security: Imperative for Change*
- 2003: PISA results
- 2007: Where are we in Florida?

1957: Sputnik



“High scholastic standards and standing, academic advancement, studiousness, and career-mindedness were conspicuous themes in our schools... It certainly was no time for youth to do their own thing or to enjoy the privilege of doing nothing.”

A. Tannenbaum, “Pre-Sputnik to Post-Watergate concern about the gifted,”
in *The Gifted: Their Talent and Development* (ed. A.H. Passow),
The 78th Yearbook of the National Society For the Study of Education
(University of Chicago Press: 1979), p. 12.

1983: *A Nation at Risk*

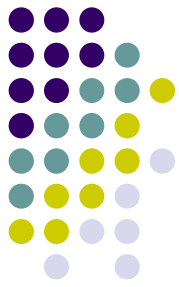


“If an unfriendly foreign power had attempted to impose on America the mediocre educational performance that exists today, we might well have viewed it as an act of war.”

A Nation at Risk: The Imperative for Education Reform, National Commission on Excellence in Education. (Washington, D.C.: U.S. Department of Education, 1983).

TIMSS

Third International Math and Science Study Trends in International Math and Science Study



“It is not the case that some countries only test their best students while we test all ability levels. Every aspect of the sampling and quality control measures is detailed in the international technical report, including response rates and any deviations from the international sampling plans.”

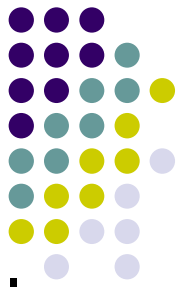
TIMSS 2003 Technical Report, M.O. Martin, I.V.S. Mullis, and S.J. Chrostowski (Eds.), 2004. Chestnut Hill, MA: Boston College.



1995 TIMSS Math

- U.S. fourth grade students were at the international average.
- Eighth grade students in 27 other countries scored higher than U.S. students, with statistically significant differences in 20 of these countries.

Mathematics and Science Education in the Eighth Grade: Findings from the Third International Mathematics and Science Study, National Center for Educational Statistics, statistical analysis report, (July, 2000). See also *Highlights from TIMSS: Overview and Key Findings Across Grade Levels*, Office of Educational Research and Improvement (Washington, D.C.: U.S. Department of Education, 1999), NCES document 1999-081.



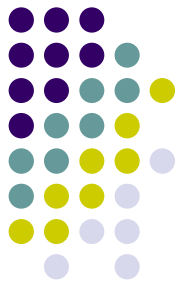
1995 TIMSS Science

- U.S. fourth graders scored above the international average in science but by eighth grade their performance started to fall behind.
- Eighth grade students from 16 other countries registered higher performance, and for 9 this difference was statistically significant.

Mathematics and Science Education in the Eighth Grade: Findings from the Third International Mathematics and Science Study, National Center for Educational Statistics, statistical analysis report, (July, 2000). See also *Highlights from TIMSS: Overview and Key Findings Across Grade Levels*, Office of Educational Research and Improvement (Washington, D.C.: U.S. Department of Education, 1999), NCES document 1999-081.

Decision:

Re-administer the TIMSS assessment in 1999



Why?

- The standards and accountability movement had started in the early 1990s, and it was believed that the benefits had accrued only to elementary students.
- Re-administering the TIMSS in 1999 would show the impact of higher standards on those same 4th graders, who would have been under the new standards for 4 more years.



1999 TIMSS-R Math

- Although the 1995 math scores of U.S. fourth graders were at the international average, by 1999 their scores as eighth graders were *22 points below* the international average.

Mathematics and Science Education in the Eighth Grade: Findings from the Third International Mathematics and Science Study, National Center for Educational Statistics, statistical analysis report, (July, 2000). See also *Highlights from TIMSS: Overview and Key Findings Across Grade Levels*, Office of Educational Research and Improvement (Washington, D.C.: U.S. Department of Education, 1999), NCES document 1999-081.

1999 TIMSS-R Science



- The results in science were even more dramatic.
- In 1995, U.S. fourth graders scored 28 points above the international average, but in 1999, the scores of eighth graders had dropped to 9 points below the international average--*a full 37-point decline.*

Pursuing Excellence: Comparisons of International Eighth Grade Mathematics and Science Achievement from a U.S. Perspective, 1995 and 1999, Initial Findings from the Third International Mathematics and Science Study – Repeat, Office of Educational Research and Improvement (Washington, D.C.: U.S. Department of Education, December 2000), p. 41-42.

Expert Reaction



“The results are quite startling: We are at the bottom of the international distribution. In the past, when international results have been reported, many people have suggested, ‘It’s really not a problem because our best students are doing okay. This is really about those ‘other’ kids in the cities who are pulling our averages down. Everything is really okay at our best schools....’



...That's simply not true: **Even our best students are not world class.** The problems we must address affect not only our average kids, but even our best kids.”

W. Schmidt, “The implications of TIMSS for teacher quality,” in *Shaping the Profession that Shapes the Future: Speeches from the AFT/NEA Conference on Teacher Quality* (1998, emphasis added), pp. 48 and 49.

2001: Road Map for National Security: Imperative for Change



The authors of this report recommend requiring **“higher levels of proficiency for all high school students,”** which will mean **“changing enduring perceptions that taking four years of science and math in high school is only for the brainy elite.”**

Clinging to that perception, according to the authors, would result in a disaster for this country.



“American national leadership must understand these deficiencies as threats to *national security*. **In the next quarter century, we will likely see ourselves surpassed, and in relative decline, unless we make a conscious national commitment to maintain our edge.**”

Road Map for National Security: Imperative for Change, The Phase III Report of the U.S. Commission on National Security/21st Century (February 15, 2001), p. iv.

Program for International Student Assessment (PISA)



PISA Math 2003

- The U.S. score was below the average score for industrialized nations.
- The U.S. ranked 24th out of 29 nations in this category.

- **PISA Problem Solving 2003**

- The U.S. score was below the average score for industrialized nations.
- The U.S. ranked 24th out of 29 nations in this category.



What do students say?

A Public Agenda study from 1997 revealed the following:

- 65% of students readily admit they could do much better in school if they tried.
- 75% think students should only pass if they have learned the required materials.
- 79% say they would learn more if schools enforced being on time, along with the completion of homework.



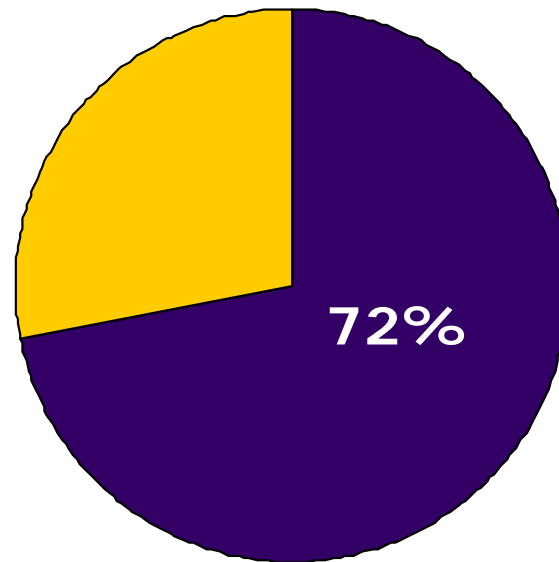
When asked whether they thought that students would pay greater attention and study harder if they were required to learn more and be tested in order to graduate, vast majorities of students answered “yes:”

- 79% of all students
- 65% of the hard core disengaged students
- 74% of white students
- 80% of African American students
- 82% of Hispanic students
- 71% of adults



Current students agree

Percentage of students who feel strongly that they would have worked harder if schools had demanded more of students, set higher academic standards and raised course requirements for graduation



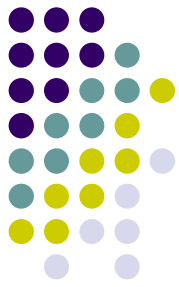
Source: The Horatio Alger Association of Distinguished Americans, *The State of Our Nation's Youth, 2005–2006*, 2005.

“Nerd Harassment”



Students who were 1.5 SDs above the mean (93rd percentile) on GPA and academic commitment indices were harassed 42 percent more than the baseline student.

John Bishop, An Economic Theory of Nerd and Slacker Harassment and its Role in Enforcing Social Norms in Schools, Center for Advanced Human Resource Studies, Cornell University, 2003.



Incidents of such harassment were *greater* for:

- Honors students
- Students with many study halls
- Students that took accelerated courses in middle school.
- Students who reported having a strong “anti-learning” crowd in middle school.

Changing the Culture: External Measures



“Schools cannot ignore nerd harassment in that it poisons the pro-learning environment that educators are trying to establish... Schools must vigorously defend the position that school is first and foremost about learning and students are expected to work hard.”

John Bishop, *An Economic Theory of Nerd and Slacker Harassment and its Role in Enforcing Social Norms in Schools*, Center for Advanced Human Resource Studies, Cornell University, 2003.



The Role of Exit Exams

“If, by contrast, students are gauged by an outside standard, they no longer have a personal interest in getting teachers off track or persuading one another to refrain from studying.”

*John Bishop, “A Steeper, Better Road to Graduation,”
Education Next, Winter 2001.*

Curriculum-Based External Exit Exams Improve Performance (Figure 1)

Studies show that students in countries and states that require students to pass curriculum-based external exit exams in order to graduate learn more than their peers who do not take such exams.

Gains for students who take exit exams, expressed in grade-level equivalents

National Assessment of Educational Progress, Math
(New York and North Carolina as compared with other states, 1998)

0.4

National Assessment of Educational Progress, Science
(New York and North Carolina as compared with other states, 1998)

0.5

International Assessment of Educational Progress,
Math and Science (Canada, 1991)

0.5

National Assessment of Educational Progress, Reading
(New York and North Carolina as compared with other states, 1998)

0.7

International Assessment of Educational Progress, Science
(15 nations, 1991)

0.7

International Assessment of Educational Progress, Math
(15 nations, 1991)

2.0

International Assessment for the Evaluation of Educational
Achievement, Reading (24 nations, 1990)

1.0

Third International Math and Science Study, Math
(40 nations, 1995)

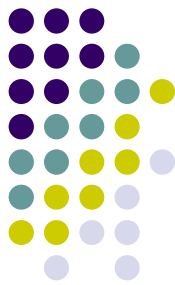
1.0

Third International Math and Science Study, Science
(40 nations, 1995)

1.3

All results are significant at the $p < 0.05$ level, with the exception of the International Assessment of Educational Progress, Science. Numbers are rounded to the nearest 0.1

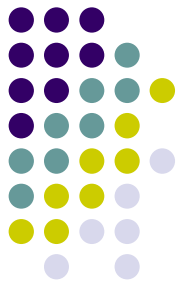
SOURCE: Author's estimates from these datasets



Changing the Culture: Increase the Level of Rigor



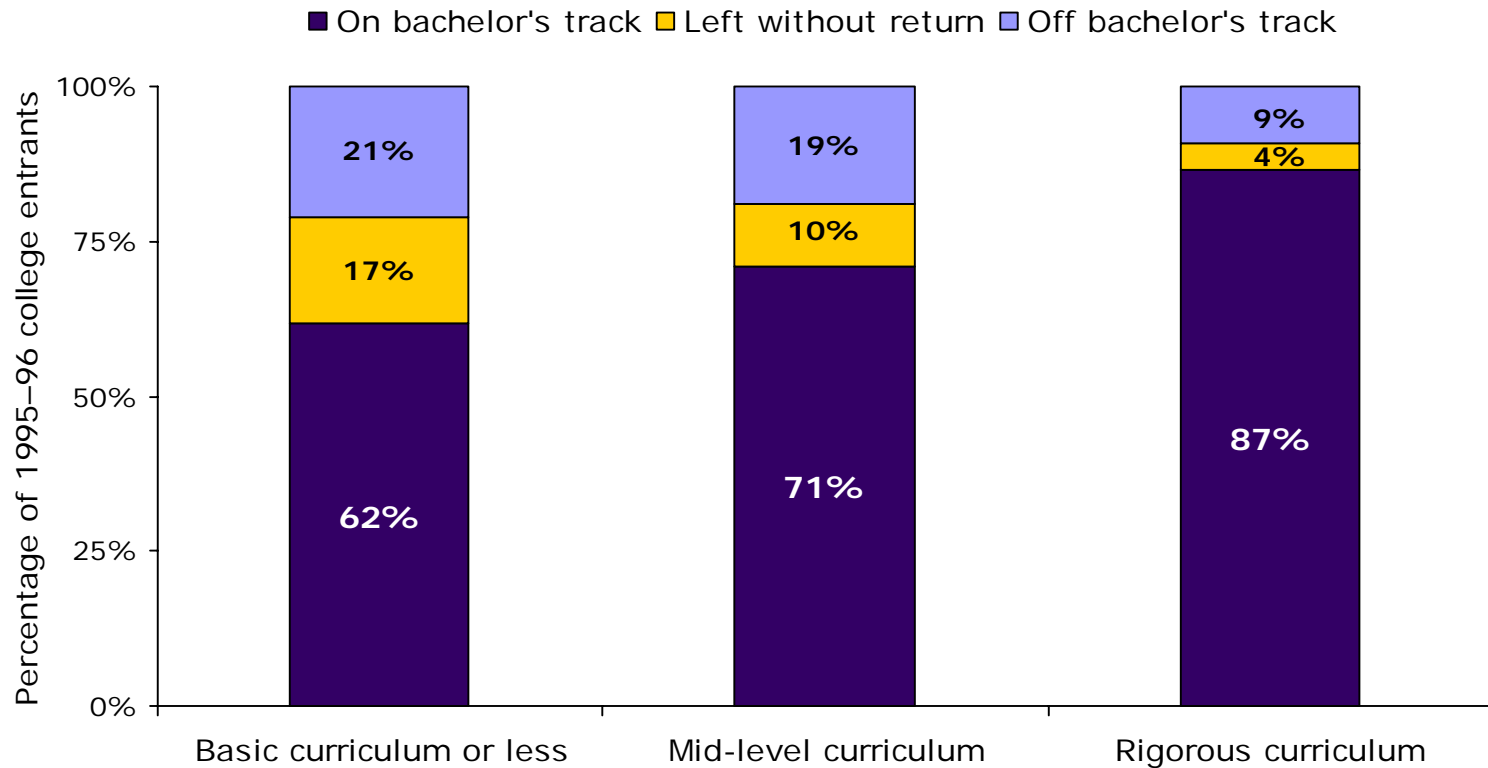
- The impact of a high school curriculum of **high academic intensity and quality** on degree completion is far more pronounced—and positively—for African-American and Latino students than *any other* pre-college indicator of academic resources.
- Finishing a course beyond the level of Algebra 2 (for example, trigonometry or pre-calculus) more than **doubles** the odds that a student who enters postsecondary education will complete a bachelor's degree.



- Students from the **lowest** two SES quintiles who are also in the **highest** Academic Resources quintile earn bachelor's degrees at a higher rate than a majority of students from the top SES quintile.

Adelman, C. 1999. *Answers in the Tool Box: Academic Intensity, Attendance Patterns, and Bachelor's Degree Attainment*. Washington, DC: U.S. Department of Education

Students who had a rigorous high school curriculum are more likely to earn a bachelor's degree

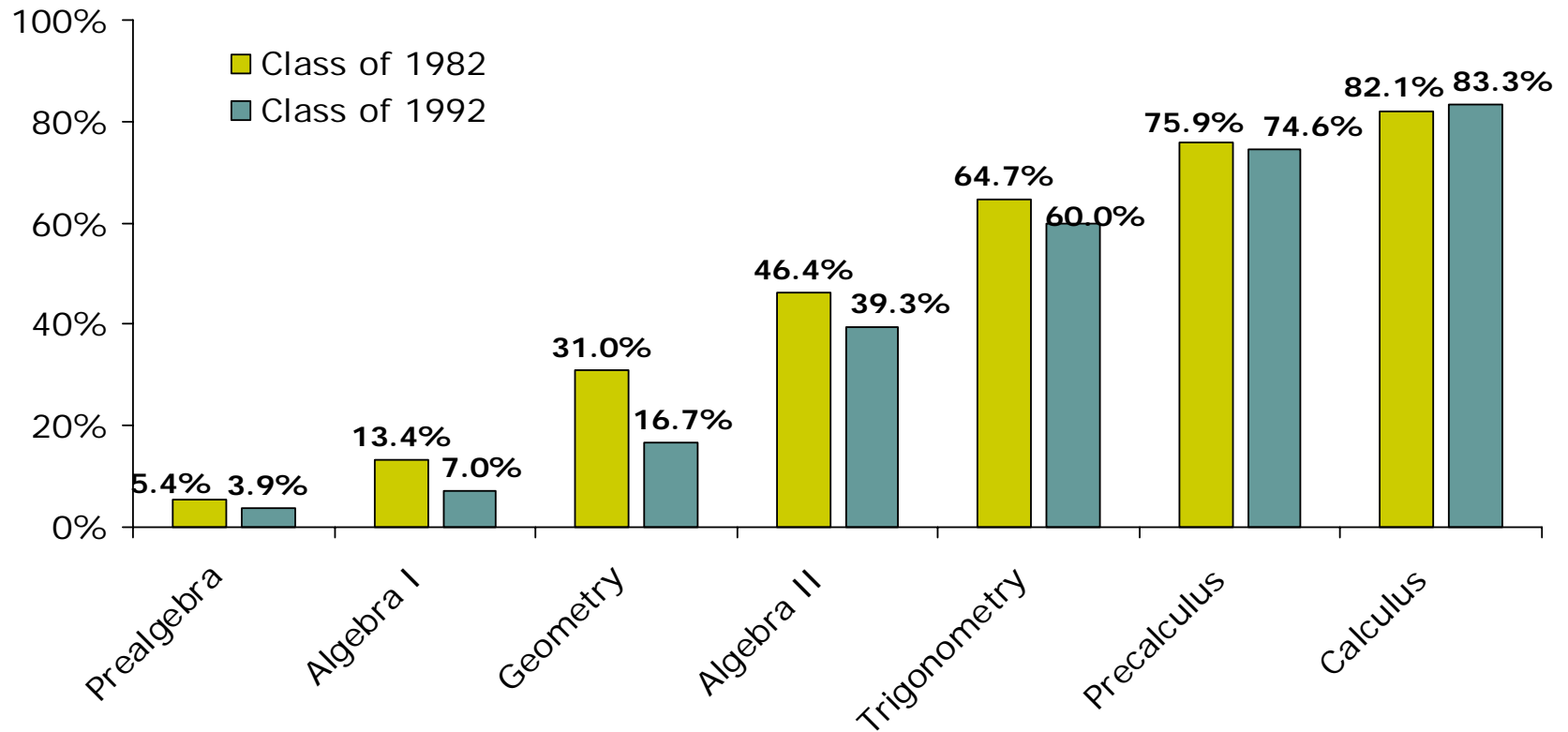


Source: Adapted from Horn, L. and Kojaku, L.K. *High School Academic Curriculum and the Persistence Path through College: Persistence and Transfer Behavior of Undergraduates Three Years after Entering Four-year Institutions*, National Center for Education Statistics, 2001.

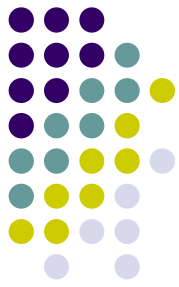
Students who had a rigorous high school curriculum are more likely to earn a bachelor's degree



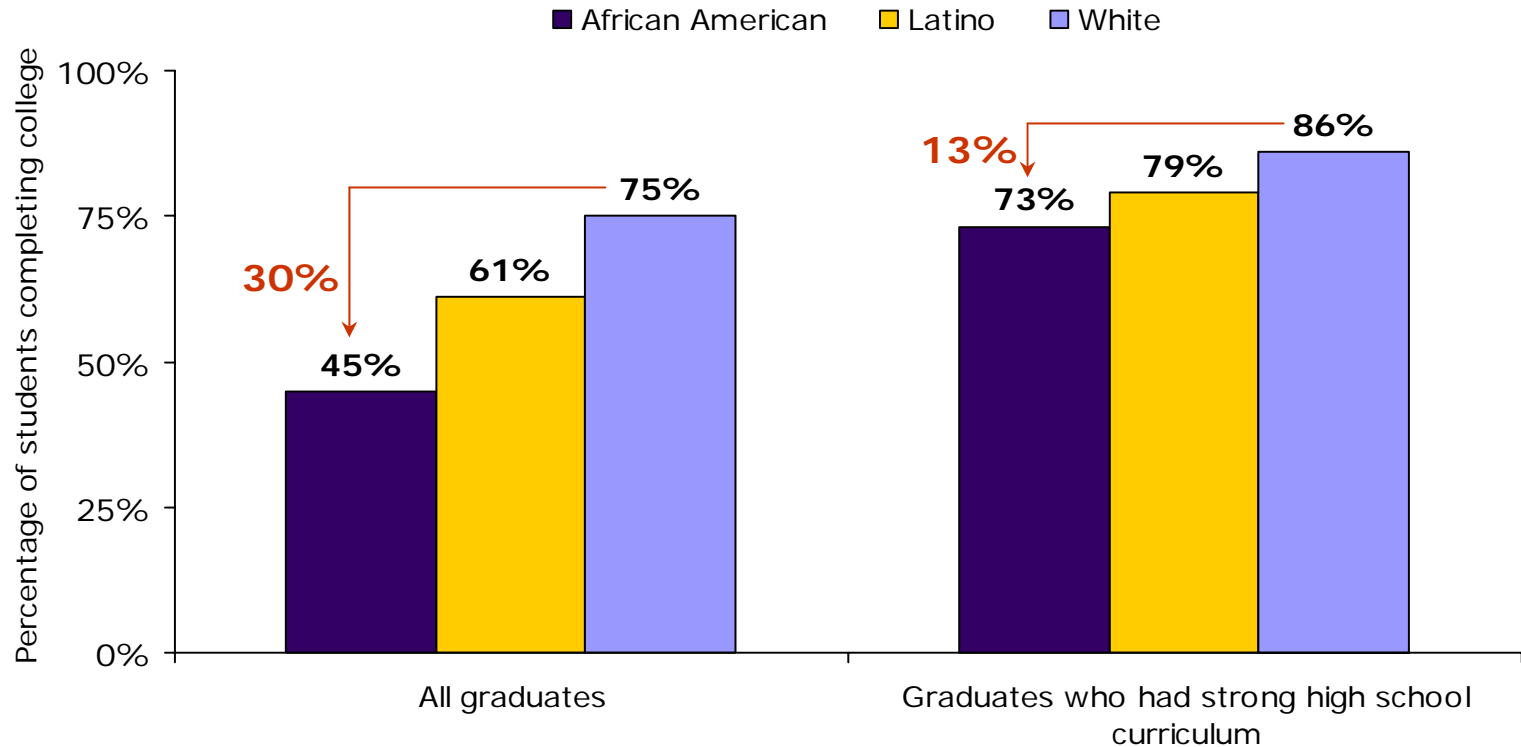
Bachelor's degree attainment by highest level of math reached, high school classes of 1982 and 1992



Source: Adelman, Clifford, *The Toolbox Revisited: Paths to Degree Completion from High School through College*, Table 5, U.S. Department of Education, 2006.



Taking challenging courses closes college completion gap between whites and minorities



Source: Adelman, C. *Answers in the Tool Box: Academic Intensity, Attendance Patterns, and Bachelor's Degree Attainment*, U.S. Department of Education, Office of Educational Research and Improvement, 1999.

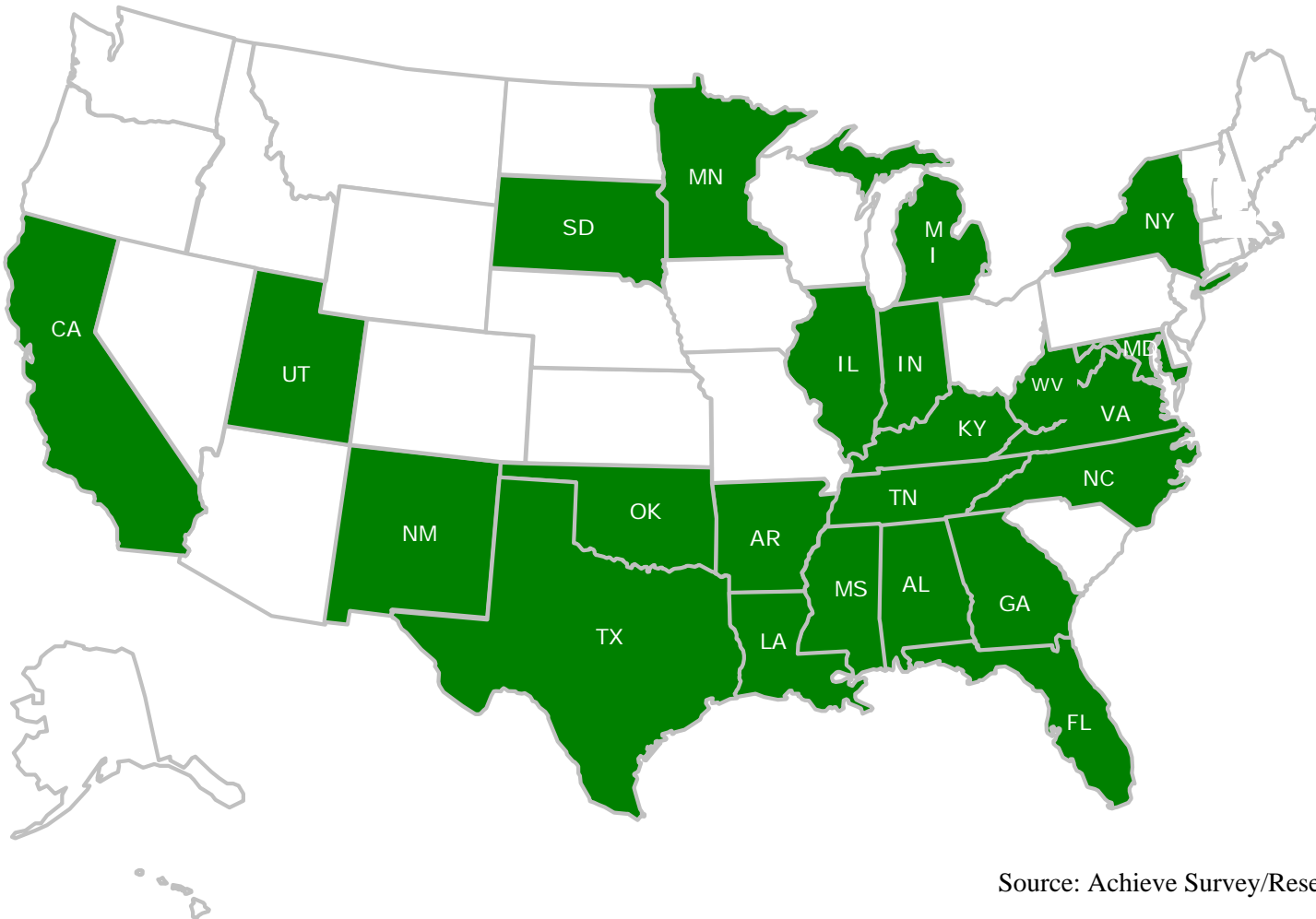
Florida High School Graduation Requirements



- New requirements for the Class of 2011:
 - High School Major
 - An area of specialization
 - Districts will develop majors and submit to the State Board of Education for approval
 - Extra year of math; Algebra I required

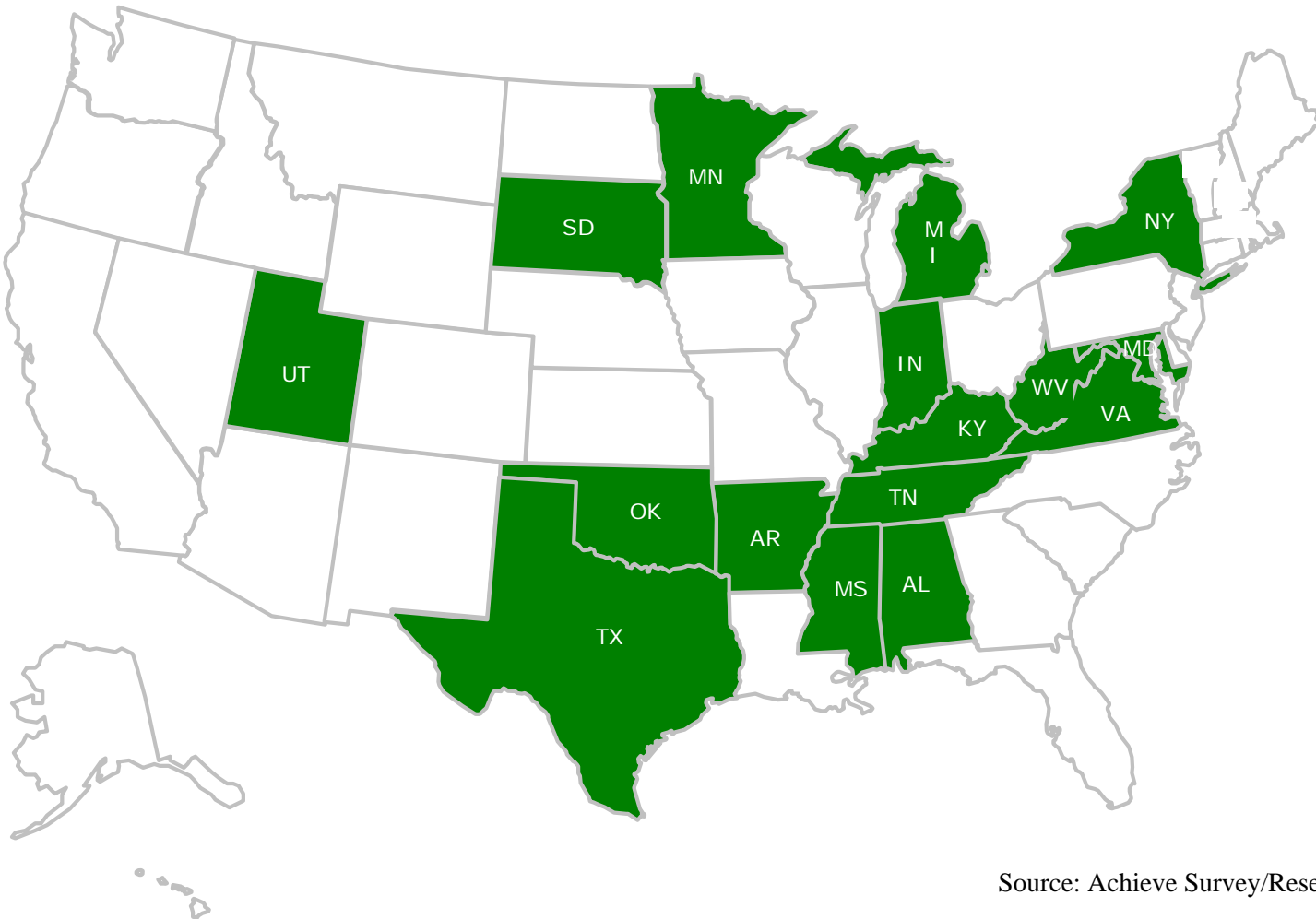
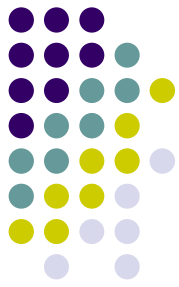
<http://public2.fldoe.org/HSMajors/Secure/mainmenu.aspx>

23 states require Algebra I



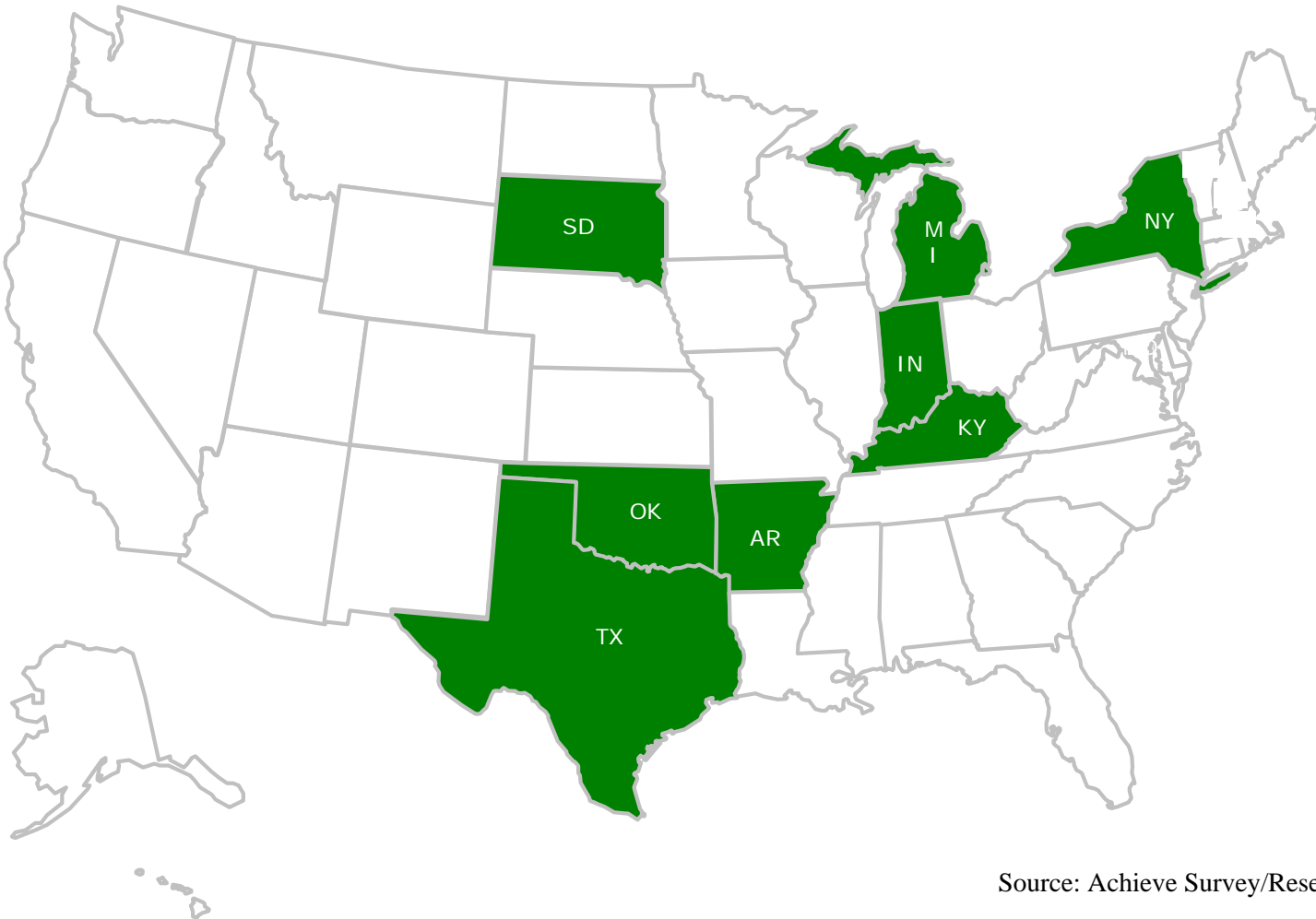
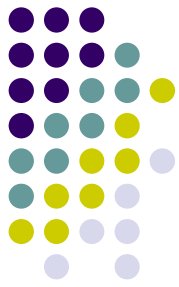
Source: Achieve Survey/Research, 2006.

16 states require Geometry



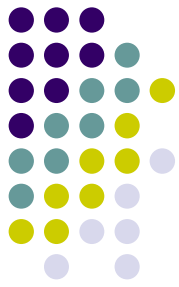
Source: Achieve Survey/Research, 2006.

Eight states require Algebra II



Source: Achieve Survey/Research, 2006.

Won't tougher standards increase the drop out rate?

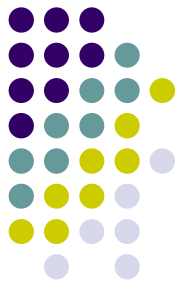


Conventional wisdom says that students will drop out if school is made more difficult.

- This is ***not*** what drop-outs themselves say:
 - 47 percent said classes were not interesting
 - 69 percent said they were not motivated or inspired to work hard.

*“The Silent Epidemic: Perspectives of High School Drop Outs.”
A report by Civic Enterprises in association with Peter D. Hart Associates for
the Bill & Melinda Gates Foundation,
March 2006.*

Won't tougher standards increase the drop out rate?



Conventional wisdom says that students will drop out if school is made more difficult.

- This is ***not*** what drop-outs themselves say:
 - 42 percent said they were not learning enough
 - 76 percent said school was boring

*Identifying Potential Drop Outs:
Key Lessons for Building an Early Warning System –
A Dual Agenda of High Standards and High Graduation Rates,”
34
Prepared for Achieve, Inc. by Craig D. Jerald, June 2006*

Won't tougher standards increase the drop out rate?



- This is ***not*** what the research says:

Singapore:

In 1980, the drop out rate was 19%. After increasing the level of rigor and ratcheting up the difficulty of national exit exams, the dropout rate plummeted to 3%.

“Overview of Singapore’s Education System,” presentation by Poon Chew Ling, education official with the Singapore Ministry of Education, in Washington, D.C, September 9, 2002.

Won't tougher standards increase the drop out rate?



- This is ***not*** what the research says:

California:

- All California high schools were studied for the effect of an increase in course difficulty on economically disadvantaged students. The study concludes:
“The results of this study do not support the hypothesis that higher levels of achievement or academic course enrollment are associated with higher dropout rates.”

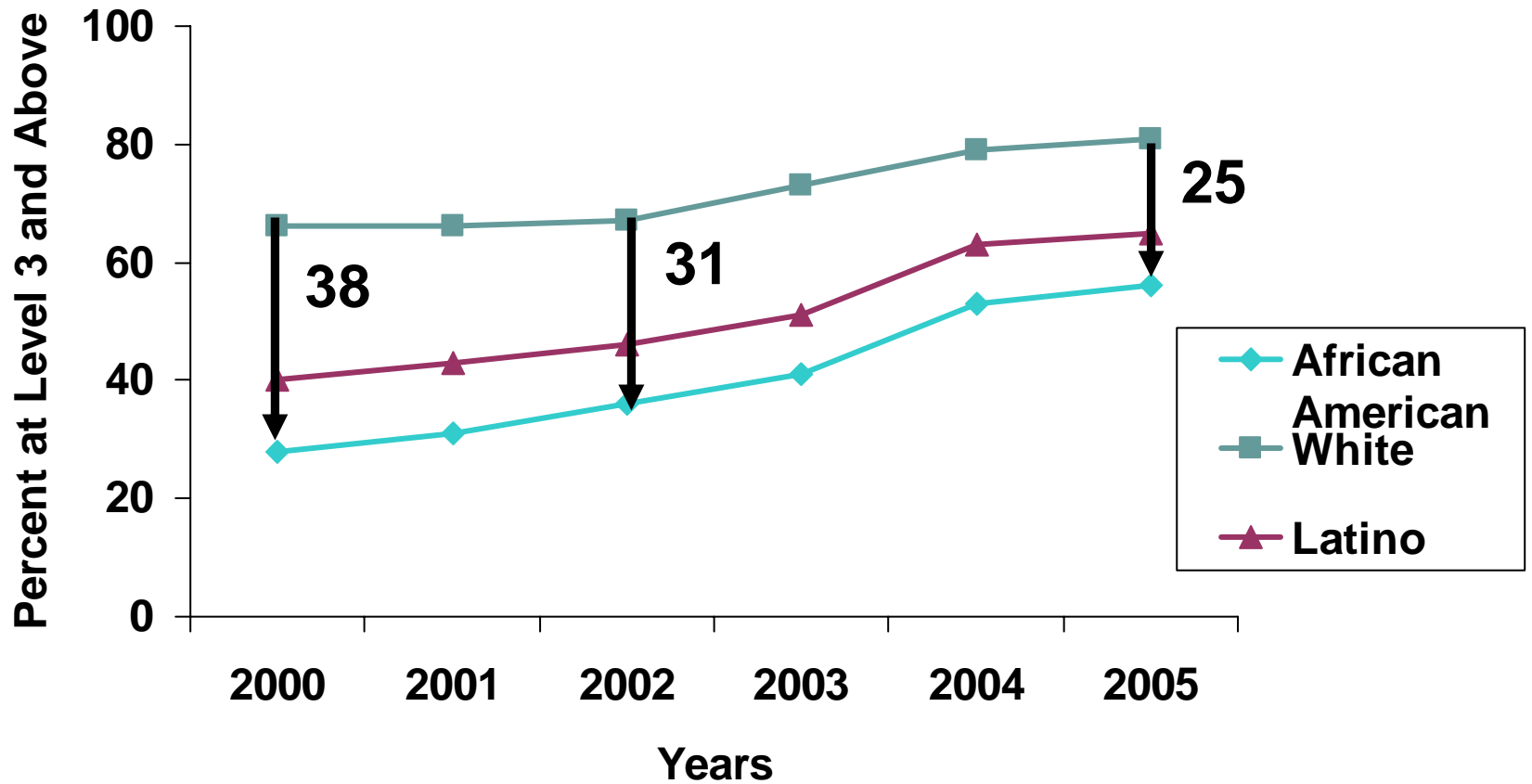
Won't tougher standards increase the drop out rate?



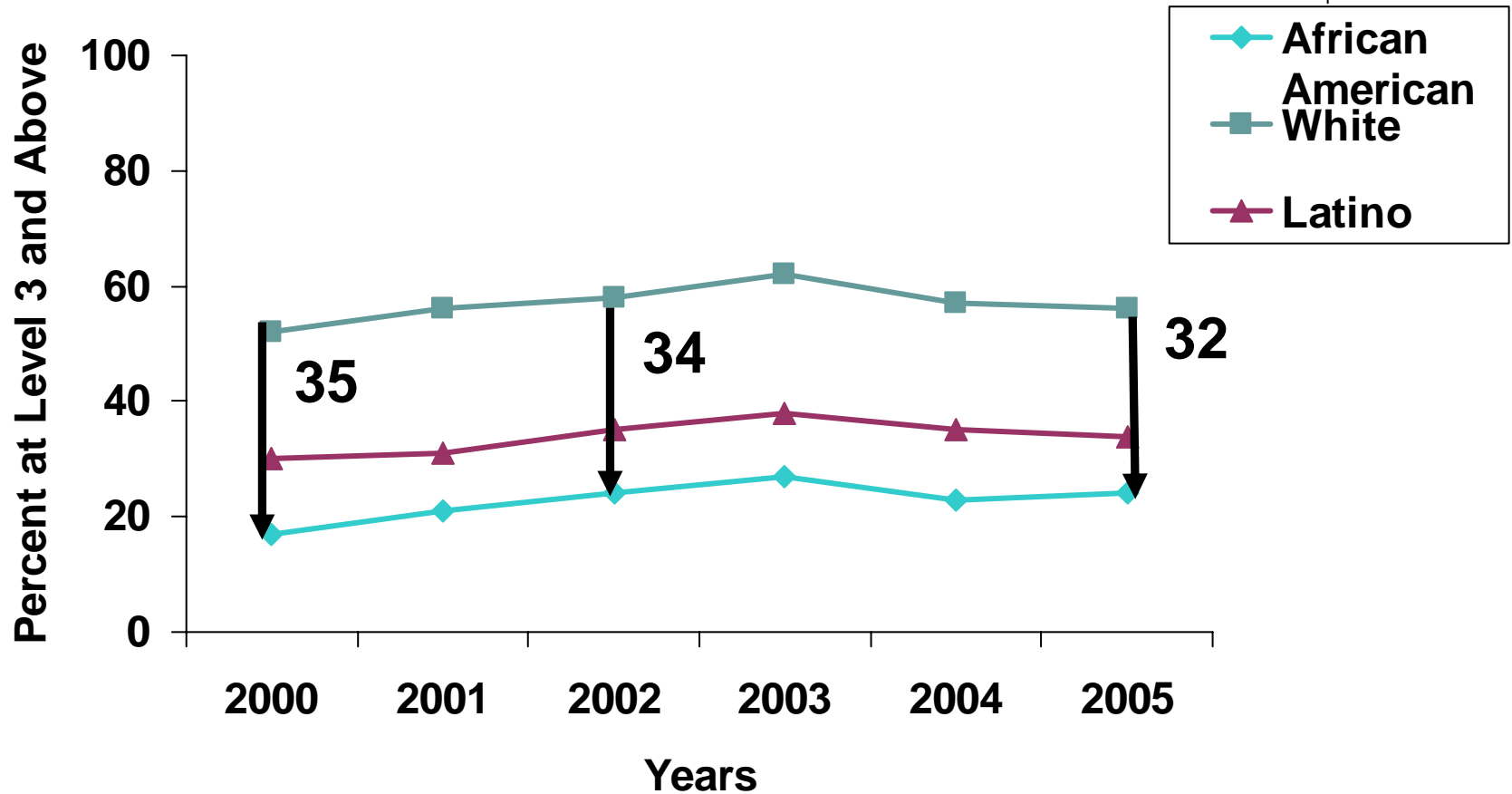
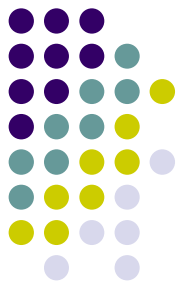
“Although non-school socioeconomic and demographic factors are associated with drop out rates, they should not be offered as an excuse for defeatism. It is incorrect to draw the conclusion that educators can do little about poverty and therefore may live with the associated problem... ***the effects of poverty can be fought.***”

M. Felter (1989). “School drop out rates, academic performance, size and poverty: Correlates of educational reforms, Educational Evaluation and Policy Analysis, vol. 11, no. 2 (emphasis added).

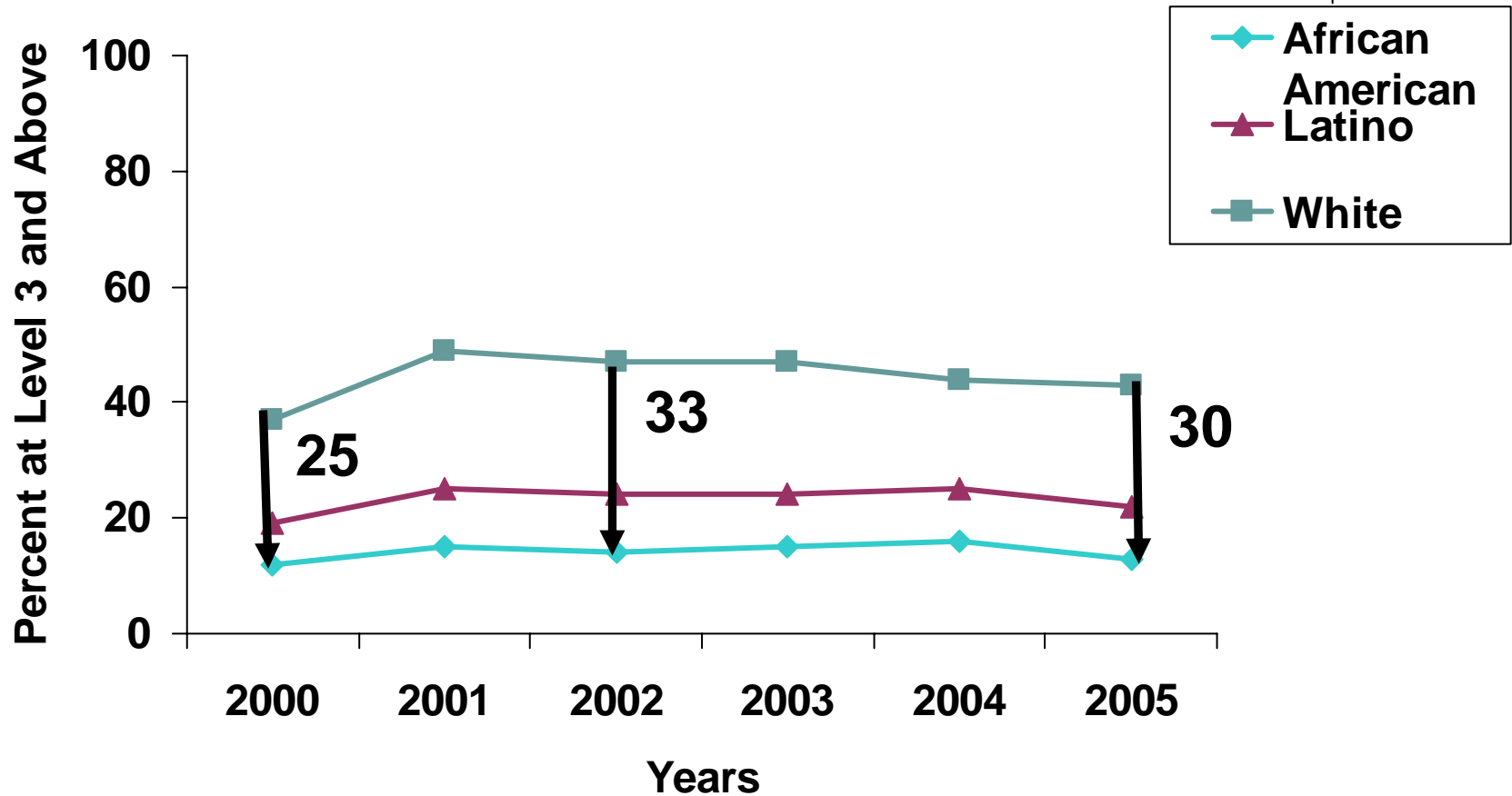
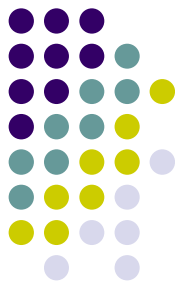
Florida Comprehensive Assessment Test Grade 4 Reading Disaggregated by Race/Ethnicity



Florida Comprehensive Assessment Test Grade 8 Reading Disaggregated by Race/Ethnicity



Florida Comprehensive Assessment Test Grade 10 Reading Disaggregated by Race/Ethnicity



What would be the economic value in closing the achievement gap in Florida?



“If all ethnic groups had the same educational attainment and earnings as whites, total personal income in the state would be about **\$15.3 billion** higher, and the state would realize an estimated **\$5.4 billion** in additional tax revenues.”

Measuring Up: The State Report Card on Higher Education
(National Center for Public Policy and Higher Education, 2004).



Selected Sources

- Education Trust: <http://www.edtrust.org>
- Public Agenda: <http://www.publicagenda.org>
- Achieve, Inc: www.achieve.org
- TIMSS: <http://nces.ed.gov/timss/>
- PISA: <http://nces.ed.gov/Surveys/PISA/>
- The War Against Excellence:
<http://www.waragainstexcellence.com/>