

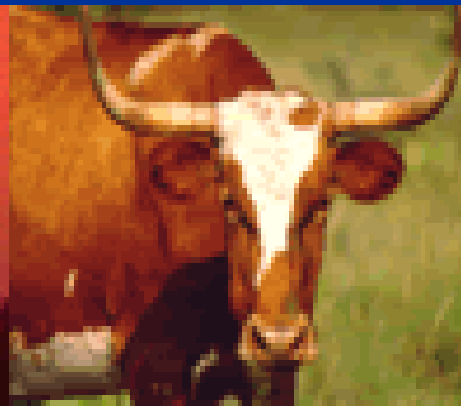
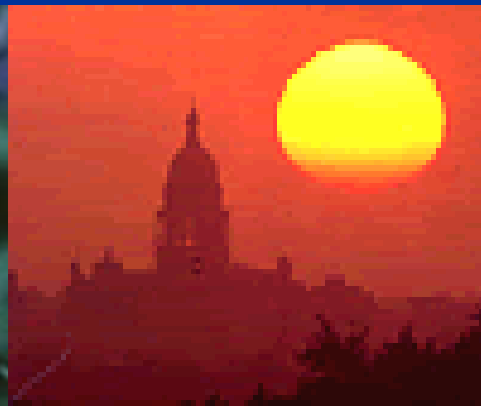


TEXAS EDUCATION AGENCY

The State of Science Education in Texas

Kenn Heydrick, Ed.D.

Director of Science



THANKS to YOU!

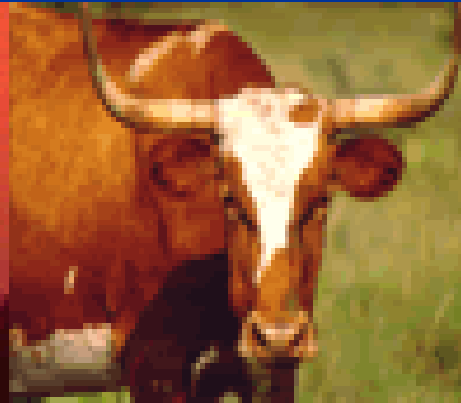


Texas Regional Collaboratives for Excellence in Science and Mathematics Teaching

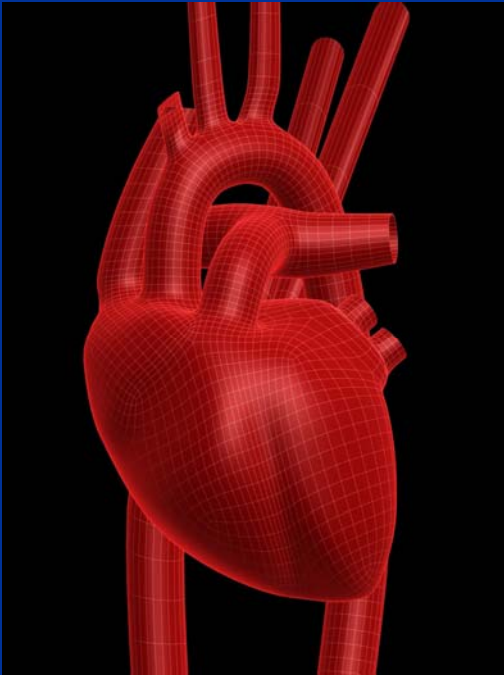
14th Annual Meeting - July 9, 2008 - Austin

The State of Science Education in Texas

1. Science TEKS Revisions
2. Assessments – TAKS and EOCs
3. Statewide Data Analysis
4. Graduation Requirements
5. College Readiness Standards
6. NAEP
7. Goals for Science Education



Science TEKS Revisions



Science TEKS Revisions

- **State Board of Education (SBOE) members nominated educators to serve on review committees.**
- **SBOE oversees all aspects of the TEKS, including the revision process.**
- **The SBOE will consider the Science timeline at an upcoming meeting.**

Science TEKS Committees

- **Spring 2008**
 - **Science review committee members have met.**
 - **K-8 Team: Since January, ongoing**
 - **9-12 Team: Since January, ongoing**
 - **Earth & Space Science: Since April, ongoing**
 - **Engineering: Since April, ongoing**

Proposed Science TEKS Revision Process

- **Action Item for July SBOE Meeting**
 - **Refinement** – Science work group members continue work. Finalize recommendations of the revised Science TEKS for their grade level or subject.
 - **K-12 Alignment** – A meeting with work group members will ensure K-12 alignment of TEKS.

Proposed Science TEKS Revision Process

- **Action Item for July SBOE Meeting**
 - **Informal Field Review** – Draft Science TEKS posted in an online survey format. Solicit comments and suggestions.
 - **Expert Content Review** – National experts review proposed Science TEKS.

Proposed Science TEKS Revision Process

- **Action Item for July SBOE Meeting**
- **Recommendation for Spring 2009**
 - **1st Reading of proposed Science TEKS provided to SBOE.**
 - **2nd and Final Reading of the proposed Science TEKS provided to SBOE.**

Proposed Science TEKS Implementation

- **Spring / Summer 2009 and Ongoing**
 - Professional development begins
- **Fall 2010**
 - Implementation of New Science TEKS
- **Fall 2011**
 - Implementation of New Online College Readiness Student Materials

Proposed Science TEKS Implementation

- **Fall 2011 – Spring 2012**
 - **Districts Review and Select Science Instructional Materials from Proclamation 2012**
- **Fall 2012**
 - **New Science Instructional Materials in Schools**

Graduation Plans



Support for 4x4 Graduation Plans

Recommended High School Program (RHSP)

- **Students must take:**
 - **1 credit of biology,**
 - **2 credits from IPC, chemistry, or physics (or PT 1),**
 - **1 credit from approved lab-based courses**
- **IPC is an option for schools until 2011-2012. For students who enter Grade 9 in 2012-13, IPC will no longer count as one of the four science credits.**

Support for 4x4 Graduation Plans

Distinguished Achievement Program (DAP)

- Students must take:
 - 1 credit of biology,
 - 1 credit from chemistry,
 - 1 credit from physics (no Principles of Technology I),
 - 1 credit from approved lab-based courses
- Advanced Measures focus on student performance at the college or professional level
 - Original research or project
 - Test data (AP, IB, PSAT)
 - College courses

2 New Science Options

- **Earth and Space Science**
 - *Will replace Geology, Meteorology, & Oceanography (GMO)*
- **Engineering**

TEKS for these new courses will be available to teach in fall 2009. But, please understand that the new science adoption will not have instructional materials available until fall 2012.



Staffing science departments and having sufficient science lab rooms will be ongoing critical issues.

Also, we need to help the public and community understand the benefits of having students complete four years of science.



Assessments:

TAKS & End-of-Course Exams



2009 Assessments: *TAKS & End-of-Course Exams*

- | | |
|------------------|--|
| April 30 | Science TAKS, Grades 5, 8, 10, Exit Level |
| May 1 | LAT Science, Grades 5, 8, 10 |
| May 4-22 | Physics End-of-Course Exam Online Field Test Window |
| May 11-29 | End-of-Course Exam Online Tests (optional);
Biology and Chemistry |

End-of-Course (EOC) Exams

- High school TAKS will be slowly phased-out and replaced with EOC exams in:
 - **Biology**
 - **Chemistry**
 - **Physics**
- Freshman class of **2011-2012** is first group to have EOC as graduation requirement.
- Specific minimal and cumulative scores have been determined for high school graduation.

EOC Assessments Implementation Plan

EOC Exam	Spring 2007	Spring 2008	Spring 2009	Spring 2010	Spring 2011	Spring 2012
Biology	Field Test	Operational	⇒ ⇒ ⇒	⇒ ⇒ ⇒	⇒ ⇒ ⇒	⇒ ⇒ ⇒
Chemistry		Field Test	Operational	⇒ ⇒ ⇒	⇒ ⇒ ⇒	⇒ ⇒ ⇒
Physics			Field Test	Operational	⇒ ⇒ ⇒	⇒ ⇒ ⇒

Science TAKS Results

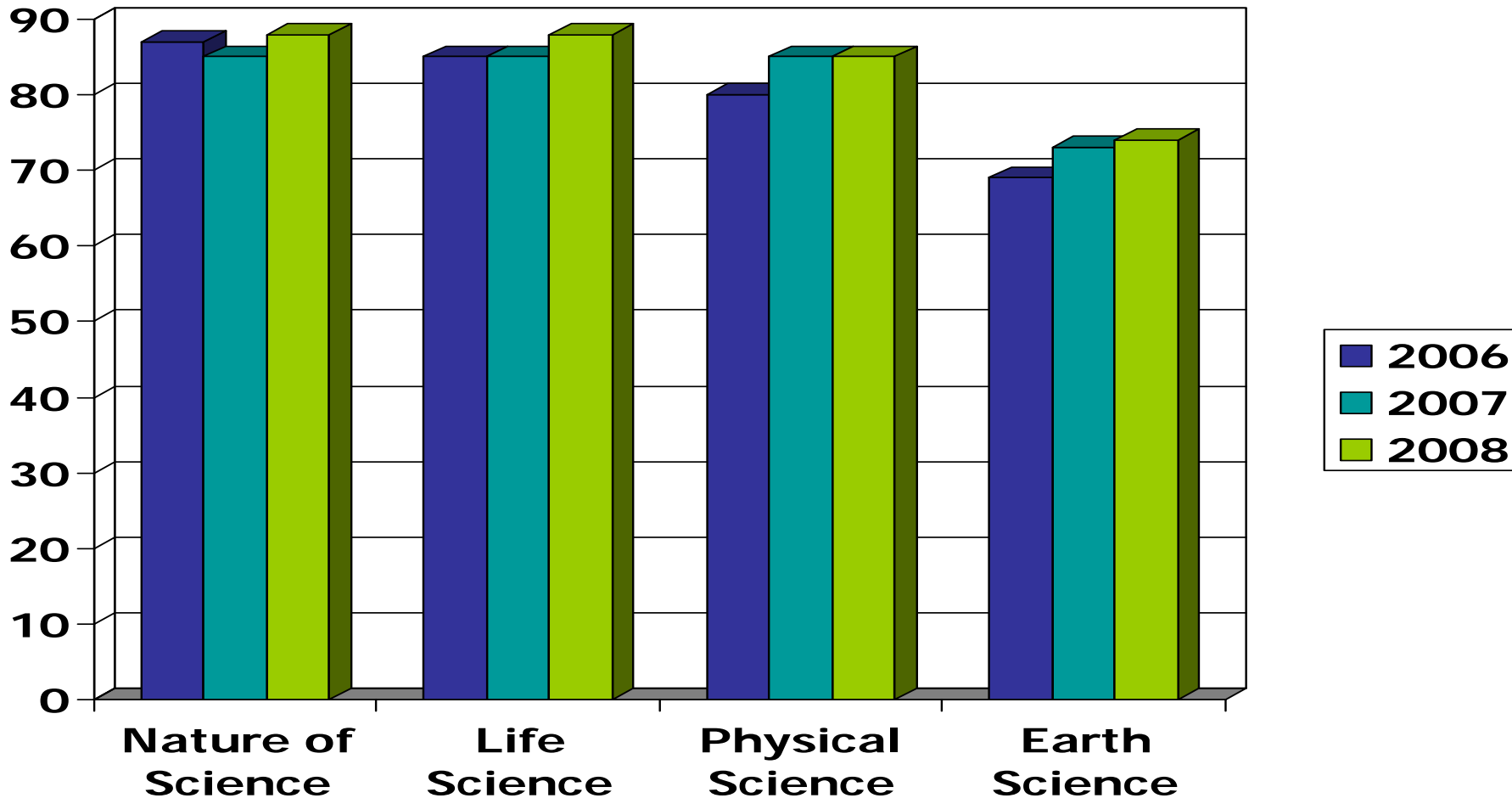


5th Grade Science TAKS

All Students	2006	2007	2008 (Prelim)
Statewide Met Standard	75 – English	77 – English	81 – English
Statewide Commended	24 – English	31 – English	37 – English
Average Scale Score	2202 – English	2251 – English	2271 – English

5th Grade TAKS Items % Correct by Objectives

All Students: Spring 2008 (Preliminary)

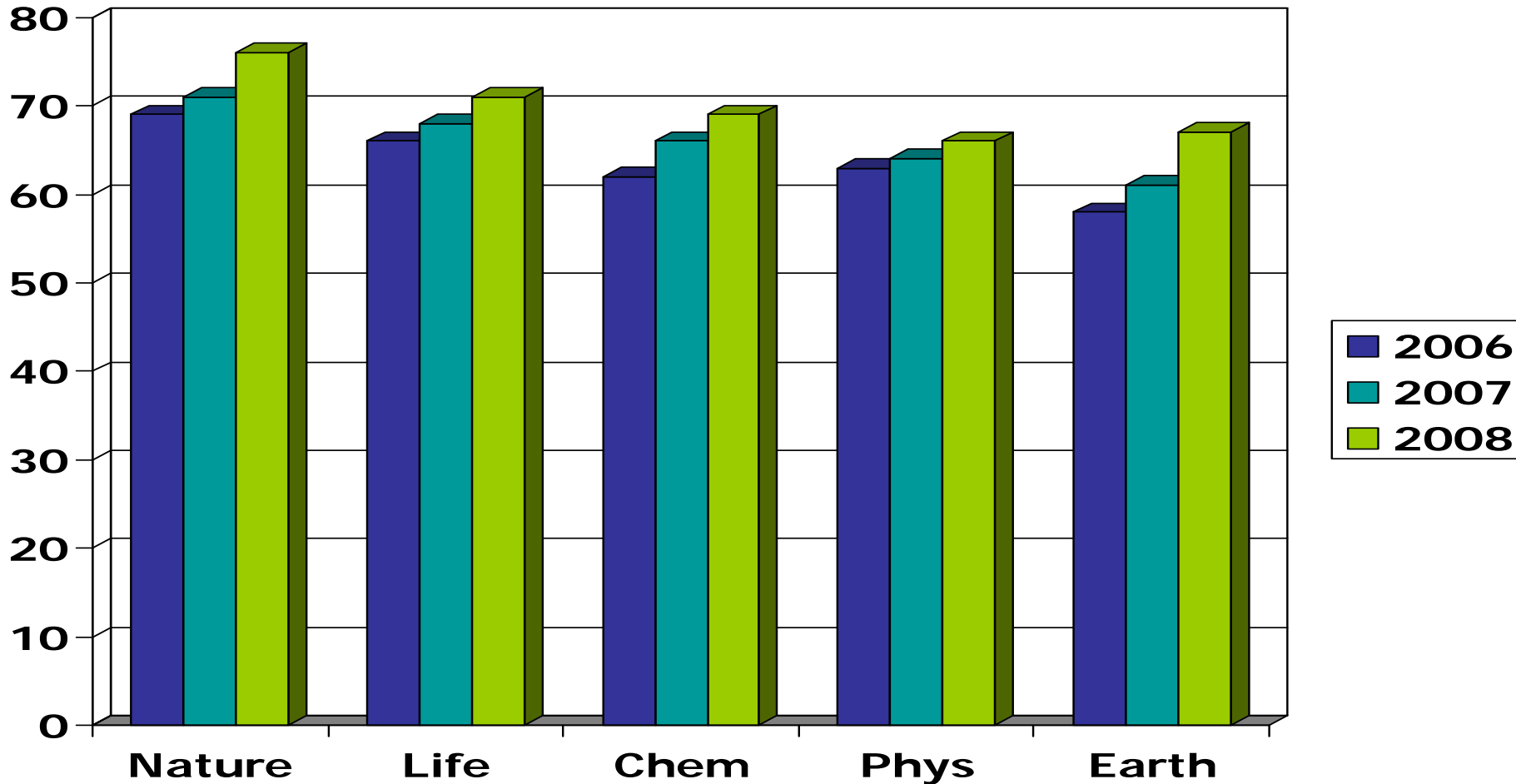


8th Grade Science TAKS

All Students	2006 2 SEM Below	2007 1 SEM Below	2008 Panel Rec.
Statewide Met Standard	71 – English	70 – English	68 – English
Statewide Commended	12 – English	17 – English	22 – English
Average Scale Score	2112 – English	2149 – English	2199 – English

8th Grade TAKS Items % Correct by Objectives

2006 - 2008 (Preliminary)

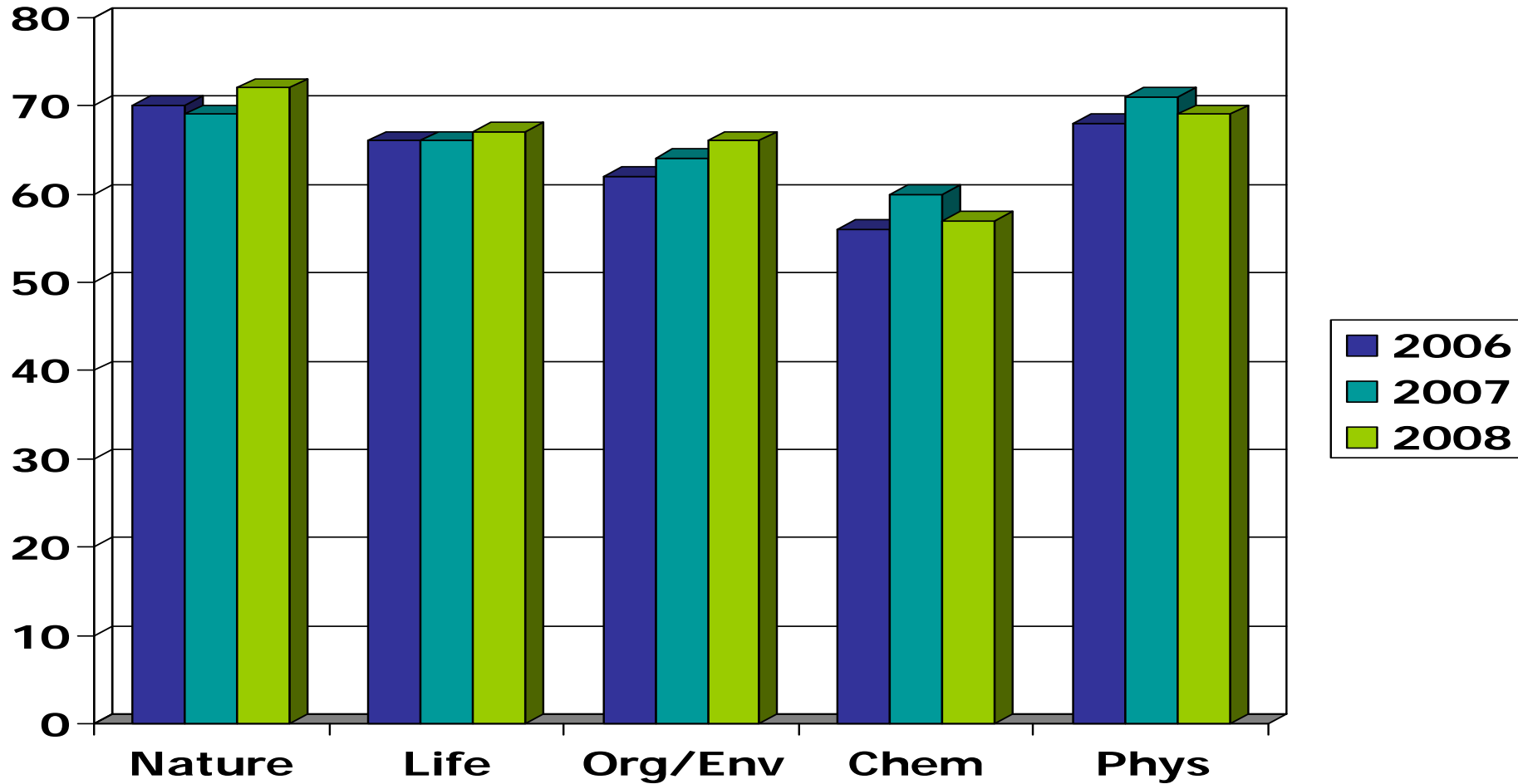


10th Grade Science TAKS

All Students	2006	2007	2008 (prelim)
Statewide Met Standard	60 – All 33 – SpecEd	58 – All 28 – SpecEd	64 – All 24 – SpecEd
Statewide Commended	11 – All 4 – SpecEd	11 – All 3 – SpecEd	14 – All 2 - SpecEd
Average Scale Score	2138 – All 2028 – SpecEd	2148 – All 2028 – SpecEd	2158 – All 1992 – SpecEd

10th Grade TAKS Items % Correct by Objectives

2006 - 2008 (Preliminary)

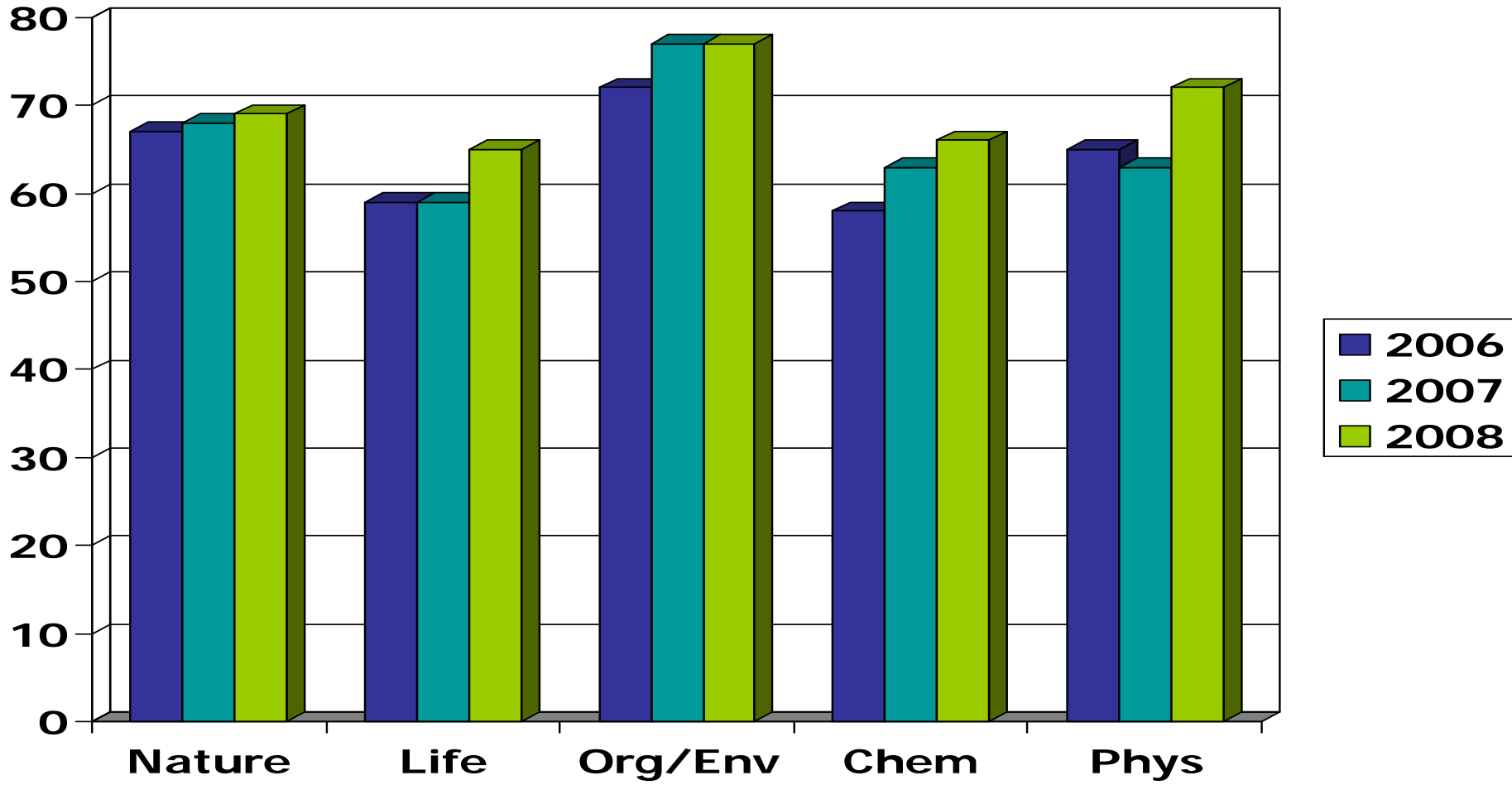


Exit Level (11th Grade) Science TAKS

All Students	2006	2007	2008 (prelim)
Statewide Met Standard	75 – All 46 – SpecEd	77 – All 51 – SpecEd	80 – All 38 – SpecEd
Statewide Commended	9 – All 2 – SpecEd	11 – All 3 – SpecEd	12 – All 2 - SpecEd
Average Scale Score	2184 – All 2089 – SpecEd	2196 – All 2169 – SpecEd	2213 – All 2068 – SpecEd

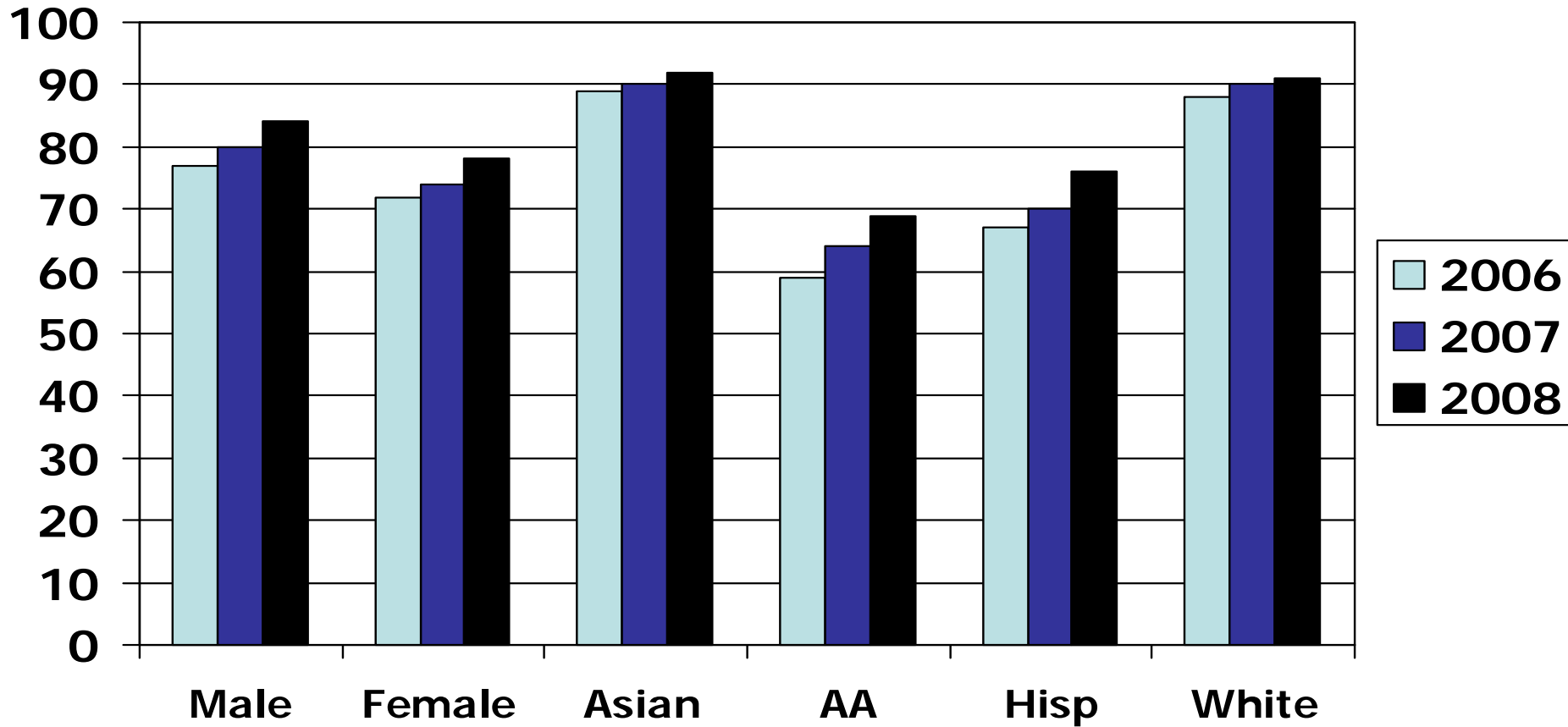
11th Grade TAKS Items % Correct by Objectives

2006 - 2008 (Preliminary)



2008 Demographic Summary

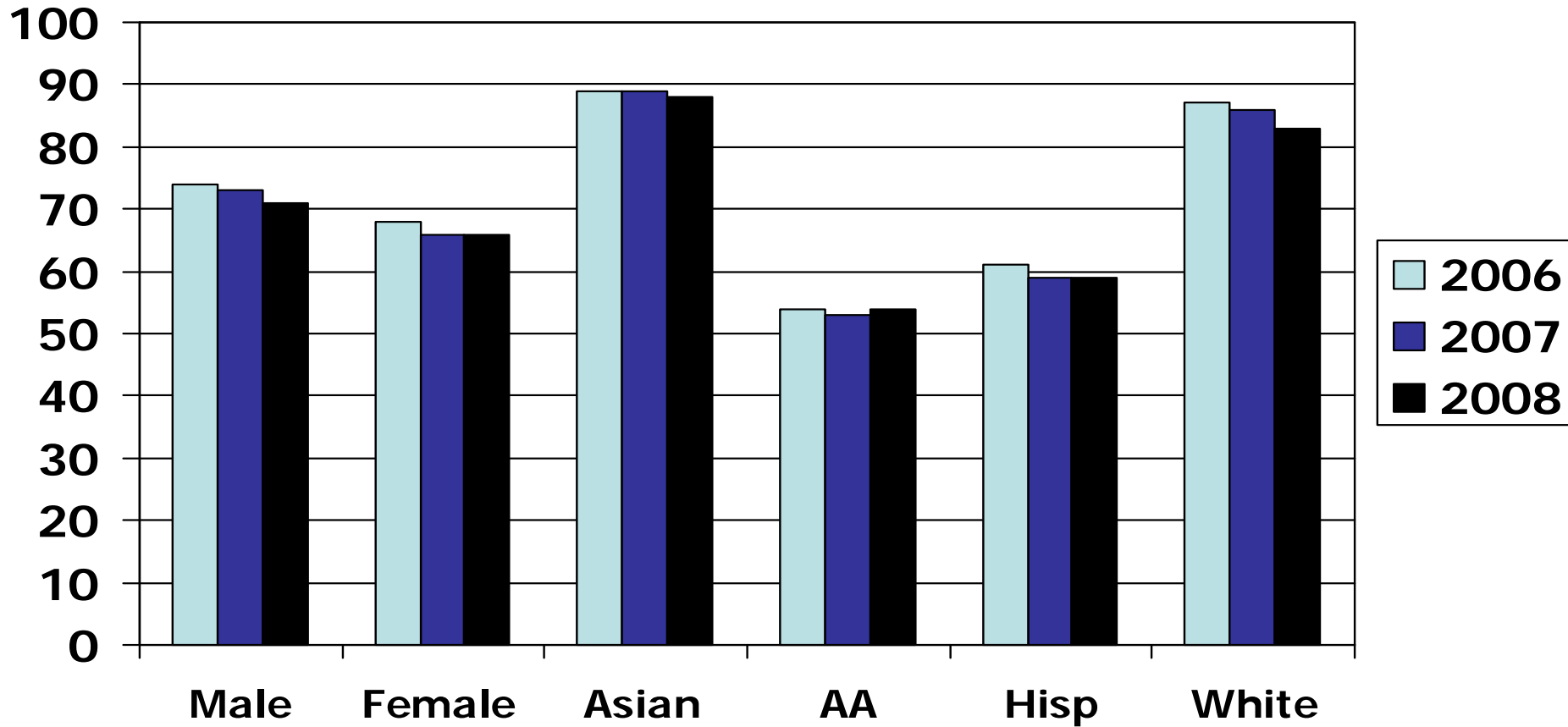
Grade 5 - Percent Met Standard



2008 Demographic Summary

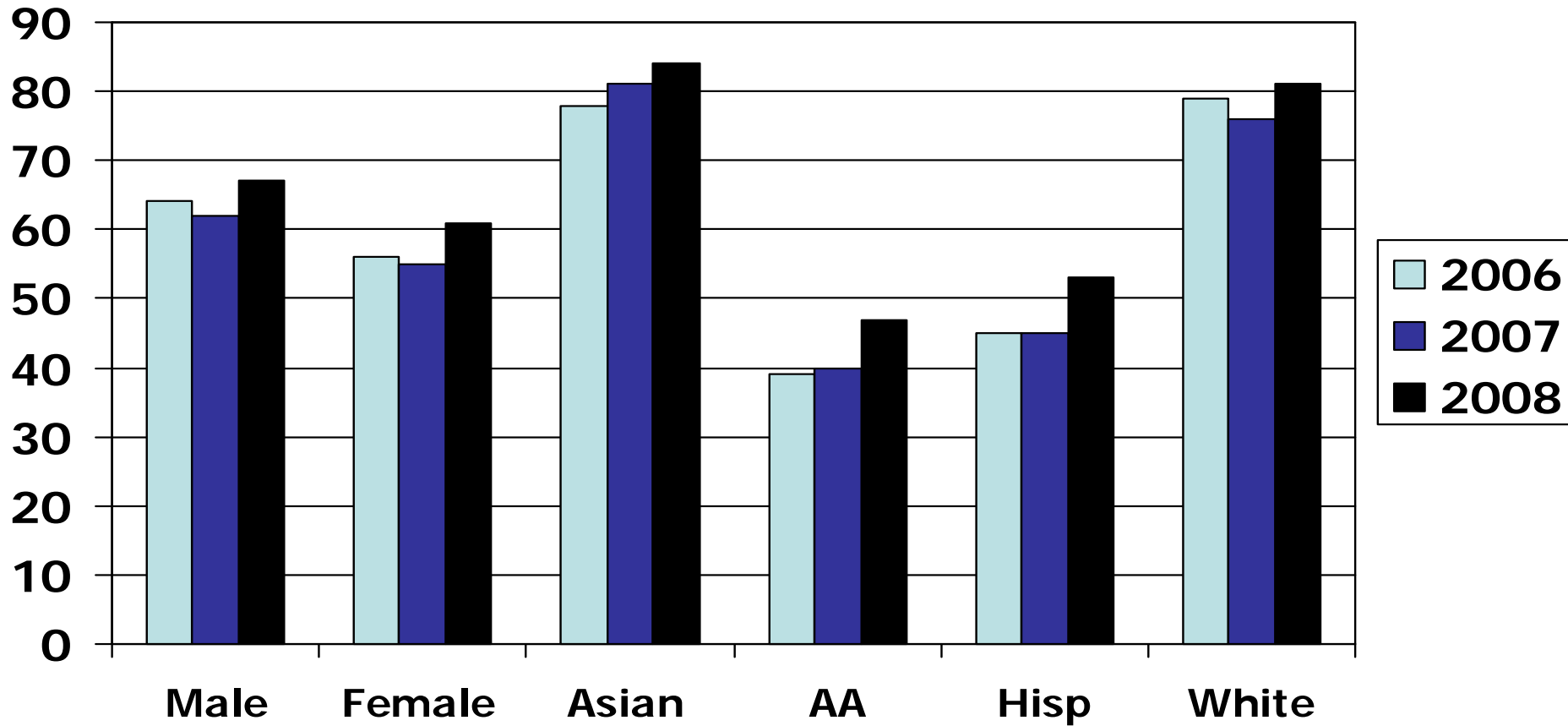
Grade 8 - Percent Met Standard

2006-2 SEM Below, 2007-1 SEM Below, 2008-Panel Rec.



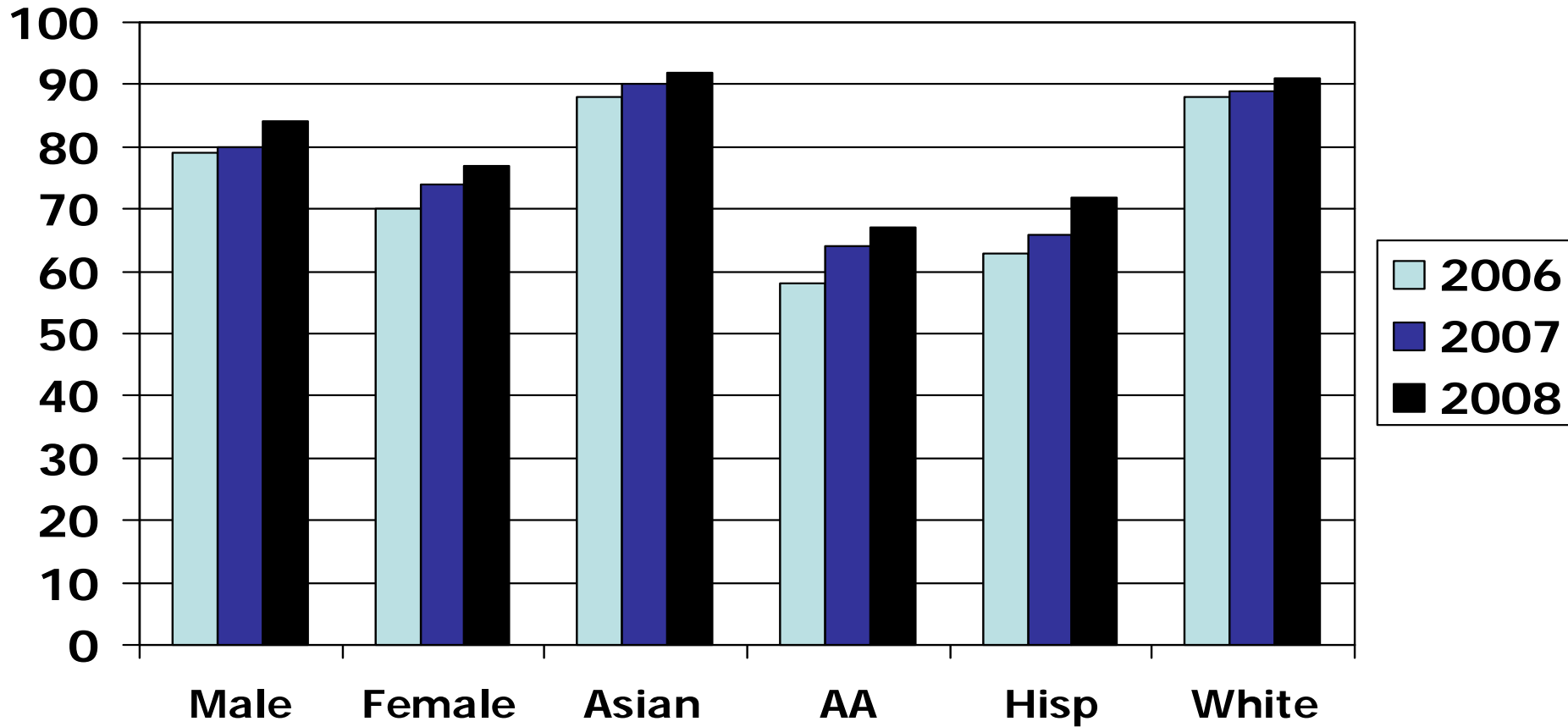
2008 Demographic Summary

Grade 10 - Percent Met Standard



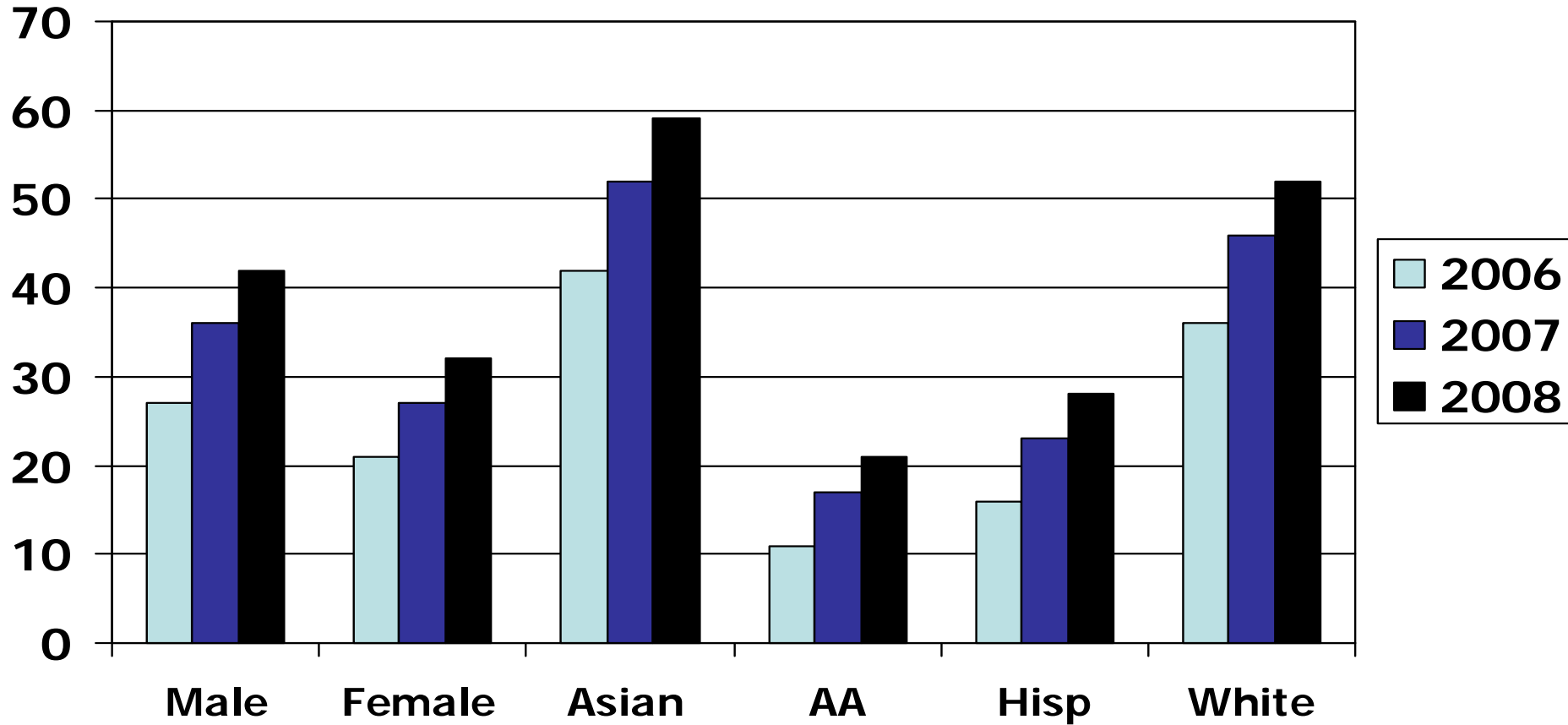
2008 Demographic Summary

Grade 11 - Percent Met Standard



2008 Demographic Summary

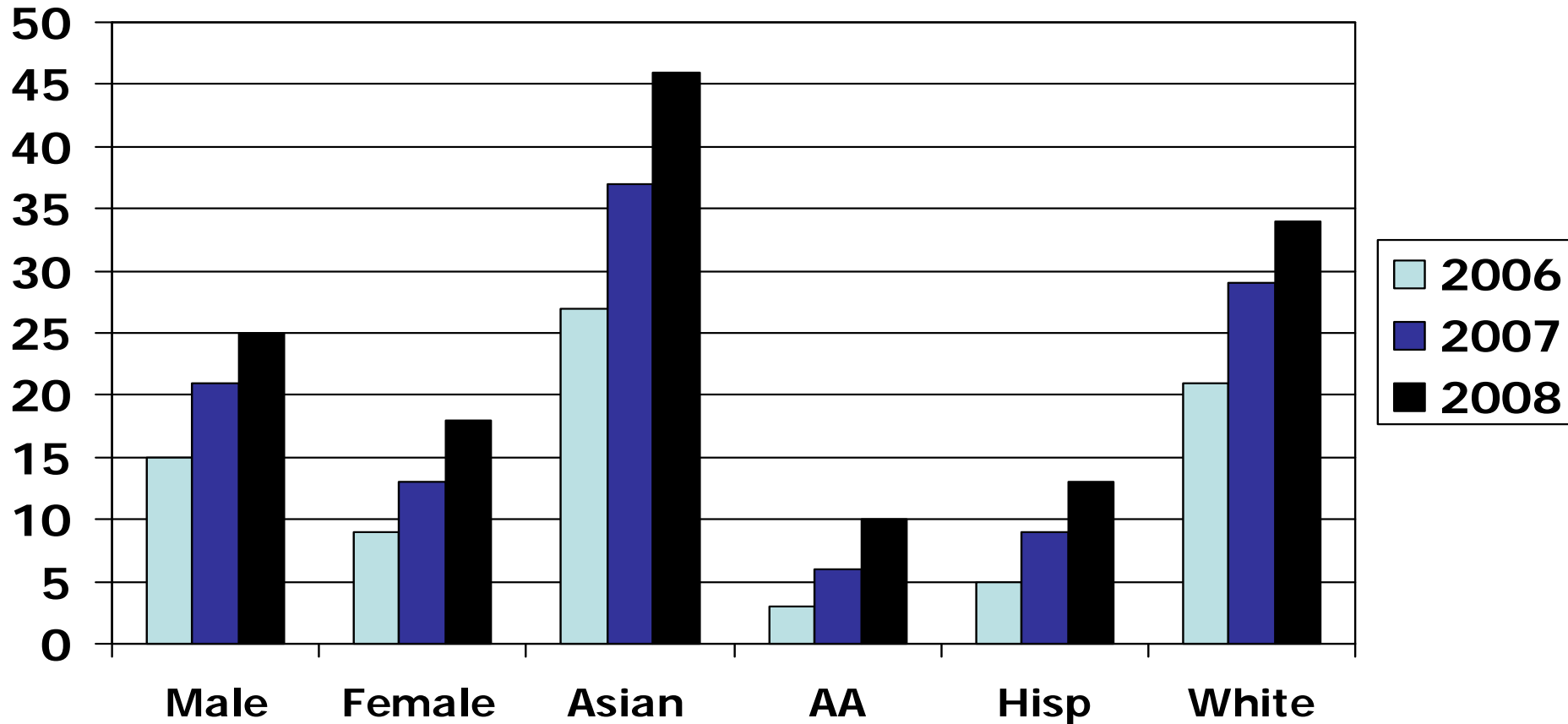
Grade 5 - Percent Commended



2008 Demographic Summary

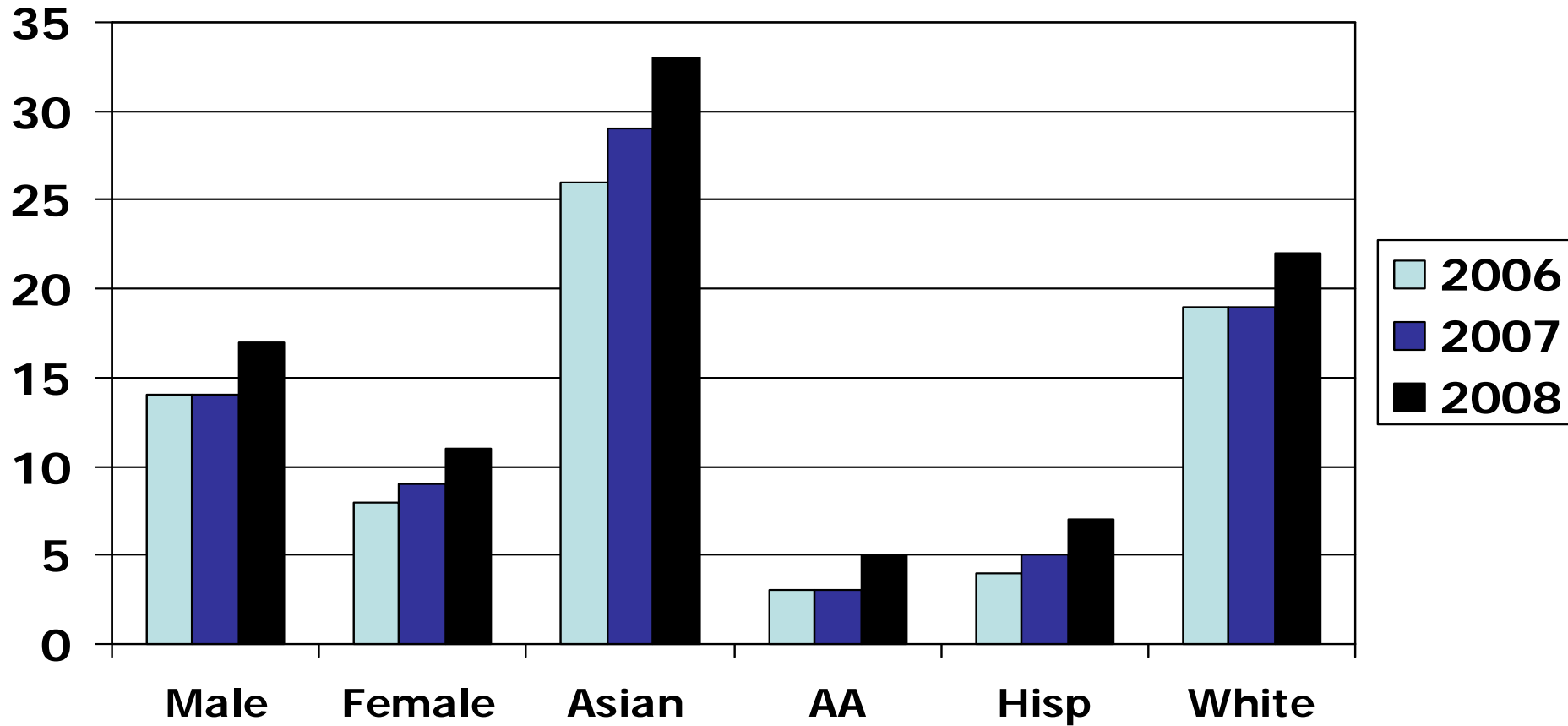
Grade 8 - Percent Commended

2006-2 SEM Below, 2007-1 SEM Below, 2008-Panel Rec.



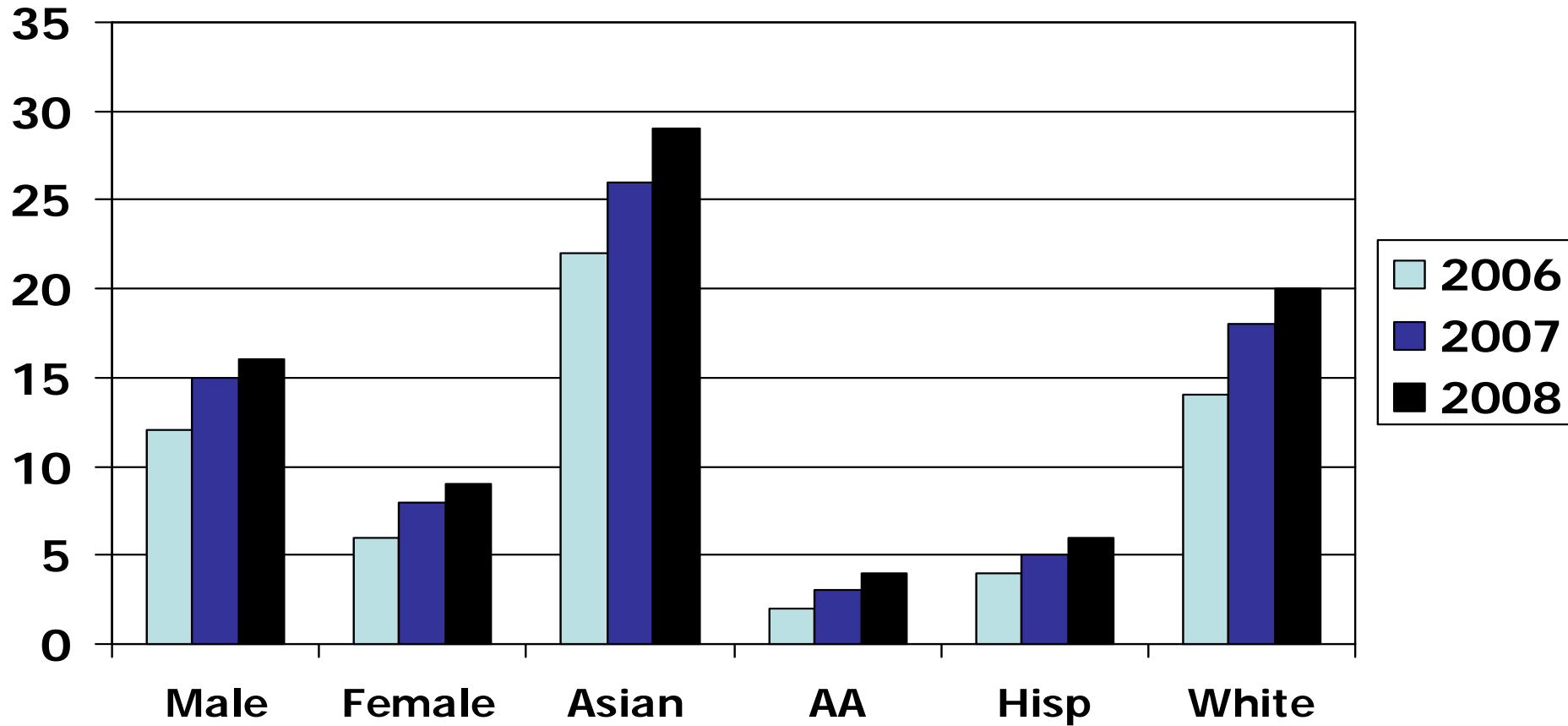
2008 Demographic Summary

Grade 10 - Percent Commended



2008 Demographic Summary

Grade 11 - Percent Commended



Texas Science Diagnostic System



***NEW vendor has been awarded
contract to manage TSDS.***



The Princeton Review Formative Assessment Programs

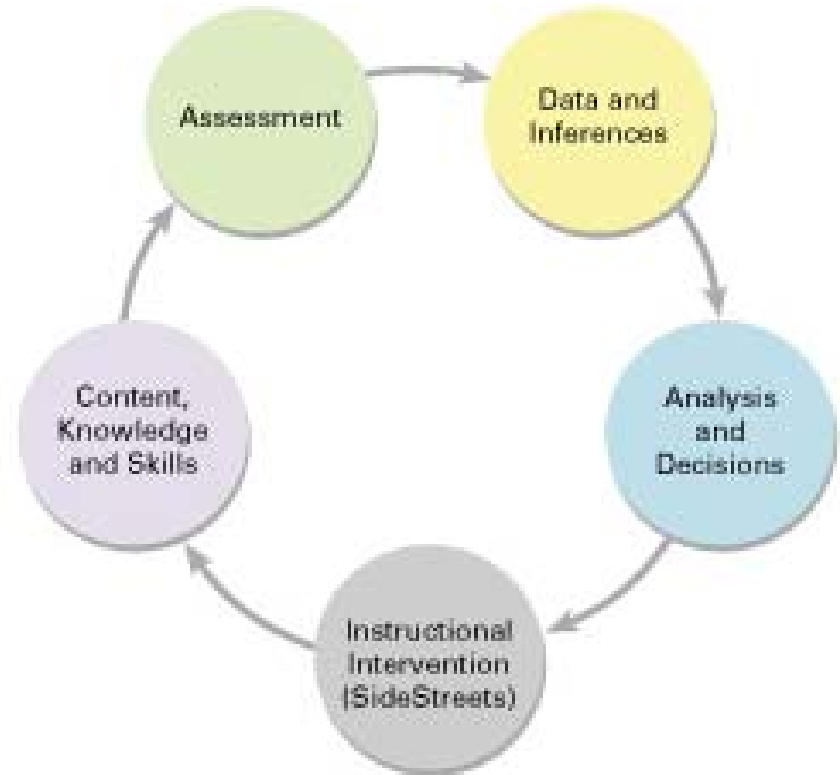
EVERY CHILD CAN ACHIEVE™



Why do we do what we do?

We believe...

- Tests do not improve student outcomes; informed instructional practice does.
- Valid, actionable data can be used to inform instruction and determine the need for intervention.
- Regular, reliable formative assessments will provide teachers and administrators with that actionable data.



EVERY CHILD CAN ACHIEVE™

New TSDS Features

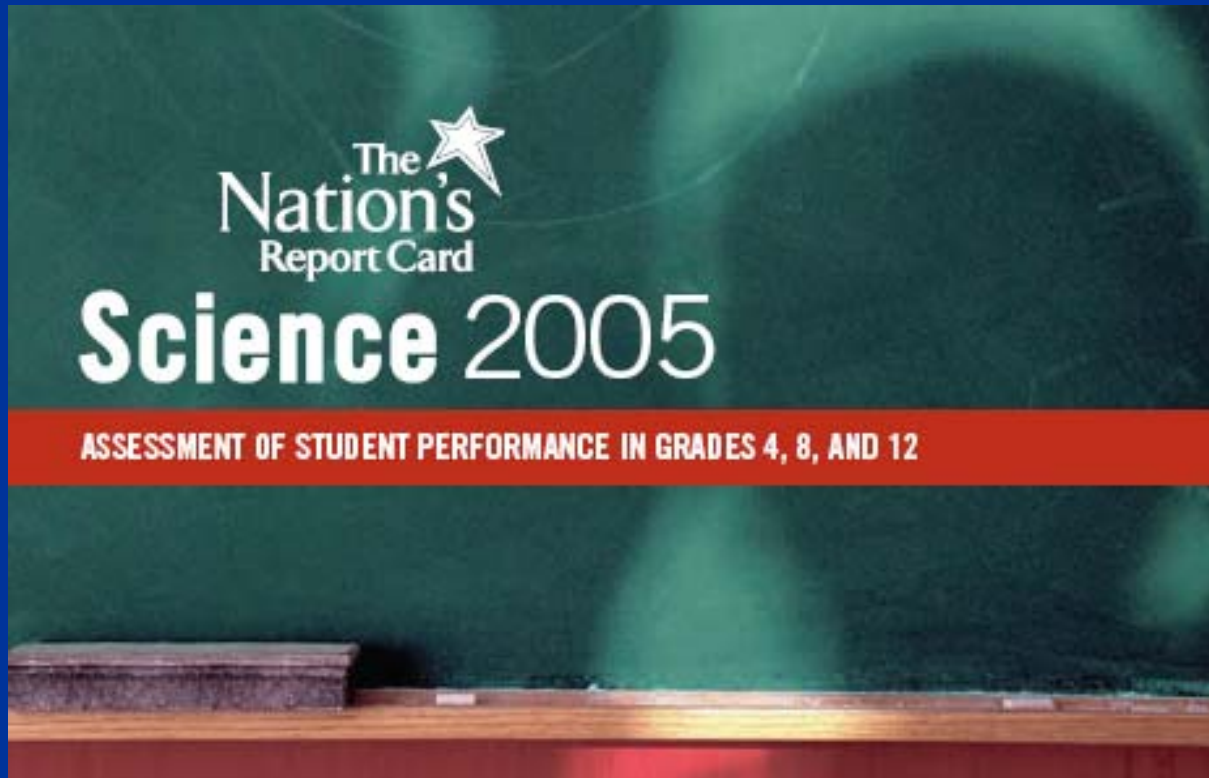
- The **new** Texas Science Diagnostic System (TSDS) will be available fall 2008.
- Features include:
 - TEKS aligned preconfigured diagnostics
 - 35 five question “Mini Assessments” targeting content contained within diagnostics
 - **Distracter explanations***
 - **Skill resources*** for teachers, students, and parents
 - Diagnostics and quizzes in English and Spanish

** new features*

New TSDS

Fall 2008

- **An online training video, available 24/7**
- **Capability for online user surveys**
- **Item validity and reliability testing**
- **Bloom's Taxonomy and Webb depth of knowledge level of difficulty tags**
- **New teacher and administrator reports**



2009 NAEP

National Assessment of Educational Progress

2009 NAEP

National Assessment of Educational Progress

- The NAEP 2009 assessment will be given in **mathematics, reading, and science** in grades 4, 8, and 12.
- January 26 to March 6, 2009
- Over 1,000,000 students in more than 19,000 public and private schools in each state and the nation.

NAEP Science Content Topics and Subtopics

Earth & Space Science	Life Science	Physical Science
<p>Earth in Space and Time</p> <ul style="list-style-type: none"> • Objects in the universe • History of Earth <p>Earth Structures</p> <ul style="list-style-type: none"> • Properties of Earth materials • Tectonics <p>Earth Systems</p> <ul style="list-style-type: none"> • Energy in Earth systems • Climate and weather • Biogeochemical cycles 	<p>Structures and Functions of Living Systems</p> <ul style="list-style-type: none"> • Organization and development • Matter and energy transformations • Interdependence <p>Changes in Living Systems</p> <ul style="list-style-type: none"> • Heredity and reproduction • Evolution and diversity 	<p>Matter</p> <ul style="list-style-type: none"> • Properties of matter • Changes in matter <p>Energy</p> <ul style="list-style-type: none"> • Forms of energy • Energy transfer and conservation <p>Motion</p> <ul style="list-style-type: none"> • Motion at the macroscopic level • Forces affecting motion

1996-2005 Framework	2009 Framework
<p>Knowing & Doing Dimension:</p> <ul style="list-style-type: none"> - Conceptual Understanding - Scientific Investigation - Practical Reasoning 	<p>Science Practices:</p> <ul style="list-style-type: none"> ▪ Identifying science principles ▪ Using science principles ▪ Conducting scientific inquiry ▪ Employing technological design <p>**</p> <p>*Steering Committee position – use only as context for items</p>
<p>Paper-and-pencil items</p> <ul style="list-style-type: none"> ▪ Hands-on performance tasks for a subsample of students ▪ >60% Constructed response (CR) ▪ <40% Multiple choice items (MC) 	<p>Paper-and-pencil items, innovative types</p> <ul style="list-style-type: none"> ▪ Hands-on performance tasks ▪ Interactive computer tasks (ICT) ▪ Hands-on and ICT for subsample of students ▪ 50% CR; 50% MC items

NAEP Item Distribution by Content Area

	Grade 4 (%)	Grade 8 (%)	Grade 12 (%)
Physical	33.0	30.0	37.5
Life	33.0	30.0	37.5
Earth/Space	33.0	40.0	25.0



College Readiness Program

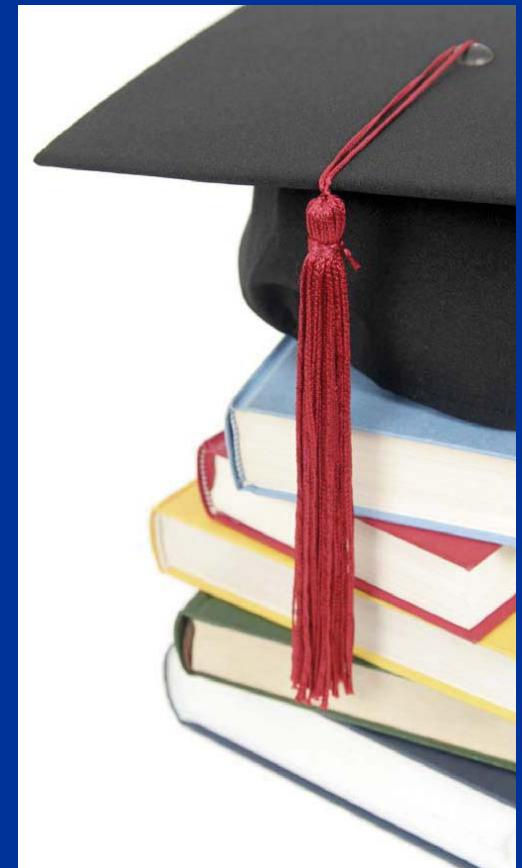
College Readiness Standards



[http://www.theccb.state.tx.us/
collegereadiness/CRS.pdf](http://www.theccb.state.tx.us/collegereadiness/CRS.pdf)

College Readiness Program

- A Collaborative Project between the **Texas Education Agency** and the **Texas Higher Education Coordinating Board**
- Director is Dr. Joseph Kulhanek
Joseph.Kulhanek@tea.state.tx.us



CRS Timeline – 3 Phases

- **Phase I:** Teams of 10 in each core subject develop College Readiness Standards (CRS)
- **Phase II:** Gap Analysis by Vertical Teams
- **Phase III:** Develop instructional strategies and support materials

College Readiness Program

- **Phase II: Vertical Teams**
 - Nominations received. Teams being formed.
 - Teams of 10 people in each core area, includes 2 co-chairs.
 - Public Education (6) & Higher Education (4)
- **Phase II: Alignment of TEKS to CRS**
 - Mathematics Gap Analysis by the Vertical Team, July 23-24
 - Science Gap Analysis – Fall 2008

College Readiness Program

- **Phase III: Develop Instructional Strategies and Support Materials**
 - Science CRS Online Student Materials must be made available during the Fall Semester of 2011
- **Phase III: Educator Support Web Portal**
 - Provides Q&A and Updates
 - Instructional Strategies
 - Professional Development



Goals

*Things to
Accomplish
Together*

Goals for Texas Science Education

(Draft – Seeking Input)

- 1. Support the active engagement of students in lab and field investigations.**
- 2. Promote science literacy so that all students see the integration of life science, earth science, and physical science – with real-life and technological applications.**
- 3. Implement the revised set of science standards so that we have clarity and specificity.**

Goals for Texas Science Education

(Draft – Seeking Input)

- 4. Support 4 years of high school science for graduation by:**
 - A. Providing professional development for teachers (in content and inclusiveness)**
 - B. Providing guidance to parents and the community (on the benefits), and**
 - C. Share options for science course credit.**

Goals for Texas Science Education

(Draft – Seeking Input)

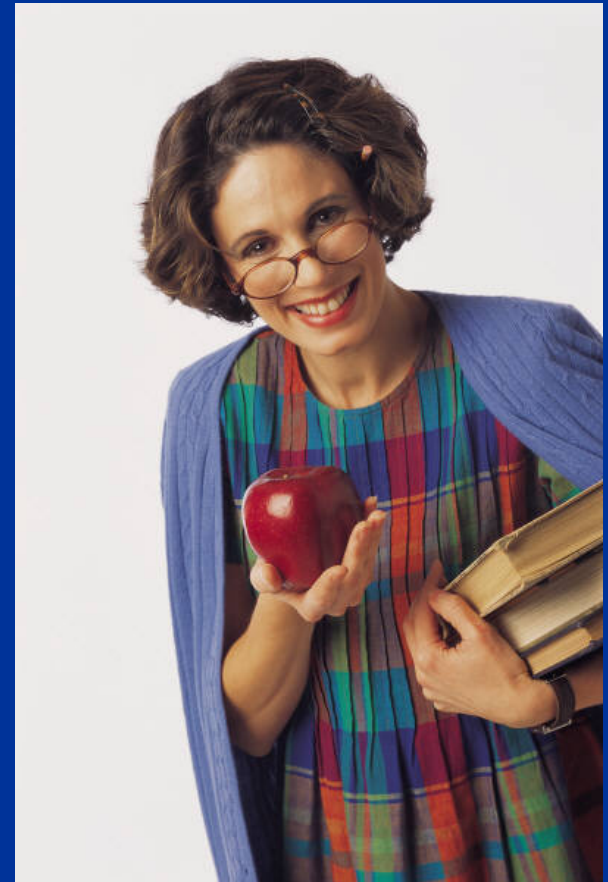
- 5. Ensure deep alignment of the state standards and assessments so that data analysis can help guide classroom instruction.**
- 6. Encourage alternate methods of professional development, such as webinars, podcasts, and webcasts.**

Goals for Texas Science Education

(Draft – Seeking Input)

- 7. Support the other foundation content areas:**
 - A. Language Arts – by encouraging writing in science and the reading of non-fiction books.**
 - B. Mathematics – by emphasizing calculations, conversions, and representations of data (tables, charts, graphs).**

We Need You!
Sign up for the . . .
Science
Listserve!



www.tea.state.tx.us/list/

Science Calendar

Science Calendar of Events (as of July 1, 2008)



2008 Events

July 4 – Independence Day Holiday
July 8-10 – Texas Regional Collaboratives Annual Meeting, Austin
July 17-18 – Texas State Board of Education Meeting, Austin
September 1 – Labor Day
September 5 – TSELA Meeting, Dallas
September 19-20 – Texas State Board of Education Meeting, Austin
October 15 – Deadline for NSTA Award Applications (may be extended to Nov. 30)
October 23 – Exit Level Science Retest (regular and online)
November 5 – TSELA Meeting, Fort Worth
November 6-8 – CAST Science Teachers Conference, Fort Worth
November 11 – Veteran's Day
November 20-21 – Texas State Board of Education Meeting, Austin
November 27 – Thanksgiving
December 25 – Christmas Day

2009 Events

January 1 – New Year's Day
January TBA – Texas State Board of Education Meeting, Austin
January 19 – Martin Luther King Jr. Day
January 26-28 – TASA Mid-winter Conference, Austin
January 30 – TSELA Meeting, Fort Worth
Late January – Early March – NAEP Assessments (selected samples; Science 4, 8, 12)
March TBA – Texas State Board of Education Meeting, Austin
March 5 – Exit Level Science Retest (regular and online)
March 19-22 – NSTA National Conference, New Orleans
March 28-31 – Texas Science and Engineering Fair, San Antonio
April 22 – Earth Day
April 24-25 – Texas Science Olympiad, College Station
April 27-May 1 – TAKS Testing
April 30 – Science TAKS, Grades 5, 8, 10, Exit Level
April 30 – Exit Level Science Retest (regular and online)
May TBA – Texas State Board of Education Meeting, Austin
May 1 – LAT Science, Grades 5, 8, 10
May 4-22 – Physics End-of-Course Exam Online Field Test Window
May 11-29 – End-of-Course Exam Online Tests (optional); Biology and Chemistry
May 25 – Memorial Day
July TBA – Texas State Board of Education Meeting, Austin
July 16 – Exit Level Science Retest (regular and online)

Texas Education Agency – Science Team – Kenn Heydrick & Irene Pickhardt, 512-463-9581, www.tea.state.tx.us

Science Contacts at TEA

We strive to provide leadership, guidance, and resources to help schools meet the educational needs of all students.

Kenn Heydrick

Director of Science

Kenn.Heydrick@tea.state.tx.us

512-463-9581



Irene Pickhardt

Assistant Director of Science

Irene.Pickhardt@tea.state.tx.us

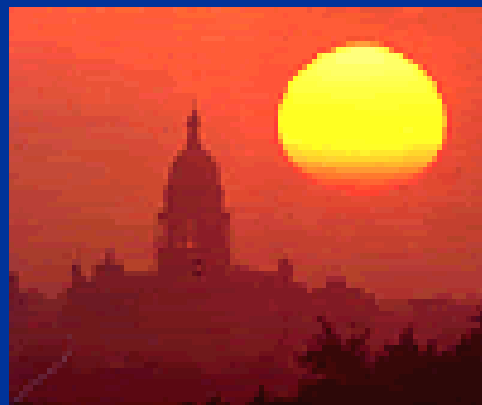
512-463-9581





TEXAS EDUCATION AGENCY

We strive to provide leadership, guidance, and resources to help schools meet the educational needs of all students.



THANK YOU!

Copyright and Terms of Service Copyright © Texas Education Agency, 2008.

These materials are copyrighted © and trademarked ™ as the property of the Texas Education Agency and may not be reproduced without the express written permission of the Texas Education Agency, except under the following conditions:

- 1) Texas public school districts, charter schools, and Education Service Centers may reproduce and use copies of the Materials and Related Materials for the districts' and schools' educational use without obtaining permission from the Texas Education Agency;*
- 2) Residents of the state of Texas may reproduce and use copies of the Materials and Related Materials for individual personal use only without obtaining written permission of the Texas Education Agency;*
- 3) Any portion reproduced must be reproduced in its entirety and remain unedited, unaltered and unchanged in any way;*
- 4) No monetary charge can be made for the reproduced materials or any document containing them; however, a reasonable charge to cover only the cost of reproduction and distribution may be charged.*

Private entities or persons located in Texas that are not Texas public school districts or Texas charter schools or any entity, whether public or private, educational or non-educational, located outside the state of Texas MUST obtain written approval from the Texas Education Agency and will be required to enter into a license agreement that may involve the payment of a licensing fee or a royalty fee. Contact [TEA Copyrights](#) with any questions you may have.