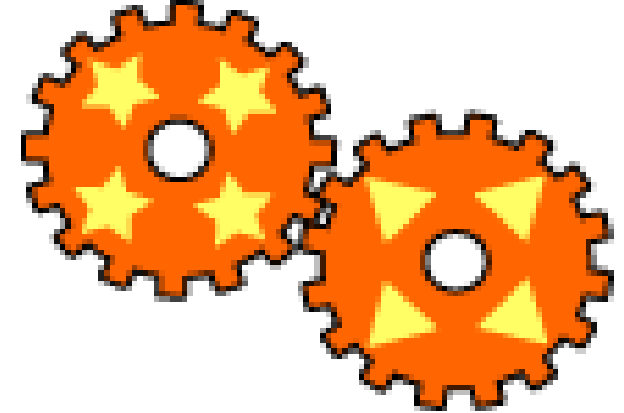




TEXAS EDUCATION AGENCY

***Texas Regional Collaboratives
for Excellence in Science Teaching***
12th ANNUAL MEETING

**Presented by:
Chris Castillo Comer
Director of Science
July 12, 2006**



Science Trends in Texas and the Nation

July, 2006

C. Comer

The State of Science in Texas



➤ 85% of all 11th graders passed the Exit Level Science Assessment

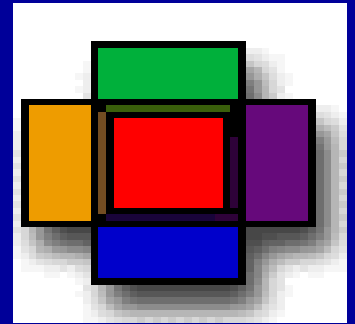
➤ 68% of all Texas seniors graduated with the Recommended High School Plan

➤ Last year 24% of all graduating seniors took 4 years of science

➤ Grade 8 science was tested this spring with a 71% pass rate for all students at 2 SEM's, and the online testing was successful with good result.

➤ The percentage of students passing science Texas Assessment of Knowledge and Skills (TAKS) increased this spring at grades 5, 10, and Exit Level Grade 11.

State Curriculum Trends



- **Emphasis on science at very early ages**
- **At-risk students identified earlier and more programs to support students in credit recovery**
- **More High Schools with dropout recovery programs specializing in technical school/employment training**
- **Emphasis on higher expectations and more science to prepare students for technical training**
- **Greater high school to college coordination**

President Bush and Science Education



President Bush's Address

\$910 Million for NSF, Dept. of Energy Commerce

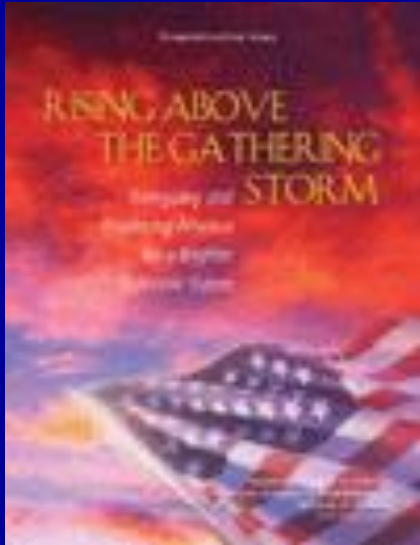
Department

Specialty schools for math and science

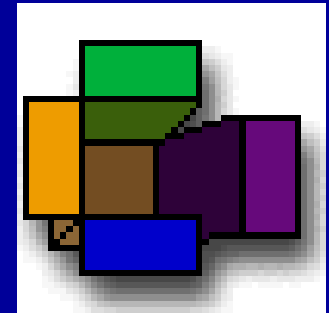
- Experiential-based Learning Opportunities
- National Labs for PD
- Scholarships, Fellowships, Summer Institutes in science and math for students and teachers
- Development of Science Parks similar
- to Asian Parks

Download report at:

<http://www.nap.edu>



National Trends in High School Science



- In 2004, five states of 30 reporting, had more than 30% of students take Physics by graduation including Texas
- Chemistry Enrollments increased; 10 states that more than 60% of their students take Chemistry by graduation, including Texas
- Certified Science Teachers continue to be in high demand.

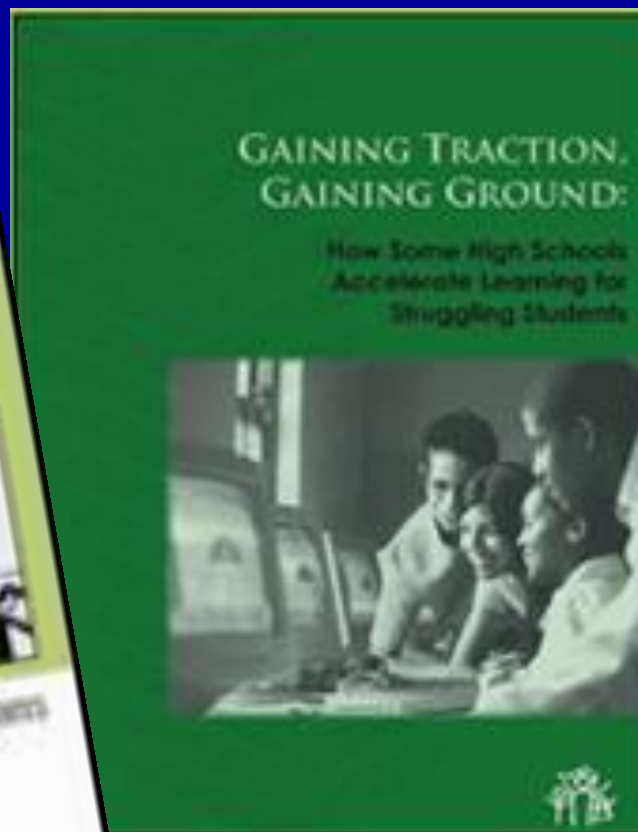
http://www.ccsso.org/project/science_and_mathematics_Education_Indicators

Changes to AP Program

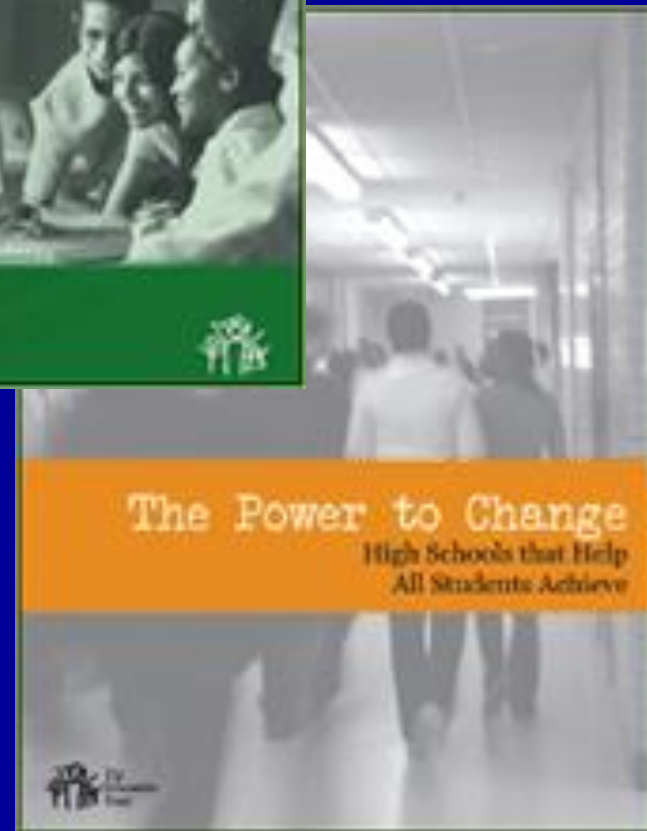
- *Feds call on Schools to Redesign Science Curriculum:*
- *NSF has awarded \$1.8 Million for Improving Advanced Placement (AP) science classes and redesigning high school science curriculum to incorporate the latest developments in biotechnology, nanotechnology and other fields for biology, chemistry, physics, and environmental science.*
- *The work should be completed by December '07 allowing for two years of professional development prior to the launch of the new AP science courses.*
- *See these related links: National Science Foundation www.nsf.gov or The College Board at www.collegeboard.com*



July, 2006



C. Comer



The Cost of NOT Having an Education...

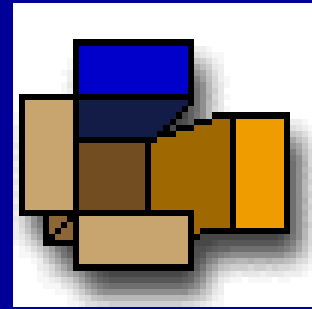
- **25% of the state's residents aged 25 and older lack a high school education;**
- **Each year another 45,000-50,000 students drop out of Texas public schools costing the state 11.4 billion in lost gross state product (GSP)**

➤AND...

- **Dropouts cost the state and federal governments \$1.4 billion annually in social costs;**
- **Are six times more likely to be incarcerated and**
- **2.7-3.7 times more likely to receive public assistance**

<http://window.state.tx.us/specialrpt/teachersalary04>

State Policies in Relation to Math & Science Enrollments



As of 2004:

- 21 states require 3 high school course credits of mathematics and 6 require four credits;
- 20 states require 3 credits of science and 3 require four credits
- In the 1990's and continuing since 2000, over 40 states raised the number of credits required for graduation in science and mathematics, and recently additional requirements have been added. In total 42 states now require at least two years of math and science and a majority three or more), while in the mid-1980's only nine states had even this requirement.

Latest demographics Show increases...



COMMISSIONER OF EDUCATION TEXAS EDUCATION AGENCY

20 EDUCATION SERVICE CENTERS

1,037 DISTRICTS / 192 CHARTER OPERATORS

District Size	Number of Students	Number of Districts	% of All Student
50,000 and Over	1,144,625	14	26.1%
25,000-49,999	915,536	26	20.9%
10,000-24,999	754,453	46	17.2%
5,000-9,999	519,110	74	11.8%
3,000-4,999	315,140	82	7.2%
1,000-2,999	278,148	127	6.3%
500-999	185,965	130	3.8%
Under 500	177,056	248	4.0%
Total	4,383,871	482	2.6%
		1,229	100.0%

7,908 CAMPUSES (INCLUDING 296 CHARTERS)

Campus Type	Number of Students	Number of Campuses	% of All Students
High School	1,187,325	1,098	27.1%
Junior High School	220,152	409	5.0%
Middle School	722,500	1,139	16.5%
Elementary School	2,167,597	4,171	49.4%
Elem. & Secondary	86,297	491	2.0%
Total	4,383,871	7,908	100.0%

STUDENTS BY ETHNICITY AND ECONOMIC STATUS

	Number of Students	% of Total	% Change From 2004
African American	621,999	14.2%	1.2%
Hispanic	1,961,549	44.7%	4.0%
White	1,653,008	37.7%	-1.0%
Other	147,315	3.4%	4.8%
Total	4,383,871	100.0%	1.7%
Economic Disadv.	2,394,001	54.6%	5.1%

STUDENTS BY GRADE

	Number of Students	% of Total	% Change From 2004
Kindergarten & Earlier	523,518	11.9%	4.0%
Elementary (1-5)	1,653,889	37.7%	1.3%
Middle (6-8)	990,415	22.6%	1.0%
High (9-12)	1,216,049	27.7%	1.8%
Total	4,383,871	100.0%	1.7%

STUDENTS BY PROGRAM

	Number of Students	% of Total	% Change From 2004
Bilingual / ESL Edu.	631,534	14.4%	4.2%
Career & Tech. Edu.	892,018	20.3%	2.8%
Gifted & Talented Edu.	337,650	7.7%	0.5%
Special Education	506,391	11.6%	1.4%

STUDENTS

GRADUATES (CLASS OF 2004)

Ethnicity	Graduates (Including Special Education)	% of All Graduates
African American	33,213	13.6%
Hispanic	85,412	35.0%
White	116,497	47.7%
Other	9,043	3.7%
Total	244,165	100.0%
Recommended H.S. Program / DAP *		68.4%
*Distinguished Achievement Program		
Total Special Education Graduates	24,954	10.2%

TEXAS SUCCESS INITIATIVE
 HIGHER EDUCATION READINESS COMPONENT *

	All	African American	Hispanic	White	Econ. Disadv.
Reading/ELA	39%	28%	30%	48%	27%
Mathematics	48%	26%	34%	62%	32%

* Percent met standard, where standards are scale scores of 2200 on TAKS mathematics and ELA with a 3 on the writing component.

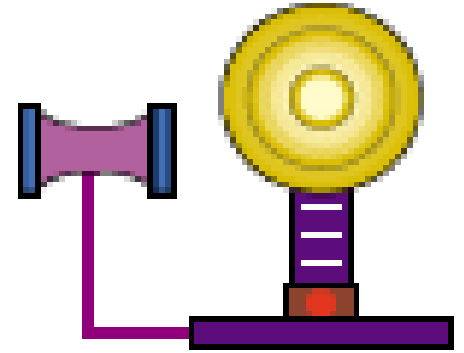
COLLEGE ADMISSION RESULTS (CLASS OF 2004)

	% At or Above Criterion *	% Tested	SAT Mean	ACT Mean
African American	7.6%	60.9%	843	17.1
Hispanic	10.5%	46.3%	894	17.9
White	37.6%	67.2%	1047	21.8
Other	44.5%	80.0%	1064	22.1
State	27.0%	61.9%	987	20.1

*The criterion is 1110 on the SAT or 24 on the ACT.



Assessing Learning.



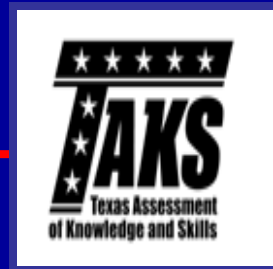
Assessing our Curriculum:

- TAKS Update
 - What's new
- All science Tests will be on the TEA Website on July 28th



How We Did Overall

Science



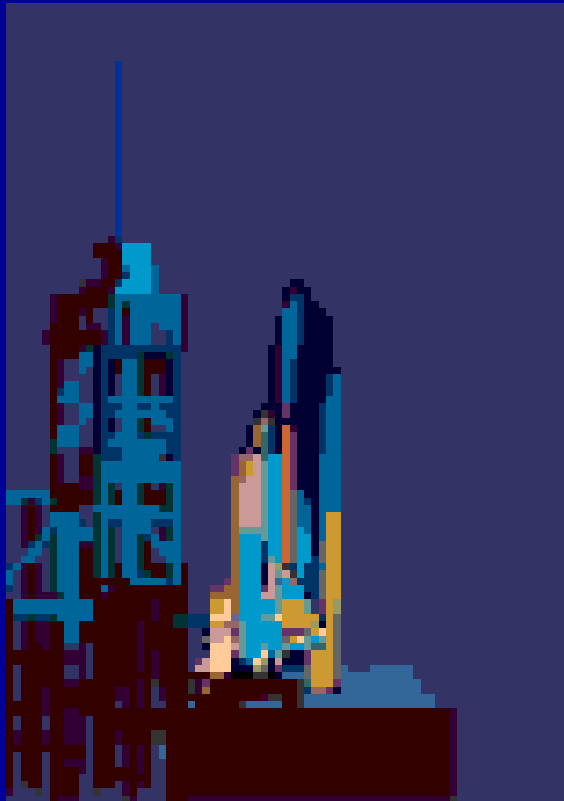
<i>Science TAKS</i>	<i>Met Standard 2004→2005</i>	<i>Commended Performance 2004→2005</i>
<i>Grade 5</i>	64%→75%	16%→24%
<i>5th Span.</i>	23%→31%	3%→5%
<i>Grade 8</i>	71%* *first testing at 2 SEM	12%* first testing at 2 SEM
<i>Grade 10</i>	54%→60%	8%→11%
<i>Grade 11</i>	71%→74%	5%→9%

Online Testing Initiatives

- Texas is moving toward expanded use of computer-administered testing and reporting in its comprehensive testing program.
- Several online testing initiatives were conducted in spring 2005 such as the Grade 8 TAKS Science Field Test



Pilot Online Science TAKS



- The online versions of the Grade 8 TAKS science field test included innovative test items that cannot be administered in a paper-and-pencil format:
 - Animation
 - Video clips
 - Slow-motion, and other student-controlled movement of animations and videos
 - Color

What Do We Know About Online Assessment Results?

- 22,000 Eighth Graders took the TAKS online during a “practice run” this past spring.
- The students scored slightly lower than they did on paper (may have been because tests didn’t count).
- Districts told the Agency that students liked online testing and adapted easily.
- Teachers liked the quick feedback.
- Educators voiced concerns about test security and the availability of computers.



Elementary Science

OBJECTIVES	2003	2004	2005	2006
1: Nature of Science	76%	83%	86%	87%
2: Life Sciences	74%	79%	81%	85%
3: Physical Sciences	66%	74%	78%	80%
4: Earth Sciences	53%	60%	67%	69%

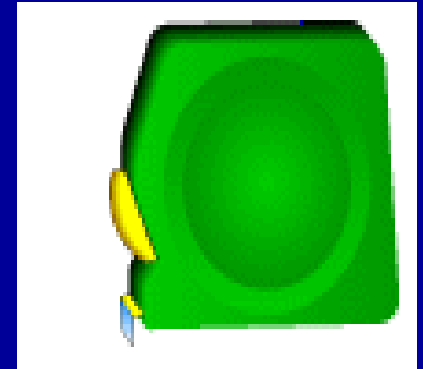
***Commended
Performance:***

**'03 → '04 → '05 → '06
4% → 16% → 26% → 24%**

TAKS-Modified (TAKS-M)

- *The federal government has proposed regulations for 2% of the special education population that could be eligible to take an assessment that reduces the complexity of the grade-level content.*
- **Currently, assessment staff have modified the TAKS (minus the field test questions) grade 5 science, grade 5 reading, and grade 10 mathematics tests *by reducing the number of answer choices, reducing complex language and vocabulary, etc.***

TAKS-Alt



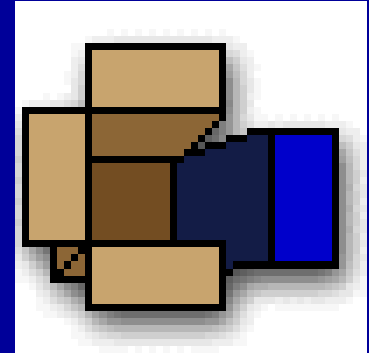
- Designed for 1% of students
- Performance-based
- Administered by Life Skills teacher
- Teacher records results on line
- Authentic grade-level activities are adapted to provide appropriate instruction & assessment opportunity for students who are functioning at Levels 1-3

Executive Order RP53

Signed by the Governor of Texas on December 16, 2005-End of Course Tests

- The development of a series of voluntary end-of-course assessments in Science, Mathematics, and other subjects, currently assessed by the 11th grade Texas Assessment of Knowledge and Skills, to measure student performance;
- For science this will include Biology, Chemistry and Physics

Biology End-of-Course Field Test



- Required for all students enrolled in Biology 2006-07
- On-Line Field Test
- Testing window extended!
 - April 23—May 18

Biology EOC

Field Test Dates

➤ **A field-testing window for Biology end-of-course exam has been added for April 23–May 18, 2007.**

Note that these mandatory field tests are planned to be administered online only during this four-week window to students enrolled in Biology courses at the time of field testing.

Science Testing Calendar 2006-07

- **October 19, 2006 Exit-Level Retest**
- **February 22, 2007 Exit-Level Retest**
- **April (exact dates TBA) TAKS-Alt
Field Test Window**
- **April 19, 2007 (Thurs.) Science
Grades 5,8, 10, 11**
- **April 23-May 18 Field-test window for
Biology EOC.**



Accountability Ratings for 2006-07

For Science:

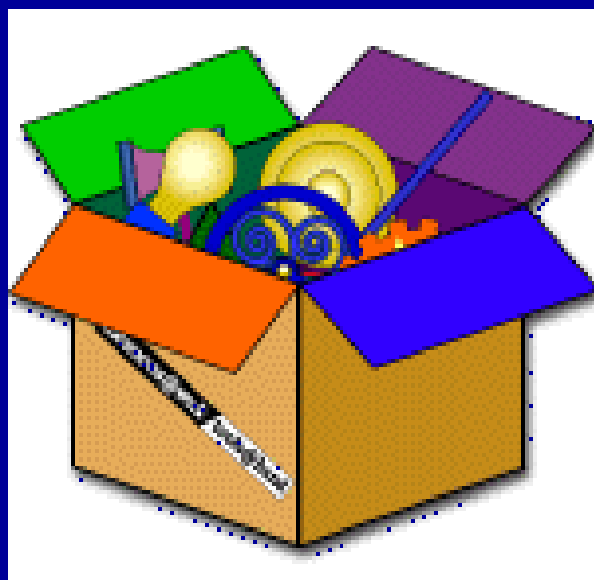
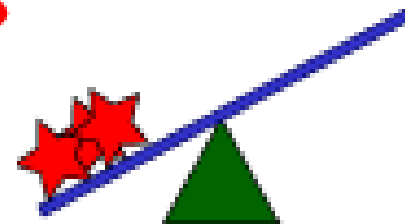
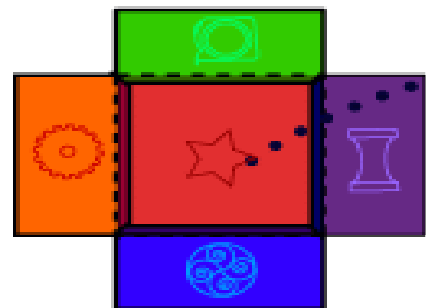
- 40% of students must pass Science TAKS in order to be Academically Acceptable
- 75% of students must pass Science TAKS for Recognized rating.

Accountability Update: 2005 and Beyond Commissioner of Education Final Decisions March 2005

*The standards for
science reflects the lower
performance compared
to reading/ELA and
performance gaps
between 2004-05 student
passing standard*

	<u>Science</u>
	A.Ac./Rec/Ex.
2005	25 / 70 / 90
2006	35 / 70 / 90
2007	40 / 75 / 90
2008	40 / 75 / 90
2009	45 / 80 / 90
2010	50 / 80 / 90

Supporting Success



Resources

Secondary Student Performance vs. Teacher Profiles

STUDENT PERFORMANCE		TEACHER PROFILES	
%Students completing High School	%Students Passing TAKS	% Teachers leaving	%Teachers teaching outside their field
<95%	23.6%	20.6%	31.2%
95-97.99%	33.8%	20.0%	28.6%
98-100%	44.9%	19.3%	27.9%

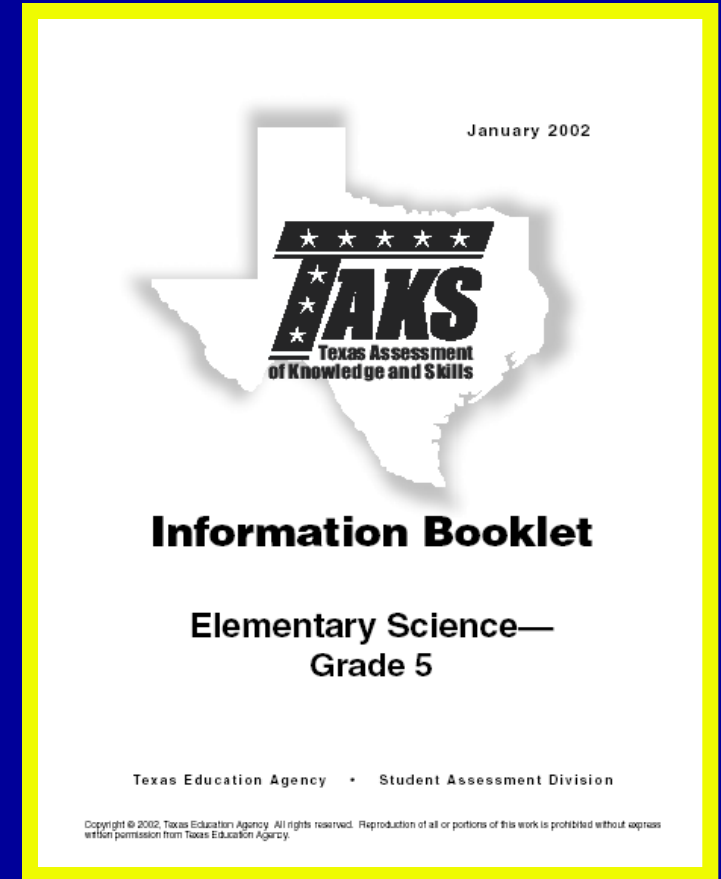
Source: Completion and TAKS data from TEA; AEIS '02-'03; Teacher Data From State Board for Educator Certification (SBEC) , AEIS '02-'03 and '03-'04

<http://www.widow.state.tx.us/specialrpt/teachersalary04/>

TAKS Information Booklets

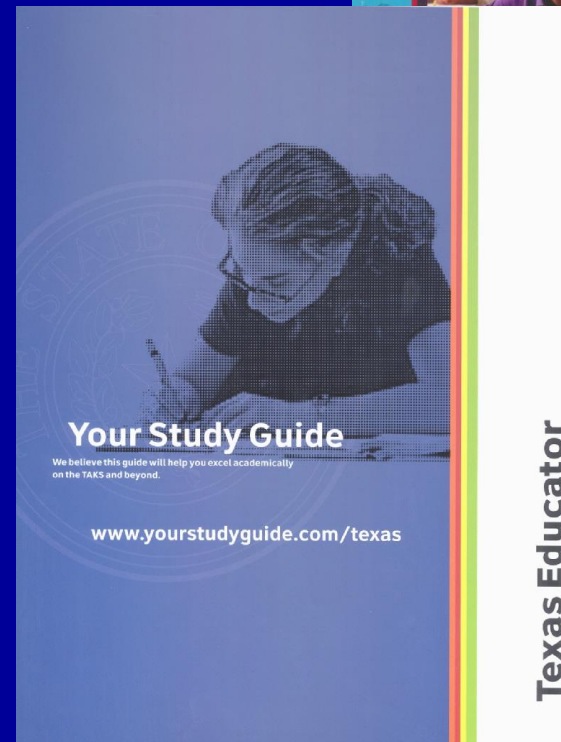
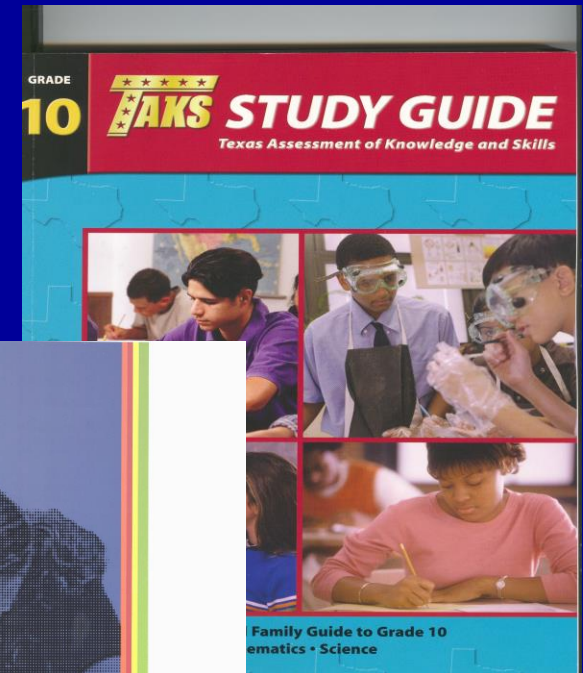
Contains:

- Objectives and TEKS student expectations
- Clarification on TEKS
- Overview of the subject area
- Reasons why each objective and TEKS student expectation are critical to student success
- Sample items

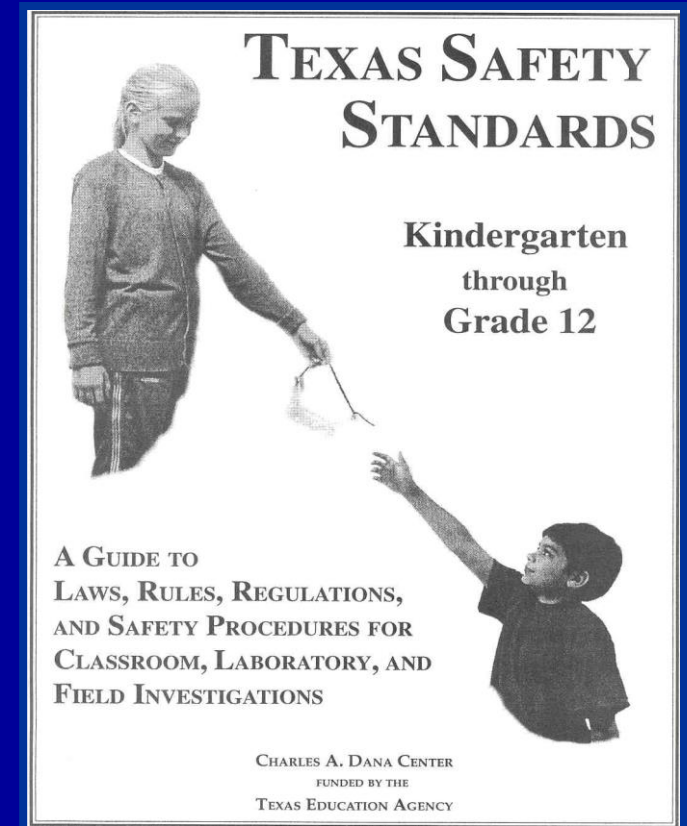
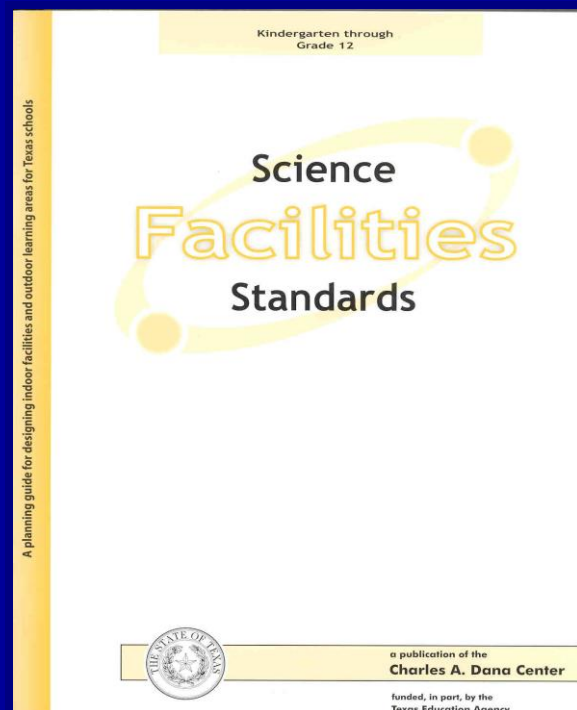




***Study Guides are
provided to
students who do
not meet the
standard.***



Safety and Facility Resources: Should be in every school library!



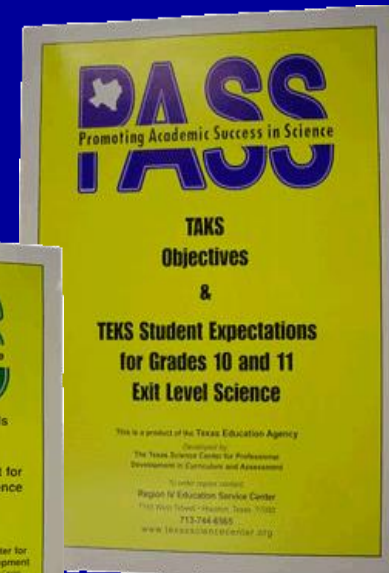
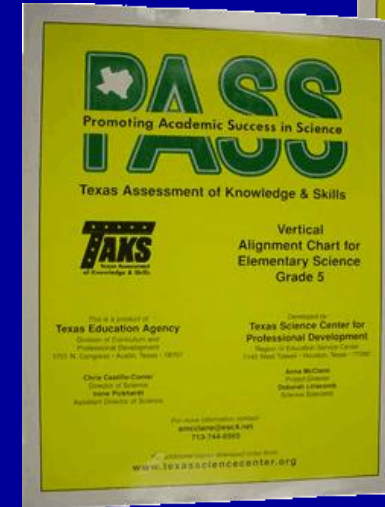
Also available online:
www.tenet.edu/teks/science/safety

Elementary and Secondary Science

➤ Vertical Alignment Chart for Secondary Science Grade 10 and Exit Level Grade 11

➤ Has TAKS OBJECTIVES and TEKS Student Expectations that are assessed from grades 1-High School Physics

➤ Gives highlights from TAKS



To Order:
<http://www.region4store.com/esc/Shop>

Elementary Spanish Science

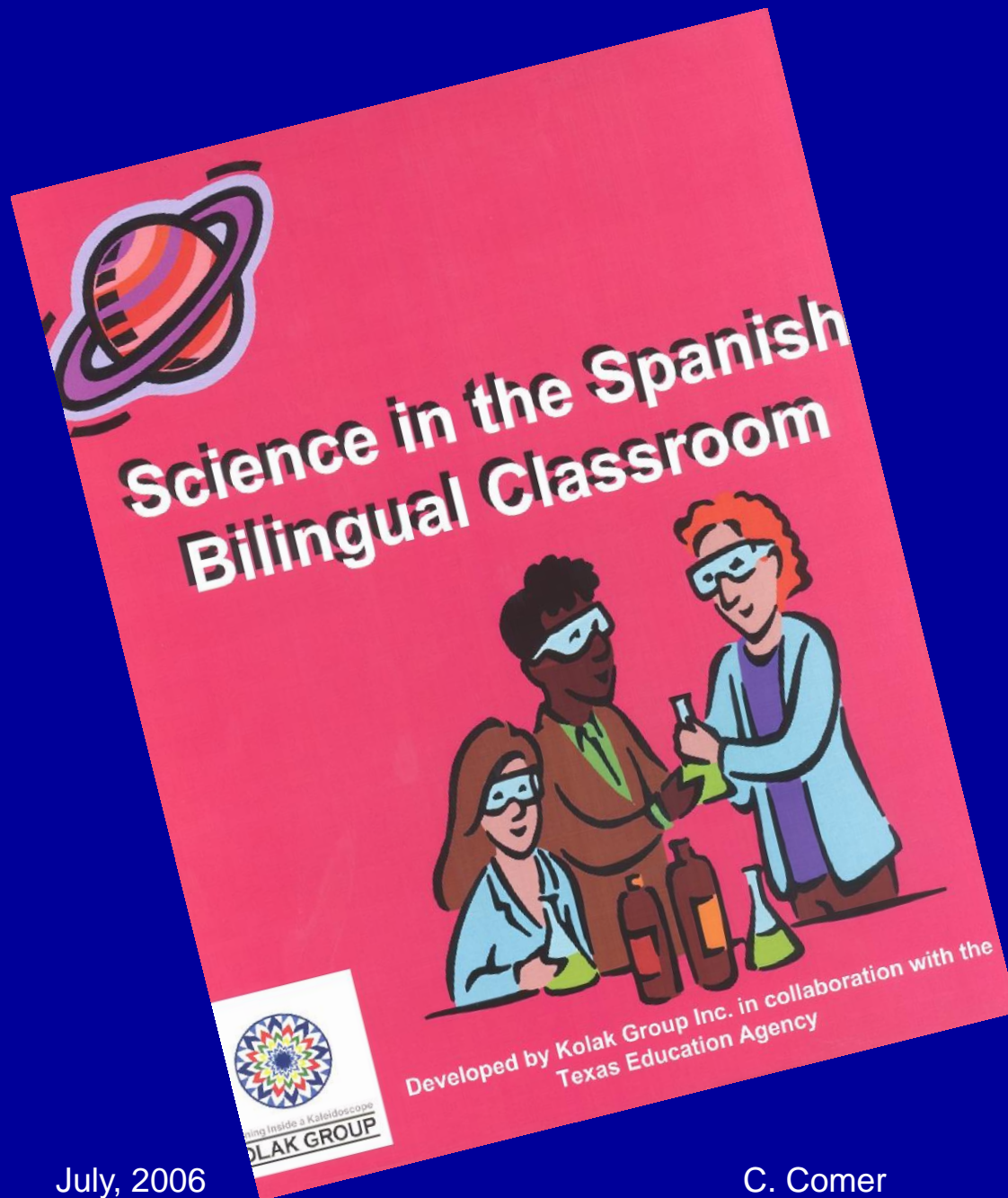
- Includes grades 1-5 in Spanish!
- Gives highlights from TAKS and
- The Texas English Language Proficiency Standards (ELPS)
- Has TAKS Science Spanish Objectives and TEKS Student Expectations that are assessed from grades 3-5

To download copies:

<http://www.tea.state.tx.us/curriculum/biling/>

Go to documents and
Science Chart 1 & 2





**Trainers available
throughout the
state!**

**For More
Information
Contact: The
Kolak Group**

cindy@kolakgroup.com

July, 2006

C. Comer

Middle School Science

- Includes grades K through High School Physics
- Gives highlights from TAKS
- Has TAKS OBJECTIVES and
- Grades 6-8 TEKS assessed on the Middle School Science TAKS given at grade 8



To order copies contact:

Charles A. Dana Center

P.O. Box M

Austin, TX 78713-8913

Phone: 512-471-6190

Fax: 512-232-1854

Products@uts.cc.utexas.edu

D. Comer



Get Ready for TSDS!

TSDS



Welcome to the Texas Mathematics and Science Diagnostic Systems

www.accesstsd.com

July, 2006

C. Comer

What is TSDS?

TSDS

- **Web-Based Diagnostic Assessment Tool**
- **Free to All Texas Public & Charter Schools**
- **Available in September 2006**
- **Part of the TEA Science Initiative**

Example of class summary report teachers can create after administering a diagnostic to students. Report summarizes individual student performance by Science strand and aggregate class performance

[\[Print Customized Report\]](#)

Ms. Teacher's Customized Report

Test Name: 4th Grade TEKS General Exam

Groups: All

GradeLevel: All

Gender: All

Ethnicity: All

Economic Status: All

Test Date Range: From: 01/01/2002 To: 01/01/2003

Today's Date: Sun 11-17-2002 16:56:47 EST

Your group's easiest strand: **Underlying Processes and Mathematical Tools**

Your group's hardest strand: **Measurement**

Student Name	Total Score	Number, Operation, and Quantitative Reasoning	Patterns, Relationships, and Algebraic Thinking	Geometry and Spatial Reasoning	Measurement	Probability and Statistics	Underlying Processes and Mathematical Tools	Date Started	Date Completed	Grade Level	Ethnicity	Gender	Birth Date	Economic Status
Student Demo	11/45	4/14	1/6	2/6	0/6	1/5	3/8	10-17-2002	10-29-2002	7	1	M	01-01-1975	01
Student Demo	14/45	5/14	3/6	2/6	1/6	0/5	3/8	10-17-2002	11-07-2002	7	1	M	01-01-1975	01

Your Customized Report Summary:

	Total	Number, Operation, and Quantitative Reasoning	Patterns, Relationships, and Algebraic Thinking	Geometry and Spatial Reasoning	Measurement	Probability and Statistics	Underlying Processes and Mathematical Tools
Total Group(s)	28%	32%	33%	33%	8%	10%	38%

How Can I Use This Content?

TSDS

- **Student Skills Diagnosis at Beginning of Year and End of Year**
- **Finding Knowledge Points of Departure**
- **Periodic Instructional Benchmarks**
- **Tests, Quizzes, Homework**

Where Are We In Development?

TSDS

- TSDS interface developed
- TSDS items being written
- TSDS tests being developed

- NOW – TSDS items reviewed
- Aug – TSDS district sign-up launches
- Sep – TSDS application launched!



Science List Serve: Please Join...

Our way of
“shouting out”
to you when
you are busy
And something
Important comes
Up for science
In Texas...



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

Our Schools



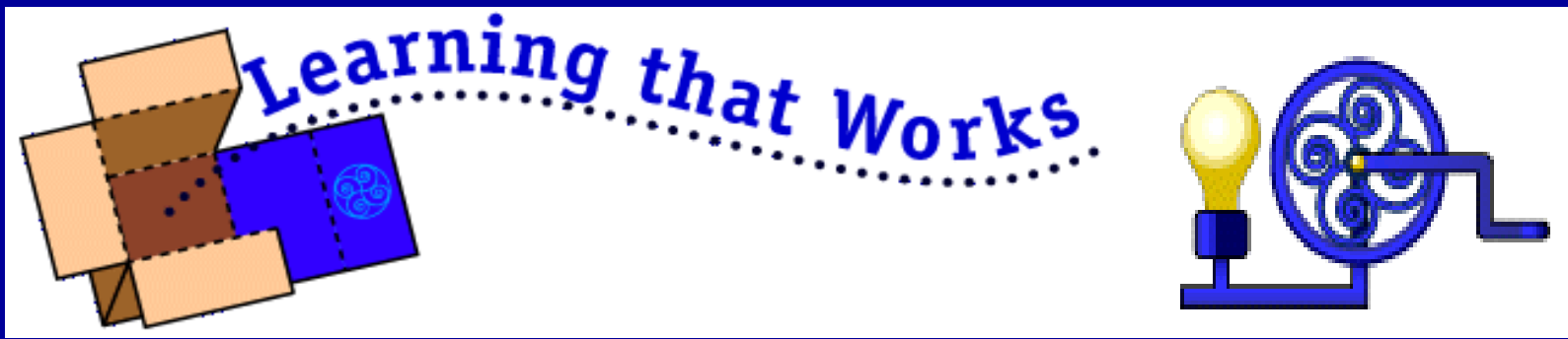
Our Stars

“We dedicate this new website—Our Schools, Our Stars—to the quiet successes our school community achieves everyday.”

Shirley J. Neeley

E-mail:

goodnews@tea.state.tx.us/comm/stars



SCIENCE IN TEXAS:

- Legislative Update
 - SBOE Update

House Bill 1

➤ Senator Shapiro:

“the Senate Education Committee is also interested in ensuring that curriculum is more rigorous so that students graduate from high school prepared to either enter the workforce or college without needing remedial courses”

➤ **HB 1 will provide:**

- Property tax relief
- A teacher pay raise
- High school allotment
- Incentives for educators
- Many other innovative programs



HB1

- **Uniform school start date is not to be before the fourth Monday in August**
- **No waivers will be granted**
 - **In effect for school year 2007-2008**
 - **Any waivers already granted for 07-08 are revoked**
- **Year-round schools not effected**

HB1

- **Emphasis on college and work readiness**
- **TEA and THECB to collaborate**
- **TEA already has an Office of P-16 Coordination**
- **All districts must provide college credit opportunities for HS students by fall 2008 (includes AP/IB as well as dual credit)**
- **Institutions of higher education are directed to assist**



HB1

- New graduation requirements include research writing and 4 courses in the four foundation subjects (ELA, SS, Math, and Science) in the Recommended High School Program and the Distinguished Achievement Program
- Begins with students entering 9th grade in 2007-2008 (4th year of Math and Science in school year 2010-2011)
- SBOE rules TBD



HB1

- Briefing book, including summaries by section and contact information, can be found at:
- <http://www.tea.state.tx.us/comm/briefingbookspecial.pdf>
- FAQ can be found at:
- <http://www.tea.state.tx.us/tea/hb1faq.pdf>



State Board of Education

Motion for first reading at September 14th SBOE Meeting:

- The SBOE will consider increasing credits for the RHSP and the DAP from 24 to 26
- Mathematics requirements for RHSP and DAP will include Algebra I, Geometry, and Algebra II and an additional approved Math course for which Algebra II is a prerequisite.
- Science for RHSP and DAP will include Biology, Chemistry and Physics and an additional approved laboratory-based science course for which there three required science courses are prerequisites.

State Board of Education

Motion for first reading at September 14th SBOE Meeting:

- This list should include a new course: Earth and Space Science.
- Staff was directed to define “laboratory based science”
- Staff was asked to assess which existing courses would be rigorous “capstone” courses for a fourth year
- Staff was also asked to present a recommendation for inclusion of an Engineering course for math and or science.

State Board of Education

Motion for first reading at September 14th SBOE Meeting:

Staff will also have to present a plan for adopting TEKS for new math and science courses.

Computer Science will also be considered as a math or science option.

Average ACT Science Test Score Increase by High School Science Course Sequence for All Texas Students

Course Sequence	% Taking	Average ACT Science Score	Average ACT Science Score Increase from Less Than 3 Years of Science
IPC, Biology, Chemistry, Physics	26%	21.4	3.0
Average Score Increase			
Biology, Chemistry, Physics	23%	21.3	2.9
Average Score Increase			
IPC, Biology, Chemistry	25%	19.1	0.7
Average Score Increase			
Less than 3 Years of Science	14%	18.4	

Texas students taking Physics on average score significantly higher on the ACT Science Test than students taking less than 3 years of science or no Physics.



TEXAS EDUCATION AGENCY

Who to Contact:

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Director of Science

512-463-9581

chris.comer@tea.state.tx.us

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