Texas Regional Collaboratives for Excellence in Science Teaching

Program Summary and TEA Final Report

2005 – 2006 Grant

December 11, 2006

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TRC Mission

The mission of the Texas Regional Collaboratives is to provide Texas science teachers with support systems of sustained and high intensity professional development and mentoring to assist them in the implementation of the Texas Essential Knowledge and Skills (TEKS). Our programs equip teachers with the knowledge and skills to engage all their students in meaningful science learning experiences, and prepare them for high achievement on the Texas Assessment of Knowledge and Skills (TAKS) and other measures.

Program Description

The TRC has three basic components of professional development. First, **Instructional Team Members**, or **ITMs**, from each Regional Collaborative are assembled to provide training to classroom teachers. Instructional Teams ideally consist of professors of Science and Science Education, Science Specialists and Master Teachers in each region. **Professional Development Academies (PDAs)** are provided by the TRC to ITMs from across the state to focus instruction on the priorities set by the Texas Regional Collaboratives and the Texas Education Agency and to improve the quality and effectiveness of professional development provided to teachers. PDAs enhance the knowledge and skills necessary to develop, sustain, and facilitate high quality Professional Development Programs in each region.

Second, each Regional Collaborative develops a **Professional Development Program (PDP)** that addresses both the TRC and TEA priorities for the year and the unique needs of teachers in their region. The PDP is provided to a network of **Science Teacher Mentors (STMs)** from multiple districts in each region. A minimum of 25 STMs from each Regional Collaborative is required, but several Collaboratives serve more than double that number. The PDP consists of training to improve teacher science content knowledge, instructional skills, classroom practice and leadership capacity. STMs receive an average of 105 contact hours of professional development in these areas. Through their participation in the TRC, STMs also receive the instructional materials necessary to implement the hands-on lessons that they have experienced in their classrooms.

Through their experiences with the Regional Collaborative, STMs become true leaders in science education in their schools and districts. To maximize the investment made in these individuals, STMs are required to mentor additional teachers, termed **Cadre Members (CMs)**, throughout the year, and serve as resources for improving student experiences in science both regionally and statewide. Using this multiplier effect, the TRC is able to scale up the number of teachers served across the state at a relatively low cost. Some mentoring occurs informally through the sharing of ideas and expertise on a campus level, team teaching, and coaching. In addition, many STMs provide

formal training and outreach through workshops on topics such as Bridging II TAKS, 5E lesson planning and implementation, aligning instruction and assessment to the TEKS and TAKS, and other more specific locally based training. This mentoring model gives STMs an opportunity to grow professionally as leaders while remaining classroom teachers. Such professional growth is not often encouraged within the confines of the traditional limitations of school culture. This fact makes participation in the TRC especially valuable to experienced teachers who wish to improve their knowledge, skills, and leadership without leaving the classroom. Cadre Members receive an average of 12 documented hours of mentoring, training, and support. Many individual teachers that participated as CMs during the 2004-05 project year chose to increase their level of commitment and become STMs for the 2005-06 program.

Each of these components contributes to the overall goal of improving the quality and rigor of classroom science instruction for P-12 students.

TRC Network

During the 2005-06 grant period, the TRC issued subawards to support **35 Regional Collaboratives** across the state. Each Regional Collaborative consisted of a partnership among numerous organizations and stakeholders with a vested interest in quality science instruction including institutes of higher education, school districts, charter schools, private schools, Education Service Centers, and business and industry. Regional Collaborative grantees are listed below by fiscal agent.

Region 1 Education Service Center/ Edinburg
Texas A&M International University/ Laredo
University of Texas-Pan American/ Edinburg
University of Texas-Brownsville
Texas A&M-Corpus Christi/ ESC 2
Region 3 Education Service Center/ Victoria
Region 4 Education Service Center/ Houston
Humble ISD/ Humble
University of Houston – Clear Lake/Environmental Institute of Houston
Rice University/Houston
University of Texas – Medical Branch/ Galveston
Region 5 Education Service Center/ Beaumont
Texas A&M – College Station
Region 7 Education Service Center/ Kilgore
Region 8 Education Service Center/ Mt. Pleasant
Texas A&M - Texarkana
Region 9 Education Service Center/ Wichita Falls
Region 10 Education Service Center/ Richardson
University of Texas – Dallas
University of Dallas - Irving
Region 11 Education Service Center/ Fort Worth
North Central Texas College/ Gainesville
University of North Texas/ Denton
Region 12 Education Service Center/ Waco
Region 13 Education Service Center/ Austin

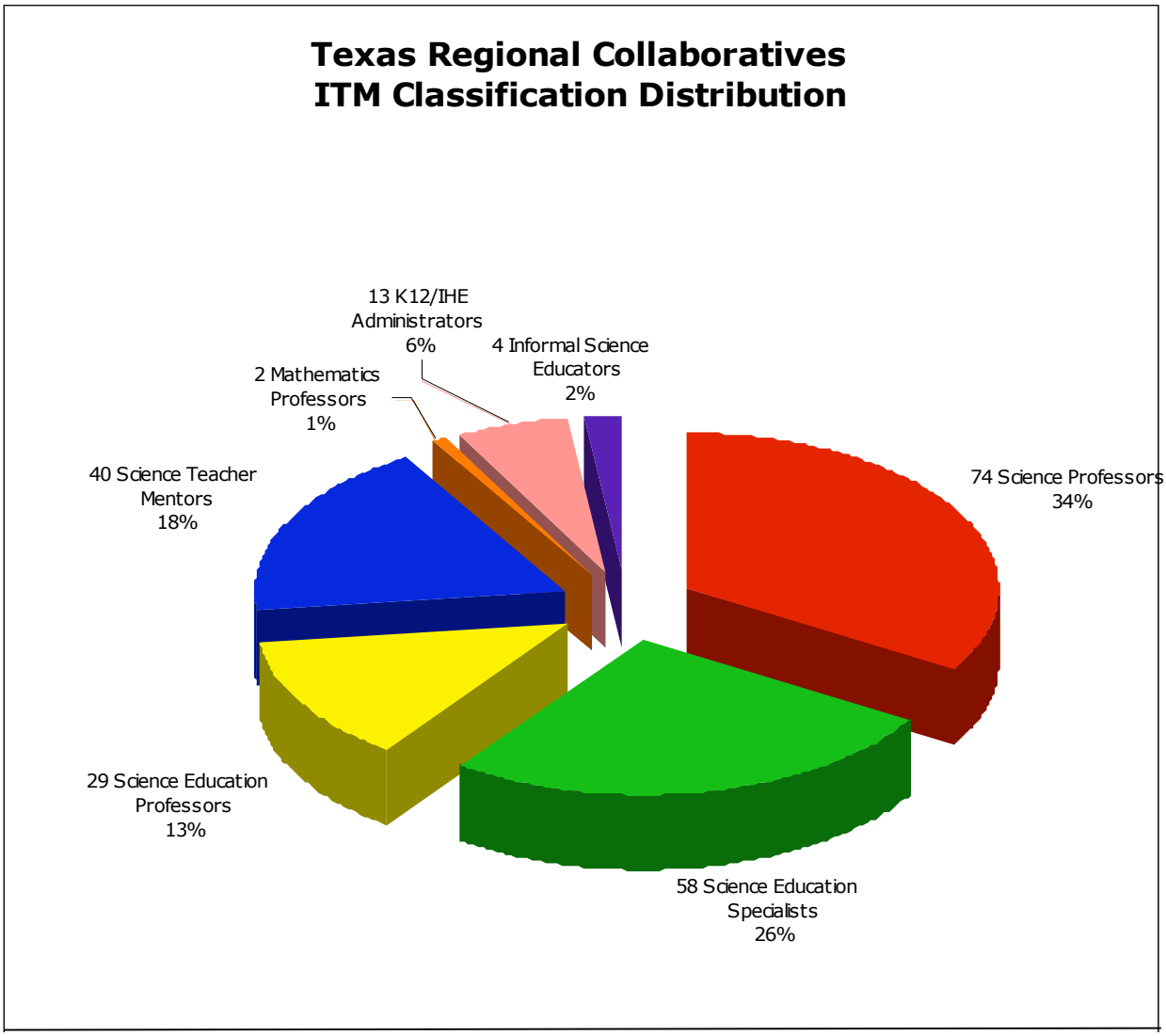
Austin ISD/ Austin
Austin Community College/ Austin
Region 14 Education Service Center/ Abilene
Region 15 Education Service Center/ San Angelo
Region 16 Education Service Center/ Amarillo
Region 17 Education Service Center/ Lubbock
Region 18 Education Service Center/ Midland
Region 19 Education Service Center/ El Paso
Region 20 Education Service Center/ San Antonio
Our Lady of the Lake University/ San Antonio

During the 2005-06 grant period, **43 Institutions of Higher Education** partnered with Regional Collaboratives across the state to provide high quality science teacher professional development. While many of these were fiscal agents as noted above, still others partnered with Education Service Centers to provide coursework and training to teachers.

1. Abilene Christian University
2. Amarillo College
3. Angelo State University
4. Austin Community College
5. Baylor University
6. Concordia University
7. Dallas Baptist University
8. Hardin-Simmons University
9. Lamar University
10. Lee College
11. Midland College
12. Midwestern State University
13. North Central Texas College
14. Northeast Texas Community College
15. Our Lady of the Lake University
16. Rice University
17. Stephen F. Austin University
18. Tarleton State
19. Texarkana College
20. Texas A&M – College Station
21. Texas A&M – Commerce
22. Texas A&M – Corpus Christi
23. Texas A&M – Galveston
24. Texas A&M International University
25. Texas A&M University – Texarkana
26. Texas Christian University
27. Texas Tech University
28. Trinity University
29. University of Dallas
30. University of Houston – Clear Lake
31. University of Houston – Downtown
32. University of Houston – Victoria
33. University of North Texas
34. University of Texas – Austin
35. University of Texas – Brownsville
36. University of Texas – Dallas
37. University of Texas – El Paso
38. University of Texas – Pan American
39. University of Texas – Permian Basin
40. University of Texas – San Antonio
41. University of Texas Health Science Center
42. University of Texas Medical Branch
43. West Texas A&M University

Instructional Team Members from these colleges and universities provided training to P-12 science teachers and served as content experts. In addition to faculty members in higher education, other ITMs included informal science providers such as museum staff members, education service center science specialists, and K-12 science administrators. The greatest number of ITMs were science professors (34%) followed by science specialists at Education Service Centers (26%). Science Teacher Mentors composed 18% of the ITM pool and usually trained their colleagues in their areas of particular expertise. Science education professors, typically from a college of education, comprised 13% of ITMS with the rest distributed among K-12/IHE administrators, informal science educators, and professors of mathematics.

Chart A: Distribution of ITMs 2005-2006



Teachers and Students Served

In addition to these higher education and Education Service Center partners, teachers from **566 school districts** and **1,689 campuses** participated in Texas Regional Collaboratives training. A list of all participating districts is located in the appendix. During the 2005-06 project year, a total of **7,282 educators** were served by the Texas Regional Collaboratives. Information on educators and students served was generally collected by having each educator complete a TRC Participant Data Form (see appendix). In some cases, participants who attended workshops did not complete an entire form, but only provided information such as their name, campus, district and grades or subjects taught. Based on an average student/teacher ratio of 65.4 students per TRC teacher, approximately **473,330 students** have been impacted by TRC

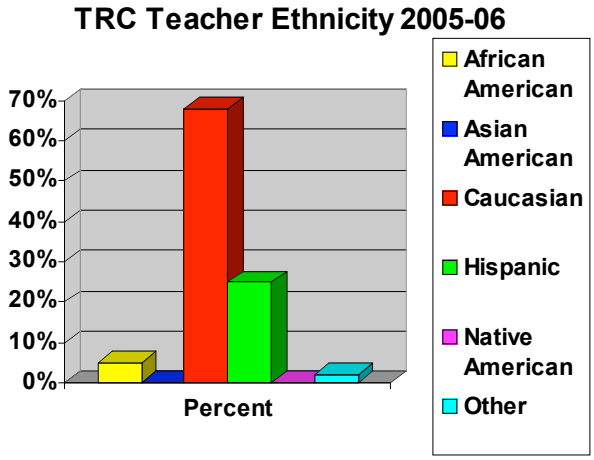
professional development. A breakdown of teacher demographics is described in Tables 1-9 while school and student demographics are described in tables 10-13.

1. *Teacher Gender*

	Number	Percent
Male	735	12%
Female	5594	88%

2. *Teacher Ethnicity*

	Number	Percent
African American	309	5%
Asian American	20	0%
Caucasian	4225	68%
Hispanic	1519	25%
Native American	9	0%
Other	93	2%

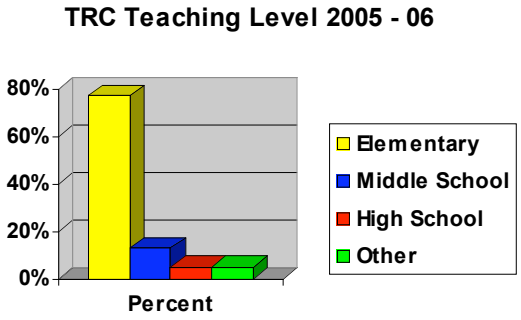


3. *Degree*

	Number	Percent
High School	75	2%
Bachelors	3481	80%
Masters	760	17%
Doctorate	40	1%

4. *Teaching Level*

	Number	Percent
Elementary	4977	77%
Middle School	838	13%
High School	338	5%
Univ/College	15	0%
Admin	31	0%
Specialist/Facilitator	62	1%
ESC	52	1%
Informal Ed	1	0%
Education Student	67	1%
Consultant	9	0%
Other	39	1%



5. *Highly Qualified*

	Number	Percent
Yes	4220	58%
No	1578	22%
Not Sure	1476	20%

6. *Certification Status*

	Number	Percent
Certified for All Subjects/Graded I teach	5504	96%
Certified, but not for all subjects/grades I teach	65	1%
Currently pursuing certification	97	2%
Currently under emergency, provisional or temporary certificate	70	1%

7. *Grades Currently Taught*

	Number	Percent			Number	Percent
PreK	92	1%		*6th*	437	6%
K	753	10%		*7th*	347	5%
1st	783	11%		*8th*	325	5%
2nd	864	12%		*9th*	215	3%
3rd	917	13%		*10th*	167	2%
4th	998	14%		*11th*	126	2%
5th	530	14%		*12th*	97	3%

8. *Subject Currently Taught*

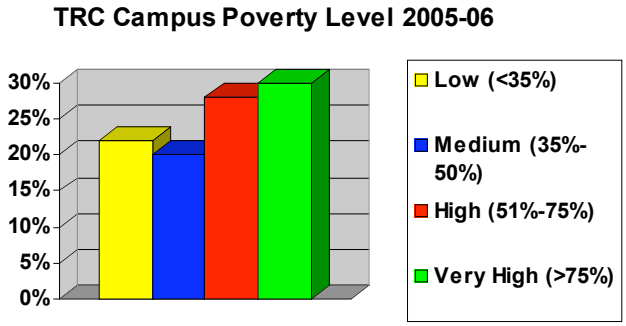
	Number	Percent
Elementary Science	4236	64%
Middle School Science	446	7%
Health	275	4%
IPC	70	1%
Biology	60	1%
Chemistry	69	1%
Physics	33	0%
GMO	1	0%
AP Science	29	0%
Mathematics	784	12%
Other Science	191	3%
Other	432	7%

9. Campus Type

	Number	Percent
Public	6290	96%
Private	170	3%
Alternative	16	0%
Charter	52	1%

10. Poverty Level

	Number of teachers	Percent
Low (<35%)	947	22%
Medium (35%-50%)	901	20%
High (51%-75%)	1232	28%
Very High (>75%)	1319	30%

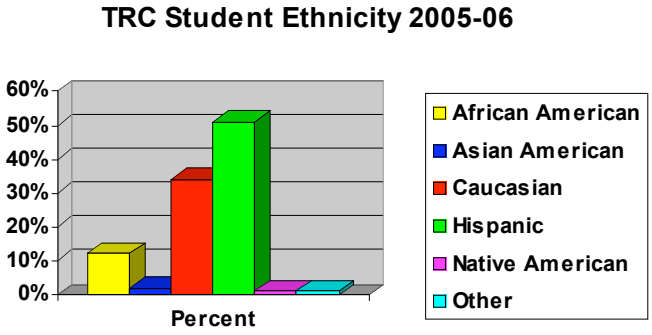


11. Title I Status

	Number	Percent
YES	5099	79%
NO	1351	21%
N/A	2	0%

12. Student Ethnicity

	Number	Percent
African American	39845	12%
Asian American	6479	2%
Caucasian	114438	34%
Hispanic	171473	51%
Native American	2771	1%
Other	3653	1%



Project Impact

Each year, the Texas Education Agency and the Texas Regional Collaboratives work collaboratively to develop specific targets and goals for statewide professional development. During the 2005-06 funding period, the Texas Education Agency charged the Texas Regional Collaboratives with the responsibility of scaling up the number of teachers served statewide with additional funding. This goal was accomplished in several ways. Table 13 compares the outputs from the 2004-05 funding period to that of 2005-06. As indicated by the data, the TRC was able to more than double its impact in most targeted areas.

13. TRC Program Comparisons

Indicator	2004-05	2005-06
Regional Collaboratives	20	35
STMs	761	1,715
CMs	1979	5,567

Students served	189,677	473,330
School Districts	324	566
Campuses	747	1,689
Total contact hours	61,246	222,140
Teachers trained in BIITAKS	2,481	5,901

In addition to increasing the overall number of teachers served by the TRC, the Texas Education Agency also placed a high priority on continuing training and dissemination on the Bridging II TAKS modules funded by TEA and developed by the Texas Science Center at Education Service Center Region 4. During the previous funding year, the TRC had focused training on Module 2: Tools for Exploring Matter. The module that was addressed during this time period was Module 1: Light and Optical Systems. It focused on the Texas Essential Knowledge and Skills (TEKS) for Grades K-8 with particular emphasis on physical science concepts related to light and optics that are required at these grade levels according to the TEKS. Table 14 shows the number and percentage of teachers trained in Bridging II TAKS versus other TEKS-based science professional development alone. All STMs received this training as part of their overall Professional Development Program of 105 hours. After being trained on the BIITAKS module, STMs were required to provide training, mentoring, and support for the colleagues they worked with in their schools and districts (CMs) to implement the BIITAKS lessons across multiple grade levels. TRC funding was also used to **supply trained teachers and campuses with the science equipment and materials they needed to teach these lessons** as well. This was one of the most attractive aspects of TRC participation both for STMs as well as CMs.

14. Teachers Served

	Number	Percent
Trained in Bridging II TAKS	5901	82%
Other Ongoing Professional Development	1287	18%

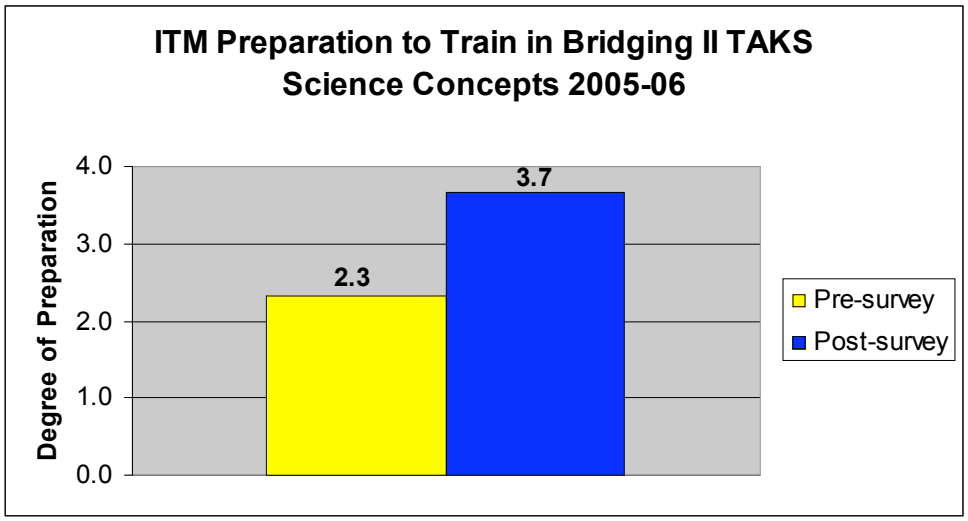
The total number of **Science Teacher Mentors** served in 2005-06 was **1,715**. Each STM received an average of 92 contact hours of professional development. The total number of **CMs** served was **5,567** with each CM receiving an average of 12 contact hours.

The **total number of contact hours** provided by the TRC was **222,140**. This included college credit hours which many teachers earned through taking coursework at the Institutions of Higher Education listed previously. TRC teachers earned a total of **1,142 college credit hours**. Such college courses primarily focus on improving teachers' science content knowledge and are taught by science and science education professors from across the state. Many teachers are able to use their involvement in the TRC to earn a master's degree from institutions that work in close collaboration with the Regional Collaboratives such as Texas Tech, UT-Brownsville, UT-Pan American, Texas A&M-Texarkana, and Our Lady of the Lake University.

Instructional Team Member (ITM) Impact

ITMs from all Regional Collaboratives attended a three-day Professional Development Academy specifically focused on Bridging II TAKS Module 1: Light and Optical Systems. Ninety ITMs received training and completed both the pre-survey and post-survey. PDAs are particularly helpful to college professors who may be well versed in their science discipline, but have little experience in P-12 instruction. PDAs familiarize these individuals with the state standards, or Texas Essential Knowledge and Skills (TEKS), which are associated with each grade level. In addition, PDAs are an excellent opportunity for those involved in P-12 education and those involved in higher education to network, communicate, and most of all, learn from each other. This is the essence of the Department of Education Math and Science Partnership program under which the TRC is funded.

Chart B: Improvements in ITM Preparation

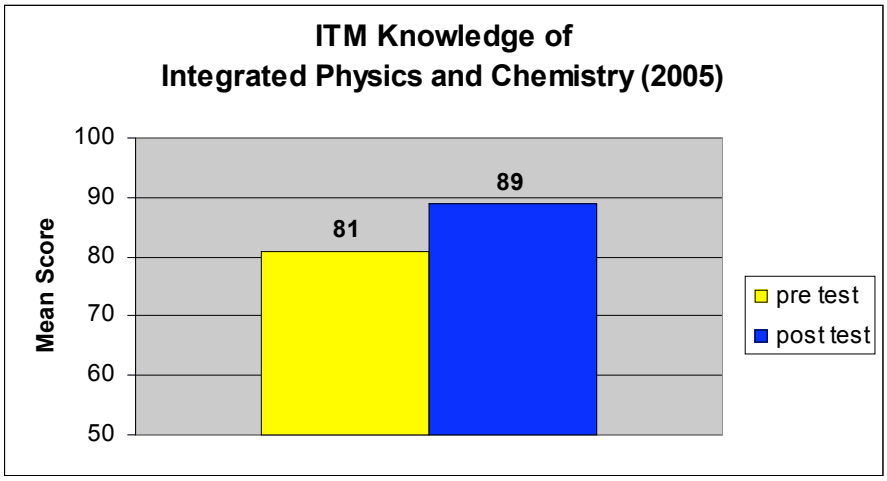


To assess the impact of the PDA on ITMs, a twenty-six item survey was developed and administered as a pre-survey prior to their training and again as a post-survey following the training (see appendix for survey). The survey focused specifically on the science concepts and instructional skills addressed in the Bridging training and assessed each ITM's level of preparation to deliver professional development based on these concepts and skills. Using a scale that included: 1=not adequately prepared; 2=somewhat prepared; 3=fairly well prepared, and 4=very well prepared, ITMs rated their level of preparation both before and after training. ITMs showed statistically significant gains in their level of preparation to train teachers in the science concepts and instructional skills addressed in the Bridging module. As indicated by Chart A, the average rating for level of preparation moved from 2.3 prior to training to 3.7 after the PDA.

ITMs also attended a PDA covering concepts from the Integrated Physics and Chemistry course. Instructional materials from the Texas Higher Education Coordinating Board Teacher Quality IPC grant "Science in the Movies" were used in this training. The objective of the IPC PDA was to prepare Instructional Team Members to train IPC teachers. Training focused on improving teacher content knowledge in the context of

lessons that could be delivered in an IPC class. The TRC administered a pre-test and post-test of content knowledge in physics and chemistry to ITMs that attended this training. While most ITMs began the training with a good background in these disciplines (as one would expect given their selection as trainers), statistically significant improvements were noted for the 41 ITMS that completed the PDA as well as the pre-test and post-test.

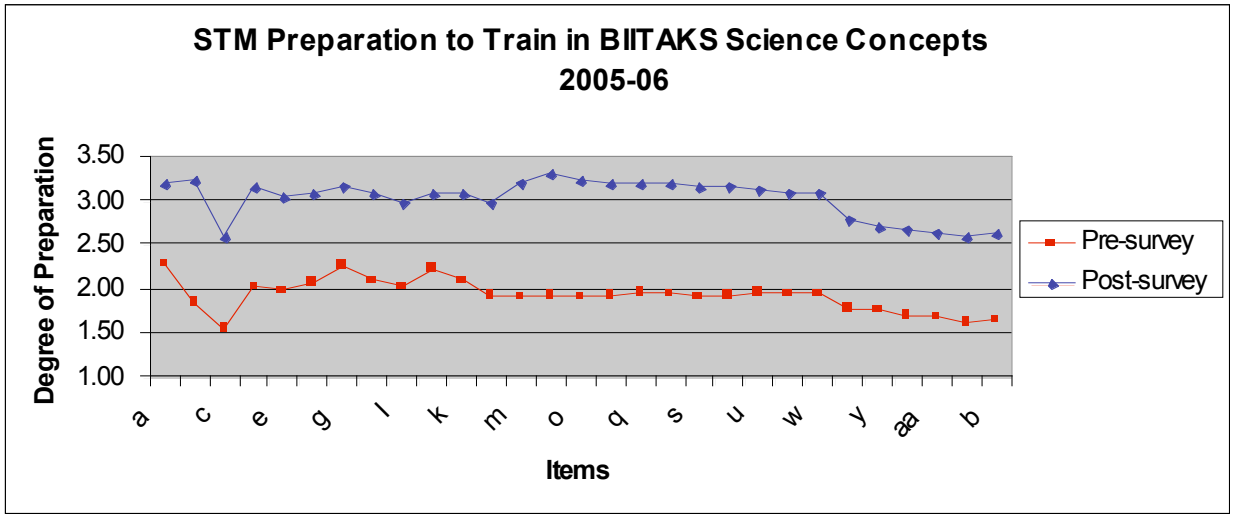
Chart C: Improvements in ITM knowledge of physics and chemistry



Science Teacher Mentor (STM) Impact

A similar survey was given to Science Teacher Mentors that were trained in Bridging II TAKS. These STMs used the knowledge and skills they gained from the training to not only implement the Bridging II TAKS lessons in their own classrooms, but to mentor other teachers at their campus and in their districts on Bridging II TAKS lessons at other grade levels as well.

Chart D: Improvements in STM Preparation to Train in BIITAKS

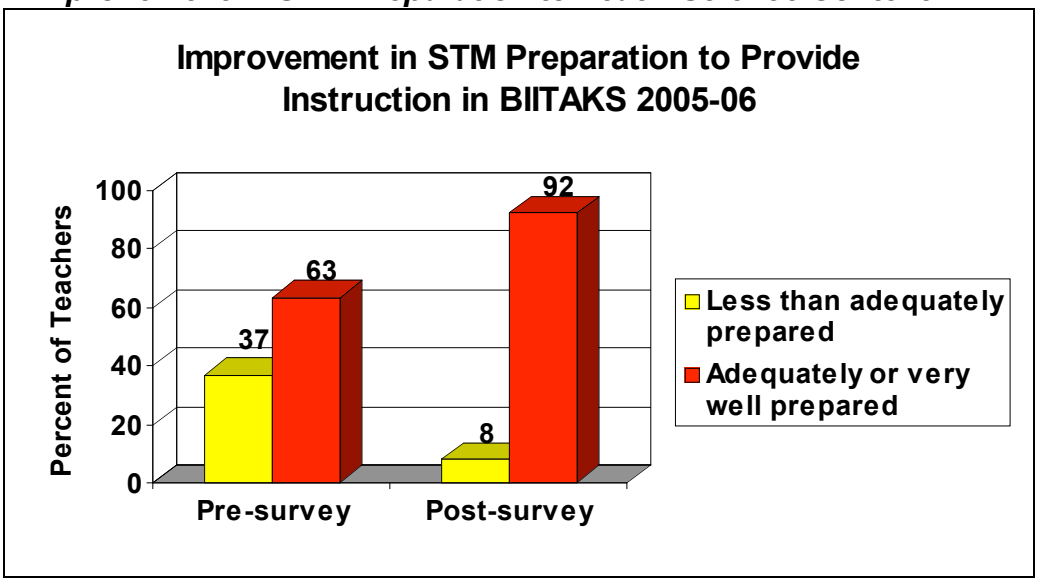


Similar improvements were noted in the STM level of preparation to train other classroom teachers with the overall average level of preparation moving from a 2.3 to a 3.2. As one would expect, the confidence these STMs felt in training others as classroom teachers improved, but was still not as high overall as that of those who work full time with adult learners and professional development. One of the goals of TRC training and involvement is to change the professional culture of the schools our STMs work in to promote and build leadership capacity in areas such as curriculum and instruction.

The Bridging II TAKS training and subsequent mentoring was a step in this direction for many teachers who had little experience presenting in front of their peers. Changes in STM level of preparation by item are illustrated in Chart D. A copy of the survey can be found in the appendix.

Since STMs are expected to both train CMs as well as implement the Bridging II TAKS instruction in their classrooms, part of the STM survey also addressed how well prepared these teachers felt before and after BIITAKS training to address the TEKS-based content of the lessons in an inquiry manner in their classrooms. STMs showed significant gains after training in their level of preparation to implement lessons covering the identified TEKS using the 5E model.

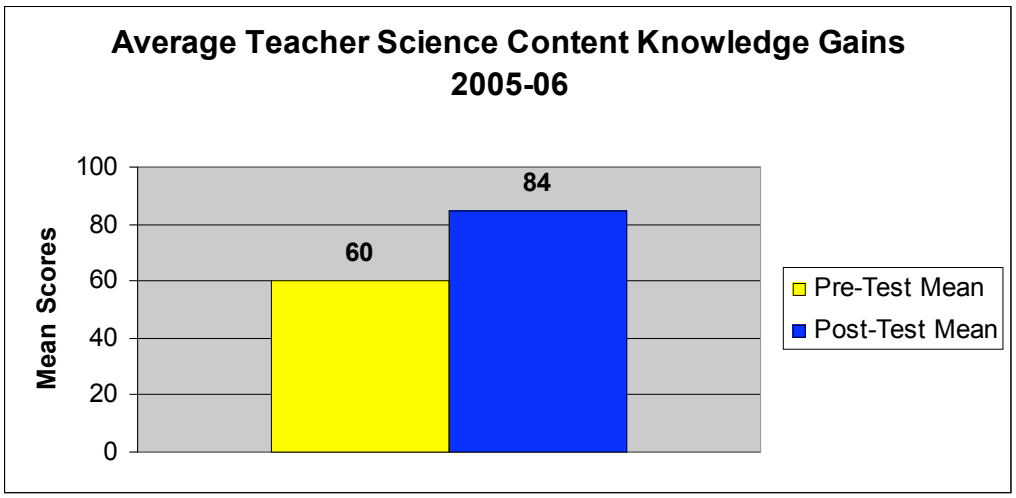
Chart E: Improvement in STM Preparation to Teach Science Content in BIITAKS



One of the primary goals of the Texas Regional Collaboratives is to improve the science content knowledge of participating teachers. Each Regional Collaborative develops a Professional Development Program to address the unique needs of the teachers who participate in that region. Regional Collaboratives may have a slightly different focus each year depending on the specific grade level of teachers that participate and a regional needs assessment. Needs assessments generally include an examination of student TAKS scores as well as local data such as district benchmarks to identify areas in need of instructional improvement.

Nine Regional Collaboratives developed formal procedures for identifying changes in teacher science content knowledge as a result of TRC training. These Collaboratives administered 21 different tests in a pre-test/post-test format. Test content covered a range of topics including physics, chemistry, biology, earth science, and science process skills. The impact of TRC professional development on the content knowledge of teachers is summarized in Chart F. Pre-test mean scores and post-test mean scores were averaged for all exams resulting in a mean scores of 60% for all pre-tests as compared to a mean score of 84% for all post-tests.

Chart F: Improvements in STM Science Content Knowledge



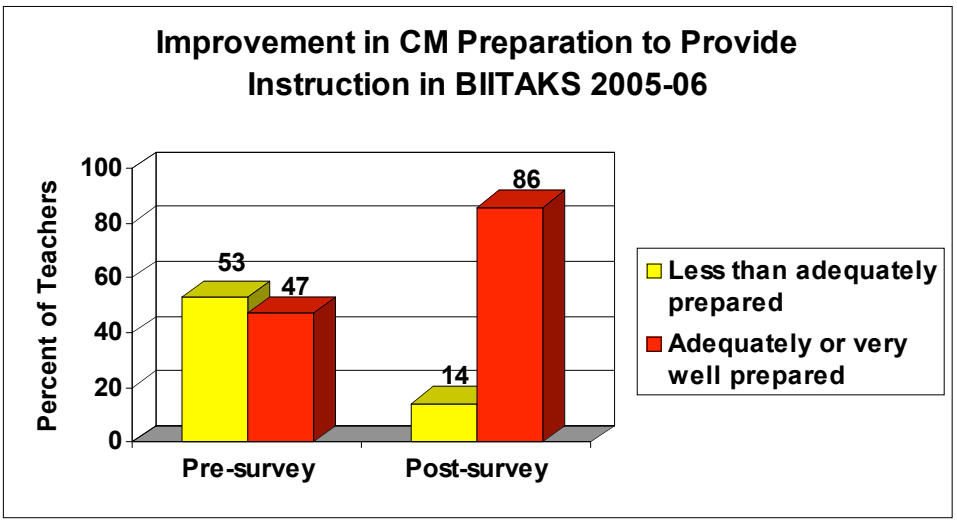
Cadre Member (CM) Impact

As mentioned earlier, 5,567 Cadre Members, primarily elementary teachers, were trained or mentored through the Regional Collaboratives in 2005-06. Of these individuals, 4,409 received training in Bridging II TAKS for an average of 12 contact hours. While STMs generally received training in multiple grade levels, K-8, CM training typically focused only on the lessons in the grade each teacher taught or the associated grade span (i.e. K-2, 3-5, 6-8).

Cadre Members who were trained in Bridging II TAKS also completed a pre-survey and post-survey related to their training (see appendix). While the survey for STMs focused on both their degree of preparation to deliver further professional development related to Bridging II TAKS and their ability to implement inquiry lessons covering the TEKS-based content addressed in BIITAKS, the CM survey focused only on their level of preparation to teach the TEKS-based content and skills addressed in the Bridging II TAKS lessons at their grade level. As evidenced by Chart G, it is clear that the training provided to CMs had a major impact on their perceptions of their level of preparation to teach the physical science content addressed in Bridging II TAKS and to use the 5E lesson planning model described in Bridging II TAKS to convey this information. This is not surprising given the limited experience most elementary teachers have with learning physical science content and the discomfort they often have with teaching science

without the textbook. The 5E Model is based on learning cycle and cognitive research that emphasizes student engagement, concrete experiences prior to abstract representations, and applications of content knowledge in a variety of contexts. In general, while 53% of respondents felt less than adequately prepared prior to training to teach the content specified for their grade level and to use the 5E lesson model, only 14% continued to feel that way after the training. Likewise, only 47% described themselves as adequately or very well prepared prior to training, but 86% felt adequately or very well prepared after the training.

Chart G: Improvement in CM Preparation to Teach Science Content in BIITAKS

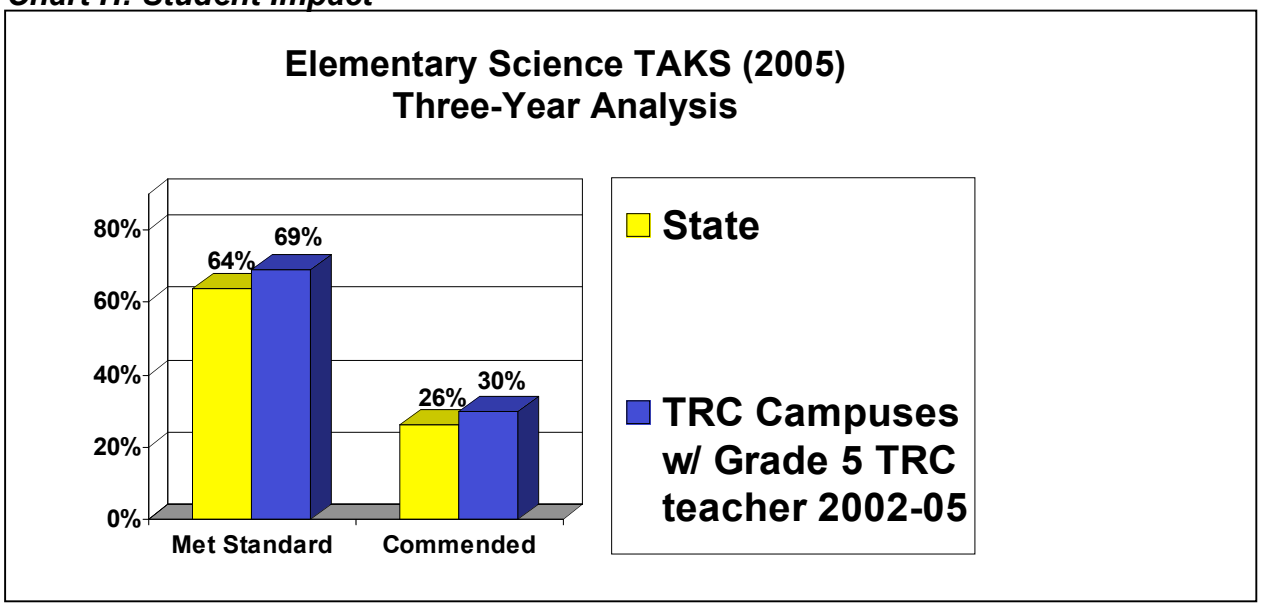


Another factor that likely influenced teachers' level of preparation may have been that the TRC supported their training and its subsequent classroom implementation with science instructional materials such as scales, safety goggles, radiometers, diffraction grating, beakers, prisms, etc. TRC funds were utilized to provide STMs and CMs with the materials needed to implement the Bridging II TAKS lessons. Given the traditional lack of science equipment in elementary classrooms, this access to instructional materials made a tremendous difference in the capacity to teach standards-based, hands-on science in many classrooms.

Student Impact

One of the most difficult tasks for professional development evaluators is to determine the effect teacher professional development has on student achievement. This is particularly challenging for a large statewide organization that serves teachers in over 500 independent school districts, charter schools, and private schools. With the implementation of the Elementary Science Texas Assessment of Knowledge and Skills (TAKS) test however, evaluators at least have a common metric by which to measure statewide student performance. This test, which is administered at Grade 5, measures student understanding of the TEKS for Grades 2-5. Test data is available only on a campus, district, regional, and state level. Test scores for individual students or students clustered within individual teachers are not available.

Chart H: Student Impact



Since the translation of teacher knowledge and skills to student performance is not instantaneous, the most reliable and valid way to analyze the impact of TRC professional development on student performance is to examine the student scores for campuses that have had TRC teacher participation over time. The TAKS test was first administered at Grade 5 in spring of 2003. Therefore, this first administration serves as a benchmark for future growth. Researchers determined that between 2003 and 2005, 21 Texas campuses had at least one Grade 5 teacher receiving a minimum of 30 contact hours of training from the TRC. An analysis of those campuses compared to the state averages indicates that 69% of students at TRC campuses met the state passing standard while 64% of students in the state met standard. In addition, 30% of TRC campuses received a commended ranking in science while statewide the average was 26%.

For the 2005-2006 school year, several individual Regional Collaboratives collected data on student achievement. For example, in the Region 10 Collaborative, Grade 5 passing percentages for TRC campuses increased approximately 11% between 2005 and 2006. In Austin ISD, the largest district in the Capital City Collaborative, passing percentages increase by 5% overall, by 12% for TRC campuses and by 25% for the lowest performing schools that participated in TRC training by leveraging additional corporate support. The Region 13 Collaborative reported passing percentages for TRC schools (elementary through high school) increased from 72% to 80%. Region 15 documented an 11% increase in TAKS passing rates for TRC campuses. The most extensive data collection came from the Austin Community College Collaborative that works with elementary teachers from two suburban school districts in central Texas. By tracking the implementation of Bridging II TAKS lessons in fifth grade classrooms for the ten campuses that participated from RRISD in this collaborative, the TRC was able to document the correlation between improvements in TAKS scores and the application of TRC training.

Chart I: Correlation between BIITAKS implementation and TAKS scores

School	Use of BIIT Module 1 Lessons at 5th Grade	Use of BIIT Module 2 Lessons at 5th Grade	TAKS 2004 % Meeting Standards	TAKS 2005 % Meeting Standards	TAKS 2006 % Meeting Standards
BCE	100%	100%	81	82	96
			+ 1		+ 14
SPE	100%	100%	79	82	94
			+ 3		+ 12
WBE	100%	100%	64	70	81
			+ 6		+ 11
CCE	100%	100%	94	88	98
			- 6		+ 10
LOE	80%	82%	69	74	86
			+ 5		+ 12
KCE	40%	46%	83	84	96
			+ 1		+ 12
LME	50%	46%	91	95	98
			+ 4		+3
FNE	0%	0%	81	87	93
			+ 6		+ 6
JVE	0%	0%	78	84	91
			+ 6		+ 7
PSE	0%	0%	72	85	87
			+13		+ 2

As evidenced in Chart I, campuses with higher rates of implementation improved their TAKS scores between 2005 and 2006 more than those with lower rates of implementation. Chart J summarizes this data and describes similar patterns of improvement in commended performance as well.

Chart J: Summary of correlation between BIITAKS implementation and TAKS passing and commended percentages in RRISD.

Percent usage of BIITAKS for 2005-06	Avg Change in % Meeting Standard from 2005-06	Avg Change in % Commended from 2005-06
Used 100% of Lessons in Module 1 and 2	+ 12	+ 7
Used 40-82% of Lessons in Module 1 and 2	+ 9	+ 3

Used 0% of Lessons in Module 1 and 2	+ 5	- 2

Another challenge in comparing student achievement data in Texas is that since the TAKS was administered in 2003, the standard for passing was gradually increased each year through 2005. Thus, comparisons of the percent passing are hindered by a lack of consistent criteria to define passing. A more valid metric for making longitudinal comparisons would be the scale score for each of these years. Unfortunately, scale score data by campus is not readily available to researchers through the Texas Education Agency. The Texas Regional Collaboratives has submitted a public information request to the Texas Education Agency to secure statewide TAKS Grade 5 Science scale score data from 2003 through 2006. When the TRC receives this data, it will be analyzed to provide more up to date results regarding the impact of TRC training on students at all campuses across the state.

Conclusion

Overall, the achievements of the Texas Regional Collaboratives for Excellence in Science Teaching during the 2005-06 funding period have been extensive. The TRC increased the number of Regional Collaboratives from 21 to 35, scaled up its services from 3,045 teachers to 7,282 educators, and increased the number of students impacted by TRC training from 189,677 in 2004-05 to 473,330 in 2005-06. The TRC also continued to recruit professors from the Colleges of Natural Sciences to provide professional development to the teachers, reaching an unprecedented total of 74 professors of science representing 43 institutions of higher education. In addition, TRC teachers received hundreds of thousands of dollars worth of classroom instructional materials to implement the lessons and content in which they were trained.

Beyond just numbers however, the Texas Regional Collaboratives has truly made a difference for many of the teachers we serve and the students they serve. Regional Collaborative teachers have provided the TRC with extensive qualitative feedback attesting to the positive impact participation in the Regional Collaborative network has had on them both personally and professionally. This feedback has been collected in the form of journal entries, workshop evaluations, emails, personal notes, etc. A few particularly notable examples have been included in the appendix and qualitative feedback in its entirety can be found on the CD of Annual Reports provided to TEA.

Unfortunately, while much has been accomplished by the Texas Regional Collaboratives over the 2005-06 program year, the services provided represent only a fraction of those needed for the 135,000 elementary teachers and the 16,000 secondary science teachers in the state. During the 2006-07 grant period, the goal of the TRC will be to continue to scale up its efforts to reach additional teachers while maintaining a focus on the long-term and sustained professional development that is the hallmark of this program.

Appendix

District List

1.	Al-Hedaya
2.	Abernathy
3.	Abilene
4.	Agua Dulce
5.	Alamo Heights
6.	Alba Golden
7.	Albany
8.	Aldine
9.	Aledo
10.	Alice
11.	Alief
12.	Allen
13.	Alpine
14.	Alvin
15.	Amarillo
16.	Anahuac
17.	Anderson-Shiro
18.	Andrews
19.	Anson
20.	Anthony
21.	Aransas County
22.	Aransas Pass
23.	Archer City
24.	Argyle
25.	Arp
26.	Aspermont
27.	Atlanta
28.	Austin
29.	Austin Diocese
30.	Austwell Tivoli
31.	Avery
32.	Avinger
33.	Awty International
34.	Axtell
35.	Azle
36.	Baird
37.	Bandera
38.	Barbers Hill
39.	Bay City
40.	Beaumont
41.	Beckville
42.	Beeville
43.	Bellville
44.	Belton

45.	Big Spring
46.	Birdville
47.	Bishop
48.	Blackwell
49.	Bloomburg
50.	Blooming Grove
51.	Blum
52.	Boerne
53.	Bonham
54.	Bowie
55.	Brady
56.	Brazos
57.	Brazos County
58.	Brazosport Christian
59.	Breckenridge
60.	Bridgeport
61.	Brooks County
62.	Brownfield
63.	Brownsboro
64.	Brownsville
65.	Bruceville Eddy
66.	Bryan
67.	Buckholts
68.	Buena Vista
69.	Bullard
70.	Buna
71.	Burkburnett
72.	Byers
73.	Caddo Mills
74.	Calallen
75.	Calhoun
76.	Callisburg
77.	Canutillo
78.	Carrizzo Springs
79.	Carroll
80.	Carrollton Farmers
81.	Carthage
82.	Castleberry
83.	Cayuga
84.	Celina
85.	Center Point
86.	Centerville
87.	Central Heights

88.	Chapel Hill
89.	Chico
90.	Chilton
91.	China Spring
92.	Chisum
93.	Chreno
94.	City View
95.	Clarksville
96.	Claude
97.	Clear Creek
98.	Cleburne
99.	Clifton
100	Clint
101	Clyde
102	Coahoma
103	Coldspring
104	Coleman
105	College Station
106	Collinsville
107	Colorado
108	Colorado city
109	Columbia-Brazoria
110	Columbus
111	Comal
112	Comanche
113	Como-Pickton
114	Connally
115	Conroe
116	Cooper
117	Copperas Cove
118	Corpus Christi
119	Corsicana
120	Cotton Center
121	Crandall
122	Crane
123	Crawford
124	Crosby
125	Cross Plains
126	Cross Roads
127	Crowley
128	Cuero
129	Culberson County
130	Cumby
131	CyFair

132	D'Hanis
133	Daingerfield
134	Daingerfield-Lone Star
135	Dalhart
136	Dallas
137	Dawson
138	Dayton
139	Decatur
140	DeKalb
141	Del Rio
142	Del Valle
143	DeLeon
144	Denton
145	Department of Defe
146	DeSoto
147	Detroit
148	Devine
149	Diboll
150	Dickinson
151	Diocese of KC
152	Donna
153	Dr. Garza
154	Driscoll
155	Eagle Mountain
156	Eanes
157	Early
158	Eastland
159	Ector County
160	Edcouch-Elsa
161	Eden
162	Edgewood
163	Edinburg
164	Edna
165	El Campo
166	El Paso
167	El Paso Diocese
168	Elgin
169	Ennis
170	Era
171	Eula
172	Evadale
173	Everman
174	Ezzell

175	Fabens
176	Fairfield
177	Falls City
178	Fannindel
179	Ferris
180	First Baptist Acad
181	Floresville
182	Flour Bluff
183	Floydada
184	Forestburg
185	Forney
186	Forsan
187	Fort Bend
188	Fort Stockton
189	Fort Worth
190	Fort Worth Diocese
191	Frenship
192	Frisco
193	Frost
194	Gainesville
195	Galena Park
196	Galve Hous Diocese
197	Galveston
198	Ganado
199	Garland
200	Gary
201	Gilmer
202	Gladewater
203	Golden Rule Charter
204	Goldthwaite
205	Goliad
206	Goose Creek
207	Graham
208	Granbury
209	Grandfalls Royalty
210	Grape Creek
211	Grapevine
212	Greenville
213	Gregory Portland
214	Groom
215	Gunter
216	Gurman

217	Gustine
218	Hale Center
219	Hallsburg
220	Hallsville
221	Hamlin
222	Hardin Jefferson
223	Harlandale
224	Harleton
225	Harlingen
226	Harmony
227	Hart Independent
228	Harts
229	Haskell
230	Hawley
231	Hays
232	HEB
233	Hemphill
234	Henderson
235	Henrietta
236	Hereford
237	Hermleigh
238	Hico
239	Hidalgo
240	Higgins
241	Highland
242	Hillsboro
243	Holliday
244	Honors Academy
245	Hooks
246	Houston
247	Hubbard
248	Hudson
249	Huffman
250	Hughes Springs
251	Humble
252	Huntington
253	Hurst Euless
254	Hutto
255	Idalou
256	Industrial
257	Ingleside
258	Ira
259	Iraan Sheffield
260	Iredell
261	Irion County

262	Irving
263	Jacksboro
264	Jacksonville
265	Jefferson
266	Jim Ned
267	Jonesboro
268	Judson
269	Karnes City
270	Katy
271	Keene
272	Keller
273	Kenedy
274	Kennard
275	Kennedale
276	Kerens
277	Kermit
278	Kilgore
279	Killeen
280	Kingsville
281	Klein
282	Knox City – O'Brien
283	Kopperl
284	Krum
285	La Gloria
286	La Joya
287	La Porte
288	Lackland
289	Lake Travis
290	Lake Worth
291	Lamar
292	LaMarque
293	Lamesa
294	Lancaster
295	Laneville
296	Laredo
297	LaVega
298	Leakey
299	Leander
300	Leary
301	Leon
302	Leuders Avoca
303	Levelland
304	Lewisville
305	Lexington
306	Liberty
307	Liberty Eylau
308	Lindale
309	Linden Kildare
310	Lipan
311	Little Cypress
312	Little Elm
313	Lockhart
314	Lockney
315	Lohn
316	Lone Oak
317	Longview
318	Lorena
319	Los Fresnos
320	Lovejoy
321	Lubbock
322	Lubbock Christian
323	Lufkin
324	Lumberton
325	Lytle
326	Madisonville
327	Magnolia
328	Manor
329	Marble Falls
330	Marfa
331	Marian
332	Marlin
333	Marshall
334	Mart
335	Martinsville
336	Mason
337	Mathis
338	Maypearl
339	McAllen
340	McCamey
341	McGregor
342	McLeod
343	Medina Valley
344	Megargel
345	Melissa
346	Mequite
347	Merkel
348	Mexia
349	Meyersville
350	Miami
351	Midland
352	Midland Academy
353	Midland Christian
354	Midway
355	Mildred
356	Miller Grove
357	Mission
358	Monahans
359	Morgan
360	Mount Pleasant
361	Mount Vernon
362	Muleshoe
363	Murchison
364	Nacona
365	Natalia
366	Navasota
367	New Boston
368	New Caney
369	New Frontiers Char
370	Newton
371	Nordheim
372	North East
373	North East Christian
374	North Forest
375	North Lamar
376	Northeast Christian
377	Northside
378	Northwest
379	Nueces Canyon
380	O'Donnell
381	Orange Grove
382	Oregon City
383	Overton
384	Paint Creek
385	Paint Rock
386	Palacios
387	Palmer
388	Pampa
389	Panhandle
390	Paris

391	Pasadena
392	Pearland
393	Pearsall
394	Pecos Barstoe
395	Penelope
396	Perrin-Whitt
397	Petersburg
398	Petrolia
399	Pewitt
400	Pflugerville
401	Pharr San Juan
402	Phoenix Charter School
403	Pine Tree
404	Pittsburg
405	Plainview
406	Plano
407	Pleasant Grove
408	Point Isabel
409	Port Aransas
410	Port Arthur
411	Port Neches
412	Post
413	Poteet
414	Poth
415	Pottsboro
416	Prairiland
417	Presidio
418	Princeton
419	Quanah
420	Queen City
421	Radford
422	Rains
423	Ralls
424	Randolph Field
425	Ranger
426	Rankin
427	Red Lick
428	Red Oak
429	Redwater
430	Ricardo
431	Rice
432	Richardson
433	Riesel
434	Rio Grande

435	Rio Hondo
436	River Road
437	Rivercrest
438	Robert Lee
439	Robinson
440	Robstown
441	Roby
442	Rockwall
443	Rogers
444	Roosevelt
445	Roscoe
446	Rotan
447	Round Rock
448	Roxton
449	Royce City
450	Rule
451	Runge
452	Sabine Pass
453	Sadler & Southmay
454	Salado
455	Saltillo
456	San Angelo
457	San Antonio
458	San Augustine
459	San Benito
460	San Elizario
461	San Marcos
462	San Perlita
463	San Saba
464	Sanger
465	Santa Fe
466	Santa Gertrudis
467	Schertz, Cibolo
468	Schleicher
469	School of Science
470	Sealy
471	Seashore Learning
472	Seguin
473	Shallowater
474	Sharyland
475	Sherman
476	Shiner
477	Silsbee

478	Simms
479	Sinton
480	Snyder
481	Socorro
482	Somerset
483	Sonora
484	South San Antonio
485	Southside
486	Southwest
487	Splendora
488	Spring
489	Springlake Earth
490	Spur
491	St Johns
492	St. Mary's Academy
493	Stamford
494	Stephenville
495	Stockdale
496	Sulphur Springs
497	Sundown
498	Sunray
499	Sweet Home
500	Sweetwater
501	Taft
502	Tatum
503	Taylor
504	Teague
505	Tejano Center
506	Temple
507	Tenaha
508	Terlingua
509	Terrell
510	Texarkana
511	Texas City
512	Texas School f Deaf
513	Texline
514	Three Rivers
515	Tidehaven
516	Trent
517	Tuloso Midway
518	Tyler
519	United
520	University of TX

521	Uvalde
522	Valley Mills
523	Valley View
524	Van Vleck
525	Venus
526	Vernon
527	Victoria
528	Victoria Diocese
529	Vidor
530	Waco
531	Wall
532	Walnut Bend
533	Walnut Creek
534	Waskom
535	Weatherford
536	Webb
537	Weslaco

538	West Hardin
539	West Orange Cove
540	West Oso
541	Westbury Christian
542	Westhoff
543	Westwood
544	Wharton
545	White Settlement
546	Whiteface
547	Whitesboro
548	Whitharral
549	Whitney
550	Wichita Falls
551	Willis
552	Wills Point

553	Windham
554	Windthorst
555	Wink
556	Wink-Loving
557	Winona
558	Winters
559	Wolfe City
560	Woodboro
561	Woodville
562	Wortham
563	Wylie
564	Yoakum
565	Ysleta
566	Zapata County

TRC Participant Data Form

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Texas Regional Collaboratives for Excellence in Science Teaching

In the Service of Texas Science Teachers
The University of Texas at Austin

2005 - 2006 Participant Data Form

Collaborative _____ Project Director _____

Today's Date _____ **Participant Classification** (Check only one) ☐ STM ☐ CM ☐ AD **Trained in BIITAKS?** ☐ YES ☐ NO

Last Name _____ First Name _____ Last 4 Digits of Social Security Number ☐☐☐☐

Home Address _____ E-mail Address _____

City _____ State _____ Zip _____ **Home Phone** Area Code _____

Education Level ☐High School ☐Bachelor ☐Master ☐Doctorate **Gender** ☐ F ☐ M

Ethnicity (check one)
☐African-American ☐Asian-American ☐Caucasian ☐Hispanic ☐Native American ☐ Other

Teaching Level (check only the one that most closely applies)
☐ Elementary ☐ Middle School ☐ High School ☐ University/College ☐ Administrator
Select one of the above ONLY if you are currently teaching in the classroom.
☐ ESC ☐ Specialist/Facilitator ☐ Informal Education ☐ Education Student ☐ Consultant
☐ Other: _____

2005-2006 is my _____ **Year of Classroom Teaching Experience**

2005-2006 is my _____ **Year as a Regional Collaborative Member**

Section I: *If you are involved in a K-12 public or private institution for the academic year 2005-2006, please complete the following* (If you are not, please complete the Section II on the back of this form)

School District _____ ☐ Dr. ☐ Mr. ☐ Ms. Superintendent's Title _____ Superintendent's Name (First and Last) _____

District Address _____ City _____ Zip _____

Campus Name _____ ☐ Dr. ☐ Mr. ☐ Ms. Principal's Title _____ Principal's Name (First and Last) _____

Campus Address _____ City _____ Zip _____

County _____ Area Code _____ Phone Number _____

The campus where I teach qualifies as a Title I (check one) ☐ Yes ☐ No

Campus Poverty Level (check one) ☐Low (<35%) ☐Medium (35-50%) ☐High (51-75%) ☐Very High (>75%)
% Economically Disadvantaged

The campus where I teach is a _____ school (check one) ☐Private ☐Charter ☐Public ☐Alternative

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Continued on Back

Your 2005-2006 Classroom Demographics Please complete **only if** you are a K-12 classroom teacher.

Please give actual numbers. Do not use percentages. (list only students that are on your classroom roll this year)

Number of African-American Students _____

Number of Asian American Students _____

Number of Caucasian Students _____

Number of Hispanic Students _____

Number of Native American Students _____

Number of Other Students _____

_____ **Total Number of Students**

Grade(s) Teaching 05-06 School Year (check all that apply)		**Subject(s) Teaching 2005-2006 School Year** (check all that apply)		**State of Texas Certification Status** (check all that apply)
☐ PreK	☐ 6th	☐ Elementary Science (PreK-5)	☐ GMO	☐ Certified for all subjects or grades I currently teach
☐ K	☐ 7th	☐ Middle School Science (6-8)	☐ AP Science	☐ Certified, but not for all subjects or grades I currently teach
☐ 1st	☐ 8th	☐ Health	☐ Other Science	
☐ 2nd	☐ 9th	☐ IPC	☐ Mathematics	☐ Currently pursuing certification
☐ 3rd	☐ 10th	☐ Biology	☐ Other: _____	
☐ 4th	☐ 11th	☐ Chemistry		☐ Currently under emergency, provisional, or temporary certificate
☐ 5th	☐ 12th	☐ Physics		

Do you meet the No Child Left Behind criteria for **"highly qualified"** status? ☐ Yes ☐ No ☐ Not Sure

Estimated total hours of college coursework completed in science or science methods ☐

Estimated total Continuing Professional Education (CPE) credits in science or science methods ☐

I certify that the above information is correct to the best of my knowledge. The information supplied above is confidential and will not be shared by the Texas Regional Collaboratives with entities outside the TRC.

Signature: _____

Section II

Please complete the following information, if you are not currently a classroom teacher, but you are a participant receiving professional development:

_____
Institution/Business/Private Consultant

_____ _____
Address City

_____ _____ **Phone** _____ _____ **Fax** _____ _____
State Zip Area Code Phone Number Area Code Fax number

I will use the Professional Development provided to: _____

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BIITAKS
Pre-survey and Post-survey

Administered to:

- ITMs - Trainer of Trainer version only
- STMs - Trainer of Trainer and Implementation
- CMs - Implementation version only

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Texas Regional Collaboratives for Excellence in Science Teaching

Bridging II TAKS Module 1: Light and Optical Systems

Instructional Team Members (ITM) Pre-survey

Date: _____

Collaborative name: _____

Name of educator receiving training: _____

Last 4 digits of SSN (to match pre-survey to post-survey): ☐ ☐ ☐ ☐

Teaching level (check only the one that most closely applies)

- ☐ Elementary teacher (PreK-5)
- ☐ Middle School teacher (6-8)
- ☐ High School teacher (9-12)
- ☐ University/College instructor
- ☐ Informal educator
- ☐ Administrator
- ☐ ISD Specialist/Facilitator
- ☐ ESC Specialist
- ☐ Independent Consultant
- ☐ Education student

Please indicate by X how well prepared you feel to do each of the following.

	ITEM	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared
A	Train elementary teachers using Bridging II TAKS Module1: Light and Optical Systems.				
B	Train secondary teachers using Bridging II TAKS Module1: Light and Optical Systems.				
C	Demonstrate 5E Model lessons across all grades, K-8.				
D	Demonstrate vertical alignment of science TEKS in grades K-8 using 5E lessons.				
E	Develop your own 5E lessons that address the TEKS in grades K-8.				

Continued on Back

	ITEM	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared
F	Train teachers to analyze and utilize the Grade K-8 science TEKS.				
G	Demonstrate interdisciplinary connections in a science lesson at Grades K-8.				
H	Identify literature for Grade K-5 that supports the science TEKS.				
I	Train teachers to recognize and design instruction based on the developmental needs of Grade K-8 learners.				
J	Train kindergarten teachers to deliver 5E lessons in which students examine properties and patterns in nature to understand the parts of a system needed to see a rainbow.				
K	Train Grade 1 teachers to deliver 5E lessons that introduce students to day and night cycles and how objects appear to move through the sky.				
L	Train Grade 2 teachers to deliver 5E lessons in which students understand the relationship between the transparency of an object and its ability to cast a shadow.				
M	Train Grade 2 teachers to deliver 5E lessons that introduce students to day and night cycles and how objects appear to move through the sky.				
N	Train Grade 3 teachers to deliver 5E lessons in which students determine that the Sun is a source of energy.				
O	Train Grade 3 teachers to deliver 5E lessons in which students model and illustrate the characteristics of the Sun.				
P	Train Grade 4 teachers to deliver 5E lessons that promote age appropriate concept development of the properties of light.				
Q	Train Grade 4 teachers to deliver 5E lessons that promote development of the concept of reflection.				
R	Train Grade 4 teachers to deliver 5E lessons in which students demonstrate an understanding of the concepts of symmetry, translation, and rotation.				
S	Train Grade 5 teachers to deliver 5E lessons that promote development of the concept of refraction.				
T	Train Grade 5 teachers to deliver 5E lessons that develop an understanding of the properties of light as it interacts with flat and curved surfaces.				
U	Train Grade 6 teachers to deliver 5E lessons that develop an understanding of the properties and uses of lenses such as in microscopes and the human eye.				
V	Train Grade 7 teachers to deliver 5E lessons in which students demonstrate an understanding of the concept of photosynthesis.				
W	Train Grade 7 teachers to deliver 5E lessons in which students develop and conduct laboratory experiences to explain the concept of photosynthesis.				
X	Train Grade 8 teachers to deliver 5E lessons that promote the understanding of waves.				
Y	Train Grade 8 teachers to deliver 5E lessons in which students explain and demonstrate the interaction of light rays in various media.				
Z	Train Grade 8 teachers to deliver 5E lessons in which students explain why objects have color.				

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Texas Regional Collaboratives for Excellence in Science Teaching

Bridging II TAKS Module 1: Light and Optical Systems

Instructional Team Members (ITM) Post-survey

Date: _____

Collaborative name: _____

Name of educator receiving training: _____

Last 4 digits of SSN (to match pre-survey to post-survey): ☐ ☐ ☐ ☐

Teaching level (check only the one that most closely applies)

- ☐ Elementary teacher (PreK-5)
- ☐ Middle School teacher (6-8)
- ☐ High School teacher (9-12)
- ☐ University/College instructor
- ☐ Informal educator
- ☐ Administrator
- ☐ ISD Specialist/Facilitator
- ☐ ESC Specialist
- ☐ Independent Consultant
- ☐ Education student

Please indicate by X how well prepared you feel to do each of the following.

	ITEM	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared
A	Train elementary teachers using Bridging II TAKS Module1: Light and Optical Systems.				
B	Train secondary teachers using Bridging II TAKS Module1: Light and Optical Systems.				
C	Demonstrate 5E Model lessons across all grades, K-8.				
D	Demonstrate vertical alignment of science TEKS in grades K-8 using 5E lessons.				
E	Develop your own 5E lessons that address the TEKS in grades K-8.				

Continued on Back

	ITEM	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared
F	Train teachers to analyze and utilize the Grade K-8 science TEKS.				
G	Demonstrate interdisciplinary connections in a science lesson at Grades K-8.				
H	Identify literature for Grade K-5 that supports the science TEKS.				
I	Train teachers to recognize and design instruction based on the developmental needs of Grade K-8 learners.				
J	Train kindergarten teachers to deliver 5E lessons in which students examine properties and patterns in nature to understand the parts of a system needed to see a rainbow.				
K	Train Grade 1 teachers to deliver 5E lessons that introduce students to day and night cycles and how objects appear to move through the sky.				
L	Train Grade 2 teachers to deliver 5E lessons in which students understand the relationship between the transparency of an object and its ability to cast a shadow.				
M	Train Grade 2 teachers to deliver 5E lessons that introduce students to day and night cycles and how objects appear to move through the sky.				
N	Train Grade 3 teachers to deliver 5E lessons in which students determine that the Sun is a source of energy.				
O	Train Grade 3 teachers to deliver 5E lessons in which students model and illustrate the characteristics of the Sun.				
P	Train Grade 4 teachers to deliver 5E lessons that promote age appropriate concept development of the properties of light.				
Q	Train Grade 4 teachers to deliver 5E lessons that promote development of the concept of reflection.				
R	Train Grade 4 teachers to deliver 5E lessons in which students demonstrate an understanding of the concepts of symmetry, translation, and rotation.				
S	Train Grade 5 teachers to deliver 5E lessons that promote development of the concept of refraction.				
T	Train Grade 5 teachers to deliver 5E lessons that develop an understanding of the properties of light as it interacts with flat and curved surfaces.				
U	Train Grade 6 teachers to deliver 5E lessons that develop an understanding of the properties and uses of lenses such as in microscopes and the human eye.				
V	Train Grade 7 teachers to deliver 5E lessons in which students demonstrate an understanding of the concept of photosynthesis.				
W	Train Grade 7 teachers to deliver 5E lessons in which students develop and conduct laboratory experiences to explain the concept of photosynthesis.				
X	Train Grade 8 teachers to deliver 5E lessons that promote the understanding of waves.				
Y	Train Grade 8 teachers to deliver 5E lessons in which students explain and demonstrate the interaction of light rays in various media.				
Z	Train Grade 8 teachers to deliver 5E lessons in which students explain why objects have color.				

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Texas Regional Collaboratives for Excellence in Science Teaching

Bridging II TAKS Module 1: Light and Optical Systems

Science Teacher Mentor (STM)

and

Cadre Member (CM) Pre-survey

This demographic information and survey (on back) should be completed by any educator that receives training on Bridging II TAKS Module **prior to the training**. Each educator will also complete a post-survey after the training.

STMs should complete Part I and Part II. CMs may complete only Part I.

Date: _____

Collaborative name: _____

Name of educator receiving training: _____

Participant Classification: ☐ STM ☐ CM ☐ Administrator

Last 4 digits of SSN (to match pre-survey to post-survey): ☐ ☐ ☐ ☐

School district (please write out): _____

Campus: _____

Teaching level (check all that apply)

☐ PreK	☐ 1st Grade	☐ 3rd Grade	☐ 5th Grade
☐ Kindergarten	☐ 2nd Grade	☐ 4th Grade	☐ 6th Grade
☐ 7th Grade	☐ 8th Grade	☐ IPC	

☐ Other: _____

Continued on Back

PART I – for STMs and CMs

Please indicate by "X" how well prepared you feel to do each of the following. Items A – J should be completed by all teachers. Items K – AA should be completed depending on the grade level you teach.

		Not Prepared	Minimally Prepared	Adequately Prepared	Very Well Prepared	NA
A	Teach all the science TEKS applicable to my grade level.					
B	Understand the relationship between the science TEKS at my grade level and those above or below me.					
C	Identify literature for my grade level that supports the science TEKS.					
D	Implement elementary 5E Model lessons that address the science TEKS in my grade level.					
E	Develop my own 5E lessons that address the science TEKS in my grade level.					
F	Implement lessons that connect science to other disciplines.					
G	Identify the equipment that is required by the science TEKS at my grade level.					
H	Implement lessons that use all the tools required by the science TEKS at my grade level.					
I	Recognize and design science instruction based on the developmental needs of students at my grade level.					
J	Identify common misconceptions about science concepts addressed by the TEKS at my grade level.					
K	FOR KINDERGARTEN TEACHERS ONLY Implement age appropriate 5E lessons in which students examine properties and patterns in nature to understand the parts of a system needed to see a rainbow.					
L	FOR 1st GRADE TEACHERS ONLY Implement age appropriate 5E lessons in which students determine the properties of magnifiers.					
M	FOR 2nd GRADE TEACHERS ONLY Implement age appropriate 5E lessons in which students understand the relationship between the transparency of an object and its ability to cast a shadow.					
N	FOR 2nd GRADE TEACHERS ONLY Implement age appropriate 5E lessons that introduce students to day and night cycles and how objects appear to move through the sky.					
O	FOR 3rd GRADE TEACHERS ONLY Implement age appropriate 5E lessons in which students determine that the Sun is a source of energy.					
P	FOR 3rd GRADE TEACHERS ONLY Implement age appropriate 5E lessons in which students model and illustrate the characteristics of the Sun.					
Q	FOR 4th GRADE TEACHERS ONLY Implement 5E lessons that promote age appropriate concept development of the properties of light.					
R	FOR 4th GRADE TEACHERS ONLY Implement age appropriate 5E lessons that promote development of the concept of reflection.					
S	FOR 4th GRADE TEACHERS ONLY Implement age appropriate 5E lessons in which students demonstrate an understanding of the concepts of symmetry, translation, and rotation.					
T	FOR 5th GRADE TEACHERS ONLY Implement age appropriate 5E lessons that promote development of the concept of refraction.					
U	FOR 5th GRADE TEACHERS ONLY Implement age appropriate 5E lessons that develop an					

Continued on Back

	understanding of the properties of light as it interacts with flat and curved surfaces.					

		Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared	**NA**
V.	FOR 6TH GRADE TEACHERS ONLY Implement age appropriate 5E lessons that develop an understanding of the properties and uses of lenses such as in microscopes and the human eye.					
W.	FOR 7TH GRADE TEACHERS ONLY Implement age appropriate 5E lessons in which students demonstrate an understanding of the concept of photosynthesis.					
X.	FOR 7TH GRADE TEACHERS ONLY Implement age appropriate 5E lessons in which students develop and conduct laboratory experiences to explain the concept of photosynthesis.					
Y.	FOR 8TH GRADE TEACHERS ONLY Implement age appropriate 5E lessons that promote the understanding of waves.					
Z.	FOR 8TH GRADE TEACHERS ONLY Implement age appropriate 5E lessons in which students explain and demonstrate the interaction of light rays in various media.					
AA.	FOR 8TH GRADE TEACHERS ONLY Implement age appropriate 5E lessons in which students explain why objects have color.					

Continued on Back

PART II – for STMs only

Please indicate by X how well prepared you feel to do each of the following.

	ITEM	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared
A	Train elementary teachers using Bridging II TAKS Module1: Light and Optics Systems.				
B	Train secondary teachers using Bridging II TAKS Module1: Light and Optics Systems.				
C	Demonstrate 5E Model lessons across all grades, K-8.				
D	Demonstrate vertical alignment of science TEKS in grades K-8 using 5E lessons.				
E	Develop your own 5E lessons that address the TEKS in grades K-8.				
F	Identify the equipment that is required by the TEKS at all grades, K-8.				
G	Train teachers to analyze and utilize the Grade K-8 science TEKS.				
H	Deliver professional development regarding science teaching to elementary and secondary teachers.				
I	Demonstrate interdisciplinary connections in a science lesson at Grades K-8.				
J	Identify literature for Grade K-5 that supports the science TEKS.				
K	Train teachers to recognize and design instruction based on the developmental needs of Grade K-8 learners.				
L	Train kindergarten teachers to deliver 5E lessons in which students examine properties and patterns in nature to understand the parts of a system needed to see a rainbow.				
M	Train Grade 1 teachers to deliver 5E lessons that introduce students to day and night cycles and how objects appear to move through the sky.				
N	Train Grade 2 teachers to deliver 5E lessons in which students understand the relationship between the transparency of an object and its ability to cast a shadow.				
O	Train Grade 2 teachers to deliver 5E lessons that introduce students to day and night cycles and how objects appear to move through the sky.				
P	Train Grade 3 teachers to deliver 5E lessons in which students determine that the Sun is a source of energy.				
Q	Train Grade 3 teachers to deliver 5E lessons in which students model and illustrate the characteristics of the Sun.				
R	Train Grade 4 teachers to deliver 5E lessons that promote age appropriate concept development of the properties of light.				
S	Train Grade 4 teachers to deliver 5E lessons that promote development of the concept of reflection.				
T	Train Grade 4 teachers to deliver 5E lessons in which students demonstrate an understanding of the concepts of symmetry, translation, and rotation.				
U	Train Grade 5 teachers to deliver 5E lessons that promote development of the concept of refraction.				
V	Train Grade 5 teachers to deliver 5E lessons that develop an understanding of the properties of light as it interacts with flat and curved surfaces.				

Continued on Back

		Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared
W	Train Grade 6 teachers to deliver 5E lessons that develop an understanding of the properties and uses of lenses such as in microscopes and the human eye.				
X	Train Grade 7 teachers to deliver 5E lessons in which students demonstrate an understanding of the concept of photosynthesis.				
Y	Train Grade 7 teachers to deliver 5E lessons in which students develop and conduct laboratory experiences to explain the concept of photosynthesis.				
Z	Train Grade 8 teachers to deliver 5E lessons that promote the understanding of waves.				
AA	Train Grade 8 teachers to deliver 5E lessons in which students explain and demonstrate the interaction of light rays in various media.				
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Continued on Back

Texas Regional Collaboratives for Excellence in Science Teaching

Bridging II TAKS Module 1: Light and Optical Systems

Science Teacher Mentor (STM)

and

Cadre Member (CM) Post-survey

This demographic information and survey (on back) should be completed by any educator that receives training on Bridging II TAKS Module **after the training is completed**.

STMs should complete Part I and Part II. CMs may complete only Part I.

Date: _____

Collaborative name: _____

Name of educator receiving training: _____

Participant Classification: ☐ STM ☐ CM ☐ Administrator

Last 4 digits of SSN (to match pre-survey to post-survey): ☐ ☐ ☐ ☐

School district (please write out): _____

Campus: _____

Teaching level (check all that apply)

☐ PreK	☐ 1st Grade	☐ 3rd Grade	☐ 5th Grade
☐ Kindergarten	☐ 2nd Grade	☐ 4th Grade	☐ 6th Grade
☐ 7th Grade	☐ 8th Grade	☐ IPC	

☐ Other: _____

Continued on Back

PART I – for STMs and CMs

Please indicate by "X" how well prepared you feel to do each of the following. Items A – J should be completed by all teachers. Items K – AA should be completed depending on the grade level you teach.

		Not Prepared	Minimally Prepared	Adequately Prepared	Very Well Prepared	NA
A	Teach all the science TEKS applicable to my grade level.					
B	Understand the relationship between the science TEKS at my grade level and those above or below me.					
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P	FOR 3rd GRADE TEACHERS ONLY Implement age appropriate 5E lessons in which students model and illustrate the characteristics of the Sun.					
Q	FOR 4th GRADE TEACHERS ONLY Implement 5E lessons that promote age appropriate concept development of the properties of light.					
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T	FOR 5th GRADE TEACHERS ONLY Implement age appropriate 5E lessons that promote development of the concept of refraction.					
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Continued on Back

	understanding of the properties of light as it interacts with flat and curved surfaces.					

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Continued on Back

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Sample Qualitative Data

Donna Wise

From: Gina Byford [byfordg@murchison.esc7.net]
Sent: Saturday, April 22, 2006 4:28 PM
To: Donna Wise
Subject: Re: Outdoor Classroom

Dear Donna,
Just wanted to say Saturday at Central ISD's outdoor classroom was the BEST!!!! It was great to have someone, (just like me), affirm what I am doing and the way I am doing it.... the week before TAKS I was **physically ill**, really considering getting out of education all together because colleagues of mine have been totally revamping the way they teach science... really just nothing but TAKS TAKS and more TAKS! no real science going on! I had told them, (in disgust), that I WILL NOT change the way I teach. To change would be a total disservice to my students, and that I would get out of education before I changed!!!!!!!!! Susan gave me hope! :) Thanks so much for the best day in a LONG time! (I really mean this!)
Sincerely,
Gina

QUALITATIVE EVALUATIONS
Submitted by Participants in the East Texas Regional Collaborative

"When I started teaching in Texas 6 years ago, I was a pretty bad teacher. I knew my science and math but not much about teaching. Not many of my students left my class loving science or math (I am very ashamed to say). Then, I found the collaborative. Watching and listening to so many wonderful teachers gave me the courage to change...When I finally threw away the worksheets and vocabulary lists and moved the desks out of rows, I realized that my students would still learn and that we could all have a little fun doing it! And, of course, one change leads to another...I took other classes and learned more...I read books....I changed....and students leave my classroom loving science." – *Angie Kveum, high school science and math teacher*

"Being a member in the ETRC has been one of the most positive experiences I have had in teacher training and continuing education.

Dr. Allard and the rest of the teaching team have shown me not only exciting and effective teaching strategies, they have helped instill a philosophy of excellence among all the members of the collaborative.

ETRC takes the word collaboration seriously. Being able to interact with other teachers, who take the profession seriously, has influenced me to be a better educator." – *Scott Hanes, high school IPC teacher*

"Participation in the collaborative has affected me in several ways. First it has made me a more competent science teacher. The fellowship of the collaborative has given me support and encouragement both in my teaching and personal endeavors. The collaborative grants have provided me with training and materials I would not otherwise have assess to in the classroom. And finally, the collaborative inspired me and made it possible to earn a Master's degree." – *Sybil Rice, middle school teacher*

"The East Texas Regional Collaborative has impacted my teaching in several ways. First is pedagogy. My lessons are often modified to fit the 5 E model. Almost every day, class begins with an explore activity. When possible, a concept is introduced using a hands-on experience with the concept, then the word or words used to describe it are introduced. Even though I know that I have not fully implemented enough authentic assessment, inquiry labs, field work and portfolios, I have an awareness of my deficiencies. This awareness helps me to plan professional development accordingly.

Second the ETRC has given me activities and resources to implement in my classroom and to share with others. By attending meetings, I get to be a student and get a fuller knowledge of the lab activities that I could not get by just being given the materials. This makes me feel more comfortable in introducing the activities into my own classroom or sharing with colleagues.

The collaborative has been a source for materials which include digital cameras, data loggers and kits (such as FOSS). These materials have been shared with other teachers and have been used in the classroom. Having these resources has helped me to meet requirements established by the state; but more importantly have helped students learn.

Finally, the collaborative has provided a useful network of teachers, people I know and trust to help me when I need it. Help is just an email away. We experience learning together, we discuss ways to improve or implement new ideas. Unlike other professional development, less sits on the shelf being forgotten; but my experiences are put to practical use or passed on to colleagues at my school. The Texas Regional Collaborative is making me into a highly qualified teacher." – *Ronald Carson, high school physics teacher*

Texas Regional Collaboratives for Excellence in Science Teaching
05-06 Annual Report
Teacher Quotes

"Don't get me wrong the training and supplies are great...but the networking far exceeds everything."
- Tracy Henry, 5th Grade

"I always thought that I wasn't smart enough to teach science...but I was wrong...I can do anything with your help!" - Lorrie Kitchens, Kindergarten

Geology Training:

"Before today when I looked down... all I saw were rocks. Now when I look down I see a world of mystery."
- Sandra Richeson, Pre-K

"I never knew that science could be so fun and engaging"
- Teresa Metzler, 2nd Grade

Environmental Ed 101 Training:

"Wow I never thought that I could learn so much from being in the outdoor classroom."
- Jaime Floyd, High School

Star Party:

"I could have never imagined that my hands could build something that would let me see the moons of Jupiter."
- Toni Holland, GT & Science

Collaborative Name: North Central Texas College

Texas Regional Collaboratives for Excellence in Science Teaching

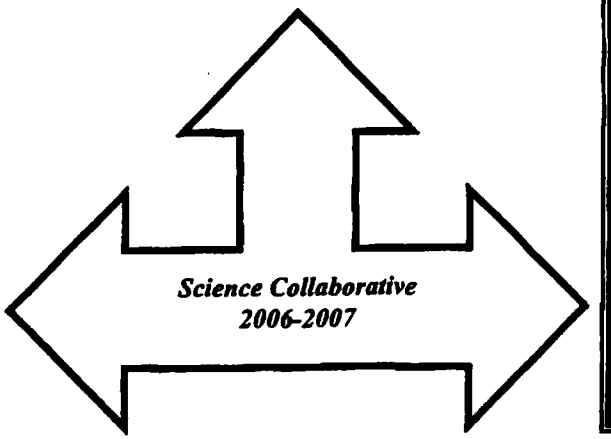
Region XI Science Collaborative Administrators Meeting
March 27, 2006

List at least one idea that you would like to see provided to your district's Science Teacher Mentors during this next collaborative year.

I want them to have the idea that science concepts can be integrated into language arts and math – it is not a "stand-alone" content area.

List at least one reason why you want your district to continue to be a member of the Region XI Science Collaborative.

The training ~~is~~ is excellent! Our STMs have truly had benefits from this program. We love the model, and the trainer-of-trainer ~~model~~ delivery method is wonderful to empower teachers in our district.



List at least one way that you have supported your Science Teacher Mentors (STM) in working with their Cadre Teachers (Mentees).

We have provided staff development days for them to implement the training. We have had teacher and administrator meetings to plan accordingly.

Becky Yarbrough

3/21/2006

INPUT FROM TEACHERS IN PROGRAM

Input #1

Subject: Collaborative for Excellence in Science Teaching Fall 2005
Sent: Saturday, September 24, 2005 9:40 PM
Name: Teaching: HS Chemistry
School: LISD LHS and DJCC Address: DJCC - Edmonds Ave, Lewisville, Texas
What has CEST allowed you to accomplish that otherwise would not have been possible ?
I was deciding if a high school chemistry teacher certification would be possible for a chemist with 30 years in industry. This class has made the transition easier.
How has the training impacted your teaching ?
My degree is in UNT Chemistry 1974. I have over 80 university hours in science. The class this summer is the BEST science class/ lab ever taken by me.

1. It was taught well.
2. A massive amount of material was presented via hands on teaching.
3. It will show an easier way of presenting concepts to students.

Give examples how you will incorporate the information from your experiences at Zoo Day into classroom instruction.
Zoo Day will have to happen first.
Give examples how you applied, or can apply, the resources given during the summer sessions.
This year substituting in high school science classes, the explanation on how to build a simple motor came up. As students in this program, we each build one this last summer.
Give examples of activities that you can incorporate into the classroom from attending the Teacher Education day at Fair Park.
The hands on models at the Science Building presented some ideas for the class room. A prime example would be sound and octaves.
What do you consider to be the major successes of CEST for your classroom ?
I will complete my teacher certification and be able to transfer 30 years of chemistry lab experience to young students.
What do you think could be improved to make CEST more effective for teachers ?
Put more "warm bodies" in this class room. The teachers are great !
Have you seen changes in how you teach ? Yes How ? I know the subject matter even better.
What else can you tell me about CEST ?
This is the best program I have been in to date. I learned more hands on science in one summer course than in many many university courses combined.

INPUT #2

I emailed .....about my 3rd and 5th science classes; I incorporated a Lot of the Bridging II and Collaborative that we have done. The district wants me to set up make and takes with teachers.
Among the things I'd like to do is the poor man's spectroscope; Betty mentioned you might be able to help provide diffraction slides. I'd need a bunch (100 or more) before September, along with any other goodies or surprises.
By the way, we were doing the sun dial activity, and someone made a Hit and run on a mail truck, so we spent some time on force and change. You'd be proud.

INPUT # 4

I wanted each of you to know how much I appreciate all that you have done and continue to do for me through the collaborative. It was another successful summer and I loved it.

Peace!

INPUT 5.

I would be glad to fill out that survey if you still need me to. I enjoyed Zoo Science Day so much!
I have registered for the CAST meeting in Houston. Ever since I have started going to the Collaborative, my life has gotten a lot more exciting! Thanks for all you do!

TEACHING AWARD TO NEW TEACHER IN CLASS ROOM

Jim, B. L. will be awarded the Distinguished Teacher award. It Is absolutely necessary that he is there for lunch and the reception on Wednesday as the awards will be given out then. Please do not let him Know as we want this to be a surprise for everyone.

Input # 6

At the December meeting of the North Texas Regional Science Collaborative I received two large boxes of science "goodies". It was like Santa Collaborative! Inside the boxes was lots of equipment, formal and informal, that I needed. Up until two years ago, when we departmentalized, we had ***no physics science equipment*** and only a few things for biology.
Our school is inside a **juvenile detention facility** so this was a big step.

Inside one of the boxes were 2 triple beam balances –the one we had wasn't very reliable so the kids were as excited to see these as I was. The hot plate we had been using was one I had brought from home; the one in the box was really needed. A lot of the smaller things such as the graduated beakers, light sockets, lamp board, safety glasses, alligator clips were on my wish list to be ordered. The intangible items such as salt, food coloring, and vinegar were things I had been buying out of my pocket. I'm sure we would have eventually gotten most of the things in the boxes but it would have been several years.

The collaborative has been a ***science lifesaver for me***. I've learned and relearned science. I graduated from college in 1974 with a BS in geology and hadn't really thought too much about science for 20 years and was never very strong in physical science. The ideas from the collaborative have been useful to my students and heightened their interest in science. Because school wasn't attractive or interesting to them, many of my students come here with few credits and many school truancies. Now they seem to really like science and do well academically while here. My students always know the week after collaborative because I come back rejuvenated and excited about teaching and doing science.

Due to the nature of the facility our teachers are very limited in using certain materials (anything that can be used to hurt themselves or others or used to disable the locks) and

going outside is limited to the exercise yard when the temperature is above 65 degrees. Dr. Roberts and Dr. Crocker are practical and knowledgeable about science and teaching science. They are always ready to give advice or instruction when I contact them. Their replies are timely and address the need I have. They understand my unique teaching situation, offering practical and useful ideas to make science relevant and able to be done here.

The networking with the professors and other science teachers in the area has been one of the richest blessings from the collaborative. I am somewhat isolated at detention and haven't felt integrated into the science teachers' community here in our district. The type of classes I can teach here are so different from regular school that I usually have trouble relating to teachers in the "free". Not so in the collaborative, I am treated as an equal with my ideas and questions treated with respect and interest.

My sister teaches second grade at a private school in Weatherford. She comes to the North Texas collaborative occasionally. When she can't come I share the collaborative teaching ideas with her and she shares them with other teachers at her school. At our science in-service district training I'm always encouraging the other science teachers to come. The collaborative has impacted me so much that without the collaborative I don't know if I would still be teaching.

Thank you, Dr. Crocker, for mentioning the collaborative at a session you were teaching at the Fort Worth Museum of Science and History.
Thank you Dr. Roberts for explaining physics so I can understand and teach it.

Input # 7

UNT Collaborative
Excellence in Science Teaching
Dr. James Roberts, director

January 25, 2006

I have been a member of the UNT Collaborative for a number of years. The Collaborative has helped me to become a better teacher in science. I taught for over 20 years in English as Second Language and Reading Improvement. When I came back to teaching science, I was totally scared. Methods have changed so much in the approach to teaching than the way I was taught. The collaborative has helped me become more proficient and confident in teaching science. It has given me information and updates in the science fields I otherwise would not have received.

I still use the "Moon Watch," and the "Crash Dummy," activities, which are TEKS related: and volume by displacement in student labs when demonstrating osmosis and diffusion.

I have also used the "poor man's sexton" (students make and use during the Moon Watch) along with other usable "poor man's" (using everyday items for construction) instruments.

I have shared my knowledge with others on campus and within the district. Several of the activities I cannot use in my class, but are TEK related to other grade levels.

I have learned how to use the graphing calculators and work physic related problems as distance in relation to known objects, such as light refraction and waves and sound waves.

I have recruited a few other teachers to join the Collaborative with me in the past. One teacher, currently attending, is new to science teaching . My goal is to continue to encourage others to participate because of the knowledge and sharing one receives at the meetings.

G. H.
Decatur Middle School
Decatur, Texas 76234

Excerpts from Summer 2006 Electronic Journals

"Actual demos far outweigh the spoken word. I will have to get an oscilloscope so the students can experience what I experienced. What a difference in understanding this makes!"

"I enjoy doing discovery activities. I can see that these activities engage the students, and if the students are enjoying what they are doing then they are more open to learning. If I enjoy discovery activities then I know the kids will ☺ Thus, I am now seeing the necessity of using this teaching method. As long as I can see it then I am capable of using this method in my classroom."

"I will use the graphing calculator to graph data made in experiments! What other items can I learn on this calculator besides calculations?"

"I really enjoy teaching using the methods we have been using! I could actually test the "boat in the water" level! I probably could test the helium balloon in a car by using a small helium balloon in the bell jar! I will use these methods and become a more effective teacher.

"Should multiple choice tests still be used?

"Elementary teachers work on very basic skills which I thought were innate. Thus, basic skills cannot be assumed and must be taught and someone must be responsible for teaching them. I will be more compassionate with kids who have missed some basic skills which should have been taught. Now that I know some basic skills that they might have missed, I will spend the extra time to teach them."

"Observation is far more powerful than description. Show rather than tell. Experience is gold and knowledge is brass."

"I have realized that I need to change my perspective when planning lessons using the 5E model. This means that I do not have to completely change my lesson plans! The collaborative is guiding me to plan the most effective lessons! This is exactly what I came here for! (Plus, I need help in optics!)"

"I learned so many things that I..... quite frankly did NOT know. I thought I knew these concepts, buy I only knew parts of these concepts.....I taught the book version. I mean I can read the information, dispersed it to the students and expect them to know it, understand it and apply it. This is a terrible method and is NOT working. Our kids need better ways of learning these concepts and this seminar was a great place to learn new ideas for all grade levels. I'm gaining a new confidence about teaching Science that I really didn't have before. My students will benefit 10 fold from what I've learned here at this seminar. I hope there will be more Science seminars in the future. A few weeks is really not enough time – although we did plenty in a short time. We owe it to our students

to provide them with every possible method of effectively learning Science. Wouldn't it be great if we could inspire the next Einstein or Marie Curie??"

"Today we learned a variety of things. I especially liked learning that the seasons were caused by the tilt in the earth's axis and angle of the sun's rays. I learned a new way of showing where the sun rises and sets. We used our bodies. One of our hands represented Florida, which is in the east (where the sun rises) and the other hand represented Washington state which represented the west – which is where the sun sets. One hand flapped, the other hand waved – this was to mark a remembrance of which hand represented which direction. We also used our bodies to turn counter-clockwise to represent the direction, the earth moves. ☺ My experience today will greatly impact my teaching. I am finding so many new ways to explain science. I plan using the above activity for a long time to come!! Thank you."

"Today's activities had many elements that attracted my attention and I learned that kids need some kind of a hook to capture their interest. Time is soo limited for instruction, that many times I just jump right into the lesson because TAKS exams are around the corner."

"Instruction needs to be precise as possible. The language should be simple and in steps.....especially for the younger students. (simple steps work well for me too!) I believe kids have an opportunity to develop an appreciation and discipline for maintaining accurate and exact information I plan using these methods in my class."

"I found some new methods of making science a bit more interesting for my students. I learned that teaching science using hands-on, tactile and visual, brings meaning to the subject matter learned. I feel like I have some new and innovative tools to help me teach students. I learned how to calculate findings myself, instead of just plugging them into a computer for an answer.....it's empowering!!"

"I was a bit confused about mechanical energy but today's activities helped to explain it better. Also, I am unfamiliar with energy chains, especially working backwards to the sun. I am more familiar with starting at the sun and working to the object. This was a challenge for me today and I am not sure if mine was correct. The activity today definitely got the concept across. I will take the energy activities into my classroom. These activities were interesting and fun as well as educational. Some of the poster pictures would pertain to middle school students such as the I-Pod, cars, etc. With this activity, the students will be able to relate items they use daily to the source of energy.

I still need some help to understand mechanical energy. I have the flashlight from the collaborative that works by squeezing the handle, which I think is mechanical energy becoming kinetic

energy....correct? I thought the flashlight was potential energy into kinetic energy? I thought the same for the radiometer? Does mechanical energy mean it involves some type of a machine or mechanical part? I'm still weak in physics but much stronger now than I ever was!"

"I learned how important it is for students to see science in action. So often students do not see the need to learn "things" and today's activities should help them to see how the concepts learned in class apply to life."
"I am learning a lot about science and about teaching in general. The important idea learned today is that if the students read about something without any prior background knowledge it is not learning. I am beginning to understand the 5E's better and why the engage is important. I often have my students read about the concept we will be studying and then wonder why they can read it and understand nothing they just read. I also give them a note taking worksheet to fill in and they can't understand it. Of course I sometimes get upset because all they need to do is read the text and find the answers. But they can't.....! ☺ I plan on using a lot of the ideas I've learned in the collaborative."

"I learned to try and give each student something to help them feel successful, if only a little bit (my math experience)."

"The major idea I learned is to let the students "play" to learn before I start explaining, (engage). Also, I know from personal experience that until they get to investigate on their own, you really can't get their attention."

"I learned some ideas to use to simplify concepts for the students. The best idea was why an image is seen upside down. Spelling out the word cat and then showing how the image is projected through a prism (letter by letter) similar to our eye lens. This worked great for me and now I can show my students. I get this question about the image often. I will take a greater knowledge about different types of waves back to the classroom. I'm excited about understanding prisms, waves, mirrors, and sound better. I still have a long way to go in my understanding but at least I've made a start."

"I learned more about understanding the TEKS and just what the students are expected to learn at a specific grade. 'Don't over teach or under teach for their grade level.' I was amazed at the level of which second graders are expected to learn. I also learned that the students will usually give you what you expect and demand, I need higher expectations for my students."

"The most amazing activity was the rock in the boat (buoyancy) and Archimedes box. We took the rock out of the boat and dropped it in the lake. Instead of the water level rising, the water level lowered. This was a heavy brain day and very interesting! If at my age I need to see and do, even with having some background knowledge, how much more do my 7th & 8th graders need? I also realized that talking too much and going too fast can lose students. I need to slow down in my explaining to give the students time to digest the information. The problem, besides time, is that I lose their attention quickly if I go too slowly."

"The activity we did today was an incredibly powerful visual aid. From a description of that activity, I would not have anticipated how much impact it could have. I look through a lot of lesson plans and activity books, and frequently dismiss the activities as pointless or trivial; I need to reassess my criteria in light of this experience."