RESEARCH

Report on an Educational Program

Department of Research and Accountability

HOUSTON URBAN LEARNING INITIATIVES IN A NETWORKED COMMUNITY 2003–2004

Houston Independent School District

HOUSTON INDEPENDENT SCHOOL DISTRICT

Board of Education

HOUSTON URBAN LEARNING INITIATIVES IN A NETWORKED COMMUNITY

ANNUAL REPORT

2003 - 2004

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Houston Urban Learning Initiatives in a Networked Community
2003–04

Overview of the System

The National Science Foundation (NSF) funding for the Houston Urban Learning Initiatives in a Networked Community (HU-LINC), the Urban Systemic Initiative, enabled students in the Houston Independent School District (HISD) to improve their achievement in mathematics and science. NSF's support in partnership with district efforts through HU-LINC made it possible to reach all students and teachers. The systemic reform leveraged internal and external resources to implement the following: standards-based curriculum, professional development, community coalitions and resources, policy changes supporting reform, and measures of accountability. The foundation of this reform was the HU-LINC's districtwide professional development in science and mathematics instruction. HU-LINC improved teaching and learning by imbedding inquiry, leadership, mentor/specialist support, technology, material support, and authentic assessment throughout the professional development program. Collaborations with universities, colleges, business, informal science, and other community organizations in the greater Houston area reinforces the strength and quality of this program. It contributed to increased teacher preparation, better teaching and learning that impacts overall student achievement in mathematics and science. Assurance for sustained reform are the policies enacted by the HISD board of trustees.

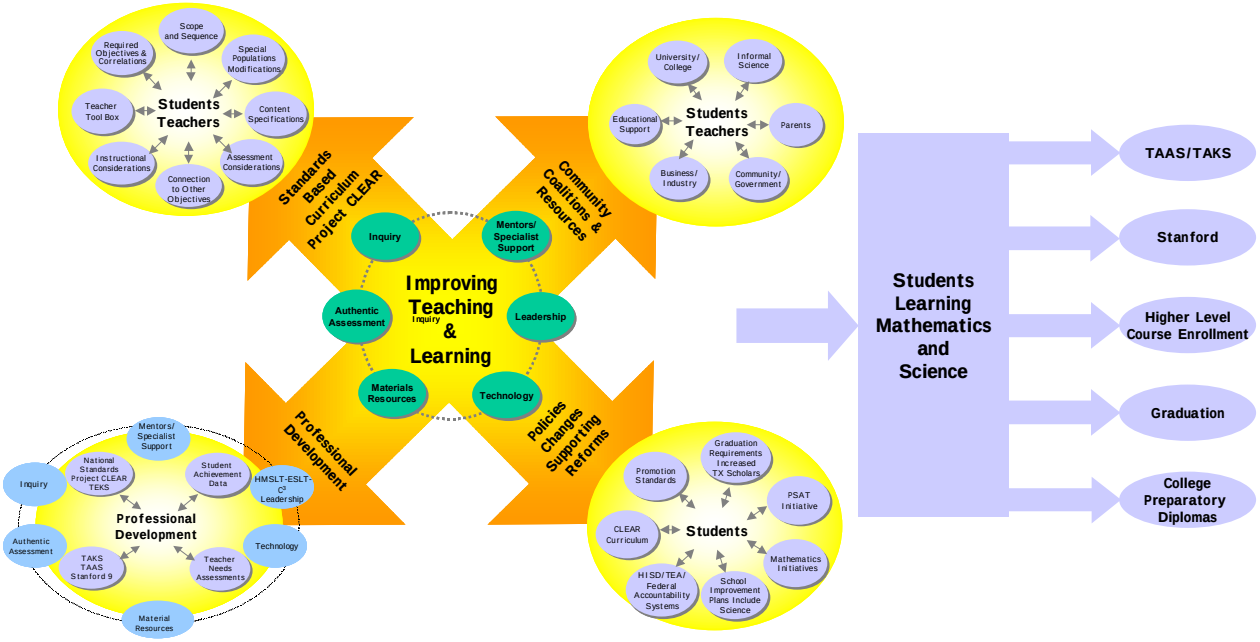

Figure 1: The Houston Urban Learning Initiatives in a Networked Community (HU-LINC) Model

The demographic data of HISD includes students, the distribution and number of schools, and science and mathematics teachers in the system. The data presented in these tables depict the changes that occurred from the 1998-99 baseline year to 2003-04, the fifth year of the initiative. **Table 1** illustrates how the total enrollment increased slightly. However, during this same time period, Hispanic students increased while all other ethnic/racial groups either decreased or remained unchanged. As a large urban district, HISD's schools continue to increase as

Table 1: Houston ISD Student Demographics 1998-99 to 2003-04

	Baseline 1998-99		2003-04	
Race/Ethnicity	**N**	**%**	**N**	**%**
African American	71,106	33.8	62,829	29.8
Asian	5,852	2.8	6,341	3.0
Hispanic	111,505	53.1	122,744	58.1
Native American	126	0.1	128	<0.1
White	21,590	10.3	19,115	9.1
Total	**210,179**	**100.0**	**211,157**	**100.0**

Table 2: Houston ISD K–12 Schools: 1998-99 to 2003-04

	Baseline 1998-99	2003-04
Elementary	195	212
Middle	47	46
High	33	38
Total	275	296

shown in **Table 2** with the largest growth occurring at the elementary level. The total number of teachers in mathematics and science increased. **(Table 3)** The demographic data presented depict a growing urban educational system, not only in its student population and schools, but also its teaching staff.

Table 3: Houston ISD Math and Science Teachers: 1998-99 to 2003-04

	Baseline 1998-99	2003-04
Elementary Teachers	6,296	6,825
Middle School Mathematics Teachers	181	283
High School Mathematics Teachers	286	302
Middle School Science Teachers	190	261
High School Science Teachers	203	258
Total	**7,156**	**7,929**

Through its unified system of community coalitions, HU-LINC serves as a catalyst to link all learners to the city's rich and varied resources, thus preparing all students for productive lives and challenging careers in science, mathematics, and technology. HU-LINC is a consortium of Houston's business, community, civic, and cultural groups working with HISD to improve mathematics and technology instruction for all HISD students. The formation of HU-LINC is a citywide demonstration of Houston's ongoing support for its children.

The HU-LINC related outcomes achieved in HISD during the 2003-04 academic year are described below.

- HISD's CLEAR on-line provides teachers the ability to access curriculum documents on the Internet using their district-purchased laptop computers.
- HU-LINC professional development opportunities integrated technology with mathematics and science in authentic and appropriate methods.
- NSF funds enabled HISD to recruit and train elementary and secondary science teachers to become HU-LINC Master Science Lead Teachers.
- The federal, state and district accountability systems gauge performance and determine accountability ratings to assure that quality teaching and learning are provided to all students.
- The PSAT Initiative is designed to aid the district to identify students with the aptitude for advanced placement courses, to prepare them for college entrance exams and to encourage their pursuit of advanced degrees.
- Implemented with the advice of the HU-LINC Business Coalition, the Texas Scholars' Program encourages students to take more rigorous courses that will better prepare them for college, technical school and the workplace.
- Coordinating new and existing resources provided instructional support for teachers of science, mathematics, and technology.
- HU-LINC increased its leadership capacity throughout the district with the ESLTs and HMSLTs providing more professional development to elementary and secondary teachers utilizing their expertise and experience.
- Parents, policy makers, institutions of higher education, businesses and industries, foundations, and other segments of the HU-LINC coalitions and partnerships expanded and enhanced activities through a network of courses, seminars, and workshops providing professional development.
- New and expanded field experiences were developed for students, teachers, and families that reflect national and state standards in science, mathematics, and technology.
- Academic performance in math and science for all students improved from baseline 1999 to the current school year.
- Gaps were reduced between minority and White students and economically disadvantaged and non-economically disadvantaged students.
- There was an increase in the number of students in subgroups who earned a college preparatory diploma.

HU-LINC DRIVER 1
IMPLEMENTATION OF STANDARDS-BASED CURRICULUM

- HISD's CLEAR on-line provides teachers the ability to access curriculum documents on the Internet using their district-purchased laptop computers.
- HU-LINC professional development opportunities integrated technology with mathematics and science in authentic and appropriate methods.
- NSF funds enabled HISD to recruit and train elementary and secondary science teachers to become HU-LINC Master Science Lead Teachers.

Introduction

The last half of the 20th century has seen dramatic changes in the landscape of our nation's cities. The abandonment of the inner cities by the middle class has resulted in higher percentages of economically disadvantaged and minority children in urban schools. These school districts face numerous challenges when trying to educate an urban population of students. New initiatives and systemic reform changes that benefit all students are required to confront these challenges in the modern public school system.

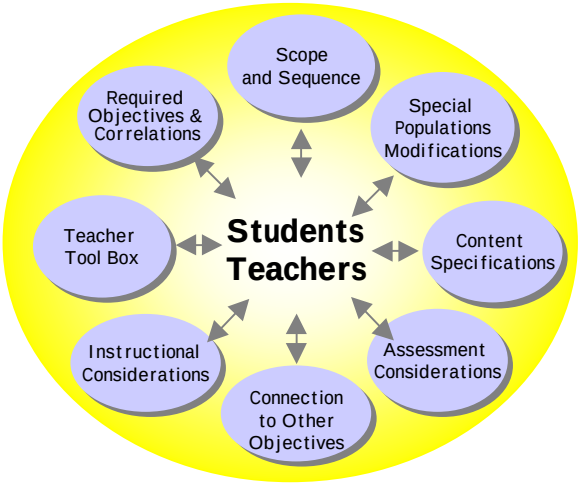

Figure 2: CLEAR Curriculum Components

The Houston Independent School District (HISD), through the Houston Urban Learning Initiative in a Networked Community (HU-LINC), has taken great strides in bringing a standards-based curriculum supported by widespread, data driven professional development in math and science to improve teaching and learning throughout the district. HU-LINC has expended tremendous amounts of resources, not only to improve the quality of teachers and pedagogy, but also to create a culture of teaching and learning that is sustained throughout the district. Building teacher leadership at the campus level contributes success to this process. HU-LINC has taken several steps to ensure that teachers receive effective professional development by enlisting the support of universities, colleges, community businesses, and community organizations. These collaborations contribute to the potency and effectiveness of this program.

The implementation and constant revision of the standards-based curriculum has yielded math and science improvement to student performance. This confirms the success of the systemic and sustained professional development model implemented by HU-LINC and HISD during the past five years.

HISD's Standards-Based Curriculum, CLEAR

CLEAR (Clarifying Learning to Enhance Achievement Results) is the district's comprehensive standards-based curriculum designed to clarify the state's curriculum requirements. **Figure 2** shows the model that encompasses the curricular components. Through the use of course syllabi and Model Lessons, teachers are given the essentials of the curriculum standards and the methodology to deliver cohesive instructional units to all students. Syllabus documents specify the sequence and pacing of units necessary for the entire curriculum to be taught and reinforce those objectives for student success.

Model Lessons provide aligned strategies and activities to teach the concepts and skills clarified in the curriculum. **Table 4** provides an overview of the curriculum developed or revised during 2003–04. CLEAR On-line gives teachers the ability to access curriculum documents on the Internet using their district-purchased laptops.

CLEAR: Mathematics:

The CLEAR mathematics curriculum is the instructional planning tool that allows teachers to effectively plan for and provide practical classroom experiences in mathematics skills and concepts that bridge the real world of problem solving. CLEAR defines the objectives to be taught, indicates alignment, limits, and supplemental

Table 4: Mathematics and Science Curriculum Developed During 2003-04

Level	Mathematics	Science
Elementary K-5	CLEAR Online 2–5 (Revised) Snapshots Grades 2–5	Model Lessons Grade 4 Snapshots Grade 4 & 5
Middle 6-8	CLEAR Online 8 (Revised) Model Lessons Gr. 7 Rollout Snapshots Grades 6-8	Model Lessons Grade 8, Grade 7 pilot (2units) Snapshots Grade 6 & 8
High 9-12	CLEAR Online Algebra I (Revised) Model Lessons Geometry, Algebra II Snapshots Algebra I, Geometry	Model Lessons Biology Snapshots IPC and Biology

resources to the adopted textbook to fill in the gaps. It provides research-based instructional strategies to use within the classroom. The Assessment Considerations section includes examples taken from the released TAKS tests and goes beyond TAKS and Stanford 10/Aprenda. A course syllabus outlining the suggested sequence of instruction including a systematic, on-going review of those objectives, ensures that all course objectives are covered by year's end.

CLEAR: Science

The science curriculum has a complete, vertically aligned, challenging curriculum. The K–8 curriculum is divided into six strands according to the National Science Standards and defines the science content that all students should know and be able to do at each grade level. A key feature of Science CLEAR is the integration of scientific processes throughout the learning of science concepts.

Teacher Resources for Assessment and Instructional Planning

Student Performance Analysis System and Teacher Toolbox

HISD has developed the Teacher Toolbox which allows teachers immediate access to student performance data and to vital areas of strengths and weaknesses in the classroom and CLEAR, the on-line curriculum. The Profiler for Academic Success for Students (PASS) is a system designed to allow teachers and academic staff the ability to view student's academic data through the Internet. The other features of the Teacher Toolbox include a state-of-the-art web portal that allows access to the district's web-based curriculum system, CLEAR On-line, including Model Lessons and Syllabus documents, and Snapshots, district created benchmark tests. Furthermore, to take advantage of these technological tools, HISD has provided all teachers with laptop computers.

Given this tool, teachers and administrators have the ability to log on to the HISD's Intranet and look up academic performance indicators of their students. Using customized data query tools that are built into the PASS system, teachers and instructional staff can collect summary data to collaborate on instructional decision-making on ways to increase student outcomes on performance measures. Teachers can review TAKS and CLEAR objectives and determine what practices have worked or will work to reach individual and various groups of students. PASS data has also been aligned to both the Texas Essential Knowledge and Skills (TEKS) and the CLEAR curriculum enabling district staff to detect trends in student performance and address issues to increase student success through sustained professional development or district training sessions.

Curriculum-Based Snapshots

Districtwide Snapshots are given to benchmark student mastery of the curriculum throughout the year and predict success on TAKS. (See Table 4) Snapshots are designed to be curriculum-based interim assessments that are directly tied to CLEAR objectives. Snapshots are given after a teacher has completed the necessary units according to district syllabi. After each Snapshot is administered, teachers examine whether students mastered the appropriate CLEAR objectives for that subject and grade level. Teachers use the on-line PASS system to review test items and identify areas of strength and weaknesses. The results of these snapshots are available on PASS. Curriculum-based snapshots are developed to reflect the increased rigor of the instruction that should be taking place within the classroom. TAKS is a comprehensive assessment of the curriculum and requires students to retain complex knowledge and skills over time. To be successful on TAKS, the instructional focus must be on teaching the entire curriculum, constantly monitoring student progress and mastery of curriculum.

Professional Development/Teacher Training: The Cornerstone of the HU-LINC Program

Upon diagnosing areas of critical need, HU-LINC in conjunction with the district and coalition partners set about addressing those deficiencies through professional development and teacher training. These areas of critical need are derived from numerous sources of data including: student achievement data, targeted weaknesses, teacher's needs assessments, and CLEAR curriculum. Professional development based on targeted areas are created both by HU-LINC Specialists and/or our university and informal science partners. Through the annual School Improvement Plans (SIP) process, schools can determine what courses teachers need to take and can assist staff to select materials for use in the classroom. **Figure 3** presents the HU-LINC developed model of the professional development and teacher training in HISD.

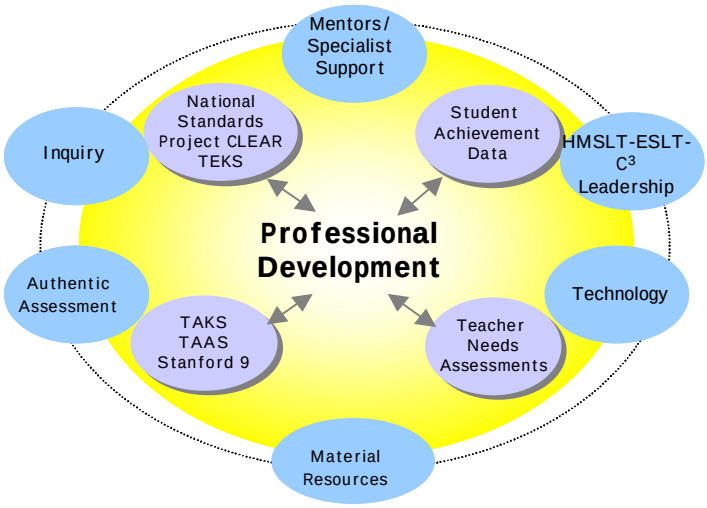

Figure 3: HU-LINC Professional Development and Teacher Training Model

The HU-LINC professional development opportunities integrate technology with the mathematics and science in authentic and appropriate ways throughout the school year. Teachers in the HU-LINC program experience a greater sense of confidence modeling the use of appropriate technology in the classroom. Professional development in math and science included content correlated to the district curricula, transferring of knowledge from concept to application, and the integration of science/math concepts across the curriculum. Math and science teachers who participate in systemic and sustained professional development increase their capacity to bring innovative and current instruction to all students. Students experience science through the use of inquiry-based resources including kits and probeware technology. The comprehensive curriculum requirements developed for all grade levels and the professional development training sessions gave teachers the ability to teach all students using these needed tools.

CLEAR Model Lessons Professional Development

Model Lessons are individual lessons that provide examples of exemplary instruction aligned to CLEAR specified objectives; they include activities, strategies, and appropriate assessments. Model lessons create units of study defined in the course syllabus. To implement these lessons in the classroom, an extensive training plan is in place with a train-the-trainer model. **(Table 5)** The Model Lesson Coordinator is the campus representative selected by the principal to attend ongoing professional development on grade/course specific curriculum content. This coordinator facilitates curriculum implementation at the campus level with regularly scheduled faculty trainings.

Table 5: Training for CLEAR Model Lesson: 2003-04

Model Lessons	Training Audiences	Number of Participants
Mathematics • Grade 2-5 (revised) • Grade 8 (revised) • Algebra I (revised) • Grade 7 (rollout) • Geometry (rollout) • Algebra II (rollout)	Planning Guide Coordinators Lead Teachers Model Lesson Coordinators	951
Science • Grade 4 (rollout) • Grade 8 (rollout) • Biology (rollout) • Grade 5 & 6 (revised) • Integrated Physics and Chemistry (revised)	Lead Teacher/Content Reps Model Lesson Coordinators Department Chairpersons Biology Representatives Chemistry Representatives	1,016

HU-LINC Master Science Lead Teacher

With NSF funding HU-LINC developed the successful HU-LINC Master Science Lead Teachers (HMSLTs) program. Through a highly competitive and selective process, 25 elementary and secondary teachers entered into the rigorous program and completed the extensive 30 hours of leadership, content and train-the-trainer professional development. HMSLTs received stipends to design, develop, prepare, and provide vertical alignment professional development for fellow teachers during June and July for a total of six weeks. The impact of these HMSLTs was felt throughout the district as participants learned to develop strategies and deliver effective presentations for the appropriate audiences. HMSLTs became proficient in using National Science Standards to conduct professional development and became instructional leaders in science. Records indicate that 25 teachers completed nine sessions during the school year and two sessions during the summer as part of the training. These teachers represented 24 different HISD campuses including 17 elementary, two middle, and three high schools.

This group of teachers progressed to training a total of 528 K-12 teachers, lead teachers, mentors, and Elementary Science Lead Teachers (ESLTs) in 10 different courses. These professional development opportunities can be seen in **Table 6**. While providing educational leadership and research-based professional development to their colleagues, this program helped guide HMSLTs to the next step of gaining Texas Master Science Teacher certification.

Elementary Science Lead Teachers

In HU-LINC's fifth year, the training and development of the ESLTs continued to be a vital part of the initiative to bring systemic reform throughout the district. Many resources, including time and money, have gone into building and sustaining the ESLT Program. This program continues to be a great source of systemic reform of science education in HISD. One of the driving forces behind creating an effective environment for teaching science throughout the district, ESLTs insisted on more professional development to garner more knowledge in teaching science to all children.

After the initial 90 hour summer course, ESLTs attend over 150 hours of training to keep abreast of the current curriculum updates and teaching strategies. Each follow-up training addresses at least one of the National Science Standard's strands: Inquiry, Questioning Skills, Mentoring and Leadership, Curriculum Integration, Materials Management and Assessment. ESLTs are to provide training for other teachers at their schools and/or subdistricts and use portfolios to provide documentation of professional development that has occurred. As indicated in **Table 7** part of the prescribed ESLT training includes inquiry-based kits. These kits are available to ESLTs for classroom loan from the HU-LINC Resource Center upon completion of the training.

Clearly the more prepared the teacher is in science content, the greater the student's chance for success and development of an interest for the

Table 6: Professional Development Led by HU-LINC Master Science Lead Teachers

Training	Participants	Coalition Partner
ESLT Training Institutes		
Cycle 2002 ESLTs- Elementary Physics & Chemistry	15	Rice University
Cycle 2003 ESLTs- Inquiry-Based Kit Institutes for: • FOSS Balance & Motion • Structures & Life • Magnetism & Electricity	30	University of Houston-Central University of Houston-Downtown
Baylor Science Leadership: • Technology (1 wk.) • Science Leadership (2 wks.)	108	Rice University Baylor College of Medicine
Elementary Teacher Training Institutes		
GEMS	147	Harris Co. Dept. of Ed.
Bridging II TAKS	70	Region IV ESC
Tech. Enhanced Math & Science	48	University of Houston-Downtown
TAKS Assessment Institute	59	Region IV ESC
High School Teacher Training Institutes		
Water Studies Institute	14	University of Houston-Downtown
Exploring Houston: Real Time Data	17	City of Pearland Police Dept. Precintct 7 Constable Tex. Dept. of Public Safety Houston Fire Dept. Houston Arboretum Houston Comm. College
Microbial Discovery Institute	17	University of Texas Health Sci. Ctr.

subject. Table 7 shows the number of ESLT teachers that participated in follow-up training during 2003–04 school year.

HU-LINC offered a series of follow-up training cycles to ESLTs to continue providing teachers with new and improved strategies to use within the classrooms. Depending on the cycle, ESLTs received five or six sessions which were designed to focus on at least one of the National Science Standard's strands. For example, Bridging to TAKS: Using Tools to Explore Matter, concentrated on the Inquiry/Questioning strand. Environments, addressed the Mentoring and Leadership strand, and Data Driven II, focused on the Assessment, Mentoring, and Leadership strand. Each session focus on providing teachers with various ways to implement strategies into the classrooms while addressing the different strands as outlined in Table 7.

Table 7: Elementary Science Lead Teacher Follow-Up Training Sessions: 2003–2004

Sequence	Schedule	#	Topics
Cycle 1999/2000	School yr.	97	Curr. integration; Vertical alignment
Cycle 2001	School yr.	134	Inquiry/Questioning; Curr. Integration
	Summer	40	GEMS
Cycle 2002	School yr.	75	Inquiry/Questioning Skills; Materials Management
	Summer	37	Physics & Chemistry; Robotics
Cycle 2003	School yr.	85	Assessment; Curr. Integration
	Summer	25	STC/FOSS Kit training

HU-LINC supported offerings for current ESLTs and regular elementary teachers who teach science. **(Table 8)** The offerings included integrated math and science with technology, and elementary science assessments. TEXTEAMS provide comprehensive and quality professional development materials for PreK–12 mathematics and science educators to assist in understanding and implementing the TEKS and TEKS-based assessments. The TEXTEAMS Mathematics Institute for Pre-Kindergarten and Kindergarten Teachers is designed to enhance participants' knowledge and understanding in five content strands: number and operation; patterns and algebraic thinking; geometry and spatial sense; measurement; and probability and statistics.

Table 8: Professional Development of Regular Math and Science Teachers

- Model Lessons: Math & Science
- AIMS
- Mathematics & Science Content
- Math and Science Lead Teacher Training
- Great Explorations in Math and Science
- Bridging II TAKS
- TEXTEAMS Mathematics for Elem.. & Sec. Teachers

HU-LINC Specialists provided districtwide professional development for almost 6,000 participants. Many times ESLTs were included as the presenters and facilitators of these courses. The HU-LINC Specialist offerings provided training on each of the following strands: STC/FOSS Kit Follow-Up, CLEAR Inquiry, Physical and Earth Science, Questioning Strategies, Mentoring and Leadership, Assessment, and Materials Management.

Table 9 indicates the elementary summer training that the University and Informal Science Coalition partners provided ESLT's and regular teachers who teach science. NSF funding allowed the HISD teachers to receive the quality, technology-enhanced science and math professional development thus increasing student achievement.

Great Explorations in Math and Science (GEMS)

The Harris County Department of Education (HCDE) and HISD offered a series of workshops designed for teachers of math and science in grade K–8. The focus of the workshop was to investigate the chemistry and physics behind bubbles such as chemical composition, the effects of evaporation, air currents, and pressure. The information provided corresponded with elementary science TAKS Objectives 1 (Nature of Science) and Objective 3 (Physical Science). A total of 91 teachers completed training in four different GEMS courses.

Secondary Professional Development

Professional development for secondary school mathematics and science teachers, funded by NSF, is designed and developed by HU-LINC Specialists in partnership with University and Informal Science Coalition members. HU-LINC utilizes a request-for-proposals process with a strict set of requirements for partners to apply in order to provide professional development offerings. All programs are based on areas of critical needs as determined by student achievement data, include inquiry-based pedagogy as the basis of instruction, and the district's curriculum, and provide a minimum of 30 contact hours. **Table 10** presents the offerings, the providers of these offerings and the number of teacher participants.

High school mathematics and science teachers are provided opportunities to participate in various programs such as the HU-LINC Mathematics and Science Integrated Program for Algebra I/IPC (Integrated Physics and Chemistry; Algebra II/Chemistry; Geometry/Biology, and Pre-Calculus, Calculus/Physics. These integrated programs include content development and technology integration. The HU-LINC High School Integrated Mathematics and Science Program promotes meaningful connections within matched levels of math and science content areas. This institute training focuses on skills and concepts and is supported with calculator and data-collection probeware technology. Two tiers of training were available during the school year 2003–2004. The Initial level was for those who had not participated in programs conducted during the past two years. Initial level teachers receive over 100 hours of professional development during the calendar year. They received training in math/science integration, data collection, curriculum connections, and campus team planning. Advanced level teachers have received the Initial level training and receive 30 additional hours of training. Advanced level teachers study probe applications, data analysis, and vertical content. Advanced teachers may also become presenters for extended training at the campus level or for districtwide curriculum offerings.Cross Content Connection (C^3) Coaches are secondary coaches helping support the above mentioned Advanced and Initial level teachers.

Table 9: HU-LINC Elementary Summer Science and Mathematics Professional Development

Course Offered	Coalition Member	#
My Health My World	Baylor Coll. of Med.	33
GEMS Institute I & II	Harris Co. Depart. of Ed.	64
Bridging II TAKS	Region IV ESC	52
Technology Enhanced Math & Science	University of Houston Downtown	19
TAKS Assessment Institute	Region IV ESC	42
Baylor Science Leadership Program	Baylor Coll. of Med.	132

High school math and science teachers also attended several programs facilitated by coalition members such as: Rice University's School Mathematics Project (RUSMP); and Texas A & M University's E^3 = Enrichment Experiences in Engineering Summer Research Program. Secondary school teachers invest a large amount of time training in order to increase student understanding and connections between mathematics and science. In this capacity, teachers perpetuate the campus implementation of systemic science and mathematics reform throughout the district.

Secondary TEXTEAMS for Secondary Mathematics and Science

TEXTEAMS provide comprehensive and quality professional development materials for PreK–12 mathematics and science educators to assist in understanding and implementing the Texas Essential Knowledge and Skills (TEKS) and TEKS-based assessments. TEXTEAMS training for middle school math and science teachers focuses on understanding the scientific principles of properties, patterns, and models and ways to use this knowledge in order to bridge curriculum and assessment. The Baylor College of Medicine conducted a TEXTEAMS biology professional development course as part of its GK-12 program. Middle school mathematics teachers attended TEXTEAMS courses in proportionality and algebraic reasoning while middle and high school teachers attended TEXTEAMS professional development for Geometry, Algebra II, and Pre-Calculus to extend the participant's understanding of the concepts developed in the TEKS.

Table 10: HU-LINC Secondary Science and Mathematics Professional Development

Course Offered	Coalition Member	#
Air, Energy & Project Learning Tree	Univ. of Houston Clear Lake	5
Algebra I Advanced Topics in Math Nano Kids	Rice University	24
E^3 Summer Research Prog.	Texas A&M Univ.	5
BrainLinks SELF	Baylor College of Medicine	28
Vertical Curr. Alignment Tech. of Mentors Orientation	HU-LINC Specialists	47
Microbial Discovery Institute	Univ. of TX Health Science Center	15
Technology Enhanced Math & Science Water Studies Institute	Univ. of Houston Downtown	9

The CLEAR standards-based curriculum, the teacher resources and tools, inquiry-based systemic and sustained professional development are the cornerstones in increasing teacher knowledge and skills in order that they can provide quality education and increase student achievement. This is evident on the TAKS and Stanford assessment data in mathematics and science in Drivers 5 and 6.

HU-LINC DRIVER 2
DEVELOPMENT OF POLICIES

- The federal, state and district accountability systems gauge performance and determine accountability ratings to assure that quality teaching and learning are provided to all students.
- The PSAT Initiative is designed to aid the district to identify students with the aptitude for advanced placement courses, to prepare them for college entrance exams and to encourage their pursuit of advanced degrees.
- Implemented with the advice of the HU-LINC Business Coalition, the Texas Scholars' Program encourages students to take more rigorous courses that will better prepare them for college, technical school and the workplace.

Since the beginning of HU-LINC, HISD has implemented policy changes that have and continue to affect math and science performance. Policies have been put into action and changes have occurred in the areas of promotion standards, graduation requirements, accountability, school improvement plans, high school mathematics classes, standards based curriculum development, and the PSAT Initiative. The Preliminary Scholastic Aptitude Test (PSAT) Initiative was developed with the goal of having all HISD students take the exam in their sophomore year with the hope of identifying more minority students for Advanced Placement courses. These HISD policies are summarized in **Figure 4**.

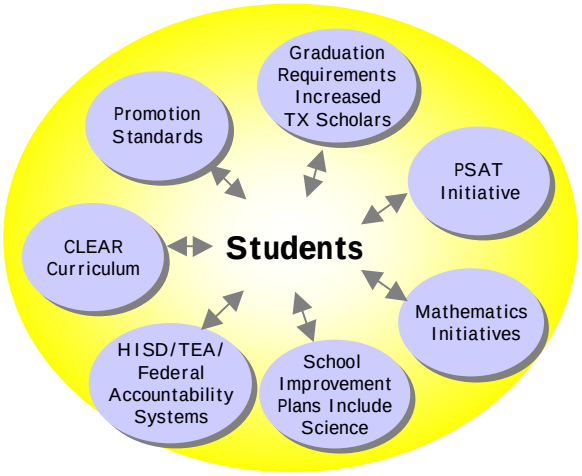

Figure 4: HISD Policies Effecting Students

Federal Accountability

The *No Child Left Behind Act of 2001 (NCLB)* is a landmark education reform bill designed to improve student achievement and change the culture of America's schools. With passage of NCLB on January 8, 2002, Congress reauthorized, amended, and renamed the *Elementary and Secondary Education Act (ESEA)*—the principal federal law affecting education K–12.

Each state is required to develop and implement a statewide accountability system that must be effective in ensuring that all districts and schools make adequate yearly progress (AYP), and in holding accountable those that do not. Annual targets in math, as well as reading are set by the state to measure progress of schools and districts toward the goal that all students must reach 100 percent proficiency in math and reading by 2013–14. **Figure 5** represents the percent of all HISD students and each subgroup meeting the state standards for 2002–03 and 2003–04. In addition to academic performance, schools must test at least 95 percent of their students in each of the subgroups in math and reading.

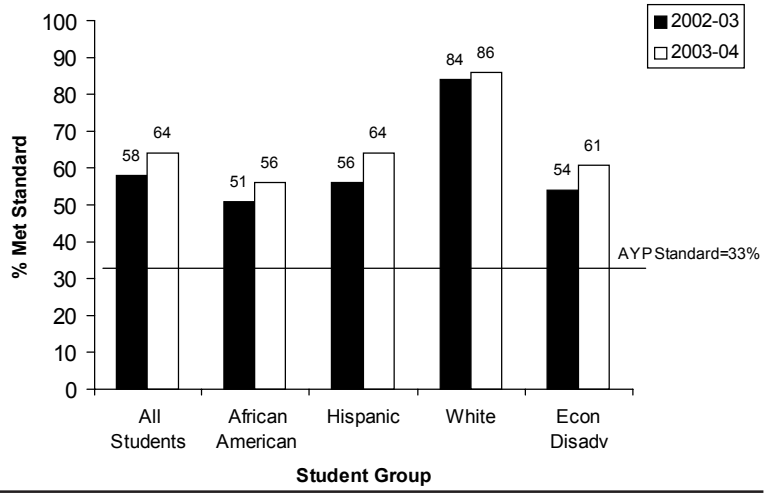

Figure 5: Percent of HISD Students Meeting Adequate Yearly Progress, 2002-03 and 2003-04.

State Accountability

The TEA Accountability System is a method of evaluating school districts and schools with regard to their performance on certain student indicators, and of assigning an accountability rating based on that evaluation. The newly revised system is based on an improvement model in which districts and campuses must meet either an absolute standard or an improvement standard for each accountability

measure. The four possible classifications for districts and individual schools are Exemplary, Recognized, Academically Acceptable, or Academically Unacceptable. The TEA accountability model was initiated in 1993 and revised for the 2003–04 school year. This new model is based on improvement for each of the measures for all student groups meeting minimum size requirements.

The student performance indicators used to determine if absolute standards are met consist of current year spring Texas Assessment of Knowledge and Skills (TAKS) and State Developed Alternative Assessment (SDAA) passing rates and dropout or completion rates from the previous year. The performance of all students and of the student groups of African American, Hispanic, White, and Economically Disadvantaged are employed in the process of assigning accountability ratings. These ratings are based on the lowest performance of any of the 36 possible measures, 10 of which are math and science indicators.

Local Accountability

The new HISD Performance Indicator Accountability System (PIAS) is a consolidation of the HISD Accountability System, the HISD Scholars Accountability System, and the Performance Indicators. While only one local system is used to give schools ratings, schools still receive ratings under the state and federal accountability systems.

The new PIAS combines three previous accountability models and is a method to assess the success of district schools by measuring the individual progress of every school in achieving a broad range of student performance indicators. The overall goal of the accountability system is to promote schools' progress in achieving their educational objectives. Specific measures are utilized for each indicator. Top level administrators and HISD Board of Education have set five-year district goals. In addition to these long-term goals, annual expectations are set each year for each school showing the incremental improvement needed every year to meet the District goals.

The PIAS is comprised of data on a number of student achievement and student outcome indicators including the subjects of math and science on the Texas Assessment of Knowledge and Skills (TAKS) in grades 3-11, Stanford and Aprenda math subtests in grades 1-11, Texas Scholars, PSAT, Scholastic Assessment Test (SAT), ACT Assessment, and the Texas Education Agency (TEA) Accountability Rating.

Preliminary Scholastic Aptitude Test (PSAT) Initiative

In the Fall of 2003, HISD implemented the PSAT Initiative. Through the HISD Foundation, funds were secured to enable the district to fund this proactive initiative by offering the PSAT to all tenth grade students attending HISD schools in the Fall of 2003. This initiative is designed to provide schools with information about sophomores' academic strengths and interests and to aid the district in identifying students with the aptitude for Advance Placement (AP) courses. This initiative also assists the district in preparing students for college entrance exams and enables students to realize the possibilities of continuing their academic careers after high school. This initiative was funded for $46,000 from the HISD Foundation and $22,614 from Title I funds. Overall, the district had 9,779 tenth graders take the PSAT in the Fall of 2003 which represented just under 80% of all sophomores in the district. **(Figure 6)** Currently, students meeting the initiative criteria will be automatically considered for AP courses.

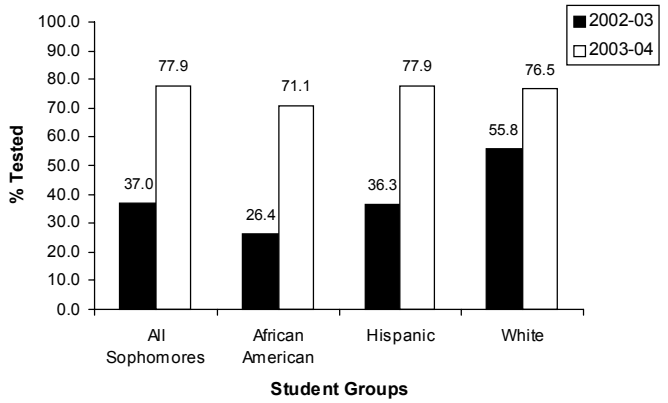

Figure 6: Percent of HISD Sophomore Students taking the PSAT, 2002-03 and 2003-04

The College Board (1997) reports that the PSAT/NMSQT can be utilized to identify students who may be successful in AP courses. Previously, HISD used teacher recommendations, self-nomination, previous courses completed, grades in course work, and scores on achievement tests to identify those students that can complete and excel in AP courses. However, this system did not identify all students who could benefit from taking AP courses. Using the results from the PSAT/NMSQT provides another method of identifying students who can profit academically and enroll in

higher level math and science AP courses. The results of the PSAT Initiative has proven that more minority and economically disadvantaged students are identified and enrolled in college-level course work.

In addition to the National Merit Scholarship finalists, other specific recognition is bestowed to high-scoring Hispanic students through the National Hispanic Scholar Program, and to high scoring African-American students through the National Scholarship Service and Fund for Negro Students which provides a National Achievement Scholarship to qualified students.

Normed-Reference Test included in HISD Accountability System

In 1996, the Houston Independent School District (HISD) instituted a national norm-referenced achievement test in an effort to continue its commitment to academic achievement. The Spring 2004 administration of the Stanford 10 represents the first administration of this new edition of the Stanford Academic Test Series. The Stanford 10 provides a means of determining the relative standing of HISD students' academic performance when compared to the performance of students from a nationally representative sample. The spring 2004 administration of the Stanford 10 represents the sixth districtwide administration of this norm-referenced test.

The Stanford 10 was designed to assess student achievement in mathematics, environment/science, and other content areas. Stanford results show that student achievement, as measured by Normal Curve Equivalents (NCEs), increased at all grade levels in Mathematics and Environment/Science from 1999 through 2004 and that the gap between subgroups decreased as indicated in Drivers 5 and 6 (see Tables 22-30).

The Recommended High School Program and Texas Scholars

The Texas Scholars Program, officially known as the Recommended High School Program, requires students to complete a more rigorous course of study beyond the minimum requirements. Implemented with the advise of the HU-LINC Business Coalition, the Texas Scholars Program encourages students to take more rigorous courses that will better prepare them for college, technical school, or the workplace. The Texas Scholars Program is endorsed by colleges and universities, the Texas Education Agency, the Texas Business and Education Coalition and the Houston Independent School District. **Table 11** shows the requirements to graduate under Recommended High School Program. HISD Board Policy made this the automatic course of study for all HISD students. For students to graduate and receive a Recommended High School diploma, students must earn three credits in mathematics and earn three credits from four areas in science.

In previous years HISD used the Texas Scholars Accountability System to measure the extent this goal was met. This system was incorporated into the new HISD Performance Indicators System (PIAS) previously described under as the local accountability system. The scholars accountability system was one of three systems combined for the 2003–04 school year as part of the district's local accountability system. The two components: the percent of graduates who are designated Texas Scholars by completing either the Recommended High School Program or the more advanced Distinguished Achievement Program, and the percent of juniors taking the PSAT examination are now two of the possible indicators used in the PIAS. Thus, the Texas Scholars Program and the PSAT Initiative along with several other indicators were combined with the original system to create the new local accountability model.

Table 11: HISD Recommended Program Requirements for Graduation

Course	Credits
Science	3.0
Mathematics	3.0
Technology Applications	1.0
World Geography	1.0
US History	1.0
US Government	0.5
Economics	0.5
English	4.0
Health	0.5
Physical Education	1.5
Speech	0.5
Second Language	2.0
World History	1.0
Fine Arts	1.0
Electives	3.5
Totals	24.0

Conclusion

Federal, state, and HISD policies have accounted for students and teachers being held accountable for higher standards and student success in mathematics and science. The accountability systems emphasize performance in math and science while the PSAT Initiative helps to identify minority students for Advanced Placement courses. The Texas Scholars program encourages students to take more rigorous course work to better prepare for college and beyond.

HU-LINC DRIVER 3

CONVERGENCE OF THE USAGE OF ALL RESOURCES TO SUPPORT SCIENCE AND MATHEMATICS EDUCATION

- Coordinating new and existing resources provided instructional support for teachers of science, mathematics, and technology.
- HU-LINC increased its leadership capacity throughout the district with the ESLTs and MSLTs providing more professional development to elementary and secondary teachers utilizing their expertise and experience.

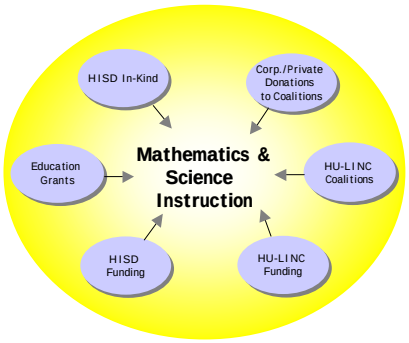

Figure 7: Funding Sources for Mathematics and Science Instruction

In Year 5 HU-LINC teachers participated in a focused and unified program supporting science, mathematics, and technology education. Through the convergences of fiscal, intellectual, material, curricular, and extracurricular resources, the program expanded and improved from the previous years. Instructional support for teachers of science, mathematics, and technology was made available through the extensive coordination of new and existing resources. Furthermore, the expertise of HU-LINC specialists, abundance of resources, and access to materials continued to grow and provide support for science, mathematics, and technology to teachers, parents, students, and district personnel.

Fiscal Resources

For the 2003–04 year, NSF continued to be the primary source of funding for HU-LINC. HISD provided non-federal funds for professional development and technology-related items through various district departments. Other sources of funding for the HU-LINC initiative came from outside organizations including universities and colleges, science institutions, businesses, foundations, and community and government organizations. (See **Figure 7** for Funding Sources)

Funds provided by NSF for HU-LINC's budget for the fiscal year of September 1, 2003 to August 31, 2004 included all direct and indirect costs, as outlined in **Figure 8.** Participant Support, the largest cost for HU-LINC, included teacher stipends, in-district travel for specialists, materials and kits for classroom use, substitute teachers, and teacher institute fees. The second largest cost was personnel, which provided salaries and benefits to HU-LINC Specialists and staff for the fiscal year. Following personnel were Other Direct Costs, Indirect Costs, and Travel. Other Direct Costs included office materials and supplies; publication, documentation, and dissemination costs; consultant services; sub-awards for Baylor College of Medicine and Rice University School Mathematics Project; Family Math and Science Nights; and coalition activities such as the Informal Science Coalition's Family Adventures. Travel costs consisted of NSF mandated meetings for PI, Co-PIs, Director, Manager,and training for for HU-LINC Specialists.

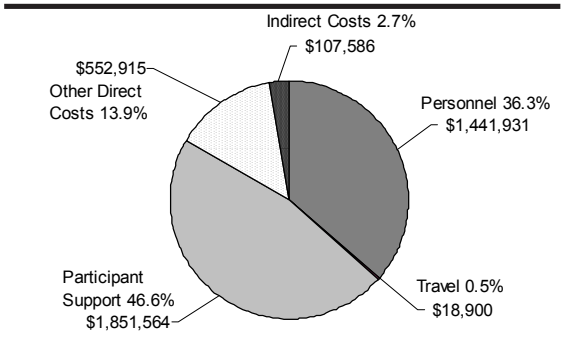

Figure 8: HU-LINC Direct and Indirect Costs, 2003-04

The HISD Cost Share for September 1, 2003 to August 31, 2004 for the NSF Cooperative Agreement totaled $1,666,184 with the cumulative total of $11,947,891 over five years. The cost share funding was provided by the district's Science Department, Algebra and Mathematics initiatives, the district's Living Resource Center and associated salaries, the Rice Model Lab, as well as technology-related items through the district's technology department as shown in **Figure 9.** The primary source of funding came from the Rice Model Lab, followed by the Living Resource Center Salaries, and the Algebra Initiative. HISD contributed technology-related equipment such as laptop computers for all teachers; televisions for large screen projection; carts and technology services such as Internet accounts, and Rice University's Electronic Community of Teachers (ECOT) for ESLTs and Mentors.

Other sources of funding for HU-LINC were provided through collaborations with HU-LINC partners and partner grants, as well as in-kind support, and Familiy Nights by HISD schools. Informal Science Coalition members provided supplies for HU-LINC familiy activities. HU-LINC offered schools an opportunity to produce a

Family Night in their school that would engage the entire family in a science, mathematics, and technology experience. The proposals submitted were to provide for printed materials and curriculum, printing and copying costs for campus-generated materials and advertisements for the event, consultant fees for specialized training, and stipends for teachers. The total dollar amount of the proposals submitted was $53,560.68 of which $49,000 was approved and funded through HU-LINC and the HISD campuses. Through increased external grants, donations, and other support among HU-LINC participants, overall achievement scored of students increased.

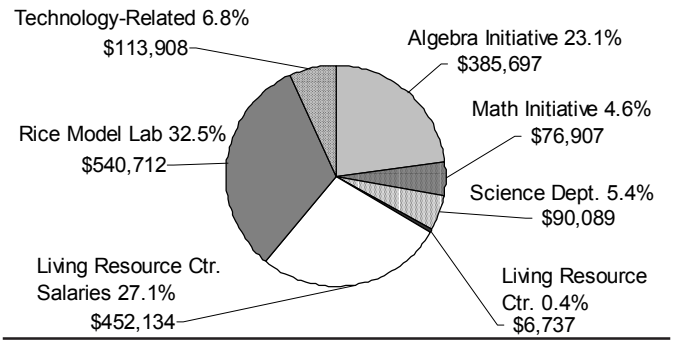

Figure 9: HU-LINC Cost Share, 2003-04

Intellectual Resources

Through the ESLT, HMSLT, and Mentor programs, the content-rich inquiry professional development, and presentations at conferences, HU-LINC's leadership capacity continued to develop throughout the fifth year. Through this expansion of resources and the increasing expertise of HU-LINC specialists and teachers; the areas of science, mathematics, and technology profited from HU-LINC's growth, influence, and expansion.

The growing leadership of ESLTs impacted schools through their expertise and effective use of science instruction materials, classroom management skills, and their proficiency with inquiry-based science. ESLTs presented to parents and faculty members; coordinated science fairs, Math and Science Family Nights, and Family Adventures; conducted grade level meetings; and assisted other campus leaders by modeling inquiry-based science instruction. Many ESLTs served as presenters and facilitators across administrative district professional development sessions. C^3 Coaches used their expertise to assist in districtwide secondary integrated math and science professional development.

HMSLT science leadership also expanded through the creation of the HU-LINC HMSLT program. Following their extensive training, as described in Driver 1, the HMLSTs designed, implemented, and presented professional development for K-12 science teachers during the summer of 2004.

The HU-LINC Mentor partner program provided support to teachers and created the opportunity to engage in partnerships with ESLTs. The program encourages instructional support in content and pedagogy, including one-on-one assistance to three to five ESLTs in model teaching as well as planning and implementing the science fairs. The mentor handbook, professional development and collaborations with community organizations provided the necessary guidance and expertise to implement successful mentor partnerships, as well as documentation of the process. These mentors were primarily secondary science teachers who completed professional development in the HU-LINC programs.

Tables 12 and **13** indicate the number of mentors in the 2003-04 year, the number of hours of professional development they earned, the courses, and number and hours of sessions offered. ESLTs and Mentors participated in on-line discussion sessions for the first time. Surveys completed by ESLTs in 2003–04 rated their mentor relationship and benefits received from excellent to moderate, with none indicating poor or unacceptable.

Drawing on their knowledge and expertise, HU-LINC specialists designed and delivered quality systemic and sustained professional development for ESLTs, HMSLTs, and K–12 science teachers. They disaggregated data and correlated it with appropriate instructional materials and inquiry kits for professional development in which teachers learned to duplicate the process for instructional needs. The Specialists provided professional development that stimulated the progression from science lead teachers to HMSLTs, ESLTs, and mentors. Furthermore, HU-LINC and HISD partnered with University of Houston and Rice University to bring the Quarknet Center to Houston offering physics professional development opportunities.

HU-LINC provided leadership at numerous state, national, and international conferences. HU-LINC was internationally recognized for collaborations and partnerships with organizations and universities in Houston and throughout Texas and was one of two foreign initiatives invited to present at Cranfield University in England.

Several HU-LINC ESLTs, HMSLTs, and specialists spread expertise as they have moved into administrative positions. Specialists offered assistance with School Improvement Plans, Family Night planning committees,

Table 12: Number of Mentors and Hours of Participation in 2003–04

Academic Level	Mentors	Hours
Elementary Teachers	20	306
Middle School Teachers	26	405
High School Teachers	4	69
Total	**50**	**780**

Table 13: Number/Hours of Prof Dev. for Mentors in 2003–04

Title	Sessions	Hrs.
Orientation	3	7.5
Vertical Curr. Alignment	3	21.0
Technology Training	2	5.0
Data Driven Decisions	1	2.0
ESLT Training	8	42.0
Total	**17**	**77.5**

budget analysis, needs assessments, and evaluation development for measuring the effectiveness of the science events. Through coordinated resources from HU-LINC's specialized group of experts, students' achievement scores were significantly impacted from the enhanced level of professional development offered to HISD's teachers and principals.

Material Resources

HU-LINC continued to provide TEKS TOOLS Kits and computer microscopes to all ESLTs and other science teachers who participated in the three week Baylor Science Leadership Program. These kits support both national and state curriculum standards for professional development and classroom use containing the essential science tools and equipment specified by TEKS, the TAKS, and CLEAR. HISD elementary school teachers received McGraw Hill Grade Level Textbook Kits. ESLTs and Mentors were able to access HU-LINC Inquiry Science Kits such as Full Option Science Systems (FOSS) and Science and Technology for Children (STC). Teacher resources included the HISD Living Resource Center, laptop computers, computer microscopes, TV monitors and carts, and Internet accounts. **(Figure 10)**

Furthermore, technological support was provided to HU-LINC participants of Explore It!, a project sponsored by NSF. Exxon-Mobil's Magnificent Moments in Math offered math kits and technical support for the activities and the refurbishment of activity materials. Baylor College of Medicine's Center for Educational Outreach introduced an on-line educational resource, BIO-Ed, for life science educators utilizing state-of-the-art technology with instant access to cutting-edge biology tools such as presentations, slide sets, and nature science news from around the world. Parent Stars, a parent program through the Children's Museum of Houston that focuses primarily on pre-kindergarten and kindergarten students, emphasized the use of numerous websites that support learning concepts in math kits offered to students. Coalition member websites are educational resources accessible from the HU-LINC website. Coalition member resources included surveys for assessing feedback regarding Family Adventure activities, family activity books, schedules, and announcements in both English and Spanish to cater the diversity among HISD families. Enhanced information, dissemination, resources, and accessibility to technology strengthened communications with teachers, principals, and community members.

Curricular Resources

Curricular resources provided by HISD include CLEAR On-line, new Mathematics Model Lessons, Mathematics Model Lessons On-line, new Science Model Lessons, and Science Model Lessons On-line. CLEAR On-line delivered curriculum and model lessons to teachers. The model lessons were created and rolled out to various grade-level teachers and included various subjects such as Exit Level TAKS review calendars and lessons. Electronic Community of Teachers (ECOT), e-TRAIN, the Profiler for Academic Success for Students (PASS), HISDConnect, the HU-LINC website, and other resources are listed in Figure 10. ECOT, an on-line collaboration between Rice University and HISD, began with HU-LINC's assistance and sustained its enormous impact on the accessibility and expansion of information to HU-LINC participants and HISD. The Employee Training Registration and Information Network (e-TRAIN) provided employees with information about training opportunities and the on-line registration. PASS offered immediate access to student demographic and performance data through HISD's intranet. Through HISDConnect, the web portal for HISD, curriculum information, the TeacherToolbox, and Snapshots for TAKS, were available to teachers, principals, and counselors.

HU-LINC used numerous technological resources to further develop and expand the initiative in 2003–04. HU-LINC's website http://com.houstostonisd.org/HU-LINC/ continued to provide organizational and professional

development information, as well as updates to all HU-LINC participants and interested parties. Converging numerous groups and organizations, the website provided opportunities to view professional development, links to HU-LINC partners and coalition members, a recruitment link for mentors, on-line mentor applications, and Texas Scholars information linked to the Texas Business Education Coalition, access to TEA and assessment resources, resources for school principals, Family Adventure transportation information, science kit information, and laptop guidelines for teachers and mentors. Because instructional support for teachers aligned with the curriculum, the overall achievement scores have increased among students.

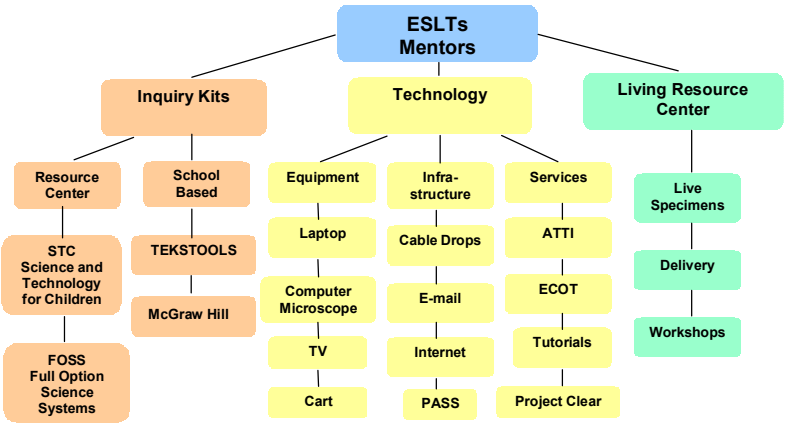

Figure 10: Resources for Elementary Science Lead Teachers & Mentors

Other Resources

Cross-collaboration among the network of six coalitions established by HU-LINC (Informal Science, University/College, Business/Industry, Community/Government, Educational Support, and Parent) provided professional development, child-centered activities, and parent-child interactions. They reinforced science and mathematics concepts for students in school and at home. The coalitions exist to help: schools meet their goals, students prepare for careers, students and teachers learn about university offerings, families access community resources, and explore external project grant opportunities.

Table 14: Informal Science Coalition Members in 2003-04

Children's Museum of Houston
Hermann Park Conservancy
Houston Arboretum and Nature Center
Houston Museum of Natural Science
Houston Zoo
Museum of Health and Medical Science
NASA and the Space Center of Houston
Nature Heritage Society

Eight organizations comprised the Informal Science Coalition. **(Table 14)**. Each HISD elementary school was adopted by at least one member from the Informal Science Coalition, and had the opportunity to participate in Family Adventure activities. Based on HISD's CLEAR, field experiences for students and professional development for teachers reinforced the mathematics and science concepts learned in school and offered parents activities to experience with their children. Coalition members used their affiliations to acquire donations and volunteers for support, materials, and assistance with Family Adventure and other activities for students, families, and teachers.

Table 15 shows nine University/College Coalition members who created professional development and course work to teachers, principals, and counselors based on achievement scores, TEKS, and CLEAR. Technology training included Rice University's Center for Technology Teaching and Learning (CTTL), ECOT preparation, and FirstClass, the host for ECOT. In a collaborative effort, Baylor College of Medicine and Rice University trained HU-LINC participants in technology integrating math and science. Experts and teachers in this linked community engaged in training, learning, and shared project work to benefit classroom instruction.

Table 15: University/College Coalition Members in 2003-04

Baylor College of Medicine
Houston Community College System
Rice University
Texas A&M University
Texas Southern University
University of Houston – Central
University of Houston – Clear Lake
University of Houston – Downtown
University of Texas Health Science Center

In collaboration with NSF and the University of Houston, HU-LINC participants and HISD teachers were involved in Research Experiences for Greater Houston High School Science and Math Teachers. Newly developed workshops resulted from the collaboration of the Houston Fire Department, Harris County Constable Precinct 7, Texas Department of Transportation, City of Pearland, Texas Police Department, Houston Community College, and the Houston Arboretum. Experts and teachers in this linked community engaged in training, learning, and shared project work to benefit classroom instruction.

HU-LINC DRIVER 4

BROAD-BASED SUPPORT FROM PARENTS, POLICY MAKERS, INSTITUTIONS OF HIGHER EDUCATION, BUSINESS AND IN INDUSTRY, FOUNDATIONS, AND OTHER SEGMENTS OF THE COMMUNITY

- Parents, Informal Science and higher education institutions, businesses, foundations, and other segments of the HU-LINC coalitions and partnerships expanded and enhanced activities through a network of courses, seminars, and workshops providing professional development.
- New and expanded field experiences were developed for students, teachers, and families that reflect national and state standards in science, mathematics, and technology.

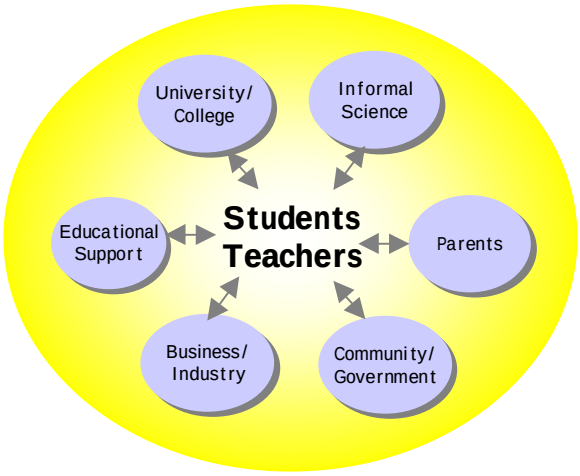

Figure 11: HU-LINC Coalitions

The expansive relationship developed among Houston community members and HISD, parents, policy makers, institutions of higher education, businesses, foundations, and other segments of the community continued to provide broad-based support in 2003-04, as indicated in **Figure 11.** As a result of the convergence, a network of courses, seminars, and workshops for professional development based on national and state standards in science, mathematics, and technology. Teachers, students, and families were afforded new and existing field experiences aimed at increasing student achievement and school performance.

University/College Coalition

The University/College Coalition continued as a representative body of all colleges and universities in the greater Houston area (See Tab le 15) and worked with the community to support superior educational achievement for students. Members of the coalition provided programs, facilities, and research needed to furnish content and expertise related to professional development activities for Houston educators. These activities emphasized standards-based curricula and inquiry-centered learning, increased performance, and heightened student interest. By working together, coalition members developed and maintained K-12 teacher education programs facilitating science, mathematics, and technology learning in urban schools with diverse populations which resulted in an increased number of Houston students pursuing related careers in these areas.

Designed for math and science teachers and based on student achievement data and CLEAR, professional development programs that supported HISD and HU-LINC continued for K-12 teachers. Elementary and middle school teachers participated in the University of Houston's Research Experience for Teacher (RET) as an opportunity to conduct a research project under the guidance of a faculty mentor, learn about the Infinity Project, and bring an Infinity Project kit to their classroom to use as a teaching tool. The projects covered biomedical engineering, optics, and computer programming. University of Houston and University of Houston – Downtown also offered Promoting Inquiry and Kits for ESLTs. ESLTs and elementary and middle school teachers were offered courses and materials aligned to CLEAR developed by scientists and educators from Baylor College of Medicine such as the Baylor Science Leadership Program, My Health My World, From Outer Space to Inner Space, and BrainLink.

Secondary math and science teachers participated in E3 Teacher Summer Research Program, an engineering research experience partnership with the Dwight Look College of Engineering, the Texas Engineering Experiment Station, and NSF offered at the Texas A&M University College Station campus. As with most of the professional development offered through HU-LINC, teachers were given credit for Continuing Professional Education, a stipend, an allowance, and classroom materials and equipment.

Other events offered to secondary teachers included the Microbial Discovery Institute created by the University of Texas Medical School and Houston Museum of Health and Science, and the Portable Planetarium Workshop offered by Rice University and the Museum of Natural Science. Texas A&M University invited high school biology teachers to a one-day conference at the campus. The University of Houston offered a research opportunity for

math and science teachers to include a stipend for up to six weeks of study. HU-LINC professional development for secondary math and science teachers provided technology equipment for classroom use, calculators, probes and sensors, as well as the opportunity to become teacher-facilitators and trainers for other secondary teachers, and serve as leaders in vertical and cross-content training.

Members of the University/College Coalition collaborated for the implementation of grants such as Baylor's GK-12 and SELF program. Members of the coalition were provided with updates and presentations regarding CLEAR and TAKS. The College of Natural Sciences at the University of Texas in Austin offered a homework service for students in grades 5–8 in math, algebra, pre-calculus, biology, chemistry, physical science, and physics. Houston Community College collaborated on a workshop for teachers called Exploring Houston. The Cullen College of Engineering at the University of Houston designed G.R.A.D.E., a weeklong camp for 9th-12th grade girls to encourage further study in engineering.

Informal Science

Continued support for HU-LINC throughout the Houston area came from members of the Informal Science Coalition, a group of representatives from various educational institutions including museums, parks, foundations, gardens, and the space center. This collaboration strengthened it's affiliation with teachers, students, and families through ongoing professional development, field experiences, and Family Adventure activities focused on state, national, and district standards. Further, Informal Science Coalition members collaborated with University/College Coalition members for teacher course offerings. **(Table 16)**.

All elementary schools were contacted to participate in an Informal Science Coalition activity during 2003-04. These schools took advantage of the free activities, transportation, flyers, brochures, and other marketing materials that HU-LINC funded and coordinated for all Family Adventure activities.

With HU-LINC's support, the Children's Museum of Houston offered Overnights at the Museum, a "sleep-over" for fourth grade girls; Adventures After School, museum tours of the exhibits and exhibit-related experiments reinforcing learning concepts; staff training to teachers of physical science, environmental science, math, arts, and literacy; Parent STARS, an inclusive learning event for families of children primarily in grades Pre-K and K; Project ACCELERATE, a math and technology after-school program with math kits and websites for tools and training for the teachers and parents; Science Workshop and Explore It!, both NSF sponsored projects, offering training, tools and materials, and technical support; and professional development for teachers to receive curriculum designed by the Lawrence Hall of Science currently in use by HISD. The Children's Museum of Houston was also involved with numerous business, community, and government organizations providing training and field activities for students, parents, and teachers.

Table 16: Participants in Family Adventure Activities in 2003–04

Informal Science Coalition Member	Number of Participants	Number of Schools
Children's Museum of Houston	6,657	45
Friends of Herman Park	*	6
Houston Arboretum and Nature Center	420	3
Houston Museum of Natural Science	2,945	47
Houston Zoo	205	4
Museum of Health and Medical Science	2,392	25
Space Center Houston	*	2
Nature Heritage Society	75	9
Total	**12,694**	**141**

* Not Reported

NASA and the Space Center of Houston provided professional development for teachers such as Mars Teacher Camp-In. Houston Arboretum and Nature Center assisted in a weeklong Exploring Houston workshop. John P. McGovern Museum of Health and Medical Science provided activities such as Healthy Lungs Mini-class revealing the effects of smoking, the Amazing Body Pavilion, presentations by non-profit organizations such as U.T. – M.D. Anderson Cancer Center, English/Spanish films in the McGovern Theater, English/Spanish schedules and announcements, healthy snacks, and evaluation forms completed by family members and teachers revealing their extreme appreciation for the museum events. Houston Zoo activities revolved around a forest theme, included English/Spanish, self-guided, zoo tour books, education volunteers to answer questions and show biofacts, and free snacks for all family members. Representatives from the Nature Heritage Society and the Houston Parks and Recreation Department, along with Houston's Mayor Bill White, showed students how to plant trees during special Arbor Day activities.

Business/Industry Coalition

Members of the Greater Houston Partnership and other organizations throughout the Houston area continued their collaborative efforts with HU-LINC. The Texas Scholars Program led students with financial needs to obtain college scholarships. **Table 17** shows the increasing number and total percentage of Texas Scholar Graduates for the last five years. Students learned about the Texas Scholars Program through community and business professionals who made presentations to eighth and ninth grade students about obtaining success in the workplace and the value of higher education. Representatives from the Business Coalition made 256 presentations to 11,282 eighth grade students, 278 presentations to 12,762 ninth grade students, and for the first time, 202 presentations to 7,334 tenth grade students. The annual Career and Education Day sponsored by the Houston Hispanic Forum continued to provide presentations to students and their parents about career options.

Other coalition members and partnering businesses included the Science, Engineering, Communication, Mathematics Enhancement (SECME); Gulf Coast Alliance of the Texas Alliance for Minorities in Engineering, Inc. (GC TAME); Texas Instruments; Vernier Company; Mr. Diosomito Engineering Camp; and Exxon-Mobil; Society of Automotive Engineers in Dallas, Texas; Pratt Space Propulsion in West Palm Beach, Florida; and the National SECME Office in Atlanta, Georgia. SECME assisted in hosting an engineering clinic at an HISD middle school. Texas Instruments and Vernier Company provided consultants for a two-day workshop for over 60 math and science teachers, along with other Informal Science and University/College coalition members. Texas Instruments and Vernier Company, together with HU-LINC specialists, managed an information and demonstration booth at CAST. Magnificent Moments in Math, an after school program at the Children's Museum of Houston and sponsored by Exxon-Mobil provided training, math kits, technical support, and refurbishment of activity materials. Finally, consultants, engineers, and professors led clinic exercises for students and teachers from the Society of Automotive Engineers, the National SECME Office, Pratt & Whitney, and the University of Houston.

Table 17: Number and Percent of HISD Texas Scholar Graduates from 1999–2000 to 2003–04

HISD Graduating Class	1999–00	2000–01	2001–02	2002–03
Number of HISD Texas Scholars	2,381	4,439	5,635	6,299
Percentage of Total HISD Graduates	31%	58%	71%	76%

Community/Government Coalition

Several organizations came together to participate in HU-LINC's Community/Government Coalition in 2003–04 such as Keep Houston Beautiful (KHB), Houston Public Library, Junior League of Houston, Houston Fire Department, Harris County Constable Precinct 7, Texas Department of Transportation, and the Pearland Police Department. Keep Houston Beautiful recognized four HISD schools with awards for making the city cleaner, improving the environment, and building community pride. The awards, Houston's Proud Partner, SPARK Parks Certificate of Recognition, and Heart of Texas Park, were presented during Mayor Lee Brown's annual Proud Partners Luncheon.

KHB's Youth Advisory Board, a group of environmentally conscious Houston area students, led hundreds of students throughout the Houston area to de-litter, paint over graffiti, rake leaves, and conduct block walks to educate neighborhood businesses on the importance of maintaining their property. HISD students participated in the Fall Mowdown 2004, mowing and de-littering empty lots. In preparation for the Major League Baseball's 75th Annual All-Star Game, KHB along with the Houston Astros, Waste Management, and the City of Houston, sponsored the All-Star Family Day Cleanup cleaning and beautifying areas surrounding Minute Maid Park. Volunteers included students and their families from HISD and surrounding areas.

The Children's Museum of Houston (CMH) partnered with the Houston Public Library to deliver free board books to hospitalized children, parents with hospitalized infants, issue library cards to parents, distribute information on parent and family support programs, and read stories to child patients. The Junior League of Houston also partnered with CMH to facilitate activities with HISD fourth grade girls to participate in museum activities. A weeklong workshop, Exploring Houston, provided high school teachers with professional development through a collaboration and partnership through the Houston Fire Department, Harris County Precinct 7, Texas Department of Transportation, Pearland Police Department, Houston Arboretum, and Houston Community College. While

HISD schools have worked with some of these organizations for several years, HU-LINC's presence and involvement has strengthened the partnerships by strong collaborations with the community and coalition members.

Educational Support

Professional development and student learning activities were offered through members of the Educational Support Coalition, which included Harris County Department of Education (HCDE), Texas Region IV Educational Service Center, and the Dana Center. HCDE provided math and science support services for teachers working with students from early childhood to high school. Professional development included Integrated Math and Science Training – IPC/Algebra I to provide an interdisciplinary conceptual approach to teaching IPC and Algebra I using minimal technology. The TEKS/TAKS/TEXTEAMS institute was offered illustrating the results of natural selection and reviewing the results of the Human Genome Project. TEXTEAMS, a comprehensive system of professional development based on the mathematics for TEKS assisted teachers in understanding and implementing the TEKS and TEKS-based assessments such as the TAKS. A special project and collaboration between the Center for Professional Development and Instructional Support at HCDE, the Lawrence Hall of Science at the University of California at Berkeley, and the Shell Oil Company Foundation established Great Explorations in Math and Science (GEMS). HU-LINC collaborated with Texas Region IV Educational Service Center and the Dana Center at the University of Texas for Bridging the TAKS II – Light and Optics trainings. The NSTA/Exxon Mobil "Building a Presence for Science" program was also implemented.

Parent Involvement

Parent involvement included members from Children's Museum of Houston's Parent STARS Program and the Parent Library, participants in the HU-LINC Family Nights, Family Adventure activities with members from the Informal Science Coalition, activities through HISD's Project Reconnect, each school's Parent Center, the HU-LINC and HISD websites, Texas Scholars communication and information to parents, and Parents Program on the HISD channel. The Parent Library provided free books to hospitalized students and parents with hospitalized children. Family Night engaged the entire family in math, science, and technology experiences investigating through interactive modular activities designed to build greater understanding using hands-on materials and technology. Family Adventure activities also correlated field experiences among students and families with Informal Science Coalition members. Project Reconnect involved a district wide public-support infrastructure through parental communications, community outreach, and public relations. Through the facilitation of parent activities, Project Reconnect also established a relationship with the Parent Learning Network of the Texas Association of School Boards. There were 29 Project Reconnect Centers serving parents throughout HISD. Each schools' Parent Center and both the HU-LINC and HISD websites provided a resource and outreach forum for families. The overall success of student achievement in the classroom is positively linked to Houston's rich resources supported by diverse groups throughout the community, businesses and organizations, schools, and families.

HU-LINC DRIVERS 5 AND 6
STUDENT ACHIEVEMENT AND MINORITY GAP REDUCTION

- Academic performance in math and science for all students improved from baseline, 1999 to the current school year.
- Gaps were reduced between minority and White students and economically disadvantaged and non-economically disadvantaged students.
- There was an increase in the number of students in subgroups who earned a college preparatory diploma.

The evidence regarding the progress HISD made as a result of systemic and sustained reform in mathematics and science is demonstrated in several measures of student achievement. These include the results of criterion and norm-referenced assessments, enrollment and completion of higher courses, graduation rates, and the extent that are prepared of college-level studies. Evidence is demonstrated through overall performance of subgroups, and reductions in the gaps between minority and majority students. (See **Figure 12**)

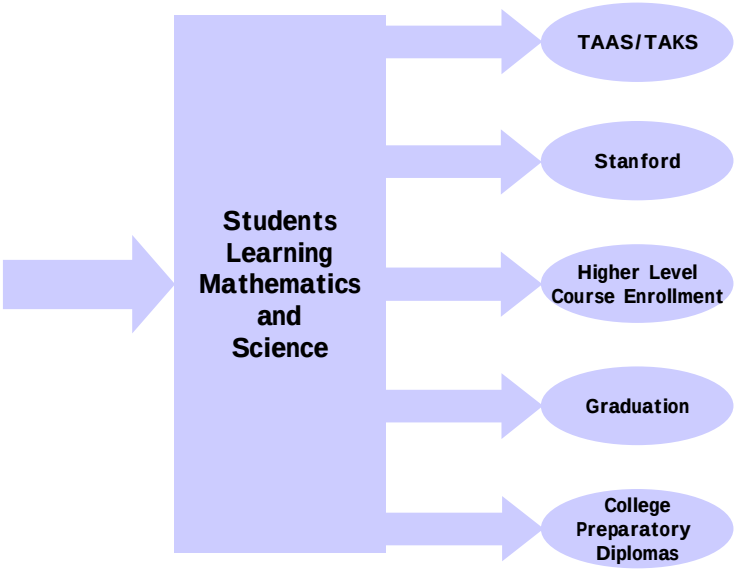

Figure 12: HU-LINC Performance Outcomes

TAAS/TAKS

The Texas Assessment of Academic Skills (TAAS) is a criterion-referenced test based on the state's curriculum. TAAS measures reading, writing, mathematics, science and social studies achievement. The Texas Assessment of Knowledge and Skills (TAKS) was initiated by the state of Texas in 2003 to replace TAAS. The TAKS is a more rigorous test that was designed to assess higher level skills in student academic performance.

Figure 13 presents the percentage of students passing the TAAS in 1999, the baseline year and in 2002, which was the final year TAAS was administered in Texas. The findings indicate an increase in passing rates on the TAAS mathematics and science subtests at all grade levels. The most substantial increase in mathematics was noted at grade 3 by 18 per-

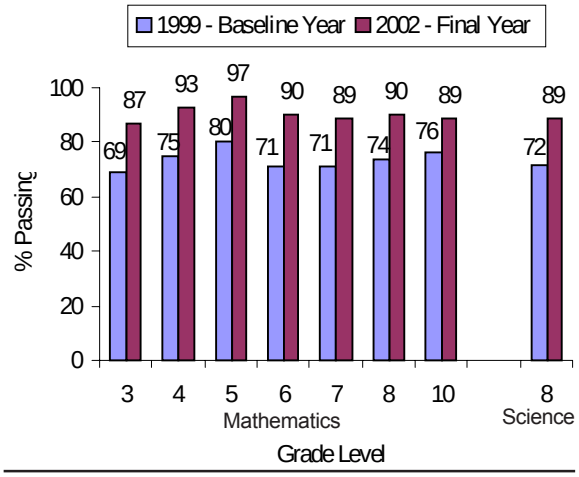

Figure 13: Percent Passing TAAS, 1999 & 2002

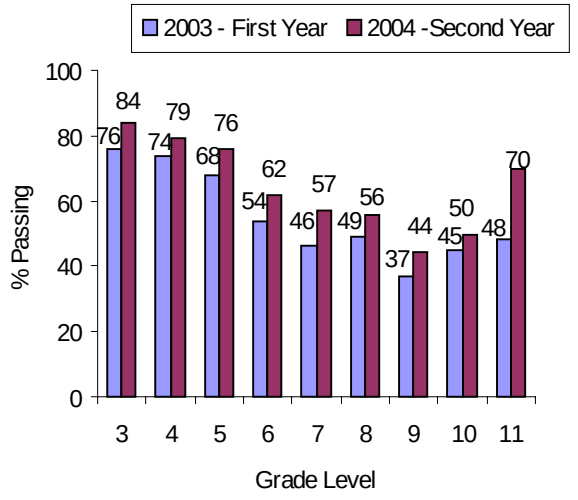

Figure 14: Percent Passing Math TAKS, 2003 and 2004

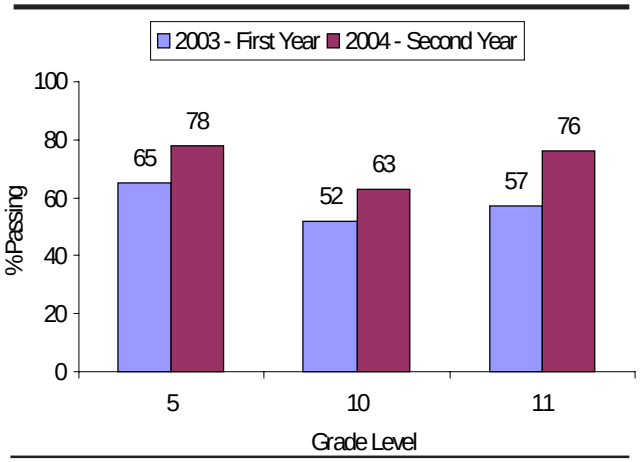

Figure 15: Percent Passing Science TAKS, 2003 and 2004

centage points. The increase in the eighth grade TAAS science passing rate was 17 percentage points higher.

Figure 14 presents the percentage of students passing TAKS mathematics in 2003, which was the first year of the test. Results for 2004 are also presented for comparison. Passing rate increases were evident at all grade levels ranging from five to 22 percentage points. The most significant gains were noted at grade 11 with 22 percentage points and grade 7 with nine points.

Figure 15 shows the percentage of students passing the TAKS science subtest. Grades 5, 10, and 11 had increases of 13, 11, and 19 percentage points, respectively.

Gap Analysis

The gaps between White and African American students on TAAS are depicted in **Table 18**. It is indicated that from baseline to 2002, the results reflect a decrease in the gaps at all levels (grades 3-8 and 10 in math and at grade 8 in science). Reductions in the gaps on the TAAS math subtest ranged from 20 percentage points at grade 4 to 10 percentage points at grade 10. On the TAAS science subtest, the reduction in the gap at grade 8 was by 15 percentage points. Table 18 also shows reductions in the gaps between White and African American students at grades 3-5, 7, 8 and 11 on the TAKS over the past two years. The reductions ranged from one to 20 percentage points. Also on the TAKS, reductions occurred on the science subtest at all grades tested. The reductions ranged from 3 to 20 percentage points.

Table 19 provides performance of White and Hispanic students. The findings were reductions in the gaps between White and Hispanic students at all grade levels on the TAAS mathematics and science subtest from baseline to 2002. The total gap in mathematics was reduced by 14 percentage points and by 15 percentage points in science. On TAKS, from 2003 to 2004, reductions occurred at grades 3-5, 7, 8, 10, and 11. There was a total gap reduction of 4 percentage points. On the TAKS science test, reductions were evident at the majority of grades tested. These results yielded a total reduction of 10 percentage points.

The gaps between males and females on TAAS in **Table 20** indicate reductions at all grade levels except third

Table 18: Districtwide Performance Gaps on TAAS/TAKS Mathematics and Science Tests, All Students Including Special Education, by Grade and Ethnicity, for White and African American,1999–2004

	TAAS -Baseline and Final Year							TAKS- First and Second Year						
Grade	White % Pass 1999	AfAm % Pass 1999	W/Af 1999 Gap	White % Pass 2002	AfAm % Pass 2002	W/Af 2002 Gap	99-02 Gap Diff	White % Pass 2003	AfAm % Pass 2003	W/Af 2003 Gap	White % Pass 2004	AfAm % Pass 2004	W/Af 2004 Gap	03-04 Gap Diff
Math														
3	89	57	**32**	95	81	**14**	**-18**	93	70	**23**	95	80	**15**	**-8**
4	93	66	**27**	96	89	**7**	**-20**	93	68	**25**	94	74	**20**	**-5**
5	94	75	**19**	99	96	**3**	**-16**	90	62	**28**	92	73	**19**	**-9**
6	91	67	**24**	95	88	**7**	**-17**	81	44	**37**	89	52	**37**	**0**
7	90	66	**24**	97	86	**11**	**-14**	78	39	**39**	85	47	**38**	**-1**
8	93	68	**25**	97	89	**8**	**-17**	80	42	**38**	84	48	**36**	**-2**
9								71	29	**42**	80	36	**44**	**2**
10	92	73	**19**	96	87	**9**	**-10**	79	40	**39**	80	38	**42**	**3**
11								77	37	**40**	95	75	**20**	**-20**
Total	92	67	**25**	96	88	**8**	**-17**	83	50	**33**	88	58	**30**	**-3**
Science														
5								83	41	**42**	89	57	**32**	**-10**
8	94	68	**26**	98	87	**11**	**-15**							
10								77	31	**46**	83	40	**43**	**-3**
11								79	37	**42**	96	74	**22**	**-20**
Total								80	37	**43**	89	56	**33**	**-10**

Table 19: Districtwide Performance Gaps on TAAS/TAKS Mathematics and Science Subtests All Students Including Special Education, for White and Hispanic by Grade Level and Ethnicity, 1999–2004

	TAAS -Baseline and Final Year							TAKS - First and Second Year						
Grade	White % Pass 1999	Hisp % Pass 1999	W/H 1999 Gap	White % Pass 2002	Hisp % Pass 2002	W/H 2002 Gap	03-04 Gap Diff	White % Pass 2003	Hisp % Pass 2003	W/H 2003 Gap	White % Pass 2004	Hisp % Pass 2004	W/H 2004 Gap	03-04 Gap Diff
Math														
3	89	71	**18**	95	85	**10**	**-8**	93	75	**18**	95	84	**11**	**-7**
4	93	75	**18**	96	94	**2**	**-16**	93	71	**22**	94	79	**15**	**-7**
5	94	79	**15**	99	97	**2**	**-13**	90	67	**23**	92	74	**18**	**-5**
6	91	70	**21**	95	92	**3**	**-18**	81	53	**28**	89	61	**28**	**0**
7	90	69	**21**	97	89	**8**	**-13**	78	42	**36**	85	55	**30**	**-6**
8	93	73	**20**	97	90	**7**	**-13**	80	45	**35**	84	54	**30**	**-5**
9								71	33	**38**	80	40	**40**	**+2**
10	92	71	**21**	96	87	**9**	**-12**	79	41	**38**	80	47	**33**	**-5**
11								77	40	**37**	95	76	**19**	**-18**
Total	92	73	**19**	96	91	**5**	**-14**	83	55	**28**	88	64	**24**	**-4**
Science														
5								83	37	**46**	89	54	**35**	**-11**
8	94	70	**24**	98	89	**9**	**-15**							
10								77	30	**47**	83	43	**40**	**-7**
11								79	35	**44**	96	70	**26**	**-18**
Total								80	35	**45**	89	54	**35**	**-10**

from baseline to 2002. However, there was an overall reduction in the gap of 2 percentage points. TAKS mathematics performance of students reflected reductions at most grade levels and no change at grades 4 and 11. Reductions ranged from 1 to 3 percentage points. TAKS science test results revealed increases of 2 and 3 percentage points in the gap at all grade levels tested.

Gaps between economically (ED) and non-economically disadvantaged (N-ED) students in **Table 21** on the TAAS mathematics test show decreases at all grade levels, ranging from 3 to 11 percentage points. An overall reduction in the gap was by 8 percentage points. The gap reduction on the TAAS science test was by 9 percentage points. TAKS performance of the subgroups indicated gap reductions at grade 11 in mathematics and grade 11 in science.

Stanford Achievement Test-Ninth and Tenth Editions

Stanford, which is a norm-referenced assessment provides the means of determining the relative standing of

Table 20: Districtwide Performance Gaps on TAAS/TAKS Mathematics and Science Subtests All Students Including Special Education by Grade Level and Gender, 1999–2004

	TAAS - Baseline and Final Year							TAKS - First and Second Year						
Grade	M % Pass 1999	F % Pass 1999	M/F 1999 Gap	M % Pass 2002	F % Pass 2002	M/F 2002 Gap	99-02 Gap Diff	M % Pass 2003	F % Pass 2003	M/F 2003 Gap	M % Pass 2004	F % Pass 2004	M/F 2004 Gap	03-04 Gap Diff
Math														
3	69	69	**0**	84	85	**1**	**+1**	77	74	**3**	84	84	**0**	**-3**
4	74	75	**1**	92	92	**0**	**-1**	73	72	**1**	80	79	**1**	**0**
5	79	81	**2**	96	97	**1**	**-1**	68	68	**0**	77	75	**2**	**+2**
6	69	74	**5**	89	91	**2**	**-3**	52	55	**3**	62	62	**0**	**-3**
7	69	74	**5**	88	90	**2**	**-3**	45	46	**1**	56	58	**2**	**+1**
8	73	75	**2**	91	90	**1**	**-1**	51	48	**3**	57	56	**1**	**-2**
9								36	39	**3**	43	45	**2**	**-1**
10	77	74	**3**	89	88	**1**	**-2**	47	47	**2**	50	51	**1**	**-1**
11								48	47	**1**	80	79	**1**	**0**
Total	72	74	**2**	90	90	**0**	**-2**	57	57	**1**	66	66	**0**	**-1**
Science														
5								46	42	**4**	63	56	**7**	**+3**
8	74	71	**3**	90	89	**1**	**-2**							
10								40	37	**3**	52	47	**5**	**+2**
11								46	44	**2**	79	74	**5**	**+3**
Total								44	41	**3**	63	58	**5**	**+2**

Table 21: Districtwide Performance Gaps on TAAS/TAKS Math, Science Tests All Students Including Special Education by Grade, Economically Disadvantaged (ED) and Non-Economically Disadvantaged (N-ED), 1999–2004

	TAAS - Baseline and Final Year							TAKS - First and Second Year						
Grade Math	ED % Pass 1999	N-ED % Pass 1999	E/N-ED 1999 Gap	ED % Pass 2002	N-ED % Pass 2002	E/N-ED 2002 Gap	99-02 Gap Diff	ED % Pass 2003	N-ED % Pass 2003	E/N-ED 2003 Gap	ED % Pass 2004	N-ED % Pass 2004	E/N-ED 2004 Gap	03-04 Gap Diff
3	58	80	**22**	82	93	**11**	**-11**	73	89	**11**	82	94	**12**	**+1**
4	69	84	**15**	91	96	**5**	**-10**	70	88	**13**	77	91	**14**	**+1**
5	77	89	**12**	96	98	**2**	**-10**	64	85	**15**	73	89	**16**	**+1**
6	67	80	**13**	89	95	**6**	**-7**	49	75	**23**	57	83	**26**	**+3**
7	66	78	**12**	87	95	**8**	**-4**	39	70	**26**	52	78	**26**	**0**
8	70	79	**9**	89	93	**4**	**-5**	43	70	**22**	51	75	**24**	**+2**
9								31	52	**18**	38	61	**23**	**+5**
10	70	78	**8**	86	91	**5**	**-3**	41	58	**14**	44	63	**19**	**+5**
11								40	57	**15**	75	87	**12**	**-3**
Total	68	81	**13**	89	94	**5**	**-8**	53	70	**12**	62	78	**16**	**+4**
Science														
5								38	73	**29**	55	82	**27**	**-2**
8	66	80	**14**	88	93	**5**	**-9**							
10								30	53	**20**	41	65	**24**	**+4**
11								35	57	**18**	70	85	**15**	**-3**
Total								35	60	**19**	54	76	**22**	**+3**

HISD students' academic performance when compared to the performance of students from a nationally representative sample. Stanford assesses student achievement in reading, mathematics, environment/science, and other core academic areas. The performance of students from the baseline year, 1999 to 2004 in mathematics and science as measured by Normal Curve Equivalents (NCEs) are presented. Administration of the Stanford - Ninth Edition, encompassing 1999–2001, utilized 1995 norms. In the spring of 2002, HISD student performance was based on 2000 norms for the first time. This process was continued for the 2003 administration. Finally, in 2004, Stanford-Tenth Edition was administered to HISD students, thus reflecting performance comparisons to a 2004 norming group. Although the norms changed over the six year period, differences were calculated from baseline to 2004 without adjustments.

Table 22 reveals Stanford average NCE scores in mathematics from 1999–2004 which reflect gains at all grade levels tested. The growth in mathematics ranged from 3 percentage points at grades 3 and 6 to 10 percentage points at grade 8. In science, growth was apparent at all grade levels, ranging from 2 percentage points at grade 3 to 9 percentage points at grade 11.

Table 22: Districtwide Stanford Math and Science Normal Curve Equivalents, All Students Including Special Education, 1999-2004

	Mathematics							Environment/Science						
Grade	Baseline NCE 1999	NCE 2001	NCE 2002	NCE 2003	NCE 2004	Diff 1999-2004		Grade	Baseline NCE 1999	NCE 2001	NCE 2002	NCE 2003	NCE 2004	Diff 1999-2004
1	46	51	50	51	53	**+7**		1	42	48	45	46	47	**+5**
2	47	52	50	51	54	**+7**		2	42	45	45	45	50	**+8**
3	52	55	52	51	55	**+3**		3	48	50	50	50	50	**+2**
4	51	55	53	53	56	**+5**		4	46	48	45	44	51	**+5**
5	50	54	53	52	57	**+7**		5	44	47	45	45	52	**+8**
6	47	51	49	49	50	**+3**		6	43	47	44	43	46	**+3**
7	42	45	46	46	51	**+9**		7	41	47	43	44	44	**+3**
8	42	43	41	43	52	**+10**		8	42	46	41	41	49	**+7**
9	45	46	44	45	51	**+6**		9	40	43	41	40	46	**+6**
10	44	46	45	43	50	**+6**		10	42	44	42	41	46	**+4**
11	44	48	47	46	51	**+7**		11	44	44	44	43	53	**+9**

Table 23: Districtwide Performance Gaps on Stanford Mathematics Test by Normal Curve Equivalents, Including Special Education, by Grade Level and Ethnicity, for White and African American, 1999–2004

	Stanford 9- 1995 Norms							Stanford 9- 2000 Norms							Stanford 10- 2004			
Grd	Wh NCE 1999	AfAm NCE 1999	Gap	Wh NCE 2001	AfAm NCE 2001	Gap	99-01 Gap Diff	Wh NCE 2002	AfAm NCE 2002	Gap	Wh NCE 2003	AfAm NCE 2003	Gap	02-03 Gap Diff	Wh NCE 2004	AfAm NCE 2004	Gap	1999-2004 Gap Diff
1	61	42	**19**	63	48	**15**	**-4**	59	48	**11**	61	48	**13**	**+2**	64	50	**14**	**-5**
2	62	41	**21**	67	47	**20**	**-1**	63	45	**18**	64	46	**18**	**0**	65	49	**16**	**-5**
3	67	48	**19**	68	51	**17**	**-2**	64	48	**16**	63	47	**16**	**0**	68	51	**17**	**-2**
4	67	46	**21**	69	50	**19**	**-2**	66	48	**18**	67	48	**19**	**+1**	69	51	**18**	**-3**
5	65	45	**20**	67	50	**17**	**-3**	65	49	**16**	67	48	**19**	**+3**	71	53	**18**	**-2**
6	66	44	**22**	69	47	**22**	**0**	64	46	**18**	64	45	**19**	**+1**	66	46	**20**	**-2**
7	62	39	**23**	62	41	**21**	**-2**	63	42	**21**	62	44	**18**	**-3**	67	47	**20**	**-3**
8	61	39	**22**	63	39	**24**	**2**	57	39	**18**	59	39	**20**	**+2**	67	49	**18**	**-3**
9	65	40	**25**	65	42	**23**	**-2**	62	41	**21**	61	41	**20**	**-1**	66	48	**18**	**-7**
10	64	39	**25**	66	40	**26**	**+1**	61	39	**22**	60	38	**22**	**0**	66	45	**21**	**-4**
11	62	38	**24**	68	41	**27**	**+3**	65	40	**25**	64	39	**25**	**0**	69	45	**24**	**0**

Stanford Gap Analysis

Gap differences between African American and White students along with Hispanic and White students in mathematics and science are provided in **Tables 23** and **24**. Stanford 9 mathematics gap differences between Whites and African Americans were reduced in the majority of grade levels between baseline, 1999 and 2001. Due to new norming standards used in 2002 for Stanford 9, the gap differences between White and African American students were reduced in two grade levels, remained unchanged in four grade levels, and increased in five grade levels (Table 23). The gaps between these groups ranged from 14 to 20 NCEs in 2004 on Stanford 10, which was the first year for this test in HISD. In addition, from 1999 to 2004, there was an overall reduction in the gaps between White and African American students at all grade levels except eleventh grade, which remained constant.

Stanford 9 mathematics gap differences between White and Hispanic students were reduced in eight of the eleven grade levels between 1999 and 2001. Again, due to change in norming standards used in 2002, gap differences between White and Hispanic students were reduced in three grade levels, stayed constant in four grade levels, and increased in four grade levels (Table 24). In 2004, the first administration of Stanford 10 in HISD, gaps between these subgroups ranged from 12 to 21 NCEs. From 1999 to 2004, there was an overall reduction in the gap between White and Hispanic students at all grade levels ranging from 1 to 3 NCEs.

Differences in performance based on gender and economic status are depicted in **Tables 25** and **26,** respectively. Stanford 9 mathematics gap differences between males and females as well as between economically disadvantaged (ED) and non-economically disadvantaged (N-ED) students decreased or remained unchanged in the majority of grade levels between 1999 and 2001 as well as between 2002 and 2003. On Stanford 10, the differences in performance between males and females ranged from 0 to 2 NCEs, while the differences

Table 24: Districtwide Performance Gaps on Stanford Mathematics Test by Normal Curve Equivalents, Grade Level, Including Special Education, and Ethnicity for White and Hispanic, 1999–2004

	Stanford 9-1995 Norms							Stanford 9- 2000 Norms							Stanford 10- 2004			
Grd	Wh NCE 1999	Hisp NCE 1999	1999 Gap	Wh NCE 2001	Hisp NCE 2001	2001 Gap	99-01 Gap Diff	Wh NCE 2002	Hisp NCE 2002	2002 Gap	Wh NCE 2003	Hisp NCE 2003	2003 Gap	02-03 Gap Diff	Wh NCE 2004	Hisp NCE 2004	2004 Gap	1999-2004 Gap Diff
1	61	45	**16**	63	49	**14**	**-2**	59	49	**10**	61	49	**12**	**+2**	64	51	**13**	**-3**
2	62	46	**16**	67	51	**16**	**0**	63	50	**13**	64	51	**13**	**0**	65	53	**12**	**-4**
3	67	51	**16**	68	53	**15**	**-1**	64	51	**13**	63	50	**13**	**0**	68	55	**13**	**-3**
4	67	51	**16**	69	55	**14**	**-2**	66	53	**13**	67	52	**15**	**+2**	69	56	**13**	**-3**
5	65	48	**17**	67	53	**14**	**-3**	65	52	**13**	67	51	**16**	**+3**	71	56	**15**	**-2**
6	66	45	**21**	69	49	**20**	**-1**	64	47	**17**	64	48	**16**	**-1**	66	49	**17**	**-4**
7	62	39	**23**	62	43	**19**	**-4**	63	44	**19**	62	44	**18**	**-1**	67	50	**17**	**-5**
8	61	39	**22**	63	41	**22**	**0**	57	39	**18**	59	40	**19**	**+1**	67	49	**18**	**-3**
9	65	43	**22**	65	44	**21**	**-1**	62	43	**19**	61	43	**18**	**-1**	66	49	**17**	**-5**
10	64	40	**24**	66	43	**23**	**-1**	61	42	**19**	60	41	**19**	**0**	66	47	**19**	**-5**
11	62	40	**22**	68	43	**25**	**3**	65	43	**22**	64	42	**22**	**0**	69	48	**21**	**-1**

Table 25: Districtwide Performance Gaps on Stanford Mathematics Test by Normal Curve Equivalents, Grade Level, Including Special Education, and Gender, 1999-2004

	Stanford 9- 1995 Norms							Stanford 9- 2000 Norms							Stanford 10- 2004			
Grd	M NCE 1999	F NCE 1999	Gap	M NCE 2001	F NCE 2001	Gap	99-01 Gap Diff	M NCE 2002	F NCE 2002	Gap	M NCE 2003	F NCE 2003	Gap	02-03 Gap Diff	M NCE 2004	F NCE 2004	Gap	1999-2004 Gap Diff
1	45	46	1	51	51	0	-1	51	50	1	50	52	2	+1	53	54	1	0
2	46	47	1	52	52	0	-1	50	50	0	51	51	0	0	53	54	1	0
3	51	54	3	54	55	1	-2	52	52	0	50	51	1	+1	55	56	1	-2
4	50	52	2	54	56	2	0	53	53	0	52	53	1	+1	55	56	1	-1
5	49	50	1	54	55	1	0	54	52	2	52	53	1	-1	56	57	1	0
6	46	49	3	50	53	3	0	50	48	2	49	50	1	-1	49	51	2	-1
7	42	43	1	44	45	1	0	46	45	1	46	47	1	0	51	52	1	0
8	42	42	0	43	43	0	0	41	41	0	43	42	1	+1	51	52	1	+1
9	44	46	2	46	46	0	-2	45	44	1	44	45	1	0	51	51	0	-2
10	45	44	1	47	46	1	0	44	46	2	44	43	1	-1	49	50	1	0
11	45	43	2	49	47	2	0	46	48	2	47	45	2	0	52	50	2	0

Table 26: Districtwide Performance Gaps on Stanford Mathematics Test by Normal Curve Equivalents, Grade Level, Including Special Education, and Economic Status, 1999–2004

	Stanford 9- 1995 Norms							Stanford 9- 2000 Norms							Stanford 10- 2004			
Grd	ED NCE 1999	N-ED NCE 1999	Gap	ED NCE 2001	N-ED NCE 2001	Gap	99-01 Gap Diff	ED NCE 2002	N-ED NCE 2002	Gap	ED NCE 2003	N-ED NCE 2003	Gap	02-03 Gap Diff	ED NCE 2004	N-ED NCE 2004	Gap	1999-2004 Gap Diff
1	42	55	13	47	60	13	0	48	56	8	48	57	9	+1	51	60	9	-3
2	43	56	13	47	64	17	+4	47	58	11	48	59	11	0	51	61	10	-4
3	48	62	14	51	64	13	-1	49	60	11	48	59	11	0	53	64	11	-3
4	48	61	13	52	65	13	0	50	62	12	50	62	12	0	54	64	10	-3
5	46	59	13	51	64	13	0	51	61	10	50	61	11	+1	55	66	11	-2
6	44	57	13	48	61	13	0	47	58	11	47	57	10	-1	48	59	11	-4
7	39	50	11	41	53	12	+1	43	55	12	44	55	11	-1	49	60	11	-5
8	38	49	11	40	51	11	0	39	49	10	40	51	11	+1	49	60	11	-3
9	41	49	8	43	51	8	0	42	51	9	42	50	8	-1	49	57	8	-5
10	39	48	9	41	51	10	+1	41	50	9	40	49	9	0	46	56	10	-5
11	38	47	9	42	53	11	+2	41	53	12	41	52	11	-1	47	58	11	-1

Table 27: Districtwide Performance Gaps on Stanford Environmental/Science Test by Normal Curve Equivalents, Grade Level, Including Special Education, and Ethnicity for White and African American, 1999–2004

	Stanford 9- 1995 Norms							Stanford 9- 2000 Norms							Stanford 10- 2004			
Grd	Wh NCE 1999	AfAm NCE 1999	Gap	Wh NCE 2001	AfAm NCE 2001	Gap	99-01 Gap Diff	Wh NCE 2002	AfAm NCE 2002	Gap	Wh NCE 2003	AfAm NCE 2003	Gap	02-03 Gap Diff	Wh NCE 2004	AfAm NCE 2004	Gap	1999-2004 Gap Diff
1	60	37	23	62	45	17	-6	60	42	18	62	43	19	+1	61	45	16	-7
2	59	38	21	62	40	22	+1	61	40	21	62	40	22	+1	63	46	17	-4
3	65	42	23	68	45	23	0	67	45	22	67	46	21	-1	68	46	22	-1
4	64	41	23	63	44	19	-4	60	40	20	62	41	21	+1	68	47	21	-2
5	61	39	22	64	43	21	-1	63	41	22	64	42	22	0	69	49	20	-2
6	65	40	25	68	44	24	-1	65	40	25	63	40	23	-2	67	42	25	0
7	61	37	24	66	43	23	-1	64	39	25	64	40	24	-1	64	40	24	0
8	65	38	27	68	42	26	-1	61	38	23	62	38	24	+1	66	45	21	-6
9	61	36	25	59	40	19	-6	58	38	20	57	37	20	0	65	43	22	-3
10	61	37	24	63	39	24	0	60	38	22	60	37	23	+1	64	40	24	0
11	62	39	23	65	39	26	+3	63	37	26	62	37	25	+1	71	48	23	0

between economically disadvantaged and non-economically disadvantaged students ranged from 8 to 11 NCEs. In addition, from 1999 to 2004, at the majority of grade levels, there were no gaps between males and females in mathematics. All gaps were reduced between economically disadvantaged and non-economically disadvantaged students.

The results of the Stanford Environment/Science for African American and White students and Hispanic and

Table 28: Districtwide Performance Gaps on Stanford Environmental/Science Test by Normal Curve Equivalents, Grade Level, Including Special Education, and Ethnicity for White and Hispanic, 1999–2004

	Stanford 9- 1995 Norms							Stanford 9- 2000 Norms							Stanford 10			
Grd	Wh NCE 1999	Hisp NCE 1999	Gap	Wh NCE 2001	Hisp NCE 2001	Gap	99-01 Gap Diff	Wh NCE 2002	Hisp NCE 2002	Gap	Wh NCE 2003	Hisp NCE 2003	Gap	02-03 Gap Diff	Wh NCE 2004	Hisp NCE 2004	Gap	1999-2004 Gap Diff
1	60	40	**20**	62	46	**16**	**-4**	60	43	**17**	62	43	**19**	**+2**	61	45	**16**	**-4**
2	59	41	**18**	62	44	**18**	**0**	61	44	**17**	62	44	**18**	**+1**	63	48	**15**	**-3**
3	65	46	**19**	68	49	**19**	**0**	67	49	**18**	67	49	**18**	**0**	68	48	**20**	**+1**
4	64	45	**19**	63	46	**17**	**-2**	60	43	**17**	62	42	**20**	**+3**	68	49	**19**	**0**
5	61	42	**19**	64	45	**19**	**0**	63	44	**19**	64	43	**21**	**+2**	69	50	**19**	**0**
6	65	41	**24**	68	45	**23**	**-1**	65	42	**23**	63	41	**22**	**-1**	67	44	**23**	**-1**
7	61	38	**23**	66	45	**21**	**-2**	64	41	**23**	64	42	**22**	**-1**	64	42	**22**	**-1**
8	65	40	**25**	68	44	**24**	**-1**	61	39	**22**	62	39	**23**	**+1**	66	47	**19**	**-6**
9	61	38	**23**	59	41	**18**	**-5**	58	39	**19**	57	38	**19**	**0**	65	44	**21**	**-2**
10	61	38	**23**	63	41	**22**	**-1**	60	38	**22**	60	38	**22**	**0**	64	43	**21**	**-2**
11	62	40	**22**	65	39	**26**	**+4**	63	39	**24**	62	38	**24**	**0**	71	50	**21**	**-1**

Table 29: Districtwide Performance Gaps on Stanford Environment/Science Test by Normal Curve Equivalents, Grade Level, Including Special Education, and Gender, 1999–2004

	Stanford 9- 1995 Norms							Stanford 9- 2000 Norms							Stanford 10- 2004			
Grd	M NCE 1999	F NCE 1999	Gap	M NCE 2001	F NCE 2001	Gap	99-01 Gap Diff	M NCE 2002	F NCE 2002	Gap	M NCE 2003	F NCE 2003	Gap	02-03 Gap Diff	M NCE 2004	F NCE 2004	Gap	1999-2004 Gap Diff
1	42	41	**1**	48	48	**0**	**-1**	46	45	**1**	45	46	**1**	**0**	46	48	**2**	**+1**
2	43	42	**1**	46	44	**2**	**+1**	44	46	**2**	46	44	**2**	**0**	50	49	**1**	**0**
3	48	48	**0**	50	50	**0**	**0**	49	50	**1**	51	50	**1**	**0**	50	50	**0**	**0**
4	46	46	**0**	48	48	**0**	**0**	44	45	**1**	45	44	**1**	**0**	52	50	**2**	**+2**
5	44	43	**1**	48	47	**1**	**0**	45	45	**0**	45	44	**1**	**+1**	52	51	**1**	**0**
6	43	44	**1**	47	48	**1**	**0**	44	43	**1**	43	43	**0**	**-1**	47	46	**1**	**0**
7	41	40	**1**	47	46	**1**	**0**	42	43	**1**	44	43	**1**	**0**	45	43	**2**	**+1**
8	43	42	**1**	46	46	**0**	**-1**	40	41	**1**	42	41	**1**	**0**	49	48	**1**	**0**
9	40	40	**0**	43	43	**0**	**0**	39	38	**1**	40	41	**1**	**0**	46	46	**0**	**0**
10	42	41	**1**	45	44	**1**	**0**	40	39	**1**	41	41	**0**	**-1**	47	44	**3**	**+2**
11	45	43	**2**	45	43	**2**	**0**	39	41	**2**	44	42	**2**	**0**	55	52	**3**	**+1**

Table 30: Districtwide Performance Gaps on Stanford Environmental/Science Test by Normal Curve Equivalents, by Grade Level, Including Special Education, and Economic Status, 1999-2004

	Stanford 9- 1995 Norms							Stanford 9- 2000 Norms							Stanford 10- 2004			
Grd	ED NCE 1999	N-ED NCE 1999	Gap	ED NCE 2001	N-ED NCE 2001	Gap	99-01 Gap Diff	ED NCE 2002	N-ED NCE 2002	Gap	ED NCE 2003	N-ED NCE 2003	Gap	02-03 Gap Diff	ED NCE 2004	N-ED NCE 2004	Gap	1999-2004 Gap Diff
1	37	52	**15**	44	58	**14**	**-1**	42	53	**11**	43	55	**12**	**+1**	44	55	**11**	**-4**
2	38	53	**15**	41	56	**15**	**0**	42	54	**12**	42	55	**13**	**+1**	47	57	**10**	**-5**
3	43	59	**16**	46	62	**16**	**0**	46	60	**14**	47	61	**14**	**0**	47	60	**13**	**-3**
4	42	57	**15**	44	58	**14**	**-1**	41	54	**13**	41	55	**14**	**+1**	48	61	**13**	**-2**
5	40	54	**14**	43	59	**16**	**+2**	42	56	**14**	42	57	**15**	**+1**	49	62	**13**	**-1**
6	40	54	**14**	43	59	**16**	**+2**	40	55	**15**	40	55	**15**	**0**	43	58	**15**	**+1**
7	37	48	**11**	43	56	**13**	**+2**	39	52	**13**	41	54	**13**	**0**	41	54	**13**	**+2**
8	38	50	**12**	42	55	**13**	**+1**	37	49	**12**	38	51	**13**	**+1**	46	58	**12**	**0**
9	36	45	**9**	40	48	**8**	**-1**	36	43	**7**	38	46	**8**	**+1**	43	53	**10**	**+1**
10	36	45	**9**	39	49	**10**	**+1**	35	46	**11**	37	48	**11**	**0**	42	53	**11**	**+2**
11	38	47	**9**	38	49	**11**	**+2**	34	46	**12**	37	50	**13**	**+1**	49	60	**11**	**+2**

White students are presented in **Tables 27 and 28**, respectively. Stanford 9 environmental/science gap differences between Whites and African Americans decreased in the majority of grade levels between 1999 and 2001. A change in norming standards used in 2002, resulted in the gap differences between these groups reduced in three grade levels, constant in two grade levels, and increased in six grade levels **(Table 27)**. From 1999 to 2004, gaps between White and African American students in science decreased or did not exist. Stanford 9 environmental/ science gap differences between White and Hispanic students showed reductions in seven of the eleven grade levels between 1999 and 2001. Again, a change in norms in 2002, resulted in gap differences between White and

Hispanic students reduced in two grade levels, unchanged in four grade levels, and increased in five grade levels **(Table 28)**.

NCE differences on the Environment/Science subtest relative to gender and economic status are found in **Tables 29** and **30**, respectively. Stanford 9 environmental/science gap differences between male and female students remained unchanged in the majority of grade levels between 1999 and 2001 as well as between 2002 and 2003 (Table 34). Based on 2004 Stanford 10 results, the gaps differences of males and females ranged from 0 to 3 NCEs. From 1999 to 2004, the gaps between males and females did not exist at the majority of grade levels. Gap differences between economically disadvantaged (ED) and non-economically disadvantaged (N-ED) students increased in the majority of grade levels tested from 1999 to 2001 (Table 35). Similar findings were apparent from 2002 to 2003 as norming standards changed for Stanford 9. Stanford 10 results in 2004 indicate gap differences of 10 to 15 NCEs between economically disadvantaged and non-economically disadvantaged groups. From 1999 to 2004, the gaps between economically disadvantaged and non-economically disadvantaged students were reduced at five grade levels, did not change at one grade level, and increased at five grade levels.

Course Enrollment and Completion

Course enrollment and completion findings are presented in **Table 31**. The enrollment figures and completion rates are depicted for students who are taking the specified courses in the corresponding academic years. The number of students eligible to complete the courses consist of those enrolled in the final semester (most mathematics and science courses require more than one semester). Overall, from 1999–2003, enrollment in mathematics courses increased by 3,290 students, and in science by 6,317 students. Although the overall completion rate in mathematics courses was stable over the past five years, the completion rates increased in Calculus and Statistics by 1 and 7 percentage points, respectively. In addition, the overall completion rate in science courses increased by 2 percentage points as a result of increases in completion rates for Biology, Physics, and Integrated Physics/Chemistry.

Tables 32 and **33** present the course enrollment by ethnicity from 1999-2000 to 2003-04. Total student enrollment in higher-level mathematics courses increased for Asian, Hispanic, Native American, and White students in mathematics courses (Table 32) and for all student ethnic groups in science courses (Table 33). African American and Hispanic total enrollment indicated a decrease in Algebra I, increases were noted in Algebra II, Geometry, Calculus, and Statistics.

Table 31: Enrollment and Completion Rates of HISD Students in Advanced Academic Mathematics and Science

	1999–00			2000-01			2001–02			2002–03			2003–04			1999-2004	
	Enroll N	Elig to Comp N	Comp Rate %	Enroll N	Elig to Comp N	Comp Rate %	Enroll N	Elig to Comp N	Comp Rate %	Enroll N	Elig to Comp N	Comp Rate %	Enroll N	Elig to Comp N	Comp Rate %	Enroll Diff N	Comp Rate Diff %
Math																	
Algebra I	19,652	15,420	74	17,224	11,009	67	18,397	12,818	76	18,253	13,585	76	17,462	14,035	74	-2,190	0
Algebra II	8,654	7,353	88	7,968	6,707	79	9,462	7,167	89	11,338	9,604	86	11,001	8,610	87	+2,347	-1
Geometry	12,564	10,533	83	12,542	10,420	73	13,332	11,066	83	13,002	10,631	81	15,009	12,058	81	+2,445	-2
Calculus	3,775	3,775	89	3,673	3,673	87	3,806	3,806	89	4,268	4,268	87	4,267	3,692	96	+492	+7
Statistics	128	128	98	213	213	97	231	231	90	284	284	88	324	285	99	+196	+1
Total	44,773	37,209	81	41,620	32,022	74	45,228	35,088	82	47,145	38,372	81	48,063	35,790	81	+3,290	0
Algebra 8th grade	1,239	1,157	96	1,081	1,037	95	1,110	1,061	97	1,264	1,184	98	1,362	1,099	95	123	-1
Science																	
Biology	15,352	13,257	75	14,223	11,794	68	15,244	13,317	80	15,826	13,596	78	15,328	12,352	78	-24	+3
Chem	6,972	6,229	88	8,024	7,203	90	9,171	8,202	88	10,764	9,531	87	11,378	9,319	86	+4,406	-2
Physics	2,460	2,460	93	2,368	2,368	89	2,311	2,311	93	2,754	2,416	96	2,862	2,457	96	+402	+3
Integrated Phys/Chem	16,353	14,095	77	17,504	15,340	66	16,812	14,609	77	15,988	13,229	79	17,886	14,578	78	+1,533	+1
Total	41,137	36,041	79	42,119	36,705	73	43,538	38,439	72	45,332	38,772	82	47,454	38,706	81	+6,317	+2

Table 32: Student Enrollment in Higher Level Mathematics and Science Courses by Ethnicity, 1998-1999 through 2003-04

	Asian						African American						Hispanic					
	99-00 N	00-01 N	01-02 N	02-03 N	03-04 N	99-04 Diff N	99-00 N	00-01 N	01-02 N	02-03 N	03-04 N	99-04 Diff N	99-00 N	00-01 N	01-02 N	02-03 N	03-04 N	99-04 Diff N
Math																		
Alg I	492	449	512	501	521	+29	6,751	5,596	5,734	5,458	5,303	-293	10,624	9,381	10,485	10,555	10,054	-570
Alg II	418	402	440	469	462	+44	3,080	2,849	3,125	3,366	3,515	+435	3,812	3,335	4,423	5,966	5,543	+1,731
Geom	456	440	431	455	481	+25	4,575	4,225	4,343	4,311	4,702	+127	5,977	6,233	6,878	6,721	8,174	+2,197
Calc	525	496	529	541	513	-12	930	936	938	977	960	+30	1,234	1,272	1,356	1,615	1711	+477
Stats	52	80	89	83	92	+40	5	10	7	19	37	+27	16	32	35	64	50	+34
Total	**1,943**	**1,867**	**2,001**	**2,049**	**2,069**	**+126**	**15,341**	**13,616**	**14,147**	**14,131**	**14,517**	**-824**	**21,663**	**20,253**	**23,177**	**24,921**	**25,532**	**+3,869**
Science																		
Biology	513	565	594	623	594	+81	5,653	5,371	4,472	5,085	4,992	-661	7,540	7,650	7,318	7,697	7,959	+419
Chem	429	409	437	445	519	+90	2,600	2,482	2,860	3,015	3,683	+1,083	3,230	2,930	3,475	4,262	5,739	+2,509
Physics	248	301	258	269	285	+37	655	659	625	584	774	+119	748	822	832	796	1,119	+371
Integ Physics/ Chem	479	497	471	518	588	-479	5,625	5,556	5,978	5,405	5,608	-17	8,828	8,664	9,184	9,220	9,999	+1,171
Total	**1,669**	**1,772**	**1,760**	**1,885**	**1986**	**+317**	**14,533**	**14,068**	**13,935**	**14,089**	**15,057**	**+524**	**20,346**	**20,066**	**20,809**	**21,975**	**24,816**	**+4,470**
Alg 8th Grd	154	146	116	169	194	+20	333	303	261	243	254	-79	608	464	402	417	528	-80

Table 33: Student Enrollment in Higher Level Mathematics and Science Courses by Ethnicity, 1998–1999 through 2003–04

	Native American						White					
	99-00 N	00-01 N	01-02 N	02-03 N	03-04 N	99–04 Diff N	99-00 N	00-01 N	01-02 N	02-03 N	03-04 N	99–04 Diff N
Math												
Algebra I	8	6	13	15	9	+1	1,777	1,792	1,653	1,724	1,575	-202
Algebra II	5	2	3	5	8	+3	1,339	1,380	1,471	1,532	1,473	+134
Geometry	5	5	7	6	11	+6	1,551	1,639	1,673	1,509	1,641	+90
Calculus	3	3	2	5	3	0	1,083	966	981	1,130	1,080	-3
Statistics	-	-	-	-	-	-	55	91	100	118	145	+90
Total	**21**	**16**	**25**	**31**	**31**	**+10**	**5,805**	**5,868**	**5,878**	**6,013**	**5,914**	**+109**
Science												
Biology	9	6	4	11	10	+1	1,757	1,833	1,835	1,772	1,773	+16
Chemistry	1	4	6	4	7	+6	1,150	1,248	1,443	1,484	1,430	+280
Physics	2	1	1	3	2	0	676	652	661	718	682	+6
Integrated Physics/ Chemistry	10	6	12	10	11	+1	1,626	1,865	1,657	1,588	1,680	+54
Total	**22**	**17**	**23**	**28**	**30**	**+8**	**5,209**	**5,598**	**5,596**	**5,562**	**5,565**	**+356**
Algebra 8th Grd	1	1	3	2	2	+1	325	300	278	375	384	+59

Graduation

Graduation results are based on the number and percentage of students who completed the required courses and earning the credits necessary to meet state and HISD requirements. **Table 34** presents graduation rates by ethnicity, gender, economic status and for special education and regular education subgroups. The graduation rates by ethnicity, gender, economic status, and instructional program increased from 1998-99 to 2002-03. Among ethnic groups, the highest increase in graduation rate was by African American and Hispanic students (29 and 28 percentage points, respectively). Males had a moderately higher graduation rate than females (30 vs. 21 percentage points). In addition, economically disadvantaged students showed an increase in graduation rate by

Table 34: Graduation Rates by Ethnicity, Gender, Economic Status, and Instructional Program, 1998–1999 through 2002–2003

	1998–1999			2000–2001			2001–2002			2002–2003			1998-2003 Rate Diff
	12th Enroll	Grad	Rate	12th Enroll	Grad	Rate	12th Enroll	Grad	Rate	12th Enroll	Grad	Rate	
Ethn													
Afri Am	3,938	2,746	70	2,677	2,609	98	2,582	2,754	*106	2,757	2,731	99	+29
Hisp	4,234	3,094	73	3,671	3,483	95	3,514	3,554	*101	3,862	3,907	*101	+28
White	1,299	1,144	88	1,228	1,173	96	1,279	1,252	98	1,322	1,291	98	+10
Asian	360	311	86	365	365	100	375	380	*101	415	417	*100	+14
Nat Am	7	4	57	3	2	67	6	5	83	6	4	67	+10
Gend													
Male	4,818	3,299	69	4,190	3,509	84	3,529	3,557	*101	3,977	3,925	99	+30
Female	5,020	4,000	80	3,754	4,123	*110	4,227	4,388	*104	4,385	4,425	*101	+21
Eco Status													
EcoDis	3,035	1,907	63	3,940	3,127	79	4,124	3,522	85	4,652	3,745	81	+18
Not EcoDis	6,803	5,392	79	4,004	4,505	*113	3,632	4,423	*122	3,710	4,605	*124	+45
Instr'l Prog													
Reg	9,007	6,670	74	7,113	7,016	99	6,973	7,318	*105	7,514	7,669	*102	+28
SpecEd	831	629	76	831	616	74	783	627	80	848	681	80	+4
Total	9,838	7,299	74	7,944	7,632	96	7,756	7,945	*102	8,362	8,350	*100	+26

* Graduates and 12th grade enrollment obtained form separate files

18 percentage points, while non-economically disadvantaged students had an increase of 45 percentage points in graduation rate.

College Preparatory Degrees

Students in HISD can earn high school diplomas with different course requirements. Students graduating with Distinguished Achievement or Recommended diplomas have completed higher level academic courses, including advanced mathematics and science courses. Students earning these diplomas demonstrated that they are prepared for college-level studies. **Figure 16** presents graduates by diploma type and **Figure 17** compares students identified as Texas Scholars based on meeting requirements for Recommended or Distinguished diplomas from 1999–2003.

Overall, Figure 5 shows a steady increase in the number of graduates earning the Recommended diploma (1,757 in 1999 to 6,319 in 2003), while there was a considerable decrease in the number of graduates earning the Regular/Minimum diploma (5,084 in 1999 to 1,790 in 2003). The number of students earning Special Education diplomas decreased from 156 to 69 students over the five year period.

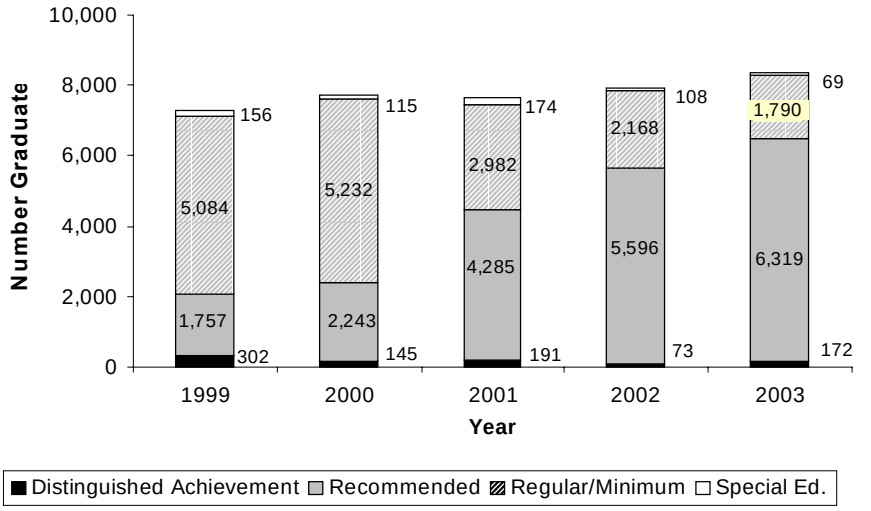

Figure 16: Graduates by Diploma Types, 1999-2003

Figure 17 indicates an increase in students identified as Texas Scholars compared to all graduates in the district. There was a decline in the total HISD graduates as the number of

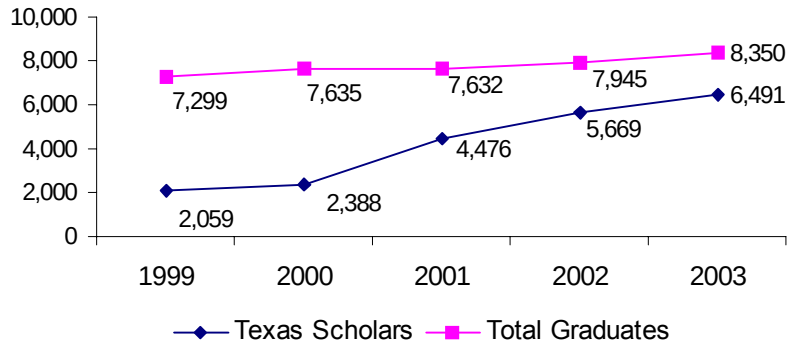

Figure 17: Texas Scholars (College Prep. Program) vs. Total HISD Graduates,1999- 2003

Texas Scholars increased. As the number of Texas Scholars increased, the difference of 5,240 total graduates and Texas Scholars in 1999 diminished to a difference of 1,931 total graduates and Texas Scholars in 2003.

Table 35 presents the types of diplomas earned by subgroups. There was an increase in the number of students in all ethnic groups who earned a college preparatory degree from 1999 to 2003. Nearly 41% of college preparatory degrees were earned by Hispanic students and 35.9% were earned by African American students.

Table 35: College Preparatory Diploma Earned by Ethnicity, 1998–1999 through 2002–03

Class	Diploma Types		Native American	Asian	African American	Hispanic	White	Total
1999	Distinguished Achievement	Count	0	37	66	54	145	302
		%	0.0	12.3	21.9	17.9	48.0	100.0
	Recommended	Count	2	152	477	697	429	1,757
		%	0.1	8.7	27.1	39.7	24.4	100.0
	HISD Total	**Count**	**1**	**189**	**543**	**751**	**574**	**2,059**
		%	0.0	9.2	26.4	36.5	27.9	100.0
2000	Distinguished Achievement	Count	0	18	57	38	32	145
		%	0.0	12.4	39.3	26.2	22.1	100.0
	Recommended	Count	2	216	514	916	595	2,243
		%	0.1	9.6	22.9	40.8	26.5	100.0
	HISD Total	**Count**	**2**	**234**	**571**	**54**	**627**	**2,388**
		%	0.1	9.8	23.9	39.9	26.3	100.0
2001	Distinguished Achievement	Count	1	35	37	30	88	191
		%	0.5	18.3	19.4	15.7	46.1	100.0
	Recommended	Count	1	251	1,457	1,802	774	4,285
		%	0.0	5.9	34.0	42.1	18.1	100.0
	HISD Total	**Count**	**2**	**286**	**1,494**	**1,834**	**860**	**4,476**
		%	0.0	6.4	33.4	41.0	19.2	100.0
2002	Distinguished Achievement	Count	0	8	28	15	22	73
		%	0.0	11.0	38.4	20.5	30.1	100.0
	Recommended	Count	5	312	2,007	2,292	980	5,596
		%	0.1	5.6	35.9	41.0	17.7	100.0
	HISD Total	**Count**	**5**	**320**	**2,035**	**2,307**	**1,002**	**5,669**
		%	**0.1**	**5.6**	**35.9**	**40.7**	**17.7**	**100.0**
2003	Distinguished Achievement	Count	0	38	28	30	76	172
		%	0.0	22.1	16.3	17.4	44.2	100.0
	Recommended	Count	3	334	2,065	2,894	1,023	6,319
		%	0.0	5.3	32.7	45.8	16.2	100.0
	HISD Total	**Count**	**3**	**372**	**2,093**	**2,924**	**1,099**	**6,491**
		%	**0.0**	**5.8**	**32.6**	**45.5**	**17.0**	**100.0**

The outstanding progress made with developing and implementing standards-based curriculum; systemic and sustained professional development; policy changes addressing more demanding standards, programs and graduation requirements; leveraging of internal and external resources; and collaboration with the HU-LINC Coalitions and partnerships, have each contributed to increased teacher preparation, better teaching and learning that impacts overall student achievement in mathematics and science.