

Committee on K-12

Meeting

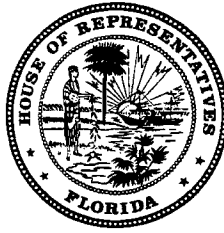
Tuesday, January 23, 2007

1:00 — 4:00 p.m.

212 Knott Building

**Marco Rubio
Speaker**

**Anitere Flores
Chair**



Florida House of Representatives

Marco Rubio

Speaker

Committee on K-12

Anitere Flores, Chair

Representative Gary Aubuchon

Representative Dorothy Bendross-Mindigall

Representative Will Kendrick

Marti Coley, Vice Chair

Representative Curtis Richardson

Representative Garrett Richter

Representative Shelley Vana

AGENDA

January 23, 2007

- I. Call to Order**
- II. Roll Call**
- III. Comments, Chair Flores**
- IV. Presentation, Dr. Norman Thagard**
 - **Associate Dean for College Relations & Professor of Electrical and Computer Engineering, Florida State University**
- V. Global Competitiveness, Dr. Cheri Pierson Yecke**
 - **Chancellor, K-12 Public Schools, Florida Department of Education**
- VI. Presentation, Deborah Leach-Scampavia**
 - **Education and Outreach Administrator, Scripps Florida**
- VII. Barriers to Creating Great Standards, Chair Flores**
- VIII. Discussion of Key Reports**
 - **Koret Task Force - Vice Chair Coley**
 - **Achieve - Representative Richter**
 - **Fordham Foundation - Representative Kendrick**
 - **College Board - Chair Flores**

IX. Florida's New Standards

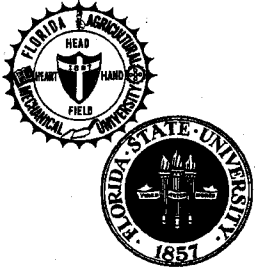
- **Reading – Barbara Elzie, Deputy Director, Just Read, Florida!**
- **Language Arts – Kate Kemker, Bureau Chief for Instruction and Innovation, Florida Department of Education**
- **Math – Mary Jane Tappen, Deputy Chancellor, K-12 Student Achievement**

X. Issues and Solutions

- **Major Areas of Interest - Mary Jane Tappen**
- **Linking Education to a Global Economy – Dr. Frank Fuller, Assistant Superintendent, Okaloosa County School District**
- **Professional Development- Pam Smith, Deputy Chancellor, K-12 Curriculum and Instruction**
- **Educational Resources - Kate Kemker**

XI. Next Steps, Kate Kemker

XII. Adjournment



Florida A&M University - Florida State University
COLLEGE OF ENGINEERING

2525 Pottsdamer Street
Tallahassee FL 32310-6046
(850) 410-6432
FAX (850) 410-6486
E-mail: nthagard@eng.fsu.edu
October 6, 2002

Biographical Data

Name: Norman E. Thagard, M.D.
Associate Dean for College Relations
Professor of Electrical Engineering
Bernard F. Sliger Eminent Scholar Chair
NASA Astronaut (retired)



Birthplace and Date: Born July 3, 1943, in Marianna, Florida, but considers Jacksonville, Florida, to be his hometown. His father is deceased; his mother, Mrs. Mary F. Nicholson, is a resident of St. Petersburg, Florida.

Education: 1961, Valedictorian, Paxon High School, Jacksonville, Florida; attended Florida State University, receiving bachelor and master of science degrees in engineering science in 1965 and 1966, respectively. 1971-2, additional graduate work in engineering science as well as pre-med course work; 1977, received a doctor of medicine degree from the University of Texas Southwestern Medical School. Currently enrolled in the University of Florida's Executive MBA program with graduation in April 2007.

Marital Status: Married to the former Rex Kirby Johnson of South Ponte Vedra Beach, Florida.

Children: Norman Gordon, May 15, 1968; James Robert, November 29, 1970; Daniel Cary, November 22, 1979. **Grandchildren:** Kaylee Rex, September 6, 2000; Ethan Charles, July 16, 2003, Hannah Ruth, December 20, 2004.

Recreational Interests: During his free time, he enjoys classical music and electronic design. Dr. Thagard has published a number of articles on digital and analog electronic design.

Organizations: Associate Fellow, AIAA (American Institute of Aeronautics and Astronautics). Member, Institute of Electrical and Electronics Engineers, Aerospace Medical Association, Association of Space Explorers, Society for Human Performance in Extreme Environments, and the Marine Corps

League. Secretary of the Executive Board of the Economic Club of Florida, the Tallahassee Symphony Orchestra Board, (Florida State) University Center Club Board of Governors, Mary Brogan Museum of Arts and Science Board, Vice Chairman (Education)-elect of the Astronaut Scholarship Foundation, and past chairman of the Education Committee Chairman of the Astronaut Memorial Foundation (AMF) Executive Board. Currently, a trustee of the AMF, Past member of the Space Studies Board of the **National Academy of Sciences** and the Explorers Club

Special Honors: Inducted into the **Astronaut Hall of Fame** (2004); Who's Who In America; Who's Who In Science and Engineering; elected Honorary Member, Phi Theta Kappa International Honor Society (2002); Erskine Visiting Fellow, University of Canterbury, Christchurch, N.Z., (2001); designated Honorary Conch and Citizen of the Florida Keys (2000); **Guest conductor** of the Tallahassee Symphony Orchestra (1999); participated in the 1998 **Tournament of Roses Parade** in Pasadena, California on an award-winning float ("Best Animation"); admitted to FSU's Circle of Gold Honorary Society (1998); Jacksonville, Florida's 5th Street re-named "**Norman E. Thagard Blvd**" (1998); recognized in **Guinness Book of Records** for setting U.S. human space flight records (1997); The Society of NASA Flight Surgeons' 1997 W. Randolph Lovelace Award; Distinguished Guest of Panama City, Panama (1997); **Recipient of Russia's Friendship Medal**, presented personally by Russian Federation President Boris Yeltsin (1996); named as **one of NASA's 15 "Superstars of Space Flight"** (1996); inducted into New Mexico's **International Space Hall of Fame** (1996); American Institute of Aeronautics and Astronautics' 1996 **Jeffries Medical Research Award**; Aerospace Medical Association's 1996 Hubertus Strughold Award for Space Medicine; at the request of the Smithsonian Institute, his Russian "SOKOL" space suit was donated to the National Air & Space Museum (1996); Henry G. Armstrong Lecturer in Aerospace Medicine (1996); **Florida Senate Commendation Resolution** (1996); **City of Tallahassee Commendation Proclamation** (1995 and 2004); Aviation Week & Space Technology's 1995 Laurels Award; American Astronautical Society's 1983 and 1995 Melbourne W. Boynton Award; Florida State University's "Grad Made Good" award (1983) and Wescott Medal (1995); designated by the Commandant of the Marine Corps an honorary Naval Astronaut Pilot (1992); Alabama Agricultural and Mechanical University Presidential Citation of Honor Award (1990); FSU's student health center designated the "**Thagard Student Health Center**" by legislative act (1986); Participant in Purdue University's Old Masters Program (1983); National Aeronautics and Space Administration's Space Flight Medal, Distinguished Service Medal and **Sustained Superior Performance Award (twice)**; inducted into **Phi Kappa Phi academic honorary society** (1971).

Honorary Degrees: 1996, Florida Atlantic University: Doctor of Humane Letters.

Experience: Dr. Thagard held a number of research and teaching posts while completing the academic requirements for various earned degrees.

In September 1966, he entered active duty with the United States Marine Corps Reserve as a student naval aviator. He was placed on the "**Captain's List**" for academic achievement in the primary phase of naval flight training (1967), achieved the rank of Captain in 1967 and was designated Training Squadron 21's "**Student of the Month,**" February, 1968 upon completing flight training with the highest overall average.

Captain Thagard was subsequently assigned to duty as an F4J Phantom pilot with VMFA-333 at Marine Corps Air Station, Beaufort, South Carolina. **He flew 163 combat missions in Vietnam** while assigned to VMFA-115 from January 1969 to 1970, for which he received **11 Air Medals**, the Navy Commendation Medal with Combat "V", and the **Vietnamese Cross of Gallantry with Palm**.

He returned to the United States and an assignment as aviation weapons division officer and F4B **maintenance test pilot** with VMFA-251 at the Marine Corps Air Station, Beaufort, South Carolina, where he received the **Marine Corps "E" Award** for excellence (1970).

Dr. Thagard resumed his academic studies in 1971, pursuing additional graduate studies as a doctoral student in electrical engineering as well as pre-medical coursework at Florida State University. Upon termination of the Engineering Science School in June, 1972, he re-located to San Antonio, Texas where he worked as an engineer for City Public Service, the electric and gas utility of the City of San Antonio. He entered the Southwestern Medical School of the University of Texas in September 1973, receiving the doctor of medicine degree in June 1977. He was selected as a NASA astronaut and upon completion of an internship in internal medicine at the Medical University of South Carolina on 30 June 1978, reported to

Johnson Space Center. He is a licensed physician and pilot who has logged over 2,000 hours of first pilot time- the majority in high-performance jet aircraft.

NASA Experience: In 1978, Dr. Thagard was **selected as one of 35 astronaut candidates from an applicant pool of 8,079**. He logged over **140 days in space during five space flights**. He was a mission specialist on STS-7 in 1983, **Flight Engineer** on STS-51B in 1985 and STS-30 in 1989, the **Payload Commander** on STS-42 in 1992, and was the **Cosmonaut Researcher for the 18th Primary Expedition to the Russian Mir Space Station** in 1995.

Dr. Thagard first flew on the crew of STS-7, which launched from Kennedy Space Center, Florida, on June 18, 1983. This was the second flight for the Orbiter Challenger and the first flight with a crew of five persons and first American flight with a woman crewmember. It was also the first flight to include members of his 1978 astronaut class. During the mission, the STS-7 crew deployed satellites for Canada (ANIK C-2) and Indonesia (PALAPA B-1); operated the Canadian-built Remote Manipulator System (RMS) to perform the first deployment and retrieval exercise with the Shuttle Pallet Satellite (SPAS-01); conducted the first formation flying of the Orbiter with a free-flying satellite (SPAS-01); carried and operated the first U.S./German cooperative materials science payload (OSTA-2); and operated the Continuous Flow Electrophoresis System (CFES) and the monodisperse Latex Reactor (MLR) experiment, in addition to activating seven "Getaway Specials." During the flight Dr. Thagard conducted various medical tests, collected data on physiological changes associated with astronaut adaptation to weightlessness, and **was the first to document the ileus associated with Space Motion Sickness (SMS)**. He also retrieved the rotating SPAS-01 using the RMS, **the first-ever capture of a rotating free-flying satellite**. Mission duration was 147 hours ending at Edwards Air Force Base, California, June 24, 1983.

Dr. Thagard then flew on STS-51B, the Spacelab-3 science mission, which launched from Kennedy Space Center on April 29, 1985, aboard the Challenger. He assisted the commander and pilot on ascent and entry in the capacity of flight engineer. Duties on orbit included satellite deployment operation with the NUSAT satellite as well as animal care for the 24 rats and two squirrel monkeys contained in the Research Animal Holding Facility (RAHF). Other duties were operation of the Geophysical Fluid Flow Cell (GFFC), Urinary Monitoring System (UMS), and the Ionization States of Solar and Galactic Cosmic Ray Heavy Nuclei (IONS) experiment. After 110 orbits of the Earth and 168 hours in space, Challenger landed at Edwards Air Force Base, California, on May 6, 1985.

He next served on the crew of STS-30, which launched from Kennedy Space Center, Florida, on May 4, 1989, aboard the Orbiter Atlantis. During this four-day mission, crew members successfully deployed the Magellan Venus-exploration spacecraft, the first U.S. planetary science mission launched since 1978, and the first planetary probe to be deployed from the Shuttle. Magellan arrived at Venus in mid-1990 and mapped almost the entire surface of Venus for the first time, using specialized radar instruments capable of "seeing" through the visually opaque Venusian atmosphere. In addition, crewmembers worked on secondary payloads involving fluid research and electrical storm studies. Mission duration was 97 hours (64 orbits of the Earth), ending with a landing at Edwards Air Force Base, California, on May 8, 1989.

Dr. Thagard was one of **the first NASA astronauts designated as a "Payload Commander,"** serving in that capacity on STS-42 aboard the Shuttle Discovery, which lifted off from the Kennedy Space Center, Florida, on January 22, 1992. Fifty five major experiments conducted in the International Microgravity Laboratory-1 module were provided by investigators from eleven countries, and represented a broad spectrum of scientific disciplines. During 128 orbits of the Earth, the STS-42 crew accomplished the mission's primary objective of investigating the effects of microgravity on materials processing and life sciences. In this unique laboratory in space, crewmembers worked around-the-clock in two shifts. Experiments investigated the microgravity effects on the growth of protein and semiconductor crystals. Biological experiments on the effects of zero gravity on plants, tissues, bacteria, insects, and human vestibular response were also conducted. Dr. Thagard was **the first to propose and use intravenous administration of the drug, Phenergan, in the successful treatment of Space Motion Sickness**. This eight-day mission concluded at Edwards Air Force Base, California, January 30, 1992.

In 1992, Dr. Thagard was selected to represent the United States as the **first American to fly in the Russian space program**, serving as the cosmonaut researcher for the Russian Mir 18 mission. He lived and trained at the Gagarin Cosmonaut Training Center (GCTC) at Star City, Russia for more than one year prior to the mission. All training as well as the flight, itself was conducted in the Russian language. Upon launching on a Russian Soyuz rocket from the Baikonaur Cosmodrome, Republic of Kazakhstan, on March

14, 1995, he became the **first NASA astronaut to launch from any site other than the Kennedy Space Center and on any non-U.S. spacecraft.** After docking with the Russian Mir Space Station on March 16, 1995, the flight continued as the 18th primary expedition to the Mir. Twenty-eight experiments were conducted in the course of the 115-day flight. At its completion, Dr. Thagard was **the U.S. record-holder for longest space flight and, with 140 days in space overall, was the most experienced U.S. astronaut ever.** The mission, which began from central Asia, ended at Kennedy Space Center, Florida, with a landing aboard the Space Shuttle Orbiter Atlantis on July 7, 1995.

Dr. Thagard retired from NASA on January 3, 1996.

Other Current activities and Positions:

Co-founder and Executive Director, Challenger Learning Center of Tallahassee, with shuttle/mission control/space station simulators, digital space theater/planetarium and IMAX theater.

Member of the Board of Directors of EMS Technologies, Inc. EMS is an Atlanta-based communications company.

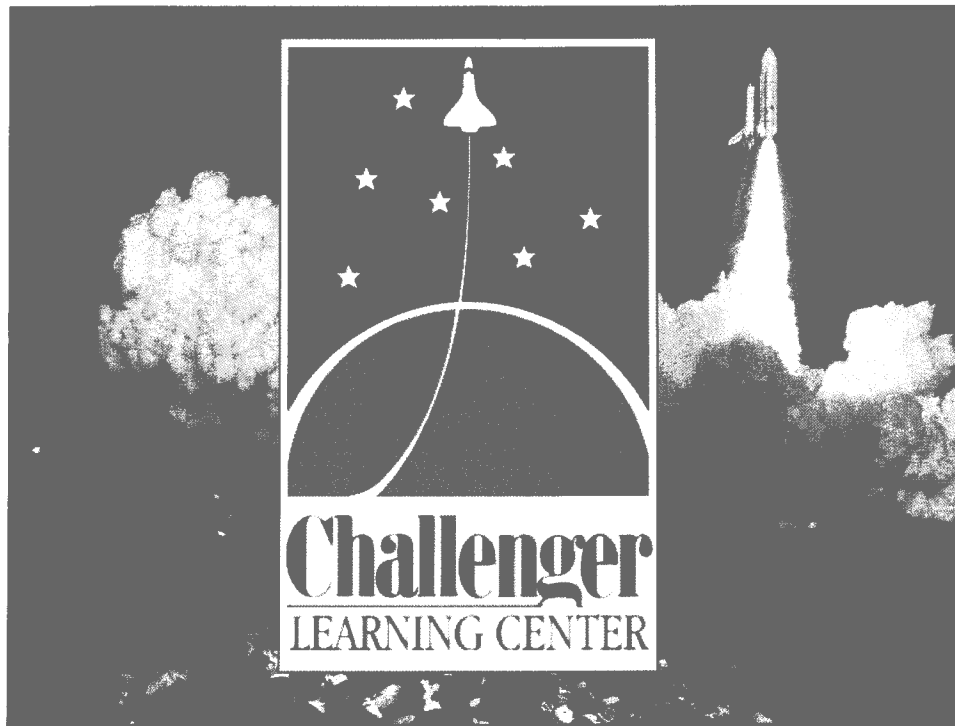
Member, Editorial Review Board of the Journal of the Society for Human Performance in Extreme Environments.

Distinguished Lecturer for the American Institute of Aeronautics and Astronautics.

He is an aerospace consultant and was **technical advisor for “VIRUS,”** a movie starring Jamie Lee Curtis and Donald Sutherland **and for “ARMAGEDDON”** starring Bruce Willis, Ben Affleck, and Liv Tyler.

Advisor for Space Adventures, Ltd., a company offering aerospace experiences, including orbital flight.

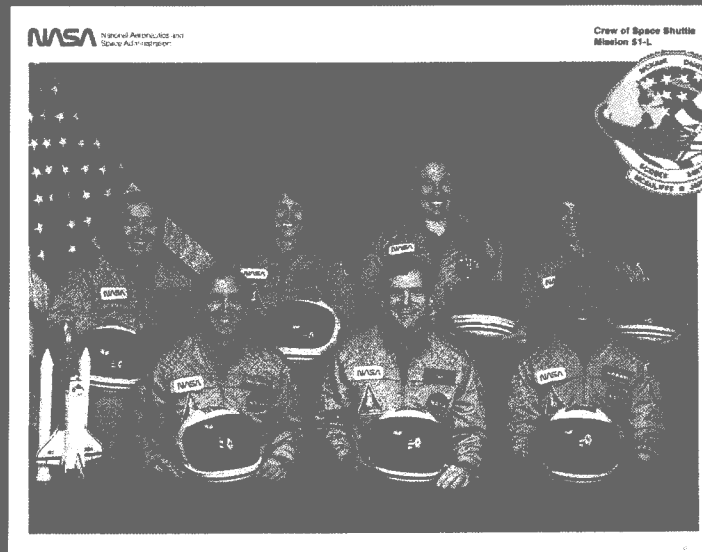
Dr. Thagard is a **very experienced public speaker** who has addressed the **National Press Club** (Washington, D.C.) and the 92nd Street Y (NYC). He is a frequently sought-after space analyst, serving recently as an analyst for ABC and CNN, and has appeared frequently on CNN, CNN International, and CNN Headline News. He has also appeared on the “Today Show,” “Good Morning America,” “Nightline,” and numerous other television and radio programs in the United States, Canada, Asia, and Europe. He was a guest on “Man-Made Movie” for Turner Broadcasting and has appeared on MTV. He also was author of a recent “op-ed” article in the N.Y. Times and Herald Tribune International.



Challenger STS-51L

January 28th, 1986

Onizuka
McAuliffe
Jarvis
Resnik
Smith
Scobee
McNair



Teacher in Space

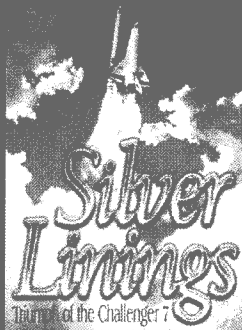
Barbara
Morgan



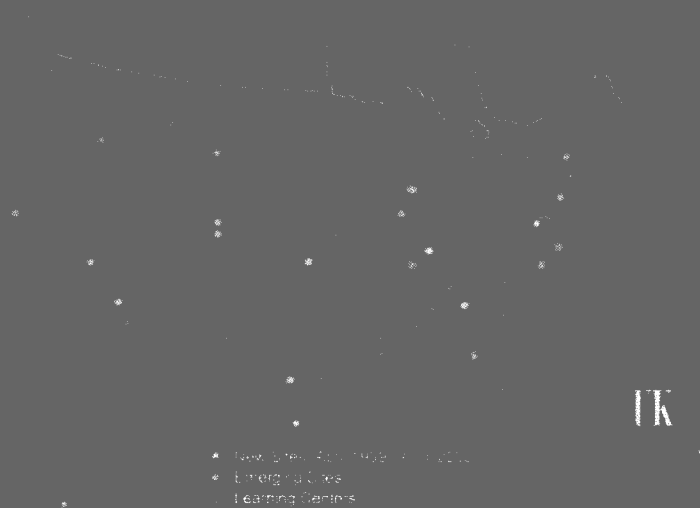
Christa
McAuliffe

June Scobee Rodgers, Ph.D. Founding Chairwoman

June Scobee Rodgers



Challenger Learning Center **Network**



Aerospace Education is not about training pilots and astronauts; rather, it provides an exciting and inspirational setting as teachers prepare students with the skills needed to succeed in an increasingly technical society and workplace.

Challenger Center for Space Science Education

THE MISSION CONTINUES

A black and white photograph of the Space Shuttle Challenger during its ascent. The shuttle is positioned vertically, with its main engines and boosters firing, creating a large plume of white smoke and fire. The shuttle is set against a dark background, possibly the sky or a launch pad.

Why a Challenger Learning Center in Tallahassee?

FAMU-FSU College of Engineering

- Shortage of American students pursuing science, engineering and technology careers
- “Prime the Pipeline”



Top Advisory Panel Warns of an Erosion of the U.S. Competitive Edge in Science

By: William J. Broad
New York Times 10/13/05

The National Academies called for an urgent and wide-ranging effort to strengthen scientific competitiveness. Citing many examples of emerging scientific and industrial power abroad they listed 20 steps the United States should take to maintain its global lead.

The proposed actions include creating scholarships to attract top students to careers in teaching math and science, scholarships for college-level study of science, math, and engineering, expanding the nation's investment in basic research, and making broadband access available nationwide at low cost.

Increasingly, experts say, strides in Asia and Europe rival or exceed America's in critical areas of science and innovation.

The panel cited many examples:

- Last year, more than 600,000 engineers graduated from institutions of higher education in China, compared to 350,000 in India and 70,000 in the United States.
- Recently, American 12th graders performed below the international average for 21 countries on general knowledge in math and science.
- The cost of employing one chemist or engineer in the United States is equal to about five chemists in China and 11 engineers in India.
- Chemical companies last year shut 70 facilities in the United States and marked 40 for closure. Of 120 large chemical plants under construction globally, one is in the United States and 50 are in China.

Mission Statement

The Challenger Learning Center is the principal public outreach operation of the FAMU-FSU College of Engineering. Our missions include the provision to K-12 students of standards-aligned, high-quality "hands-on" educational experiences in science and engineering through the use of high fidelity aerospace simulators.

Our state-of-the art large-format and domed digital theaters significantly augment our ability to accomplish this mission through exhibition of thematically related large-format films and planetarium programs. It is also our mission to provide the general public with stunningly unique, hugely entertaining audio-visual experiences through acquisition for and exhibition in the theaters of the best films and programs available.



Vision Statement

To be the impetus for increased engineering college enrollment by becoming the recognized regional leader in informal science and technology education and to be the leading destination for a regional audience of the absolute best in large-format film and planetarium programs available anywhere.



Dr. C.J. Chen, Dean

Dean's Agenda:

"Outreach to Future Students"

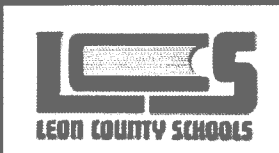
"The College of Engineering can help bring quality education to life for the next generation of engineers and scientists."

Norman E. Thagard, M.D.



- ★ •STS-7 '83 Challenger
- STS-51-B '85 Challenger
- STS-30 '89 Atlantis
- STS-42 '92 Discovery
- Mir 18 '95 Atlantis

**5 Flights Logged
Over 140 Days in
Space**



Memorandum of Understanding

Leon County School System agrees:

- Provide 2 school teachers for nine months to work full-time at the Center

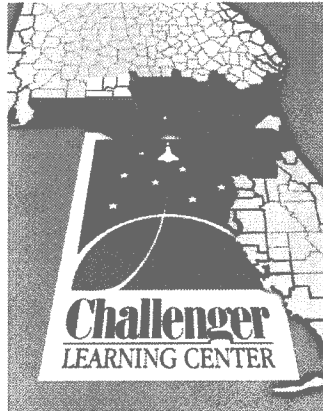
Challenger Learning Center agrees:

- Train every 6th grade teacher annually
- Host every Leon County 6th grader (approx. 2,200) to the Center for the "Ultimate Classroom" (Mission Simulator, IMAX film, Planetarium show)

Service Area

Service Area:

- Alabama - 5 counties
- Florida - 34 counties
- Georgia - 27 counties

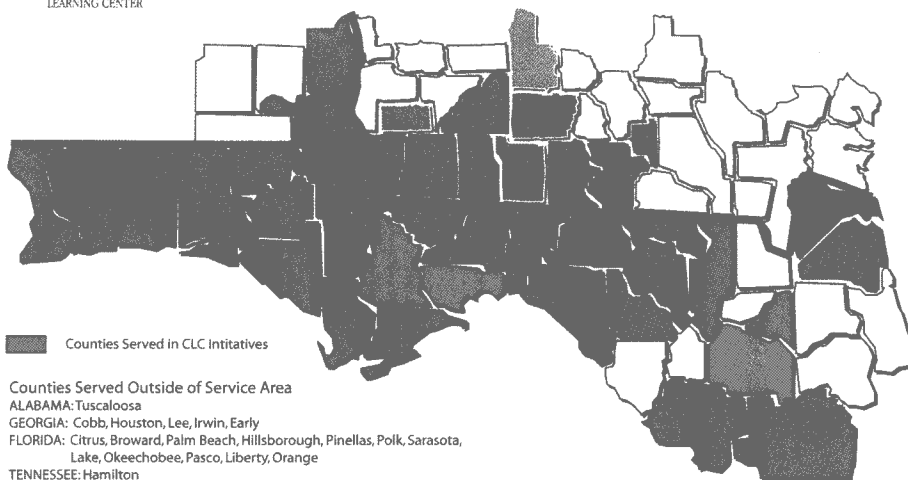


This service area has a significantly high percentage of students that are...

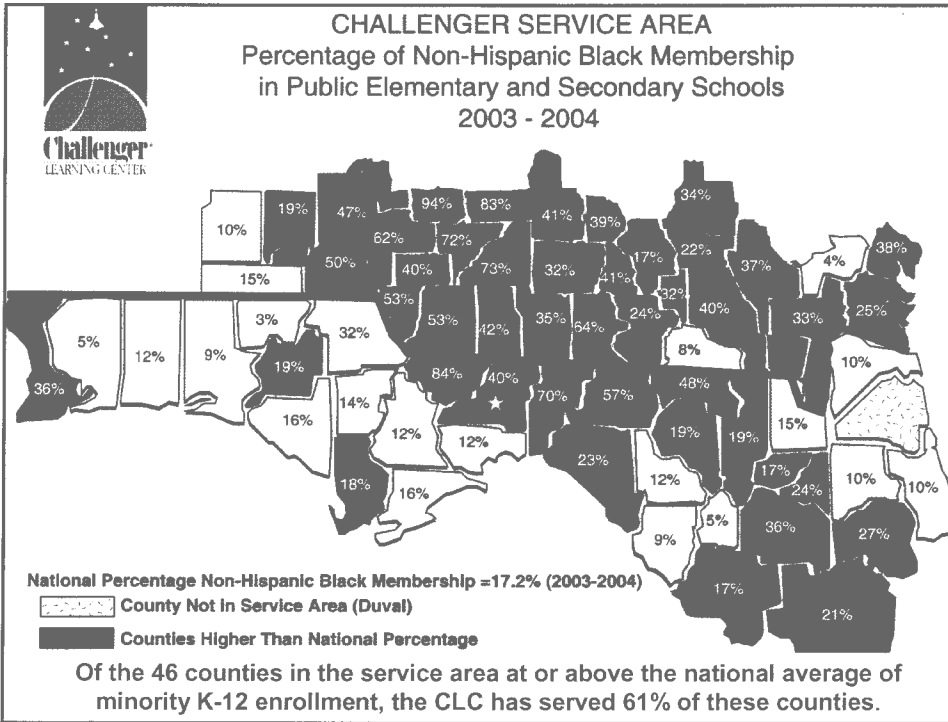
- Minority
- Live in poverty
- Members of families whose parent(s) serve in the military



Counties that have visited the Challenger Learning Center from its 66 County Service Area



The Challenger Learning Center has served 62% of its 66 county service area in the past two years, plus an additional 20 counties outside the service area.



Challenger Learning Center Facility Components

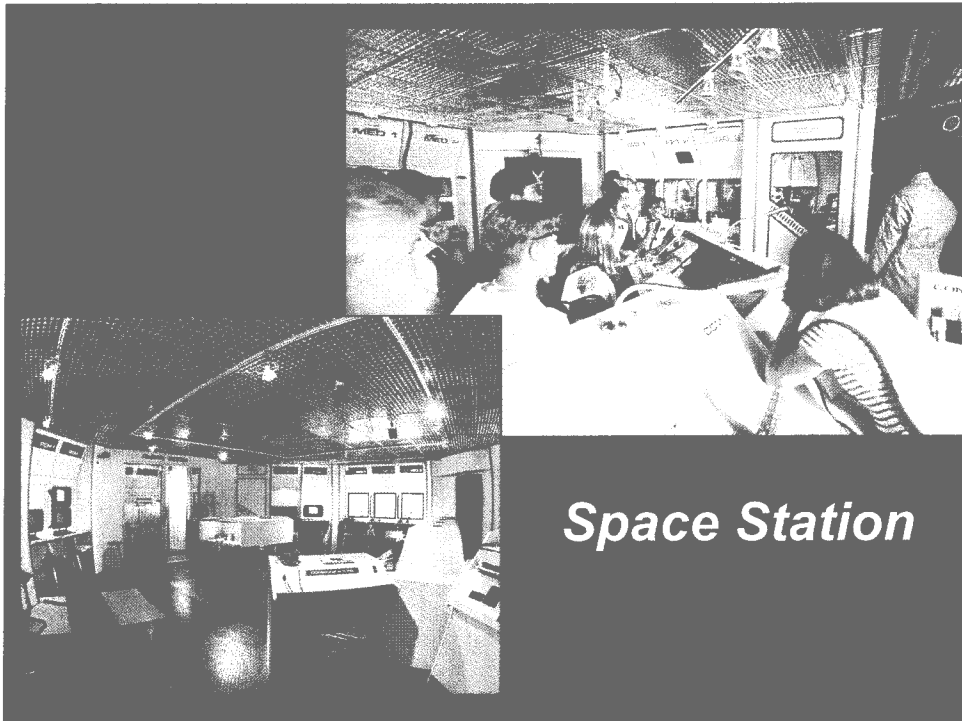
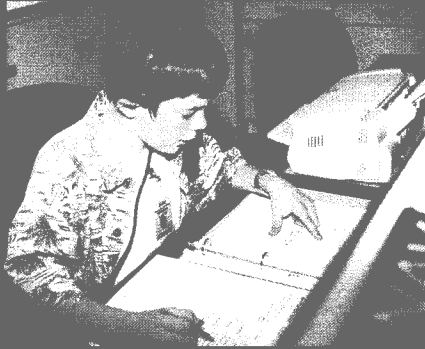
- Space Mission Simulator
- IMAX® Theatre
- Digistar 3 Planetarium
- Gift Shop
- Concessions Stand



Space Mission Simulator



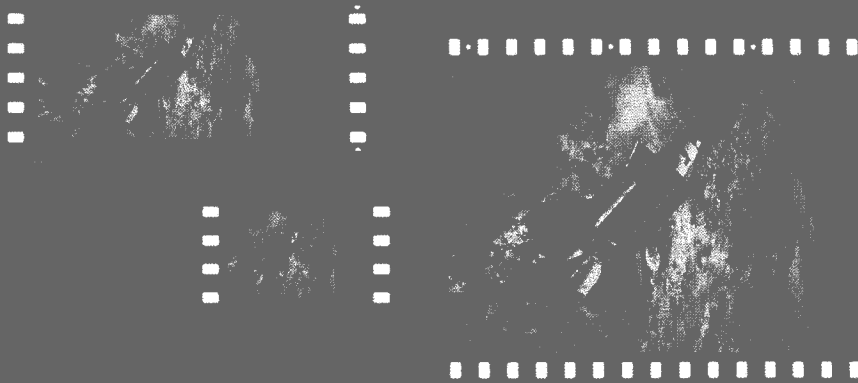
Mission Control



Space Station

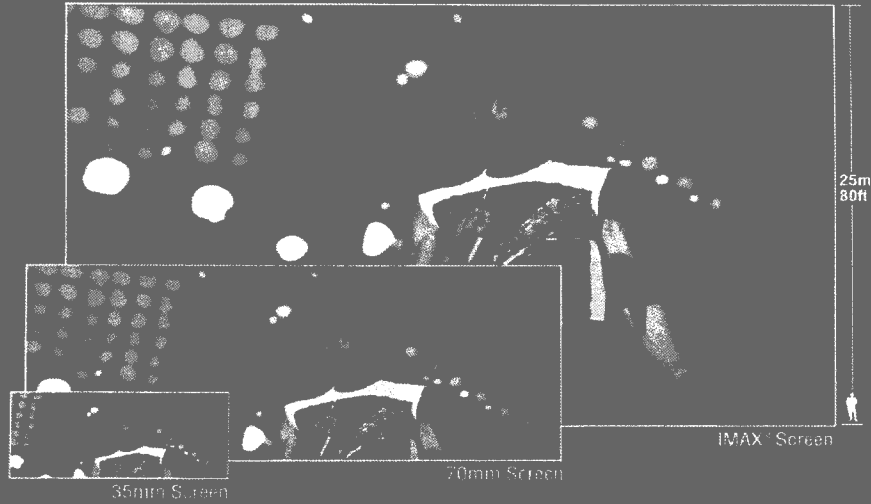
15/70 Large Format Film Theater

Giant Screen - **Giant Format** The 15/70 Film Frame



The largest film frame in motion picture history -- more than ten times the size of conventional 35mm -- and three times the size of standard 70mm.

Giant Screen - Giant Format



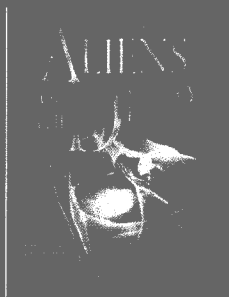
Because the frame is so large and has so much information you can project on to giant screens with incredible clarity. The IMAX theatre here in Tallahassee is 5 stories high - (62 feet tall by 71 feet wide).

IMAX

IMAX is the original system, with a giant flat screen, that makes full use of your peripheral vision.

IMAX THEATRE

- A destination for teachers and their students – IMAX provides an
- A variety of educational materials including personal guides
- Materials designed to
- Materials included that aid in the preparation of the FCAT



Aliens of the Deep

Fighter Pilot

Magnificent Desolation:
Walking on the Moon



Challenger Learning Center

Planetarium

Digital Space Theatre

50' Dome

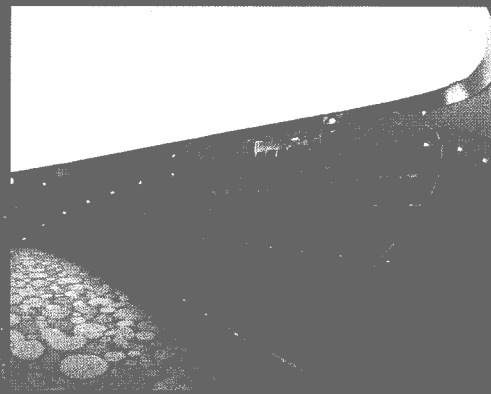
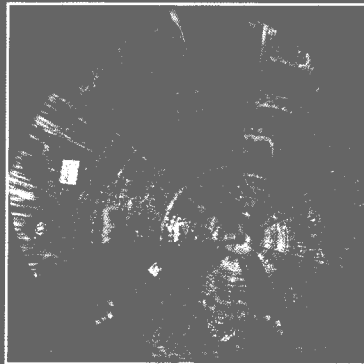
130 Seat Auditorium

Full-Dome High Definition Video Projection

20,000 W of Dolby Digital Surround Sound

Planetarium

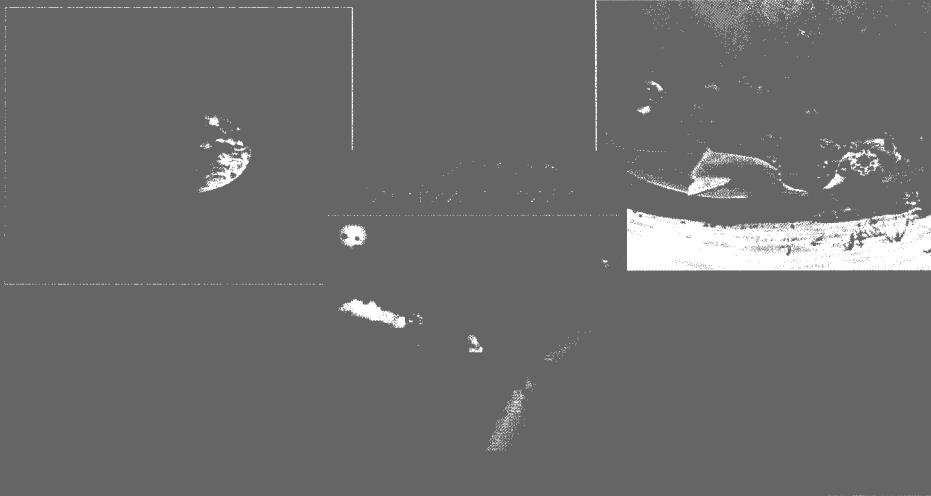
Digital Space Theater



New Horizons

Secrets of the Cardboard Rocket

Kalukahina: The Enchanted Reef



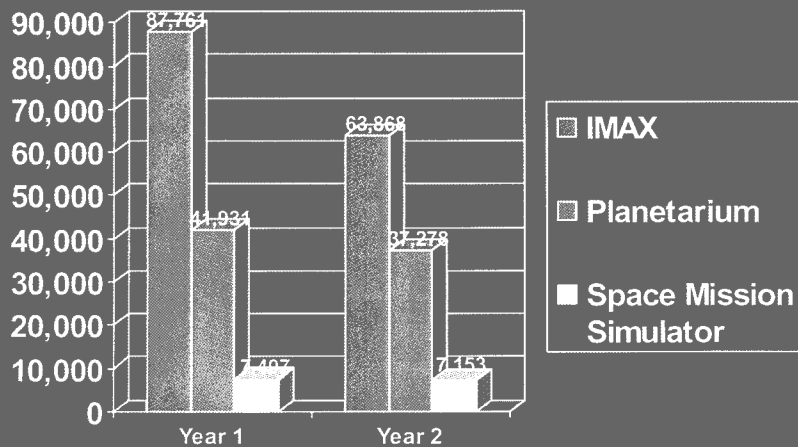
Challenger Learning Center

Funding History

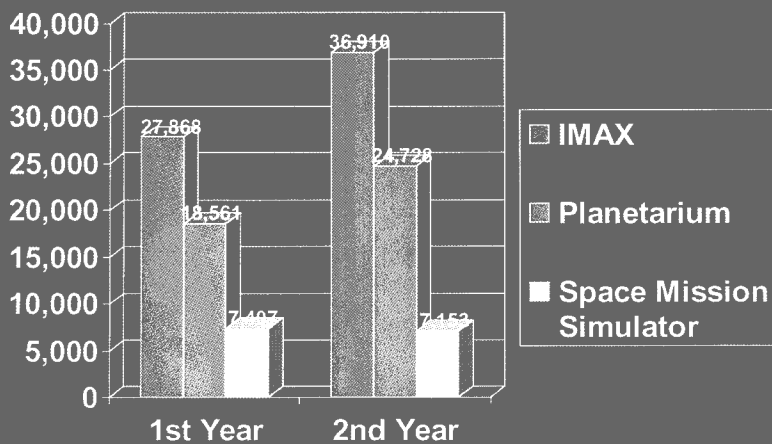
- \$5.6M Legislated Appropriations for Construction
 - 1998 - \$2.5 M Leon County 75 K
 - 1999 - \$3.0 M City of Tallahassee 25 K
- \$2.0M City of Tallahassee & \$1.8M land in-kind
- \$1.0M University Loan
- \$800,000 FAMU & FSU President's Discretionary Fund



Total Attendance Per Venue Calendar Year



Student Attendance Per Venue Calendar Year





"I know one good answer to the questions people are asking about American education... the answer is Challenger Center."

*- Buzz Aldrin,
Astronaut*

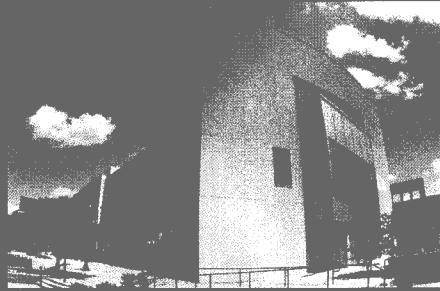
Gemini 12, Apollo 11



Florida A&M University-Florida State University
COLLEGE OF ENGINEERING



<http://www.challengertlh.com>



Michelle Personette
Director

(850) 645-STAR (7827) fax: (850) 645-7784

E-mail: personette@eng.fsu.edu

Global Competitiveness

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

Historic Milestones

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

1957: Sputnik

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

3

...Instead, they were brought up in a period of total talent mobilization, requiring the most able-minded to fulfill their potentials and submit their developed abilities for service to the nation."

A. Tannenbaum, "Pre-Sputnik to Post-Watergate concern about the gifted," in *The Gifted: Their Talent and Development* (ed. A.H. Passow), *70th Yearbook of the National Society for the Study of Education* (University of Chicago Press, 1979), p. 17.

4

1983: *A Nation at Risk*

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

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

5

TIMSS

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

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

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

6

1995 TIMSS Math

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

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

7

1995 TIMSS Science

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

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

8

Decision: Re-administer the TIMSS assessment in 1999

Why?

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

9

1999 TIMSS-R Math

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

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

10

1999 TIMSS-R Science

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

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

11

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

12

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

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

13

2001: Road Map for National Security: Imperative for Change

"The inadequacies of our systems of research and education pose a greater threat to U.S. national security over the next quarter century than any potential conventional war that we might imagine...."

14

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

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

15

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

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

16

Program for International Student Assessment (PISA)

PISA Math 2003

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

PISA Problem Solving 2003

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

17

PISA: Reading Literacy

- Understanding, using and reflecting on written texts, in order to achieve one's goals, to develop one's knowledge and potential and to participate in society.

18

PISA: Reading Literacy

- Retrieving information
- Forming a broad general understanding
- Developing an interpretation
- Reflecting on and evaluating the content of a text
- Reflecting on and evaluating the form of a text

19

PISA: Mathematical Literacy

- An individual's capacity to identify and understand the role that mathematics plays in the world, to make well-founded judgments and to use and engage with mathematics in ways that meet the needs of that individual's life as a constructive, concerned and reflective citizen.

20

PISA: Scientific Literacy

- An individual's scientific knowledge and use of that knowledge to identify questions, to acquire new knowledge, to explain scientific phenomena, and to draw evidence-based conclusions about science-related issues, understanding of the characteristic features of science as a form of human knowledge and enquiry, awareness of how science and technology shape our material, intellectual, and cultural environments, and willingness to engage in science-related issues, and with the ideas of science, as a reflective citizen.

21

What do students say?

A Public Agenda study from 1997 revealed the following:

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

22

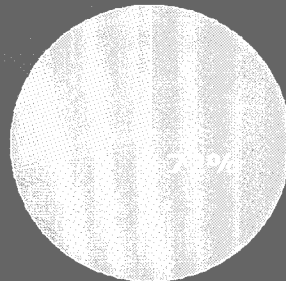
When asked whether they thought that students would pay greater attention and study harder if they were required to learn more and be tested in order to graduate, vast majorities of students answered "yes:"

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

23

Current students agree

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



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

24

“Nerd Harassment”

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

John Bishop, An Economic Theory of Nerd and Slacker Harassment and its Role in Enforcing Social Norms in Schools, Center for Advanced Human Resource Studies, Cornell University, 2005.

25

Incidents of such harassment were *greater* for:

- Honors students
- Students with many study halls
- Students that took accelerated courses in middle school.
- Students who reported having a strong “anti-learning” crowd in middle school.
- Students who believed they were being graded on a curve.

26

Changing the Culture: External Measures

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

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

27

"When exams are graded on a curve or college admissions are based on class rank, students can maximize their joint welfare if no one puts in extra effort. In the game that results, rewards, such as friendship and respect, and punishments, such as ridicule, harassment, and ostracism, enforce the cooperative solution: "don't study much."

28

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

*John Bishop, "A Steeper, Better Road to Graduation,"
Education Next, Winter 2003*

29

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

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

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

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

..... 1.2

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

..... 1.2

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

..... 1.2

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

..... 1.2

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

..... 1.2

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

..... 1.2

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

..... 1.2

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

..... 1.2

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

..... 1.2

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

SOURCE: Author's estimates from these sources

30

Changing the Culture: Increase the Level of Rigor

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

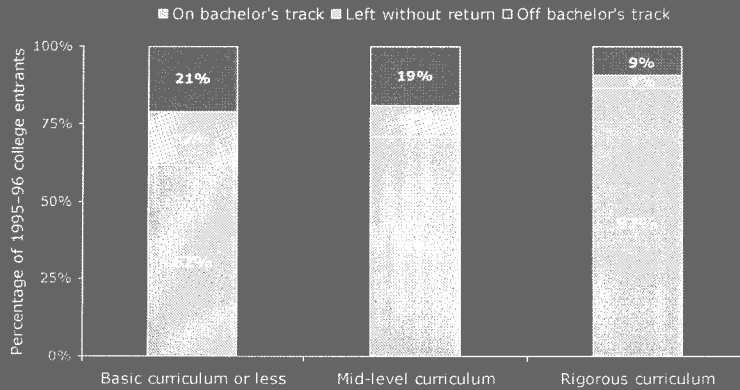
31

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

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

32

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

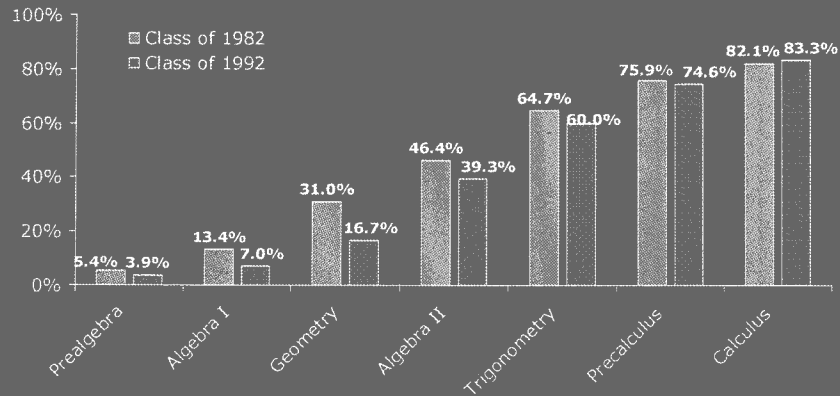


Source: Adapted from Horn, L. and Kogaku, J. K. *High School Academic Curriculum and the Persistence Path through College: Persistence and Transfer Behavior of Undergraduates Three Years after Entering Four-year Institutions*. National Center for Education Statistics, 2001.

33

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

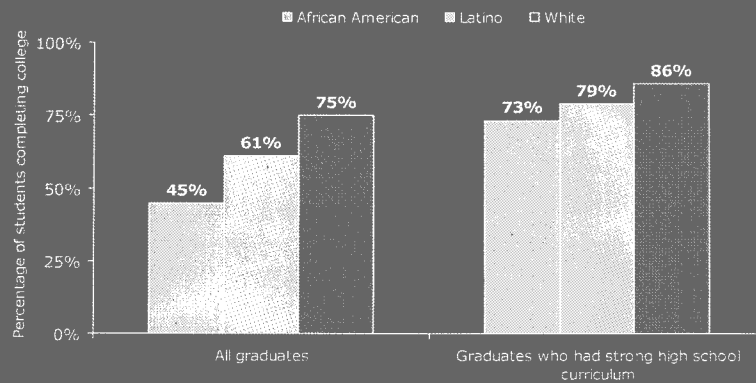
Bachelor's degree attainment by highest level of math reached, high school classes of 1982 and 1992



Source: Adelman, Clifford, *The Toolbox Revisited: Paths to Degree Completion from High School through College*, Table 8, U.S. Department of Education, 2006.

34

Taking challenging courses closes college completion gap between whites and minorities



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

35

Florida High School Graduation Requirements

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

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

36

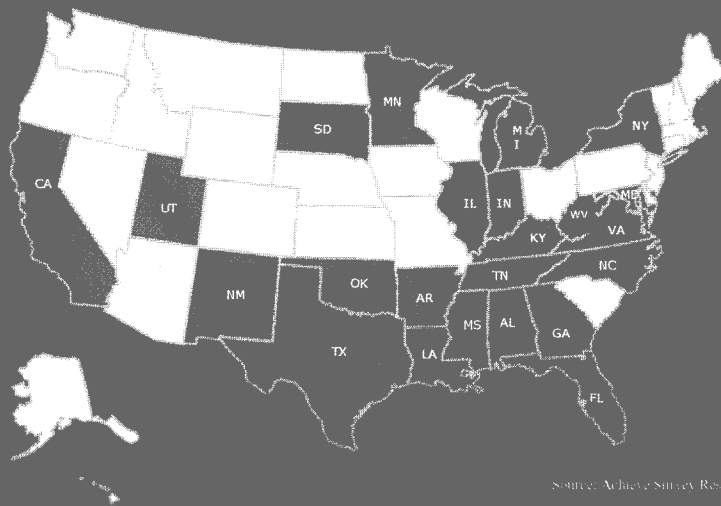
Florida

Major Areas of Interest (MAI)

- Web Design
- Engineering
- Science & Technology
- Aviation Institute
- Environmental Science
- Math/Science
- Performing Arts
- Medical Arts & Science
- Agriscience
- Pre Medicine & Allied Health
- Bio-technology

37

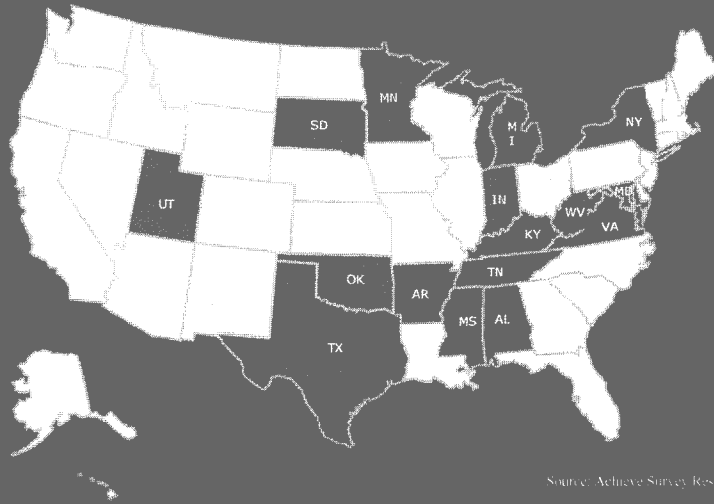
23 states require Algebra I



Source: Achieve Survey Research, 2006

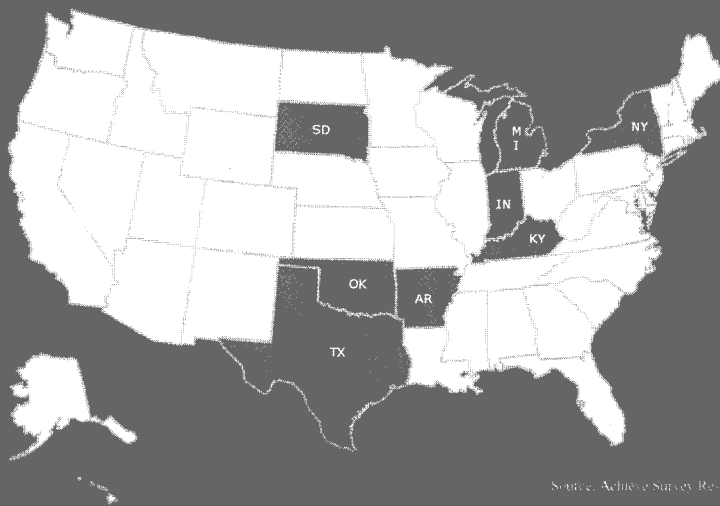
38

16 states require Geometry



39

Only eight states require Algebra II



40

Won't tougher standards increase the drop out rate?

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

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

*"The Silent Epidemic: Perspectives of High School Drop Outs."
A report by Civic Enterprises in association with Peter D. Hart
Associates for the Bill & Melinda Gates Foundation.
March 2005.*

41

Won't tougher standards increase the drop out rate?

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

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

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

42

Won't tougher standards increase the drop out rate?

- This is *not* what the research says:

Singapore:

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

"Overview of Singapore's Education System," presentation by Poon Chew Ling, education official with the Singapore Ministry of Education, in Washington, D.C. September 9, 2007.

43

Won't tougher standards increase the drop out rate?

- This is *not* what the research says:

California:

- All California high schools were studied for the effect of an increase in course difficulty on economically disadvantaged students. The study concludes:

"The results of this study do not support the hypothesis that higher levels of achievement or academic course enrollment are associated with higher dropout rates."

44

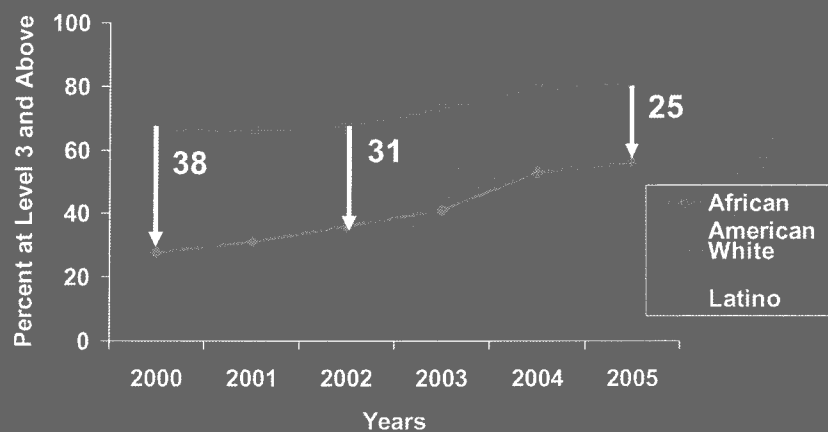
Won't tougher standards increase the drop out rate?

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

M. Feiler (1999). "School drop out rates, academic performance, size and poverty: Correlates of educational returns. Educational Evaluation and Policy Analysis, vol. 11, no. 2.

45

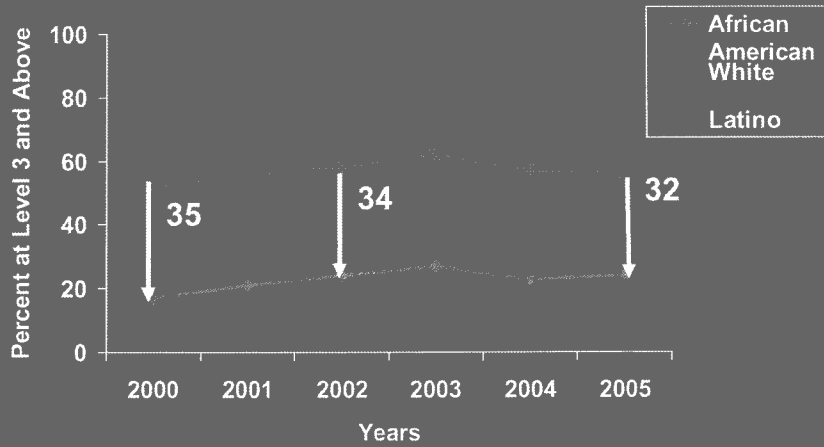
Florida Comprehensive Assessment Test Grade 4 Reading Disaggregated by Race/Ethnicity



Data Source: Florida State Department of Education, <http://www.firn.edu/doe/sas/fcat/fcatscor.htm>

46

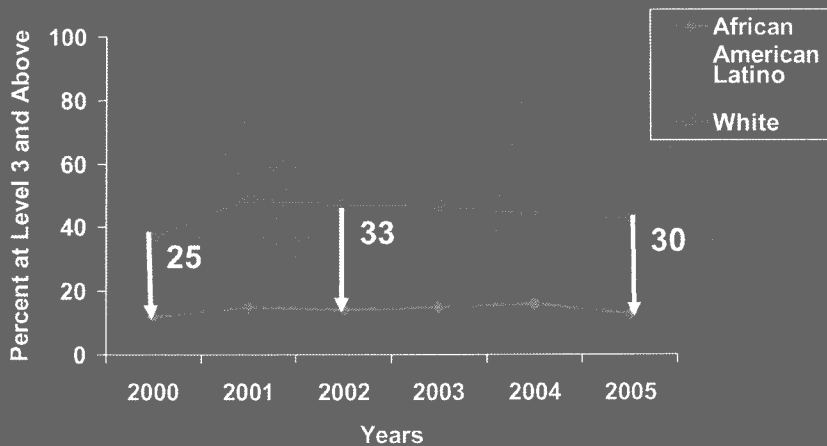
Florida Comprehensive Assessment Test Grade 8 Reading Disaggregated by Race/Ethnicity



Data Source: Florida State Department of Education. <http://www.firn.edu/doe/sas/fcat/fcatscor.htm>

47

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



Data Source: Florida State Department of Education. <http://www.firn.edu/doe/sas/fcat/fcatscor.htm>

48

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

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

Measuring Up: The State Report Card on Higher Education
(National Center for Public Policy and Higher Education, 2001).

49

"Second only to a weapon of mass destruction detonating in an American city, we can think of nothing more dangerous than a failure to manage properly science, technology, and education for the common good over the next quarter century."

Roll of Honor: National Science Foundation's Challenge The Phase III Report of the U.S. Commission on National Security in the 21st Century (February 15, 2001), p. vii.
Roll of Honor: National Science Foundation's Challenge The Phase III Report of the U.S. Commission on National Security in the 21st Century (February 15, 2001), p. 39.

50

Resources Necessary to Meet the Need

- A++ Funding
 - \$1,400,000 for standard revisions (\$700,000 to revise standards – two subject areas in 2007)
 - \$600,000 for Personnel – Subject Areas Specialists – an additional 8 positions will be necessary to support implementation annually

Professional Development

- \$350,000 for Master Trainers at the District Level *plus* \$1,250,000 for “school leaders” per subject area
- \$150,000,000 for all subject area teachers annually (Three-day summer academy and two-day school year follow-up.)

51

Selected Sources

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

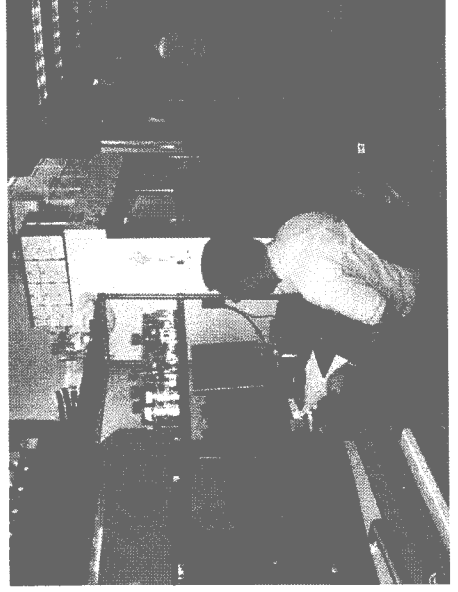
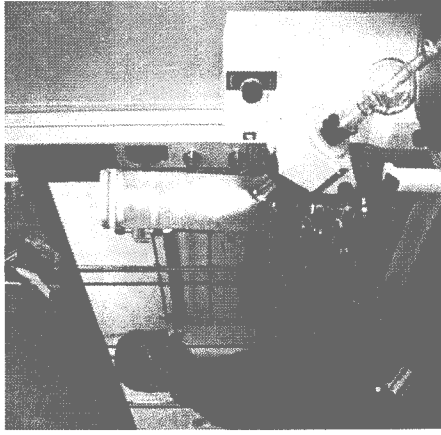
52



Deborah Leach-Scampavia is the Administrator for Education and Outreach for Scripps Florida. Ms. Leach-Scampavia's studies, as an undergraduate student, have been in the field of Biology and as a graduate student, in the field of Education. She worked for nine years as a researcher at Chevron Research in CA and 16 years as a research scientist in the Department of Bioengineering at the University of Washington, Seattle. Her research and publication focus has been in the field of surface characterization of catalytic and bio materials using ESCA (Electron Spectroscopy for Chemical Analysis) and ToF SIMS (Time-of-Flight Secondary Ion Mass Spectrometry).

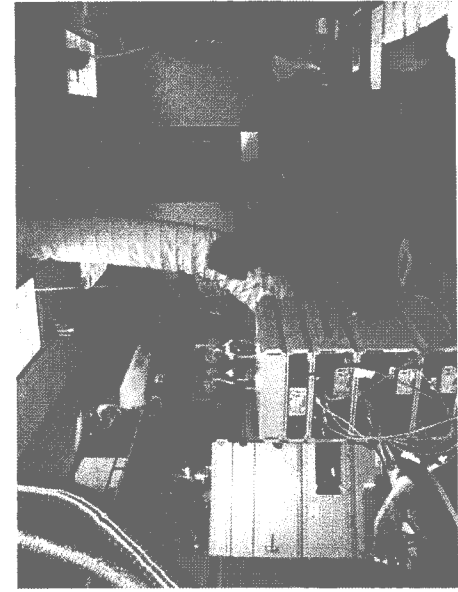
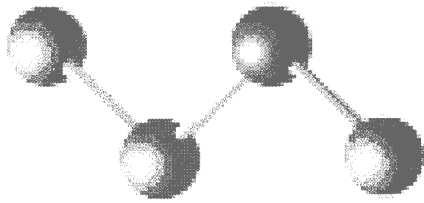
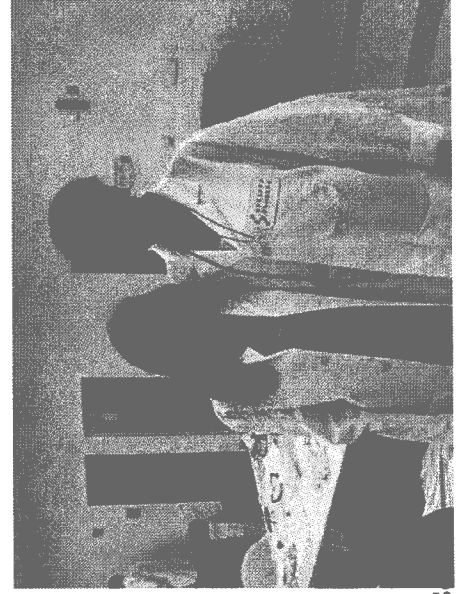
Following a history of volunteer efforts in science education outreach at Chevron Research and at the University of Washington, Ms. Leach-Scampavia began working for the University of Washington Engineered Biomaterials (UWEB) K-12 Education Outreach program. Her efforts at UWEB involved the coordination of the Summer Institutes for Middle and High School Science Teachers (STI) and oversight of the portable science kit curriculum and materials developed by the UWEB outreach program.

January 2007



SCRIPPS FLORIDA

THE SCRIPPS RESEARCH INSTITUTE



What is Scripps Florida?

Scripps Florida

Leveraging TSRI:

- 42 yrs of proven success
- 2900 employees
- #1 NIH-funded research institute
- 40 Biotech startups in 22 yrs

- **Perform high impact basic biomedical research**
- **Improve the human condition by fostering translation of our discoveries into useful products**
- **Enable the highest quality graduate scientific education and post graduate scientific training**

What Are We Doing At Scripps Florida?

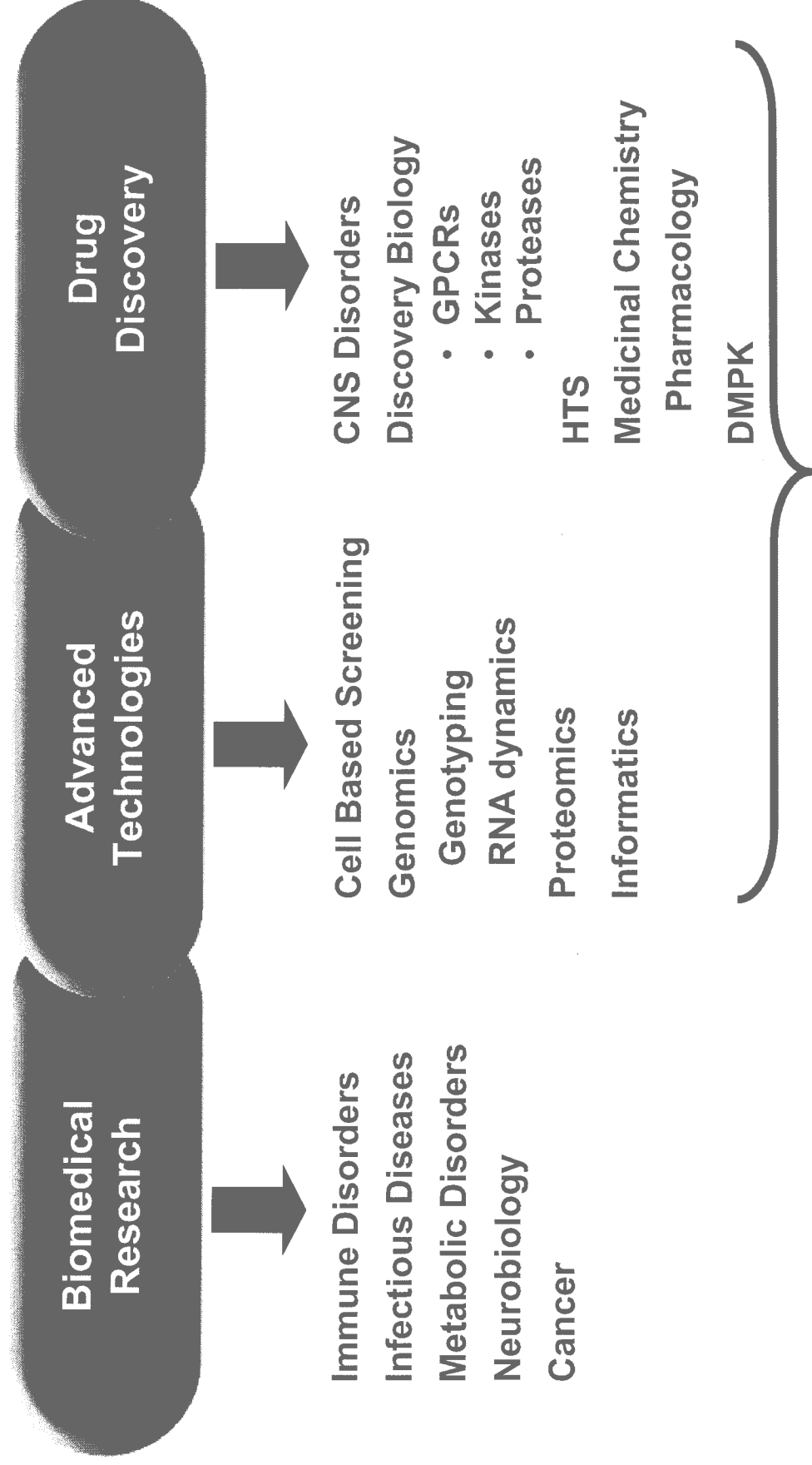
- **Fundamental Biomedical Research and Drug Discovery**
- **Applying Cutting-Edge Technologies (Biotech, Robotics & IT)**
- **Teaching a New Generation of Scientists Who Understand Both**

Toward What End?

- **Develop a Drug Discovery Platform**
- **Eliminate Much of the Guesswork**
- **Reduce Risk**
- **Significantly Shorten Timelines**

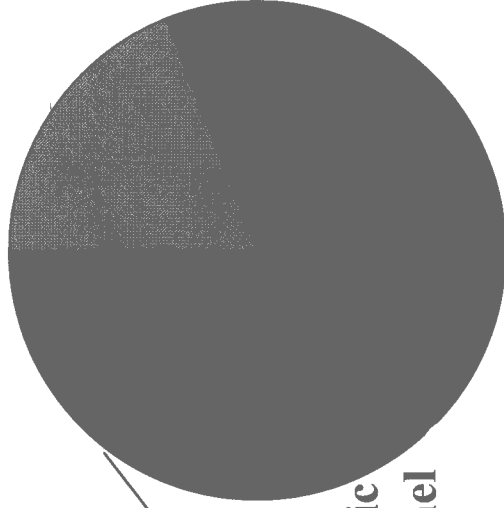
Interdisciplinary Themes of Scripps Florida

Collaboration is Key



Scripps Florida Employment Profile

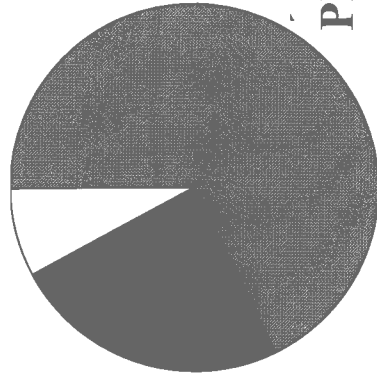
Admin & Support
Staff (19%)



Graduate Students
6%

6%

MS/BS
20%



PhD 55%

Scripps Florida Professional Skills

- **Critical Thinking**
- **Analytical Reading & Writing**
- **Communication**
- **STEM**
 - **Sciences:** Biology, Chemistry and Physics
 - **Technology:** Computers, Biotechnology, Lab Skills
 - **Engineering:** Robotics, Instrumentation
 - **Mathematics:** Computational analysis, Statistics

Scripps Florida Professional Skills

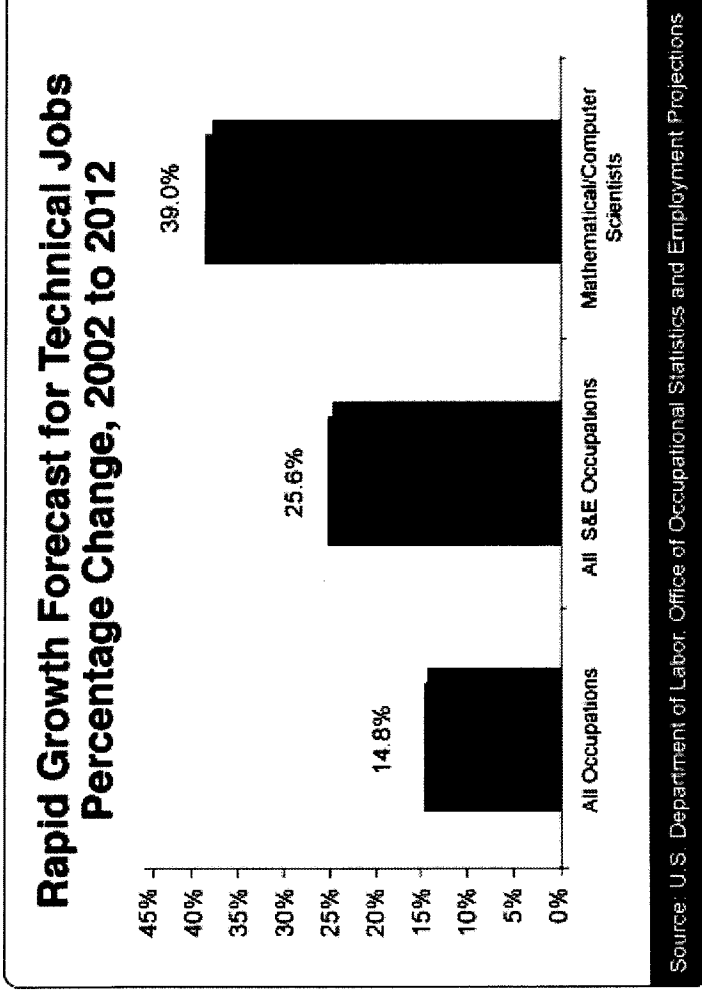
- PhD Scientists
 - The Architect
 - From conceptualization to the bench
- Research staff
 - The Machine
 - The point of discovery
- Administrative/Support staff
 - The Infrastructure
 - business development, EHS, procurement, HR, animal care, grants/budgets management

Bioscience Current Issues

K-12 Education

- New Technologies have defined the US economy since WWII
- Bioscience discovery will drive the economy of the 21st Century
- Currently, ~32% of the US work force is in Science and Engineering
- Student STEM achievement levels in the US and Florida are not high enough to meet 21st Century biotechnology workforce needs
- **K-12 education is critical to motivating and preparing our future workforce**

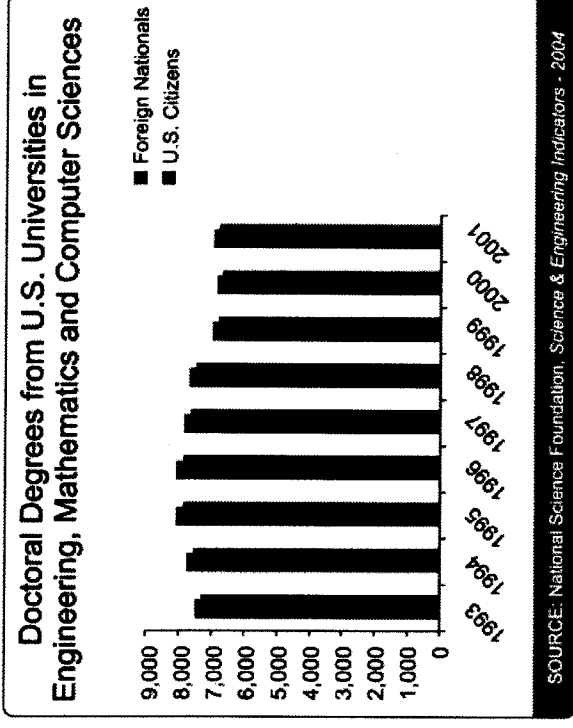
Bioscience Critical Issues



“In a number of key technical fields, like science, technology, engineering and mathematics (STEM), the total number of graduates with advanced degrees has not kept pace with demand. This demand is projected to increase in the coming years...”*

**CompeteAmerica*

Bioscience Critical Issues



- The US has been able to rely on the talents/achievements of foreign students
- As technologies and opportunities establish and grow in other countries, will the US be able to fill its graduate schools without the best and brightest foreign students?

Florida Colleges & Universities --Foreign National Engineering Degrees

- Foreign nationals account for approximately 46% of all engineering master's degrees awarded in Florida's main engineering universities.
- Foreign nationals account for more than 67% of all engineering PhDs from the same universities.

K-12 Education

What is Scripps Florida Doing?

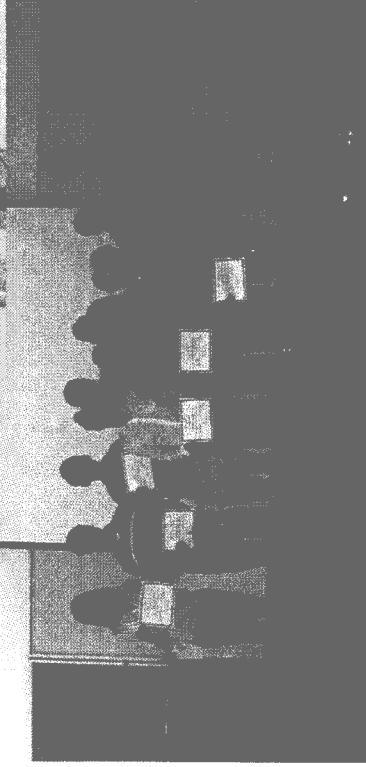
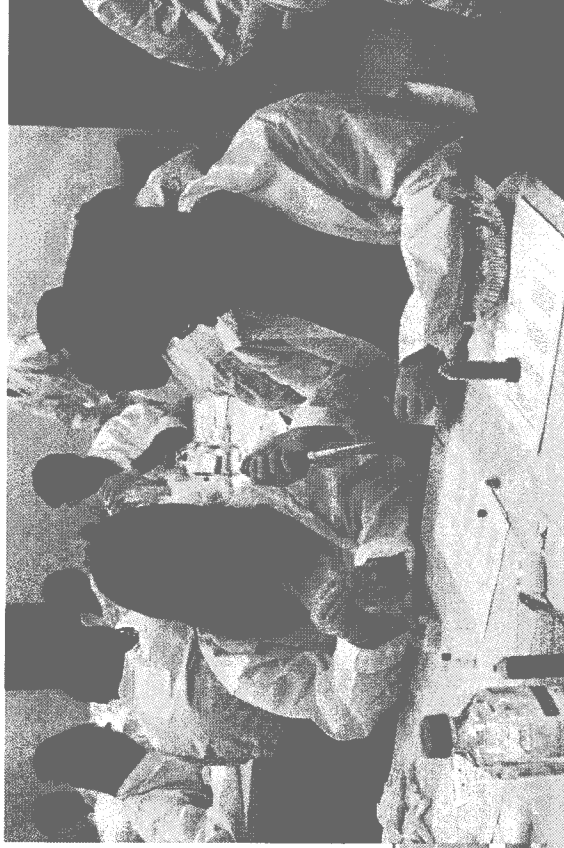
- **Education Outreach – Current Programs**
 - High School
 - Summer Research Internships (6 weeks)
 - High School Students and Science Teachers
 - Science Saturdays (Scripps/SFSM), Tours, and Career Days
 - Middle School
 - Introduction to Basic Sciences - How the World Works
- **Education Outreach - Long Term Objectives**
 - Involve Regional College Students in High/Middle School Outreach
 - Develop Portable Science Program
 - Design Permanent Bioscience Exhibit at South Florida Science Museum

Scripps Florida Education Outreach

Introduction to Science



Science Saturday



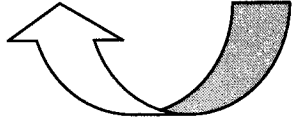
Summer Research Internships

Scripps Research Institute - 2006. All rights reserved.

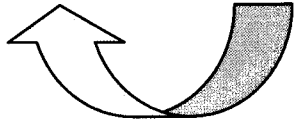
Conclusion

- Decline in US K-12 STEM has been happening for decades
 - FCAT is the canary in the mineshaft
- What does Scripps Florida need?
 - K-12 education that motivates and prepares students
 - Sunshine State Standards
 - communication skills, analytical reading & writing skills, critical thinking skills
- What will it take to succeed?
 - Investment in teachers
 - teacher effectiveness is a key factor in improving student learning
 - Involvement by parents/community
 - create an upward spiral of success

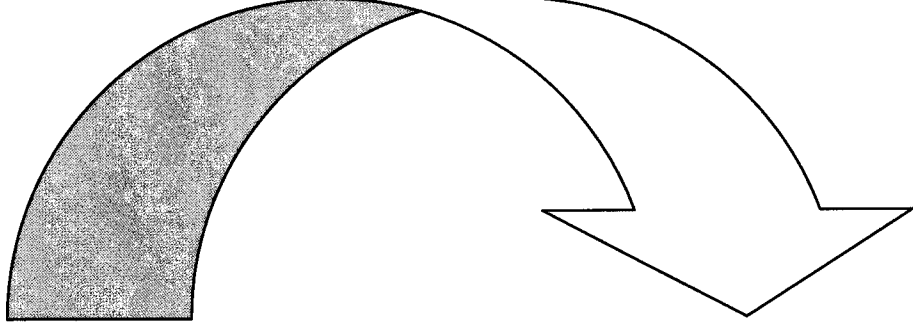
Development & Growth



Effective Effort



Motivation & Confidence



Community Campaign for Proficiency

<http://www.efficacy.org/>

Florida's New Standards

Rigorous
Measurable
Clear and Concise

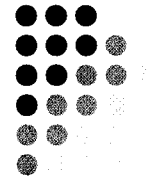
Increased Student Achievement in Florida

Barbara Elzie, Deputy Director, Just Read,
Florida!

Kate Kemker, Bureau Chief, Bureau of
Instruction and Innovation

Pam Smith, Deputy Chancellor, K-12
Public Schools

Mary Jane Tappen, Deputy Chancellor, K-12
Public Schools



Goals for the Revision

- Streamline the standards
- Organize the revision by specific grade level
- Restructure the numerical identification system
- Use clear and concise language in standards and benchmarks
- Ensure the rigor across the grade levels
- Address the lack of cognitive complexity across all grades
- Include those skills needed for postsecondary success and work related skills.

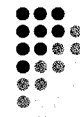


Reading and Language Arts Stakeholders



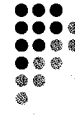
- Alternative Assessment Advisory Committee,
- Bureau District Partners for Exceptional Student Education,
- Florida Association for Media in Education,
- Florida Association of Supervisors of Media,
- Florida Center for Reading Research,
- FCAT Reading Content Advisory Committee,
- FCAT Writing Content Advisory Committee,
- Florida Council of Teachers of English,
- Florida's Council of Language Arts Supervisors,
- Reading Supervisors of Florida,
- Statewide Advisory Committee for the Education of Exceptional Students, and
- K-12 district reading contacts.

Key Differences



1996	2006
Reading	Reading Process
Literature	Literary Analysis
Writing	Writing Process
Language	Writing Applications
Listening, Viewing & Speaking	Communication
	Information & Media Literacy

Florida's New Reading Standards, Guiding Research



- 1998 ~ Preventing Reading Difficulties in Young Children
- 2000 ~ Report of the National Reading Panel
- Basic findings:
 - Explicit instruction in the essential components of reading:
 - phonemic awareness,
 - phonics,
 - fluency,
 - Vocabulary, and
 - comprehension.

Key Differences: Reading

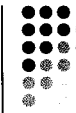


- The grade levels were clustered PK-2, 3-5, 6-8 and 9-12.
- There was more emphasis on verbs such as recognize, list, name, which are at the lower levels of Bloom's Taxonomy.
- The benchmarks were more global and theoretical.
- There are separate standards and benchmarks for grades K-8.
- Higher order thinking skills are addressed throughout. Verbs such as create, develop and analyze are used, which are at the higher levels of Bloom's Taxonomy.
- The benchmarks are explicit and can inform instruction.



Reading Process

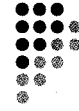
- Concepts of Print
 - ⦿ Standard: The student demonstrates knowledge of the concept of print and how it is organized and read.
- Phonological Awareness
 - ⦿ Standard: The student demonstrates phonological awareness.
- Phonemic Awareness
 - ⦿ Standard: The student demonstrates phonemic awareness.



Reading Process

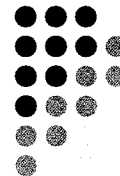
- Phonics/Word Analysis
 - ⦿ Standard: The student demonstrates knowledge of the alphabetic principle and applies grade level phonics skills to read text.
- Vocabulary Development
 - ⦿ Standard: The student uses multiple strategies to develop grade appropriate vocabulary.
- Reading Comprehension
 - ⦿ Standard: The student uses a variety of strategies to comprehend grade level text.

Florida's New Reading Standards, Example of Rigor



- 1996 second grade vocabulary benchmark example:
 - * The student uses knowledge of appropriate grade, age and developmental-level vocabulary in reading.
- 2006 second grade benchmark example:
 - * The student will:
 - use new vocabulary that is introduced and taught directly;
 - listen to, read and discuss familiar and conceptually challenging text;
 - use context clues to determine meanings of unfamiliar words;
 - categorize key vocabulary and identify features;
 - relate new vocabulary to familiar words;
 - identify base words and common prefixes to determine the meanings of prefixed words;
 - identify antonyms, synonyms and homophones;
 - determine the correct meanings of words with multiple meanings (e.g. mine) in context and
 - determine meanings of unfamiliar words by using a dictionary and digital tools.

Language Arts Standards



Literary Analysis

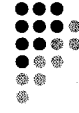


- Fiction
 - ⊗ Standard: The student identifies, analyzes, and applies knowledge of the elements of a variety of fiction and literary texts to develop a thoughtful response to a literary selection.
- Non-Fiction
 - ⊗ Standard: The student identifies, analyzes, and applies knowledge of the elements of a variety of non-fiction, informational, and expository texts to demonstrate an understanding of the information presented.

Writing Process



- Pre-Writing
 - ⊗ Standard: The student will use prewriting strategies to generate ideas and formulate a plan.
- Drafting
 - ⊗ Standard: The student will write a draft appropriate to the topic, audience, and purpose.
- Revising
 - ⊗ Standard: The student will revise and refine the draft for clarity and effectiveness.



Writing Process

- Editing for Language Conventions
 - ⦿ Standard: The student will edit and correct the draft for standard language conventions.
- Publishing
 - ⦿ Standard: The student will write a final product for the intended audience.



Writing Applications

- Creative
 - ⦿ Standard: The student develops and demonstrates creative writing.
- Informative
 - ⦿ Standard: The student develops and demonstrates informative writing that provides information related to real-world tasks.
- Persuasive
 - ⦿ Standard: The student develops and demonstrates persuasive writing that is used for the purpose of influencing the reader.

Communication



- Penmanship
 - ⊗ Standard: The student engages in the writing process and writes to communicate ideas and experiences.
- Listening and Speaking
 - ⊗ Standard: The student effectively applies listening and speaking strategies.

Information and Media Literacy



- Informational Text
 - ⊗ Standard: The student comprehends the wide array of informational text that is part of our day to day experiences.
- Research Process
 - ⊗ Standard: The student uses a systematic process for the collection, processing, and presentation of information.

Information and Media Literacy



- **Media Literacy**
 - ⊗ Standard: The student develops and demonstrates an understanding of media literacy as a life skill that is integral to informed decision making.
- **Technology**
 - ⊗ Standard: The student develops the essential technology skills for using and understanding conventional and current.

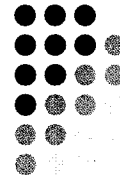
Access Points for Students with Significant Cognitive Disabilities



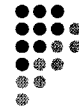
- Independent
- Supported
- Participatory

Revision of Mathematic Standards

Florida, Math Matters!



Florida's New Mathematics Standards, Timeline



- September 2006 – Framers
- October 2006 through January 2007 – Writers Draft K-7 Standards and Secondary Content Standards with Comment and Review from Framers
- February through March 2007 - Public Review and Mathematicians Review
- April through May 2007 – Revisions Based on Review
- June 2007 – Present New Standards to the State Board of Education

Florida, Math Matters!

Florida's New Mathematics Standards, Guiding Research



Research

- College Board
- International Center for Leadership in Education
- Singapore's Standards
- Fordham Foundation
- California, Indiana, and Massachusetts Standards
- Koret Task Force
- Achieve's America Diploma Project

Findings - Recommendations

- Too many topics, not enough depth, hodgepodge of topics with little coherence - vertically align topics
- Vague, not sufficiently detailed to guide curriculum – standards should be expressed succinctly, coherently, and with optimum brevity
- Lack of rigor - enhance the rigor from grade 5 on

Florida, Math Matters!

Example of Variation in Number of Grade Level Expectations (GLEs -grain size)



	1st	2nd	3rd	4th	5th	6th	7th	Mean
CA	25	31	38	43	27	36	40	34.3
FL	78	84	88	89	77	78	89	83.3
MO	20	27	31	33	34	38	34	31.0
MN	18	26	26	25	26	30	27	26.3
NY	56	45	52	56	67	64	63	56.4
KS	57	59	57	56	60	69	74	61.7

Mean number of GLEs by grade level across all 42 state documents: 47

Florida, Math Matters!

Florida's New Mathematics Standards: Key Differences (Draft)



Out With the Old

- Grade Clusters: K-2, 3-5, 6-8, 9-12
- Old Strands:
 - ✦ Number Sense, Concepts, and Operations;
 - ✦ Measurement;
 - ✦ Algebraic Thinking;
 - ✦ Geometry and Spatial Sense; and
 - ✦ Data Analysis and Probability

In With the New

- Grade specific: K-7, Content specific Algebra through Calculus
- New "Big Ideas" K – 7, which may be different as content progresses;
- Secondary:
 - ✦ Algebra
 - ✦ Geometry
 - ✦ Trigonometry
 - ✦ Statistics
 - ✦ Discrete Math
 - ✦ Financial Literacy
 - ✦ Calculus

Florida's New Mathematics Standards, Example of Increase Conciseness and Rigor (Draft)



Out With the Old

3. Knows about measurement of time including A.M. and P.M., clocks and calendars

Data Analysis and Probability

Analyzes real-world data and makes predictions of larger populations by applying formulas to calculate measures of central tendency and dispersion using the sample population data, and using appropriate technology, including calculators and computers.

Florida, Math Matters!

In With the New

3. Tells time to the nearest minute and determines amount of time elapsed

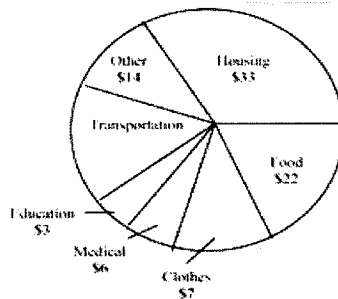
Statistics – Summarizing Data

Calculate and interpret measures of variance and standard deviation. Use these measures to make comparisons among sets of data.

U.S. Textbook Problems Emphasize Mechanical Formulas: Gr. 6 Pie Chart Requires Summing to a Total



Cost of Raising a Child to Age 18 (for each \$100)

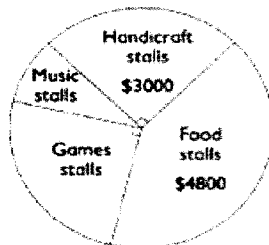


- What is the cost of transportation?
- For each \$100 a parent spends raising a child to age 18, how much more is spent on housing and clothes than on education?
- TEST PREP. For each \$300 spent, estimate how much is spent for food and clothes
1) \$329 2) \$90 3) \$29 4) \$130
- Which costs are about twice as much as the cost of education? Five times as much? Eleven times as much?

Singapore Textbooks Use Scaffolding Within Multi-step Problems : Gr. 6 Pie Chart Problem Incorporating Angles



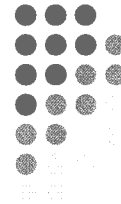
The pie chart represents the amount of money collected by various stalls at a funfair.



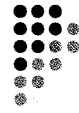
- What fraction of the total amount of money was collected by the games stalls?
- What was the total amount of money collected by the various stalls?
- How much money was collected by the music stalls?
- What was the ratio of the money collected by the food stalls to the money collected by the handcraft stalls?

Source: Singaporemath.com Inc (2003). *Active Primary Math Series*

Issues and Solutions



Major Areas of Interest!



- 2007-2008 Florida 9th grade students will be enrolling for the first time in major areas of interest

$$16 + 4 + 4 = 24 \text{ Credits}$$

↑
Core Classes

↑
MAI

↑
Other Electives

↑
Total

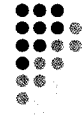
Accomplishments!



- 180 state-approved major areas of interest utilizing the current courses in the state's course code directory
- Electronic submission process for district proposals
- 50 districts submitted over 700 more!
- Review and final approval of 262 more
- 442 state-approved major areas of interest available to all districts
- Data analysis listing all major areas of interest available in each school based on current course offerings....average 130 plus 89 more if one or two courses were added!

Let's Take a Look!

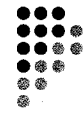
What made this possible?



- Hard and efficient work by dedicated educators
- Hard and efficient work by dedicated database managers
- Decision that only an electronic tool could manage all this information
- Decision that this electronic tool must track student enrollment and progress
- Decision that this electronic system must “talk” to other MIS systems where student course enrollment and transcripts are managed as well as FACTS.org

TEAMWORK!

This Same Process Will Align Florida's Standards to Instruction



- Approved standards are placed in a database and assigned a level of rigor
- Course descriptions are built from this database and assigned a course rigor level based on the standards covered in the course
- Course exit exams are built from course descriptions
- Course descriptions define approved curriculum resources
- Course descriptions guide teacher professional development and required content knowledge



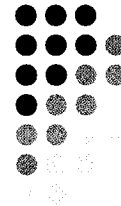
Dr. Frank Fuller

Dr. Frank Fuller has 37 years experience in public and charter schools. In those 37 years, Frank has held the following positions: teacher, assistant principal, elementary school principal, middle school principal, high school principal, district “lead” principal, assistant superintendent, charter school director, adjunct professor and visiting clinical professor.

Currently, Frank is the Assistant Superintendent of Non-Traditional Schools/CHOICE for the Okaloosa District School Board, Florida (www.okaloosaschools.com). Dr. Fuller’s current duties include management of the state and national award winning career educational project – CHOICE (www.choiceinstitutes.com).

Professional Development

Process for Implementing
The New Sunshine State
Standards

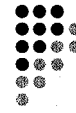


Professional Development

- Closing the Gap Between Standards and Student Achievement
- Increasing student achievement and supporting instructional staff
 - Upgrading the skills and knowledge of teachers to reach world class standards in education
 - Including high quality trainers, training, and appropriate follow-up and coaching



All Florida teachers will need intense professional development.



- Train the Trainer models
 - During the summer and school year
- Coordinate with statewide advisory groups such as:
 - Reading Supervisors
 - Association of School Administrators
 - Superintendent and School Board Associations
 - FL Council of Teachers of English
 - FL Association of Media and Education
 - Council of Language Arts Supervisors

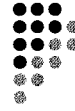
Initial Training



- Includes a “Crosswalk” from the 1996 Sunshine State Standards to the New Sunshine State Standards
- Alignment of resources and lesson plans
- Differentiated instructional strategies for meeting the needs of diverse populations

Proposed K-8 Professional Development Timeline

RLA = Reading and Language Arts SS = Social Studies

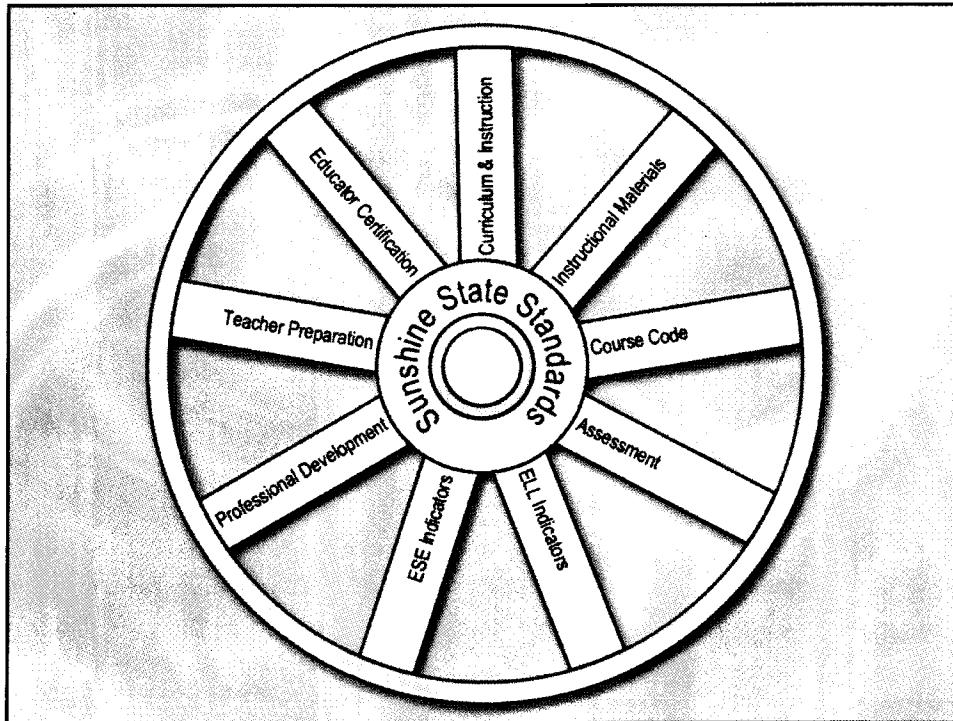


	2007-08	2008-09	2009-10	2010-11
K	Math	Science	RLA/SS	
1	RLA	Math	Science	SS
2		RLA	Math	Science
3	Math	Science	RLA/SS	
4	RLA	Math	Science	SS
5		RLA	Math	Science
6	Math	Science	RLA/SS	
7	RLA	Math	Science	SS
8		RLA	Math	Science

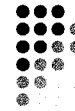
Proposed Systematic Training Plan for 9-12 Teachers



Content Topics	2007-08	2008-09	2009-10	2010-11	2011-12
Reading	X			X	
Writing		X			X
Literature			X		
Information Literacy			X		
Algebra	X			X	
Geometry		X			X
Financial Literacy	X			X	
Trigonometry			X		
Statistics		X			X
Calculus	X				
Discrete Math			X		
Physics/Chemistry		X		X	
Biology			X		
Earth/Space				X	
History			X		
Economics				X	
Geography				X	
Political Science					X

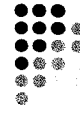


Developing World Class Curriculum



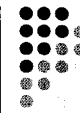
- Curriculum
 - ⊗ Rigorous content students for all students
 - ⊗ Redesign of the course code system
 - ⊗ Alignment of instructional materials with standards
- Assessment
 - ⊗ Florida Comprehensive Achievement Test
 - ⊗ Alternative assessment for Exceptional Student Education
 - ⊗ Comprehensive English Language Learning Assessment
- Educators
 - ⊗ Educator Certification
 - ⊗ Teacher Preparation
 - ⊗ Professional Development

Developing World Class Curriculum



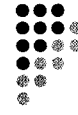
- Critical Thinking
- Problem Solving
- Innovation Skills
- Communication Skills
- Collaborative Skills
- Global Awareness
- Self-Direction

Teachers must be enabled to:



- access data and resources to develop curricula and instructional materials;
- use the Internet and other technology to communicate with parents, other teachers, principals, and administrators;
- retrieve Internet-based learning resources; and
- lead to improvements in classroom instruction in the core academic subjects, that effectively prepare students to meet challenging State academic content and student academic achievement standards.

As defined by "No Child Left Behind"



Educational Resources

- Students and teachers need access to modern tools for the classroom
 - ⊗ Computers
 - ⊗ Technology devices
 - ⊗ Productivity software
- Parent training and involvement in the curriculum
- Guidelines for school libraries

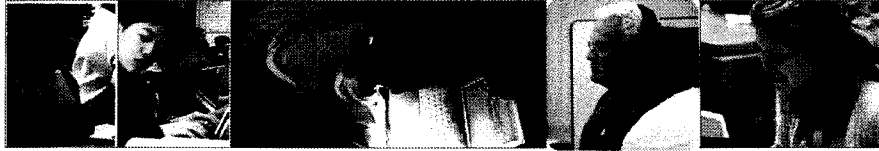


Educational Resources

- Digital content aligned to the academic standards
 - ⊗ Lesson Plans
 - ⊗ Learning Exercises
 - ⊗ Images
 - ⊗ Podcasts
 - ⊗ Videos
 - ⊗ Animations
 - ⊗ Simulations

Florida's Digital Warehouse

Transforming education through technology



Lesson Plans
Standards based lessons for integrating technology in the classroom.



Instructional Materials
Digital content for teachers to use in the curriculum.




Student Work
Videos, animations, and photos created by Florida's students.



Professional Development
Videos, handouts, and web links to educator training in the curriculum areas and technology.

Florida Digital Warehouse ▶ Lesson Plan ▶ Grade 8 ▶ Math



Grade 8 Mathematics

Links

Florida Center for Mathematics and Science
National Council of Teachers of Mathematics

Animation
Audio
Image
Presentation
Simulation
Text
Video

Title	Time	Standard	Author	Access
Baseball Proportion	45:00	MA.A.3.3.3	Pinellas County Teacher	Download
Bubbles	35:00	MA.B.3.3.1	Liberty County Teacher	Download
Bungee m&ms	15:00	MA.D.2.3.1	Florida Digital Educator	Download
Cylinder	55:00	MA.B.3.3.1	Alachua County Teacher	Download
Drops on a Penny	40:00	MA.E.1.3.1	PAEC	Download
Exploring Linear Equations	45:00	MA.D.2.3.2	FCMS	Download
Famous People	20:00	MA.A.4.3.1	Hillsborough County Teacher	Download
Get a Half Life	50:00	MA.A.3.3.3	Madison County Teacher	Download
Go Fish	15:00	MA.A.3.3.2	NEFEC	Download
Hands on Equations	45:00	MA.D.1.3.1	Duval County Teacher	Download
Human Coordinate Plane	35:00	MA.C.3.3.2	FCMS	Download
A Human Number Line	45:00	MA.A.1.3.4	Hendry County Teacher	Download
Line Up	55:00	MA.A.1.3.4	Escambia County Teacher	Download



Grade 8 Mathematics

Links

Florida Center for Mathematics and Science
National Council of Teachers of Mathematics

Animation

Audio

Image

Presentation

Simulation

Text

Video

Hands on Equations

One & Two Step Equations
Overview of the Lesson

Title	Time	Standard	Author	Access
Baseball Proportion	45:00	MA.A.3.3.3	Pinellas County	Download
Bubbles	35:00	MA.B.3.3.1	Liberty County Teacher	Download
Bungee m&ms	15:00	MA.D.2.3.1	Florida Digital	Download
Cylinder	55:00	MA.B.3.3.1	Alachua County	Download
Drops on a Penny	40:00	MA.E.1.3.1	PAEC	Download
Exploring Linear	45:00	MA.D.2.3.2	FCMS	Download
Famous People	20:00	MA.A.4.3.1	Hillsborough County	Download
Get a Half Life	50:00	MA.A.3.3.3	Madison County	Download
Go Fish	15:00	MA.A.3.3.2	NEFEC	Download
Hands on Equations	45:00	MA.D.1.3.1	Duval County Teacher	Download
Human Coordinate	35:00	MA.C.3.3.2	FCMS	Download
A Human Number	45:00	MA.A.1.3.4	Hendry County	Download
Line Up	55:00	MA.A.1.3.4	Escambia County	Download



Lit 2 Go

Links

Just Read! Florida
Florida Center for Reading Research

Animation

Audio

Image

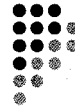
Presentation

Simulation

Text

Video

Title	Time	Standard	Author	Access
The Boy's Live of Lincoln	05:53		Unknown	Download
The Cat and Mouse	01:30		Unknown	Download
The Chimes: A Goblin Story,	11:53		Charles Dickens	Download
Christopher Columbus: Part 1	05:32		Wilbur F. Gordy	Download
Christopher Columbus: Part 2	06:41		Wilbur F. Gordy	Download
Coffee and Tea	00:10		Unknown	Download
The Emperor's New Clothes	11:09		Hans Christian Anderson	Download
Fire! Fire! Burn Stick!	04:14		Unknown	Download
Hernando De Soto	04:46		Wilbur F. Gordy	Download
Humpty Dumpty	00:12		Unknown	Download
Jabberwocky	01:21		Lewis Carroll	Download
The Kilkenny Cats	00:17		Unknown	Download
Miss Muffet	00:12		Unknown	Download
Old King Cole	00:23		Unknown	Download



Issues and Concerns

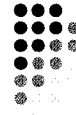
- Student access to 21st Century Skills
- Students performing below the average in PISA 2003
 - ⊗ with limited access to computers
 - ⊗ shortest experience on using computers
 - ⊗ low frequency use of computers at home
 - ⊗ low confidence in their ability to undertake routine tasks on the computer



Textbook Adoption

	Textbook Production	State provides list of approved textbooks	Choice of books for use in classroom	Textbook Provision
Finland	State and commercial	No	Teachers - free choice	School provides at primary level
New Zealand	State and commercial	No	Teachers- free choice	School provides (loaned, parents contribute for damage)
Singapore	State and commercial with state approval	State prescribes content and produces Approved Textbook List	Teachers - from Approved Textbook List	Parents buy, free for needy
Florida	Commercial	State adoption review process	Districts must opt 50% of funds from adopted list and 50% from non-adopted	District provides

Issues and Concerns



- A++ Funding
 - ⊛ \$1,400,000 for standard revisions (\$700,000 to revise standards – two subject areas in 2007)
 - ⊛ \$600,000 for Personnel – Subject Areas Specialists – an additional 8 positions will be necessary to support implementation annually
- Professional Development
 - ⊛ \$350,000 for Master Trainers at the District Level plus \$1,250,000 for “school leaders” per subject area
 - ⊛ \$175,000,000 for all subject area teachers annually (Three-day summer academy and two-day school year follow-up.)

Florida's New Standards

Rigorous
Measurable
Clear and Concise

Increased Student Achievement in Florida

