

**2012 R. Tait McKenzie
Memorial Lecture Introduction**

AAHPERD CEO Paul Roetert



www.aaahperd.org

2012 R. Tait McKenzie

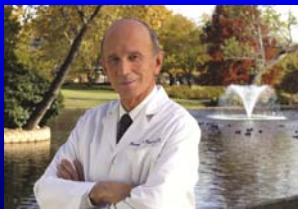
Memorial Lecture



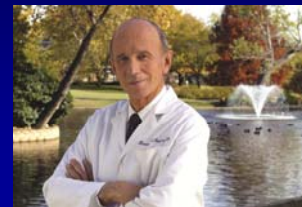
Kenneth H. Cooper, M.D., M.P.H.

**Founder and Chairman
Cooper Aerobics Center**

www.CooperAerobics.com



**Texas Youth Evaluation Project
2008 / 2010**



How is Obesity Determined?

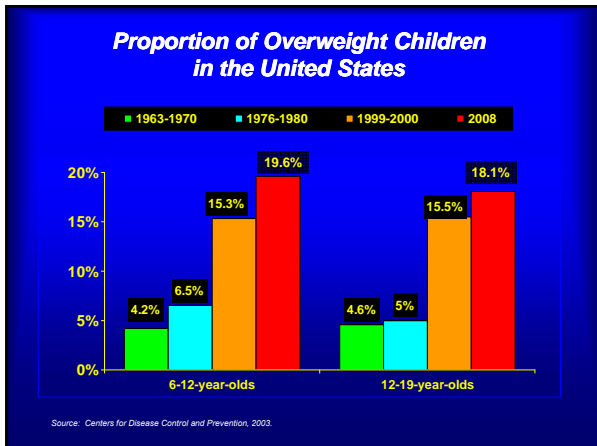
Body Mass Index

$$\text{BMI} = \frac{\text{(Weight in pounds)}}{\text{(Height in inches)} \times \text{(Height in inches)}} \times 703$$

OR

**PERCENT BODY FAT as determined by skinfold
measurements**

Obese: Top 5 percentile
Overweight: Top 15 percentile



“... obesity rates for children 6 to 11 years old are estimated to have increased from 15.1 to 18.8 percent between 1999 and 2004. The Department of Health and Human Services estimates that 20 percent of children and youth in the United States will be obese by 2010.

“... According to one estimate, insured children treated for obesity are approximately three times more expensive for the health system than the average insured child.”

— USGAO, “Childhood Obesity and Physical Activity,” Dec. 6, 2006

States with Highest Obesity Rate (Children 10 – 17 Years)

Ranking	State	% of Children
1	Mississippi	21.9%
2	Georgia	21.3%
3	Kentucky	21.0%
7 (tie)	Texas	20.4%

Source: Trust for America's Health, How Obesity Threatens America's Future 2010

Obesity Among Texas Children (Overweight & Obese), 2005

4 th Grade	8 th Grade	11 th Grade
42 %	39 %	36 %

70 % of these children will become obese as adults.

Source: Texas Comptroller of Public Accounts and U.S. Centers for Disease Control and Prevention Texas Medicine, June 2007, p. 24

There is an epidemic of adult-onset diabetes being seen in children. It is estimated that among children born after the year 2000:

- 1 out of 3 children will develop diabetes (higher in Hispanics and African-Americans)

If they develop adult-onset diabetes before 14 years of age, it is estimated that that will shorten their lifespan by 17 to 27 years. As a result, this may be the first generation in which parents live longer than their children.

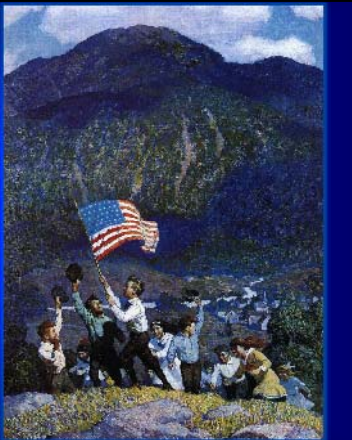
Child Obesity Problem Worse Than Thought

- Rising in Every Group
- Heaviest:
 - Black Teenage Girls
 - Hispanic Teenage Boys

Journal of Pediatrics, March 2010

"America's Greatest
Wealth is in Her
Healthy Children"

– N.C. Wyeth, c. 1925



Stanford Achievement Test Ninth Edition (SAT-9) 2004

FITNESSGRAM® Tests AEROBIC CAPACITY

#1 PACER (Progressive Aerobic Cardiovascular Endurance Run)

Set to music, a paced, 20-meter shuttle run increasing in intensity as time progresses.

Or:

- **One-Mile Run**
Students run (or walk if needed) one mile as fast as they can.
- **Walk Test**
Students walk one mile as fast as they can (for ages 13 or above since the test has only been validated for this age group).

FITNESSGRAM® Tests BODY COMPOSITION

#2 Skin Fold Test

Measuring percent body fat by testing the triceps and calf areas.



Or:

- **Body Mass Index (BMI)**
Calculated from height and weight

FITNESSGRAM® Tests MUSCULAR STRENGTH AND ENDURANCE

#3 Curl-Up

Measuring abdominal strength and endurance, students lie down with knees bent and feet unanchored.

Set to a specified pace, students complete as many repetitions as possible to a maximum of 75.



FITNESSGRAM® Tests MUSCULAR STRENGTH AND ENDURANCE

#4 Trunk Lift

Measuring trunk extensor strength, students lie face down and slowly raise their upper body long enough for the tester to measure the distance between the floor and the student's chin.



FITNESSGRAM® Tests


MUSCULAR STRENGTH AND ENDURANCE

#5 Push-Up

Measuring upper body strength and endurance, students lower body to a 90-degree elbow angle and push up. Set to a specific pace, students complete as many repetitions as possible.

Or:

- Modified Pull-Up (proper equipment required)**
With hands on a low bar, legs straight and feet touching the ground, students pull up as many repetitions as possible.
- Flexed Arm Hang**
Students hang their chin above a bar as long as possible.



FITNESSGRAM® Tests


FLEXIBILITY

#6 Back-Saver Sit and Reach

Testing one leg at a time, students sit with one knee bent and one leg straight against a box and reach forward.

Or:

- Shoulder Stretch**
With one arm over the shoulder and one arm tucked under behind the back, students try to touch their fingers and then alternate arms.



Jason Jigger
Grade: 5 Age: 10
IG School: [redacted]
Instructor: Mary Anderson
Date: 3/22/11 Weight: 125 lbs
Current: 3/22/11 Height: 5'11" IG Score: 125
Test: 3/22/11

REPORT FOR PARENTS

People score in all phases and skills, but measures not based on regular physical activity and a healthy level of physical fitness. The FITNESSGRAM® includes aerobic capacity, trunk strength, muscular endurance, flexibility, and body composition. This report will help you understand your child's overall health-related fitness skills. You will also see information on how to improve your child's fitness skills.

REPORT FOR STUDENT

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HEALTHY FITNESS ZONE

Aerobic Capacity (V02 Max)
Current: 40.0
Healthy Fitness Zone: 40.0-50.0
Needs Improvement - High Risk: 30.0-40.0
Needs Improvement - Some Risk: 20.0-30.0
Previous Standard: 10.0-20.0

Pacer Lap
Current: 1:15
Healthy Fitness Zone: 1:15-1:30
Needs Improvement - High Risk: 1:30-1:45
Needs Improvement - Some Risk: 1:45-2:00
Previous Standard: 2:00-2:15

Abdominal/Curl-Up
Current: 14
Healthy Fitness Zone: 14-20
Needs Improvement - High Risk: 10-14
Needs Improvement - Some Risk: 6-10
Previous Standard: 6-10

Trunk Extension/Trunk Lift
Current: 11
Healthy Fitness Zone: 11-15
Needs Improvement - High Risk: 7-11
Needs Improvement - Some Risk: 3-7
Previous Standard: 3-7

Elbow Body/Push-Up
Current: 11
Healthy Fitness Zone: 11-15
Needs Improvement - High Risk: 7-11
Needs Improvement - Some Risk: 3-7
Previous Standard: 3-7

Flexibility (Back-Saver Sit and Reach R/L)
Current: 11.0
Healthy Fitness Zone: 11.0-15.0
Needs Improvement - High Risk: 7.0-11.0
Needs Improvement - Some Risk: 3.0-7.0
Previous Standard: 3.0-7.0

Body Mass Index
Current: 20.2
Healthy Fitness Zone: 18.0-22.0
Needs Improvement - High Risk: 16.0-18.0
Needs Improvement - Some Risk: 14.0-16.0
Previous Standard: 14.0-16.0

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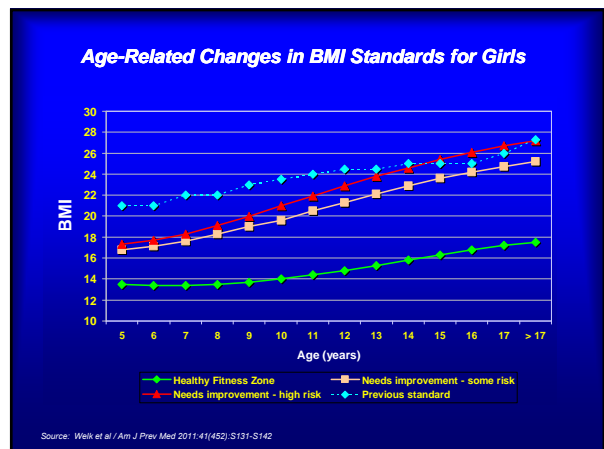
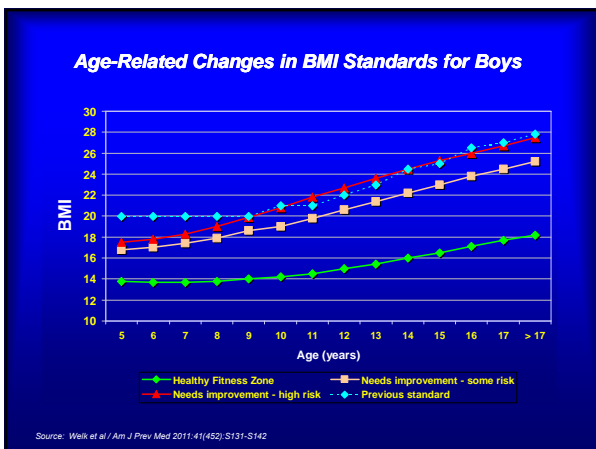
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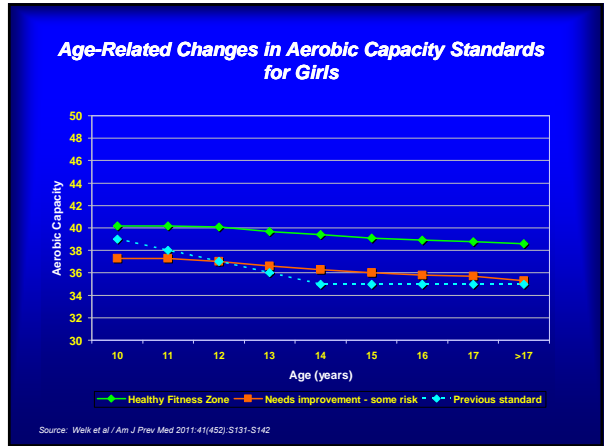
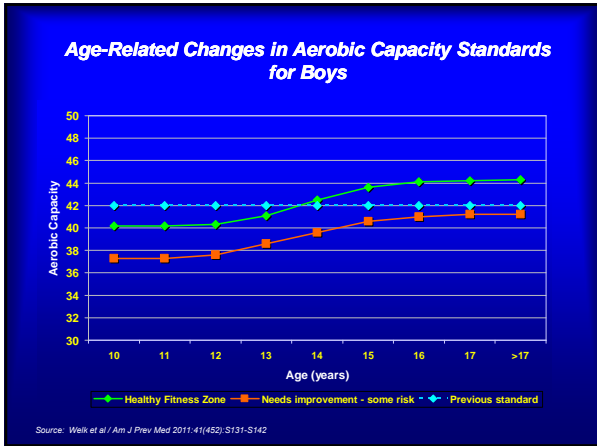
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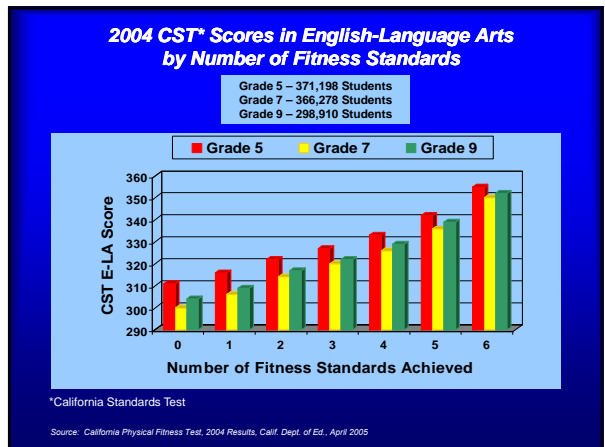
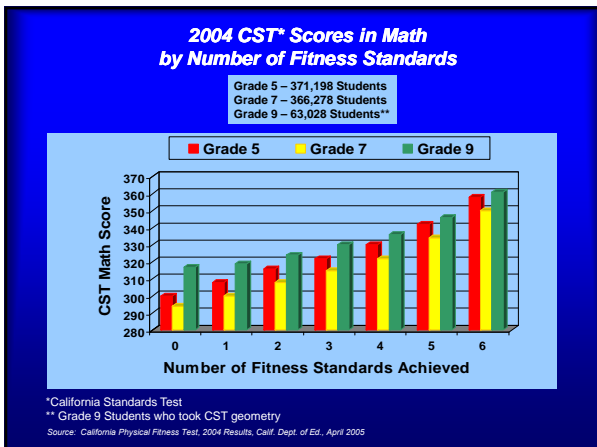
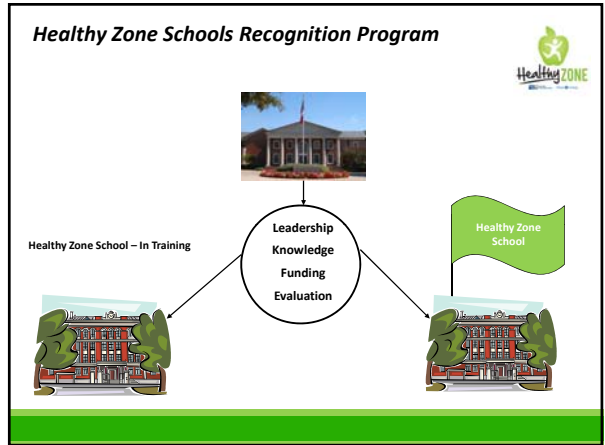
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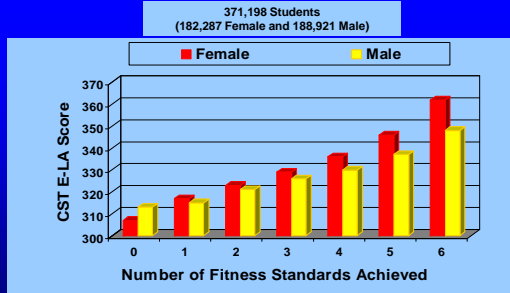




www.NFLPlay60Fitnessgram.com

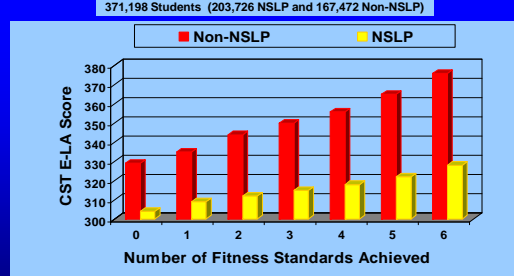


**2004 CST* Scores in English-Language Arts in Grade 5
By Gender and Number of Fitness Standards**



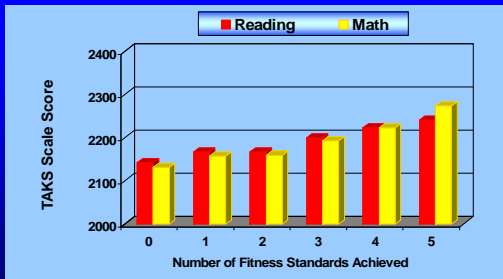
*California Standards Test
Results using math scores were consistent with those using English-Language Arts scores.
Results for seventh- and ninth-grade students were consistent with those for fifth graders.
Source: California Physical Fitness Test, 2004 Results, Calif. Dept. of Ed., April 2005

**2004 CST* Scores in English-Language Arts in Grade 5
by Socioeconomic Status** and Number of Fitness Standards**



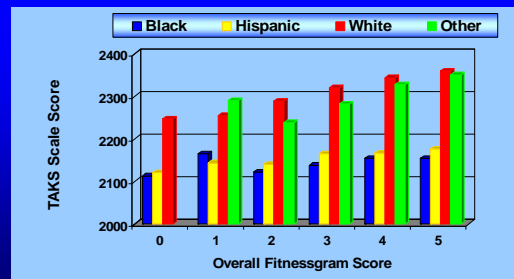
*California Standards Test
**National School Lunch Program
Results using math scores were consistent with those using English-Language Arts scores.
Results for seventh- and ninth-grade students were consistent with those for fifth graders.
Source: California Physical Fitness Test, 2004 Results, Calif. Dept. of Ed., April 2005

**2006 TAKS Scores in Reading and Math
Austin, Texas ISD
8189 5th and 7th Grade Students**



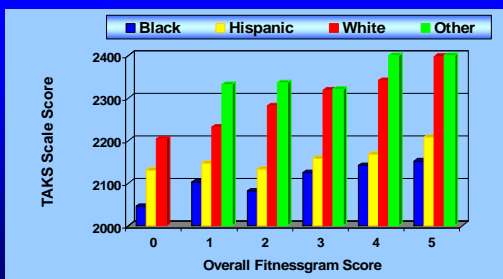
Source: DPE Publication Number 06.07 2/16/07

**2006 TAKS Reading Scores by Ethnicity
Austin, Texas ISD
8189 5th and 7th Grade Students**



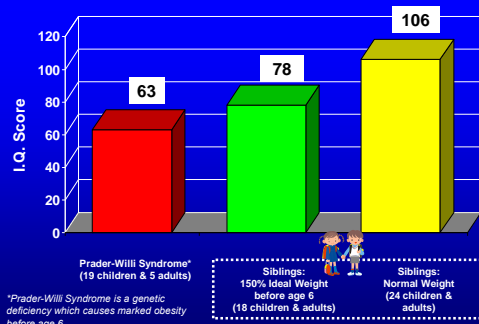
Source: DPE Publication Number 06.07 2/16/07

**2006 TAKS Math Scores by Ethnicity
Austin, Texas ISD
8189 5th and 7th Grade Students**



Source: DPE Publication Number 06.07 2/16/07

Early-Onset Obesity and Its Effect on I.Q.



*Prader-Willi Syndrome is a genetic deficiency which causes marked obesity before age 6.

Source: Miller, et al. J of Ped. Vol. 149, Issue 2, Aug 2006, 192-198.e3

"... discovered a link between marked obesity in toddlers and lower IQ scores, cognitive delays, and brain lesions similar to those seen in Alzheimer's disease patients."

Source: Miller, et al, *J of Ped.* Vol. 149, Issue 2, Aug 2006, 192-198.e3

"... emerging research showing that physical activity sparks biological changes that encourage brain cells to bind to one another. For the brain to learn, these connections must be made."

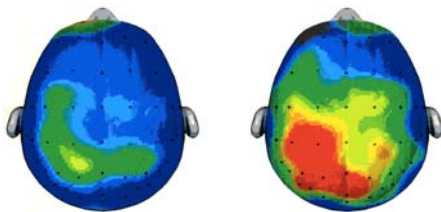
"... exercise provides an unparalleled stimulus, creating an environment in which the brain is ready, willing, and able to learn."

"Exercise is fertilizer for the brain."

*Spark: The Revolutionary New Science of Exercise and the Brain, John J. Ratey, MD, 2008.

Increasing Physical Activity

Brain after sitting quietly Brain after 20 minute walk

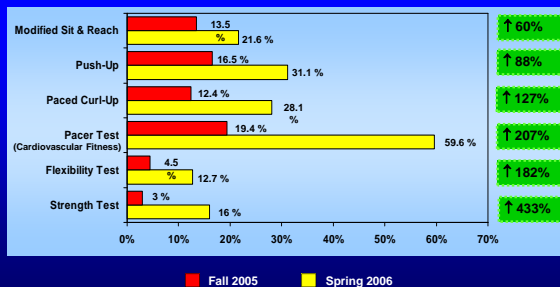


Articles: Physically Fit Students & Academics

1. Christian K. Roberts, et al, "Low Aerobic Fitness and Obesity Are Associated with Lower Standardized Test Scores in Children," *The Journal of Pediatrics* Vol. 156, Issue 5 (May 2010): 711-718.e1.
2. Lesley Cottrell, Ph.D., Assoc. Prof., Pediatrics, University of West Virginia, Morgantown, *American Heart Association's 2010 Conference on Nutrition, Physical Activity and Metabolism*, San Francisco, CA, March 2, 2010.
3. American Heart Association, "Fact Sheet: Physical Education in Public Schools," March 1, 2010.
4. Dawn Podulka Coe, et al, "Effect of Physical Education and Activity Levels on Academic Achievement in Children," *Medicine & Science in Sports & Exercise* 38(8), (December 2009/January 2010): 1515-1519.
5. Virginia R. Chomitz, Ph.D., et al, "Is there a Relationship Between Physical Fitness and Academic Achievement? Positive Results from Public School Children in the Northeastern United States," *Journal of School Health* Vol 79, No. 1 (January 2009): 30-37.
6. Darla M. Castelli, et al, "Physical Fitness and Academic Achievement in Third- and Fifth-Grade Students," *Journal of Sport & Exercise Physiology* Vol. 29, No. (2) (Apr 2007): 239-252.
7. J.B. Grissom, "Physical Fitness and Academic Achievement," *Journal of Exercise Physiologyonline* Vol. 8, No. 1 (February 2005): 11-25.

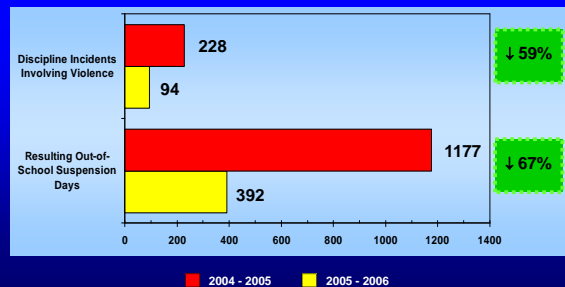
Fitnessgram Results: Percentage of Students in Healthy Fitness Zone

Woodland Elementary School, Kansas City PSD #33
Fall 2005 – Spring 2006, Grades 4 and 5



Fitnessgram Results: Percent Reduction in Disciplinary Issues

Woodland Elementary School, Kansas City PSD #33
Fall 2005 – Spring 2006, Grades 4 and 5



Results

"PE4Life has had a tremendous influence on the lives of our students. It's not just the increased levels of fitness we are seeing in our kids which has everyone excited. Students are also more motivated throughout the day, their enthusiasm is way up, and discipline issues are way down."

— Craig Rupert
(Principal, Woodland Elementary School)

Cooper High School

Summary of a 10-week program focusing on students' FITNESSGRAM scores and overall performance



Cooper Fitness Center®
Exercise with a Purpose
at Craig Ranch

Cooper High School

- "I've lost 6 pounds already!" (after 2 weeks of program participation)
- "Do we get to keep coming after December? I need this program for my life. I don't know enough yet to do this on my own."
- "Without you guys, I might end up dead in a ditch somewhere, but now I am getting healthy and I am taking care of myself."
- "Can we bring friends to join the program next semester? I have some people who would like to come."

Cooper High School

- "We would like nutritional information. How can I eat healthy when I have to eat what my mom buys? I need to learn ways to make healthy choices."
- "Please, please please! Let us come back in January!"
- I am sad this is our last night. I hope we can come back and continue to work together and motivate each other."
- "We are on this journey together and we won't let each other fail. This experience is going to make us friends for life. We are going to get healthy together and we have made a bond that will never go away."



Senate Bill 530

**Passed by Texas State
House of Representatives and
Senate on May 27, 2007**

**Signed into Law by
Governor Rick Perry
on June 13, 2007**

**Fitnessgram® approved as official testing
vehicle by the Texas Education Agency
on September 27, 2007**

Senate Bill 530

Exercise Requirements (Sep 2007)

Grades K – 5

- 30 minutes 5 times/week or
- 45 minutes 3 times/week (135 minutes total)
- 225 minutes over 2 weeks (45 minutes 3 times the first week, 45 minutes 2 times the second week)

Grades 6 – 8

- Same as above, but only 4 of 6 semesters are required

Grades 9 – 12

- No physical education requirement

Testing Requirements (using the Fitnessgram®)

- Beginning in the 2007-08 school year, all students grades 3 - 12 will be required to be tested annually at some time during the school year.

Texas Education Agency Approved Coordinated School Health Programs

- **Bienestar**
- **CATCH**
- **Healthy & Wise**
- **Great Body Shop**



Texas Youth Evaluation Project 2008
Total # of Students Grades 3-12: 2,658,665

Grade	FITNESSGRAM® Test Total # of 2,658,665		
	Total	Girls	Boys
3	331,379	162,429	168,950
4	325,558	159,176	166,382
5	321,096	157,724	163,372
6	298,930	146,881	152,049
7	287,952	141,136	146,816
8	265,853	129,227	136,626
9	272,255	130,877	141,378
10	219,119	106,986	112,133
11	184,379	90,717	93,662
12	152,144	75,673	76,471

6,532 campuses out of 9,212 (70.91%)
1,074 districts out of 1,267 (84.77%)

Texas Youth Evaluation Project 2008
Total # of Students Grades 3-12: 2,658,665

Grade	FITNESSGRAM® Test % Achieving Healthy Fitness Zone on all 6 tests		
	Total # Students	Girls	Boys
3	102,342	33.25	28.60
4	80,539	28.50	21.14
5	66,798	23.82	17.89
6	60,663	23.08	17.60
7	55,441	21.32	17.26
8	48,971	18.99	17.88
9	39,456	13.90	15.04
10	28,650	12.42	13.70
11	21,152	10.68	12.24
12	13,040	8.18	8.96

6,532 campuses out of 9,212 (70.91%)
1,074 districts out of 1,267 (84.77%)

Grade	2007-2008 Data			2008-2009 Data			2009-2010 Data		
	Total	Girls	Boys	Total	Girls	Boys	Total	Girls	Boys
3	102,342	33.25	28.60	116,096	36.42	30.89	119,401	37.27	30.98
4	80,539	28.50	21.14	95,842	33.53	24.55	102,709	34.22	25.26
5	66,798	23.82	17.89	79,281	28.02	20.85	87,389	30.12	21.81
6	60,663	23.08	17.60	75,610	28.20	20.55	83,982	30.23	21.7
7	55,441	21.32	17.26	66,950	26.01	19.58	76,555	28.14	21.42
8	48,971	18.99	17.88	60,004	22.28	19.80	67,218	24.18	21.62
9	39,456	13.90	15.04	46,206	16.25	16.14	48,278	17.04	15.71
10	28,650	12.42	13.70	32,865	13.33	13.88	32,069	13.16	12.98
11	21,152	10.68	12.24	24,416	11.10	12.16	23,431	10.6	11.14
12	13,040	8.18	8.96	15,468	8.78	9.25	15,214	8.07	8.54

Boys Followed from Grades 3-5, 8-10

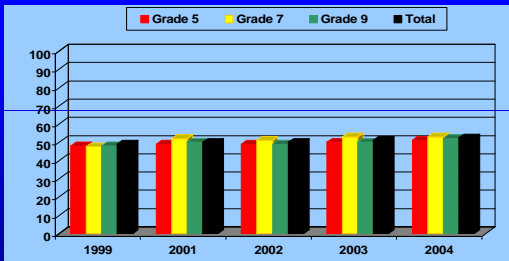
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Percentage of California Students Passing 5 or 6 FITNESSGRAM Tests*



*California Physical Fitness Tests Results, 2005

Source: Research Quarterly for Exercise and Sport, Dec 2005, p. 383.

Los Angeles Times CALIFORNIA

31% in state pass student fitness test

Schools Slog: Tom Tomasko seeks to improve results by having celebrity athletes promote P.E.

LOS ANGELES (AP) — The state's fitness standards are being tested by a new fitness test that will be used to measure whether students are getting enough physical education. The test is part of a new law that requires schools to provide 20 minutes of physical education each day for students in grades K-12.

The new law also requires schools to provide 20 minutes of physical education each day for students in grades K-12. The law is part of a new law that requires schools to provide 20 minutes of physical education each day for students in grades K-12.

FITNESSGRAM® Test 2008 Achieved "Healthy Fitness Zone" in all 6 Tests Boys: 25,000±

Grade	El Paso ISD	Statewide
3	55.79	27.64
4	53.89	20.36
5	55.90	17.29
6	44.35	17.10
7	38.43	16.93
8	39.34	17.55
9	27.60	14.40
10	19.43	13.12
11	20.73	11.71
12	11.65	8.56

FITNESSGRAM® Test 2008 Achieved "Healthy Fitness Zone" in all 6 Tests Girls: 22,000±

Grade	El Paso ISD	Statewide
3	69.47	32.09
4	68.43	27.40
5	55.76	23.03
6	56.11	22.59
7	48.59	20.93
8	41.65	18.70
9	23.11	13.40
10	29.26	11.94
11	20.10	10.25
12	10.29	7.82

El Paso Independent School District Physical Education Program Elements

Exercise Requirements

Grades K – 5

- 45 minutes/day taught by a **Certified Physical Education Teacher**
- Daily recess 15-20 minutes
- United States Tennis Association (USTA) Partnership – (provides skill development for students)

Grades 6 – 7

- 50 minutes daily or 90 minutes every other day
- United States Tennis Association (USTA) Partnership

Grade 8

- One semester 50 minutes daily or 90 minutes every other day

Grades 9 – 12

- 1-1/2 credits of physical education are required (less than 35% of the students actually take a P.E. class). Other activities allow them to waive this requirement.

Testing Requirements (using the Fitnessgram®)

- All students grades 3 – 12 will be tested annually.

Texas Education Agency Physical Fitness Assessment Initiative

10 Variables Compared with Levels of Fitness

- Attendance Rate
- Eligible for free lunch program
- Eligible for reduced lunch program
- TAKS
- Occurrence of substance abuse
- Occurrence of violence
- Occurrence of weapons
- Occurrence of truancy
- Obesity
- Diabetes

The Dallas Morning News
Tuesday, March 10, 2009

Study: Fit kids do better in school

TEA cites improved learning, behavior, arts teachers for more PE.

By **TERENCE LUTZ**

ALBANY — These students who are physically fit are more likely to do well on achievement tests and less likely to have disciplinary problems, according to a study released Monday by the Texas Education Agency.

Based on annual physical fitness assessments of more than 2 million students in the state, the agency reported that students with a higher percentage of students in shape also had higher scores on standardized tests and fewer disciplinary problems, according to the Texas Department of Education and Skills.

Schools with a higher percentage of students in shape also had higher scores on standardized tests and fewer disciplinary problems, according to the Texas Department of Education and Skills.

“More and more requirements have been created for the opportunity for students and schools to meet and for ways into their schools,” said Richard P. Smith, director of the Texas Department of Education and Skills.

He also criticized the growing practice of pulling students

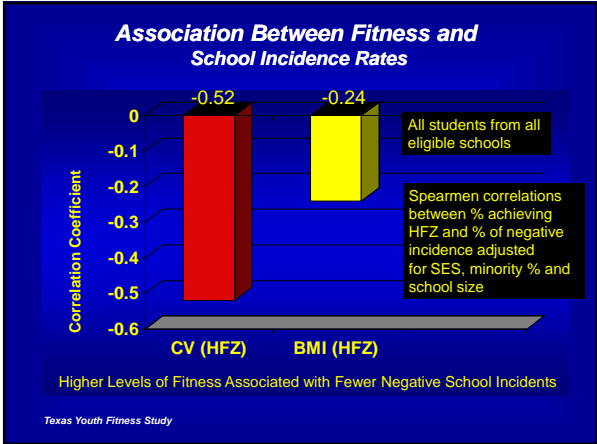
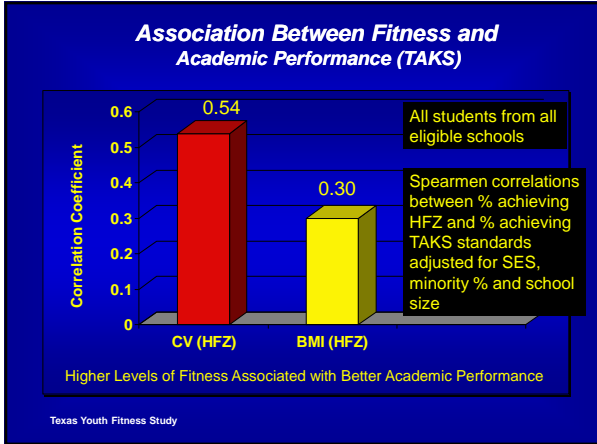
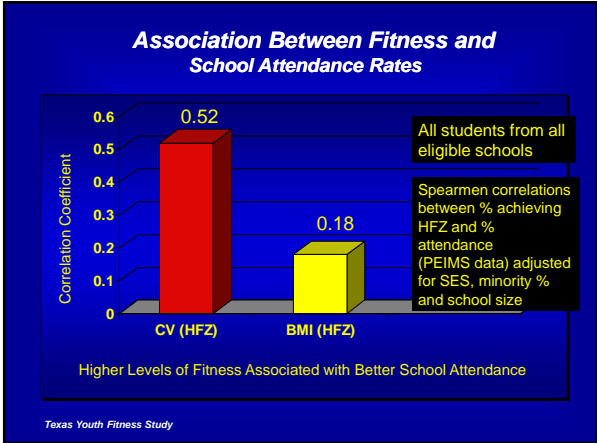
out of the classroom to create for the TAKS test — a practice he called “substantial child abuse.”

The fitness study released by the TEA was based on the Fitnessgram test — developed by the Cooper Institute of Dallas — given to students at 5,221 Texas schools in the 2007-08 school year. The assessments measured students in grades three through 12 in five areas — body composition, aerobic capacity, muscular strength, endurance and flexibility. The results determined whether a student was in a “healthy” or “at risk” for their age and grade.

But groups representing the state teachers are suing against the legislation, claiming it would further erode students’ ability to take recess and that more requirements have been created for the opportunity for students and schools to meet and for ways into their schools,” said Richard P. Smith, director of the Texas Department of Education and Skills.

He also criticized the growing practice of pulling students

Dr. Kenneth Cooper of the Cooper Institute of Dallas released study results that showed how fitness affects academic performance, attendance and discipline in Texas schools.

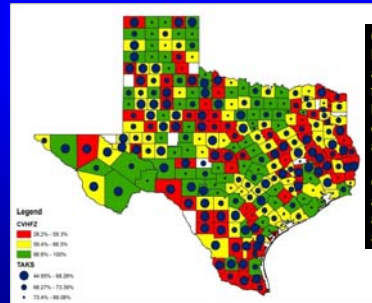


**Texas Education Agency
Physical Fitness Assessment Initiative**

Additional Analyses

- % Passing each of the six tests
- Regional comparisons
- Ethnic comparisons
- Comparison with other states

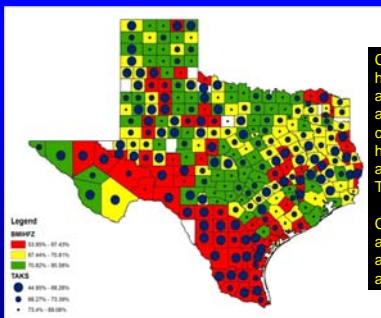
Distribution of CV Fitness AND TAKS Achievement by County



Counties with low or high levels of achievement in CV fitness also tended to have corresponding low or high levels of achievement on TAKS.

Causality can't be assumed but associations are apparent.

Distribution of BMI Achievement AND TAKS Achievement by County



Counties with low or high levels of achievement in BMI also tended to have corresponding low or high levels of achievement on TAKS.

Causality can't be assumed but associations are apparent.

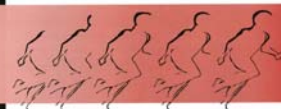
Responsible Organization

Primary responsibility for the Texas Youth Evaluation Project will be held by The Cooper Institute, a 501(c)(3) organization.

The Cooper Institute will be responsible for implementation of the program, testing, and training of the students, collection, and analysis of the data.



Research Quarterly for



Exercise and Sport

Texas Youth Fitness Study
Supplement to
Research Quarterly
for Exercise and Sport
Vol. 81, No. 3


September 2010

2010 Nanjing International Conference on Youth Fitness and Health



28-31 October, 2010
Nanjing, China




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 NANJING NORMAL UNIVERSITY

**Health-Related Physical Fitness Levels of
 Jiangsu Elementary and Middle-School and Students**

Presenter: Yuling Zou

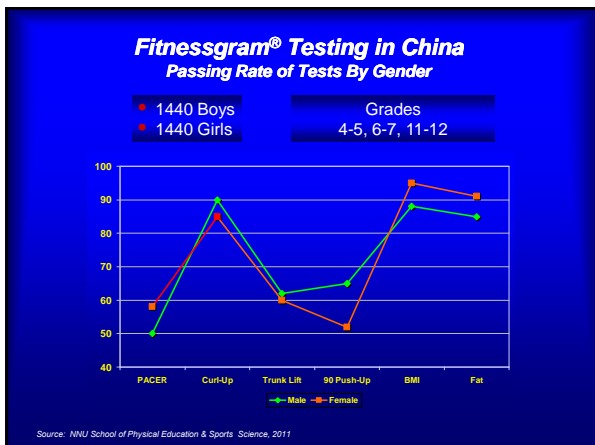
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 NANJING NORMAL UNIVERSITY

1. Needs/Purposes

- There is a lack of large-scale health-related physical fitness (HRPF) studies of children and youth in China
- Determinants and correlates of the Chinese children/youth's HRPF is also not clear
- To address the needs, we conducted a large-scale survey study of elementary and junior and senior high school students in Jiang Su province, China
- The specific aims of the study included: (1) To determine the passing rates of HRPF of Jiangsu children and adolescents using FitnesGram and (2) To examine the associations between HRPF and gender/age

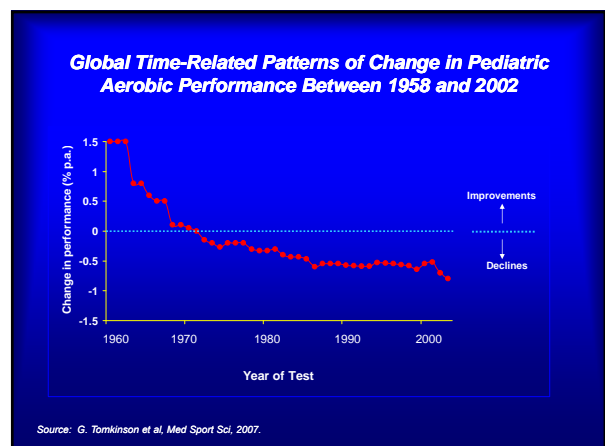
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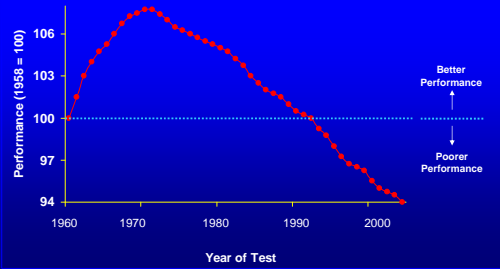
**Secular Changes in Pediatric Fitness
 1958 - 2003**

- 6 – 19 years of age.
- 25,455,527 students.
- 27 countries.
- Average: ↓ 0.36% per year (total 16.2%).
- Improved late 1950s – 1970.
- Magnitude of the decrease increased after 1970.

Source: G. Tomkinson et al, Med Sport Sci, 2007.



Global Time-Related Patterns of Performance in Pediatric Aerobic Performance Between 1958 and 2002

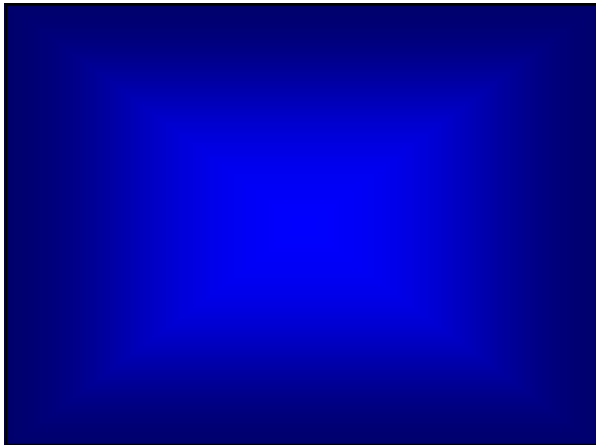


Source: G. Tomkinson et al, *Med Sport Sci*, 2007.

Worldwide Performance 20-m Shuttle Run 1983 - 2003

- 6 – 19 years of age.
- 418,026 children.
- 37 countries.
- Best: Estonia, Iceland, Lithuania, Finland
- Worst: Singapore, Brazil, USA, Italy, Portugal, Greece

Source: T. Olets, *J Sports Sci*, Oct 2006.



The Cooper Institute

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