



The 2006 Brown Center Report  
on American Education:

# HOW WELL ARE AMERICAN STUDENTS LEARNING?

*With special sections on the  
nation's achievement, the  
happiness factor in learning,  
and honesty in state test scores*

THE BROOKINGS INSTITUTION

*The Brown Center Report on American Education*

Part

I

# THE NATION'S ACHIEVEMENT



## A tale of two NAEPS

Nine year olds showed significant gains in math on the long-term trend NAEP.

Table

**1-1**

	1990	1999	2004	1990-2004 Change	Change in Years of Learning
Age 9	230	232	241	+11	1.1
Age 13	270	276	281	+11	1.3
Age 17	305	308	307	+2	

Years of learning based on 1990 score differences. Age 9: 1 year equals 1/4th the difference between ages 9 and 13 (10 scale score points). Age 13: 1 year equals 1/4th the difference between ages 13 and 17 (8.75 scale score points). Not applicable for age 17.

Source: <http://nces.ed.gov/nationsreportcard/ltr/results2004/nat-math-scalescore.asp>  
Standard deviations in 1990 were Age 9, 33 points; Age 13, 31 points; Age 17, 31 points

## A tale of two NAEPS

But the gains for similarly aged students on the main NAEP were twice as big, an historically unprecedented leap.

Table

1-2

	1990	1992	1996	2000	2003	2005	1990-2005 Change	Change in Years of Learning
Grade 4	213	220	224	226	235	238	+25	2.0
Grade 8	263	268	270	273	278	279	+16	2.1
Grade 12	294	299	304	301	—	—		

Years of learning based on 1990 score differences. Grade 4: 1 year equals 1/4th the difference between 4th and 8th grades (12.5 scale score points). Grade 8: 1 year equals 1/4th the difference between 8th and 12th grades (7.75 scale score points).

Source: NAEP data explorer, <http://nces.ed.gov/nationsreportcard/nde/>

Standard Deviations in 1990 were: Grade 4, 32 points; Grade 8, 36 points; Grade 12, 36 points

## Reading scores lag behind math on the trend NAEP.

Gains for 7 and 13 year olds are unimpressive, and scores for 17 year olds have actually declined.

Table

1-3

	1990	1999	2004	1990-2004 Change	Change in Years of Learning
Age 9	209	212	219	+10	0.8
Age 13	257	259	259	+2	0.2
Age 17	290	288	285	-5	

Years of learning based on 1990 score differences. Age 9: 1 year equals 1/4th the difference between ages 9 and 13 (12 scale score points). Age 13: 1 year equals 1/4th the difference between ages 13 and 17 (8.25 scale score points). Not applicable for age 17.

Source: <http://nces.ed.gov/nationsreportcard/ltt/results2004/nat-reading-scalescore.asp>  
Standard deviations in 1990 were Age 9, 45 points; Age 13, 36 points; Age 17, 41 points



**The main NAEP confirms only meager gains in reading.**

The reason for no progress remains a mystery.

Table

1-4

	1992	1994	1998	2000	2002	2003	2005	1992-2005 Change	Change in Years of Learning
Grade 4	217	214	215	213	219	218	219	+2	0.2
Grade 8	260	260	264	—	264	263	262	+2	0.3
Grade 12	292	287	291	—	287	—	—		

Years of learning based on 1990 score differences. Grade 4: 1 year equals 1/4th the difference between 4th and 8th grades (10.75 scale score points). Grade 8: 1 year equals 1/4th the difference between 8th and 12th grades (8.0 scale score points).

NOTE: Beginning with 2002 scores reported here, results include students who required special accommodations to take the NAEP. Standard Deviations in 1992 were: Grade 4, 36 points; Grade 8, 36 points; Grade 12, 33 points

Source: NAEP data explorer, <http://nces.ed.gov/nationsreportcard/nde/>

Part

II

# THE HAPPINESS FACTOR IN STUDENT LEARNING



**Confidence: “I usually do well in mathematics” (8th grade)**  
(countries ranked by percent agree a lot)

Table

**2-1**

Country	Percent Students “Agree A Lot”	National Score
Jordan	48	424
Egypt	46	406
Israel	43	496 ✓
Ghana	41	276
Bahrain	40	401
Tunisia	39	410
Cyprus	39	459
Palestinian Authority	39	390
United States	39	504 ✓
South Africa	38	264
International Average	27	467
Romania	18	475 ✓
Singapore	18	605 ✓
Latvia	17	508 ✓
Moldova	17	460
Netherlands	16	536 ✓
Malaysia	13	508 ✓
Chinese Taipei	11	585 ✓
Hong Kong	10	586 ✓
Korea	6	589 ✓
Japan	4	570 ✓

(✓ – above international average)

Source: TIMSS 2003 Userguide (see almanacs, bsalm1\_m3.pdf, pg.67):  
<http://timss.bc.edu/timss2003i/userguide.html>

Reported in the International Mathematics Report: this question is one of four questions constituting the student confidence index.



## Confidence: “I usually do well in mathematics” (4th grade)

(countries ranked by percent agree a lot)

Table

2-2

Country	Percent Students “Agree A Lot”	National Score
Cyprus	61	510 ✓
Tunisia	58	339
Iran	56	389
Slovenia	53	479
Morocco	49	347
International Average	37	495
Moldova	25	504 ✓
Netherlands	24	540 ✓
Belgium-Flemish	23	551 ✓
Hong Kong	16	575 ✓
Japan	10	570 ✓

(✓ – above international average)

United States: 46% agree a lot, national mean score 518

Source: TIMSS 2003 Userguide (see almanacs, asalm1\_m3.pdf, pg.30):

<http://timss.bc.edu/timss2003i/userguide.html>

**Enjoyment: “I enjoy mathematics” (8th grade)**  
(countries ranked by percent agree a lot)

Table

**2-3**

Country	Percent Students “Agree A Lot”	National Score
Botswana	65	366
Egypt	61	406
Morocco	60	387
Iran	58	411
South Africa	56	264
Ghana	53	276
Jordan	50	424
Lebanon	50	433
Tunisia	45	410
Palestinian Authority	45	390
International Average	29	467
Sweden	15	499 ✓
Latvia	14	508 ✓
England	14	498 ✓
Estonia	14	531 ✓
Slovak Republic	13	508 ✓
Chinese Taipei	13	585 ✓
Japan	9	570 ✓
Korea	9	589 ✓
Slovenia	7	493 ✓
Netherlands	6	536 ✓

(✓ – above international average)

United States: 22% agree a lot, national mean score 504

Source: TIMSS 2003 International Mathematics Report, ch. 4, pg. 159

## Enjoyment: “I enjoy mathematics” (4th grade)

(countries ranked by percent agree a lot)

Table

2-4

Country	Percent Students “Agree A Lot”	National Score
Iran	81	389
Armenia	71	456
Morocco	71	347
Tunisia	70	339
Lithuania	58	534 ✓
International Average	50	495
Chinese Taipei	31	564 ✓
Netherlands	30	540 ✓
Hong Kong	30	575 ✓
Japan	29	565 ✓
Belgium-Flemish	27	551 ✓

(✓ – above international average)

United States: 54% agree a lot, national mean score 518

Source: TIMSS 2003 International Mathematics Report, ch. 4, pg. 160

**Relevance: Teachers reporting students “relate what is being learned in mathematics to daily lives” (8th grade)**  
(countries ranked by percent)

Table

2-5

Country	Percent	National Score
Chile	87	387
Jordan	72	424
Palestinian Authority	72	390
Botswana	71	366
Iran	69	411
United States	66	504 ✓
Slovak Republic	66	508 ✓
Malaysia	64	508 ✓
Egypt	63	406
Ghana	63	276
International Average	50	467
Tunisia	38	410
Belgium–Flemish	32	537 ✓
Singapore	32	605 ✓
Italy	31	484 ✓
Chinese Taipei	27	585 ✓
Netherlands	26	536 ✓
Bulgaria	26	476 ✓
Hong Kong	26	586 ✓
Russian Federation	24	508 ✓
Japan	14	570 ✓

(✓ – above international average)

NOTE: “Percent” refers to percent of students whose teachers reported students doing the activity about half of the lessons or more

Source: TIMSS 2003 International Mathematics Report, ch. 7, pg. 284

## American students are much more confident about their math abilities than Singaporean students.

Fig

2-1

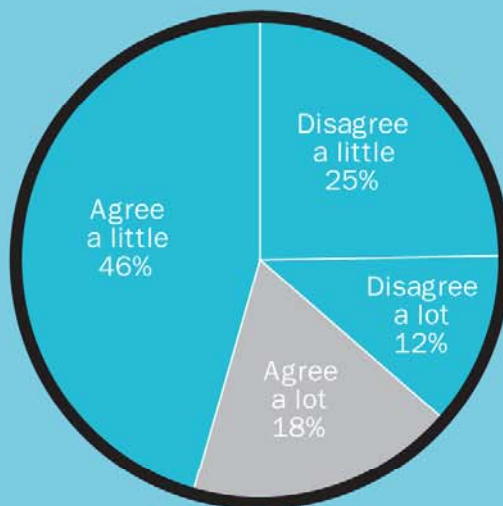
Students were asked whether they agreed with the statement, "I usually do well in mathematics."

**39% of American students agreed a lot.**

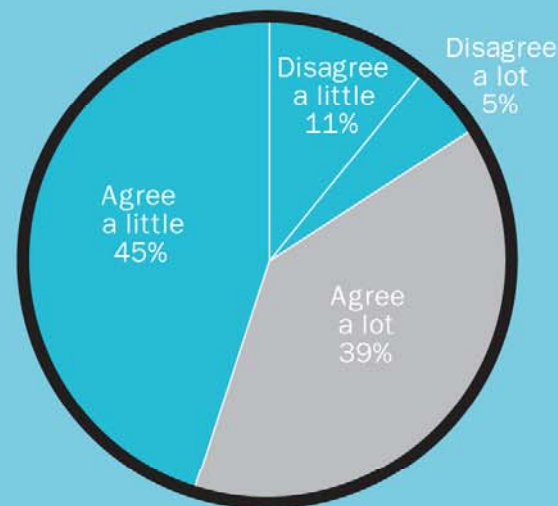
NOTE: Data refer only to 8th grade.

Source: TIMSS 2003 Userguide (see almanacs, bsalm1\_m3.pdf, pg. 67):  
<http://timss.bc.edu/timss2003i/userguide.html>

Singapore students



U.S. students





## But even the least confident student in Singapore outscores the most confident American student!

Fig

2-2

Students were asked whether they agreed with the statement, "I usually do well in mathematics."

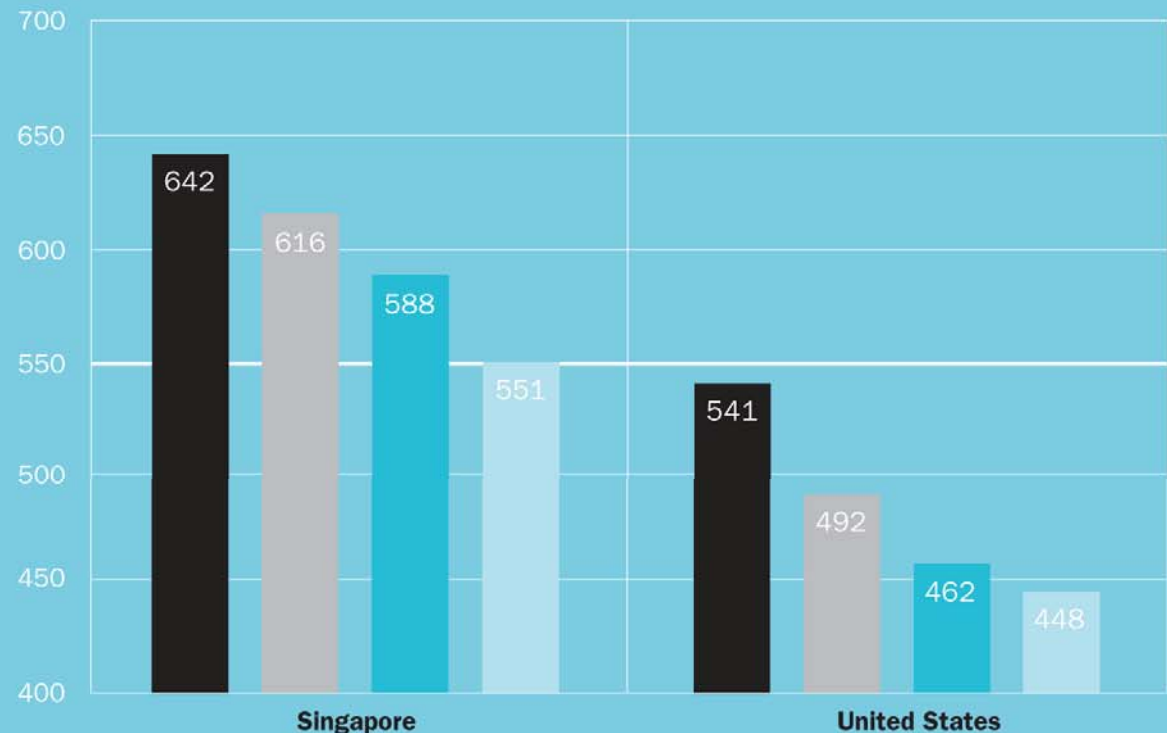
NOTE: Data refer only to 8th grade.

Source: TIMSS 2003 Userguide (see almanacs, bsalm1\_m3.pdf, pg. 67):  
<http://timss.bc.edu/timss2003i/userguide.html>



- Agree a lot
- Agree a little
- Disagree a little
- Disagree a lot

Average math scores



Part

III

# ARE STATES HONESTLY REPORTING TEST SCORES?



## States report higher proficiency rates in 8th grade math.

Comparison of state and NAEP proficiency

Fig

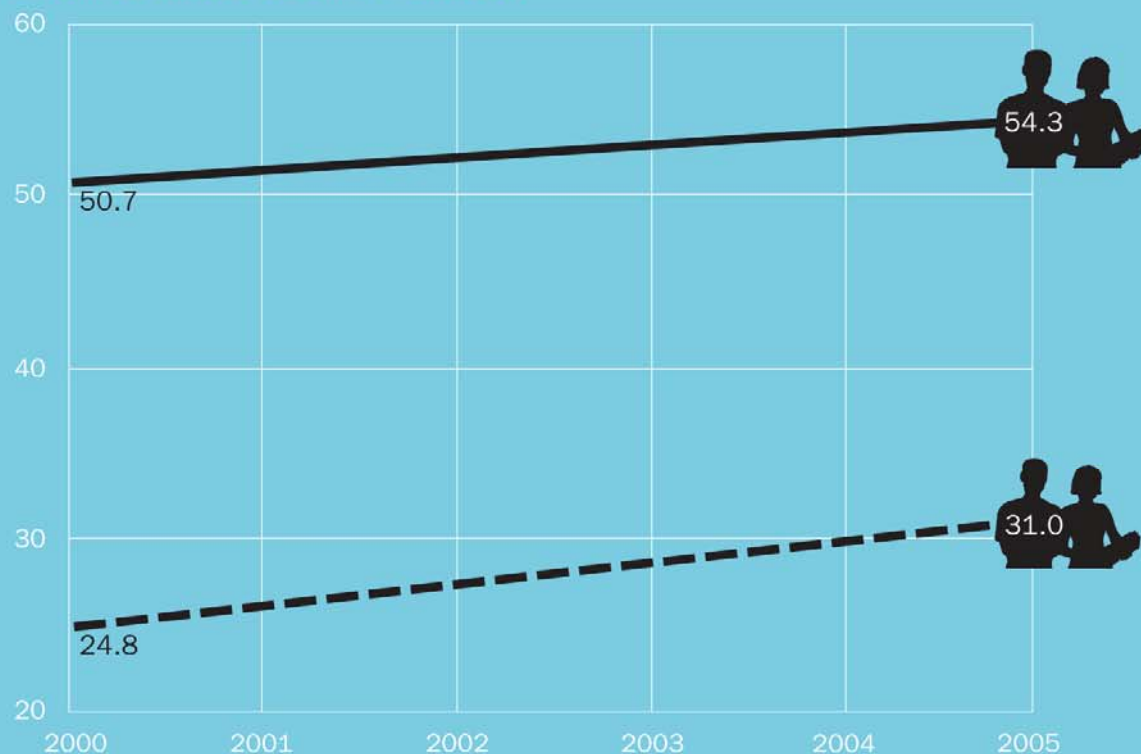
3-1

**But the NAEP/state gaps have narrowed since NCLB.**

Note: N=23 states

Source: Brown Center database of state and NAEP data

Percent of students reaching proficiency



— State  
- - - NAEP

## The states report large gains in 4th grade math.

Comparison of state and NAEP proficiency

Fig

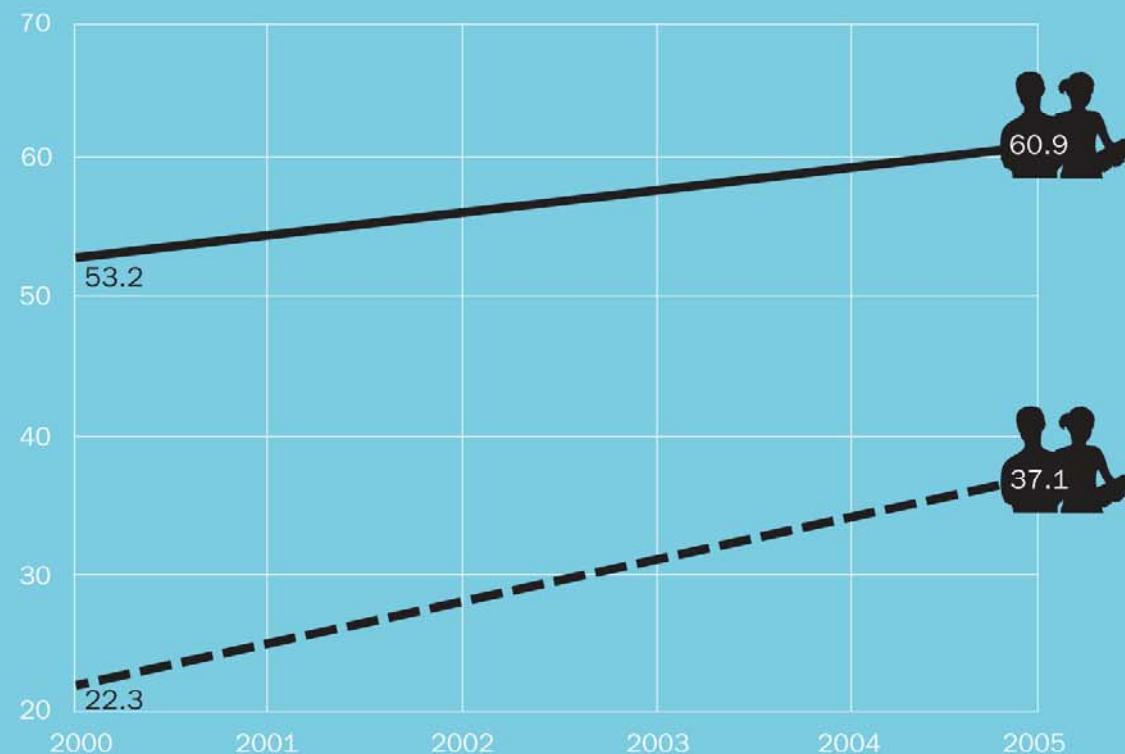
3-2

**However, the NAEP gains are even larger.**

Note: N=19 states

Source: Brown Center database of state and NAEP data

Percent of students reaching proficiency



— State  
- - - NAEP

## States are reporting large gains in 8th grade reading.

Comparison of state and NAEP proficiency

Fig

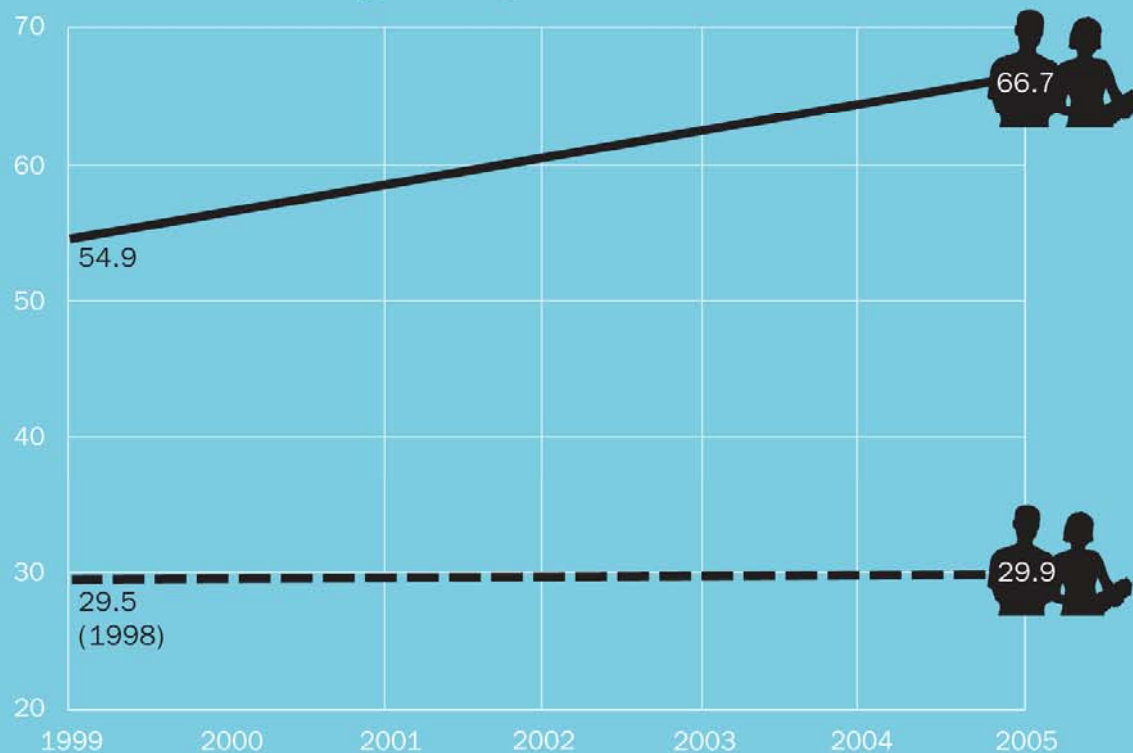
3-3

### While NAEP scores are flat.

Note: N=19 states

Source: Brown Center database of state and NAEP data

Percent of students reaching proficiency



— State

- - - NAEP



## The State-NAEP gap is also widening in 4th grade reading.

Comparison of state and NAEP proficiency

Fig

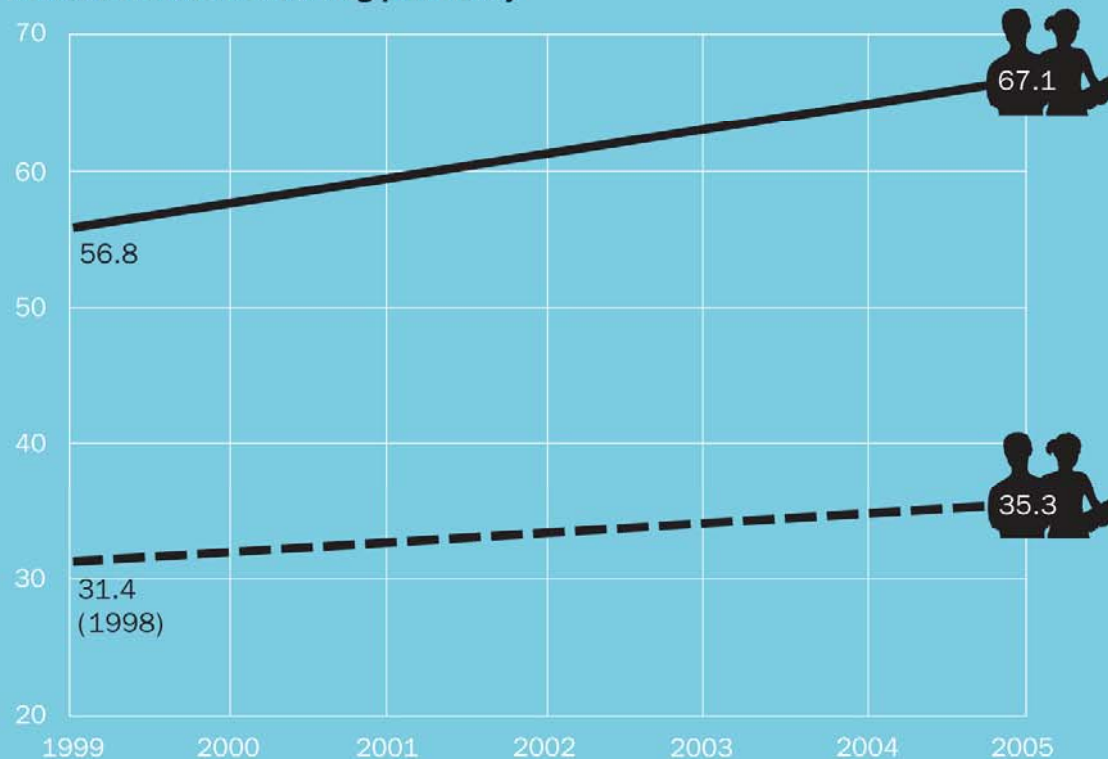
3-4

**But states are not on pace to reach 100% proficiency by 2014.**

Note: N=18 states

Source: Brown Center database of state and NAEP data

Percent of students reaching proficiency



— State  
- - - NAEP

## NAEP-TIMSS 8th grade test comparison: percentage of items classified at a lower grade level

Table

3-1

Content Area	NAEP	TIMSS
Number	27	4
Measurement	37	25
Geometry	43	3
Data	10	4
Algebra	18	0

Source: NCES (2006), *Comparing Mathematics Content in NAEP, TIMMS, and PISA 2003 Assessments*