SREB

Keeping Middle Grades Students on the Path to Success in High School

Increasing Engagement and Achievement in SREB States

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Southern Regional Education Board

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Challenge to Lead Series



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It is part of the *Challenge to Lead* education goals series, directed by Joan Lord. For more information, e-mail joan.lord@sreb.org. *Goals for Education: Challenge to Lead* is available on the SREB Web site at www.sreb.org. A full listing of the goals, including reports on each goal, is printed on the inside back cover.

A Message from the President of SREB

The middle grades have been drawing a lot of attention lately — *and for good reason*. Progress in middle grades reading has stalled — and the news is not much better in math. The reading situation is serious enough that **a special SREB committee of leaders from across the region recently called for SREB states to make improving adolescent reading the most immediate priority in public schools**.

Research is now clear that the high school dropout problem is rooted far earlier — as early as sixth grade — than some education policy leaders had thought. Although SREB states have made good progress in *early grades* achievement, when students reach the *middle grades,* they begin to lose momentum and often reach the ninth grade unprepared. Too many students then begin to disengage from their studies and miss valuable opportunities to stay on the path to success in high school and beyond.

Although SREB states have made good progress in *early grades* achievement, when students reach the *middle grades,* they begin to lose momentum and often reach the ninth grade unprepared.

Recent scores on state tests show that middle grades students have made some progress in meeting their state's academic standards over the last half-decade. Yet a closer look at state standards indicates that too many SREB states have set them too low. Quite a few states have taken steps to improve their standards and to increase the rigor in their curricula. These actions are promising, but more work needs to be done.

This report outlines steps that you and other SREB state leaders can take to regain progress in middle grades reading and math achievement. It outlines many policies and programs to help ensure that all middle grades students in your state stay engaged in school and excited about learning. And it lays out five specific strategies your state can use to keep students on the path to success — from building a better-aligned sequence of math courses, to increasing professional development for middle grades teachers.

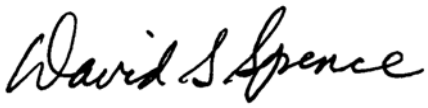
Without successful intervention strategies and programs in the middle grades, it is often too late for high school programs to make much difference.

Every step in students' educational journey from the middle grades into high school is critical. Without successful intervention strategies and programs in the middle grades, it is often too late for high school programs to make much difference in retaining struggling students and guiding them toward graduation.

Keeping Middle Grades Students on the Path to Success in High School is part of SREB's important *Challenge to Lead* Goals for Education series on the progress the region is making on these ambitious goals. Approved by state leaders in 2002, the goals are designed to focus your attention on helping all students in your state make smooth transitions from one grade to the next — from

the time they enter school until they graduate from college or career programs. The goals also focus on closing achievement gaps for black and Hispanic students and for students from low-income families — groups that are growing rapidly in public schools.

As the region faces continued economic and work force challenges, this is an especially timely report. You as a state policy-maker or education leader should consider its recommendations carefully as we all work together to help more students succeed.



Dave Spence

Keeping Middle Grades Students on the Path to Success in High School

Increasing Engagement and Achievement in SREB States

Achievement in the middle grades for all groups of students exceeds national averages and performance gaps are closed.

One of the SREB *Challenge to Lead* Goals for Education

Many SREB states have raised student achievement in the *early grades* in recent years — and some states are national leaders in early grades achievement gains. But many states see their momentum run out as students rise into the *middle grades*. In fact, state assessment results show that students' progress in the middle grades is not sufficient for states to meet SREB's *Challenge to Lead* Goals for Education or the federal *No Child Left Behind Act* requirements.

The National Assessment of Educational Progress (NAEP), often called The Nation's Report Card, shows that achievement in eighth-grade reading in the SREB region is stagnant and progress in math is much too slow.

The tough reality is that many middle grades students say they are bored and disengaged in school, often losing interest and falling behind just as they should be preparing for the rigor of the high school curriculum. The result is that the ninth grade becomes a roadblock for these students — especially the ones who falter in reading or math, quit coming to school regularly or get into disciplinary trouble in the middle grades. These are the students who eventually drop out.

SREB states need to develop new momentum in middle grades performance. You as a policymaker and education leader should develop a plan to address the stall in reading and math test results in your state. This report — part of SREB's long-term *Challenge to Lead* series that helps states monitor educational progress — outlines important steps you can take to help your state raise middle grades achievement.

The tough reality is that many middle grades students say they are bored and disengaged in school, often losing interest and falling behind just as they should be preparing for the rigor of the high school curriculum.

The good news is that raising achievement does not require a complete makeover of the middle grades. Today, research provides clear, straightforward directions for improvement that all states can follow — from state-level leadership in improving adolescent reading, professional development tailored specifically for middle grades teachers, and work that ensures eighth-graders are ready for Algebra I, to engaging students

academically and exciting their interest in preparing for high school studies and careers.

National studies and analyses of successful school practices show that the middle grades need a special focus to ensure that all students have the academic and career preparation they need for high school and beyond. This is especially important as SREB states face major demographic shifts. These shifts include growth in the proportion of students from low-income families and increases in the number of Hispanic children, as well as children from other backgrounds who are learning English. They also include continued growth in students who are the first in their families to attend college or pursue specialized career training.

This report poses several fundamental questions to help you determine whether middle grades students in your state enter high school ready to succeed and to help you find strategies that can boost middle grades achievement:

- Is your state increasing the percentages of eighth-graders who meet state standards in reading and math?
- Are all students in the middle grades scoring at or above the NAEP Basic level in reading and math? Are greater percentages of eighth-graders in your state scoring at or above the NAEP Proficient level than in the nation?
- Are your state's reading and math standards in the middle grades set at the right levels?
- Are more students enrolling in pre-algebra and Algebra I in eighth grade in your state?

Question 1:

Is your state increasing the percentages of eighth-graders who meet state standards in reading and math?

Quite possibly. Most SREB states made some progress from 2003 to 2007 on SREB's *Challenge to Lead* goal that calls for all middle grades students to meet state standards in reading and math. Of the 13 SREB states that tested eighth-graders in reading in both years, 11 had gains in the percentages meeting state standards. Of the 14 states that tested in math in both years, 12 had gains. (See Table 1.)

The Center on Education Policy (CEP) considers a state's gains to be "moderate" if they increase at least 1 percentage point on average per year. Using that measure in a 2008 national study, CEP concluded that seven SREB states — Alabama, Arkansas, Kentucky, Louisiana, Maryland, Tennessee and Texas — made at least moderate progress in eighth-grade reading from 2002 to 2007.

Although seven SREB states made at least moderate gains in reading and even more did so in math, this rate of progress is still not sufficient.

State education report cards also showed progress in reading. In the SREB median states, the proportion of students meeting state standards increased 6 percentage points, from 70 percent in 2003 to 76 percent in 2007. In six SREB states — Delaware, Georgia, North Carolina, Tennessee, Texas and West Virginia — 80 percent or more of eighth-graders met state standards in reading in 2007. Across the region, state percentages ranged

Table 1

Percent of Eighth-Graders in SREB States Meeting State Standards

	Reading					Mathematics				
	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007
SREB Median	70	71	73	75	76	52	60	60	62	64
Alabama	— [1]	57	70	72	72	— [1]	— [2]	63	68	67
Arkansas	42	52	57	66	63	22	32	33	44	48
Delaware	70	71	79	84	82	47	50	53	62	61
Florida	49	45	44	46	49	56	56	59	60	63
Georgia	81	85	83	89	88	67	73	69	77	81
Kentucky	— [3]	— [3]	— [3]	— [3]	65	31	34	36	34	49
Louisiana	52	47	50	55	57	47	53	51	53	55
Maryland	60	64	66	67	68	40	46	52	55	57
Mississippi	57	62	57	55	52	48	60	53	59	54
North Carolina	86	88	88	87	88	82	84	84	61	65
Oklahoma	71	74	73	75	79	65	69	69	72	77
South Carolina	20	26	29	25	25	19	22	22	22	20
Tennessee	80	81	87	90	92	79	83	87	85	88
Texas	88	89	83	83	89	72	66	61	67	71
Virginia	70	72	76	78	79	75	80	81	76	77
West Virginia	— [4]	80	80	81	80	— [4]	69	70	73	71

Note: The SREB median is the average of the two SREB median states.

[1] Alabama did not report performance in percentages of students at state standards in 2003.

[2] Alabama did not administer a mathematics assessment in 2004.

[3] Kentucky did not report eighth-grade results for reading from 2003 to 2006.

[4] West Virginia received a waiver from the U.S. Department of Education for 2003.

Sources: State education report cards.

widely, from 25 percent in South Carolina to 92 percent in Tennessee. These differences are attributable to the range in number and rigor of the standards, the rigor of the assessments, and cut scores on the state tests.

CEP applied its measure for progress to math achievement and concluded that 12 SREB states — Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Oklahoma, Tennessee, Texas and West Virginia — made at least moderate progress in the percentages of students meeting state standards from 2002 to 2007.

The percentage of students meeting state standards in math in the SREB median states increased 12 points, from 52 percent in 2003 to 64 percent in 2007. In only two SREB states — Georgia and Tennessee — 80 percent or more of eighth-graders met state standards in math in 2007. The percentages ranged widely for the same reasons as they did in reading, from 20 percent in South Carolina to 88 percent in Tennessee.

Even though the CEP study found that some **SREB states had made moderate gains in reading and even more did so in math, this rate of**

progress still is not sufficient. It does not ensure that these states will meet the *No Child Left Behind Act* (*NCLB*) requirement that all students meet state standards by 2014. **Your state — and all SREB states — must set more aggressive timetables and annual objectives in order to follow the federal law**.

To ensure *NCLB* compliance and to meet SREB's *Challenge to Lead* goal, you and other policy-makers also need to know whether **achievement gaps** are narrowing for students who historically have scored low on state assessments. From 2003 to 2007, about half of SREB states with test scores for both years narrowed the gaps between black and white eighth-graders and between Hispanic and white eighth-graders on these assessments. But too many states made no progress in closing these gaps.

In **reading** in the SREB median states, 82 percent of white eighth-graders met state standards in 2007, compared with 61 percent of both black and Hispanic eighth-graders. (See Table 2.)

Table 2

Percent of Eighth-Graders Meeting State Standards in Reading, by Racial/Ethnic Group

	White			Black			Hispanic		
	2003	2005	2007	2003	2005	2007	2003	2005	2007
SREB Median	74	80	82	40	55	61	55	57	61
Alabama	— [1]	79	81	— [1]	55	59	— [1]	56	58
Arkansas	51	66	71	21	35	**44**	32	46	50
Delaware	79	87	90	55	67	**70**	55	67	**72**
Florida	62	56	61	27	24	**29**	38	34	**40**
Georgia	88	90	94	73	76	**83**	65	68	**80**
Kentucky	— [2]	— [2]	66	— [2]	— [2]	48	— [2]	— [2]	53
Louisiana	70	68	72	32	33	**42**	53	51	54
Maryland	74	81	82	40	49	**53**	45	52	**55**
Mississippi	73	73	68	40	41	**37**	56	56	45
North Carolina	92	94	94	76	79	**80**	65	75	**76**
Oklahoma	— [3]	79	84	— [3]	53	62	— [3]	57	64
South Carolina	30	41	34	8	15	12	12	17	15
Tennessee	— [3]	91	95	— [3]	78	87	— [3]	72	85
Texas	94	92	95	82	78	**84**	83	75	84
Virginia	77	83	86	51	63	**67**	55	66	63
West Virginia	— [4]	80	80	— [4]	72	74	— [4]	76	71

Notes: The SREB median is the average of the two SREB median states.

States that narrowed the gap between this group and white students from 2003 to 2007 are shown in **bold**.

[1] Alabama did not report performance in percentages of students at state standards in 2003.

[2] Kentucky did not report eighth-grade results for reading from 2003 to 2006.

[3] Oklahoma did not report data by race and ethnicity in 2003 and reported "regular education" students only. Tennessee did not report demographic data for eighth-graders in 2003.

[4] West Virginia had a waiver from the U.S. Department of Education for 2003.

Sources: State education report cards.

In 2003, the gap in reading between black and white eighth-graders was wider, at 34 points, and the gap between white and Hispanic eighth-graders was narrower, at 19 points. Gaps between groups remain wide.

In **math** in the SREB median states, 44 percent of black and 56 percent of Hispanic eighth-graders met state standards in 2007, compared with 75 percent of white eighth-graders — leaving gaps of 31 points and 19 points, respectively. In 2003, the gap in math between black and white eighth-graders was much wider, at 38 points. Between Hispanic and white eighth-graders, it was the same, at 19 points. (See Table 3.)

Although achievement gaps are narrowing in some SREB states on state assessments, significant gaps clearly remain in most states. To boost achievement, you and other state leaders need to examine the results of your state's assessments to ensure that all groups are improving.

Table 3

Percent of Eighth-Graders Meeting State Standards in Mathematics, by Racial/Ethnic Group

	White			Black			Hispanic		
	2003	2005	2007	2003	2005	2007	2003	2005	2007
SREB Median	67	73	75	29	41	44	48	55	56
Alabama	— [1]	74	75	— [1]	45	52	— [1]	57	58
Arkansas	30	43	57	4	10	22	13	25	39
Delaware	59	66	75	26	32	41	33	40	48
Florida	70	71	75	31	36	**42**	47	52	**56**
Georgia	77	79	89	52	56	**73**	54	58	**75**
Kentucky	34	39	52	10	15	28	23	23	39
Louisiana	68	79	71	27	32	**36**	51	51	52
Maryland	54	67	73	18	30	35	27	40	43
Mississippi	65	68	69	31	38	**40**	49	59	**55**
North Carolina	90	91	77	69	71	45	68	76	54
Oklahoma	— [2]	75	83	— [2]	46	59	— [2]	58	68
South Carolina	29	34	29	7	9	7	13	14	13
Tennessee	— [2]	92	92	— [2]	76	79	— [2]	80	82
Texas	84	75	83	57	44	**58**	63	50	**64**
Virginia	78	86	84	52	67	**64**	60	73	65
West Virginia	— [3]	71	72	— [3]	54	57	— [3]	61	62

Notes: The SREB median is the average of the two SREB median states.

States that narrowed the gap between this group and white students from 2003 to 2007 are shown in **bold**.

[1] Alabama did not report performance in percentages of students at state standards in 2003.

[2] Oklahoma did not report data by race and ethnicity in 2003 and reported "regular education" students only. Tennessee did not report demographic data for eighth-graders in 2003.

[3] West Virginia had a waiver from the U.S. Department of Education for 2003.

Sources: State education report cards.

Question 2:

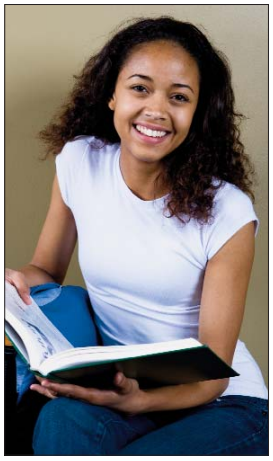
Are all students in the middle grades scoring at or above the NAEP Basic level in reading and math? Are greater percentages of eighth-graders in your state scoring at or above the NAEP Proficient level than in the nation?

The short answer to these questions is "no." **SREB states have stalled in eighth-grade NAEP reading** achievement for nearly a decade, and they **have made little progress in eighth-grade NAEP math** achievement in recent years.

In **reading**, roughly 70 percent of eighth-graders in the SREB median states — and in the nation — scored at or above the **NAEP Basic** level in 1998, and again in 2003, 2005 and 2007. (See Box 1 for definitions of NAEP levels.) The percentages scoring at or above the higher **NAEP Proficient** level in reading also were stagnant. Twenty-six percent of eighth-graders in the SREB median states met or exceeded the NAEP Proficient level in reading in 2005 and 2007, compared with 29 percent in the nation. (See Tables 4 and 5.)

Only five SREB states — Florida, Georgia, Maryland, Tennessee and Texas — made gains at the NAEP Basic level in eighth-grade reading from 2003 to 2007. The promising news is that over the period, three SREB states — Delaware, Maryland and Virginia — continued to meet the *Challenge to Lead* goal of having a greater percentage of students scoring at the NAEP Proficient level in reading than the nation.

Math achievement at both NAEP levels improved somewhat from 2003 to 2007, increasing by 3 percentage points in the SREB median states. **Nearly all SREB states made gains in math at the NAEP Basic level over the period**,



In reading, Delaware, Maryland and Virginia continued to meet the *Challenge to Lead* goal of having a greater percentage of students scoring at the NAEP Proficient level than the nation from 2003 to 2007.

Box 1

How does NAEP define achievement levels?

The National Assessment of Educational Progress identifies three levels of student achievement, established by a panel of educators, elected officials, business leaders and state representatives:

- **Basic:** *Partial mastery* of the knowledge and skills that are fundamental for proficient work at a given grade level.
- **Proficient:** Solid academic performance for each grade assessed. *Demonstrated competence* over challenging subject matter.
- **Advanced:** *Superior performance*.

with most states making gains of 5 percentage points or more. Texas showed an impressive gain of 9 percentage points from 2003 to 2007, and four other SREB states increased by 7 points over the period. Still, three of every 10 students in the region fell short of NAEP's Basic level — defined as "partial mastery." While states made progress in math, too many eighth-graders are still not ready for high school.

At the same time, six SREB states — Delaware, Maryland, North Carolina, South Carolina, Texas and Virginia — equaled or exceeded the national percentages of eighth-graders scoring at or above the **NAEP Proficient** level in 2007, and thereby met the *Challenge to Lead* goal in math. This was the first time that Delaware met this goal.

Maryland's eighth-grade gains were particularly notable from 2003 to 2007, with a jump of 5 percentage points in **reading** at the NAEP Basic level, and 7 percentage point gains in **math** at both the NAEP Basic and Proficient levels.

Are achievement gaps narrowing on national assessments among black, Hispanic and white eighth-graders, and between students from low-income families and other students in SREB states? Although progress in narrowing gaps in achievement on state assessments was disappointing for half of SREB states, **regional**

Table 4

Percent of Eighth-Graders Scoring At or Above NAEP Basic Level

	Reading				Mathematics			
	1998	2003	2005	2007	2000	2003	2005	2007
United States	71	72	71	73	62	67	68	70
SREB Median	69	71	69	71	56	64	64	67
Alabama	67	65	63	62	53	53	53	55
Arkansas	68	70	69	70	49	58	64	65
Delaware	64	**77**	**80**	**77**	— [1]	**68**	**72**	**74**
Florida	67	68	66	71	— [1]	62	65	68
Georgia	68	69	67	70	54	59	62	64
Kentucky	**74**	**78**	**75**	**73**	60	65	64	69
Louisiana	63	64	64	64	47	57	59	64
Maryland	70	71	69	**76**	**62**	**67**	66	**74**
Mississippi	62	65	60	60	42	47	52	54
North Carolina	**74**	**72**	69	71	**67**	**72**	**72**	**73**
Oklahoma	**80**	**74**	**72**	72	**62**	65	63	66
South Carolina	66	69	67	69	53	**68**	**71**	**71**
Tennessee	**71**	69	**71**	71	52	59	61	64
Texas	**74**	71	69	**73**	**67**	**69**	**72**	**78**
Virginia	**78**	**79**	**78**	**79**	**65**	**72**	**75**	**77**
West Virginia	**75**	**72**	67	68	58	63	60	61

Notes: The SREB median is the average of the two SREB median states.

States percentages that are equal to or greater than the national percentages are shown in **bold**.

[1] These states did not report information in 2000.

Source: National Assessment of Educational Progress.

Table 5

Percent of Eighth-Graders Scoring At or Above NAEP Proficient Level

	Reading				Mathematics			
	1998	2003	2005	2007	2000	2003	2005	2007
United States	30	30	29	29	25	27	28	31
SREB Median	26	27	26	26	18	23	23	26
Alabama	22	22	22	21	16	16	15	18
Arkansas	23	27	26	25	13	19	22	24
Delaware	23	**31**	**30**	**31**	—[1]	26	**30**	**31**
Florida	23	27	25	28	—[1]	23	26	27
Georgia	25	26	25	26	19	22	23	25
Kentucky	**30**	**34**	**31**	28	20	24	23	27
Louisiana	17	22	20	19	11	17	16	19
Maryland	**31**	**31**	**30**	**33**	**27**	**30**	**30**	**37**
Mississippi	19	21	18	17	9	12	14	14
North Carolina	**30**	29	27	28	**27**	**32**	**32**	**34**
Oklahoma	**30**	**30**	25	26	18	20	21	21
South Carolina	22	24	25	25	17	26	**30**	**32**
Tennessee	27	26	26	26	16	21	21	23
Texas	27	26	26	28	24	25	**31**	**35**
Virginia	**33**	**36**	**36**	**34**	**25**	**31**	**33**	**37**
West Virginia	28	25	22	23	17	20	18	19

Notes: The SREB median is the average of the two SREB median states.

States percentages that are equal to or greater than the national percentages are shown in **bold**.

[1] These states did not report information in 2000.

Source: National Assessment of Educational Progress.

progress in closing gaps on NAEP was more promising. In **reading**, the gap between the percentages of black and white eighth-graders at the NAEP Basic level widened in the SREB median states from 2003 to 2007 by 1 percentage point, reaching 27 percent in 2007. But the gap between Hispanic and white eighth-graders narrowed by 2 percentage points, to 17 percent in 2007.

In **math** in the SREB median states, the gap narrowed between black and white eighth-graders and between Hispanic and white eighth-graders at the NAEP Basic level, by 4 percentage points and 7 percentage points, respectively. Yet, as with state assessments, **gaps remain large**.

The gap between black and white eighth-graders in math was 34 percentage points in 2007. The gap between Hispanic and white eighth-graders in math was 20 percentage points that year.

Roughly half of black eighth-graders scored at the NAEP Basic level in reading and math in 2007. About six of 10 Hispanic eighth-graders scored at this level in reading and math. (See Table 6.)

Table 6

Percent of Eighth-Graders Scoring At or Above NAEP Basic Level, By Racial/Ethnic Group

	Reading						Mathematics					
	White		Black		Hispanic		White		Black		Hispanic	
	2003	2007	2003	2007	2003	2007	2003	2007	2003	2007	2003	2007
United States	82	83	53	54	54	57	79	81	39	47	47	54
SREB Median	80	80	54	53	**61**	**63**	76	80	38	46	**49**	**60**
Alabama	75	74	46	43	—[1]	**61**	68	70	27	31	—[1]	37
Arkansas	79	79	42	43	**68**	**60**	69	74	26	42	37	46
Delaware	**85**	**87**	**60**	**63**	**60**	**69**	**81**	**86**	**48**	**56**	**47**	**58**
Florida	79	80	48	**55**	**62**	**67**	78	80	36	**48**	**53**	**61**
Georgia	81	**84**	**54**	**56**	**55**	**62**	77	80	36	**48**	**49**	**55**
Kentucky	81	76	**54**	**55**	—[1]	—[1]	68	73	38	42	—[1]	—[1]
Louisiana	80	77	46	48	—[1]	—[1]	75	79	36	44	—[1]	—[1]
Maryland	80	**86**	**55**	**60**	**61**	**69**	**79**	**88**	**44**	**53**	**49**	**64**
Mississippi	80	78	50	46	—[1]	—[1]	67	74	27	35	—[1]	—[1]
North Carolina	**83**	82	**56**	53	52	56	**85**	**85**	**49**	**53**	**55**	**61**
Oklahoma	80	80	51	52	**62**	52	73	74	37	43	**47**	46
South Carolina	**82**	81	**53**	51	—[1]	51	**84**	**83**	**46**	**55**	—[1]	**62**
Tennessee	76	80	47	48	—[1]	**67**	69	75	28	38	—[1]	51
Texas	**84**	**86**	**56**	**61**	**59**	**64**	**84**	**90**	**47**	**64**	**58**	**70**
Virginia	**85**	**85**	**62**	**64**	**78**	**67**	**82**	**86**	**49**	**56**	**59**	**64**
West Virginia	72	69	**60**	52	—[1]	—[1]	63	63	**39**	31	—[1]	—[1]

Notes: The SREB median is the average of the two SREB median states.

States percentages that are equal to or greater than the national percentages are shown in **bold**.

[1] These states had too few students to report values.

Source: National Assessment of Educational Progress.

The gap between eighth-graders from low-income families and all other eighth-graders in the SREB median states also continued to be large at the NAEP Basic level from 2003 to 2007, narrowing only slightly — by 1 percentage point in reading and 4 points in math. The gap between these students on NAEP at the Basic level was 23 percentage points in reading and 24 points in math in 2007. (See Table 7.)

The lack of progress in narrowing gaps may continue if the percentages of students from low-income families in SREB states continue to grow, as is likely to be the case.

A key indicator of family income is student eligibility for free and reduced-price lunches through the National School Lunch Program. (See Box 2.) The percentage of public school students eligible for the program in the SREB

Box 2

What makes a student eligible for the National School Lunch Program?

For a family of four in 2008:

Free Lunch: Family income of $27,560 or less, at or below 130 percent of the federal poverty level.

Reduced-Price Lunch: Family income of $27,561 to $39,220, between 130 percent and 185 percent of the federal poverty level.

Table 7

Percent of Eighth-Graders from Low-Income Families[1] Scoring At or Above NAEP Basic Level

	Reading						Mathematics					
	Low Income			All Others			Low Income			All Others		
	2003	2005	2007	2003	2005	2007	2003	2005	2007	2003	2005	2007
United States	56	57	58	82	81	82	47	51	55	78	79	81
SREB Median	**57**	56	**59**	81	80	**82**	**48**	50	**55**	76	77	79
Alabama	52	49	50	77	76	75	35	37	37	68	69	73
Arkansas	**61**	**57**	**58**	80	80	**82**	**47**	**51**	54	70	76	77
Delaware	**61**	**66**	**66**	**85**	**85**	**83**	**50**	**52**	**61**	77	**81**	**81**
Florida	55	56	**61**	78	74	79	45	50	**55**	75	77	78
Georgia	54	52	57	**82**	80	**82**	39	44	49	77	77	78
Kentucky	**69**	**67**	**64**	**85**	**82**	**82**	**51**	**52**	**57**	76	75	79
Louisiana	54	54	54	77	77	78	45	47	53	72	74	79
Maryland	51	51	**61**	78	78	**82**	42	45	**57**	75	76	80
Mississippi	**56**	50	51	78	78	78	33	39	43	66	73	75
North Carolina	**56**	55	57	**82**	78	**82**	**53**	**57**	**58**	**82**	**83**	**85**
Oklahoma	**64**	**64**	**64**	**83**	80	81	**50**	50	54	76	77	79
South Carolina	**58**	55	55	80	79	81	**51**	**57**	**59**	**81**	**84**	**83**
Tennessee	55	**57**	**58**	77	**81**	**82**	39	44	50	70	75	76
Texas	**57**	**57**	**62**	81	80	**85**	**54**	**59**	**68**	**81**	**83**	**88**
Virginia	**62**	**65**	**65**	**85**	**83**	**84**	**49**	**52**	**57**	**81**	**83**	**84**
West Virginia	**63**	56	**59**	81	75	77	**51**	46	49	73	72	73

Notes: The SREB median is the average of the two SREB median states.

State percentages that are equal to or greater than the national percentages are shown in **bold**.

[1] Students are considered "low income" if they are approved for the National School Lunch Program.

Source: National Assessment of Educational Progress.

median states grew from 39 percent in 1990 to 51 percent in 2006 — greater than the 44 percent eligible nationwide.

In 12 SREB states in 2006, more than half of all public school students were from low-income families. As SREB's 2008 state progress reports, *On the Move*, have shown, school enrollment is projected to grow in most SREB states in the next decade, and this growth is expected to come largely from historically lower-income racial and ethnic groups.

In short, **eighth-grade NAEP scores at both the Basic and Proficient levels in the SREB region clearly show that reading achievement has stagnated and progress in math is not sufficient**.

To improve achievement for middle grades students and close gaps, you and other policymakers in SREB states need to set appropriate academic standards that ensure instruction at higher levels — and provide critical academic interventions for struggling students. If you do not, you cannot ensure that more students will be prepared for high school.

Eighth-grade NAEP scores at both the Basic and Proficient levels in the SREB region clearly show that reading achievement has stagnated and progress in math is not sufficient.

Question 3:

Are your state's reading and math standards in the middle grades set at the right levels?

The SREB region has made progress in setting higher academic standards, but **more than half of SREB states continue to have middle grades reading and math standards that appear to be either too high or too low**. Setting these standards — and the related assessments and cut scores — at the right levels is crucial in boosting student achievement.

Why is the level of rigor so important? If middle grades standards are set too low, they do not challenge students to perform at even basic levels, leaving too many students unprepared to succeed in high school courses. If middle grades standards are set too high, too many students may score lower than they should, and as a result, too many schools may be inappropriately labeled "in need of improvement" under *No Child Left Behind*.

To help states gauge adequate rigor, a 2007 study by the National Center for Education Statistics compared state academic standards with NAEP math and reading "frameworks" (the blueprint that determines the academic content that NAEP uses to assess students). The study concluded that **the percentages of students meeting state standards should fall between the percentages scoring at the NAEP Basic and Proficient levels**.

By looking at your state assessment results and monitoring where the percentages of students at

each level fall, you and other policy-makers can track the progress of your state in setting standards at the right level of rigor.

In six SREB states, the percentages of eighth-graders meeting state standards in **reading** stood between the percentages meeting the NAEP Basic and Proficient levels in 2007. In these states — Arkansas, Florida, Kentucky, Louisiana, Maryland and Mississippi — reading standards appear to be *about right*. (See Table 8.)

In one SREB state — South Carolina — the percentage of eighth-graders meeting state standards in reading in 2007 was the same as the percentage meeting the NAEP Proficient level, indicating that reading standards in South Carolina appear to be *high*.

In the remaining nine SREB states, the percentages of eighth-graders meeting state standards in reading were equal to or greater than the percentages meeting the NAEP Basic level in 2007, indicating that reading standards in these states appear to be *low*.

More SREB states appear to have set standards at the right levels in math than in reading. The percentages of eighth-graders meeting state math standards in 2007 stood between the percentages that scored at the NAEP Basic and Proficient levels in eight SREB states: Arkansas, Delaware, Florida, Kentucky, Louisiana, Maryland, North Carolina and Texas. These states appear to have set math standards *about right*.

South Carolina had a lower percentage of students meeting its state standards in math than it had meeting the NAEP Proficient level, indicating that math standards in South Carolina appear to be *high*.

In the remaining seven SREB states — Alabama, Georgia, Mississippi, Oklahoma, Tennessee, Virginia and West Virginia — the percentages of eighth-graders meeting state math standards were greater or equal to the percentages meeting the NAEP Basic level, indicating that math standards in these states appear to be *low*.

Because the NAEP Basic level represents only "partial mastery" of a subject at a grade level — not competency — **state leaders should work to ensure that standards are set higher than this level and closer to the NAEP Proficient level**. States also must commit to ensuring that all students *meet* the higher standards. This means your state needs to provide professional development to help teachers learn how to develop lessons based on the new standards and how to teach all students to meet the standards. It also means that schools need support systems for students who do not meet the standards at first and need extra help. Schools need to create a culture of success — ensuring that all students understand that failure is not an option.

Some SREB states already have made adjustments in their state standards, assessments and cut scores in recent years to better align the curriculum and performance expectations with those of national benchmarks. Texas raised its curriculum standards over three years, starting in 2003. Georgia and North Carolina revised their curriculum standards in 2006. Arkansas revised tests and changed cut scores in 2005 to better reflect its standards. Other SREB states may need to adjust their state standards — strengthening the framework for a strong curriculum and effective accountability system.

More SREB states appear to have set standards at the right levels in math than in reading.

When standards are raised, states often see a drop in scores on state tests, followed by an eventual rise on both state and national assessments. When changes occur, policy-makers and education leaders need to inform the public so parents and students can anticipate possible score declines and be prepared to adjust to the new rigor in the curriculum.

Table 8

Are State Standards, Assessments and Cut Scores at the Right Levels? Comparison: Percent of Eighth-Graders Meeting State Standards and Scoring At or Above NAEP Basic and Proficient Levels, 2007

	Reading				Mathematics			
		NAEP				NAEP		
	State Standard	Basic Level	Proficient Level	Standards Status[1]	State Standard	Basic Level	Proficient Level	Standards Status[1]
Alabama	72	62	21	Set LOW	67	55	18	Set LOW
Arkansas	63	70	25	Set about RIGHT	48	65	24	Set about RIGHT
Delaware	82	77	31	Set LOW	61	74	31	Set about RIGHT
Florida	49	71	28	Set about RIGHT	63	68	27	Set about RIGHT
Georgia	88	70	26	Set LOW	81	64	25	Set LOW
Kentucky	65	73	28	Set about RIGHT	49	69	27	Set about RIGHT
Louisiana	57	64	19	Set about RIGHT	55	64	19	Set about RIGHT
Maryland	68	76	33	Set about RIGHT	57	74	37	Set about RIGHT
Mississippi	52	60	17	Set about RIGHT	54	54	14	Set LOW
North Carolina	88	71	28	Set LOW	65	73	34	Set about RIGHT
Oklahoma	79	72	26	Set LOW	77	66	21	Set LOW
South Carolina	25	69	25	Set HIGH	20	71	32	Set HIGH
Tennessee	92	71	26	Set LOW	88	64	23	Set LOW
Texas	89	73	28	Set LOW	71	78	35	Set about RIGHT
Virginia	79	79	34	Set LOW	77	77	37	Set LOW
West Virginia	80	68	23	Set LOW	71	61	19	Set LOW

Note: The SREB median is the average of the two SREB median states.

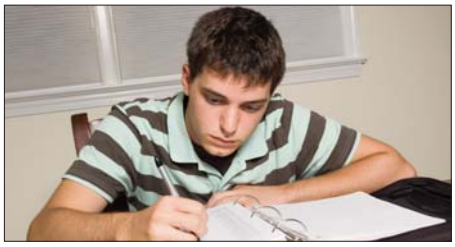
[1] Based on a 2007 National Center for Education Statistics study that concluded percentages of students meeting state standards should fall between the percentages scoring at the NAEP Basic and Proficient levels.

Sources: National Assessment of Educational Progress, National Center for Education Statistics, and state education report cards.

Question 4:

Are more students enrolling in pre-algebra and Algebra I in eighth grade in your state?

Nearly all SREB states increased the percentage of eighth-graders enrolled in **pre-algebra** or higher-level math courses from 2003 to 2007. The percentage of students enrolled in the SREB median states increased 9 percentage points from 2003 to 2007 — 1 point more than in the nation. Both the SREB median states and the nation enrolled 70 percent of eighth-graders in pre-algebra or higher in 2007. The percentages of eighth-graders enrolled across the region ranged from 53 percent to 87 percent. Nine SREB states — Alabama, Arkansas, Florida, Georgia, Maryland, Oklahoma, South Carolina, Tennessee and Virginia — enrolled higher percentages of students in pre-algebra or higher-level courses than the nation. Georgia and Maryland were highest at 87 percent. (See Figure 1 and Appendix A.)



Students who succeed in an advanced math curriculum in high school are more likely to graduate and enroll in postsecondary programs.

All SREB states also increased the percentage of eighth-graders enrolled in **Algebra I** or higher courses from 2003 to 2007. The SREB median states increased the percentage enrolled by 9 percentage points — 2 points less than the nation. The percentage of students enrolled in Algebra I or higher in the SREB median states in 2007 was lower than in the nation — 37 percent compared with 44 percent. The percentages enrolled in Algebra I across the region ranged from 22 percent to 57 percent. Higher percentages enrolled in these courses in five SREB states — Delaware, Florida, Georgia, Maryland and Virginia — than in the nation. Maryland was highest among SREB states. (See Figure 2.)

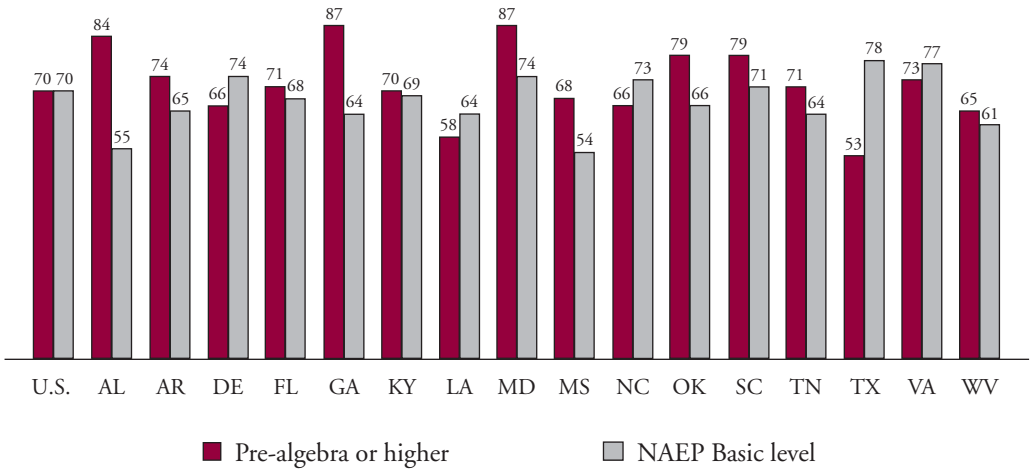
Why is it important for students to begin taking higher-level math courses in eighth grade? The *Challenge to Lead* goals call for SREB states to increase the percentages of eighth-graders completing Algebra I to ensure that higher percentages of students are ready for rigorous math and science courses in high school. Students who succeed in an advanced math curriculum in high school are more likely to graduate and enroll in postsecondary programs. They also are more likely to pursue careers in math and science fields — where shortages are growing. Reports from NAEP in 2001, 2002, 2004 and 2009 showed that students who took higher-level math courses in eighth grade scored higher on NAEP. Eighth-graders who took pre-algebra scored better than those who took lower-level math courses, and eighth-graders who took Algebra I did better than those who took pre-algebra.

These results are true in particular for black and Hispanic students. The NAEP reports noted that black and Hispanic eighth-graders are less likely to take Algebra I than white eighth-graders, and they are more likely to take eighth-grade math — which is not pre-algebra.

Comparing eighth-graders' math achievement on NAEP in SREB states with their enrollment in pre-algebra and Algebra I provides compelling evidence that the higher-level courses are beneficial.

Figure 1

Percent of Eighth-Graders Enrolled in Pre-Algebra or Higher and Percent Scoring At or Above NAEP Basic Level in Math, 2007



Source: National Assessment of Educational Progress.

- **The percentages of eighth-graders in SREB states who enroll in pre-algebra are similar to the percentages who score at the NAEP Basic level — defined as "partial mastery" of grade-level knowledge and skills.**

  Student enrollments in pre-algebra or higher-level courses appear to be highly related to achievement at the NAEP Basic level. Even so, 11 SREB states had greater percentages of eighth-graders enrolled in pre-algebra or higher than scored at or above the NAEP Basic level in math in 2007, although two states were close in percentages. Therefore, pre-algebra or higher in eighth grade is related to partial mastery of math knowledge and skills and does not ensure competence in eighth-grade math as measured by NAEP.

  Five SREB states had higher percentages of students at or above the NAEP Basic level than were enrolled in pre-algebra or higher-level courses. These states enrolled fewer students in pre-algebra or higher than might have benefitted from it.

- **There is a similar relationship between the percentages of eighth-graders taking Algebra I and those scoring at the NAEP Proficient level — defined as "demonstrated competence."**

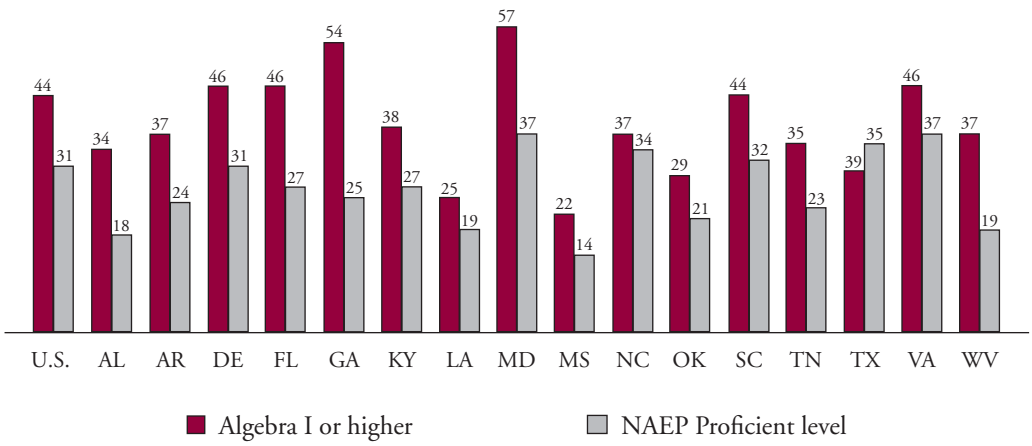
  In 2007, 26 percent of eighth-graders in the SREB median states scored at or above the NAEP Proficient level in math, compared with 37 percent of the eighth-graders who were enrolled in Algebra I or higher.

  Percentages of eighth-graders in the region enrolled in Algebra I or higher ranged from 22 percent to 57 percent. Yet, enrollment in Algebra I or higher does not ensure competence in eighth-grade math as measured by NAEP.

  Among the five SREB states with greater percentages of eighth-graders in Algebra I or higher than the nation, two — Maryland and Virginia — also surpassed the nation in the percentage scoring at the NAEP Proficient level.

Figure 2

Percent of Eighth-Graders Enrolled in Algebra I or Higher and Percent Scoring At or Above NAEP Proficient Level in Math, 2007



Source: National Assessment of Educational Progress.

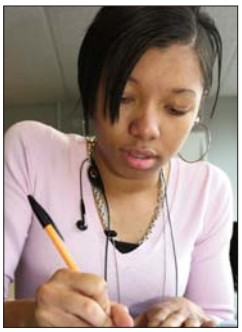
As important as higher-level courses are for improving achievement, current research highlights the importance of students' *preparation* for the higher-level courses. Recent studies (including one by the Brown Center on Education Policy at the Brookings Institution in 2008) report that as districts and states begin requiring more eighth-graders to enroll in Algebra I, they find that many students are unprepared to be successful. Students need a strong foundation in basic math knowledge and skills before they can master the more abstract concepts in algebra. Thirty-three percent of eighth-graders in the SREB median states did not score at the NAEP Basic level in math in 2007. These students are unlikely to do well in pre-algebra — and certainly not in Algebra I.

By this analysis, it may not be sound practice for a state to set an immediate target to enroll a greater percentage of students in algebra than score at the NAEP Basic level. States nevertheless need to step up efforts to ensure that greater percentages of students are ready for algebra in the eighth grade and for high school math. The long-range target should be for all students to be ready for college and careers. This means taking a detailed look at the entire math curriculum from the early grades through the middle grades.

A 2008 study from the American Institutes for Research shows that students' math performance in the United States falls off from the early grades to the middle grades. The report indicates that math curriculum standards and expectations need to be strengthened throughout the elementary and middle grades. The report notes that the K-8 math curricula should build students' preparation for higher-level math courses step by step.

While NAEP math scores in 2007 for fourth-graders in SREB states showed progress at both the NAEP Basic and Proficient levels, far too many students are entering the middle grades without the basic math knowledge and skills they need. Instead of *building on a strong foundation* of basic math knowledge and skills in the middle grades, the middle grades math courses must focus on *providing the foundation* for many students. This leaves less time for preparing all sixth- and

seventh-graders for pre-algebra and algebra by the eighth grade.



SREB states should place a new and fresh emphasis on what it means to provide all students with a solid math foundation.

This is particularly true for minority students and students from low-income families. The gaps in performance between these students and white students *at all levels* on both state and national math assessments persist. The percentages of black and Hispanic fourth-graders unable to demonstrate partial mastery of basic math knowledge and skills underscore the need for stronger preparation for these students prior to, and during, the middle grades. Despite progress in narrowing achievement gaps at all levels, gaps remain. While these students need access to pre-algebra and Algebra I classes in seventh and eighth grades, they need high-quality math instruction throughout the early and middle grades to prepare them for these courses.

For your state to continue increasing the percentage of *all* eighth-graders enrolled in pre-algebra and Algebra I, **you and other state leaders need to ensure that the courses leading to Algebra I — from the early grades through the middle grades — build a foundation step by step and are sufficiently rigorous**. You also need to provide students with the support they need to be successful throughout the curriculum and to ensure that they have opportunities to catch up when they fall behind.

To prepare students for high school, SREB states should place a new and fresh emphasis on what it means to provide all students with a solid math foundation. To do otherwise leaves too many middle grades students — especially black and Hispanic students — without adequate preparation for high school.

What Can You and Your State Do?

State leaders need to take action. Otherwise, SREB states can expect ninth-grade enrollments to continue to bulge as many eighth-graders find they cannot handle the rigors of high school. In most SREB states, ninth-grade classes have swelled because they enroll both new students making the transition from middle grades to high school *and* those who failed ninth-grade courses — some for the second or third time. For every 100 eighth-graders in the SREB median states in 2007, the ninth-grade class in 2008 swelled to 114 students. The SREB state with the largest bulge in 2008 had 122 ninth-graders.

The ninth-grade bulge is a symptom of significant problems that ultimately lead many students to drop out of high school. In fact, students' chances of graduating slip if they fail even one class in ninth grade. The pattern is progressive: Many students stall in sixth grade, fail in ninth and then wait there until they can leave. Others lose interest and do not see the connection between school and their future. Their curiosity turns to boredom and disengagement.

Policy-makers and education leaders can play an important role in changing this reality. You need to ensure that schools serving middle grades students recognize a clear basic mission: to prepare students for success in high school. You also should provide the necessary state support and technical assistance so that schools and districts can succeed in meeting the mission. Districts and schools should be encouraged to work together to develop a school culture that engages student learning and promotes student success — recognizing that student failure cannot be an option. The state should establish goals and standards, and it should place a priority on teaching and learning that help students reach them. Schools also should help students make connections to their future career possibilities.

Five specific strategies can help your state make a difference.

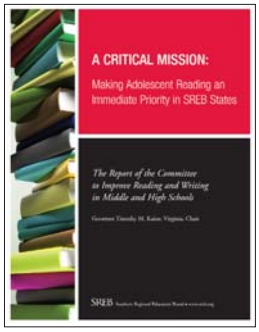
SREB recommends **five specific strategies that can help your state move middle grades achievement in the right direction**:

1. **Implement the recommendations of the SREB Committee to Improve Reading and Writing in Middle and High Schools.**
2. **Provide an accelerated curriculum to all students not achieving on grade level as they enter the middle grades.**
3. **Restructure the middle grades math curriculum to help more students prepare for Algebra I by eighth grade.**
4. **Improve professional development and the regulations for certification (and re-certification) of middle grades teachers — as well as teacher preparation — to ensure that more middle grades teachers are qualified to teach their assigned subjects.**
5. **Build on adolescents' aspirations for college and careers to engage them in educational and career planning.**

Strategy 1:

Implement the recommendations of the SREB Committee to Improve Reading and Writing in Middle and High Schools

The SREB Committee to Improve Reading and Writing in Middle and High Schools issued a hard-hitting report in May 2009 to draw state leaders' attention to the fact that many students leave the middle grades without the reading skills they will need in high school. The report, ***A Critical Mission: Making Adolescent Reading an Immediate Priority in SREB States***, asserts that: "Reading is the key to helping students reach higher levels of learning in all subjects. Yet student achievement in middle grades and high school reading is low and not progressing." The report urges states to make reading throughout the middle grades and high school the top priority in public education.



The report urges states to make reading throughout the middle grades and high school the top priority in public education.

Research is clear about what needs to be done. According to the national literacy experts who advised the Committee, researchers have reached consensus on how to improve adolescent reading skills. Reflecting their advice, the Committee report calls for state leaders to take bold, immediate action to develop **statewide policies to increase literacy and to help teachers implement effective instructional strategies** to increase literacy in classrooms statewide. The report further charges state leaders to **work in partnership with leaders in school districts and schools** to get the job done.

The Committee makes **four recommendations** for state action. First, it calls for states to identify the specific reading skills students need to master in order to meet academic standards in key subjects in the middle grades and high school. Second, states should ensure that the curricula and instructional strategies teachers use in each subject help students master these reading skills.

Third, states need statewide programs to help all students build the skills they need — including special assistance for struggling readers. Finally, states need to ensure that teachers and school leaders are well-trained to help students improve their reading skills. Continual training should become part of credentialing and professional development for all public school educators. (See Box 3 for the specific Committee recommendations.)

Research is clear about what needs to be done.

Three SREB states are highlighted in the 2009 report *Five states' efforts to improve adolescent literacy*, from the National Center for Education Evaluation and Regional Assistance. The report provides case studies of statewide efforts made by Alabama, Florida and Kentucky to improve adolescent literacy. The lessons learned in these states and others identified in the report can help all SREB states launch or expand their statewide adolescent literacy efforts.

Box 3

Recommendations of the SREB Committee to Improve Reading and Writing in Middle and High Schools

- **Each SREB state should develop a comprehensive set of policies that establishes improvement in reading as the most immediate critical priority for public middle grades and high schools.**

  Established and supported by the governor, legislature and/or the state board of education, these policies should:

  - Require the state to identify the reading skills students need to improve reading achievement and to meet state standards in key academic subjects from the middle grades through high school.
  - Provide for the development of curricula and teaching strategies to help students master these reading skills in each subject.
  - Establish statewide reading intervention programs that schools can use to assist struggling readers in the middle grades and high school.
  - Enable all teachers to embed reading instruction into each subject, through teacher preparation, certification/licensure and professional development.

- **Each state's K-12 education agency should develop a detailed plan to work with school districts to help them implement the policies — and then monitor districts' progress**.

Source: *A Critical Mission: Making Adolescent Reading an Immediate Priority in SREB States,* SREB, 2009.

STRATEGY 2:

Provide an accelerated curriculum to all students not achieving on grade level as they enter the middle grades

Students who end the elementary years without the academic foundation they need for success in the middle grades are likely to struggle in school from then on. *That is, unless the middle grades curriculum can help them catch up.* About one in three students scored below the NAEP Basic level in fourth-grade reading in the SREB median states in 2007 — and one in five students did so in math. These students need extra help in the middle grades to be successful and to become ready for high school.

SREB's *Making Middle Grades Work (MMGW)* school improvement program has issued reports for many years indicating that the curriculum in many middle grades classrooms is not sufficiently challenging to ensure that all students

are ready for high school. It has called for an accelerated curriculum for all middle grades students, especially in reading and mathematics. **But the students who enter the middle grades *below grade level* face a particular challenge**. They face catching up and keeping up at the same time. And they do so at a stage in their lives when social, emotional and biological changes are occurring at a fast pace. Schools in your state need to identify these students early, diagnose their academic deficiencies and help them catch up through an accelerated curriculum.

Schools need to identify struggling students early, diagnose their academic deficiencies and provide intervention through an accelerated curriculum.

Soon after all students make the transition to the middle grades, their **classroom teachers need to assess them** to determine their skill levels in key subjects, particularly in reading and math. Teachers and other school personnel need to plan individual interventions for those who are behind, including tutoring, group activities and special instruction. These interventions should be coordinated with regular classroom activities so that students can remain in regular classes to the greatest extent possible. In this way, they do not become further behind.

The process of assessment and intervention should continue until the students have caught up to grade level; then their teachers should continue to monitor their progress carefully. SREB states should support ongoing classroom assessments that tell teachers what students know and do not know about upcoming lessons. These kinds of assessments make it possible for teachers to adjust their lessons to the students' needs — and make their lessons more productive.

A 2007 Johns Hopkins University study documented how school leaders and teachers can identify vulnerable middle grades students who need intensive intervention. The study found **four indicators**, or "distress signals," that can predict which sixth-graders — especially those attending high-poverty urban schools with high enrollments of minority students — will not complete high school within one year of their expected graduation date. The distress signals include attendance below 80 percent for the year, a final unsatisfactory behavior mark in one class, and a failing grade in either math or English.

The distress signals in the middle grades are behavior problems, a failing grade in math or English, and poor attendance.

The study provides clear evidence that if schools and teachers in your state do not intervene to help these students as early as sixth grade, they are likely to drop out of high school. The study recommends that schools monitor their middle grades students continuously for the four distress signals so they can intervene as soon as possible. Teachers, counselors and school leaders should step in and re-engage these students immediately — both academically and behaviorally — to help them **succeed** in their classes.

What does research say these students need? Middle grades instruction needs **to involve each student actively**. Students who have been identified as high-risk or struggling learners need **extra-help** sessions that preview upcoming lessons and fill gaps in their knowledge so they can participate more fully in their classes. Some students — particularly those with social and emotional problems — need

Middle grades students need to know educators care and are watching.

smaller classes. Some students need **tutoring** to build deficient skills in math and reading. Other students need **mentors** and behavior guidelines to help them learn what acceptable behavior is. Schools need to respond when students are absent for more than two days at a time. In short, research shows that middle grades students need to know educators care and are watching.

Teachers and school leaders need to be well-trained to help middle grades students stay involved in school. Teacher preparation programs and professional development for middle grades teachers and leaders need to provide training on how to recognize and address the early signs of disengagement. Schools also need to take action to overcome other problems that can lead to disengagement, including bullying, teacher turnover and teacher vacancies.

You as a policy-maker need to ensure that your state has policies that result in more middle grades students making consistent progress and staying engaged in school. Your state can provide a middle grades curriculum that is different from the early grades and high school curricula in purpose and outcomes. It should be coordinated with both, building on the foundation set in the early grades and leading to success in high school.

STRATEGY 3:

Restructure the middle grades math curriculum to help students prepare for Algebra I by eighth grade

To help prepare middle grades students for high school, the *Challenge to Lead* goals call for your state to increase the percentages of all groups of students who complete Algebra I by the end of eighth grade. Many SREB states have been successful in pursuing this goal.

The National Mathematics Advisory Panel notes that many believe low achievement in algebra is a central education policy concern.

But as some SREB states increased enrollment in Algebra I, they found that many students were not ready for the rigor of the course. The issue, then, is how your state and other SREB states can ensure that students are better-prepared in the middle grades for higher-level math so they are ready for Algebra I — or at least, pre-algebra — in eighth grade.

The way to reach this goal is to prepare students step by step for Algebra I — beginning as early as fourth or fifth grade. The middle grades math curriculum needs to be **carefully structured so that each course leads to the next**. You as a policy-maker need to make certain that education leaders in your state have implemented a middle grades math curriculum that builds this sequence.

The importance of building a sequence is echoed nationwide. In the introduction to its final report, the National Mathematics Advisory Panel appointed by President Bush in 2006 notes that many believe low achievement in algebra — called a threshold course in mathematics — is a central education policy

concern. The report notes that math achievement in the United States begins to decline in the grade when algebra course work begins. It surveyed states and school districts nationwide on key topics that constitute Algebra I and what students need to know before they begin the course.

The national math panel discovered a key problem: There is no universal agreement on the topics that comprise Algebra I. All of the variations of Algebra I *within* a state make it very difficult for school systems to develop middle grades math curricula that can adequately prepare students. The panel urges each state to **agree on the topics** to cover in Algebra I so the math curricula in the earlier grades can be narrowed and focused.

Each state should agree on the topics to cover in Algebra I so the math curricula in the earlier grades can be narrowed.

The panel believes each state then can help students in the earlier grades build the skills and knowledge they will need to succeed in the state's Algebra I course. The report even provides a list of suggested topics for algebra for states to consider and a guide for establishing curricula for the earlier grades. (See Appendices B and C.) The list and guide may be good starting points for your state if it has not developed a statewide consensus. The panel also emphasizes the importance of professional development to ensure that teachers are well-trained and have credentials to teach these skills. (See Appendix D for state information about teacher certification in math.)

All SREB states need to follow the panel's advice: The middle grades math curriculum should be focused sharply so that courses at each grade level cover topics that lead stepwise to readiness for Algebra I by eighth grade. States also need to assess students' progress regularly in all math courses so that teachers can determine when students are ready for new topics.

The middle grades math curriculum should be focused sharply so that courses lead stepwise to readiness for Algebra I by eighth grade.

Two SREB states — Maryland and Texas — have been particularly successful in improving math achievement in the middle grades since 2003 by following similar practices. Within the last decade, each state restructured its math curriculum to align with its state standards and assessments. As part of that process, both states narrowed the focus of their middle grades math curriculum to key topics that would prepare students directly for algebra.

Both states introduced strategies to help teachers identify struggling students and launched intervention programs to help students before they fall behind. Both states offered teachers and school leaders extensive professional development opportunities so they could implement the curriculum changes successfully. Both began to make information on student achievement more accessible to schools and parents. Many of these actions preceded the recommendations of the national math panel. Nevertheless, they are all in accord with the recommendations and **serve as valuable models** for other SREB states.

Curriculum reform in Maryland

Maryland launched its Voluntary State Curriculum (VSC) for grades K-8 in 2003, which it developed with substantial involvement from teachers in the state. As the overall curriculum reform was under way, Maryland's state superintendent of schools became concerned about a lack of progress among middle school students on the state assessments. In 2006, the superintendent convened a Middle School Steering Committee to make further recommendations for improving student achievement. The committee called for ensuring that seventh-graders were ready to take pre-algebra and that eighth-graders were ready to take Algebra I. It also called for a greater emphasis on problem-solving, applied learning and the integration of math, science and technology. In addition to supporting more professional development, the committee encouraged teacher preparation programs to work closely with school districts to give pre-service teachers experience with the VCS in the local schools as early as possible in their training.

Maryland led the nation in increasing the percentages of eighth-graders scoring at or above the NAEP Basic and Proficient levels in math from 2005 to 2007.

Maryland also added state-level specialists to support the middle grades curriculum, including math specialists. The state provided block grants to districts so they could apply for state funding to hire instructional coaches to provide teachers with ongoing, job-embedded professional development. The coaches worked directly with teachers to improve their instruction, their use of student assessment information, their planning opportunities with peer teachers, and their collaboration with other educators on whole-school planning.

These efforts have paid off for Maryland. In 2003, 39 percent of the state's eighth-graders took pre-algebra, and 44 percent took Algebra I. By 2007, 30 percent took pre-algebra and 57 percent took Algebra I. **Maryland led the nation** in increasing the percentages of eighth-graders scoring at or above the NAEP Basic and Proficient levels in math from 2005 to 2007.

Initiatives in Texas

The **Texas** Legislature began the reform of its elementary and middle grades curriculum in 1999 through a law that created the Student Success Initiative. The legislation set promotion requirements for students in grades three, five and eight and provided funding for schools to help struggling students, particularly in reading and math, so that more students would be ready for promotion. The state then aligned its middle grades math curriculum and provided interventions for struggling students.

The Texas Math Initiative (TMI) grew out of the Student Success Initiative. The math initiative emphasizes the diagnosis of students' math skills, intervention for struggling students, instructional support for teachers and professional development — all to support math achievement. It provides tools that teachers use to determine whether students have mastered key concepts in the Texas curriculum — known as the Texas Essential Knowledge and Skills (TEKS) — and which students need extra help, particularly with pre-algebra skills in grades three through eight.

Texas' middle grades math curriculum is designed to ensure that all students are ready for Algebra I. According to the law, students should learn to use "algebraic thinking" in grades six through eight as a foundation for higher-level math. In addition to the number of students enrolled in eighth-grade math courses that were focused on "algebraic thinking," NAEP reported that Texas had 53 percent of eighth-graders enrolled in pre-algebra or higher in 2007.

Texas also made funding available to districts through the Accelerated Math Instruction program to help struggling math students from kindergarten through eighth grade. It provided additional funding through the Intensive Math Instruction program to specific schools with many students at risk of not being promoted to the next grade.

These efforts have paid off for Texas. **Texas led the nation** in increasing the percentage of eighth-graders scoring at or above the NAEP Basic level in math from 2003 to 2007. In 2007, 78 percent of the state's eighth-graders scored at or above the NAEP Basic level, up from 69 percent in 2003. Eighth-graders in Texas also made an impressive 10-point gain in students scoring at or above the NAEP Proficient level: 35 percent in 2007, up from 25 percent four years earlier.

Texas led the nation in increasing the percentage of eighth-graders scoring at or above the NAEP Basic level in math from 2003 to 2007.

STRATEGY 4:

Improve professional development and the regulations for certification (and re-certification) of middle grades teachers — as well as teacher preparation — to ensure that more middle grades teachers are qualified to teach their assigned subjects

Without effective teachers, middle grades students — particularly those who are below grade level when they leave the elementary grades — have little chance of being ready for high school. You as a policy-maker can put in place in your state the professional standards and policies to ensure that these students *do* have effective teachers.

First, you can help ensure that your state has **teacher preparation programs** that focus on what middle grades students need and that train teachers to provide it. Many SREB states have begun reforming teacher preparation programs, and these efforts should continue. More middle grades preparation programs, however, are needed.

Second, you should **create policies that require all middle grades teachers to be credentialed specifically to teach the middle grades**, and you should take steps to ensure that districts are held accountable for enforcing the licensing laws in your state. The good news is that 12 SREB state have credentials for middle grades teachers. Four SREB states provide middle grades endorsements to the

basic teaching credential for teachers who complete specific professional development requirements. (See Table 9.) The bad news is that research on "out-of-field" teaching shows that the middle grades credentials are not necessarily *required* when it comes to assigning teachers to classes. Teachers with elementary and high school credentials often are assigned to teach middle grades classes, and often without the knowledge and skills they need to teach the students and subjects effectively.

Third, since most teachers who are likely to teach the middle grades in the next five years are already teachers — or are students nearly ready to graduate from teacher preparation programs — your state also should **provide effective professional development for all current middle grades teachers**. This will require continual on-the-job training in middle grades content areas and instructional practices so these teachers can help all students achieve at high levels.

According to the latest 50-state survey of schools and staffing conducted by the Council of Chief State School Officers, math teachers in the middle grades should be a particular concern for state leaders. The survey showed that from 1994 to 2004, the number of secondary math teachers (grades seven through 12) increased substantially — up 20 percent. But the qualifications of math teachers

Table 9

Available Credentials for Middle Grades Teachers

License Patterns by State	License Type	Grade Levels
Alabama	License	4-8
Arkansas	License	4-8
Delaware	License	5-9
Florida	Endorsement	5-9
Georgia	License	4-8
Kentucky	License	5-9
Louisiana	Endorsement	4-8
Maryland	License	4-9
Mississippi	Endorsement	4-8
North Carolina	License	6-9
Oklahoma	Endorsement	4-8
South Carolina	License	5-8
Tennessee	License	5-8
Texas	License	4-8
Virginia	License	6-8
West Virginia	License	5-9

Notes: "License" means a middle grades license is available.
"Endorsement" means a middle grades credential is available only as an add-on to an existing credential.
Source: National Middle Schools Association Web site.

— as measured by the percentage with degrees and credentials in their teaching field — dropped. In the SREB median states, only 69 percent of teachers whose main assignment was middle grades math were certified in math, compared with 91 percent of high school math teachers. (See Appendix D.)

High-quality professional development programs tied to incentives, including re-credentialing requirements, can ensure that these teachers are better able to advance the learning of middle grades students. What are **the key professional development needs** of middle grades teachers?

- The SREB Reading Committee calls for professional development to help middle grades (as well as high school) teachers **embed reading instruction into** their subjects.
- The National Mathematics Advisory Panel report indicates that math teachers need more courses in math. They also need to know how to assess students' strengths and weaknesses and how to intervene **to help students overcome their weaknesses**.
- Middle grades teachers also need professional development to **identify students who are disengaging from school** and to learn how to help them re-engage.

High-quality professional development can advance the learning of middle grades students.

The National Staff Development Council (NSDC) and the School Redesign Network at Stanford University published a 2009 report analyzing research findings in both the United States and member nations of the Organisation for Economic Co-Operation and Development (OECD) on various forms of professional development for teachers. **The report indicates that the right kinds of professional development for teachers can lead to improvements in student achievement**. It draws four broad conclusions about effective teacher professional development in the United States, saying it should:

- be **intensive, ongoing, and connected to the teacher's daily practice**, instead of episodic and workshop-style, like most school district efforts.
- focus on **student learning** and address the teaching of specific curriculum content so teachers can work together to determine why and how students learn specific topics, instead of focusing on general topics.
- **align with school improvement priorities and goals** and be supported by the school or district, instead of isolated efforts unrelated to school activities.
- build **strong working relationships** among teachers that extend to planning, instruction, assessment, curricular design and school decision-making, instead of perpetuating the isolation many teachers experience in American schools.

The NSDC report indicates that states need to provide much more — and much better — professional development for teachers than they currently do. The report contrasts the typical American teacher's professional development opportunities with those of OECD teachers and concludes that the United States is substantially behind in building teachers' capacity to impact student learning. In most European and Asian countries, *half of the teacher's work day* is spent on tasks related to teaching — but not actually teaching — such as preparing for class, grading papers, meeting with students and parents, and working with colleagues on instructional projects and strategies to help specific students. In contrast, American teachers devote about *three to five hours per week* to all such activities. While they may occasionally attend professional development workshops, these are generally brief and infrequent.

Teachers need their professional development activities to be related directly to their daily work requirements.

Two general conclusions result from the NSDC analysis: **Teachers in your state need to be engaged in more professional development, and they need their professional development activities to be related directly to their daily work requirements**.

Research indicates that teachers need about 50 hours of intensive professional development in any one area if they are to improve their skills enough to make a difference in student learning. This is significantly more than most U.S. teachers receive. Few have professional development opportunities within their schools. They rarely have significant time for studying in their field, learning from instructional coaches within the school, planning with colleagues, or researching instructional strategies that may be appropriate for individual students.

If SREB states are to improve the middle grades curriculum and the instructional practices of teachers, they need to improve the professional development for middle grades teachers. In working together in professional development activities **within their own schools**, teachers can learn from each other and gain support for implementing the practices they are learning.

STRATEGY 5:

Build on adolescents' aspirations for college and careers to engage them in educational and career planning

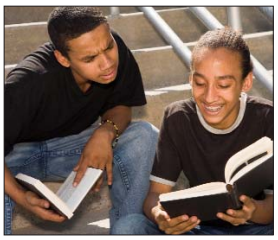
All too often, students in the middle grades — particularly those from families with low incomes — engage in "magical thinking" when it comes to their futures. They envision themselves in college or in specific careers, but they do not know what it takes to get there. This is a key finding from marketing research conducted by the Ad Council for the *KnowHow2Go* media campaign, designed to help students prepare for college. Students report that they plan to "just show up for college" like they have for other grades in school. They don't realize that

college is different — that it requires specific academic preparation, financial planning and college selection. Furthermore, many don't recognize that they must apply to college. Their minds simply transport them to college campuses — like magic.

The good news is that middle grades students have high aspirations for completing high school and going to college. Three recent surveys paint an optimistic picture:

- When the National Association of Secondary School Principals (NASSP) surveyed middle grades students in 2007, 93 percent indicated there was *no chance* they would drop out of high school. Eighty-four percent said they would be *somewhat* or *very* prepared to succeed in high school.
- Researchers at the Institute for Higher Education Policy (IHEP) who surveyed middle grades students in the same year found that 87 percent said they were either *definitely* or *probably* going to college.
- Researchers at the Ad Council in 2006 found that 91 percent of teens from low-income families indicated they are *very* or *somewhat* likely to receive a college degree.

Middle grades students have high aspirations for completing high school and going to college, but many do not know what it takes to get there.



But these same surveys also paint a dismal picture of student preparation and planning for high school and beyond:

- When NASSP researchers asked middle grades students how much information they had to help them make choices about courses to prepare them for high school, 68 percent indicated they had *some* or *none*. When asked how much they knew about the courses required for high school graduation, 25 percent said they *didn't know anything*.
- When the Ad Council asked students from low-income families — most of whom would be first-generation college students — on whom they rely for information when considering college, 26 percent said parents, 24 percent said friends and siblings, 15 percent said themselves, 22 percent said teachers, and 5 percent said counselors.

The parents of middle grades students also have high aspirations for their children. According to the IHEP survey, nearly nine of 10 middle grades parents expected their child to go to college. But they — like their children — are not taking the necessary steps to meet that goal.

- According to the Ad Council research, 73 percent of low-income parents believed their child is "college material." However, only 20 percent of them reported encouraging their children to seriously consider or apply to college, and over half (57 percent) stated that the decision to attend college is up to the child.
- The IHEP survey results found that 39 percent of middle grades parents got advice from family about preparing their children for college, 34 percent from friends, 29 percent from school counselors, 27 percent from

teachers, and 37 percent reported no sources. But this same survey showed that parents who were not high school graduates were not confident about courses to advise their children to take.

A significant task for school leaders is to help students make a positive connection between what they do now in school and what they will do in their future.

The Ad Council survey results showed that about two-thirds of low-income parents do not know that students should start thinking about college before they enter high school. Parents and students appear to be depending on unreliable sources of information — and not tapping reliable sources — to make important college and career decisions.

The enthusiasm and optimism of most middle grades students about their future is currently met with a lack of sufficient programming and information in their schools. A significant task for school leaders is to help students make a positive connection between what they do now in school and what they will do in their future.

School leaders need to help students understand that preparation for high school, college and careers is a series of step-by-step decisions, starting with engaging — getting actively involved — in school and attending class each day.

Some SREB states have been successful in developing programs that build this culture of engagement. These programs can become models for others. Building on their efforts, **you as a policy-maker and education leader can take three important steps** to help your schools and districts build a culture of educational and career planning in the middle grades.

- **Provide the necessary resources so that the middle grades curriculum can include a comprehensive high school-, college- and career-development program.**

College and career exploration should be an essential element of the middle grades curriculum. When students engage in career exploration, they build self-esteem, improve motivation and increase achievement. Career education should be tied to the academic curriculum and the general culture of the school.

In fact, research indicates that career planning is more effective the earlier it is introduced. Comprehensive planning for high school and college should begin in the middle grades — as early as sixth grade. If disengagement can begin then, activities to ensure engagement must be planned for then as well.

If disengagement can begin in sixth grade, activities to ensure engagement must be planned for then as well.

Some basic activities are simple. Community representatives of various careers should be regular guests in middle grades schools, visiting classes and speaking in assemblies. Their experience can help students understand how to prepare for various careers — and realize that the skills and knowledge adults use in their jobs link to what they learn in the middle grades and high school. Attractive materials about colleges should rotate regularly on school bulletin boards, and state higher education agencies should provide materials regularly. College and career fairs should be highlights of the school calendar — not just routine activities. State colleges and universities should be active partners.

At the state level, Web-based student information portals in most SREB states provide high-quality, up-to-date information about colleges and careers. **North Carolina** was the first in the region to have or develop a comprehensive college and career planning Web site, known as College Foundation of North Carolina (CFNC.org). The remaining 15 SREB states are developing them. These Web sites inform students about high school graduation and college entrance requirements and provide financial aid and career information.

North Carolina's Department of Public Instruction provides curricular materials so that teachers and counselors can introduce the Web site to students. It also provides professional development for counselors to help students use the sites effectively.

The portals are generally designed to serve high school students, although a few permit eighth-graders to have e-mail accounts and store personal educational information. The federal *Children's Online Privacy Protection Act of 1998* (COPPA) precludes giving e-mail accounts to children under the age of 13 without parental permission, except under strict conditions. However, college and career Web sites can be expanded to include information for a younger audience without asking for personal information.

Few SREB states have designed these key college and career planning resources — the state Web portals — as effectively as they could for students as young as eighth grade. The North Carolina CFNC Web site hosts a special program for elementary students to explore careers — Paws for Jobland — that other states could adapt for middle grades students. Or states could do as **Maryland**'s Business Roundtable has done and build a Web site specifically for teens — and even younger children — to explore careers and college: Be What I Want To Be (www.bewhatiwanttobe.com).

All SREB states should take steps to ensure their Web portals appeal to younger students — while not detracting from their overall usefulness to older students. Experts working with SREB's Go *Alliance*, a network of SREB state representatives responsible for college and career outreach, suggested making all the state Web sites more accessible to schools with middle grades. They also recommended making the sites less dependent on text, more visually appealing and more interactive. Media Web sites for teens and tweens (ages 9 to 14) such as Webkinz, Nickelodeon, Disney, Discovery Kids, and My Space — which attract many students for hours each day — are good examples of sites that are much more active and dynamic.

All SREB states should take steps to ensure their Web portals appeal to younger students — while not detracting from their overall usefulness to older students.

Policy-makers and education leaders do not have to start from scratch on this effort. You can urge your state to take cost-effective steps to revise sections or add elements to your existing Web resource, and thereby provide teachers and counselors with a valuable tool for working with middle grades students. By introducing middle grades students to the same Web site they will need as high school students, you can help them take the first steps in their longer-term planning process.

■ **Require middle grades students to develop online academic plans linked to career development.**

Most SREB states have created opportunities for high school students to develop academic plans, often using Web-based tools. Three SREB states — Florida, Kentucky and South Carolina — require students in the middle grades to build an academic plan. In doing so, these students begin to make the connection between the courses they need for high school graduation and their longer-range goals.

Academic plans help middle grades students make the connection between the courses they need for high school graduation and their longer-range goals.

South Carolina requires that eighth-graders work with their parents to create an individual graduation plan (IGP) as part of the state's Personal Pathways to Success program, created by the *South Carolina Education and Economic Development Act* (2005). In developing the IGP, students choose courses to meet the state's high school graduation requirements. Students also must decide on a career major in a field of study to guide the selection of their electives courses. Schools, in partnership with local businesses, then help students gain work experience in their fields of choice. South Carolina begins its Personal Pathways to Success program in the elementary grades with career exploration. Students can change their career majors in high school, but this process of selection is an important step in career decision-making.

Florida requires middle grades students to complete a career and education planning course in seventh or eighth grade that includes an academic plan for high school. Students use an electronic Personal Education Planner, or ePEP, on Florida's online student advising Web site, FACTS.org. Florida requires that the plan be based on the student's own objectives and that it be developed after the students have had opportunities to explore various career opportunities. The student, parent, instructor and school counselor or academic advisor all sign the plan once it is complete, and it is then maintained online and available to all parties. The plan requires students to declare major interests and to list the courses they will take to fulfill high school graduation requirements and meet their own career goals. The plan remains available to the student online throughout high school and can be altered as the student changes career interests.

Kentucky made the transition in 2006 from paper-and-pencil graduation plans (for students in eighth through 12th grades) to online Individual Learning Plans, or ILPs, starting in sixth grade. The new system is online so students can access college and career information and explore options in developing their four-year course plan for high school. Teachers and students work together on the plans, allowing teachers to get to know their students better. Students also have an "account" on the system and may upload and share their achievements with others.

- **Provide more middle grades school counselors who can work with principals to promote a culture of engagement and provide information about college and careers to students and parents.**

The College Board has recommended 10 important roles that middle grades counselors can play in their schools — all ones that promote a culture of engagement: getting to know students individually, planning career days, providing college and career resources to students, and inviting local professionals to schools to introduce careers. The roles also include helping teachers incorporate college and career lessons into the existing curriculum, and working with parents on college and career planning for their children — through translators if necessary.

Especially in difficult economic times, middle grades counselors are essential.

You as a policy-maker and education leader should **recognize middle grades school counselors as key members** of the school leadership team and **establish high expectations** for them. Especially in difficult economic times, these professionals are essential. Counselors have a key responsibility to keep each student involved and interested in school and to create a culture of engagement for the school as a whole. But principals may need incentives to assign counselors to these roles and not to routine administrative tasks.

One of the most pressing issues hampering counselors' effectiveness is the high ratio of students assigned to them: in most states, one counselor for several hundred students. With the support of state leaders, schools should **provide more professional counselors who are trained** in adolescent social and emotional development and can provide effective academic and career advisement. *All* students need access to highly qualified counselors who have the time to develop relationships with them — counselors who know each student's academic and career plans. Personalized time together creates a strong sense of caring that can help the student stay involved and on track in class. Lower student-counselor ratios allow counselors to provide more frequent and higher-quality advisement sessions.

Schools should not depend on untrained career or graduation advisors to reduce the work load. Any additional advisement job roles should supplement — but not supplant — actual counselors. Students frequently raise complex issues when they discuss their academic and career plans. Trained counselors can help them address these issues. If schools employ career or graduation advisors to serve some roles, these individuals should work closely with counselors and refer the students to the counselors as needed. If these advisors are linked to the counseling office, the advisors can refer the students to the counselors — who already should have a relationship with the students.

In Summary: Challenges Ahead

The SREB *Challenge to Lead* goals set a high bar for student achievement in the middle grades: They call for SREB states to meet state standards for all students on state assessments, to exceed national averages for all groups on national assessments and to enroll more students in algebra in eighth grade. **Too many students in SREB states, however, continue to leave the middle grades without being ready for high school**.

Progress has stalled in improving middle grades achievement in reading. While enrollments in algebra and pre-algebra are increasing, scores on NAEP in math are not keeping pace. Although most gaps in achievement between black and white students and between Hispanic and white students are narrowing somewhat, significant gaps remain.

Your state can take steps to help middle grades students stay on the path to success in high school. Students are generally inquisitive and excited to learn in the middle grades, and they are interested in their future. But too many middle grades students lag behind in achievement, and others become bored along the way. Schools must be prepared to intervene to help these students. Tutoring should be readily available to help them fill knowledge and skill gaps. Counselors need to connect with students and parents and help them set clear educational goals. Career development should be a part of the curriculum so it can help spark students' imagination.

You and other policy-makers and education leaders should develop policies that support students and their teachers in the middle grades — policies that call for:

- **a high priority on the improvement of reading for middle grades students**.
- **an accelerated curriculum for all students not achieving on grade level**.
- **readiness for algebra** by eighth grade, which may require restructuring the middle grades math curricula to focus on the skills that help students prepare for algebra and high school courses.
- **professional development and certification (and re-certification)** that ensure teachers have the knowledge to teach their subjects well and the instructional skills to keep middle grades students engaged in learning.
- **career development programs** that promote educational/career planning and sufficient middle grades counselors in the schools.

All of these state efforts can make a difference in middle grades achievement — and, ultimately, in high school and college graduation rates. The middle grades are a critical part of the students' educational path — not simply a bridge from the early grades to high school. Most adolescent students aspire to college and good careers, and policy-makers and education leaders know students need the right preparation to help them get there.

It is your job as a state leader to help ensure that middle grades achieve their mission. State leaders, working together with district and school leaders and educators, can move far more middle grades students in the right direction.

Appendix A

Percent of Eighth-Graders Scoring At or Above NAEP Basic and Proficient Levels in Math and Percent Enrolled in Pre-Algebra, Algebra I or Higher

	Percent Scoring At or Above				Percent Enrolled			
	NAEP Basic		NAEP Proficient		Pre-Algebra or Higher		Algebra I or Higher	
	2003	2007	2003	2007	2003	2007	2003	2007
United States	67	70	27	31	62	70	33	44
SREB Median	64	67	23	26	61	**70**	28	37
Alabama	53	55	16	18	57	**84**	19	34
Arkansas	58	65	19	24	**62**	**74**	21	37
Delaware	**68**	**74**	26	**31**	55	66	28	**46**
Florida	62	68	23	27	58	**71**	**33**	**46**
Georgia	59	64	22	25	**79**	**87**	31	**54**
Kentucky	65	69	24	27	60	**70**	25	38
Louisiana	57	64	17	19	50	58	15	25
Maryland	**67**	**74**	**30**	**37**	**83**	**87**	**44**	**57**
Mississippi	47	54	12	14	56	68	16	22
North Carolina	**72**	**73**	**32**	**34**	61	66	**34**	37
Oklahoma	65	66	20	21	**79**	**79**	28	29
South Carolina	**68**	**71**	26	**32**	**70**	**79**	27	**44**
Tennessee	59	64	21	23	54	**71**	22	35
Texas	**69**	**78**	25	**35**	61	53	28	30
Virginia	**72**	**77**	**31**	**37**	**71**	**73**	**34**	**46**
West Virginia	63	61	20	19	60	65	30	37

Notes: The SREB median is the average of the two SREB median states.

State percentages that are equal to or greater than the national percentages are shown in **bold**.

Sources: National Assessment of Educational Progress and state education report cards.

Appendix B

Recommended Major Topics of School Algebra[1]

Symbols and Expressions

- Polynomial expressions
- Rational expressions
- Arithmetic and finite geometric series

Linear Equations

- Real numbers as points on the number line
- Linear equations and their graphs
- Solving problems with linear equations
- Linear inequalities and their graphs
- Graphing and solving systems of simultaneous linear equations

Quadratic Equations

- Factors and factoring of quadratic polynomials with integer coefficients
- Completing the square in quadratic expressions
- Quadratic formula and factoring of general quadratic polynomials
- Using the quadratic formula to solve equations

Functions

- Linear functions
- Quadratic functions — word problems involving quadratic functions
- Graphs of quadratic functions and completing the square
- Polynomial functions (including graphs of basic functions)
- Simple nonlinear functions (e.g., square and cube root functions; absolute value; rational functions; step functions)
- Rational exponents, radical expressions and exponential functions
- Logarithmic functions
- Trigonometric functions
- Fitting simple mathematical models to data

Algebra of Polynomials

- Roots and factorization of polynomials
- Complex numbers and operations
- Fundamental theorem of algebra
- Binomial coefficients (and Pascal's Triangle)
- Mathematical induction and the binomial theorem

Combinatorics and Finite Probability

- Combinations and permutations, as applications of the binomial theorem and Pascal's Triangle

[1] Topics selected by the national mathematics panel as central to the teaching of algebra.

Source: *The Final Report of the National Mathematics Advisory Panel,* U.S. Department of Education, 2008.

Appendix C

Benchmarks for the Critical Foundations of Algebra: Guideposts for State Frameworks and School Districts[1]

Fluency With Whole Numbers

- By the end of Grade 3, students should be proficient with the addition and subtraction of whole numbers.
- By the end of Grade 5, students should be proficient with multiplication and division of whole numbers.

Fluency With Fractions

- By the end of Grade 4, students should be able to identify and represent fractions and decimals, and compare them on a number line or with other common representations of fractions and decimals.
- By the end of Grade 5, students should be proficient with comparing fractions and decimals and common percent, and with the addition and subtraction of fractions and decimals.
- By the end of Grade 6, students should be proficient with multiplication and division of fractions and decimals.
- By the end of Grade 6, students should be proficient with all operations involving positive and negative integers.
- By the end of Grade 7, students should be proficient with all operations involving positive and negative fractions.
- By the end of Grade 7, students should be able to solve problems involving percent, ratio and rate and to extend this work to proportionality.

Geometry and Measurement

- By the end of Grade 5, students should be able to solve problems involving perimeter and area of triangles and all quadrilaterals having at least one pair of parallel sides (i.e., trapezoids).
- By the end of Grade 6, students should be able to analyze the properties of two-dimensional shapes and solve problems involving perimeter and area, and analyze the properties of three-dimensional shapes and solve problems involving surface area and volume.
- By the end of Grade 7, students should be familiar with the relationship between similar triangles and the concept of the slope of a line.

[1] Recommendations from the national mathematics panel for sequencing algebra readiness content.

Source: *The Final Report of the National Mathematics Advisory Panel,* U.S. Department of Education, 2008.

Appendix D

Percent of Public School Teachers Assigned to Teach Math Classes Who Hold Credentials in Math: Grades 7-12, 2004

	Middle Grades	High School
SREB Median	69	91
Alabama	NA	NA
Arkansas	66	NA
Delaware	71	92
Florida	NA	NA
Georgia	11	89
Kentucky	NA	NA
Louisiana	76	88
Maryland	NA	NA
Mississippi	64	96
North Carolina	17	48
Oklahoma	36	92
South Carolina	NA	NA
Tennessee	95	91
Texas	NA	64
Virginia	84	90
West Virginia	94	96

Note: The SREB median is the average of the two SREB median states.
"NA" indicates not available.
Source: Council of Chief State School Officers.

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Challenge to Lead Goals for Education

The reports listed below for each goal, and other reports on the goals, are found at www.sreb.org.

1. All children are ready for the first grade.
   Ready to Start: Ensuring High-Quality Prekindergarten in SREB States
2. Achievement in the early grades for all groups of students exceeds national averages and performance gaps are closed.
   Set for Success: Improving Reading and Mathematics Achievement in the Early Grades
3. Achievement in the middle grades for all groups of students exceeds national averages and performance gaps are closed.
   Keeping Middle Grades Students on the Path to Success in High School
4. All young adults have a high school diploma — or, if not, pass the GED tests.
   Getting Serious About High School Graduation
5. All recent high school graduates have solid academic preparation and are ready for post-secondary education and a career.
   Getting Students Ready for College and Careers
6. Adults who are not high school graduates participate in literacy and job-skills training and further education.
   Investing Wisely in Adult Learning is Key to State Prosperity
7. The percentage of adults who earn postsecondary degrees or technical certificates exceeds national averages.
   Creating College Opportunity for All: Prepared Students and Affordable Colleges
8. Every school has higher student performance and meets state academic standards for all students each year.
   Focusing on Student Performance Through Accountability
9. Every school has leadership that results in improved student performance — and leadership begins with an effective school principal.
   Schools Need Good Leaders Now: State Progress in Creating a Learning-Centered School Leadership System
10. Every student is taught by qualified teachers.
    Resolve and Resources to Get a Qualified Teacher in Every Classroom
11. The quality of colleges and universities is regularly assessed and funding is targeted to quality, efficiency and state needs.
    Holding Colleges and Universities Accountable for Meeting State Needs
12. The state places a high priority on an education system of schools, colleges and universities that is accountable.
    From Goals to Results: Improving Education System *Accountability*

The Southern Regional Education Board has established these Goals for Education. They are built on the groundbreaking education goals SREB adopted in 1988 and on an ongoing effort to promote actions and measure progress. The goals raise further the sights of the 16 SREB states and challenge them to lead the nation.

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