

By: Senator(s) Nunnelee

To: Education;
Appropriations

SENATE BILL NO. 2033

1 AN ACT TO ESTABLISH THE "MISSISSIPPI SCIENCE, TECHNOLOGY,
2 ENGINEERING AND MATHEMATICS (STEM) EDUCATION COMPETITIVENESS ACT";
3 TO PROVIDE DEFINITIONS; TO PRESCRIBE THE RESPONSIBILITIES OF THE
4 STATE DEPARTMENT OF EDUCATION AND LOCAL SCHOOL DISTRICTS IN
5 ADDRESSING STEM INSTRUCTION, COORDINATION AND CAREERS; AND FOR
6 RELATED PURPOSES.

7 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MISSISSIPPI:

8 **SECTION 1.** This act shall be known and may be cited as the
9 "Mississippi Science, Technology, Engineering and Mathematics
10 (STEM) Education Competitiveness Act."

11 **SECTION 2.** For purposes of this act:

12 (a) "Department" means the State Department of
13 Education.

14 (b) "K-12" means Kindergarten through the Twelfth
15 Grade.

16 (c) "Public education" means education in public
17 schools in grades Kindergarten through the Twelfth Grade (K-12).

18 (d) "STEM" means science, technology, engineering and
19 mathematics.

20 (e) "Technology" means the processes and mechanisms
21 used to modify and control our environment; technology includes
22 chemical, structural, mechanical, electrical and electronic
23 systems of which computers and information technology is only a
24 small segment.

25 **SECTION 3.** It is the intent of the Mississippi Science,
26 Technology, Engineering and Mathematics (STEM) Education
27 Competitiveness Act to place students at the center of science,
28 technology, engineering and mathematics competitiveness. The
29 success of teachers, schools, school districts and state education

30 agencies will be measured in terms of student competitiveness.

31 The State Department of Education, and local school districts in
32 partnership with other organizations, shall have as priorities:

33 (a) Maintaining students' early natural curiosity about
34 science and technology by emphasizing incremental, "clinically"
35 tested improvements in STEM curricula;

36 (b) Building cumulative STEM competencies in students
37 by building on the foundation of knowledge established at each
38 level of education, from elementary grades where students have
39 innate curiosity about their world and how it works through middle
40 school, high school and beyond;

41 (c) Providing students with hands-on, open-ended,
42 real-world problem-solving experiences which are linked to the
43 curriculum; using science, engineering and technology modules; and
44 grouping such experiences and modules by discipline and level of
45 difficulty;

46 (d) Promoting hands-on activities for students,
47 including research-oriented classes or student-centered (as
48 opposed to credit-centered) science fairs in middle school grades,
49 making high school science fairs more appealing to students
50 through authentic research projects that emphasize the use of
51 mathematics in reporting results and promoting engineering and
52 technology competitions in high school;

53 (e) Recognizing and rewarding students who excel in
54 academics;

55 (f) Supporting undergraduate, as well as graduate,
56 students of STEM;

57 (g) Connecting university research in science and
58 engineering to undergraduate, high school and middle school
59 students statewide; and

60 (h) Illustrating STEM careers for students at all
61 levels, including for entering first-year college students.

62 **SECTION 4.** The Department of Education shall develop
63 policies and programs to increase the number and quality of STEM
64 teachers by:

65 (a) Increasing STEM coursework for pre-service
66 teachers, including authentic research experiences through
67 research classes, internships and externships;

68 (b) Training pre-service and in-service teachers on
69 21st Century information technology;

70 (c) Offering an effective alternate certification and
71 transition to teaching assistance for nonteaching scientists,
72 engineers, mathematicians and other technically-trained
73 professionals who are qualified and wish to teach STEM;

74 (d) Recommending differential pay for STEM teachers,
75 subject to specific appropriation therefor;

76 (e) Improving in-service training;

77 (f) Improving professional development by focusing on
78 the STEM curricula; and

79 (g) Providing opportunities for mentoring of teachers
80 by master teachers.

81 **SECTION 5.** School districts shall prepare strategic plans
82 which, when implemented, will:

83 (a) Deploy current computer technology in classrooms
84 through school buildings.

85 (b) Require computer training for teachers in
86 pre-service and support in-service training of teachers to use
87 current technology effectively in the classroom.

88 (c) Provide effective teaching materials, including
89 those for hands-on activities and access to on-line teaching and
90 learning resources.

91 (d) Strengthen the supportive climate that positively
92 affects female and minority student interest and self-confidence
93 in STEM.

94 **SECTION 6.** In the area of STEM education, the department
95 shall prepare a report, to be submitted to the Governor, and the
96 Education Committees of the Senate and the House of
97 Representatives, concerning the status of, and plans to:

98 (a) Adopt pre-engineering content standards and a
99 pre-engineering curriculum.

100 (b) Support regional STEM high schools that effectively
101 emphasize STEM content for a diverse student population and
102 provide a supportive culture of excellence that positively affects
103 all students', and especially women and minority students',
104 interest and self-confidence in STEM.

105 (c) Use partnerships with private sector and
106 nongovernmental organizations to assist in setting STEM content
107 standards, curricula and high performance standards.

108 (d) Monitor research on STEM teaching and learning.

109 (e) Propose and evaluate best practices in teaching
110 STEM in accordance with content standards.

111 (f) Disseminate best practices to school districts.

112 (g) Maintain on-line STEM content standards and
113 curricula.

114 (h) Maintain a centralized website as a one-stop
115 resource for teachers.

116 (i) Employ an adequate number of science coordinators
117 at the department so that they are readily available to all school
118 districts.

119 (j) Provide public outreach and parental educational
120 materials.

121 (k) Stress the importance of education in general and
122 four-year college degrees in particular.

123 (l) Support high performance standards and resist
124 lowering standards when student performance is low.

125 (m) Develop better student assessment mechanisms and
126 other outcome measures to be used to establish accountability.

127 (n) Use current funds more efficiently and redirect
128 cost savings to support academic areas of need.

129 (o) Address discontinuities between what exists in
130 public education and what should exist in order to meet the
131 current educational needs of students.

132 **SECTION 7.** The State Department of Education shall cooperate
133 with statewide organizations and partnerships to enhance the
134 research experience of STEM students at all levels. These efforts
135 may include, but are not limited to:

136 (a) Supporting science fairs, where students explain
137 their observations by using math, at the middle and high school
138 level;

139 (b) Supporting technology competitions, where students
140 use various information technology and software programs to
141 address community issues, at the middle and high school level;

142 (c) Supporting pre-engineering competitions, where
143 students engage in robotic competitions, at the middle and high
144 school level;

145 (d) Establishing summer science, technology and
146 engineering research experiences at four-year universities for
147 teachers and high school students to increase research
148 competencies;

149 (e) Supporting science, technology and engineering
150 students in undergraduate and graduate research;

151 (f) Encouraging graduate students to apply their
152 research in public education settings;

153 (g) Coordinating good mentoring of students at all
154 levels to overcome stereotypes of scientists, technologists,
155 engineers and mathematicians;

156 (h) Emphasizing education as a family and community
157 value;

158 (i) Showcasing STEM professionals in the community as
159 role models for students;

- 160 (j) Encouraging partnership formation at the local
161 level;
162 (k) Encouraging parental support for high achievement
163 in STEM; and
164 (l) Communicating the value of retaining some of the
165 community's best and brightest students as knowledge workers.

166 **SECTION 8.** This act shall take effect and be in force from
167 and after July 1, 2004.