

XI.E.

CONNECTICUT STATE BOARD OF EDUCATION
Hartford

TO BE PROPOSED:
June 4, 2008

RESOLVED, That the State Board of Education, pursuant to Section 10-14n of the Connecticut General Statutes and the No Child Left Behind Act, approves Grade 5 and Grade 8 Science Achievement Standards for the Connecticut Mastery Test, and directs the Commissioner to take the necessary action.

Approved by a vote of _____, this fourth day of June, Two Thousand Eight.

Signed: _____
Mark K. McQuillan, Secretary
State Board of Education

CONNECTICUT STATE BOARD OF EDUCATION
Hartford

TO: State Board of Education

FROM: Mark K. McQuillan, Commissioner of Education

SUBJECT: Connecticut Mastery Test (CMT) - Achievement Standards for the Grade 5 and Grade 8 Science Tests

For the first time in March 2008, Connecticut administered a Grade 5 and Grade 8 science test to satisfy *No Child Left Behind* (NCLB) requirements. For each grade, a total science score will be reported as well as subscores in the following five areas: (1) Life Science; (2) Physical Science; (3) Earth Science; (4) Content Knowledge; and (5) Scientific Inquiry, Literacy and Numeracy. (See Attachments 1 and 2 for description of the Grade 5 and Grade 8 science tests.) In addition, results will be reported in terms of the percentage of students scoring in each of five performance achievement levels (i.e., below basic, basic, proficient, goal and advanced). The purpose of this report is to recommend for approval achievement standards for the Grade 5 and Grade 8 science tests. A report summarizing the Science Standard Setting Procedures was presented to the Connecticut State Board of Education during its February 2008 meeting. The recommendations take into consideration input from our CMT Science Standard-Setting Committees and impact data (i.e., student score distributions divided into the five categories, based on cut scores set in Round 2) based on prior results from the other CMT content areas. The Standard-Setting Committees were selected to be representative of a diverse group of Connecticut educators in terms of district socioeconomic factors, gender, race and other relevant factors. A list of panel members is included in Appendix A. All procedures were discussed with and approved by our Technical Advisory Committee (TAC) prior to implementation. The TAC is composed of nationally recognized experts in the measurement field. A list of the TAC members is included in Appendix B.

Overview of the Development of the CMT Science Test

An overview of the steps used in the process of designing and developing the new CMT science assessment is presented below. These procedures are consistent with those previously used in the development of prior generations of the CMT.

- Content and testing experts at the Connecticut State Department of Education (CSDE) carefully reviewed the items in terms of the test content and the test structure as well as appropriateness for Grades 5 and Grade 8 students. Special consideration was given to the each test's alignment with the new State curriculum frameworks.

- A CMT Content Advisory Committee comprised of Connecticut educators reviewed the test for both content and structure and advised the work of the CSDE. Decisions were made through an iterative process with the advisory committee having several opportunities to provide input throughout the design phase.
- Based on input from various advisory groups, test specifications and item specifications were written to guide the test development process. The State Board of Education and the Connecticut education community have received information at key points in the development process.
- Items written according to the final specifications were reviewed by both curriculum and assessment staff at the CSDE, by Content Advisory Committees and by a Fairness Committee to ensure that all test items fairly assess all children. As a result of these extensive reviews, some test items were modified or eliminated, as appropriate.
- Those items that fared well through the review process were then pilot-tested with a sample of grade-appropriate Connecticut students. The data that resulted from the pilot were carefully examined to ensure that each test item was not misleading or confusing to students and had the appropriate psychometric qualities.
- CMT test forms for Grade 5 and Grade 8 were constructed based on data from the pilot study as well as the test specifications for each test.

Description of the Grade 5 and Grade 8 Science Assessments

The CMT science assessments measure, over several years, what students have learned about core science concepts and how scientific inquiry is done. The assessments include questions related to concepts in life science, physical science and earth science and how those concepts apply to real world issues and technologies. The 2004 Core Science Curriculum Framework describes the conceptual focus of four Content Standards for each grade in the PK-8 span, as well as the Expected Performances assessed on the CMT.

The Elementary Science CMT is a cumulative test administered at Grade 5. It assesses science knowledge and abilities described in the Framework Expected Performances for Grades 3, 4 and 5.

The Middle School Science CMT is a cumulative test administered at Grade 8. It includes science knowledge and abilities described in the Core Science Curriculum Framework for Grades 6, 7 and 8.

Results of the CMT will be reported in various ways and are intended to help improve the performance of students, support modifications in curriculum and instructional practices, and stimulate higher expectations for student achievement. School districts receive sets of student reports that show how well individual students did on each section of the CMT.

Overview of the Standard Setting Process

Measurement Incorporated (MI), the CMT prime contractor, assisted the Department in the standard setting process. Over a three-day proposed period (May 20-22), the standard-setting activity took place in Connecticut using a “bookmark” method. With the bookmark procedure, the CMT Science Standard Setting Committee examined test items from the 2008 CMT administration in a difficulty-ordered booklet and made judgments about the performance of a minimally qualified examinee at each of the five performance achievement levels (i.e., below basic, basic, proficient, goal and advanced) in each of the two grades.

Panelists engaged in three rounds of ratings. Prior to the first round, panelists were provided Performance Level Descriptors which describe what students at each of the five performance achievement levels can do. Normative feedback was provided between Rounds 1 and 2 so that panelists were able to compare their judgments to those of other panelists. Between Rounds 2 and 3 impact data as well as prior results from the other CMT content areas were supplied to help reduce differences among the judgments of the panelists. The panelists’ final bookmark selections from Round 3 were then analyzed to produce the recommended cut scores that define the five achievement levels.

Establishment of Standards for Third Generation CAPT

Appendix C presents the projected percentages of students who will score at or above the Grade 5 and Grade 8 standards as well as the estimated scale score cut scores for the Grade 5 and Grade 8 science tests. Based on the best data that were available at the time of the Standard Setting committee meetings, we are able to **estimate** the scale score cut points that correspond to the projected percentages. When the data file from the 2008 CMT administration is complete and accurate, we will be able to determine the exact scale score cut points. The same scale score cut points established for the 2008 administration will be applied in all future CMT administrations within the current generation.

Prepared by:

William Congero, Ph.D., Director
Bureau of Student Assessment

Reviewed by:

Barbara Q. Beaudin, Ed.D., Acting Associate Commissioner
Division of Assessment and Accountability

June 4, 2008

APPENDIX A

Grade 5 Standards Review Panel Members

Name	Current Position	Experience instructing ELLs	Experience instructing students with disabilities	Highest Degree
Marcia Benvenuti	MS Asst. Principal	YES	NO	MA
Rebecca Bergeron	Resource Teacher Math/Science	YES	YES	6th yr
Lisa Bress	Science Teacher Leader K-6	YES	YES	6th yr in Admin. Ed;/Leadership
Sally Dastoli	K-12 Science	YES	YES	6TH Year EDLR
Monica S. Franzone	K-12 Science Coordinator	YES	YES	Ed.D.
Linda Froschauer	K-5 Curriculum Instruction Leader Science/Math	NO	NO	6th yr
Michael Ginsburg	Math/Science (5-6)	NO	YES	6th yr
Patricia Grondin	Science Coordinator K-8	NO	NO	Master's
Bonnie Maur	Pre-K-12 Science Coordinator	YES	YES	6th yr administration
Barbara Pudim	K-12 Math/Science Coordinator	YES	YES	Masters

Grade 8 Standards Review Panel Members

Name	Current Position	Experience instructing ELLs	Experience instructing students with disabilities	Highest Degree
Barbara Barker	Science Teacher	NO	NO	M. Ed
Jane Callery	Grade 6 Teacher, Science Curriculum Facilitator	YES	YES	6th year
Lenore J. Gallagher	Grade 7 Science Teacher	YES	YES	Masters
Vera Gray	Grade 7 Science 6, 7, 8 / Dept Head	YES	YES	6th yr
Amy E. Hall	Science Teacher - Grade 8	YES	YES	Master's
Beth Lancaster	Teacher	YES	YES	MED
Inez Liftig	Teacher	NO	YES	MAT
Dennis Martin	Science Teacher	YES	YES	MS
Melinda Meyer	K-8 Science Coordinator	YES	YES	Masters
Sherry Mitchell	Science Educator/Adjunct Professor	YES	YES	2 Masters; working on 6th yr
Kimberly Mowery	Teacher/Science Coordinator	NO	NO	AB
Edward M. O'Connell	Science Coordinator	NO	YES	M.A.
Aresta L. Thompson	Director of Science, K-12	YES	YES	6th yr
Robb White	7-8 Science Dept Coordinator	NO	YES	MS
Cynthia H Wilbur	Science Resource	YES	YES	Masters

APPENDIX B

Technical Advisory Committee (TAC) Members

Dr. Peter Behuniak, Professor
University of Connecticut
Measurement, Evaluation, and Assessment Program
Department of Educational Psychology
NEAG School of Education

Dr. Robert Linn, Professor Emeritus
University of Colorado
Co-Director, National Center for Research on Evaluation, Standards, and Student Testing
and former president of the American Educational Research Association and the National
Council on Measurement in Education

Dr. William Mehrens, Professor Emeritus
Michigan State University

Dr. Joseph Ryan, Interim Dean
College of Teacher Education and Leadership
Arizona State University West

Dr. Hariharan Swaminathan, Department Chair
University of Connecticut
Measurement, Evaluation, and Assessment Program
Department of Educational Psychology
NEAG School of Education

APPENDIX C

CMT Science - Grades 5 and 8

Estimated Scale Score Ranges by Achievement Level

Grade	Below Basic	Basic	Proficient	Goal	Advanced
5	100-187	188-212	213-247	248-299	300-400
8	100-201	202-220	221-243	244-298	299-400

Estimated Percentages at Achievement Levels Grade 5

	Below Basic	Basic	Proficient	Goal	Advanced
% At This Level	7%	11%	26%	41%	15%
% At or Above This Level	100%	93%	82%	55%	15%

Estimated Percentages at Achievement Levels Grade 8

	Below Basic	Basic	Proficient	Goal	Advanced
% At This Level	15%	10%	17%	44%	15%
% At or Above This Level	100%	85%	75%	59%	15%