

Agenda Item: Connecticut Mastery Test & Connecticut Academic Performance Test
Science Results

Meeting Date: October 18, 2016

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This report presents the Spring 2016 results for the Science Connecticut Mastery Test (CMT) that was administered in grades 5 and 8 and the Science Connecticut Academic Performance Test (CAPT) that was administered in grade 10.

2016 CMT Science Results

The Fourth Generation Science CMT is the standard assessment administered to all students in Grades 5 and 8. The content of the test measures students’ understanding of life, earth, and physical scientific concepts; application to real-world issues; scientific inquiry; and scientific reasoning to solve problems. The test includes multiple-choice and open ended questions.

This year in science Grade 5 had a two percentage point decrease and grade 8 showed a seven percentage point decrease from 2015.

The table below summarizes the percentage of students at or above goal for science since 2007.

Overall Results: Percentage of Students by Content Area At/Above Goal for 2007-2016

| Grade Level | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|-----------------|------|------|------|------|------|------|------|------|------|------|
| Grade 5 Science | NA | 78 | 89 | 86 | 89 | 92 | 81 | 76 | 84 | 82 |
| Grade 8 Science | NA | 92 | 90 | 88 | 89 | 84 | 88 | 90 | 89 | 82 |

A total of 273 fifth graders were tested, with 93% of the students scoring at or above proficiency and 82% of the students scoring at or above goal. In grade 8, 272 students were tested and 91% of the students scored at or above proficiency and 82% scored at or above goal.

The table below indicates the percentage of students performing in each of the five performance levels: Level 1 (Below Basic), Level 2 (Basic), Level 3 (Proficient), Level 4 (Goal), and Level 5 (Advanced). Levels 4 and 5 are considered “Mastery” by the state and Level 3 is considered “Proficient”. The majority of our students reach the “At/Above Grade Level” bands.

Percent of Students by Performance Level

| Grade | Level 1 Below Basic | Level 2 Basic | At/Above Grade Level | | |
|-------|------------------------|------------------|-----------------------|-----------------|---------------------|
| | | | Level 3 Proficient | Level 4 Goal | Level 5 Advanced |
| 5 | 1 | 6 | 11 | 45 | 37 |
| 8 | 6 | 4 | 9 | 49 | 33 |

The next section of tables detail student performance in the areas of special education, English Learners (EL), and gender. The percentage of students performing in each of the five performance levels: Level 1 (Below Basic), Level 2 (Basic), Level 3 (Proficient), Level 4 (Goal), and Level 5 (Advanced) are listed in addition to the percentage of students performing at or above proficiency and at or above goal.

Percent of Special Education Learners by Performance Levels

| Grade | # Tested | Below Basic | Basic | Proficient | Goal | Advanced | % At/Above Proficiency | % At/Above Goal |
|-------|----------|-------------|-------|------------|------|----------|------------------------|-----------------|
| 5 | 19 | 5 | 42 | 42 | 11 | 0 | 53 | 11 |
| 8 | 29 | 31 | 24 | 24 | 21 | 0 | 45 | 21 |

Percent of English Learners by Performance Levels

| Grade | # Tested | Below Basic | Basic | Proficient | Goal | Advanced | % At/Above Proficiency | % At/Above Goal |
|-------|----------|-------------|-------|------------|------|----------|------------------------|-----------------|
| 5 | 8 | 13 | 25 | 38 | 13 | 13 | 64 | 26 |
| 8 | 2 | 50 | 0 | 0 | 50 | 0 | 50 | 50 |

Percent of Students by Gender by Performance Levels

| Group | Grade | # Tested | Below Basic | Basic | Proficient | Goal | Advanced | % At/Above Proficiency | % At/Above Goal |
|--------|-------|----------|-------------|-------|------------|------|----------|------------------------|-----------------|
| All | 5 | 273 | 1 | 6 | 11 | 45 | 37 | 93 | 82 |
| Male | 5 | 127 | 1 | 5 | 11 | 45 | 39 | 95 | 84 |
| Female | 5 | 146 | 1 | 8 | 11 | 45 | 36 | 92 | 81 |
| All | 8 | 272 | 6 | 4 | 9 | 49 | 33 | 91 | 82 |
| Male | 8 | 132 | 6 | 4 | 11 | 42 | 36 | 89 | 78 |
| Female | 8 | 140 | 5 | 4 | 6 | 55 | 30 | 91 | 85 |

The state has placed Avon in District Reference Group (DRG) B. The table below compares the performance of Avon with DRG A and similar DRG B school districts. These scores represent the percentage of students scoring at or above goal in the area of science.

Comparison of 2016 CMT Science At/Above Goal Among DRG A/B Districts

| DRG | Group | Science 5 | Science 8 |
|------------|---------------|------------------|------------------|
| A | Darien | 83.5 | 91.3 |
| A | Easton | 87.5 | 84.5 |
| A | New Canaan | 90.0 | 89.4 |
| A | Redding | 90.6 | 82.9 |
| A | Ridgefield | 86.6 | 88.3 |
| A | Weston | 88.9 | 85.2 |
| A | Westport | 86.6 | 85.6 |
| A | Wilton | 80.0 | 88.8 |
| B | Avon | 82.1 | 82.0 |
| B | Bethany | 86.0 | -- |
| B | Brookfield | 81.4 | 81.4 |
| B | Cheshire | 84.8 | 81.5 |
| B | Fairfield | 80.4 | 83.0 |
| B | Farmington | 88.0 | 83.0 |
| B | Glastonbury | 87.1 | 87.1 |
| B | Granby | 90.3 | 85.2 |
| B | Greenwich | 77.6 | 80.3 |
| B | Guilford | 75.7 | 80.8 |
| B | Madison | 75.5 | 81.3 |
| B | Monroe | 90.7 | 84.2 |
| B | New Fairfield | 68.2 | 77.6 |
| B | Newtown | 76.3 | 84.4 |
| B | Orange | 85.1 | -- |
| B | Simsbury | 87.7 | 85.4 |
| B | South Windsor | 80.8 | 81.3 |
| B | Trumbull | 85.6 | 78.4 |
| B | West Hartford | 75.0 | 74.5 |
| B | Regional #15 | 86.5 | 81.3 |

Ranking for Avon DRG A: 8/9 9/9
Ranking for Avon DRG B: 11/20 8/18

2016 CAPT Science Results

The Third Generation CAPT test assesses 10th grade students on important scientific knowledge and skills from the areas of life science, physical science, and earth science. Student’s knowledge about scientific inquiry, literacy, and numeracy are imbedded in the assessment. The test is comprised of multiple choice and open-ended items that assess five equally weighted content strands:

- Energy Transformations
- Chemical Structures and Properties
- Global Interdependence
- Cell Chemistry and Biotechnology
- Genetics, Evolution and Biodiversity

The table below displays student performance in the area of Science for all students, special education, English Learners (EL), and gender. The percentage of students performing in each of the five performance levels: Level 1 (Below Basic), Level 2 (Basic), Level 3 (Proficient), Level 4 (Goal), and Level 5 (Advanced) are listed in addition to the percentage of students performing at or above proficiency and at or above goal. The percentage of all students at or above proficiency declined by three percentage points while the percentage of all students at or above goal decreased six percentage points from last year.

| Group | # Tested | % Below Basic | % Basic | % Proficient | % Goal | % Advanced | % At/Above Proficiency | % At/Above Goal |
|--------|----------|---------------|---------|--------------|--------|------------|------------------------|-----------------|
| All | 283 | 2 | 4 | 20 | 25 | 48 | 93 | 73 |
| SPED | 24 | 17 | 21 | 38 | 21 | 4 | 63 | 25 |
| EL | 3 | 33 | 0 | 67 | 0 | 0 | 67 | 0 |
| Male | 146 | 3 | 4 | 22 | 23 | 48 | 93 | 71 |
| Female | 137 | 1 | 4 | 19 | 28 | 48 | 95 | 76 |

Percentage of Students At/Above Goal for 2007-2016

| Content | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|---------|------|------|------|------|------|------|------|------|------|------|
| Science | 78 | 76 | 70 | 76 | 75 | 76 | 83 | 76 | 79 | 73 |

Percentage of Students At/Above Proficiency for 2007-2016

| Content | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|---------|------|------|------|------|------|------|------|------|------|------|
| Science | 97 | 97 | 96 | 97 | 97 | 96 | 97 | 96 | 96 | 93 |

Avon has been placed by the state in District Reference Group (DRG) B. The tables below compare the performance of Avon with DRG A and similar DRG B school districts. These scores represent the percentage of students scoring at or above goal and at or above proficiency in science.

Avon (DRG B) Compared to DRG A Districts

| Group | At/Above Goal |
|----------------|---------------|
| <i>Avon</i> | <i>73.1</i> |
| Darien | 78.0 |
| New Canaan | 79.7 |
| Ridgefield | 81.4 |
| Weston | 76.1 |
| Wilton | 81.5 |
| Region 9 | 77.6 |
| Ranking | <i>7/7</i> |

Avon Compared to Like DRG B Districts

| Group | At/Above Goal |
|----------------|---------------|
| <i>Avon</i> | <i>73.1</i> |
| Brookfield | 67.4 |
| Cheshire | 69.1 |
| Fairfield | 71.2 |
| Farmington | 77.2 |
| Glastonbury | 73.3 |
| Granby | 81.4 |
| Greenwich | 73.2 |
| Guilford | 73.4 |
| Madison | 71.9 |
| Monroe | 77.7 |
| New Fairfield | 60.7 |
| Newtown | 78.8 |
| Simsbury | 84.7 |
| South Windsor | 78.4 |
| Trumbull | 76.6 |
| West Hartford | 78.8 |
| Region 5 | 77.0 |
| Region 15 | 80.4 |
| Ranking | 14/19 |

SUMMARY:

In grade five, there continues to be slight improvement in the overall performance of students scoring at or above goal on the Science CMT since 2014. Overall science content knowledge continued to show very good growth. However, the gains in inquiry, literacy, and numeracy dropped below the 2015 level, while still showing slight improvement compared to 2014. Beginning in 2015, science instruction was implemented daily to address the steady decline of 5th grade students scoring at or above goal in science that began in 2012. Teachers were also paired off to share students for mathematics and science instruction, allowing for a more in-depth science experience. Presently, the grade 5 science curriculum is being revised to align with and reflect the recently adopted Next Generation Science Standards (NGSS).

In 8th grade, the percentage of students at or above goal has remained relatively stable for this cohort. The science teachers continue to administer a pretest at the beginning of the school year to all 8th grade students to identify their levels of performance and knowledge in the areas of science process skills, earth science, biology and physical science. The results of the pretest are used to inform and guide instruction throughout the school year. The average pre-test score for the past seven years has been 66%. This cohort scored at 63%. Students who performed below the established benchmark, were provided additional support and remediation in the classroom throughout the school year.

In grade ten, the percentage of students moving down to the proficient level has increased slightly from previous years. The Global Interdependence strand showed the weakest overall performance. This could be the direct result of the ecology unit in Biology being taught fourth quarter, after the CAPT testing window. This cohort also did not benefit from the expanded chemistry unit which is now being taught in 8th grade.

In conclusion, our 6-12 science curriculum is designed and based on the new Next Generation Science Standards (NGSS) in terms of content and skill-development. The existing CMT and CAPT assessments focus on a slightly different body of content. The legacy CAPT exam occurs in early spring in sophomore year while our curriculum is designed to help all students reach mastery level by the end of junior year. Based on this, students are taking the CAPT exam before they study a variety of topics such as ecology. As part of the Science curriculum review and revision, a variety of content was shifted between grades 6, 7 and 8 and we continue to “tweak” the implementation of the revised curriculum. We anticipate our students will be well-prepared when the CMT and CAPT are replaced by the State Department of Education with a new assessment that is aligned with the NGSS that have been adopted by the State.