Science Program Evaluation Report
K-12

Prepared by:
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2015-2016

Committee Members
Vivekanand Baliya - William Annin Middle School
Michael Gilmore - Ridge High School
Richard Hartman- William Annin Middle School
Evona Panycia - William Annin Middle School
David Petersen - William Annin Middle School
Daniel Smith - Ridge High School
Christopher Swanson - William Annin Middle School
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Program Scope and Highlights

The Science K-12 Program Evaluation took place on August 28, 31, and September 1, 2, 2015 and continued throughout the 2015-2016 school year. Both middle and high school science staff members worked collaboratively and addressed the following Professional Standards for Teachers: Standard Six: Assessment; Standard Nine: Professional Learning; and Standard Ten: Leadership and Collaboration.

The evaluation addressed the following topics: placement and qualification suggestions at the high school, surveys of Peer Group Districts, surveys of Bernards Twp science teachers and alumni of RHS to better understand the program’s successes, analysis of performance data (course grades and standardized test scores) from grade 8, 9, 10, 11, and 12 science courses, analysis of performance data (course grades) from grade 9, 10, and 11 math courses, comparing science grade with math placement, comparing grade 4 and 8 NJASK science scores among peer group districts, addressing current alignment to Next Generation Science Standards and outlining curriculum that needs to be aligned in the future.

Still, information needs to be gathered using surveys from teachers and alumni in district as well as administration from out of district regarding their science programs so that Bernards can be further compared to its peer groups.

Program Mission Statement and Vision

Mission – The goal of science education is to empower our students to act as future leaders, innovators and ambassadors in the civic forum that can make informed decisions that directly affect the integration of science and technology in society.

Vision –
Students
- who are leaders, innovators, and multi-talented, lifelong learners
- who are globally aware, contributing participants of society
- that objectively participate in global decision making
- that will make decisions by recognizing, using and evaluating evidence over hearsay
- that will be able to adapt to an ever-changing technology-driven world
- identify and more fully understand how science applies to daily lives
- who can knowledgeably evaluate new technologies and their impact on society

Our Goal:
All Students:
- will graduate with a working understanding of science supported by a basic set of scientifically related skills including deductive reasoning and analysis, a fundamental science vocabulary, and ability to formulate an evidence based opinion in order to be prepared to make scientifically informed decisions through an objective lens.

Students having completed all Mathematical classes in addition to the above:
- Will possess additional critical thinking ability, application, analytical skills, use of data to answer questions, and a mathematical ability to understand a system of equations related to each science discipline.
- Students have an opportunity for success as a science major in college.

Students having completed all Honors classes in addition to the above:
- Will have more exposure to in-depth science content, advanced analysis and application
- Honors track is highly recommended for students who desire to pursue a science major in college and student will be well prepared for a potential career path in science

Students having completed all Advanced Placement classes in addition to the above:
- Will receive preparation for Advanced Placement tests
- Part of the Advanced Placement program from The College Board.
- Content, activities, and pace correspond with entry level college courses.

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**Analysis of Current Program**

K-5
The science program begins at the K-5 level. The elementary science program is designed to provide students with opportunities to begin to develop the understandings and scientific inquiry skills necessary to be problem-solvers in an increasingly scientific and technological world.

Much of the elementary program uses inquiry-based science kits that provide a means to support generalist elementary teachers in readily and accurately provide science instruction. Concepts include:

- **Kindergarten**
  - Trees & The Lifecycle of the Butterfly
- **First Grade**
  - Weather, Balance and Motion, From Seed to Plant
- **Second Grade**
  - Insects, Changes, Sun, Moon and Stars
- **Third Grade**
  - Human Body, Ideas and Inventions, Chemicals
Middle School
The middle school program introduces formal science in three grade level units; Physical Science in sixth grade, Life Science in seventh grade and Earth Science in eighth grade. At the middle school, students have science on a daily basis and hence they develop interests and academic experience in science. The focus in the middle school at every grade level is inquiry-based, hands-on instruction where students learn science by experimentation and immersion into science. Increasing emphasis is placed on technical reading and writing skills while maintaining a focus on direct experience and participation in the science process.

Concepts at the middle school include:

- **Physical Science - sixth grade**
  - Matter and Its Interactions, Motion and Stability, Energy, Waves and Electromagnetic Radiation.

- **Life Science - seventh grade**
  - Molecules to Organisms, Ecosystems, Heredity, Biological Evolution.

- **Earth Science - eighth grade**

High School
The high school science program is designed to build upon the foundation of knowledge that students acquired through their elementary and middle school science experiences. The program consists of a study of each of the major scientific fields: Biology, Chemistry, and Physics. In order to best meet the needs of each student, instruction is offered at several levels of complexity and rigor. Students will also have the opportunity to expand their studies by selecting elective or advanced placement (AP) science courses.

High school science offerings at each grade level include:

- **Ninth Grade**
  - Biology - Fundamental, CP Conceptual, CP Mathematical & Honors

- **Tenth Grade**
  - Chemistry - Fundamental, CP Conceptual, CP Mathematical & Honors

- **Eleventh Grade**
  - Physics - Fundamental, CP Conceptual, CP Mathematical & Honors & Advanced Placement

- **Twelfth Grade**
  - Genetics Principles and Issues, Forensic Science, CP Environmental Science
  - Advanced Placement courses in Physics II, Chemistry, Biology & Environmental Science
What resources are we using?
Technology resources available to all science teachers: chromebook carts, computer labs, PASCO probes and Labquest equipment, Educanon, Data Studio interfacing software, Tracker software for computer-based video analysis, Google Drive, Classroom and Webpages, iPads, Pasco probes and SPARKvue, classroom projectors, Glogster, CRP Motion Detection software, Smart Boards, BrainPOP, Discovery Education (United Streaming), Quiz Machines, Renaissance Receivers clickers, student personal technological devices, scientific equipment (microscopes, slides, balances, glassware, ramps, carts, etc.)

How do we assess?
Teachers use assessments (some common) amongst same level courses, formative activities, summative unit tests, research projects, presentations, laboratory experiments and reports.

Do we have formal data about its success/failure?
The current Bernards Township School District science program is successful.

Student test scores have been analyzed for the Science SAT Subject Tests, New Jersey Biology Competency Test, New Jersey Assessment of Skills and Knowledge for 4th and 8th grade science, Advanced Placement Tests for High School Science (see data below in Testing Data).

Student grades in science classes have been analyzed and support that the current placement requirements for science tracks at Ridge High School are appropriate. The program evaluation team analyzed data to evaluate potential changes to the placement requirements for Honors Science.

Problem Statement - The validity of the current placement process for students entering Ridge, continuing in honors science and requesting advanced placement science courses has come under scrutiny. The team completed extensive discussion and data searches using past and recent student data.

Proposed Solutions: Based on Ridge student data (2013, 2014 & 2015) the current placement system is working, albeit scheduling challenges do ensue when students add/drop honors classes, creating classes of disproportionate size.

Modifications to placement requirements include:

1. Placement suggestions regarding AP science classes in 11th and 12th grade.
   
   a. The committee believes that if a student has qualified for any AP science class previously, the student should maintain eligibility for subsequent AP science courses regardless of academic success in that previous AP science class. Example: students earns a C in 11th grade AP Physics, they can still qualify for 12th grade AP Environmental Science/AP Biology.

   b. The committee believes that if a student does not qualify for AP Biology, 9th grade biology grade should be considered during the appeal process. Placement into AP Biology should be considered if the student earned an A- in Mathematical Biology or a B- in Honors Biology.
c. The committee believes that if a student does not qualify for AP Environmental Science, 10th grade chemistry grade should be considered during the appeal process. Placement into AP Environmental Science should be considered if the student earned an A- in Mathematical Chemistry or a B- in Honors Chemistry.

2. Investigate the feasibility of opening AP Chemistry as a first year course (open to a select group of sophomores).

Analysis of Placement Process

*Placement of Students in 9th Grade Biology Courses*

Upcoming high school freshmen can be placed into one of four different Biology courses based on their performance in 8th grade science. An analysis was conducted to determine the validity of the 9th grade placement into the four different courses for science: CP Conceptual Biology (CP-Biology-C), CP Mathematical Biology (CP-Biology-M), Honors Biology and Fundamental Biology. In this analysis, course specific data was analyzed using student's 8th grade science final course grades versus corresponding 9th grade Biology final course grades in each of these four courses. In Figure 1, the distribution of entering 2014-2015 freshmen who were enrolled in these aforementioned courses is shown. Based on this data, 75% of students were enrolled in either CP-Biology-M or Honors Biology.

![9th Grade Biology Course Enrollment Distribution in 2015](image)

*Figure 1*
The performance of these students, based on their final course grade, in each of these courses is seen Figure 2. The percent distribution of final grades for these same students is displayed as a stacked histogram in Figure 3 (only CP-Biology-C, CP-Biology-M & Honors Biology performance is shown).

As an initial data set for analyzing the validity of the placement process, the 2014 New Jersey Assessment of Skills and Knowledge in Science Grade 8 (NJ ASK Science 8) performance ratings for these students were compared to their successive performance on the 2015 New Jersey Biology Competency Test (NJBCT) (Figure 4). A more detailed analysis was also performed using the performance outcomes in 9th grade correlated to the 8th grade science final course grade of these same students (Figure 5). The goal of this analysis was to determine if the 8th grade science grade was predictive of their 9th grade science grade. Performance data used in this analysis was from Biology students from the graduating class of 2015 (2012-13 academic year).

The same data described above was also used to measure perceived success of 9th grade Biology students. Tables 1-3 provide an analysis of student’s final average in 8th grade science and their corresponding final average in 9th grade science. Data is separated by each of the three main courses that the 8th grade student entered and completed in 9th grade Biology (Table 1 – Conceptual, Table 2 – Mathematical, Table 3 – Honors). Each table shows the grade the student earned in 8th grade (column) versus the grade the student earned in 9th grade Biology (row) as a percentage. A grade of B- or better was established as a benchmark for a final grade to identify student success in each class. Based on these criteria, 100% of students who earned an A or better in 8th grade science were successful (as defined above) in Honors Biology. Based on this
dataset, current placement criteria for students entering 9th grade Honors Biology seem to be appropriate. The percentages in these tables can also be used as predictors to help guide students towards proper course placement to achieve success in 9th grade Biological science, especially in those classes where there are no prerequisites such as Mathematical and Conceptual Biology.

Figure 3
Figure 4

Performance of 9th Graders (2015) on NJ ASK 8 and NJBCT

- CP-Biology-C
- CP-Biology-M
- Honors Biology
- Fundamental Biology
Predictive Performance Using Course Placement
Class of 2015

9th Grade Final Course Grade

Honors Biology
CP-Biology-M
CP-Biology/C

8th Grade Final Course Grade
### Table 1

**CP-Biology-Conceptual**

<table>
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<th>Grade 9 Final Course Grade</th>
<th>A-</th>
<th>B+</th>
<th>B</th>
<th>B-</th>
<th>C+</th>
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<th>D</th>
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</table>

Total # of Students: 2.00 13.00 30.00 22.00 23.00 5.00 5.00 1.00 1.00

% Success: 100.0% 92.3% 93.3% 63.6% 47.8% 0.0% 20.0% 0.0% 0.0%

### Table 2

**CP-Biology-Mathematical**

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<th>A-</th>
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<th>B</th>
<th>B-</th>
<th>C+</th>
<th>C</th>
<th>C-</th>
</tr>
</thead>
<tbody>
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<td>100.0%</td>
<td>10.0%</td>
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<td>0.0%</td>
<td>0.0%</td>
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<td>0.0%</td>
<td>0.0%</td>
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<td>A</td>
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<td>5.6%</td>
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<tr>
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<tr>
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<td>11.1%</td>
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<tr>
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Total # of Students: 3.00 20.00 46.00 54.00 37.00 18.00 7.00 0.00 2.00

% Success: 100.0% 100.0% 100.0% 94.4% 86.5% 66.7% 57.1% 0.0% 0.0%
Table 3

<table>
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<tr>
<th>Grade 9 Score</th>
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Students who took CP Chemistry (M) then took physics; what level physics did they take and what grade did they earn?

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<th>Honors Physics</th>
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**CPM CHEM**

**CPC CHEM**

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Response to the Next Generation Science Standards

Curriculum was rewritten to align with Next Generation Science Standards (NGSS) in Summer 2015 for 6th Grade Physical Science and 7th Grade Life Science, Mathematical Chemistry, Honors Chemistry, Mathematical Biology, and Honors Biology Curriculum still needs to be aligned with Next Generation Standards for 8th Grade Earth Science, Conceptual Biology, Conceptual Chemistry, Conceptual Physics, Mathematical Physics, Honors Physics, and Science Electives: Genetics, Environmental Science, and Forensic Science.

AP science courses were aligned to college board AP standards in recent years and will not be realigned to Next Generation Science Standards.

Shared consensus on science instruction complete in 2015 by 6-12 science department staff. Effective science instruction should be: inquiry-based, student centered, hands on, research and data driven, collaborative, discussion based, design-oriented, incorporate the use of technology, and have real-world application.

In May 2016, teachers from grades 3, 4, and 5 gathered, during an after school curriculum workshop, to review Next Generation Science Standards-aligned materials in order to make recommendations for adoption. Results from the post-workshop survey may be accessed here: 3-5 SCIENCE SURVEY RESULTS. Based on the survey results, Knowing Science is the recommended inquiry-based science kit series for adoption at the elementary level.

Curriculum writing for grades 3, 4, and 5 science realignment is planned for Summer 2016. Curriculum writing for grades K, 1, and 2 science realignment is scheduled for Summer 2017.

Technology use in the classroom should be chosen appropriately to align with Next Generation Science Standards. Instruction should use district chromebooks and incorporate google apps.

STEM Pathways that are currently being proposed should all offer inquiry based experiences that correspond with Next Generation Science Standards and increase student opportunities.

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Prior Goals and Progress

Prior Recommendations Grades 6-8:

1. The district should reconsider room utilization at William Annin Middle School. Current large class sizes combined with inadequate gas and water supplies have lead to a diminished lab program in many 6 and 7th grade classrooms. This goes against our district
philosophy, NJ CCCS, and research in best practices. The issue was noted in the 2003 program evaluation and was not addressed.

2. Adopt and implement the recommendations of the district lab report committee. The committee composed of teachers from grades 6-12 has made recommendations that will provide consistency across grade levels to limit the need to re-teach lab format and to provide consistent goals for science labs.

3. Rewrite the grade 7 curriculum in 2010-11 to match the new CCCS with a focus on evolution, ecology, and genetics. The current curriculum does not correctly balance the topics in proportion to their coverage in the NJCCCS. A new textbook should be adopted to better match these topics and provide better support materials.

4. Incorporate more technology-based lab experiences into the curriculum. Utilize the recommendations in the 2010-2013 technology plan to better integrate the science curriculum with the 8.1 NJCCCS.

Grades 6-8 Progress:
1. This recommendation is still outstanding. Many science classrooms are inadequately equipped, water supply is lacking in many science rooms, and gas availability has been removed from all classrooms.
   b. Gas needed in 300A, 300B, 300C, 303, 307, 309, 312, 313, 315, 316
   c. Lab stations needed in 303, 307, 309, 313
2. A lab report format has been standardized.
3. Grade 7 curriculum has been realigned.
4. Technology-based lab experiences are slowly increasing. More professional development is needed in this area.

Prior Recommendations Grades 9-12:
1. Develop Meteorology and Oceanography as semester course offerings in the Science Department
2. Refurbish rooms 307 and 309 to complete goal as specified in the 1997 Middle States Evaluation
3. Review current technology hardware and develop a needs assessment for upcoming year
4. Survey seniors to validate number of students planning to pursue careers in science

Grades 9-12 Progress:
1. A semester course in Meteorology was not implemented. The Marine Biology elective was implemented in 2009 and ran as a semester elective course for 2 years. Marine Biology was cut from the science offerings along with Astronomy after the 2010-2011 year.
2. Refurbishment of rooms 307 and 309 was completed.
3. Yes- new technology was implemented. Teachers use google applications, chromebooks, teacher tablets and classroom projectors, chemistry uses labquest with various probes.
   a. Needs assessment →
i. Physics needs more desktops in the classroom so they can run their probes and other equipment.

ii. All teachers in the science department would use additional chromebooks carts.

iii. Chemistry needs more labquest devices.

4. No, this was not accomplished. Program Evaluation committee has developed a Ridge High School Alumni Survey in google forms that will be sent out to collect this information.

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**Program Comparisons**

Thirty-nine (39) school districts replied to requests to share information about their science program sequence with us. Of these thirty-nine school districts, eleven (11) were high school only districts (no K-8 program).

Of twenty-eight (28) districts with comprehensive middle school science programs, twenty (20) run discipline-specific science programs, which focus on the student of a single scientific field each year, as we do, while eight (8) run integrated programs. Of the twenty districts running discipline-specific programs, only one, Hamilton Township School district in Mercer County, follow the same sequence of 6th grade Physical Science, 7th grade Life Science, 8th grade Earth and Space Science, as we do.

At the high school level, of the thirty-nine (39) school districts participating in the survey, only eight (8) follow a course progression similar to ours (9th grade Biology, 10th grade Chemistry, 11th grade Physics).

These districts are:
- Becton Regional
- Cranford
- Emerson
- Mahwah
- Northern Valley Regional
- Ridgewood
- Scotch Plains-Fanwood
- West Morris Regional

Of the schools following a different science progression sequence, three (3) offer Earth or Environmental Science as the ninth grade course, eight (8) are ‘Physics First’ districts, offering Physics as the ninth grade course, and twelve (12) offer a choice of ninth grade course to ninth graders.
## Testing Data

### NJ ASK 4 Science (2014)

<table>
<thead>
<tr>
<th>Student Population</th>
<th>Percent at or Above State Standards</th>
<th>Mean Scale Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bernards</td>
<td>DFG J</td>
</tr>
<tr>
<td>Science (All Students)</td>
<td>91.1</td>
<td>97.9</td>
</tr>
<tr>
<td>Science (GE)</td>
<td>99.7</td>
<td>99.3</td>
</tr>
<tr>
<td>Science (SE)</td>
<td>95.7</td>
<td>91.0</td>
</tr>
</tbody>
</table>

### NJ ASK 4 Science – Percent at or Above State Standards by Subgroup*

<table>
<thead>
<tr>
<th>Student Population</th>
<th>Female</th>
<th>Male</th>
<th>White</th>
<th>Asian</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science (All Students)</td>
<td>99.5</td>
<td>98.7</td>
<td>98.6</td>
<td>100</td>
</tr>
</tbody>
</table>

### NJ ASK 4 Science – District Mean Scale Scores By Subgroup*

<table>
<thead>
<tr>
<th>Student Population</th>
<th>Female</th>
<th>Male</th>
<th>White</th>
<th>Asian</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science (All Students)</td>
<td>258.8</td>
<td>262.4</td>
<td>256.7</td>
<td>272.7</td>
</tr>
</tbody>
</table>

### NJ ASK 4 Science – District Mean Scale Scores By Year

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Science (All Students)</td>
<td>260.7</td>
<td>258.0</td>
<td>257.5</td>
<td>259.4</td>
<td>248.6</td>
</tr>
<tr>
<td>Science (GE)</td>
<td>262.9</td>
<td>260.0</td>
<td>260.8</td>
<td>263.0</td>
<td>249.8</td>
</tr>
<tr>
<td>Science (SE)</td>
<td>248.2</td>
<td>248.4</td>
<td>244.0</td>
<td>245.1</td>
<td>243.1</td>
</tr>
</tbody>
</table>

### NJ ASK 4 Science – Mean Scale Scores by School

<table>
<thead>
<tr>
<th></th>
<th>CH</th>
<th>LC</th>
<th>MP</th>
<th>OS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science (All Students)</td>
<td>259.3</td>
<td>258.2</td>
<td>270.6</td>
<td>254.3</td>
</tr>
<tr>
<td>Science (GE)</td>
<td>261.6</td>
<td>260.5</td>
<td>272.2</td>
<td>256.0</td>
</tr>
<tr>
<td>Science (SE)</td>
<td>240.3</td>
<td>247.2</td>
<td>257.2</td>
<td>247.9</td>
</tr>
</tbody>
</table>
ASK-4 Science Mean Scale Scores by School and DFG J (2010-14)
### NJ ASK 8 Science (2014)

<table>
<thead>
<tr>
<th>Student Population</th>
<th>Percent at or Above State Standards</th>
<th>Mean Scale Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bernards</td>
<td>DFG J</td>
</tr>
<tr>
<td>Science (All Students)</td>
<td>96.2</td>
<td>96.0</td>
</tr>
<tr>
<td>Science (GE)</td>
<td>99.0</td>
<td>98.7</td>
</tr>
<tr>
<td>Science (SE)</td>
<td>78.8</td>
<td>79.5</td>
</tr>
</tbody>
</table>

### NJ ASK 8 Science – Percent at or Above State Standards by Subgroup*

<table>
<thead>
<tr>
<th>Student Population</th>
<th>Female</th>
<th>Male</th>
<th>White</th>
<th>Asian</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science (All Students)</td>
<td>96.9</td>
<td>95.5</td>
<td>96.4</td>
<td>97.3</td>
</tr>
</tbody>
</table>

### NJ ASK 8 Science – District Mean Scale Scores By Subgroup*

<table>
<thead>
<tr>
<th>Student Population</th>
<th>Female</th>
<th>Male</th>
<th>White</th>
<th>Asian</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science (All Students)</td>
<td>250.6</td>
<td>251.0</td>
<td>247.3</td>
<td>263.6</td>
</tr>
</tbody>
</table>

*Only reported for subgroups with a population greater than forty.
## NJ Biology Competency Test (2014)

### Percent At or Above State Standards & Mean Scale Score By Gender, & Subgroup*

<table>
<thead>
<tr>
<th>Student Population</th>
<th>Number of Students with a Valid Score</th>
<th>Percent at or Above State Standards</th>
<th>Mean Scaled Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Students</td>
<td>493</td>
<td>84.0</td>
<td>238.9</td>
</tr>
<tr>
<td>DFG J (all students)</td>
<td>4,087</td>
<td>86.9</td>
<td>241.1</td>
</tr>
<tr>
<td>General Ed.</td>
<td>446</td>
<td>87.9</td>
<td>242.9</td>
</tr>
<tr>
<td>Special Ed.</td>
<td>47</td>
<td>46.8</td>
<td>201.2</td>
</tr>
<tr>
<td>Female</td>
<td>245</td>
<td>82.0</td>
<td>235.8</td>
</tr>
<tr>
<td>Male</td>
<td>242</td>
<td>85.5</td>
<td>242.0</td>
</tr>
<tr>
<td>White</td>
<td>362</td>
<td>81.5</td>
<td>232.8</td>
</tr>
<tr>
<td>Asian</td>
<td>104</td>
<td>94.2</td>
<td>262.2</td>
</tr>
</tbody>
</table>

*Only reported for subgroups with a population greater than forty.

## NJ BCT Mean Scale Score vs. DFG J (2010-14)

![Bar chart comparing NJ BCT mean scale scores to DFG J from 2010 to 2014](chart.png)
Overview: 2015 NJBCT Performance by Demographic Group; Comparison of RHS, Former DFG J District High Schools, and Overall State Performance

### Ridge High School (2015)

<table>
<thead>
<tr>
<th>Demographic Group</th>
<th>Partially Proficient (&lt;199) #</th>
<th>Partially Proficient (&lt;199) %</th>
<th>Proficient (200-249) #</th>
<th>Proficient (200-249) %</th>
<th>Advanced Proficient (250-300) #</th>
<th>Advanced Proficient (250-300) %</th>
<th>Scale Score Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Students</td>
<td>55</td>
<td>12.0%</td>
<td>236</td>
<td>51.4%</td>
<td>168</td>
<td>36.6%</td>
<td>237.7</td>
</tr>
<tr>
<td>Gen Ed</td>
<td>36</td>
<td>8.8%</td>
<td>211</td>
<td>51.5%</td>
<td>163</td>
<td>39.8%</td>
<td>241.1</td>
</tr>
<tr>
<td>Spec Ed</td>
<td>18</td>
<td>38.3%</td>
<td>24</td>
<td>51.1%</td>
<td>5</td>
<td>10.6%</td>
<td>209.4</td>
</tr>
</tbody>
</table>

### State (2015)

<table>
<thead>
<tr>
<th>Demographic Group</th>
<th>Partially Proficient (&lt;199) #</th>
<th>Partially Proficient (&lt;199) %</th>
<th>Proficient (200-249) #</th>
<th>Proficient (200-249) %</th>
<th>Advanced Proficient (250-300) #</th>
<th>Advanced Proficient (250-300) %</th>
<th>Scale Score Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Students</td>
<td>42.2%</td>
<td>44.8%</td>
<td>13.0%</td>
<td>205.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gen Ed</td>
<td>35.1%</td>
<td>49.7%</td>
<td>15.2%</td>
<td>211.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spec Ed</td>
<td>76.5%</td>
<td>21.5%</td>
<td>2.0%</td>
<td>178</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Ridge High School 2015 NJBCT Performance Distribution by Course

Percentage of RHS Students by Performance Category and Course:
2015 NJBCT

2015 9th Grade NJBCT Performance
While student performance on the New Jersey Biology Competency Test (NJBCT) has fluctuated over the course of the past five years (2010-2015), the most recent (2015) scale score mean for the categories of *Total Students, General Education Students, and Special Education Students* exceeds that of both the Former DFG J High Schools and the Overall State performance. Additionally, the percentage of RHS students scoring in the Advanced Proficient range in the demographic categories of *Total Students, General Education Students, and Special Education Students,* on the NJBCT, exceeds that of both the Former DFG J High Schools and the Overall State. The percentage of RHS students scoring in the Partially Proficient range in the demographic categories of *Total Students and Special Education Students* is lower than that of both the Former DFG J High Schools and the Overall State; however, the percentage of RHS *General Education Students* scoring in the Partially Proficient range exceeded that of their counterparts in the Former DFG J High School group. General education teachers of biology have incorporated NJBCT student performance data into their professional learning community (PLC) work over the past two years. This may be a contributing factor in noticed improvement of student performance.

### SAT Subject Test Mean Scores (2010 – 2014)

<table>
<thead>
<tr>
<th></th>
<th>Biology (M)</th>
<th>Biology (E)</th>
<th>Chem</th>
<th>Physics</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>698</td>
<td>676</td>
<td>677</td>
<td>715</td>
</tr>
<tr>
<td>2013</td>
<td>674</td>
<td>680</td>
<td>647</td>
<td>727</td>
</tr>
<tr>
<td>2012</td>
<td>651</td>
<td>673</td>
<td>615</td>
<td>684</td>
</tr>
<tr>
<td>2011</td>
<td>685</td>
<td>635</td>
<td>633</td>
<td>704</td>
</tr>
<tr>
<td>2010</td>
<td>664</td>
<td>606</td>
<td>660</td>
<td>696</td>
</tr>
</tbody>
</table>

### Ridge HS SAT Subject Tests Comparison to General NJ Test Takers and National Test Takers (2010-2014)

<table>
<thead>
<tr>
<th></th>
<th>Biology- Molecular</th>
<th>Biology- Ecological</th>
<th>Chemistry</th>
<th>Physics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RHS</td>
<td>NJ</td>
<td>All</td>
<td>RHS</td>
</tr>
<tr>
<td>2014</td>
<td>698</td>
<td>672</td>
<td>653</td>
<td>676</td>
</tr>
<tr>
<td>2013</td>
<td>674</td>
<td>669</td>
<td>655</td>
<td>680</td>
</tr>
<tr>
<td>2012</td>
<td>651</td>
<td>671</td>
<td>654</td>
<td>673</td>
</tr>
<tr>
<td>2011</td>
<td>685</td>
<td>668</td>
<td>635</td>
<td>635</td>
</tr>
<tr>
<td>2010</td>
<td>664</td>
<td>661</td>
<td>638</td>
<td>606</td>
</tr>
</tbody>
</table>
Trends in student performance on the SAT Subject tests in Biology and Physics are superior to that of NJ students, as a whole, and national test takers. Student performance on the SAT Subject test in Chemistry is comparatively not as strong and warrants further investigation to determine if instructional or curricular changes can support increased student success on this assessment.
Alignment of Topics Covered on SAT Science Subject Matter Tests to District Science Curriculum:

### BIOLOGY

<table>
<thead>
<tr>
<th>Science Topic</th>
<th>Approximate % Representation on SAT Subject Matter Test (E)</th>
<th>Approximate % Representation on SAT Subject Matter Test (M)</th>
<th>Represented in NGSS</th>
<th>Represented in Honors Biology Curriculum</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cellular and Molecular Biology</strong></td>
<td>12%</td>
<td>25%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Cell Structure and Organization</td>
<td></td>
<td></td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>• Mitosis</td>
<td></td>
<td></td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>• Photosynthesis</td>
<td></td>
<td></td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>• Cellular Respiration</td>
<td></td>
<td></td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>• Enzymes</td>
<td></td>
<td></td>
<td>NO (not explicitly)</td>
<td>YES</td>
</tr>
<tr>
<td>• Biosynthesis</td>
<td></td>
<td></td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>• Biological Chemistry</td>
<td></td>
<td></td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td><strong>Ecology</strong></td>
<td>25%</td>
<td>12%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Energy Flow and Nutrient Cycles</td>
<td></td>
<td></td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>• Populations, Communities, Ecosystems</td>
<td></td>
<td></td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>• Biomes</td>
<td></td>
<td></td>
<td>NO (not explicitly)</td>
<td>YES</td>
</tr>
<tr>
<td>• Biodiversity</td>
<td></td>
<td></td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>• Human Impact</td>
<td></td>
<td></td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td><strong>Genetics</strong></td>
<td>12%</td>
<td>25%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Meiosis</td>
<td></td>
<td></td>
<td>YES (but not phases)</td>
<td>YES</td>
</tr>
<tr>
<td>• Mendelian genetics and inheritance patterns</td>
<td></td>
<td></td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>• Molecular genetics</td>
<td></td>
<td></td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Organismal Biology</td>
<td>25%</td>
<td>25%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>-----</td>
<td>-----</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>• Structure, function and development of</td>
<td></td>
<td></td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>organisms (emphasis on plants and</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>animals)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Animal behavior</td>
<td></td>
<td></td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(not as a</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>topic, but as</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>individual</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>examples)</td>
<td></td>
</tr>
<tr>
<td>Evolution and Diversity</td>
<td>25%</td>
<td>12%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Origin of Life</td>
<td></td>
<td></td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>• Evidence of Evolution</td>
<td></td>
<td></td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>• patterns of evolution</td>
<td></td>
<td></td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>• Natural Selection and Speciation</td>
<td></td>
<td></td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>• Classification and Diversity of</td>
<td></td>
<td></td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>Organisms</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## CHEMISTRY

<table>
<thead>
<tr>
<th>Science Topic</th>
<th>Approximate % Representation on SAT Subject Matter Test</th>
<th>Represented in NGSS</th>
<th>Represented in Honors Chemistry Curriculum</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Structure of Matter</strong></td>
<td>25%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Atomic Structure</td>
<td>YES</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>• Molecular Structure</td>
<td>YES</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>• Bonding</td>
<td>YES</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td><strong>States of Matter</strong></td>
<td>16%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Gases</td>
<td>YES (at middle level)</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>• Liquids and Solids</td>
<td>YES (at middle level)</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>• Solutions</td>
<td>YES (at middle level)</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td><strong>Reaction Types</strong></td>
<td>14%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Acids and Bases</td>
<td>NO</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>• Oxidation-Reduction</td>
<td>NO</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>• Precipitation</td>
<td>NO</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td><strong>Stoichiometry</strong></td>
<td>14%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Mole concept</td>
<td>YES</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>• Chemical Equations</td>
<td>YES</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td><strong>Equilibrium and Reaction Rates</strong></td>
<td>5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Equilibrium Systems</td>
<td>YES</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>• Rates of Reactions</td>
<td>YES</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td><strong>Thermochemistry</strong></td>
<td>6%</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td><strong>Descriptive Chemistry</strong></td>
<td>12%</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td><strong>Laboratory</strong></td>
<td>8%</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>Science Topic</td>
<td>Approximate % Representation on SAT Subject Matter Test</td>
<td>Represented in NGSS</td>
<td>Represented in Honors Physics Curriculum</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>-------------------------------------------------------</td>
<td>---------------------</td>
<td>----------------------------------------</td>
</tr>
<tr>
<td>Mechanics</td>
<td>36-42%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>● Kinematics</td>
<td></td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>● Dynamics</td>
<td></td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>● Energy and Momentum</td>
<td></td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>● Circular Motion</td>
<td></td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>● Simple Harmonic Motion</td>
<td></td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>● Gravity</td>
<td></td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Electricity and Magnetism</td>
<td>18-24%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>● Electric Fields, Forces, Potentials</td>
<td></td>
<td>PARTIAL</td>
<td>YES</td>
</tr>
<tr>
<td>● Capacitance</td>
<td></td>
<td>PARTIAL</td>
<td>YES (time permitting)</td>
</tr>
<tr>
<td>● Circuit Elements and DC Circuits</td>
<td></td>
<td>PARTIAL</td>
<td>YES</td>
</tr>
<tr>
<td>● Magnetism</td>
<td></td>
<td>YES</td>
<td>YES (time permitting)</td>
</tr>
<tr>
<td>Waves and Optics</td>
<td>15-19%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>● General Wave Properties</td>
<td></td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>● Reflection and Refraction</td>
<td></td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>● Ray Optics</td>
<td></td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>● Physical Optics</td>
<td></td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>Heat and Thermodynamics</td>
<td>6-11%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>● Thermal Properties</td>
<td></td>
<td>PARTIAL</td>
<td>YES</td>
</tr>
<tr>
<td>Topic</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>-----</td>
<td>-----</td>
<td>----</td>
</tr>
<tr>
<td>Laws of Thermodynamics</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td><strong>Modern Physics</strong></td>
<td>6-11%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quantum Phenomena</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Atomic</td>
<td>PARTIAL</td>
<td>YES (time permitting)</td>
<td>NO</td>
</tr>
<tr>
<td>Nuclear Physics</td>
<td>PARTIAL</td>
<td>YES (time permitting)</td>
<td>NO</td>
</tr>
<tr>
<td>Relativity</td>
<td>NO</td>
<td>YES (time permitting)</td>
<td>NO</td>
</tr>
<tr>
<td><strong>Miscellaneous</strong></td>
<td>4-9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Analytical Skills</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>New Topics in Physics</td>
<td></td>
<td></td>
<td>Topics are variable</td>
</tr>
<tr>
<td>Year</td>
<td># of Students Enrolled</td>
<td># of Test Takers</td>
<td>% Passing Score (^\dagger)</td>
</tr>
<tr>
<td>------</td>
<td>-----------------------</td>
<td>------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>2014</td>
<td>83</td>
<td>76</td>
<td>99%</td>
</tr>
<tr>
<td>2013</td>
<td>66</td>
<td>64</td>
<td>94%</td>
</tr>
<tr>
<td>2012</td>
<td>48</td>
<td>46</td>
<td>83%</td>
</tr>
<tr>
<td>2011</td>
<td>46</td>
<td>45</td>
<td>85%</td>
</tr>
<tr>
<td>2010</td>
<td>44</td>
<td>44</td>
<td>84%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th># of Students Enrolled</th>
<th># of Test Takers</th>
<th>% Passing Score (^\dagger)</th>
<th># of Students Enrolled</th>
<th># of Test Takers</th>
<th>% Passing Score (^\dagger)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>101</td>
<td>84</td>
<td>89%</td>
<td>80</td>
<td>74</td>
<td>100%</td>
</tr>
<tr>
<td>2013</td>
<td>111</td>
<td>95</td>
<td>79%</td>
<td>82</td>
<td>80</td>
<td>99%</td>
</tr>
<tr>
<td>2012</td>
<td>123</td>
<td>114</td>
<td>81%</td>
<td>102</td>
<td>102</td>
<td>89%</td>
</tr>
<tr>
<td>2011</td>
<td>83</td>
<td>67</td>
<td>64%</td>
<td>84</td>
<td>84</td>
<td>88%</td>
</tr>
<tr>
<td>2010</td>
<td>97</td>
<td>90</td>
<td>71%</td>
<td>88</td>
<td>87</td>
<td>93%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th># of Students Enrolled</th>
<th># of Test Takers</th>
<th>% Passing Score (^\dagger)</th>
<th># of Students Enrolled</th>
<th># of Test Takers</th>
<th>% Passing Score (^\dagger)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>37</td>
<td>34</td>
<td>100%</td>
<td>37</td>
<td>34</td>
<td>100%</td>
</tr>
<tr>
<td>2013</td>
<td>42</td>
<td>31</td>
<td>100%</td>
<td>42</td>
<td>31</td>
<td>100%</td>
</tr>
<tr>
<td>2012</td>
<td>30</td>
<td>28</td>
<td>100%</td>
<td>30</td>
<td>29</td>
<td>90%</td>
</tr>
<tr>
<td>2011</td>
<td>24</td>
<td>22</td>
<td>95%</td>
<td>24</td>
<td>22</td>
<td>86%</td>
</tr>
<tr>
<td>2010</td>
<td>26</td>
<td>25</td>
<td>100%</td>
<td>26</td>
<td>25</td>
<td>92%</td>
</tr>
</tbody>
</table>

\(^\dagger\) Passing score is a 3, 4, or 5.
Class of 2015 (10th & 11th grade) Student Enrollment and Grades

<table>
<thead>
<tr>
<th>Total # of Students Enrolled (434 students)</th>
<th>CP Conceptual</th>
<th>CP Math</th>
<th>Honors</th>
<th>AP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry</td>
<td>84</td>
<td>178</td>
<td>159</td>
<td></td>
</tr>
<tr>
<td>Physics</td>
<td>88</td>
<td>145</td>
<td>115</td>
<td>73</td>
</tr>
</tbody>
</table>

| % Students who earned a B- or higher        | Chemistry     | 58%     | 87%    | 98%|
|                                            | Physics       | 94%     | 97%    | 88%|

| % Students who earned an A- or higher       | Chemistry     | 19%     | 39%    | 58%|
|                                            | Physics       | 0%      | 45%    | 26%|

Grade 11 Science Enrollment vs Concurrently Enrolled Math Course

<table>
<thead>
<tr>
<th></th>
<th>AP Physics I</th>
<th>Honors Physics</th>
<th>CP Physics (M)</th>
<th>CP Physics (C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Algebra II</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>34</td>
</tr>
<tr>
<td>Algebra II</td>
<td>0</td>
<td>0</td>
<td>34</td>
<td>33</td>
</tr>
<tr>
<td>Honors Algebra II</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Math Analysis I</td>
<td>12</td>
<td>77</td>
<td>106</td>
<td>8</td>
</tr>
<tr>
<td>Honors Analysis</td>
<td>22</td>
<td>25</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Calculus</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>AP Calculus</td>
<td>36</td>
<td>10</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>
# Class of 2015 Average GPA in Science Course vs Concurrently Enrolled Math Course

<table>
<thead>
<tr>
<th></th>
<th>AP Physics I</th>
<th>Honors Physics</th>
<th>CP Physics (M)</th>
<th>CP Physics (C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Algebra II</td>
<td>N/A</td>
<td>N/A</td>
<td>*</td>
<td>9.8</td>
</tr>
<tr>
<td>Algebra II</td>
<td>N/A</td>
<td>N/A</td>
<td>8.9</td>
<td>10.4</td>
</tr>
<tr>
<td>Honors Algebra II</td>
<td>N/A</td>
<td>*</td>
<td>*</td>
<td>N/A</td>
</tr>
<tr>
<td>Math Analysis I</td>
<td>6.3</td>
<td>7.9</td>
<td>9.2</td>
<td>11.2</td>
</tr>
<tr>
<td>Honors Analysis</td>
<td>8.0</td>
<td>9.6</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Calculus</td>
<td>N/A</td>
<td>*</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>AP Calculus</td>
<td>10.0</td>
<td>9.4</td>
<td>*</td>
<td>N/A</td>
</tr>
</tbody>
</table>

## Grade 8 NJ-ASK Science - Percentage of Advanced Proficient

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bernards</td>
<td>55%</td>
<td>53%</td>
<td>58%</td>
<td>62%</td>
<td>56%</td>
</tr>
<tr>
<td>Chatham</td>
<td>60%</td>
<td>60%</td>
<td>64%</td>
<td>64%</td>
<td>60%</td>
</tr>
<tr>
<td>Glenrock</td>
<td>54%</td>
<td>45%</td>
<td>57%</td>
<td>67%</td>
<td>49%</td>
</tr>
<tr>
<td>Haddonfield</td>
<td>51%</td>
<td>50%</td>
<td>46%</td>
<td>51%</td>
<td>33%</td>
</tr>
<tr>
<td>Millburn</td>
<td>57%</td>
<td>65%</td>
<td>64%</td>
<td>61%</td>
<td>55%</td>
</tr>
<tr>
<td>Montgomery</td>
<td>70%</td>
<td>60%</td>
<td>69%</td>
<td>74%</td>
<td>70%</td>
</tr>
<tr>
<td>Mountain Lakes</td>
<td>57%</td>
<td>58%</td>
<td>62%</td>
<td>64%</td>
<td>43%</td>
</tr>
<tr>
<td>Ridgewood</td>
<td>59%</td>
<td>51%</td>
<td>55%</td>
<td>54%</td>
<td>37%</td>
</tr>
<tr>
<td>West Windsor-Plainsboro</td>
<td>62%</td>
<td>62%</td>
<td>65%</td>
<td>64%</td>
<td>62%</td>
</tr>
</tbody>
</table>
Goals/Recommendations

Goal #1: Technology Improvements

Problem Statement: Updated and accessible technology is needed to support classroom instruction and laboratory work.

Supporting Data:
- Non-Chromebook computers are in limited supply and cannot be relied upon. These technologies are necessary for videos data analysis applications and real-time data collection (through computer interface data probes). Additionally such equipment would support the use of more interactive simulations for scenarios impossible to expose students to in the classroom laboratory (such as zero gravity environments).
- Increased access to Chromebook carts is needed for science department use at WAMS and RHS.
- Increased access to iPad minis is needed for science department use at WAMS

Proposed Solutions: Budget for more chromebooks, iPad minis and desktops to be in classrooms

Goal #2: Classroom Renovations


Supporting Data: Many science classrooms are inadequately equipped at WAMS, water supply is lacking in many science rooms, and gas availability has been removed from all classrooms. At RHS, some rooms need to be renovated.

Proposed Solutions:
- WAMS: entire renovations are desperately needed (as planned for in recent past) in Classrooms 303, 307, 309, 313 and Prep Rooms 305 and 311
- WAMS: water needed in 300A, 300B, 300C science classrooms.
- WAMS: lab stations/ more space needed in 303, 307, 309, 313
- RHS: Room 307 needs the gas pipe repaired. Rooms 313 and 314 renovation needs to be completed.
- RHS 404: needs permanent water and drains; smaller lab tables / flexible student work spaces.

Goal #3: Finish updating curriculum to align to Next Generation Science Standards (NGSS); monitor and evaluate new curriculum implementation.

Problem Statement: All district science curricula needs to be aligned to Next Generation Science Standards (NGSS). Give teachers the time to review textbooks and other instructional materials to formulate recommendations for the revised curricula.

Supporting Data: NGSS are available and some curricula have already been revised.

Proposed Solutions: Follow 5-year curriculum revision cycle to align all science curricula to NGSS
Goal #4: Improve student performance on SAT Subject test in Chemistry

Problem Statement: Many students opt to participate in the optional SAT Subject tests in the core science areas. Historically, our Honors science courses have been designed to address topics assessed on the SAT Subject tests in addition to NJ Core Curriculum Content Standards. With the adoption of the Next Generation Science Standards we have seen a divergence in core content and desired student learning outcomes between the SAT Subject tests and the NGSS.

Supporting Data: Student performance on SAT Subject test in Chemistry trends relatively lower than that of either Biology or Physics.

Proposed Solution: Review Honors Chemistry curriculum and instructional strategies to identify opportunities to better address content covered on the SAT Subject test in Chemistry.