

SCIENCE

Primary Goal - To help students in the elementary and junior high school years to understand the world through the application of the various science disciplines as well as the scientific method, and to enable students at the senior high school level to gain proficiency in specialized science areas.

<u>Staff</u>	<u>Students</u>	<u>Budget</u>	<u>Cost Per Student</u>
45.58	5,648	\$5,141,665	\$910

ELEMENTARY

2009 NYS Fourth Grade Science Assessment
Total Population

	Number Tested		Average Score		Level 4		Level 3		Level 2		Level 1	
	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008
District	372	397	86	87	65%	70%	28%	26%	6 %	4%	1%	0%
Blue Creek	56	77	88	88	77	74	18	22	4	4	2	0
Boght Hills	72	78	88	87	68	72	29	23	3	5	0	0
Forts Ferry	75	77	81	85	48	62	37	31	11	7	4	0
Latham Ridge	56	55	83	85	54	58	37	38	9	4	0	0
Loudonville	39	43	91	89	77	84	23	16	0	0	0	0
Maplewood	12	17	88	86	58	65	42	35	0	0	0	0
Southgate	62	67	88	87	73	70	19	27	6	3	2	0

In New York State, there are benchmark assessments at grades 4 and 8 to ascertain if students are going to attain the necessary skill for graduation. The New York State science assessment at grade 4 was marked by continued strong performance of our students. This year, 93% achieved at level 3 or 4 compared to 96% the previous year and 96% in 2007. Throughout the district, we had only 1% of our students score at level 1. We witnessed a decline in the number of our students scoring at level 4 from 70% to 65%; however, the average score remained relatively constant at 86%. Science content and skill application are prominently featured on this test and a lab portion requires our students to apply science in an authentic setting. This test also is a requirement for district accountability as part of the No Child Left Behind Federal legislation.

We noted last year that the results from the district examination at grade 6 were not included. This was due to the fact that we discovered results were reported inconsistently throughout the district. Subsequently, this has been rectified and we are now reporting the results for all our students, including Maplewood, even though the Maplewood test is somewhat different in content from the test administered in the other

SCIENCE (cont.)

buildings. We continue to value this test as a valuable benchmark between the 4th and 8th grades and it mirrors the State testing format in that it includes written responses, multiple choice, and a performance piece. Our results were very strong as 95% of our students received grades of C or better; with 85% receiving A's or B's and 58% of the entire student body earning an A. Elementary faculty annually review the test and update it. We consider this assessment to be a valuable source of information about the progress of our elementary students in the science curriculum.

HIGHLIGHT

The content area of science continues to provide teachers with the opportunity to implement hands-on, discovery-based instruction. Teachers are encouraged to incorporate experimentation, demonstration, problem solving experiences and the use and manipulation of materials during science instruction.

OBJECTIVES

- Continue to monitor student performance and the administration and scoring of the Grade 4 New York State Science Assessment. Utilize time during the school year for staff development in familiarize elementary teachers with the NYS Science Assessment.

Evaluation: Were students successful on this state assessment? What areas are in need of improvement? Were any problems identified in the administration of this assessment? Were any problems identified with the scoring of this assessment? Was time utilized during the school year to familiarize elementary teachers with state assessment?

Students continue to demonstrate success on the state assessment.

Problems with the administration of the assessment were identified. One school used two different lab set ups, causing confusion during scoring. A memo went out to principals and teachers this spring to remind teachers that the lab set ups for each school need to be quite similar.

- Continue to keep staff informed of the resources and materials available for science instruction. Gather then distribute information about supplementary learning experiences for science offered in each elementary school.

Evaluation: Were the staff in all seven elementary buildings kept informed of available resources and materials for science instruction?

SCIENCE (cont.)

In September, teachers at each grade level completed a survey to identify the location of science materials allocated for each school. We learned that a number of items cannot be located at each building. In the spring an additional survey was distributed to determine if these missing items are being used at any of the schools and if they are worth replacing.

- Continue to refine the district plan to improve the systemic approach to K-6 science instruction in the district. Continue to review and revise K-6 science curriculum to address curricular and instructional needs. Review Maplewood science curriculum, and begin the process of creating consistency between Maplewood and the other six elementary buildings.

Evaluation: Was a plan developed to improve science instruction in the district? Has a plan been developed for creating a consistent program amongst the seven elementary buildings?

During the summer a comparison of Maplewood and North Colonie science topics was completed. Generally speaking, similar topics/objectives are taught at each grade. In April, a group of fifth and sixth grade teachers thoroughly examined which NYS performance indicators were covered at each school at the fifth and sixth grade levels. We are planning to utilize curriculum development days during the summer to align and map the science curriculums at the fifth and sixth grade levels.

Follow-up meetings have also occurred with Laura Lehtonen of Capital Region BOCES. The purpose of these meetings was to gain ideas and strategies for the revisions to curriculum at grades 5 and 6.

LEVEL 7-8

Regents Earth Science 8X

	2008-09	2007-08	2006-07	2005-06	2004-05
Percent passing	100%	100%	100%	100%	100%
Number enrolled	92	94	91	92	95

SCIENCE (cont.)**Science 7E Final Exam Assessment**

Grade	Number of Students/Percentage 2008-09	Number of Students/Percentage 2007-08
A	85/73.3%	81/76%
B	27/23.3%	22/21%
C	4/3.4%	3/3%
D	0/0%	1/1%
F	0/0%	0/0%

**District Final Examinations
Grade 7 Science**

Grade	Number of Students/Percentage 2008-09	Number of Students/Percentage 2007-08
A	73/20.6%	91/25%
B	135/38%	123/33%
C	87/24.5%	92/25%
D	34/9.6%	39/11%
F	26/7.3%	25/7%

Grade 8 Science

Grade	Number of Students/Percentage 2008-09	Number of Students/Percentage 2007-08
A	101/25.7%	103/28%
B	156/39.7%	137/38%
C	75/19.1%	79/22%
D	29/7.4%	26/7%
F	32/18.1%	20/6%

NYS Grade 8 Science Assessment

	Number Tested	Number/% Level 4	Number/% Level 3	Number/% Level 2	Number/% Level 1
2008-09	486	262/54%	177/36%	47/10%	0/0%
2007-08	449	304/68%	121/27%	21/5%	3/1%
2006-07	419	273/65.1%	119/28.4%	21/5.0%	6/1.4%
2005-06	467	296/63.4%	151/32.3%	18/3.8%	2/0.4%
2004-05	467	296/63.4	151/32.3	18/3.8	2/0.4

SCIENCE (cont.)

Junior High School students who have talent and interest in science have the opportunity to earn high school credit by taking the high school Earth Science course in grade 8. The culminating assessment for this course is the Earth Science Regents exam. This year, we had 94 students attempt this exam compared to 93 the previous year. Again, we achieved a 100% passing rate on this test. Also, our students did extremely well with 98% of them scoring 85% or above and thus, earning mastery level. We have a number of students also scoring in the highest levels with 69% of our students scoring in the 95 – 99% range. The 94 students that took this exam represent 19% of the Shaker Junior High School eighth grade class.

The Science 7E program ensures that students are prepared for the Earth Science program. This year, 73% of our students scored an A or higher compared to 76% in 2007-2008. Overall, nearly 97% of this population scored either A's or B's on the assessment. There were no students with either D's or F's. On the district final exam for grade 7, the number of students achieving D's or F's remained constant at 17% compared to 18% for the previous year. We had slightly fewer A's on this examination, 21% compared to 25% the previous year, but overall, results were mostly consistent with the previous year. As the departmental goal is to have no more than 15% of the students achieve a D or an F, it appears as if we are moving in the right direction and are closer to realizing that objective. Results on the grade 8 final exam were also mostly consistent with the previous year. The number of students achieving A's or B's was 65%, compared to 66% the previous year, and 58% for the 2006-2007 school year. Fifteen percent of our students scored in the D or F range, compared to 13% the previous year.

PROGRAM HIGHLIGHTS

- On the New York State Science 8 assessment, 90% of our students achieved at levels 3 or 4, a slight decrease from the 2007-2008 school year, where 95% of the students achieved proficiency or mastery. We are very proud of the fact that we had no students achieving at level 1. As with the grade 4 exam, this test is also used to determine accountability for the Federal No Child Left Behind mandate. It is also used as a benchmark to identify students in need of academic intervention services. These services help students attain the requisite science content and skill necessary to pass the required Living Environment Regents at Shaker High School.
- More and more of the junior high school science teachers are using technology in their science classes.

SCIENCE (cont.)

OBJECTIVES

- Analyze results of the 2008 New York State Grade 8 Science Assessment.

Evaluation: Were any curricular/instruction revisions suggested?

No curricular or instruction revisions needed. Our students continue to do well on the Science 8 Assessment. Ninety-five percent (95%) of our students achieved levels 3 and 4. Twenty-four (24) students were required to receive AIS. Only three students scored a level 1 and twenty-one students scored on level 2. These results are consistent with previous years.

- Analyze results of the 2008 Earth Science Exam.

Evaluation: Were any curricular/instruction revisions suggested?

No curricular/instruction revisions are needed at this time. Ninety-eight percent of our students scored 85 or higher on the 2008 Earth Science Regents exam.

- Monitor the Earth Science Laboratory Program.

Evaluation: Were any needs for revisions identified?

The four Earth Science teachers at Shaker Junior High School went to a comprehensive review course given at Shaker High School regarding the new Part D lab exam. Our science teachers are up-to-date regarding the new demands and expectations for this exam.

- Monitor the use of the new Earth Science book.

Evaluation: Were any needs for revisions identified?

The teachers at Shaker Junior High School are pleased with the new Earth Science book. We will continue to review, revise, and update the implementation of this new book.

- Monitor the 7E Laboratory Program.

Evaluation: Were any needs for revisions identified?

There are no curricular revisions to be made at this time. The laboratory teacher continues to re-align topics to be consistent with the regular science teacher.

- Continue to facilitate technology integration into Science instruction.

SCIENCE (cont.)

Evaluation: Did more teachers avail themselves of current technologies?

More and more science teachers are using technology in their science classes. Further curriculum work is forthcoming regarding this objective.

- Review, revise, and update the 7th and 8th grade summer school mid-term and final exams.

Evaluation: Were the 7th and 8th grade Summer School mid-term and finals exams updated?

Both the summer school mid-term and final exams were updated.

LEVEL 9-12

NYS - Regents - Science

Earth Science -SHS- 254 tested (96.9% of those enrolled) Percent passing = 96.8%
Total including Grade 8 Students Percent passing = 97.7%

Biology -SHS- 390 tested -(99.4% of those enrolled) Percent passing = 100%

Chemistry -SHS - 325 tested (99.7% of those enrolled) Percent passing = 86.2%

Physics -SHS -241 tested (99.5% of those enrolled) Percent passing = 87.6%

Percentage of students scoring 85% or higher on Regents examinations:

Earth Science	69.0%
Biology	65.4%
Chemistry	25.8%
Physics	45.6%

There are four New York State Regents exams in science at Shaker High School: Living Environment, Earth Science, Chemistry, and Physics. Living Environment is referred to as Biology in this annual evaluation. This year's results continue to be strong in Living Environment (Biology) and Earth Science, but also witnessed a decline in our results in Chemistry and Physics. In Earth Science, we include the students who took the Regents in the accelerated science course at Shaker Junior High School. Last year's passing rate was 98.1% and this year's passing rate of 97.7% was nearly identical. We are also very pleased with the fact that the number of students achieving mastery by scoring 85% or better jumped to 69% from 60.5% in the previous year.

SCIENCE (cont.)

Living Environment's passing rate was at an all time high with 98.2% of our students passing this Regents exam, a requirement for getting a Regents diploma in New York State. We also increased the percentage of our students scoring at the mastery level, 55%, compared to 48% the previous year.

As noted earlier, Regents results in Chemistry and Physics declined from the previous year. In June, 86% of our students passed the Chemistry Regents compared to 95% in the previous year. However, through summer school and the addition of a tutorial program generously backed by the Board of Education, our passing results on this Regents jumped to 92% of the class passing the exam. This result is more in line with the results over the past five years, which range from 92% - 95% passing when factoring in the August Regents results. Furthermore, the percentage of students scoring at mastery (85% or better) was 26% and is very much in line with the results over the past five years which show between 23% and 31% of the Chemistry Regents test takers scoring at this level. In Physics, the percentage passing dipped from 96% to 88%. However, again, the percentage of students scoring 85% or better remains in line with the results over the past five years. This year's class had 46% of the students taking the exam achieving mastery compared to the range of 43% to 57% at the mastery level over the past five years. Mr. Bogert is monitoring the situation in the Chemistry and Physics program closely to ensure that results on the these Regents exams improve for the 2009-2010 school year.

CEEB Achievement Tests-Performance standards = ** Biology E; 666 Biology M; Chemistry 666; Physics 735

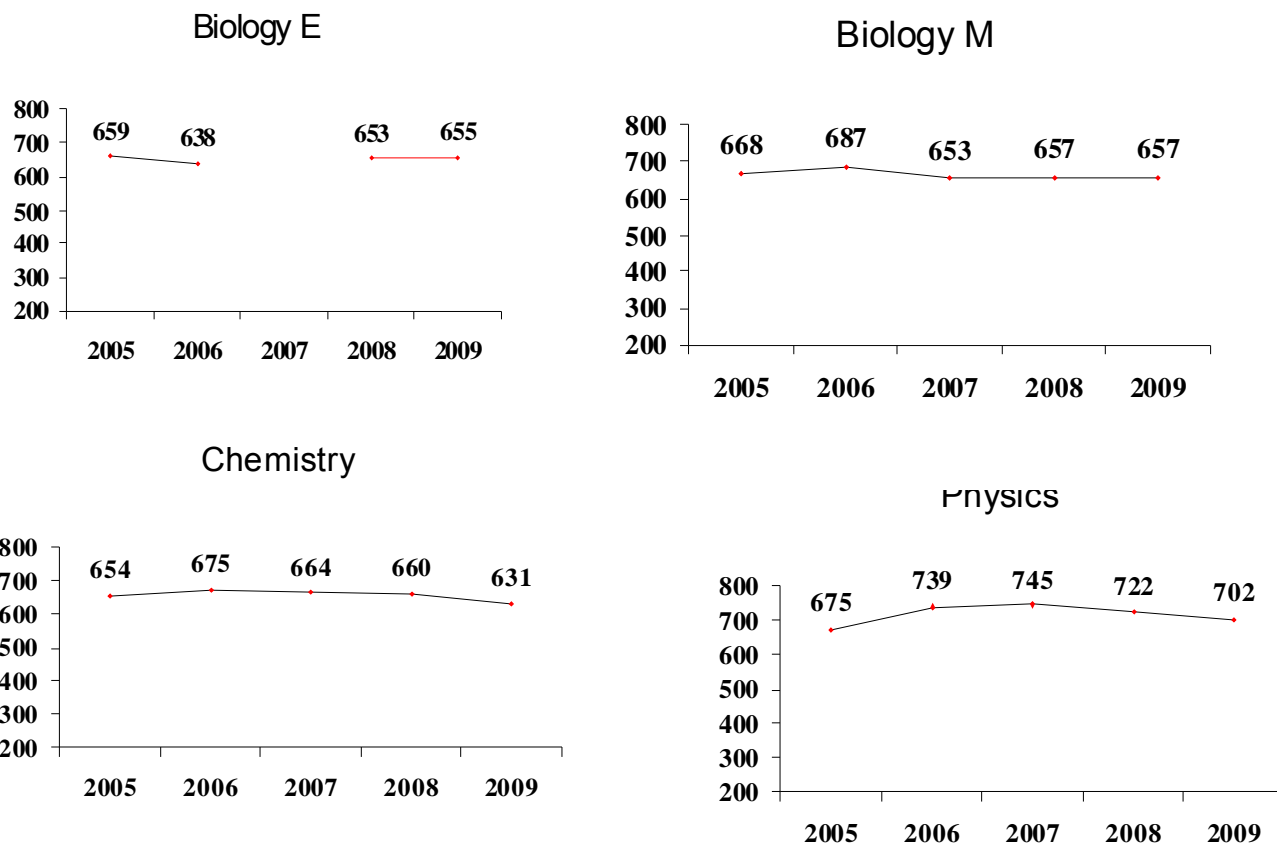
	Biology E	Difference over/under Performance Standard - **	Biology M	Difference over/under Performance Standard - 666
	655		657	-9
Number Tested	12		25	

**No mean score available; data set too small.

	Chemistry	Difference over/under Performance Standard - 666	Physics	Difference over/under Performance Standard - 735
	631	-35	702	-33
Number Tested	52		11	

SCIENCE (cont.)

(2005-2009 Results - CEEB Science Achievement Tests)



The department offers four achievement exams sponsored by the College Entrance Examination Board (CEEB). These include achievement exams in Biology E, Biology M, Chemistry, and Physics. Twelve students took the Biology E achievement test and achieved a mean score of 655 compared to 653 the previous year. On the Biology M achievement test, 25 test takers matched last year's results with a mean of 657, up slightly from the 653 achieved during the 2006-2007 school year. In Chemistry, we had about the same number of test takers for this achievement test, 52 (50 in 2007-2008); however, our mean score dipped significantly from the previous year's mark of 660. However, looking over the trends for the past five years, we note that although this score of 631 represents a decline from the previous year, it nonetheless represents not the lowest, but the second lowest mean score of the past six test administrations.

In Physics, achievement results also dipped, but nonetheless are strong. The current year's mean score was 702 compared to 722 for the previous year. Nonetheless, this mean score represents outstanding achievement for our Physics students. In all achievement tests, we continue to outscore State and National means.

SCIENCE (cont.)**CEEB Advanced Placement** - Performance standard = 90% score "3" or higher

	Biology	Difference over 90%
SHS Percent scoring "3" or Higher	95%	+5
Number tested	19	
NYS Percent scoring "3" or higher	58	
US Percent scoring "3" or higher	50	

	Chemistry	Difference over 90%
SHS Percent scoring "3" or Higher	96%	+6
Number tested	26	
NYS Percent scoring "3" or higher	68	
US Percent scoring "3" or higher	55	

	Physics B	Difference over 90%
SHS Percent scoring "3" or Higher	93%	+7
Number tested	43	
NYS Percent scoring "3" or higher	69	
US Percent scoring "3" or higher	60	

	Physics C, Mechanics	Difference over 90%
SHS Percent scoring "3" or Higher	100%	+10
Number tested	8	
NYS Percent scoring "3" or higher	76	
US Percent scoring "3" or higher	70	

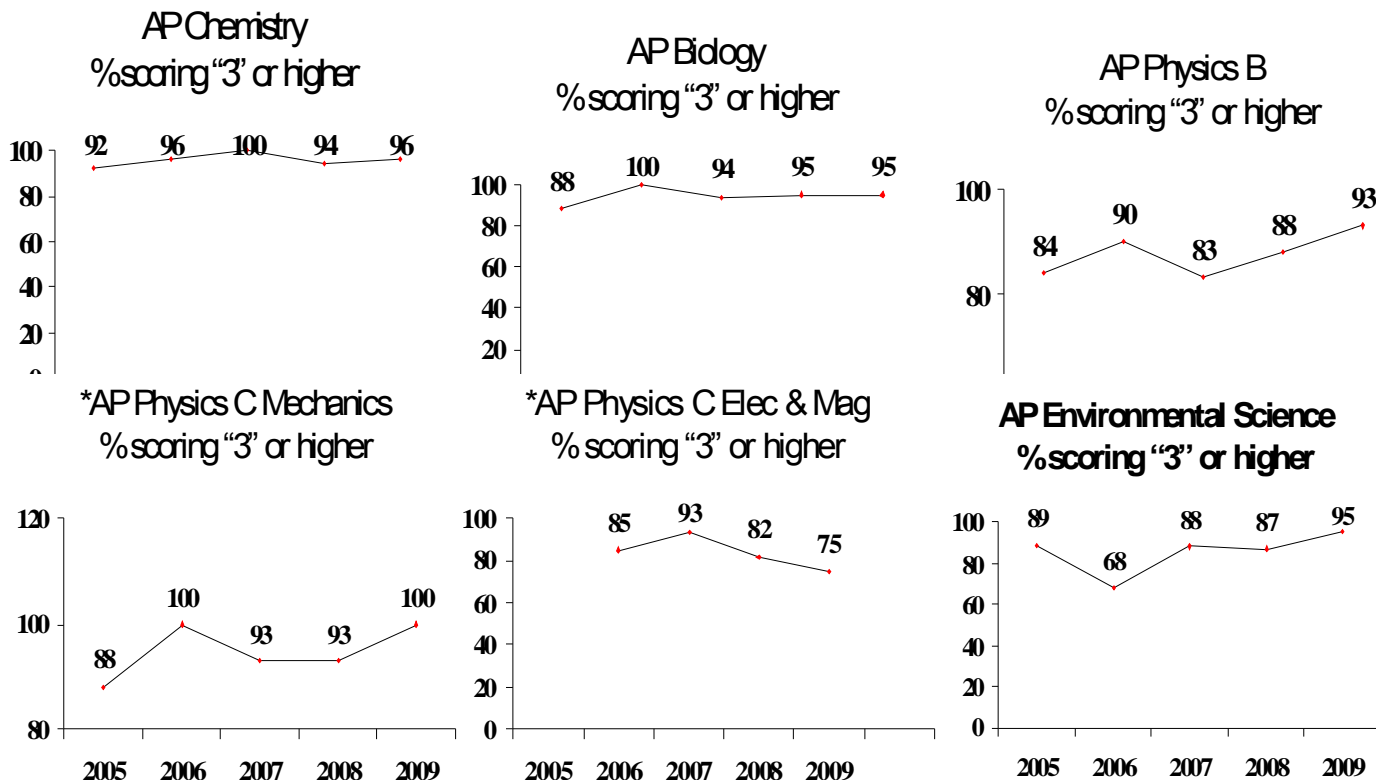
	Physics C, Electricity & Magnetism	Difference over 90%
SHS Percent scoring "3" or Higher	75	- 15
Number tested	8	
NYS Percent scoring "3" or higher	76	
US Percent scoring "3" or higher	71	

	Environmental Science	Difference over 90%
SHS Percent scoring "3" or Higher	95%	+ 5
Number tested	20	
NYS Percent scoring "3" or higher	55	
US Percent scoring "3" or higher	50	

*Data from NYS and US data are for 2009.

SCIENCE (cont.)

(2005-2009 Results - CEEB AP)



*AP Physics C Mechanics and AP Physics C Electricity & Magnetism not offered this year.

The department also offers multiple opportunities in the Advanced Placement program. Students have the following AP opportunities in Science: Biology, Chemistry, Physics B, Physics C Electricity & Magnetism, Physics C Mechanical, and Environmental Science. With some of these exams, one must be careful not to draw too many conclusions as there are very few test takers. For example, in Physics C Electricity & Magnetism, there were only eight students tested and six of them achieved a score of 3 or better, thus leaving the percent of students scoring 3 or better at 75%, below the departmental goal of 90%. However, because of the low number of test takers for this test, it would be premature and unreliable to draw too many conclusions from these results. Typically, students struggle with this difficult exam. Likewise, in Physics C Mechanical, there were also eight test takers, all of whom scored at 3 or better. Again, conversely, it would be unreliable to draw too many conclusions regarding the success of our students due to the low number of test takers. Nonetheless, we congratulate the department for their good efforts in both Physics C Electricity & Magnetism and Physics C Mechanical.

SCIENCE (cont.)

The other exam results remain consistent or were slightly better than the previous years. For example, for the CEEB AP exam in Biology, 95% of our students scored 3 or better, identical to that of the previous year. In Chemistry, we had a slight increase of students scoring a 3 or better (96% vs. 94%). Our Physics B exams were up as well with 93% of our students scoring a 3 or better compared to 88% the prior year. Finally, by far and away, we had our best year in AP Environment Science, with 95% of our students scoring 3 or better compared to 87% the previous year. This result is also the best result by far in the past five years where results have typically ranged from 68% achieving at level 3 or better to 89%. Noteworthy also is that in comparing Physics B and Physics C, we must note that Physics C is a Calculus-based program and is the most difficult science AP currently offers.

Regents Competency Tests (RCT)

Grade 9

Subject	Number Failing		Percent of Class Not Completing Requirement	
	2008-09	2007-08	2008-09	2007-08
	10	9	18%	19%

Grade 10

Subject	Number Failing		Percent of Class Not Completing Requirement	
	2008-09	2007-08	2008-09	2007-08
	2	5	.4 %	.6%

Grade 11

Subject	Number Failing		Percent of Class Not Completing Requirement	
	2008-09	2007-08	2008-09	2007-08
	1	1	.2%	0%

Grade 12

Subject	Number Failing		Percent of Class Not Completing Requirement	
	2008-09	2007-08	2008-09	2007-08
	0	1	0%	0%

PROGRAM HIGHLIGHTS

STATISTICAL

- Our Earth Science Regents pass rate dipped slightly from last year, though it

SCIENCE (cont.)

was still quite high. Of note however, is when summer school is factored in, we obtained a 100 pass rate which has not been achieved in the previous 4 years. This is a nice accolade for our summer program.

- Living Environment numbers were at a 5 year high. Most impressive is the mastery rate which soared above the 65% mark for the first time. Our results were boosted specifically by strong numbers in the Science In Our Lives program.
- Our Advanced Placement numbers continue to be impressive. Of note was our Physics B course as well as our Environmental Science course. Both courses came in with five year highs for percent scoring a 3 or better.
- Final Marks in our courses were once again very good overall. A total of thirteen courses showed final mark improvements over last year. Five other courses remained at 100% within expected range.

CURRICULAR

- Laboratory grading practices were modified in the Earth Science program to improve grading consistency while still holding students accountable for their work. Curriculum alignment in the Earth Science lab was improved by working with teachers from other laboratory programs and modifying the biology labs to increase correlation. This was the second year of a four year plan to improve grading and curriculum alignment in all Regents labs.
- Our Science Research Program helped produce a third INTEL Science and Engineering Fair finalist in as many years. Prateek Bahgel won the local RPI science competition and traveled to compete globally with his work. He placed second in the world for his division.
- The Forensics program ran for the second year and remained a tremendous success. We were able to support a curriculum workshop to have teachers review the first year of the course and make some additional improvements. We would like to expand the program to two sections in the future.
- Honors and AP – B Physics textbooks as well as Environmental Science textbooks were purchased and proved to be fantastic resources for those programs.
- A new Advanced Placement Physics laboratory was installed and is working fabulously.

SCIENCE (cont.)

OBJECTIVES

- Evaluate and, if necessary, modify our procedures and practices for laboratory in our core subjects (continued from 07-08 school year).

Evaluation: Was an evaluation done to determine if our procedures and practices are appropriate? If deemed necessary, have changes been made to improve our system?

The Earth Science laboratory program was assessed and improved upon from previous years. The first major change in the program was the grading policy which is now modeled after the Biology grading policy. To review the new policy: The laboratory now counts as a straight 20% of a student's course grade. Any student who is incomplete in lab will earn a zero for every lab not turned in by the end of the quarter. Previously, a student incomplete in lab would automatically earn a 60 in the class for each quarter incomplete. This meant that a student who was missing many labs in a quarter could earn the same 60 as a student who was only missing a single lab in the same quarter. The new policy prevents too punitive a consequence if a student is only missing a single lab, but still holds students accountable for their work. Additionally, we have adjusted our laboratory timing so that each lab is worth a certain amount time, depending on the lab activity being performed, which counts toward the NYS mandate of 1200 minutes. The new timing reflects more closely the amount of time performing the actual laboratory as opposed to a straight 46 minutes (total class time). In this way we ensure that the amount of time our students are earning towards the NYS mandate is not time spent preparing, discussing or cleaning up after a laboratory.

The other changes were to individual labs themselves where we reworked numerous questions and procedures to better reinforce concepts deemed important to a more thorough understanding of the content. Some labs received more changes than others based on the discretion of the Earth Science teachers with input from the Biology and Chemistry resource teachers.

- Update curriculum in the new Forensics program. Evaluate and, if necessary, make modifications to the program to address student needs in subsequent years.

Evaluation: Was the Forensics course updated? If needed, were appropriate changes made to the program to better meet the needs of the students in subsequent years?

SCIENCE (cont.)

We teach Forensics content in two courses. Our new Forensics elective program is the primary and most thorough forensics curriculum. This curriculum was developed many years ago, but has been put into place last year to great success. Additionally, our Integrated Regents Program, Level IV – Business, is Forensics based and the content is nearly as rich as it is in the dedicated Forensics elective. Both teachers were able to work together this past summer to share their own individual ideas and update units. The majority of changes reflected enhancements to the laboratory activities. Other laboratories were added to the curriculum to help strengthen the hands-on component of both courses. Also, assessments were evaluated and improved upon to reflect the enhancements and additions made to the regular curriculum.

Both teachers reported that the forensics programs have been excellent this year. The improvements that were made last summer have strengthened our hands-on component in each course, as well as added appropriate rigor. Forensics continues to be a much sought after program. We have thirty applicants for forensics next year and we plan to run two sections.

- Successfully install a new computerized Advanced Placement Physics laboratory to replace the older lab.

Evaluation: Was a new physics laboratory installed successfully?

The installation of the new computer lab was highly successful. All software was installed and each computer was imaged before it was put into the laboratory. After the computers were installed, our teacher was able to work in conjunction with the technology department to ensure that each computer was running as expected.

The new computers are desktop models which are faster, easier to maintain and, because of their 17" flat screen monitors, much easier to work with for students. At this time, the computers have performed flawlessly. Our teacher did not report any issues with the computers this year. We may work to develop a solution for getting the desktop cases off the table tops for next year. This has not been a major concern, but any extra space on the table tops could be beneficial.

- Evaluate, design and begin implementation process of a new chemistry program to address the needs of students who are traditionally struggling in chemistry at the Regents level.

Evaluation: Was it determined that a new chemistry program is necessary? If so, is the new program designed and ready for implementation?

SCIENCE (cont.)

A summer curriculum workshop in 2009 is scheduled to accomplish this goal. This will be important and beneficial work to help students in our current Regents level program who are struggling to be successful. We expect to frame the program this summer as well as begin writing curriculum for the program. The program will be ready to “kick off” in fall of 2010.

- Successfully adopt new textbooks in Physics and Environmental Science and begin curriculum modification process to integrate new books into established curriculum.

Evaluation: Were new textbooks successfully adopted and integrated into Physics and Environmental Science programs?

We were delighted to be able to adopt a new Advanced Placement Environmental Science book, as well as a new Physics book in Advanced Placement B level and honors physics. The teachers were able to create new assignments from each book as well as adopt their current instruction to the more beneficial resources found in the new books. Additionally, assessments were modified and improved to reflect the change in texts. For next year, we wish to adopt new books for the Regents level physics students and the regular Environmental Science students.

- Evaluate and, if necessary, modify current IRP 3 and 4 curriculums in Science to better integrate content areas with math and CTE courses.

Evaluation: Were the current IRP 3 and 4 curriculums evaluated and modified to better integrate with math and CTE?

In IRP IV science, current activities were improved, as well as numerous new activities created. While the IRP IV science curriculum was more of a freshening, a tremendous amount of work was done to overhaul the IRP III science curriculum from the ground up. A new map was developed by the outgoing teacher early in the summer with completely new topics and activities that better aligned with the technology component of the program. Additionally, after hiring a new teacher for the program, we were able to bring the team back together late in summer to familiarize the new teacher with the program and the new maps.

Our new teacher has worked out very well, as has the new curriculum content. Our students are doing more hands-on activities than before. We have also increased the amount of problem solving and critical thinking in the program by doing more chemistry related concepts.