

Lackawanna County Science PSSAs

2009 Science Results

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The Institute for Public Policy & Economic Development

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*A partnership among Keystone College, King's College, Luzerne County Community College,
Marywood University, Misericordia University, Penn State Wilkes-Barre, The Commonwealth Medical College,
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Produced by *The Institute for Public Policy and Economic Development*

Senior Researchers

Teri Ooms
Sherry Murray

Research Associates

Christina Miller

Coordinator

Marla Doddo

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Introduction:

The purpose of the School Assessment Report (SAR) is to provide educators, administrators, parents, business and industry, and civic leaders with information regarding student proficiencies in the public K-12 school system – the same system that trains our future workforce. Since local and regional economies are dependent upon the strength of the workforce, K-12 education is a strong economic development tool. To guarantee an adequate future workforce, within the next several years (through 2014), the Commonwealth of Pennsylvania must ensure that each child is proficient in reading, mathematics, and the sciences – a goal that coincides with the Federal No Child Left Behind Act (NCLB). Moreover, parents, guardians and educators can mutually assist in student proficiency improvements if they take the necessary actions to help students learn and advance their skills.

The SAR measures and analyzes Pennsylvania System of School Assessment (PSSA) science statistics from 2007 to 2009. Fourth, eighth, and eleventh grade student proficiencies are evaluated across Lackawanna County, and are compared with state and county averages. While the PSSA is broken down into four sections of proficiency – reading, writing, mathematics and science, this SAR specifically examines science proficiencies. The 2008-2009 school year marks the second year that Pennsylvania formally assessed science proficiencies. As such, the Pennsylvania Department of Education administered the science portion of the PSSA on a pilot basis only, seeking feedback that would allow it to revise the exam that will become part of next year's regular statewide test. According to the Pennsylvania Department of Education, the science exam attempts to move beyond the testing of facts and superficial knowledge, a trend that has dominated U.S. science education for decades, towards assessment of student abilities to engage in critical thinking and make accurate, evidence-based predictions.

Report Methodology

This SAR is designed to summarize the performance and monitor the progress of Lackawanna County public schools with regard to science assessments. In doing so, this report aims to identify Lackawanna County's strengths, as well as areas that require timely improvement. As this was the first year of science testing, the state viewed the assessment largely as a pilot study aimed at gathering data and making corrections for subsequent, full-scale testing. Given its pilot status, the state focused on a smaller population – specifically, students in grades four, eight and eleven. As such, the statistics and comparisons reported herein are reflective of the smaller group's grades only and do not necessarily reflect the knowledge and skills of the county's entire public school population.



PSSA scores, which serve as the foundation of the report, are found on the Pennsylvania Department of Education's website at <http://www.pde.state.pa.us>. **PSSA results are organized by county and divided into the following proficiency ratings: advanced, proficient, basic, and below basic.** The total number of proficient scores is calculated by combining the number of PSSA test takers who scored advanced or proficient on the science section.

For clarification, those requiring an Individualized Educational Program are classified as "IEP" students. This category includes any student with a disability who requires a service and/or accommodation in addition to the standard educational approach used for non-IEP students. Usually, the term IEP refers to at least one of the following disabilities: autism, deafness, deaf-blindness, emotional disturbance, hearing impairment, learning disability, mental retardation, multiple disabilities, orthopedic impairment, other health-impairment, speech or language impairment, traumatic brain injury or visual impairment including blindness.

Economically disadvantaged students comprise another subcategory. This group includes those who are eligible for free or reduced fee lunch. Data on this group is not available for each year since 2002, which introduces uncertainty in trend predictions for this group. Similarly, data for both African-American and Hispanic students is sparse at best, with information lacking for most school districts. For schools with fewer than ten students in the subgroup, data is not reported.

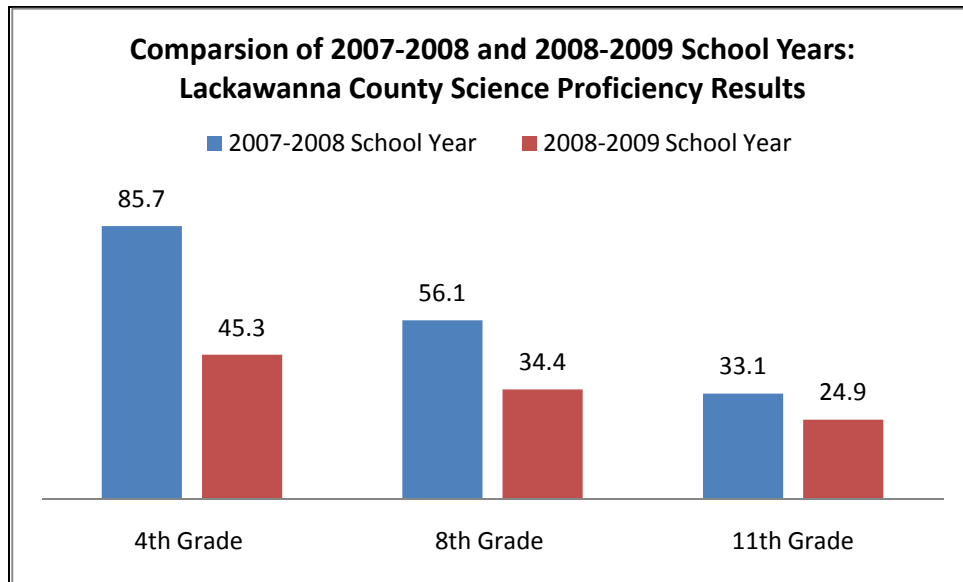
Student Performance

Lackawanna County Science Proficiency Results

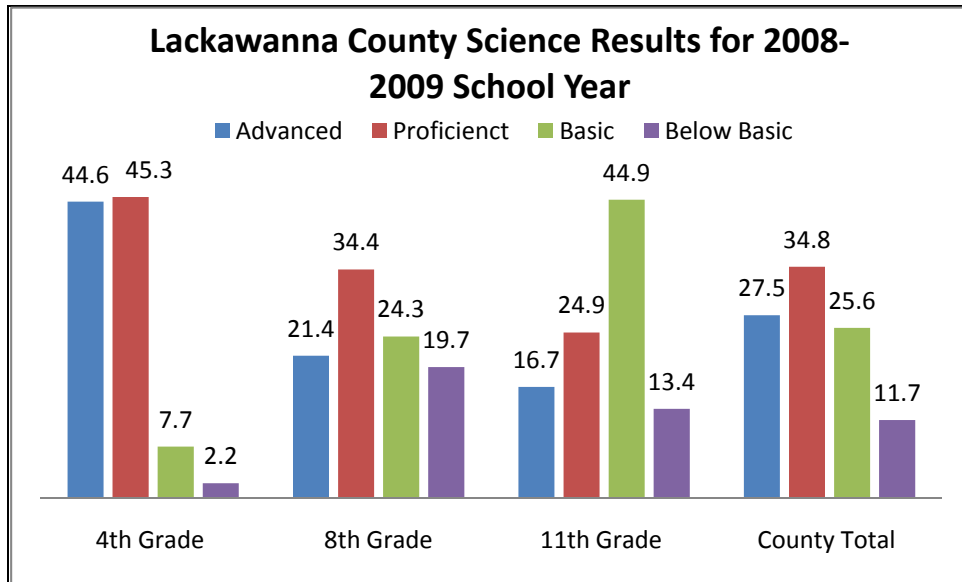
During the 2008-2009 school year, 6,017 of Lackawanna County's fourth, eighth, and eleventh grade students took the science PSSA. Of the total test takers in the study group (grades four, eight and eleven), 34.8% scored at least proficient in science. Fourth graders achieved the highest scores, with an average science proficiency score of 45.3%. Eighth graders achieved an average science proficiency score of 34.4%, while eleventh graders achieved an average science proficiency score 24.9%. Lackawanna County's combined science averages for the 2008-2009 school year (34.8%) ranked above the state-wide science proficiency average (21.6%).

Lackawanna County Science PSSA- 2008 Results

Grades	Total of Students Tested	Advanced %	Proficiency %	Basic %	Below Basic %
County Total: Grade 4	2001	44.6	45.3	7.7	2.2
County Total: Grade 8	2056	21.4	34.4	24.3	19.7
County Total: Grade 11	1960	16.7	24.9	44.9	13.4
County Total	6017	27.5	34.8	25.6	11.7



It is the intent of No Child Left Behind to have all students capable of exhibiting scientific knowledge at a proficient level by 2014. In order to reach this goal, it is necessary for schools to systematically convert the number of students performing at a level considered to be basic or below basic to a proficient or advanced level. The graph below represents the number of students at each ability level in Lackawanna County during the most recent round of testing. Ideally, the number of students scoring proficient or advanced should be at a much higher level than the number of those scoring basic or below basic.



The county’s fourth graders have shown strong scientific aptitudes, with those scoring proficient or advanced significantly outnumbering those scoring basic or below basic. By contrast, the county’s eighth graders had a higher “proficiency” rating than the other rating categories in the eight grade. Lackawanna County’s eleventh graders demonstrated the greatest disparity between levels of proficiency and non-proficiency; eleventh graders performed the poorest, with the highest percentage of those ranked “basic” in the county]. In Lackawanna County, as well as statewide, science proficiencies exhibit a trend of decreasing proficiencies with grade level progression.

Lackawanna County School District Proficiencies and Rankings

The table below details Lackawanna County’s test group scores, in order of proficiency ranking, as determined by the performance of all fourth, eighth and eleventh grade students within each school district.

Science Proficiency Scores for 2008-2009 School Year				
School Districts	4th Grade	8th Grade	11th Grade	Total
Abington Heights SD	38.5	38.4	31.5	36.1
Carbondale Area SD	49.5	22.2	20.5	30.7
Dunmore SD	47.9	34.6	35.2	39.2
Lakeland SD	33.3	35.9	26.6	31.9
Mid Valley SD	44.7	34.8	28.6	36
North Pocono SD	43	37.2	21.9	34
Old Forge SD	60.9	36.8	14	37.2



Lackawanna County Science PSSA- 2008 Results

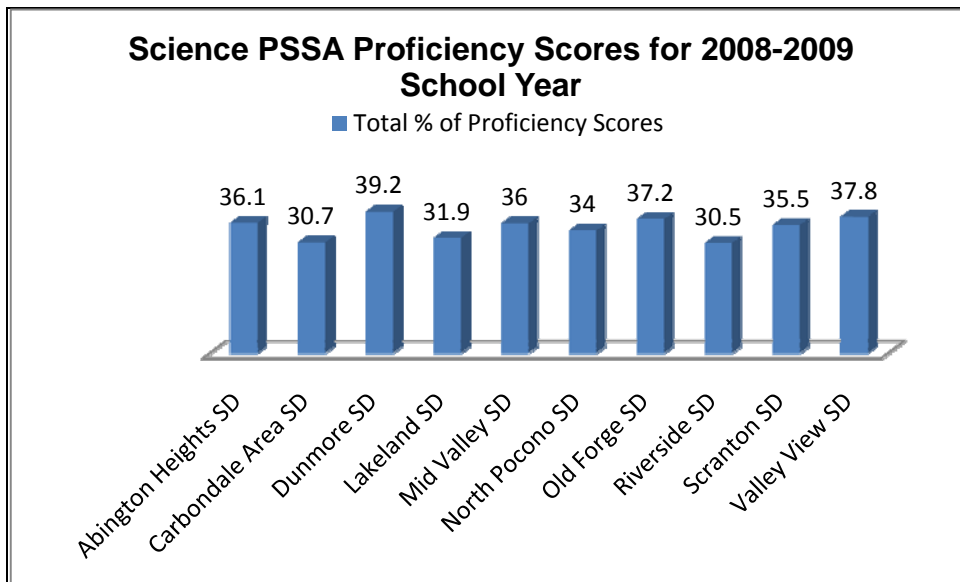
Riverside SD	37.3	30	24.2	30.5
Scranton SD	51.2	33.3	22.2	35.5
Valley View SD	47.3	41.7	24.5	37.8
Total	45.3	34.4	24.9	34.8

School District PSSA Science Performance: 2008-2009 School Year					
School Districts	Grades	% Advanced Science (2009)	% Proficient Science (2009)	% Basic Science (2009)	% Below Basic Science (2009)
ABINGTON HEIGHTS SD	4	56.5	38.5	5	0
ABINGTON HEIGHTS SD	8	26.6	38.4	20.7	14.4
ABINGTON HEIGHTS SD	11	24	31.5	37.1	7.5
ABINGTON HEIGHTS SD	District Total	35.7	36.1	20.9	7.3
CARBONDALE AREA SD	4	40.5	49.5	9	0.9
CARBONDALE AREA SD	8	20.5	22.2	24.8	32.5
CARBONDALE AREA SD	11	17	20.5	37.5	25
CARBONDALE AREA SD	District Total	26	30.7	23.7	19.4
DUNMORE SD	4	42.7	47.9	6.8	2.6
DUNMORE SD	8	19.6	34.6	24.3	21.5
DUNMORE SD	11	25.8	35.2	34.4	4.7
DUNMORE SD	District Total	29.3	39.2	21.8	9.6
LAKELAND SD	4	59.5	33.3	4.8	2.4
LAKELAND SD	8	24.8	35.9	27.4	12
LAKELAND SD	11	24.8	26.6	36.7	11.9
LAKELAND SD	District Total	36.3	31.9	22.9	8.7
MID VALLEY SD	4	39.4	44.7	13.6	2.3
MID VALLEY SD	8	16.7	34.8	28.8	19.7
MID VALLEY SD	11	10.1	28.6	49.6	11.8
MID VALLEY SD	District Total	22	36	30.6	11.2
NORTH POCONO SD	4	51.7	43	3.9	1.3
NORTH POCONO SD	8	25.9	37.2	28.1	8.8
NORTH POCONO SD	11	13.9	21.9	47.8	16.3
NORTH POCONO SD	District Total	30.5	34	26.6	8.8
OLD FORGE SD	4	31.9	60.9	5.8	1.4
OLD FORGE SD	8	16.2	36.8	17.6	29.4
OLD FORGE SD	11	18	14	48	20
OLD FORGE SD	District Total	22	37.2	23.8	16.9
RIVERSIDE SD	4	50	37.3	8.8	3.9
RIVERSIDE SD	8	14.5	30	29.1	26.4

Lackawanna County Science PSSA- 2008 Results

RIVERSIDE SD	11	8.1	24.2	55.6	12.1
RIVERSIDE SD	District Total	24.2	30.5	31.1	14.1
SCRANTON SD	4	32.7	51.2	12.5	3.6
SCRANTON SD	8	17.6	33.3	24.5	24.7
SCRANTON SD	11	13.1	22.2	49.1	15.6
SCRANTON SD	District Total	21.1	35.5	28.7	14.6
VALLEY VIEW SD	4	41.3	47.3	7.6	3.8
VALLEY VIEW SD	8	32.2	41.7	18.5	7.6
VALLEY VIEW SD	11	12.5	24.5	53.8	9.2
VALLEY VIEW SD	District Total	28.6	37.8	26.6	6.8

According to the above data, the Dunmore School District performed the best on the science PSSA, with an average proficiency of 39.2%. Riverside School District performed the poorest, with an average proficiency of 30.5%.



School District Science Results for 2008-2009 School Year

The table below identifies Lackawanna County school district results for the 2008-2009 PSSA science assessment. The table illustrates proficiency results by grade level and provides the percentage of students at each level of attainment (advanced, proficient,

basic, below basic). Overall district averages are calculated at the bottom each district's section within the table.

School District Science Results: 2007-2008

The tables below identify Lackawanna County school district results for the 2007-2008 PSSA science assessment. The table illustrates proficiency results by grade level and provides the percentage of students at each level of attainment (advanced, proficient, basic, below basic). Overall district averages are calculated at the bottom each district's section within the table.

School District PSSA Science Performance: 2007-2008 School Year					
Analysis of Attainment Level by District for Science PSSA		% Advanced Science (2008)	% Proficient Science (2008)	% Basic Science (2008)	% Below Basic Science (2008)
ABINGTON HEIGHTS SD	4	56.3	35.1	5.6	3.0
ABINGTON HEIGHTS SD	8	17.7	47.3	24.3	10.7
ABINGTON HEIGHTS SD	11	9.9	26.4	48.5	15.2
ABINGTON HEIGHTS SD	District Total	25.5	36.3	27.9	10.2
CARBONDALE AREA SD	4	27.6	56.3	11.5	4.6
CARBONDALE AREA SD	8	18.5	39.8	24.1	17.6
CARBONDALE AREA SD	11	11.1	14.8	42.6	31.5
CARBONDALE AREA SD	District Total	18.5	35.6	27.1	18.8
DUNMORE SD	4	46.7	47.5	4.1	1.6
DUNMORE SD	8	10.7	43.4	31.1	14.8
DUNMORE SD	11	12.3	35.8	43.2	8.6
DUNMORE SD	District Total	22.2	41.6	27.8	8.4
LAKELAND SD	4	50.0	38.0	7.4	4.6
LAKELAND SD	8	16.4	47.0	25.4	11.2
LAKELAND SD	11	10.2	38.9	42.7	8.3
LAKELAND SD	District Total	23.1	41.4	27.3	8.3
MID VALLEY SD	4	29.5	58.9	9.3	2.3
MID VALLEY SD	8	9.4	41.4	28.9	20.3
MID VALLEY SD	11	2.3	15.5	51.9	30.2
MID VALLEY SD	District Total	13.7	38.6	30.1	17.6

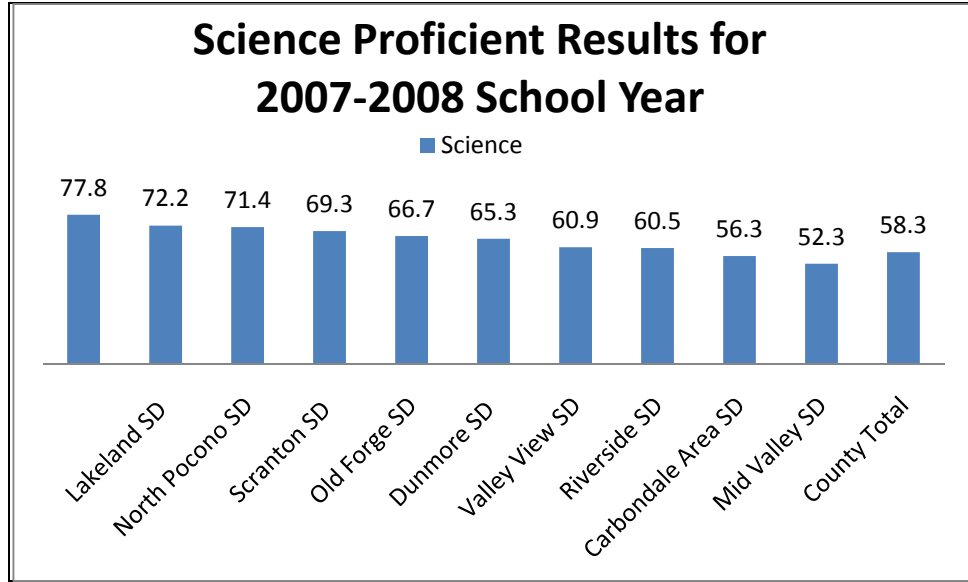
School District PSSA Science Performance: 2007-2008 School Year					
Analysis of Attainment Level by District for Science PSSA		% Advanced Science (2008)	% Proficient Science (2008)	% Basic Science (2008)	% Below Basic Science (2008)



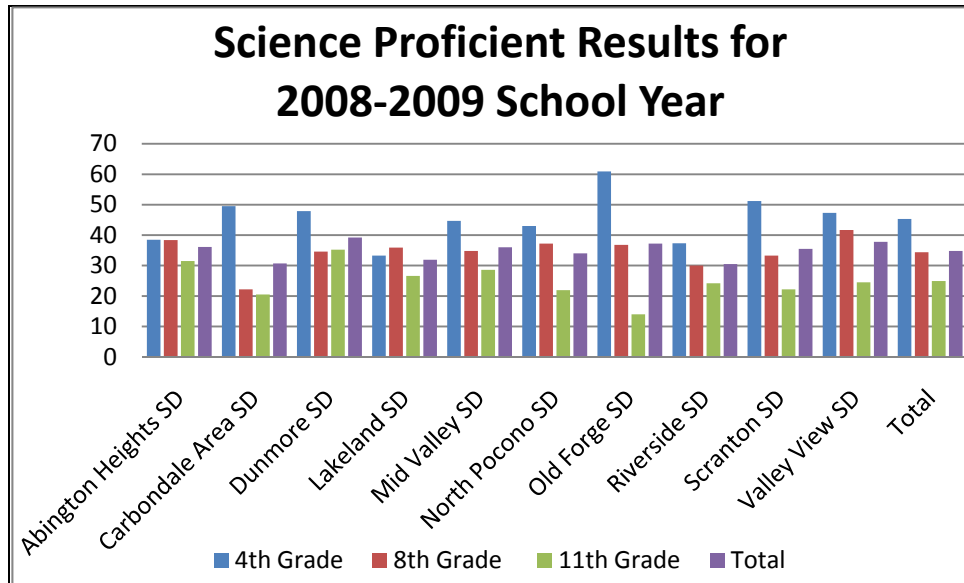
Lackawanna County Science PSSA- 2008 Results

NORTH POCONO SD	4	47.2	42.7	6.9	3.3
NORTH POCONO SD	8	18.9	48.7	22.2	10.2
NORTH POCONO SD	11	9.1	29.2	49.4	12.3
NORTH POCONO SD	District Total	24.7	40.4	26.2	8.7
OLD FORGE SD	4	41.4	39.7	13.8	5.2
OLD FORGE SD	8	9.8	58.5	23.2	8.5
OLD FORGE SD	11	11.6	39.1	34.8	14.5
OLD FORGE SD	District Total	19.1	46.9	24.4	9.6
RIVERSIDE SD	4	46.2	39.6	12.3	1.9
RIVERSIDE SD	8	4.1	34.1	36.6	25.2
RIVERSIDE SD	11	4.4	25.7	52.2	17.7
RIVERSIDE SD	District Total	17.3	33.0	34.2	15.5
SCRANTON SD	4	36.8	45.7	14.3	3.2
SCRANTON SD	8	9.6	37.8	29.7	22.8
SCRANTON SD	11	4.2	15.0	48.8	32.0
SCRANTON SD	District Total	16.4	32.6	31.3	19.7
VALLEY VIEW SD	4	46.5	43.9	8.6	1.1
VALLEY VIEW SD	8	21.3	41.6	25.2	11.9
VALLEY VIEW SD	11	5.3	23.8	56.8	14.1
VALLEY VIEW SD	District Total	23.7	36.1	30.9	9.2

Science Results for all 4, 8, 11th grades combined in 2007-2008 School Year:



Science Results for all 4, 8, 11th grades analyzed in 2008-2009 School Year



Special Populations

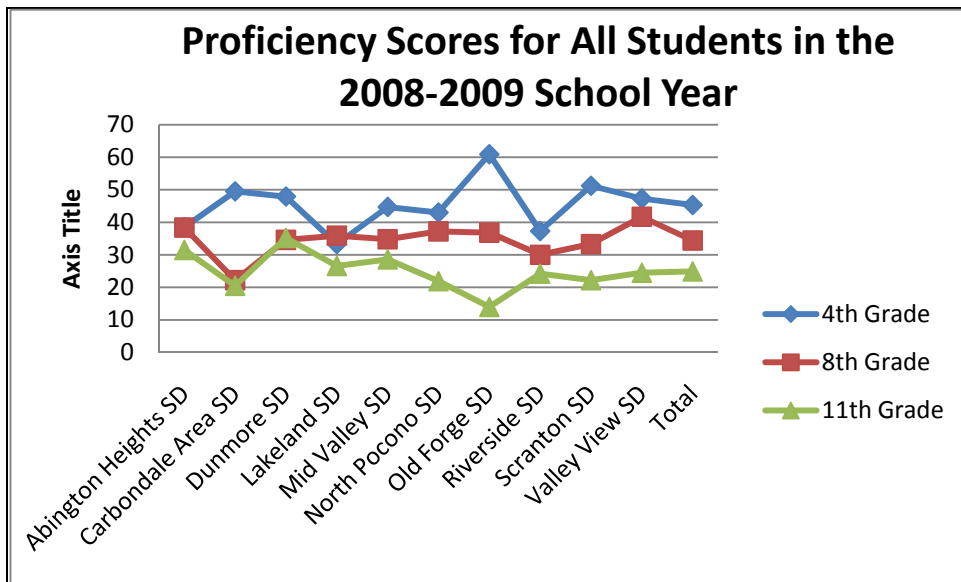
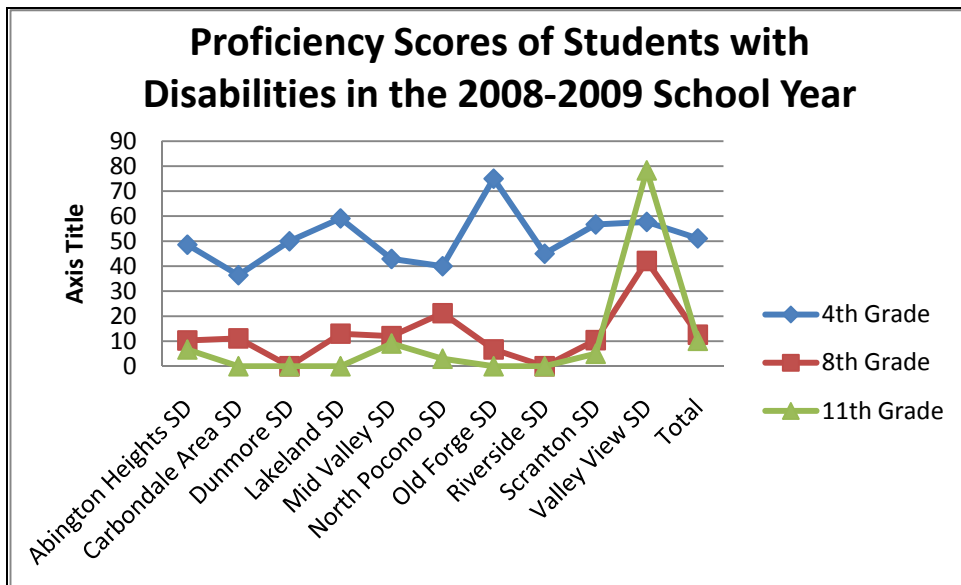
Students with Disabilities

In this SAR, a student with a disability is defined as any student who requires the use of an Individualized Education Program (IEP) to meet his/her educational goals. In Lackawanna County, 908 fourth, eighth and eleventh grade students with disabilities took the science portion of the PSSA during the 2008-2009 school year. Overall, this group achieved a 24.6% proficiency rating, although fourth grade scores differ drastically from eighth and eleventh grade results. It should be noted that although the scores of students with disabilities are often reported separately from the aggregated data, their scores are equally factored into each school district's proficiency total and Annual Yearly Progression (AYP) goals.

Students with Disabilities Tested in the Science PSSA: 2008-2009 School Year					
	Students Tested	Advanced	Proficient	Basic	Below Basic
County Total: Grade 4	385	27.2	51.1	14.9	6.6
County Total : Grade 8	294	5.1	12.6	25.7	5.1
County Total : Grade 11	229	0.46	10.2	39	47.6
County Total	908	10.9	24.6	26.5	19.7

When compared with their peers, Lackawanna County's students with disabilities performed at a lower level in eighth and eleventh grades. Fourth grade students with disabilities demonstrated a proficiency score of 51.1% whereas their counterparts in the regular fourth grade had an overall average proficiency score of only 45.3%, a 5.8% difference.

The following two charts provide science proficiency scores for students with disabilities and their peers in the 2008-2009 school year:



Economically Disadvantaged

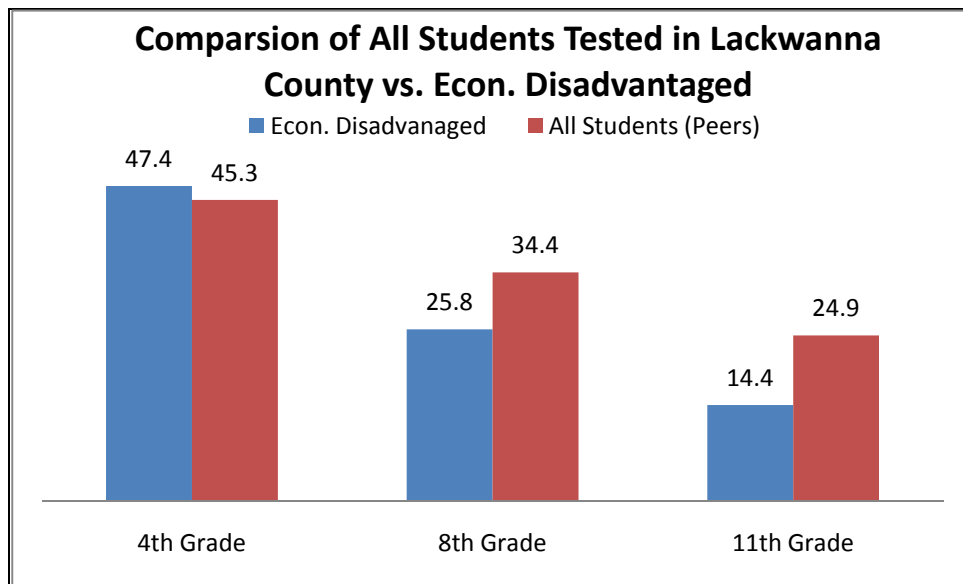
Economically disadvantaged students comprise another subgroup whose performance is monitored and analyzed via PSSA testing. The Pennsylvania Department of Education considers a student “economically disadvantaged” based on his or her participation in the free or reduced fee lunch program. Traditionally, students who are

raised in low-income environments tend to perform at a significantly lower level than peers from higher socioeconomic backgrounds.

In Lackawanna County, 2,017 participants of the science portion of the PSSA during the 2008-2009 school year in the fourth, eighth and eleventh grade classified as economically disadvantaged took the science portion. Overall, this subgroup achieved a 29.2% science proficiency score - although proficiency ratings varied widely among the three grade levels compared.

Science PSSA Scores for the Econ. Disadvantaged Students					
Grades	Total # of Students	Advanced	Proficient	Basic	Below Basic
4th Grade	796	29.3	47.4	8.6	4.6
8th Grade	708	12	25.8	24.5	27.5
11 Grade	513	9.9	14.4	43.1	22.3
Total	2017	17	29.2	25.4	18.1

In regard to science proficiencies for the 2008-2009 school year, Lackawanna County's economically disadvantaged students performed at a lower level at all grade levels when compared with their non-economically disadvantaged peers. It should be noted, however, that certain grade levels were outperformed only marginally in terms of overall score. For example, fourth grade economically disadvantaged students reported a 47.4% science proficiency score, compared with 34.8% for all Lackawanna County's fourth graders.

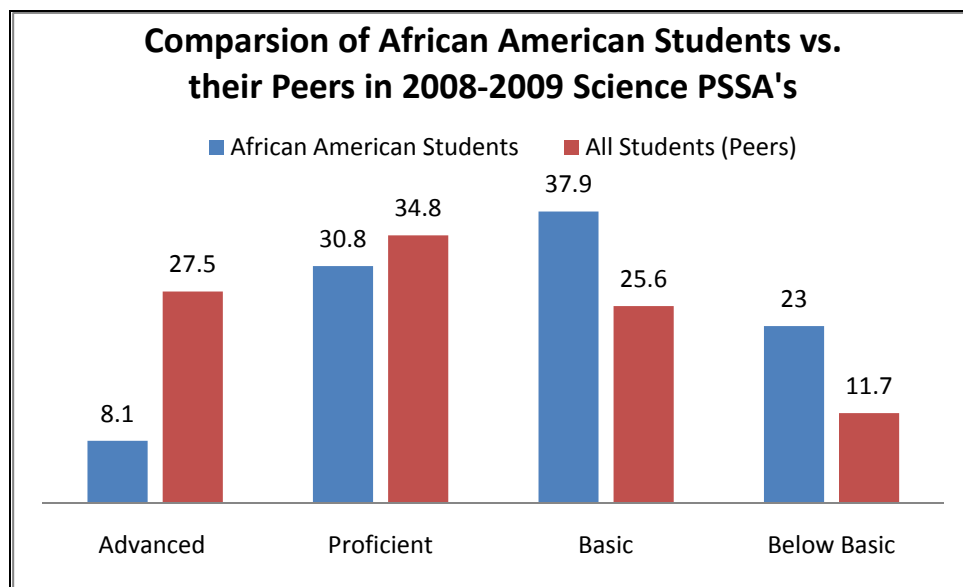


African- American Students

Lackawanna County’s African-American students, a subgroup also monitored by PSSA testing as dictated by NCLB, are its most underrepresented population - with only 222 students testing in science during the 2008-2009 school year. It should be further noted that only one district (Scranton School District) has an African-American population large enough to be independently reported (population greater than 10). As such, the generalizations and analysis that follow should be tempered with caution given the little data available this year.

African American Students Tested in Science PSSA in 2008-2009					
Grades	Total # of Students	Advanced	Proficient	Basic	Below Basic
4th Grade	84	20.2	52.4	21.4	6
8th Grade	55	1.8	32.7	27.3	38.2
11th Grade	40	2.5	7.5	65	25
County Total	179	8.1	30.8	37.9	23

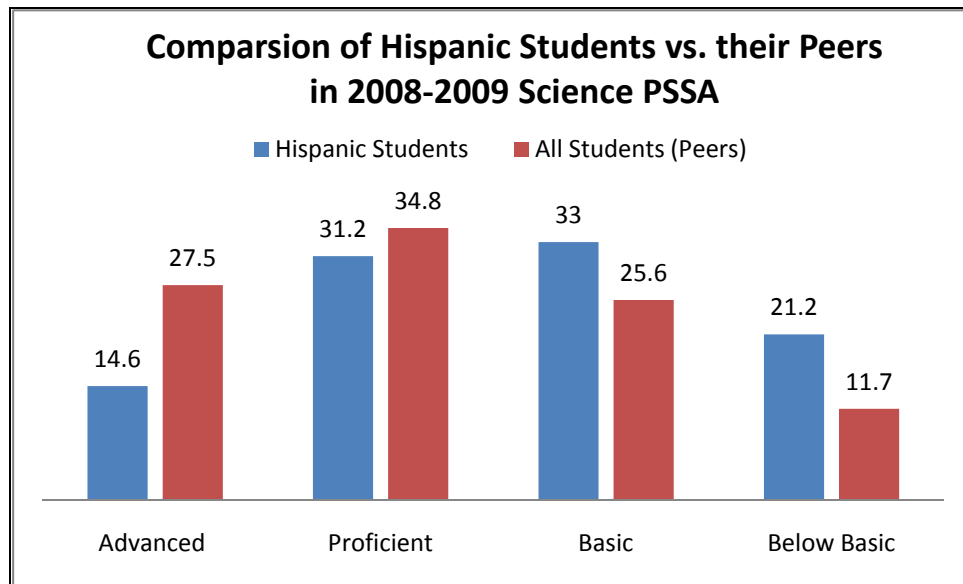
According to the data available, African-American students achieved a science proficiency rating of 30.8% for 2008-2009 school year, compared with a 33.8% proficiency score in the prior year. African-American students’ science scores are comparable to their peers at all grade levels, whereas their non-African-American peers scored a 34.8% science proficiency rating.



Hispanic Students

In Lackawanna County, 241 Hispanic students took the science portion of the PSSA during the 2008-2009 school year and achieved a 31.2% proficiency score. Not all students at all grade levels within each school district are reflected, as grades with fewer than ten students in a particular subgroup are not measured. Like the African-American subgroup population, only one district (Scranton School District) had an Hispanic population large enough (population greater than 10) to be scored and reported. Again, the generalizations and analysis that follow should be tempered with caution, given the small amount of data available in this testing year.

Hispanic Students Tested in Science PSSA in 2008-2009 School Year					
Grades	Total # of Students	Advanced	Proficient	Basic	Below Basic
4th Grade	104	21.2	52.9	23.1	2.9
8th Grade	76	7.9	27.6	31.6	32.9
11th Grade	61	14.8	13.1	44.3	27.9
County Total	241	14.6	31.2	33	21.2



Conclusion

The 2008-2009 school year marked the second round of PSSA testing in science. Overall, Lackawanna County's fourth grade students exhibited a higher degree of scientific prowess, with over 45.3% of students scoring proficient. In both years of testing, fourth grade scores exceeded eighth and eleventh grade scores. With 2008-2009 school year being only the second year of testing, there was a dramatic drop in the fourth grade scores in the most recent round of testing; in 2007-2008 school year, fourth graders achieved a science proficiency score of 85.7%, compared with 45.3% in the 2008-2009 school year. Many reasons may factor into this significant one-year drop. The county's eleventh graders, however, require careful examination, as their scores ranked lower than the county's fourth and eighth grade scores. The most recent data suggests that as students enter higher grade levels, their abilities to think and investigate scientifically regress. The causes for such drops across grade levels are worth careful consideration, warranting a review of the educational pedagogy and overarching curriculum guiding students through such critical transition periods.

According to the Pennsylvania Department of Education, future science testing will place a heavy emphasis on "inquiry-based learning," a form of instruction that emphasizes abstract reasoning, thinking and prediction skills, rather than more traditional science curriculum rooted in fact and note memorization skills. This paradigm shift is reflective of our growing need to become more competitive and capable in an ever expanding global economy - particularly in terms of science and math proficiencies. The most recent results of the *Program for International Student Assessment (PISA)*, an assessment tool used to compare fifteen-year-olds from around the world, found that American students significantly trail most modern countries in science and math abilities, including: Finland, Japan, Canada, China, Australia, Germany and the United Kingdom. As such, the need for quality science instruction is paramount if the U.S. wishes to remain a leader in the global marketplace.

Science proficiency examinations have recently been added to the PSSA, and, in time, social studies examinations will also be added. Therefore, schools with reduced instruction time in these subjects to focus on mathematics, reading, and writing PSSAs may be doing themselves a disservice to meet today's PSSA demands. It is critical for school districts to investigate best practices to ensure proficiencies in all subjects are met. Teaching specifically to the test should be avoided.

The education triad (administrators, teachers and parents) must form a more effective collaborative effort to ensure that real learning is taking place. For Pennsylvania, emphasis on improving higher education attainment and other continuing education is critical. The economic development success of any region is dependent upon the quality of its workforce, and quality training should begin in elementary school. Specifically, the best economic development strategy is one that maximizes the potential of the public Pre-K – 12 education system.



Many successful school districts have found ways to achieve higher scores and better academic learning skills such as:

- Diagnosing student instructional needs and finding ways to provide appropriate instruction
- Adopting common pedagogical methods so that students can easily move from one classroom to another and apply the same skills
- Using a systematic approach through a scientific thinking process while giving students the ability to take time in and out of class to plan, think, write, confer, read, change their minds, and have fun while learning as well
- Stressing higher-order thinking skills
- Coaching and providing whole-group brainstorming and small-group response sessions
- Offering fun academic activities within the classroom
- Peer or teacher conferences
- Focusing on professional development on the teaching of scientific problem solving and thinking

Best practices from around the country can be evaluated for adoption in local school districts after appropriate research and analysis has been completed.

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Marywood University, Misericordia University, Penn State Wilkes-Barre, The Commonwealth Medical College,
University of Scranton, & Wilkes University*

*7 South Main Street, Suite 201
Wilkes-Barre, PA 18701
570.408.9850
570.408.9854 fax*

*120 Wyoming Avenue, Third Floor
Scranton, PA 18503
570.207.0340
570.207.0340 fax*

www.institutepa.org
info@institutepa.org