



The Pennsylvania Basic Education/Higher Education Science and Technology Partnership

2013-2014 Annual Service Report

Executive Summary

Once again, Science In Motion (SIM) in its role as the premier high school science education outreach program for the Commonwealth battled financial hardship during the 2013-14 school year. The lack of program funding restoration forced one of our SIM Consortium sites to close its doors permanently, and many of the SIM sites reduced service areas, delayed service to schools for several months, or stopped service before the end of the school year. Despite the Commonwealth's economic hardships, Science In Motion sustained bipartisan support by members of the Pennsylvania General Assembly. Science In Motion was still able to provide hands-on, inquiry-based experiences to the schools served. All active Science In Motion sites eventually opened and resumed service to their schools, despite the financial challenges. As a whole, the average number of months of operation for SIM sites was 9.1 this school year with only one-third of the sites being open for business six months or less. Of the sites that were able to hire science education specialists (mobile educators) from the eleven colleges and universities, Science In Motion staff members presented over 2,478 hands-on laboratory experiences to 233 different schools. The program also provided an additional 9,766 drop-off laboratory kits for short term loan and offered 27 days of professional development workshop opportunities consortium-wide for teachers. Overall, Science In Motion provided 1,510 different teachers with 886 different labs creating 227,697 student experiences during the 2013-2014 school year.

What is Science In Motion?

Most Pennsylvania high schools cannot afford the modern, well-maintained equipment that it takes to prepare students for today's modern technology careers in science, engineering and other technical fields. Modern scientific training is especially expensive as it requires multiple sets of equipment so that each student can get a hands-on, inquiry-based experience. This classroom deficiency is compounded by the added need for intensive maintenance and management of equipment and software, training to keep teachers up-to-date on advances in science and technology, and access to relevant, standards-aligned activities that utilize the technology. Additionally, even if an individual school musters the resources to provide an up-to-date lab experience, much of the equipment would sit on the shelf for most of the year as it would be used for only one topic in the breadth of curriculum that must be covered. In 1987, a team of Pennsylvania science teachers, a local college, and the National Science

Foundation set out to tackle these problems. They developed a hugely successful shared-resources partnership that is now known nationally as Science In Motion.

Science In Motion (SIM) addresses the needs of science, technology, engineering, and mathematics in the classroom by providing the following support to schools:

- Access to well-maintained, modern, scientific equipment and supplies costing hundreds of thousands of dollars.
- Visiting science education specialists to team-teach high-tech science labs with the school's faculty.
- Professional development workshops to help teachers keep abreast of the latest developments in science and transfer that knowledge in to classroom activities and hands-on laboratory experiments.
- Standards-aligned laboratory activities for students.

Science In Motion provides these services through a partnership between the Commonwealth and 11 select colleges and universities in Pennsylvania. This shared-resources partnership has several advantages. First, high schools now have access to multiple sets of equipment that they could otherwise never afford. This equipment remains in circulation, shared by a regional cluster of schools rather than sitting on a shelf of a single school most of the time. Teachers in the program say that SIM makes a difference between being well-resourced for teaching science as opposed to not being adequately resourced. Additionally, the host colleges and universities provide not only administrative and grant support, but also modern laboratory space for preparation of experiments, chemical ordering, safety and disposal services, and work study and assistantship opportunities for pre-service teachers. Finally, with colleges and universities as partners, the door is now open for local corporate, foundation and community backing for science education.

The value of the SIM model has been proven in multiple assessments, and its success can also be seen by the spread of SIM throughout much of Pennsylvania, a backlog of requests for establishment of new sites in the Commonwealth, and the adoption of the model in other regions, including a statewide programs in Alabama.

Why is Science In Motion important to Pennsylvania's economic future?

As older industries cease to be a source for jobs in the Commonwealth, it is imperative for job creation and sustained economic growth that Pennsylvania has a workforce trained for the new emerging economy in science, technology, engineering, and math. Science In Motion addresses this need by providing hands-on experiences with modern technology to hundreds of thousands of students in the Commonwealth - the same technology required for today's skilled workforce. No other program in the Commonwealth delivers so much state-of-the-art science equipment and supports so many schools at so little cost.

Why is Science In Motion cost-effective?

Through its shared-resources model and partnerships with higher education, SIM is an extremely cost-effective model. By sharing equipment, science expertise, and professional development resources, SIM provides services that no single school could individually afford. For example, a SIM site can thoroughly support one subject area (e.g., chemistry) in at least 10 schools for only \$200,000 per year. For a single school to purchase these services and resources independently, it would cost nearly \$79,600 per school. The SIM approach realizes a taxpayer cost savings for each subject of nearly \$59,600 per school. The typical SIM center serves more than 10 schools resulting in a savings of at least \$595,820 per site to the Commonwealth compared to non-resource-sharing models.

The value of services and resources not charged to the state-awarded budget and thus, not quantified, should not be overlooked. In addition, the 10% overhead allowed by the state contracts falls significantly short of the cost of infrastructure provided by these higher education institutions. This infrastructure, which is provided at the cost of the participating higher education institutions, includes:

- Office and laboratory space
- Access to advanced chemistry and biology research equipment not yet purchased by the outreach program
- Electric, gas, and water utilities
- Deionized/distilled water sources
- Chemical safety, storage, and disposal services
- Shared preparation area equipment including chemical hoods, autoclaves, and dishwashers
- Van parking (at most sites)
- Approved gas tank storage areas
- General clerical and accounting support

It is this infrastructure and the access to higher education science and education faculty expertise that makes the Pennsylvania Basic Education/Higher Education Science and Technology Partnerships cost-efficient. However, what makes these partnerships most effective in keeping Pennsylvania science curricula current is the constant infusion of new concepts and related activities into high school classrooms through the close relationships formed between teachers at the secondary level and their college/university counterparts who are actively engaged in cutting edge research.

Is Science In Motion Effective?

The SIM Consortium would like to revisit program effectiveness in more detail, but with the current funding perils, we have been unable to complete an up-to-date assessment. Although in the past Science In Motion has consistently demonstrated its effectiveness to improve classroom science test scores, averaging over the years a 13% improvement in biology scores and a 17% improvement in chemistry scores compared to students in control schools. These findings are consistent with those of sister science van programs in other states.

In 2008, SIM initiated pilot pre/post testing for individual labs both to measure student learning as well as improve curriculum quality. Students across the Commonwealth participating in the SIM program in 2008 demonstrated an average 67% improvement in the pre/post test results for laboratory modules. Sequential budget cuts and delays since 2009, have forced many sites to shut down for a period before beginning to serve schools. Hence, no assessment has been completed, and no sites have completed any pre/post testing for individual labs since 2008.

Science In Motion Service Areas

During the 2013-2014 school year, 11 colleges and universities participated in the Science In Motion consortium including; Clarion University, Drexel University, Elizabethtown College, Gettysburg College, Juniata College, Lehigh Carbon Community College, Susquehanna University, University of Pittsburgh at Bradford, Ursinus College, Westminster College, and Wilkes University. Unfortunately Gannon University chose to shut down their SIM program permanently this fiscal year due to the financial constraints. Their equipment was distributed among the eleven remaining sites. All operational sites offered service to participating schools this fiscal year. Subject matter varies among sites and includes, but is not limited to, high school Chemistry, Biology, Physics, and middle school integrated science curricula. Demographics near each site dictate the size of the service area (Figure 1) as well as success of funding beyond state appropriations, which in turn influences the number of individual schools and school districts served per site (Appendix A). The map below highlights the school districts served by each SIM consortium member site; however, not every school in each school district is served. Some sites have been forced to decrease their historical service area depicted, due to multiple funding reductions.

Service Report

The SIM Consortium service record for the 2014 school year reveals decreased service from 2013 with the exception of the total number of students in accelerated classes (Table 2). Diminished state funding caused many sites to struggle to offer basic mobile educating services, and administrative backing was either nonexistent or minimal among all higher education partners. Many sites were not permitted to send equipment or mobile educators out to the classrooms until their initial state reimbursement was received. Only three SIM sites were able to open and run for the entire school year; these sites opened by utilizing alternate funds. The total student contacts have decreased over the past four years (Figure 2). The total number of equipment loans and the mobile educators teaching visits are the lowest they've been since the conception of the consortium (Figure 3 and Figure 4).

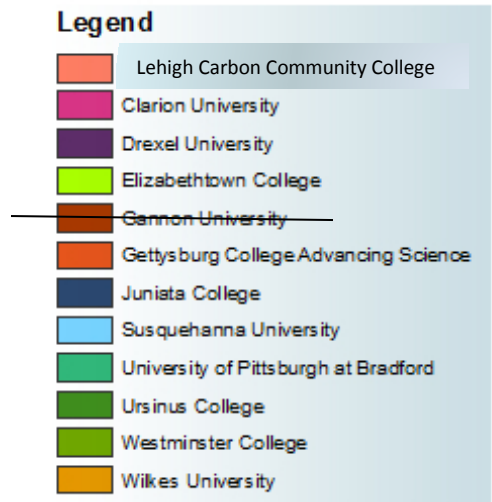
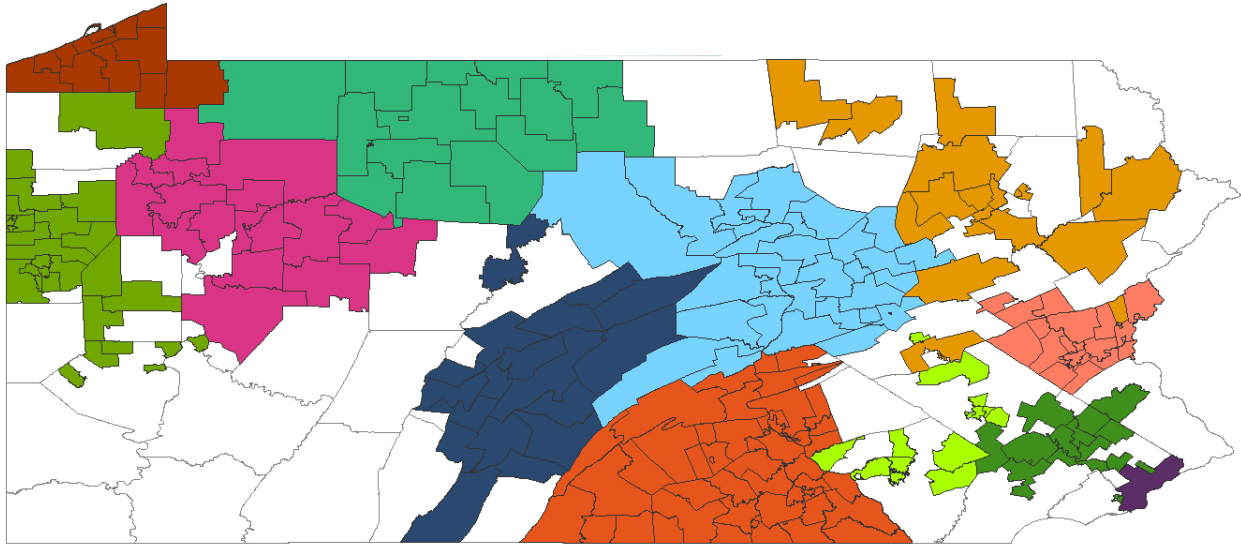


Figure 1

School district service area in the Commonwealth by the Science In Motion (SIM) Consortium color-coded by site. Gannon University is no longer hosting the SIM program. Lehigh Carbon Community College is now hosting the SIM program in the Lehigh region. Not every school in each school district highlighted participates in the SIM program.

Table 2

The Science In Motion Consortium site members combined service records for school years ending 2004 through 2014.

School Year ending	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Biology teaching visits	958	2,432	2,184	2,372	2,090	2,216	1,127	1,576	1,377	1,211	1,080
Chemistry teaching visits	1,261	2,676	1,961	2,247	1,830	2,001	1,407	1,604	1,108	1,019	900
Other teaching visits	1,171	1,091	1,020	948	1,283	1,204	896	980	593	646	498
Total teaching visits made	3,390	6,199	5,165	5,567	5,203	5,421	3,430	4,160	3,078	2,886	2,478
Total equipment loans	1,517	3,986	6,447	7,492	8,271	7,775	6,403	7,984	8,256	7,238	6,298
Total student contacts	96,235	179,990	217,366	262,566	280,224	236,359	188,622	207,380	208,328	214,164	202,931
Different schools served	235	280	307	331	337	324	291	294	312	244	231
Different teachers served	449	589	698	776	715	752	612	768	713	626	624
Different labs taught	565	724	986	1,050	1,143	1,286	1,059	1,046	1,050	925	886
Total students in accelerated	19,083	31,289	48,819	69,366	72,298	18,993	48,010	49,124	46,197	50,043	57,221

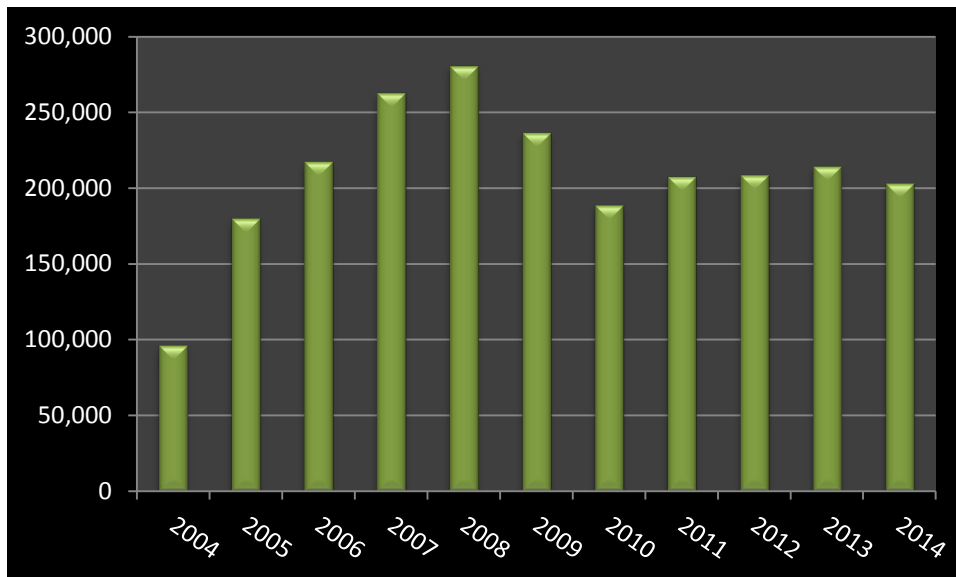


Figure 2

The total number of student contacts by the Science in Motion Consortium from school years ending 2004 through 2014.

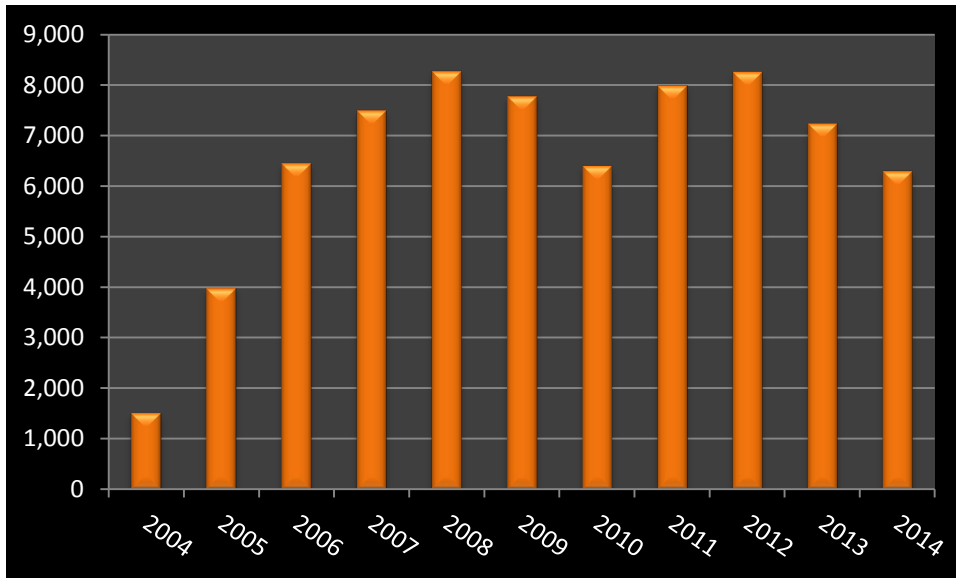


Figure 3

The total number of equipment loans by the Science in Motion Consortium from school years ending 2004 through 2014.

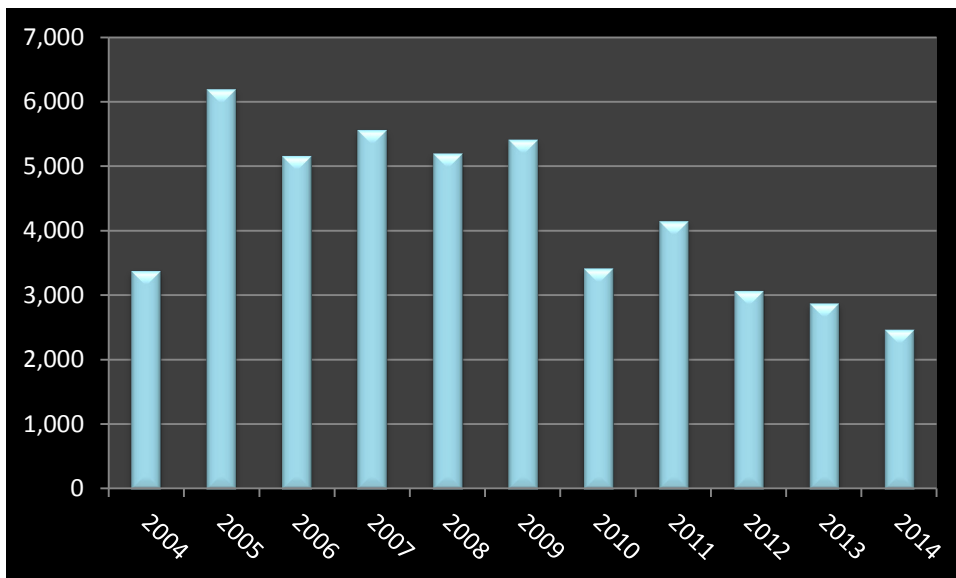


Figure 4

The total number of teaching visits by the Science in Motion Consortium from school years ending 2004 through 2014.

Many of the higher education partners did not allow their SIM programs to begin service until the annual passage and signing of the budget enabled contracts to be processed. It has become increasingly difficult for even the established sites to keep their outstanding and experienced mobile educators from looking for and accepting other sources of employment due to annual funding uncertainties. Overall, the member institutions would be able to serve more teachers and students if state funding and contracts could be reliably anticipated and processed.

All sites have struggled to maintain a high level of service to their schools despite funding reductions and delays. Other sources of grants, gifts, and donations have allowed some sites to significantly enhance programs beyond the level supported by the state allocation; however, such support is transient at all sites. Much of the SIM Consortium efforts this fiscal year were spent inventorying, divvying, and transferring/delivering Gannon University SIM program equipment and vehicle to the other sites. As a group, the SIM Consortium participated in our annual Capitol Day to showcase our program at the east wing of the Rotunda; eight sites were still operating and were able to participate.

Science In Motion Consortium sites receive more requests for school service than their sites are able to provide. Although SIM programs have struggled financially, we are very appreciative of the funds we have been awarded each year from state appropriations. Science in Motion services are greatly cherished and needed by the schools, teachers, and students that participate in the program. We are a unique and valued program, which cost-shares modern scientific equipment and expertise effectively among the schools we are able to serve. No other program in the Commonwealth delivers so much state-of-the-art science equipment and supports so many schools at so little cost.

Appendix A

School Districts and individual schools served during the 2013-2014 school year by each site of the Science In Motion Consortium (11 total in alphabetical order).

Clarion University	
School Districts and Private School Systems (20)	Individual Schools (34)
Allegheny-Clarion Valley School District	Allegheny -Clarion Valley Jr/Sr High School
	Clarion County Career Center
Armstrong School District	Elderton Jr/Sr High School
	Ford City Jr/Sr High School
	Kittanning Junior High School
	Kittanning Senior High School
	Lenape Technical School
Brockway School District	Brockway Jr/Sr High School
Brookville Area School District	Brookville Jr/Sr High School
Clarion Area School District	Clarion Area Jr/Sr High School
Clarion-Limestone Area School District	Clarion –Limestone Jr/Sr High School
Cranberry Area School District	Cranberry Area Jr/Sr High School
Diocese of Erie	Immaculate Conception School
	Saint Patrick School
	Venango Catholic High School
DuBois Area School District	DuBois Area High School
	DuBois Area Middle School
	Jefferson County-DuBois Area Vocational-Technical School
DuBois Christian School	DuBois Christian School
Forest Area School District	East Forest Jr/Sr High School
	West Forest Jr/Sr High School
Franklin Area School District	Franklin High School
	Franklin Middle School
Keystone School District	Keystone Jr/Sr High School
North Clarion County School District	North Clarion County Jr/Sr High School
Oil City Area School District	Oil City Middle School
	Oil City Senior High School
Punxsutawney Area School District	Punxsutawney Area High School
	Punxsutawney Area Middle School
Redbank Valley School District	Redbank Jr/Sr High School
Titusville Area School District	Titusville High School
	Titusville Middle School
Union School District	Union High School
Valley Grove School District	Rocky Grove Jr/Sr High School

Drexel University

School Districts and Private School Systems (1)	Individual Schools (7)
School District of Philadelphia	Benjamin Franklin High School George Washington High School Julia R. Masterman High School Kensington International Business High School Parkway-Northwest High School Philadelphia High School for Girls William W. Bodine High School

Elizabethtown College

School Districts and Private School Systems (13)	Individual Schools (17)
Columbia Borough School District	Columbia Jr/Sr High School
Eastern Lancaster County School District	Garden Spot High School
Eastern Lebanon County School District	ELCO High School
Elizabethtown Area School District	Elizabethtown Area High School
Hempfield Area School District	Hempfield HS
Lancaster School District	J.P. McCaskey High School McCaskey East High School Wheatland Middle School
Lebanon Catholic School	Lebanon Catholic School
Manheim Township School District	Manheim Township High School Manheim Township Middle school
Muhlenburg School District	Muhlenburg Middle School
Palmyra Area School District	Palmyra Area High School
Penn Manor School District	Penn Manor High School
Solanco School District	Solanco High School George A. Smith Middle School
Warwick School District	Warwick Middle School

Gettysburg College

School Districts and Private School Systems (19)

Adams County Christian Academy
Bermudian Springs School District
Camp Hill School District
Chambersburg Area School District

Cumberland Valley School District
Diocese of Harrisburg

Fairfield Area School District
Gettysburg Area School District

Greencastle-Antrim School District
Hanover Public School District
Northern York School District
Shippensburg Area School District
Spring Grove Area School District

Susquehanna Township School District
Upper Adams School District

Upper Dauphin Area School District
West Perry School District
York City School District

York Suburban School District

Individual Schools (38)

Adams County Christian Academy
Bermudian Springs High School
Camp Hill High School
Chambersburg Area Middle School North
Chambersburg Area Middle School South
Chambersburg Area Senior High School
Cumberland Valley High School
Annunciation BVM
Delone Catholic High School
Immaculate Conception School
Sacred Heart School
Seven Sorrows School
St. Andrew School
St. Francis Xavier School
St. Joseph School, in Dallastown
St. Joseph, Mechanicsburg
St Rose of Lima
Fairfield Area Middle School
Franklin Township Elementary School
Gettysburg Area High School
Gettysburg Area Middle School
Gettysburg Montessori Charter School
Vida Charter School
Greencastle-Antrim High School
Hanover High School
Northern High School
Shippensburg Area Middle School
Spring Grove Area High School
Spring Grove Area Middle School
Susquehanna Township High School
Arendtsville Elementary School
Biglerville High School
Upper Adams Middle School
Upper Dauphin Area High School
West Perry High School
Ferguson K- 8 School
William Penn High School
York Suburban High School

Juniata College

School Districts and Private School Systems (15)	Individual Schools (23)
Bellefonte Mennonite School	Bellefonte Mennonite School
Calvary Christian Academy	Calvary Christian Academy
Diocese of Altoona-Johnstown	Bishop Guilfoyle Catholic High School
	Hollidaysburg Catholic School
	St. John the Evangelist School, in Altoona
Forbes Road School District	Forbes Road Jr/Sr High School
Grier School	Grier School
Hollidaysburg Area School District	Hollidaysburg Area Senior High School
	Hollidaysburg Area Junior High School
Huntingdon Area School District	Huntingdon Area High School
	Huntingdon Area Middle School
Juniata Valley School District	Juniata Valley Jr/Sr High School
Mifflin County School District	Mifflin County High School
	Mifflin County Junior High School
	Mifflin County Middle School
Mount Union Area School District	Mount Union Area Jr/Sr High School
Northern Bedford County School District	Northern Bedford County High School
Southern Huntingdon County School District	Southern Huntingdon High/Middle School
Spring Cove School District	Central High School
	Spring Cove Middle School
Tyrone Area School District	Tyrone Area High School
	Tyrone Area Middle School
Williamsburg Community School District	Williamsburg Jr/Sr High School

Lehigh Carbon Community College

School Districts and Private School Systems (8)	Individual Schools (8)
Allentown School District	William Allen High School
Carbon County School Districts	Carbon Career and Technical Institute
Lehigh County School Districts	Lehigh Career and Technical Institute
Northern Lehigh School District	Northern Lehigh High School
Parkland School District	Parkland High School
Panther Valley School District	Panther Valley High School
Salisbury School District	Salisbury High School
Whitehall-Coplay School District	Whitehall-Coplay High School

Susquehanna University

School Districts and Private School Systems (19)**Individual Schools (20)**

Bloomsburg Area School District

Bloomsburg Area High School

Bloomsburg Christian School

Bloomsburg Christian School

Central Columbia School District

Central Columbia Middle School

Central Dauphin School District

Central Dauphin High School

Danville Area School District

Danville High School

Danville Middle School

Juniata County School District

East Juniata High School

Greenwood School District

Greenwood Middle/High School

East Lycoming School District

Hughesville Jr/Sr High School

Line Mountain School District

Line Mountain Jr/Sr High School

Middletown Area School District

Middletown Area High School

Millville Area School District

Millville High School

Milton Area School District

Milton Area High School

Montoursville Area School District

Montoursville Area High School

Muncy School District

Muncy Jr/Sr High School

Selinsgrove Area School District

Selinsgrove Area High School

Shikellamy School District

Shikellamy High School

Sunbury Christian Academy

Sunbury Christian Academy

Tri-Valley School District

Tri-Valley Jr/Sr High School

Williamsport Area School District

Williamsport Area High School">

University of Pittsburgh at Bradford

School Districts and Private School Systems (13)**Individual Schools (19)**

Austin Area School District

Austin High School

Bradford Area School District

Bradford Area High School

Floyd C. Fretz Middle School

Coudersport Area School District

Coudersport Area Junior and Senior High School

Diocese of Erie

Elk County Catholic High School

Elk County Catholic Middle School

Galeton Area School District

Galeton Area Junior/Senior High School

Kane Area School District

Kane Area High School

Kane Area Middle School

The Learning Center

The Learning Center, in Bradford

Northern Potter School District

Northern Potter Jr/Sr High School

Oswayo Valley School District

Oswayo Valley Jr/Sr High School

Otto-Eldred School District

Otto-Eldred Elementary

Otto-Eldred Jr/Sr High School

Port Allegany School District

Port Allegany Junior and Senior High School

Smethport Area School District

Smethport Jr/Sr High School

Warren County School District

Eisenhower Middle School and High School

Sheffield Area Middle School and High School

Warren Area High School

Ursinus College

School Districts and Private School Systems (17)**Individual Schools (29)**

Boyertown Area School District

Boyertown Area Senior High School

Colonial School District

Plymouth Whitemarsh High School

Downingtown Area School District

Downingtown Middle School

Downingtown High School East

Downingtown High School West

Lionville Middle School

Pickering Valley Elementary School

Great Valley School District

Great Valley High School

Methacton Area School District

Arcola Intermediate School

Methacton High School

Norristown Area School District

Montgomery County Youth Center

Norristown Area High School

Roosevelt Alternative School

North Penn School District

North Penn High School

Owen J. Roberts School District

Owen J. Roberts High School

Owen J. Roberts Middle School

Perkiomen Valley School District

Perkiomen Valley High School

Perkiomen Valley Middle School East

Perkiomen Valley Middle School West

Phoenixville Area School District

Phoenixville Area High School

The School District of Philadelphia

Nueva Esperanza Academy Charter School

Souderton Area School District

Souderton Area High School

Spring-Ford Area School District

Spring-Ford 7th Grade Center

Spring-Ford 9th Grade Center

Spring-Ford Senior High School

Tredyffrin/Easttown School District

Conestoga High School

Twin Valley School District

Twin Valley High School

Upper Merion Area School District

Upper Merion Area High School

Wyomissing Area School District

Wyomissing Area Jr/Sr High School">

Westminster College

School Districts and Private School Systems (31)**Individual Schools (47)**

Allegheny Valley School District

Acemetonia Primary School

Butler School District

Center Township Elementary School

Cray Challenges School

Cray Challenges School

Erie Diocese

Kennedy Catholic High School

Farrell Area School District

Farrell Elementary School

George Junior Republic

George Junior Republic

Greenville Area School District

East Elementary School

Grove City Area School District

Grove City Senior High School

Hillview Intermediate Center

Grove City Christian Academy

Grove City Christian Academy

Hermitage School District

Delahunty Middle School

Hickory High School

Jamestown Area School District

Jamestown Elementary School

Jamestown Jr/Sr High School

Lakeview School District

Lakeview High School

Oakview Elementary School

Laurel School District

Laurel Jr/Sr High School

Mercer Area School District

Mercer Elementary School

Mercer Middle-High School

Mohawk Area School District

Mohawk Elementary School

Mohawk High School

Neshannock Township School District

Memorial Elementary School

Neshannock Jr/Sr High School

New Castle Area School District

George Washington Intermediate School

John F Kennedy Primary School

New Castle Jr/Sr High School

Notre Dame School District

Notre Dame Elementary School

Penncrest School District

Maplewood Middle-High School

Saegertown Jr/Sr High School

Pine Richland School District

Pine Richland High School

Pittsburgh School District

Pittsburg Perry High School

Reynolds School District

Reynolds Jr/Sr High School

Seneca Valley School District

Seneca Valley Intermediate High School

Seneca Valley Senior High School

Sharon School District

Sharon High School

Sharpsville Area School District

Sharpsville Area High School

Shenango Area School District

Shenango Elementary

Shenango Jr/Sr High School

Slippery Rock Area School District

Slippery Rock Elementary School

Slippery Rock High School

Westminster College continued on next page

Westminster College continued

South Butler County School District
 Union Area School District
 West Middlesex Area School District
 Wilmington Area School District

South Butler Intermediate Elementary School
 Union Memorial Elementary School
 Oakview Elementary School
 East Lawrence Elementary
 New Wilmington Area Elementary
 Wilmington Area High School
 Wilmington Area Middle School

Wilkes University**School Districts and Private School Systems (24)**

Blue Mountain School District
 Carbondale School District
 Dallas School District
 Dunmore Area School District
 Elk Lake School District
 Hanover Area School District
 Hazleton Area School District
 Lake-Lehman School District
 Lakeland School District
 Mid Valley School District
 Northwest Area School District
 Old Forge School District
 Pen Argyl Area School District
 Pittston Area School District
 Pocono Mountain School District
 Towanda Area School District
 Tri-Valley School District
 Troy Area School District
 Tunkhannock Area School District
 Western Wayne School District
 Wilkes-Barre Area School District

 Williams Valley School District
 Wyoming Area School District
 Wyoming Valley West School District

Individual Schools (27)

Blue Mountain High School
 Carbondale High School
 Dallas High School
 Dunmore High School
 Elk Lake Jr/Sr High School
 Hanover Jr/Sr High School
 Hazelton Area High School
 Lake-Lehman Jr/Sr High School
 Lakeland Jr/Sr High School
 Mid Valley High School
 Northwest Area Senior High/Middle School
 Old Forge Jr/Sr High School
 Pen Argyl High School
 Pittston Area Senior High School
 Pocono Mountain East High School
 Towanda Jr/Sr High School
 Tri Valley Jr/Sr High School
 Troy Area Jr/Sr High School
 Tunkhannock High School
 Western Wayne High School
 Coughlin High School
 Grand Army of the Republic (GAR) Jr/Sr High School
 Meyers Jr/Sr High School
 Williams Valley Jr/Sr High School
 Wyoming Area Secondary Center
 Wyoming Valley West- High School
 Wyoming Valley West-Middle School
