



**The Pennsylvania Basic
Education/Higher Education Science
and Technology Partnership**

2014-2015 Annual Service Report

Executive Summary

Once again financial hardship plagued the 2014-15 school year for Science In Motion (SIM) in its role as the premier high school science education outreach program for the Commonwealth. The lack of program funding restoration forced many of the SIM sites to reduce service areas, delay service to schools for several months, or stop 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 8.7 this school year, with only one site open for an entire 12 month period. 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 1,709 hands-on laboratory experiences to 270 different schools. The program also provided an additional 6,018 drop-off laboratory kits for short term loan and offered 13 days of professional development workshop opportunities consortium-wide for teachers. Overall, Science In Motion provided 623 different teachers with 858 different labs creating 143,723 student experiences during the 2014-2015 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 technological 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 into 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 program 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. 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 2014-2015 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 during the 2013-2014 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 excessive and multiple funding reductions.

Service Report

The SIM Consortium service record for the 2015 school year reveals decreased service from 2014 with the exception of the total number of schools served and site teaching visits beyond high school Chemistry or Biology disciplines (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 one SIM site was able to open and run for the entire school year; this number is down from three sites last fiscal year. All sites have had to secure alternative funding to offer the basic program. The total student contacts have decreased by approximately 64,600 over the past four years (Figure 2). The total number of mobile educator teaching visits is the least since the conception of the consortium (Figure 3). Not only did the teaching visits decrease since last year, but there was also a decrease in usage in the lab kits and equipment delivered by 280 drop-off labs (Figure 4).

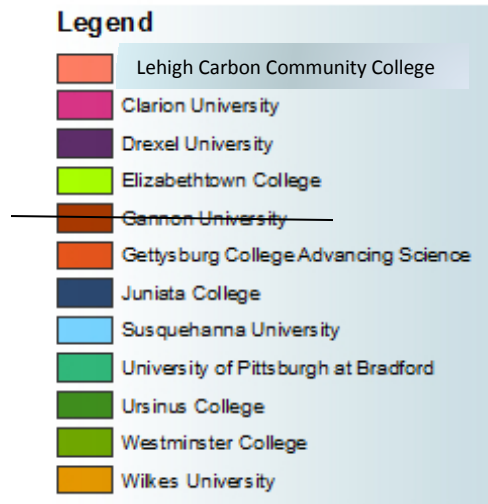
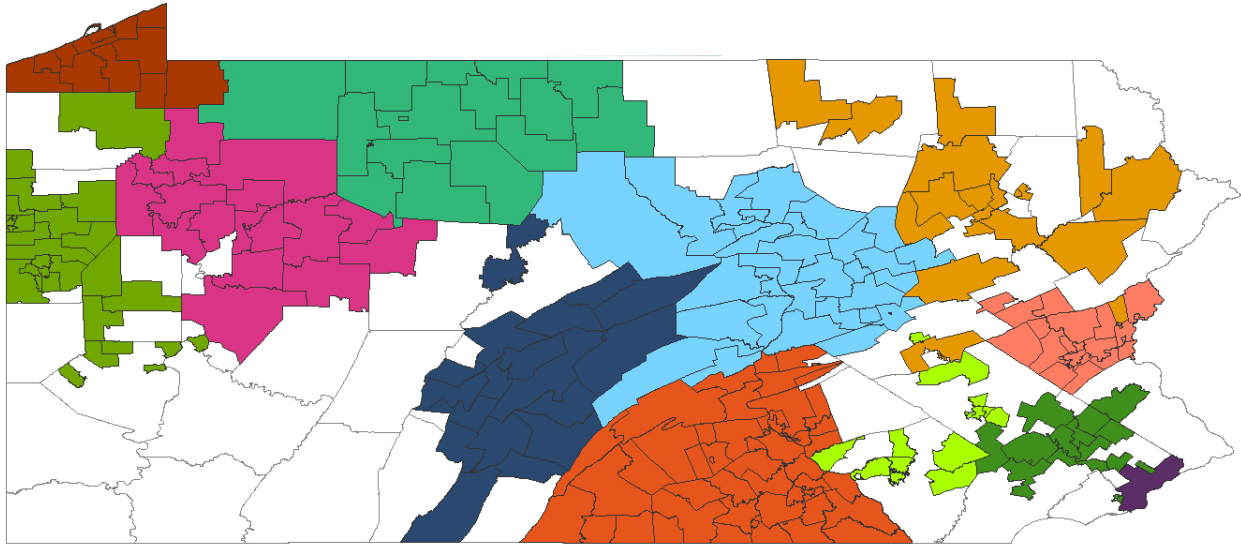


Figure 1

School district service area in the Commonwealth by the Science In Motion (SIM) Consortium color-coded by site. Gannon University as of fiscal year 2013-14 no longer hosts 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 2015.

School Year ending	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Biology teaching visits	958	2,432	2,184	2,372	2,090	2,216	1,127	1,576	1,377	1,211	1,080	655
Chemistry teaching visits	1,261	2,676	1,961	2,247	1,830	2,001	1,407	1,604	1,108	1,019	900	453
Other teaching visits	1,171	1,091	1,020	948	1,283	1,204	896	980	593	646	498	601
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	1,709
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	6,018
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	143,723
Different schools served	235	280	307	331	337	324	291	294	312	244	231	270
Different teachers served	449	589	698	776	715	752	612	768	713	626	624	623
Different labs taught	565	724	986	1,050	1,143	1,286	1,059	1,046	1,050	925	886	858
Total accelerated students	19,083	31,289	48,819	69,366	72,298	18,993	48,010	49,124	46,197	50,043	57,221	29,741

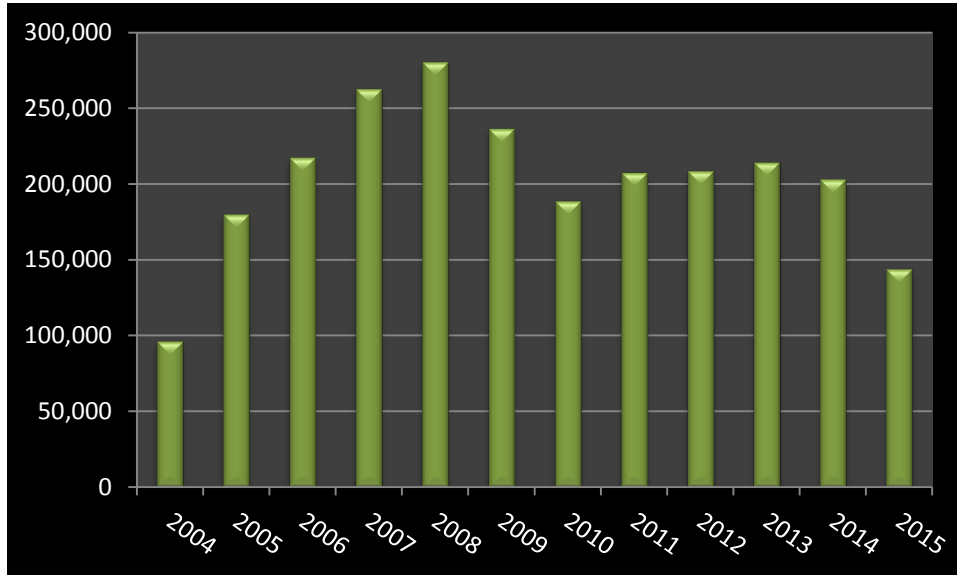


Figure 2

The total number of student contacts by the Science in Motion Consortium from school years ending 2004 through 2015.

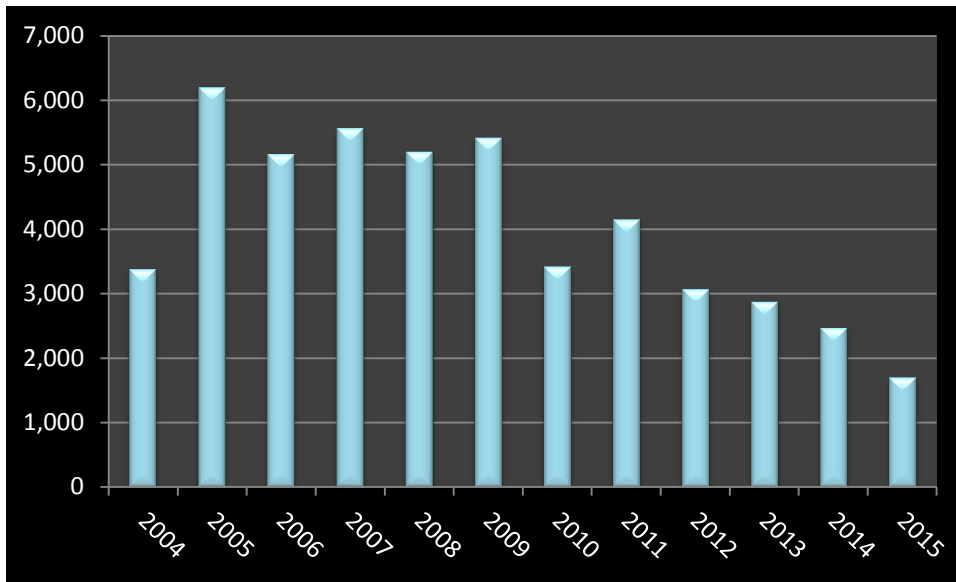


Figure 3

The total number of teaching visits by the Science in Motion Consortium from school years ending 2004 through 2015.

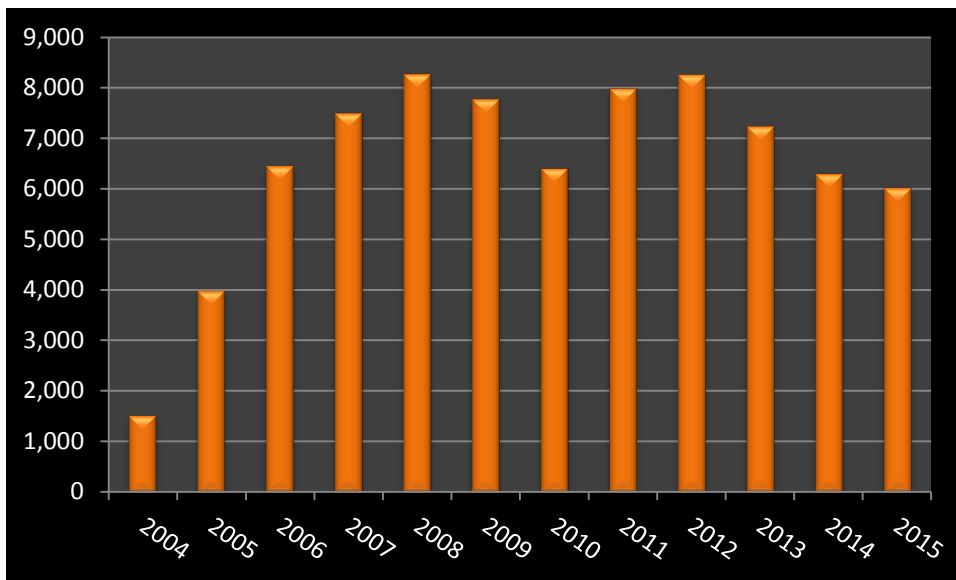


Figure 4

The total number of equipment loans by the Science in Motion Consortium from school years ending 2004 through 2015.

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 introducing the SIM program to newly elected and returning legislators, to make sure we were included in the new 2015-2016 state budget (which has not been determined). As a group, the SIM Consortium participated in our annual Capitol Day to showcase our program at the east wing of the Rotunda; nine out of the eleven 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. The Science In Motion programs offered by the higher education institutional sites have struggled financially, and although we are very appreciative of the funds we have been awarded each year from state appropriations, they are not enough to offer a whole-hearted program. Science in Motion services are greatly cherished and needed by the schools, teachers, and students that participate in the program. Many participants have seen their service diminish and in some cases end over the past four years. 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 2014-2015 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

Beulah Baptist Christian Day School
Cristo Rey Philadelphia High School
George Washington High School
Julia R. Masterman High School
Parkway-Northwest High School
Philadelphia High School for Girls
William W. Bodine High School

Elizabethtown College

School Districts and Private School Systems (12)

Individual Schools (14)

Donegal School District

Donegal High School

Eastern Lancaster County School District

Garden Spot Middle School

Hempfield Area School District

Hempfield High School

La Academia Partnership Charter School

Lancaster School District

J.P. McCaskey High School

Reynolds Middle School

Wheatland Middle School

Lebanon School District

Lebanon High School

Manheim Township School District

Manheim Township High School

Manheim Township Middle school

Muhlenburg School District

Muhlenburg Middle School

Northern Lebanon School District

Northern Lebanon High School

Pottsville Area School District

Pottsville Area High School

Solanco School District

Solanco High School

Warwick School District

Warwick Middle School

Gettysburg College

School Districts and Private School Systems (20)**Individual Schools (42)**

Adams County Christian Academy
Bermudian Springs School District

Adams County Christian Academy
Bermudian Springs High School
Bermudian Springs Middle School

Chambersburg Area School District

Chambersburg Area Middle School North
Chambersburg Area Middle School South
Chambersburg Area Senior High School

Conewago Valley School District

New Oxford Intermediate School
New Oxford Middle School

Cumberland Valley School District
Diocese of Harrisburg

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 School District

Fairfield Area Middle School

Gettysburg Area School District

Franklin Township Elementary School
Gettysburg Area High School
Gettysburg Area Middle School
Lincoln Elementary School
Gettysburg Montessori Charter School

Greencastle-Antrim School District

Greencastle-Antrim High School

Hanover Public School District

Hanover High School
Hanover Middle School

Mechanicsburg Area School District

Mechanicsburg Area Middle School

Northern York School District

Northern High School

Shippensburg Area School District

Shippensburg Area Middle School

Spring Grove Area School District

Spring Grove Area High School
Spring Grove Area Middle School

Susquehanna Township School District

Susquehanna Township High School

Upper Adams School District

Arendtsville Elementary School
Bendersville Elementary
Biglerville High School
Upper Adams Middle School

Upper Dauphin Area School District

Upper Dauphin Area High School

Waynesboro School District

Waynesboro Middle School

West Perry School District

West Perry High School

York Suburban School District

York Suburban High School

Juniata College

School Districts and Private School Systems (16)	Individual Schools (25)
Bellefonte Area School District	Bellefonte Area Middle School Bellefonte Area High School
Belleville Mennonite School	Belleville 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 (5)	Individual Schools (8)
Allentown School District	Dieruff High School South Mountain Middle School Mosser Elementary School
East Penn School District	Emmaus High School
Parkland School District	Parkland High School
Salisbury School District	Salisbury High School
Whitehall-Coplay School District	Whitehall-Coplay High School Whitehall-Coplay Middle School

Susquehanna University

School Districts and Private School Systems (20)**Individual Schools (22)**

Bloomsburg Area School District

Bloomsburg Area High School

Bloomsburg Christian School

Bloomsburg Christian School

Central Columbia School District

Central Columbia High School

Central Dauphin School District

Central Dauphin High School

Danville Area School District

Danville Middle School

Danville High School

East Lycoming School District

Hughesville Jr/Sr High School

Greenwood Friends School

Greenwood Friends School

Greenwood School District

Greenwood Middle/High School

Juniata County School District

East Juniata High School

Line Mountain School District

Line Mountain Jr/Sr High School

Millville Area School District

Millville High School

Montoursville Area School District

Montoursville Area High School

Muncy School District

Muncy Jr/Sr High School

North Schuylkill School District

North Schuylkill High School

Selinsgrove Area School District

Selinsgrove Area High School

Shamokin Area School District

Shamokin High School

Shikellamy School District

Shikellamy Middle School

Shikellamy High School

Tri-Valley School District

Tri-Valley Jr/Sr High School

Warrior Run School District

Warrior Run High School

Williamsport Area School District

Williamsport Area High School">

University of Pittsburgh at Bradford

School Districts and Private School Systems (13)	Individual Schools (21)
Austin Area School District	Austin High School
Bradford Area School District	Bradford Area High School Floyd C. Fretz Middle School
Cameron County School District	Cameron County High 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
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 Youngsville Elementary/Middle School Youngsville High School

Ursinus College

School Districts and Private School Systems (13)	Individual Schools (15)
Boyertown Area School District	Boyertown Area Senior High School
Colonial School District	Plymouth Whitemarsh High School
Downingtown Area School District	Downingtown High School East
Great Valley School District	Great Valley High School
Methacton Area School District	Methacton High School
North Penn School District	North Penn High School Oak Park Elementary York Avenue Elementary
Owen J. Roberts School District	Owen J. Roberts High School
Pennridge School District	Pennridge High School
Phoenixville Area School District	Phoenixville Area High School
Pottsgrove Area School District	Pottsgrove High School
Spring-Ford Area School District	Spring-Ford Senior High School
Twin Valley School District	Twin Valley High School
Wyomissing Area School District	Wyomissing Area Jr/Sr High School

Westminster College

School Districts and Private School Systems (35)**Individual Schools (55)**

Butler School District	Butler Jr/Sr High School
	Center Township Elementary School
Cray Challenges School	Cray Challenges School
Ellwood City School District	Lincoln High 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
	Greenville High School
Grove City Area School District	Grove City Senior High School
	Hillview Intermediate Center
Grove City Christian Academy	Grove City Christian Academy
Hempfield Area School District	Hempfield Area High School
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
McKeever Environmental Center	McKeever Environmental Center
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 Christian Academy	New Castle Christian Academy
New Castle Area School District	George Washington Intermediate School
	John F Kennedy Primary School
	New Castle Jr/Sr High 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
Portersville Christian School	Portersville Christian School
Reynolds School District	Reynolds Jr/Sr High School
	Reynolds Elementary School

Westminster College continued on next page

Seneca Valley School District

Seneca Valley Intermediate High School

Seneca Valley Senior High School

Sharon School District

Sharon High School

Case Elementary

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

South Butler County School District

South Butler Intermediate Elementary School

South Fayette School District

South Fayette Elementary School

Union Area School District

Union Memorial Elementary School

West Middlesex Area School District

Oakview Elementary School

Wilmington Area School District

Pulaski Elementary

New Wilmington Area Elementary

Wilmington Area High School

Wilmington Area Middle School

Wilkes University

School Districts and Private School Systems (25)**Individual Schools (27)**

Blue Mountain School District	Blue Mountain High School
Carbondale School District	Carbondale High School
Crestwood Area School District	Fairview Elementary
Dallas School District	Dallas High School
Diocese of Scranton	Holy Cross High School
Elk Lake School District	Elk Lake Jr/Sr High School
Hanover Area School District	Hanover Jr/Sr High School
Hazleton Area School District	Hazleton Area High School
Lake-Lehman School District	Lake-Lehman High School
Lakeland School District	Lakeland Jr/Sr High School
Mid Valley School District	Mid Valley High School
Northwest Area School District	Northwest Area Senior High/Middle School
Pen Argyl Area School District	Pen Argyl High School
Pittston Area School District	Pittston Area Senior High School
Pocono Mountain School District	Pocono Mountain East High School
Towanda Area School District	Towanda Jr/Sr High School
Tri-Valley School District	Tri Valley Jr/Sr High School
Troy Area School District	Troy Area Jr/Sr High School
Tunkhannock Area School District	Tunkhannock High School
Wallenpaupack Area School District	Wallenpaupack High School
Wayne Highlands School District	Wayne Highlands High School
Western Wayne School District	Western Wayne High School
Wilkes-Barre Area School District	Coughlin High School Meyers Jr/Sr High School
Wyoming Area School District	Wyoming Area Secondary Center
Wyoming Valley West School District	Wyoming Valley West- High School Wyoming Valley West-Middle School
