



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

2010-2011 Annual Report

Executive Summary

The year 2010 brought new financial challenges for Science In Motion (SIM) in its role as the premier high school science education outreach program for the Commonwealth. Pennsylvania's current economic status, along with the change of administration, once again resulted in budget reductions and funding delays. The reductions and delays forced many of the SIM Consortium sites to reduce service areas or delay service to schools for several months. Faced with an overall 10% cut to an award that had been cut by 25% the previous fiscal year, Science In Motion was still able to provide hands-on inquiry-based experiences to the schools we serve. Despite these early challenges, all Science In Motion sites eventually opened and resumed service to their schools. The majority of SIM sites were open 10 months or more this school year; however, as a whole the average number of months of operation was 9.4. Our science education specialists (mobile educators) from the twelve colleges and universities presented over 4,160 hands-on laboratory experiences to 294 different schools. The program also provided an additional 14,755 drop-off laboratory kits for short term loan and offered 44 days of professional development workshop opportunities for teachers. Overall, Science In Motion provided 768 different teachers with 1,046 different labs creating 207,380 student experiences during the 2010-2011 school year.

Despite the Commonwealth's economic hardships, Science In Motion sustained bipartisan support by members of the Pennsylvania General Assembly. This fiscal year the Senate joined the House in overriding Governor Rendell's veto on a House Bill 101 that established the basic education/ higher education science partnership in the School Code. The addition to the School Code has been a long-time goal of the SIM Consortium and gave us some momentum going forward in what was again a very difficult year.

What is Science In Motion?

Most Pennsylvania high schools cannot afford the modern high-tech equipment that it takes to prepare students for today's 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, engineering, and technology 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 to the classroom.
- Standards-aligned laboratory activities for students.

Through SIM, even the poorest rural and urban schools can provide their students with hands-on modern science and technology training. Teachers in the program say that SIM makes a difference between being well-resourced for teaching science as opposed to not being adequately resourced.

Science In Motion provides these services through a partnership between the Commonwealth and 12 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. 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. For example, in 2008, SIM leveraged nearly one quarter of a million dollars in matching support.

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 statewide programs in Delaware and Alabama.

Why is Science In Motion important?

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 tens 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 Science In Motion is 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
- Approved gas tank storage areas
- Van parking (most sites)
- 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?

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

There are currently 12 colleges and universities integrated in the Science In Motion consortium including; Cedar Crest College, Clarion University, Drexel University, Elizabethtown College, Gannon University, Gettysburg College, Juniata College, Susquehanna University, University of Pittsburgh at Bradford, Ursinus College, Westminster College, and Wilkes University. The subject matter varies among sites (Table 1) along with the size of the service area (Figure 1) and school districts and individual schools served per site (Appendix A). The map highlights the school districts served by each SIM consortium member site; however, not every school in each school district is served. Some sites have had to decrease their historical service area due to funding reductions.

Table 1

The Science In Motion Consortium members and the science disciplines they offered for the 2010/11 school year.

SIM Site	Science Disciplines			
	Biology	Chemistry	Physics	Middle School
Cedar Crest College	■	■		
Clarion University	■	■	■	
Drexel University		■	■	■
Elizabethtown College	■			
Gannon University	■	■		
Gettysburg College	■	■		
Juniata College	■	■		■
Susquehanna University	■	■	■	
University of Pitt- Bradford	■	■		
Ursinus College	■	■	■	
Westminster College	■	■		
Wilkes University	■	■		

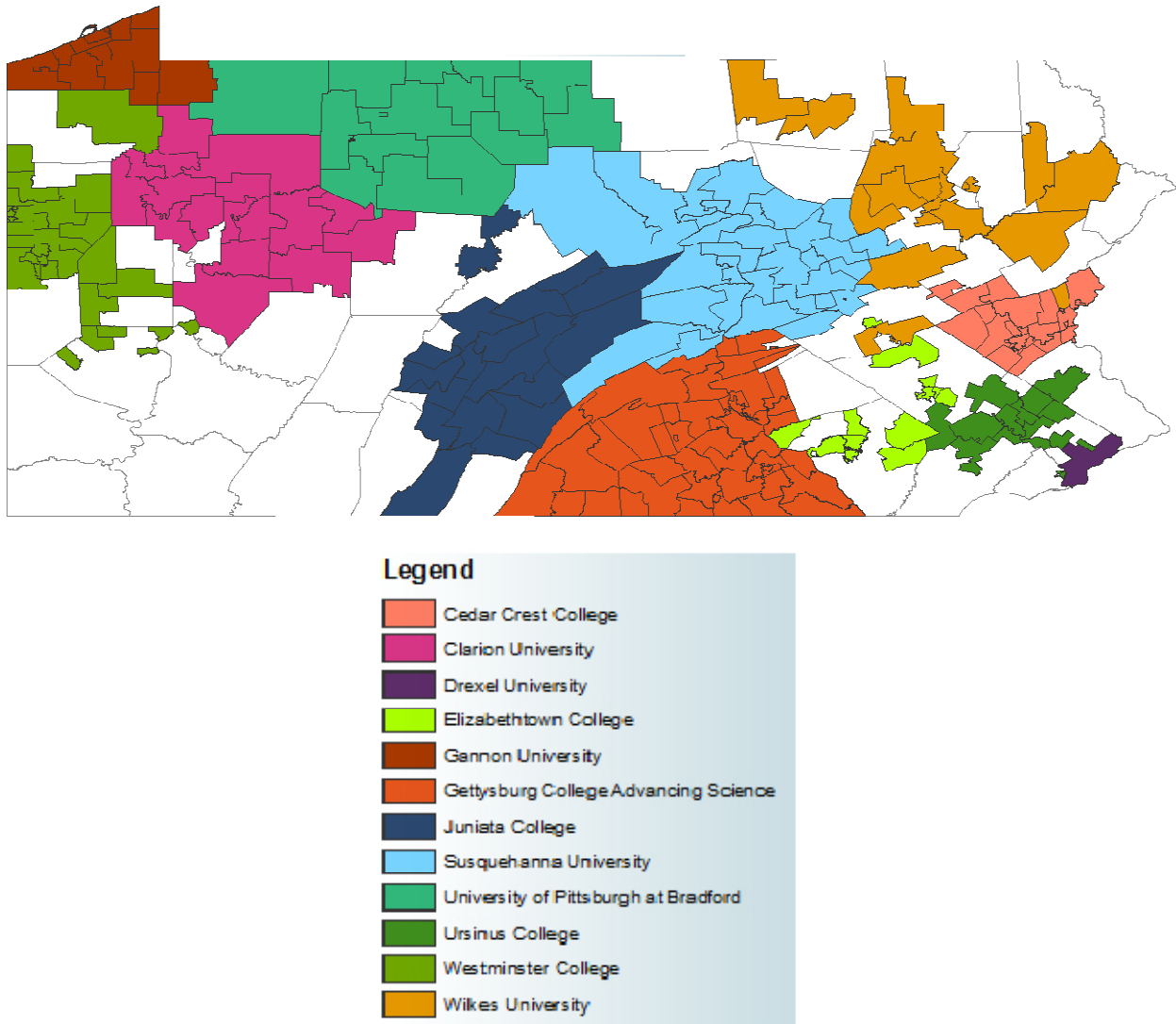


Figure 1
 School district service area in the Commonwealth by the Science In Motion (SIM) Consortium color-coded by site. Not every school in each school district highlighted participates in the SIM program.

Service Report

Even with the decreased funding, the SIM Consortium service record for the 2010/2011 school year reflects increased service from 2009/10 with the exception of the number of different labs taught (Table 2). Many sites struggled to open their doors last year, with no administrative backing and delayed funding; many sites did not send mobile educators out to the classroom until they actually received the check from the state. Some sites were able to open and run for the whole school-year due to the use of alternative funding to run SIM programs at their host institutions; some sites were able to continue to serve their schools without an interruption in services. However, most sites current service levels were constrained by inadequate funding. The total student contacts increased only slightly from last year (Figure 2). The total number of equipment loans skyrocketed from previous years (Figure 3) which may be explained by many sites not hiring mobile educators or having very few or no classroom visits until

late in the school year. These staffing difficulties were mirrored in the decrease in mobile educator teaching visits for last year as well as this year (Figure 4).

Table 2

The twelve Science In Motion Consortium members combined service records for school years 2003/04 to 2010/11.

School Year	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
Biology teaching visits	958	2,432	2,184	2,372	2,090	2,216	1,127	1,576
Chemistry teaching visits	1,261	2,676	1,961	2,247	1,830	2,001	1,407	1,604
Other teaching visits	1,171	1,091	1,020	948	1,283	1,204	896	980
Total teaching visits made	3,390	6,199	5,165	5,567	5,203	5,421	3,430	4,160
Total equipment loans	1,517	3,986	6,447	7,492	8,271	7,775	6,403	14,755
Total student contacts	96,235	179,990	217,366	262,566	280,224	236,359	188,622	207,380
Different schools served	235	280	307	331	337	324	291	294
Different teachers served	449	589	698	776	715	752	612	768
Different labs taught	565	724	986	1,050	1,143	1,286	1,059	1,046
Total students in accelerated classes	19,083	31,289	48,819	69,366	72,298	18,993	48,010	49,124

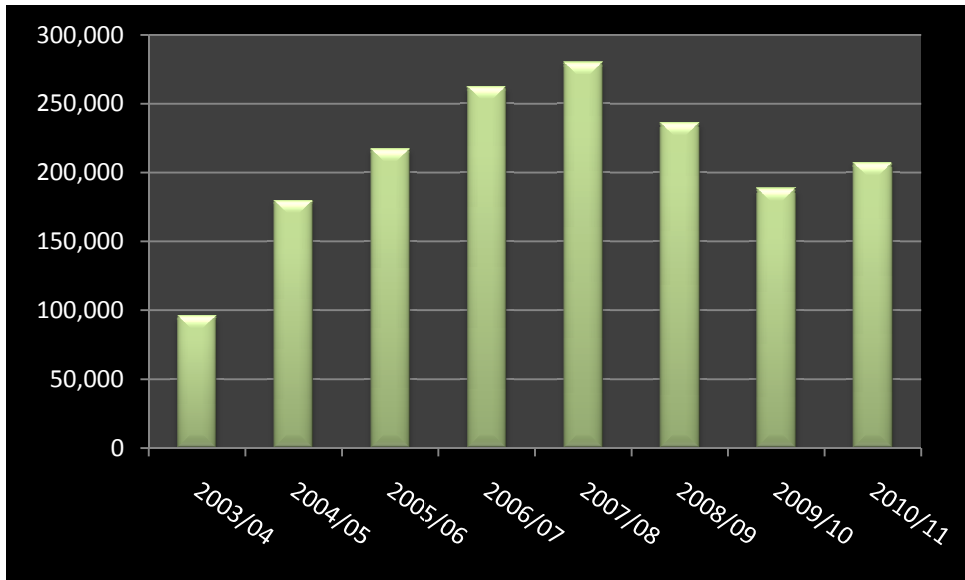


Figure 2

The total number of student contacts by the Science in Motion Consortium from school years 2003/04-2010/11.

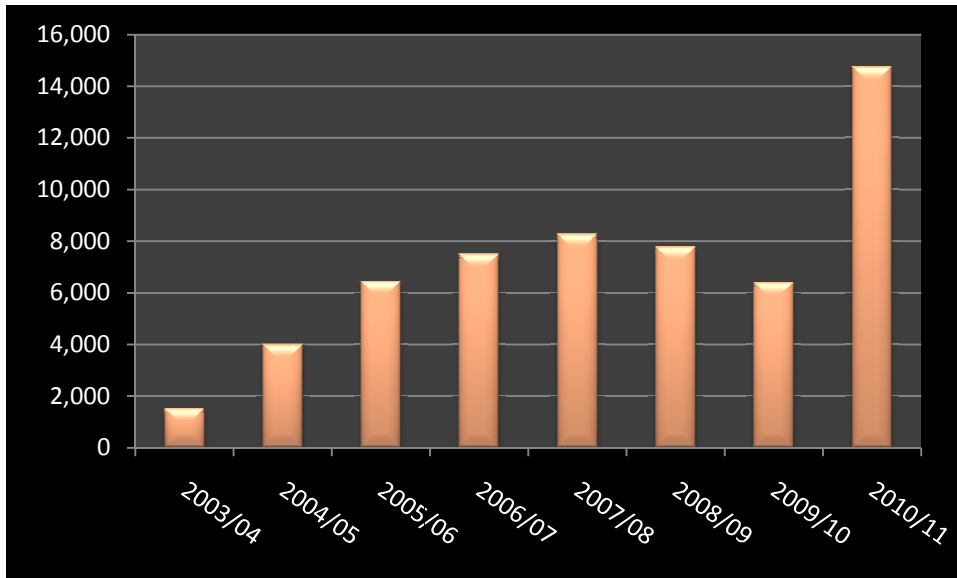


Figure 3

The total number of equipment loans by the Science in Motion Consortium from school years 2003/04-2010/11.

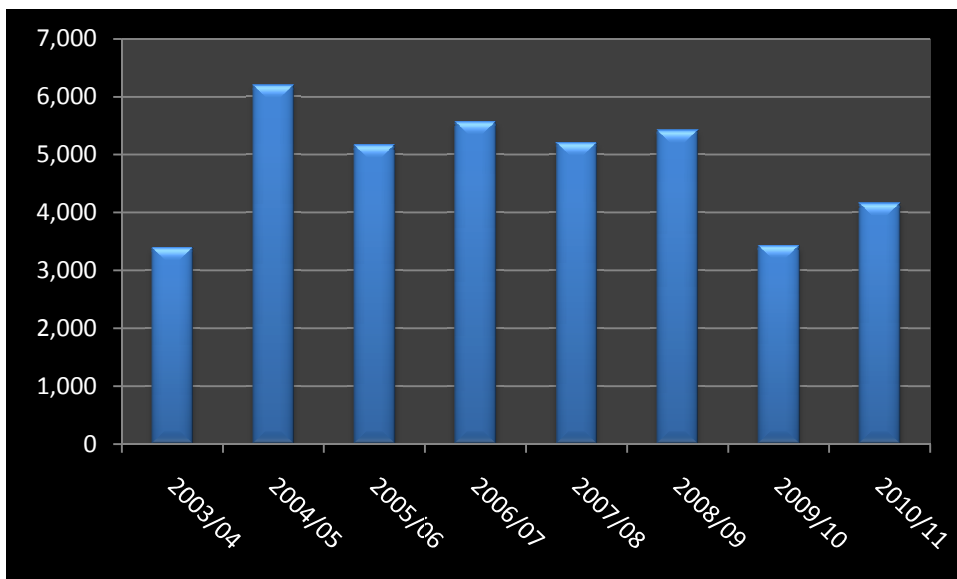


Figure 4

The total number of teaching visits by the Science in Motion Consortium from school years 2003/04-2010/11.

Now more than ever, due to the historical delays in the receipt of funds, many of the higher education partners will not allow programs to begin service until the annual passage and signing of the budget enables contracts to be processed. There was an average delay of 7.8 months between the date the programs began until the first reimbursement was received (ranging from 2-11 months). 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.

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 ephemeral at all sites. Science In Motion sites receive more requests for school visits than their mobile educators are able to fulfill. Although SIM has struggled financially, we are very appreciative of the funds we have been awarded each year from the state budget. The SIM program is greatly appreciated 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 2010-2011 school year by each site of the Science In Motion Consortium (12 total in alphabetical order one site per page).

Cedar Crest College	
School Districts (12)	Individual schools (12)
Allentown Area County School District	Agora Cyber Charter School
Catasauqua Area School District	Catasauqua High School
East Penn School District	Emmaus High School
Northern Lehigh Area School District	Freedom High School
Northwestern Lehigh Area School District	Jefferson Elementary
Parkland Area School District	Liberty High School
Saulsbury Township School District	Muhlenberg Elementary
Southern Lehigh Area School District	Parkland High School
Whitehall-Coplay School District	Pleasant Valley High School
Northampton Area School District	Shafer Elementary
Lehigh Area	Whitehall High School
Palmerton Area School District	William Allen High School

Clarion University

School Districts (18)**Individual schools (34)**

Allegheny-Clarion Valley	Allegheny -Clarion Valley Junior/Senior High School
Armstrong	Brockway Junior/Senior High School
Brockway	Brookville Junior/Senior High School
Brookville	Clarion Area Junior/Senior High School
Clarion Area	Clarion –Limestone Junior/Senior High School
Clarion-Limestone	Clarion County Career Center
Cranberry Area	Cranberry Junior/Senior High School
Dubois	DuBois Middle School
Forest	DuBois High School
Franklin	DuBois Christian School
Keystone	East Forest School
North Clarion	West Forest School
Oil City Area	Elderton Junior/Senior High School
Punxsutawney	Ford City Junior/Senior High School
Redbank	Franklin Middle School
Rocky Grove	Franklin High School
Titusville Area	Jefferson County Vo-Tech School
Union	Keystone Junior/Senior High School
	Kittanning Middle School
	Kittanning High School
	Lenape Vo-Tech School
	North Clarion Junior/Senior High School
	Oil City Middle School
	Oil City High School
	Punxsutawney Middle School
	Punxsutawney High School
	Rocky Grove Junior/Senior High School
	Saint Patrick’s Catholic School
	Titusville Middle School
	Titusville High School
	Redbank Junior/Senior High School
	Union Junior/Senior High School
	Venango Christian High School
	Immaculate Conception School

Drexel University

School Districts (1)

Individual schools (19)

School District of Philadelphia

Bartram

Ben Franklin

Bodine

Central

Communications and Technology

Franklin Learning Center

FELS

George Washington

Girls High

Lamberton

Masterman

Mennonite

New Media Technology Charter School

Northeast High School

Parkway-Northwest High School

Philadelphia Military Academy at Elverson

St.Huberts

West Philadelphia

West Philadelphia HS Academy of Automotive and Mechanical
Engineering

Elizabethtown College

School Districts (16)	Individual schools (19)
Columbia Borough	Columbia Borough Jr-Sr High School
Eastern Lancaster County	Garden Spot High School
Elizabethtown Area	Elizabethtown Area High School
Hempfield Area	Hempfield High School
Lancaster	J.P. McCaskey High School
	McCaskey East High School
	Phoenix Academy
	Wheatland Middle School
Lebanon	Lebanon High School
Manheim Township	Manheim Township High School
Muhlenburg	Muhlenburg Middle School
Pequea Area	Pequea Valley High School
Pottsville Area	Pottsville Area High School
Reading	Reading High School
Warwick	Warwick Middle School
Commonwealth Connections Academy	Commonwealth Connections Academy HS Level
Lancaster Country Day School	Lancaster Country Day HS Level
Lancaster Mennonite School System	Lancaster Mennonite Middle School
Mt. Calvary Christian School	Mt. Calvary Christian School HS

Gannon University

School Districts (13)**Individual schools (21)**

Cathedral Preparatory School	Cathedral Preparatory School
Mercyhurst Preparatory	Mercyhurst Preparatory
Erie City School District	East High School
	Central Tech
	Strong Vincent
	Bayfront Maritime Alternative
	Northwest Collegiate Academy
	Perseus Maritime School of Excellence
	Roosevelt Middle School
Fairview School District	Fairview High School
Fort Leboeuf School District	Fort Leboeuf High School
General McLane School District	General McLane High School
Harbor Creek School District	Harbor Creek High School
Iroquois School District	Iroquois High School
Millcreek Township School District	McDowell Senior High School
	McDowell Intermediate High School
North East School District	North East High School
Northwestern School District	Northwestern High School
Union City Area School District	Union City High School
	Union City Middle School
Wattsburg Area School District	Seneca High School

Gettysburg College

School Districts (21)	Individual schools (37)
Camp Hill SD	Adams County Christian Academy
Central York SD	Alloway Creek Intermediate School
Chambersburg Area SD	Ardentsville Elementary School
Conewago Valley SD	Biglerville High School
Diocese of Harrisburg	Camp Hill High School
Fairfield Area SD	Cedar Cliff High School
Gettysburg Area SD	Central York High School
Greencastle-Antrim	Chambersburg Area Middle School
Hanover Public SD	Chambersburg Area Senior High School
Littlestown Area SD	Conewago Valley Intermediate School
Mechanicsburg Area SD	Dauphin County Technical School
Northern York SD	Delone Catholic High School
Shippensburg Area SD	Fairfield Middle School
Spring Grove Area SD	Fairview Elementary School
Upper Adams SD	Gettysburg Area High School
Upper Dauphin SD	Gettysburg Area Middle School
Waynesboro Area SD	Greencastle-Antrim High School
West Perry SD	Hanover High School
West Shore SD	Immaculate Conception School
York City SD	Lincoln Elementary
York Suburban SD	Mechanicsburg Area Middle School
	Montessori Academy of Chambersburg
	Northern High School
	Shalom Christian Academy
	Shippensburg Area Middle School
	Spring Grove Area High School
	Spring Grove Area Middle School
	St. Andrew School
	St. Francis Xavier School
	St. Joseph Dallastown
	St. Rose of Lima School
	Upper Adams Middle School
	Upper Dauphin High School
	Upper Dauphin Middle School
	West Perry High School
	William Penn High School
	York Suburban High School

Juniata College

School Districts (13)

Individual schools (23)

Belleville Mennonite

Belleville Mennonite

Altoona-Johnstown Diocese

Bishop Guilfoyle High School

Hollidaysburg Catholic Middle School

St. John's Evangelist School

Calvary Christian Academy

Calvary Christian Academy

Forbes Road School District

Forbes Road Jr/Sr High School

Grier School

Grier School

Hollidaysburg Area School District

Hollidaysburg Area High School

Hollidaysburg Junior High School

Huntingdon Area School District

Huntingdon Area High School

Huntingdon Area Middle School

Mifflin County School District

Indian Valley Area High School

Indian Valley Middle School

Lewistown Area High School

Lewistown Middle School

Strodes Mills Middle School

Mount Union Area School District

Mount Union Jr/Sr High School

Northern Bedford County School District

Northern Bedford County Jr/Sr High School

Southern Huntingdon Area School District

Southern Huntingdon Junior/High School

Spring Cove Area School District

Central High School

Spring Cove Middle School

Tyrone Area School District

Tyrone Area High School

Tyrone Area Junior High School

Susquehanna University

School Districts (22)**Individual schools (28)**

Berwick	Berwick Area High School
Bloomsburg	Bloomsburg Christian School
Central Columbia	Bloomsburg High School
Central Dauphin	Central Columbia High School
	Central Columbia Middle School
	Central Dauphin High School
Danville	Danville Area High School
Juniata County	East Juniata High School
Greenwood	Greenwood High School
East Lycoming	Hughesville High School
	Juniata High School
Line Mountain	Line Mountain High School
	Meadowbrook Christian Academy
Middletown Area	Middletown High School
Millville	Millville Area High School
Milton	Milton Area Senior High School
Montoursville	Montoursville High School
Mount Carmel Area	Mt. Carmel Area Junior/Senior High School
Muncy	Muncy High School
North Schuylkill	North Schuylkill Junior/Senior High School
	Northumberland Christian School
Selinsgrove Area	Selinsgrove Area High School
Shamokin Area	Shamokin Area Junior/Senior High School
Shikellamy	Shikellamy High School
South Williamsport	South Williamsport Area High School
	Sunbury Christian Academy
Tri-Valley	Tri-Valley Junior/Senior High School
Williamsport Area	Williamsport Area High School

University of Pittsburgh at Bradford

School Districts (9)**Individual schools (16)**

Bradford Area School District

Bradford Area High School

Coudersport Area

Coudersport Area Junior and Senior High School

Elk County Catholic

Eisenhower Middle School and High School

Elk County Catholic High School

Elk County Catholic Middle School

Kane Area School District

Floyd C. Fretz Middle School

Oswayo Valley School District

Kane Area High School

Otto-Eldred School District

Kane Area Middle School

Port Allegany School District

Oswayo Valley Junior and Senior High School

Smethport Area School District

Otto-Eldred Elementary

Warren County School District

Otto-Eldred Junior and Senior High School

Port Allegany Junior and Senior High School

Sheffield Middle School and High School

Smethport Junior and Senior High School

The Learning Center

Warren High School

Ursinus College

School Districts (16)	Individual schools (27)
Boyertown Area	Arcola Middle School
Colonial	Boyertown High School
Downingtown Area	Conestoga High School
Methacton Area	Downingtown East High School
Norristown	Downingtown West High School
North Penn	Downingtown Middle School
Owen J. Roberts	Great Valley High School
Perkiomen	Methacton High School
Phoenixville Area	Montgomery County Youth Center
Souderton Area	Norristown High School
Spring-Ford	North Penn High School
Tredyffrin/Easton	Nueva Esperanza
Twin Valley	Owen J. Roberts High School
Upper Marion	Owen J. Roberts Middle School
William Penn	Perkiomen Valley High School
Wyomissing	Perkiomen Valley Middle School East
	Perkiomen Valley Middle School West
	Phoenixville High School
	Plymouth Whitmarsh High School
	Roosevelt
	Souderton High School
	Spring-Ford High School
	Spring-Ford 9th Grade Center
	Spring-Ford 7th Grade Center
	Twin Valley High School
	Upper Marion High School
	Wyomissing High School

Westminster College

School Districts (22)	Individual schools (59)
Penncrest	Acemetonia Elementary
Jamestown Area	Center Elementary
Hermitage	Cray Challenges School
Farrell Area	Delahunty Elementary School
Mercer Area	East Side Elementary
Grove City Area	East Lawrence Elementary
Slippery Rock Area	Farrell Elementary
Laurel	George Junior Republic
	George Washington Elementary
Union Area	Grove City Christian Academy
Mohawk Area	Grove City College
New Castle Area	Grove City High School
Pine Richland	Hermitage Middle School
Northern Allegheny	Hickory High School
Moon Area	Hillview Intermediate School
Highlands	Jamestown Elementary School
Leechburg Area	Jamestown High School
Butler	John F Kennedy Elementary School
Allegheny Valley	Kennedy Catholic High School
West Middlesex Area	Maplewood High School
Shenango Area	Mercer Elementary School
Notre Dame	Mercer High School
Sharpsville	Mohawk Elementary School
	Mohawk High School
	Neshannock Elementary School
	Neshannock High School
	New Castle High School
	Notre Dame Elementary School
	Oakview Elementary
	Perry Traditional Academy
	Pine Richland High School
	Reynolds High School
	Seneca Valley Intermediate School
	Seneca Valley High School
	Sharon High School
	Sharpsville High School
	Union Elementary School
	West Middlesex Elementary School
	Westminster College Preschool
	Wilmington Area Elementary

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**Westminster College
continued**

Wilmington Area Middle School
Wilmington Area High School
Reynolds High School
Saegertown High School
Seneca Valley Intermediate School
Seneca Valley High School
Sharon High School
Sharpsville High School
Shenango Elementary
Slippery Rock Elementary School
Slippery Rock High School
South Butler Elementary School
Sto Rox Elementary School
Union Elementary School
West Middlesex Elementary School
Westminster College Preschool
Wilmington Area Elementary
Wilmington Area Middle School
Wilmington Area High School

Wilkes University

School Districts (22)**Individual schools (30)**

Blue Mountain	Blue Mountain High School
Dallas	Coughlin High School
Elk Lake	Dallas High School
Hanover Area	Elk Lake High School
Hazleton Area	Grand Army of the Republic (GAR) High School
Holy Redeemer HS	Hanover High School
Lake Lehman	Hazleton High School
Lehighton	Holy Redeemer High School (formerly Bishop: Hafey, Hoban, & O'Reilly and Seton Catholic)
Northwest area	Lake Lehman High School
Old Forge	Lakeland High School
Pen Argyl	Lehighton High School
Pocono Mountain	Meyers High School
Riverside	MMI Preparatory High School
Towanda	Northwest High School
Tri-Valley	Old Forge High School
Troy	Pen Argyl High School
Tunkhannock Area	Pittston Area High School
Wallenpaupack	Pocono Mountain East High School
Wayne Highlands	Pocono Mountain West High School
Western Wayne	Riverside High School
Wilkes-Barre Area	Towanda High School
Wyoming Valley West	Tri Valley High School
	Troy High School
	Tunkhannock High School
	Wallenpaupack High School
	Wayne Highlands
	Western Wayne High School
	Wyoming Are High School
	Wyoming Valley West- High School
	Wyoming Valley West-Middle School
