

**Greetings from Pittsburgh:
The History of Pittsburgh and Its Rivers through Postcards**

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Overview

Rivers define Pittsburgh. Rivers have formed Pittsburgh's unique geography, history, culture, commerce, and industry. People have not only drawn water from the rivers, but wealth, adventure, and inspiration as well. We sometimes take our rivers for granted, but any understanding of the Pittsburgh region must begin with an appreciation of the pervasive influence the rivers have had on Pittsburgh's development.

This curriculum unit will engage students in a discovery of Pittsburgh and its rivers that will promote student achievement of district and state standards in communications, mathematics, citizenship, and the arts and humanities. Students will examine the history of Pittsburgh and its rivers by utilizing visual images to compare and contrast Pittsburgh of the past and present. The study of postcards, a field known as deltiology, will be used as a primary source of visual images. Postcard images provide unique glimpses into history, and in some cases, provide

the only known historical record of events and places. This popular art form has left a rich legacy of Pittsburgh images.

This unit has been designed for use with secondary Learning Support students, but can be adapted for use with mainstream secondary or middle school students. It can be taught in an English or U.S. History class, or as an interdisciplinary unit taught by two or more teachers.

Rationale

This curriculum unit addresses three issues that I face as a teacher: 1) teaching students to “read” images, 2) increasing students’ knowledge of their community and its history, and 3) helping students meet district and state graduation requirements.

I am a Learning Support teacher at Schenley High School. The students I work with have a wide range of learning needs, but one of the most common characteristics is a limited ability to read and comprehend printed materials. While it is important to help students develop skills and strategies to obtain information from various kinds of word-based texts, their difficulties in reading make it more likely that they will receive information about their world through visual media such as photographs, film, and video. Therefore it is critical that they develop the skills necessary to comprehend, analyze, and evaluate the information obtained from such sources.

Reading images is a form of literacy. The ancient Chinese proverb, “A picture is worth a thousand words,” is very true. A skilled observer can obtain as much information from a painting, photograph, or series of images as a skilled reader can from a book. In addition, images can often be used to lead reluctant readers to a deeper understanding of printed materials.

Although most of my students have lived in Pittsburgh all their lives, many know very little of Pittsburgh beyond their own neighborhoods. I have found that if we, as teachers, expect students to know something, we must consciously and deliberately develop learning experiences that lead them to that knowledge. Assuming that students will pick up information on their own often leads to disappointment.

As part of their graduation requirements, all high school students in Pennsylvania, including students with exceptionalities, are required to pass the Pennsylvania State System of Assessment (PSSA) tests in reading, writing, and mathematics, at or above the proficient level. Most of the students with exceptionalities in my classes are unable to pass these tests, and are therefore

required to submit a portfolio that demonstrates their proficiency in reading, writing, and mathematics at their ability level.

This curriculum unit addresses all three of these issues by utilizing visual sources of information such as postcards to engage students in a discovery of Pittsburgh that will promote student achievement of district and state standards in reading, writing, and mathematics, as well as citizenship and the arts and humanities. As a result of their participation in this series of activities, students will create work that will become part of their portfolios to be submitted to meet district and state requirements for graduation.

Objectives

In this unit, learners will participate in a variety of activities designed to help them achieve eight main objectives:

1. The learner will use visual images to compare and contrast Pittsburgh of the past and present.
2. The learner will describe various uses people have made of Pittsburgh's rivers, and explain how river use has changed over time.
3. The learner will give examples of ways the rivers have influenced Pittsburgh's development in one or more of the following areas: geography, history, culture, commerce, industry.
4. The learner will write for a variety of purposes, including to inform and to narrate, given a choice of prompts and topics.
5. The learner will demonstrate effective comprehension strategies to obtain information from various kinds of texts and images.
6. The learner will demonstrate effective research skills, including location and use of print and non-print sources, and effective use of traditional and emerging technologies.
7. The learner will work collaboratively with other students to produce an exhibit of "Then & Now" images of Pittsburgh and its rivers using found images (from library and internet research, postcards, the collection of the Photo Antiquities Museum, and other sources) and photographs taken by students.
8. The learner will use acquired math skills to calculate the following:
 - Age of images
 - Dimensions of framing/display materials
 - Cost of materials needed to present final projects, such as photo developing, framing and other display materials, refreshments for exhibition reception
 - Area of wall/table/floor space needed for exhibit

Strategies

Primary sources are invaluable in understanding history. They give us an unvarnished view of the past, and allow us to draw our own conclusions. When we think of primary sources, we usually think of written or printed documents such as diaries, letters, and census records. However, visual images provide equally valuable historical information.

Visual images are historical documents in their own right. They need no accompanying text to convey valuable information. A skilled observer can obtain as much information from a painting, postcard or photograph as a skilled reader can from a written document.

To help students use images as sources of historical information, I have developed a process to guide them. A worksheet based on this process is included in the Appendix at the end of this unit.

Using Images as Historical Documents

1. First, spend some time just looking at the image.
 - This allows the viewer to become familiar with the image
2. Describe what you see. Identify elements in the image that you recognize. Use a K-W-L chart to organize your information.
 - A K-W-L chart is an effective tool to help students access prior knowledge, make links to new learning, and form questions that increase comprehension.
 - Students should write what they know in the “K” section of the K-W-L chart.
3. Make a list of questions about the image.
 - Help students use clues in the image and their own prior knowledge to form “who, what, where, when” questions, and answer them, if possible. They should put these questions in the “W” section of the K-W-L chart.
4. Do research to answer your questions.
 - Research can take the following forms:
 - Ask someone; discuss the image with a partner.
 - Look at other images of the same subject or from the same time period.
 - Go to other sources of information about the subject.
 - Visit the site (or object).
 - Students should summarize their research in the “L” section of the K-W-L chart.

5. Compare this image with another of the same subject (or from the same time period).
 - Use Steps 1 through 4 to analyze the second image.
 - Use a Venn diagram to find similarities and differences between the two images.

The process outlined above mentions the use of two graphic organizers: a K-W-L chart and a Venn diagram. Since visual literacy is one of the primary concepts of this curriculum unit, the use of graphic organizers to help students organize and analyze their information visually is an important and effective choice of learning strategies. A K-W-L chart is one type of graphic organizer that would work well with this unit.

The K-W-L chart is a method to help students activate prior knowledge of a topic. It serves as a model for active thinking while analyzing a source of information. The chart is divided into three vertical columns which are labeled K, W, and L. The K stands for helping students recall what they KNOW about a given topic before instruction or research. The W stands for helping students determine what they WANT to learn. The L stands for helping students identify and articulate what they LEARN as they study.

The other graphic organizer suggested for this unit is the Venn diagram. By using two overlapping circles, a student can analyze the attributes of two different images and visually organize their similarities and differences. For example, if a student were to examine views of the Point (where Pittsburgh's three rivers meet), he or she might discover that both images have boats and bridges. These attributes would be listed in the section of the diagram where the circles overlap. The student might then discover that in one image, the boats are loaded with coal, and in the other, the boats are being used for recreation. These observations would be listed in the separate parts of the circles for each image.

Other graphic organizers such as concept webs may also be useful for this unit. Graphic organizers enhance a learner's ability to think in visual terms and to link new learning to prior knowledge. Many resources on using graphic organizers are available from publishers of educational materials, and several websites feature the use of graphic organizers. Some of these resources are listed in the Annotated Bibliography.

Postcards

I have chosen to use postcards as the primary source of visual images for this curriculum unit. The postcard is an art form that most people are familiar with.

Almost everyone has sent or received a postcard from a vacation spot. The classic postcard message, “Having a wonderful time—wish you were here,” has become part of American culture. Postcards are colorful, inexpensive, and depict almost any subject one can imagine. Collecting postcards has been popular since they were first produced, and the general interest in collectibles of all kinds today has spurred a renewed interest in this hobby. Postcard collecting has evolved to a level where a new word was created to describe this area of study—deltiology. Derived from a Greek word meaning “little tablet,” the word deltiology encompasses not only the collecting aspect of this field, but the study of the history, production, artists, and printers of the postcard.

I became interested in collecting vintage postcards a few years ago as a sidelight to my research into my own family history and the related history of Pittsburgh. One of the first postcards I acquired was a view of the school where I teach, Schenley High School. The card was published around 1916, the year Schenley opened. From this card I learned that the street which runs in front of the school, now called Bigelow Boulevard, was at that time called Grant Boulevard. I began to look for more postcards, and have found at least six different postcard views of Schenley High School dating from 1916 to the late 1930s. I scanned and enlarged several of these images and displayed them in my classroom. Many of my students were very interested in the images, and spontaneously began to ask questions about when they were produced and where they came from. I began to appreciate the possibilities of using these images to stimulate my students’ interest in Pittsburgh and its history, and in developing the skills they needed to learn more.

A Postcard Chronology

Like most things, postcards have changed over time. The types of cards produced during a given era are so distinctive that one can often determine the age range of a card without looking for a postmark or other clues that might help date it.

The U.S. government first authorized the use of “private mailing cards” on May 19, 1898. Most of these cards were used as advertisement for businesses and retailers. One that I have in my collection was printed for Kaufmann’s Department Store, and shows views of the Pittsburgh Post Office and the Allegheny County Court House. There is usually some space on the front or picture side of a private mailing card for a message, because the back was reserved “exclusively for the address,” as my Kaufmann’s card states. The era of private mailing cards lasted until about 1901.

By the end of 1901, the government permitted private printers the use of the term, “post card.” Because no other writing was permitted on the address side, printers left as much as an inch of white space along one edge of the picture side for messages. The postcards from this era, 1901-1915, are commonly called “undivided back.” Postcard collecting became an enormously popular hobby during this time. Many families had albums or boxes filled with postcards from all over the world.

The next major change in postcards came in 1907. Printers were now permitted to use a line to divide the backs of postcards into two halves—one for the address and one for the message. Not only did this allow for longer messages, it also enabled the printers to use the full space on the front of the card for the image. These cards are called “divided back.”

Up until the end of the divided back era (about 1915), most color postcards were made from black and white images and then tinted. The printing was usually done by firms in Germany. Because those doing the tinting had little knowledge of the actual scene they were printing, the colors chosen often had little to do with the actual object, building or scene that was depicted. I have several postcards of Carnegie Library in Oakland from this era, and in each one, the colors of the roof are different. So, although color may add to the beauty of these cards and may help highlight certain details, one must bear in mind that the colors themselves may not be historically accurate.

Often the same image found on postcards was used on other types of souvenir items. When Schenley High School opened in 1916, a number of items were made to commemorate the event. I have a postcard, a small decorative cup, and a “ribbon” plate, all using the same image of Schenley, all made in Germany.

The next significant change in postcards reflected the significant changes taking place in the world. After the United States entered World War I, American use of products made in Germany dropped to almost nothing. Postcard production shifted to the United States and England. Cards made during this era, from about 1915 to 1930, had a white border around the image to save ink and lower production costs, and are called “white border” cards. Although the general quality of these cards was poorer than the early cards, the cards usually included more information about the images in the captions on the back.

In about 1930, new printing processes created an almost canvas or “linen” finish to postcards. These cards used bright colors and usually had a white border around the image. Postcard production flourished during this era. One of the best known printers was Curt Teich. The thousands of images created by this firm are documented in the Curt Teich Postcard Archives in Illinois. Curt Teich used a

numbering system for its postcards that recorded the year of publication and other printing information. The linen era lasted until the end of World War II.

The last major change in postcard production occurred during World War II. Postcards produced since this time are called “chromes” and resemble glossy photographs.

Where to Find Postcards and Other Visual Images

I began to develop this curriculum unit as a way to use the postcards I had acquired to help my students learn, so I already had a plethora of visual resources to use. If you do not have such a collection at hand, there are many places where postcards and other sources of visual images can be found. Postcards can be found in rare and used book stores, antique shops, at flea markets and estate sales, and possibly in one’s own attic or bureau drawers. Your students and their families may be able to share postcards and other images with your class. Most of the cards in my collection came from online auctions such as eBay. Even if you don’t buy anything online, it is worthwhile to look from time to time at the postcard listings found in these auctions. Most listings have pictures. Browsing these listings will help you become familiar with the images that exist and also help you identify examples of postcards from different eras.

Locally, there are many good sources of historical images of Pittsburgh. The Pennsylvania Room of the Carnegie Library in Oakland has a large and well-catalogued collection. The Senator John Heinz Pittsburgh Regional History Center, located in the Strip District, is also a valuable resource. The collections of the Western Pennsylvania Genealogical Society are also housed there. A little-known, but incredibly rich storehouse of photographic treasures is the Photo Antiquities Museum on the North Side. All of these organizations have extremely knowledgeable and helpful staff members who enjoy helping people learn more about Pittsburgh. Contact information is located in the Annotated Bibliography at the end of this curriculum unit.

Classroom Activities

The activities for this unit fall into four main categories: 1) activities designed to provide background information, 2) activities to facilitate student selection and research of images, 3) ongoing writing activities, and 4) field trips to record present-day images of selected sites. The culminating activity will be an exhibit of “Pittsburgh Then & Now” images created by students.

It is not necessary for students to complete every activity detailed here in order to achieve the learning objectives. Teachers should choose those activities

which best fit their teaching situation, considering students' learning needs and interests, instructional time and resources available, and how this unit might support and enhance the existing curriculum.

Background Activities

Activity #1: Photo Antiquities Museum Field Trip

This activity will provide background information for students to begin their investigation and collection of visual images of Pittsburgh. We will visit the Photo Antiquities Museum, located on Pittsburgh's North Side, which has an immense collection of photographs dating back to the very beginning of photography. The curator and docents are extremely knowledgeable, and can gear their presentations to specific topics, periods of history, and student needs. Specific topics to be addressed for this unit include:

- History of photography
- How cameras work
- Tips on how to take photographs
- View photographs of specific topics such as:
 - Pittsburgh rivers
 - Pittsburgh baseball parks and sports stadiums
 - The Point
 - Pittsburgh bridges

If possible during this field trip, we will stop at Pittsburgh's North Shore sports stadiums, PNC Park and Heinz Field, to allow students to begin taking their own photographs.

Activity #2: Deltiology

Through lecture, discussion, and hands-on examination of postcards, this activity will provide students with a working knowledge of deltiology, the study of postcards. In addition to examining actual postcard images of Pittsburgh, they will learn how they can date the images by looking at the style of the postcards and by using postmarks, if available. Since postcards will be used as the primary source of visual images for this unit, this information will be critical to helping students achieve the learning objectives.

Activity #3: Video: Pittsburgh History Series: Things That Aren't There Anymore

Students will view and discuss this video to get some ideas of the type of subjects they can begin to research. WQED's online Teacher's Guide for this series has several excellent suggested activities to accompany this and other videos in the Pittsburgh History Series.

Activity #4: Video: Pittsburgh History Series: The Mon, the Al, and the O
This video focuses on Pittsburgh's three rivers, the Monongahela, the Allegheny and the Ohio. Like "Things That Aren't There Anymore," this video will provide background information on possible topics for research on the rivers, their use, and their significance.

Research Activities

Activity #1: Internet Research

Students will have several opportunities to go to one of the school's computer labs, as a class and individually, to locate, select, and research images of Pittsburgh's past.

Activity #2: Research at Carnegie Library, Pennsylvania Room

The main branch of Carnegie Library is located within a few blocks of Schenley High School. The Pennsylvania Room houses an extensive collection of photographs and other visual images of Pittsburgh. The library staff is well-trained, knowledgeable and helpful. Students will have at least one opportunity to visit the library for research as group. They will be encouraged to use this valuable resource on their own as well.

Ongoing Writing Activities

Students will develop their ability to write for a variety of purposes by engaging in the following writing activities throughout the project:

Activity #1: Informative Essay on one of the following topics:

- A brief history of photography
- How a camera works
- How the use of Pittsburgh's rivers has changed over time
- A brief history of Pittsburgh's baseball parks, including Exposition Park, Three Rivers Stadium and PNC Park, all located on the shore of the Allegheny River.
- How Pittsburgh's rivers have influenced Pittsburgh's development
- The history of one or more of Pittsburgh's bridges
- How the Point has changed over time

Activity #2: Narrative Essay

Students will write a narrative based on their research on a Pittsburgh image, or pair of images, of their choice. The narrative can be a factual retelling of the story

behind the images, or a work of historical fiction using imaginary characters to illuminate real events.

Activity #3: Captions

Students will write concise, accurate, and descriptive captions to accompany their pairs of “Pittsburgh Then & Now” images.

Activity #4: Brochure

Students will work in small groups to create a brochure to inform visitors of the background, purpose and participants of the “Pittsburgh Then & Now Exhibit.”

Activity #5: Writing a postcard message

Students will select a postcard image and write an appropriate message that would fit in the message area. Examples of actual messages from vintage postcards can be used as models or inspiration.

Field Trips

Activity #1: Photo Antiquities Museum Field Trip

This activity is detailed under Background Activities above. As mentioned, during this field trip, students will hopefully have the opportunity to take “now” photographs that they can compare with “then” images of Pittsburgh’s baseball parks, rivers, and the Point.

Activity #2: River Field Trip

One of the best ways to study a topic is to have first-hand experience with it. A Lock and Dam Cruise or a Sightseeing Cruise on one of the Gateway Clipper boats will provide students with the opportunity to see the rivers up close, and to take photographs of subjects popular in postcard art, such as the Point. These narrated cruises are also informative, and students may find useful information for their particular areas of research.

Activity #3: Small Group Field Trips

For students who want to investigate and compare images from other Pittsburgh sites, small group field trips of up to five students will be arranged.

Culminating Activity: Pittsburgh Then & Now Exhibit

This activity will incorporate the results of all the other activities students have engaged in throughout this unit. In order to prepare for the exhibit, students will complete the following steps:

- Students will research and collect vintage images of Pittsburgh from:

- Carnegie Library
 - Internet sites
 - Photo Antiquities Museum
- Students will visit one or more selected sites shown in the images and take a photograph of the site as it is now.
- Students will compare and contrast the “then & now” images, using the “Images as Historical Documents” process detailed under the **Strategies** section above. A K-W-L chart or other graphic organizer will be used to organize information and guide students in their inquiry.
- Students will write accurate and informative captions for each of their images.
- Students will produce a timeline of important events within the time span of the pair of images.
- Students will mount and/or frame images, with captions, for display.
- Students will produce the following written materials for the exhibit:
 - Invitations
 - Posters to advertise the exhibit
 - A brochure or catalog which will be available for visitors at the exhibit
- Students will arrange for refreshments for the exhibit through Schenley High School’s Culinary Arts program, or another caterer. (Some of the students who will be involved in the exhibit are also enrolled in the Culinary Arts program, and can participate in planning and preparing the food.)

Annotated Bibliography/Resources

Books

Ashworth, Ralph. *Greetings from Pittsburgh: A Picture Postcard History*. Lanham, MD: The Vestal Press, Ltd., 2000.
This book

Crouch, Stanley. *One Shot Harris: The Photographs of Charles "Teenie" Harris*. New York, NY: Harry N. Abrams, Inc., 2002
Charles "Teenie" Harris was one of Pittsburgh's finest photo-journalists. During his long career with the Pittsburgh Courier he took thousands of photographs documenting life in Pittsburgh's black communities. This book presents some of his best work.

Lorant, Stephan. *Pittsburgh: The Story of an American City*. Lenox, MA: Authors Edition, Inc., 1964, 1975.
This classic history of Pittsburgh contains hundreds of images from Pittsburgh's past.

Smith, Arthur G. *Pittsburgh Then and Now*. Pittsburgh: University of Pittsburgh Press, 1990.
Smith has taken a selection of vintage Pittsburgh photographs and shown them side by side with photographs of the same site as it appeared in the late 1980s. Students can use his work as a model of how to produce "then and now" pairs of images.

Stevens, Norman D., Ed. *Postcards in the Library: Invaluable Visual Resources*. New York: The Haworth Press, Inc., 1995.
Among the topics covered the 21 essays in this collection are postcard collections such as the Curt Teich Postcard Archives and the San Diego State University's Adams Postcard Collection, deltiologist George Watson Cole's published classification system, and using postcards as resources for historic preservation.

Toker, Franklin. *Pittsburgh: An Urban Portrait*. State College, PA: Penn State University, 1986.
This book gives historical background and descriptions of the architecture of Pittsburgh's distinctive neighborhoods. Students may find it especially useful when constructing timelines of a particular building or area.

Wilson, Janet, Ed. *Pittsburgh Revealed: Photographs Since 1850*. Pittsburgh, PA: Carnegie Museum of Art, 1997.

This book contains many early photographs of Pittsburgh, and documents the various changes that have occurred.

Websites

Bridges and Tunnels of Allegheny County. <http://pghbridges.com>
This labor of love gives descriptions, details and images of almost every bridge that ever existed in Allegheny County.

Bridging the Urban Landscape. <http://www.carnegielibrary.org/exhibit>
Carnegie Library, in collaboration with Common Knowledge Pittsburgh, has created this online hypertext exhibit of some 600 historical photographs and images, accompanied by text, of Pittsburgh, its bridges and its neighborhoods. Drawn from the unique resources of the Library's Pennsylvania Department, this ongoing exhibit was initially made possible by a grant from the National Telecommunications and Information Administration (NTIA). Although this site is still a work in progress, several sections are complete and contain a number of images that students may find useful for this unit.

eBay.

<http://www.ebay.com>

eBay is the best known online auction. Millions of items in almost any category you can imagine are offered each day to the highest bidder. Even if you don't buy, it is instructive and fun to browse the listings.

The Graphic Organizer. <http://www.graphic.org/>

Several different graphic organizers are described at this website. Suggestions for use are also given, as well as the types of learners a particular graphic organizer would benefit.

Graphic Organizers.

<http://www.ncrel.org/sdrs/areas/issues/students/learning/lr1grorg.htm>

This website is part of the North Central Regional Educational Laboratory. It gives examples of several kinds of graphic organizers.

WQED Multimedia: Pittsburgh History Series Teachers Guide.

<http://www.wqed.org/erc/pghhist/index.html>

Wonderful resources to help you use the Pittsburgh History Series videos in your classroom.

Videos

Sebak, Rick. Pittsburgh History Series: The Mon, the Al, and the O.

Sebak, Rick. *Pittsburgh History Series: Things That Aren't There Anymore*.

Curriculum Resources

Using Primary Sources. Parsippany, NJ: Pearson Education, Inc., 2003.

Green, Phyllis, Ed. *Graphic Organizers*. San Antonio, TX: Novel Units, Inc., 2002.

Community Resources

Carnegie Library

4400 Forbes Avenue

Pittsburgh PA 15213-4080

412-622-3116

<http://www.clpgh.org/index.html>

Photo Antiquities Museum

531 East Ohio Street

Pittsburgh, PA 15212

412-231-7881

<http://www.photoantiquities.com/>

The Senator John Heinz Pittsburgh Regional History Center

1212 Smallman Street

Pittsburgh, PA 15222

412-454-6000

<http://www.pghhistory.org>

Appendix A:

Using Images as Historical Documents

Primary sources are invaluable in understanding history. They give us an unvarnished view of the past, and allow us to draw our own conclusions. When we think of primary sources, we usually think of written documents such as diaries, letters, and census records. However, visual images provide equally valuable historical information.

Visual images are historical documents in their own right. They need no accompanying text to convey valuable information. A skilled observer can obtain as much information from a painting, a postcard, or a photograph as a skilled reader can from a written document.

The steps below can guide you in using a visual image to learn about the past.

1. First, spend some time just looking at the image.
2. Describe what you see. Identify elements in the image that you recognize.
 - Use a K-W-L chart to organize your information.
3. Make a list of questions about the image. Use clues in the image and your own prior knowledge to form “who, what, where, when” questions, and answer them, if possible.
4. Do research.
 - Ask someone; discuss the image with a partner.
 - Look at other images of the same subject or from the same time period.
 - Go to other sources of information about the subject.
 - Visit the site (or object).
5. Compare this image with another of the same subject.

- Use Steps 1 through 4 to analyze the second image.
- Use a Venn diagram to find similarities and differences between the two images.

Appendix B: Standards

This curriculum unit addresses the following district standards:

Reading, Writing, Speaking and Listening

1. All students use effective research and information management skills, including locating primary and secondary sources of information with traditional and emerging library technologies.
2. All students read and use a variety of methods to make sense of various kinds of complex texts.
3. All students respond orally and in writing to information and ideas gained by reading narrative and informative texts and use the information and ideas to make decisions and solve problems.
4. All students write for a variety of purposes, including to narrate, inform and persuade, in all subject areas.
5. All students analyze and make critical judgments about all forms of communication, separating fact from opinion, recognizing propaganda, stereotypes and statements of bias, recognizing inconsistencies and judging the validity of evidence.
6. All students exchange information orally, including understanding and giving spoken instructions, asking and answering questions appropriately, and promoting effective group communications.
7. All students listen to and understand complex oral messages and identify their purpose, structure and use.

Mathematics

1. All students use numbers, number systems, and equivalent forms (including numbers, words, objects and graphics) to represent theoretical and practical situations.

2. All students compute, measure and estimate to solve theoretical and practical problems, using appropriate tools, including modern technology such as calculators and computers.

Arts and Humanities

3. All students relate various works from the visual and performing arts and literature to the historical and cultural context within which they were created.

Citizenship

1. All students demonstrates an understanding of major events, cultures, groups and individuals in the historical development of Pennsylvania, the United States and other nations, and describe the patterns of historical development.
2. All students demonstrate understanding of themes and patterns of geography, know the location of major bodies of water, land masses and nations, and describe the relationships between geography and historical, economic and cultural development.
7. All students demonstrate their skills of communicating, negotiating and cooperating with others.
8. All students demonstrate that they can work effectively with others.

Science and Technology

9. All students demonstrate basic computer literacy, including word processing, software applications, and the ability to access the global information infrastructure, using current technology.