

# **Pittsburgh, a City of Rivers and Bridges Past and Present**

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## **Overview**

My unit, *Pittsburgh, a City of Rivers of Bridges, Past and Present*, will explore and discuss the magnificent view of the city of Pittsburgh with an emphasis on the rivers and their bridges. Pittsburgh and its many neighborhoods and communities would be isolated and less accessible without bridges. The unit will focus on the 1700's to 2003. My goal is to awaken my students to these natural resources, the Allegheny, the Ohio, and the Monongahela, Pittsburgh's three rivers, so they will realize their true uniqueness, beauty, magnitude, and purpose, not just in the United States but also throughout the world. The unit will include some folklore and tales surrounding river life and the construction of the bridges. Students will individually sketch the rivers, boats, and landscape. They will collectively sketch, plan, and paint a mural showcasing what they learned. This unit will be taught in an interdisciplinary way in the art room, emphasizing the creative designs and diverse styles of various bridges as well as their architectural functions and form.

During a period of ten to twelve weeks, third, fourth, and fifth graders will be immersed in American art and regional western Pennsylvania art and architecture. This time frame can be adjusted to meet the students' needs. Students meet for forty-minute periods for approximately six classes each month.

## **Rationale**

The purpose of this unit is to provide students with opportunities to review photographic and pictorial documentation, including texts such as *Pittsburgh*

*Revealed*, of the evolving landscape of the three rivers in order to set the scene and be able to imagine and grasp Pittsburgh's legacy from the 19<sup>th</sup> and 20<sup>th</sup> centuries. It will feature folk art, including several paintings from a recent exhibit at the local Heinz History Center, as a focal point for classroom activities.

The unit will introduce images and anecdotal information from a personal interview with Nat Youngblood, so that students can get to know a regional artist who captured the essence and beauty of the rivers. He frequently traveled on boats in the region for days at a time and wrote and painted about them upon his return. His watercolor paintings were reproduced for decades in the 1950's, 1960's, and 1970's in the Sunday magazine section of the *Pittsburgh Press* for an extensive audience to see. Pupils will have opportunities to analyze the sketches and discuss chronicles of artists familiar with river life a century ago, such as Jon Banvard, an artist from Philadelphia. He traveled the Ohio River, the Mississippi River, and the Missouri River with a sketchbook in hand. Studying his pen and ink sketches enables one to capture a real sense of the rapids, the cliffs, the keelboats, barges, and steamboats along his journey. His personal accounts vividly describe his floating gallery on the water. He survived his adventures with his dog, nicknamed Rem, which was an abbreviated form of Rembrandt. The artist experienced a near drowning, dangerous rapids, and thieves on his boat, floods, snakes, and wild animals. He recorded much of this in sketches, drawings, and illustrations featuring barges on the local rivers as well as in other cities in the world.

A variety of Reuben Thwaites' river journey photos from 1894, published in the photo collection, *Essays, Pilgrims in the Ohio, The River Journey & Photographs*, will be a focal point for part of the unit. The black and white photos capture life along the Ohio as seen through the eyes of a person in a rowboat. Students will compare and contrast several of them as they consider what is dramatically different today. On June 11, 1894, when Thwaites and his three companions arrived at the confluence of the Ohio and Mississippi Rivers, which was Cairo, Illinois, this was their final destination. It was the termination of a six-week adventure floating down the Ohio River in a fifteen-foot rowboat (Thwaites 1). This should be particularly appealing since one of the passengers was a ten-year-old boy who was with his father, mother, and an uncle. They spent thirty-eight days traveling down the Monongahela River in western Pennsylvania to the Ohio and then to the Mississippi River. Thwaites remarked that he could have chosen to make this expedition in a steamboat, but from the deck of a steamer he would have had a completely different point of view. This is why he chose to take his family on an extended camping trip. He captured on film lots of information about the waterfront: steam boats; wharf boats, houseboats, a fishing skiff, freight and driftwood, on the muddy shore, and bridges (Thwaites 17, 23-24). From an artist's point of view, Thwaites' pictures were circular in format, which distinguished them from other visual representations of that period.

Placing the objects of interest in the center contributed lots of interest. Thwaites's desire was to be like a pioneer, with a skiff, and a primitive campsite, and his experiences are recorded in *Afloat Down the Ohio*. Selections from the book will be examined.

The unit will also encourage students to do research to acquire knowledge so that they will be prepared to compare and contrast the architectural and engineering marvels in Pittsburgh such as the Smithfield Bridge and the Liberty Bridge. As students complete the lessons throughout this unit, they will expand their perspective of other rivers and bridges around the world. Students will be exposed to primary and secondary sources of factual information and anecdotal stories about the bridges. The unit is designed to provide examples of ways to use an interdisciplinary approach in the art room, encompassing literature, folklore, and music to support and enhance the art. A variety of two and three dimensional art activities will be a part of the unit.

The unit will emphasize the folklore surrounding river life. It will expose tales about the construction of bridges. It will provide insights to the creation of designs and diverse styles of bridges emphasizing their uniqueness, function, and architectural beauty, form, and structure.

*Pittsburgh, a City of Bridges Past and Present*, is designed to support the Pittsburgh Public School curriculum and align with the following prescribed Curriculum Content Standards: Arts and Humanities; Citizenship; Reading, Writing, Speaking and Listening; Environmental and Ecology; and Career Education and Work Content Standards. Students do learn about the Allegheny, the Ohio, and the Monongahela Rivers as part of the third grade Pittsburgh Schools Social Studies curriculum. In third grade art, students focus on *Pennsylvania and Pittsburgh, Then and Now*. The fourth grade social studies curriculum is *Around the World* and their science curriculum is the FOSS, which incorporates the water and river environment. The fifth grade art curriculum is *American Art*. The fifth grade social studies curriculum focus is America. For fifth graders, this unit will be an opportunity for students to discover how the environment shaped and influenced the culture in Western Pennsylvania and how this continues to impact their lives today. This involves understanding the history of how rivers were formed here in western Pennsylvania, why flooding has always occurred, and how it was a natural place to build bridges.

As an art teacher in an elementary school situated on edge of a cliff near Mt. Washington, a Pittsburgh neighborhood, I love the fact that I have a room with a view. It is no ordinary view; it is an extraordinary panoramic view of the city of Pittsburgh. It is majestic and breathtaking. It features buildings with diverse facades and downtown skyscrapers that line the Monongahela River. Beyond the skyline, the horizon line fades far off into the distance. As I gaze to the east, I see Oakland, a section of the city with steeples, buildings, and tall houses dotting the

riverbanks. Down below on the river in the foreground, I observe barges as they slowly progress down the river. If I gaze to the west, I see expansive yellow and blue bridges, railroad tracks, stadiums, and many more arches projecting across the river. Once the sun sets and the night falls, I see the city transforming yet again with thousands of lights that span the arched bridges' contour outlines. This would be an appropriate time to reflect on a quote I once read, which is, "A river seems a magic thing...magic, moving, living part of the very earth itself" (Gilpin, 1949).

It is a fact that my students grow up with this view. The water is a daily sight for them. An interesting thought to ponder, as Leonardo da Vinci once said, is "Water is the driver of nature." The rivers are something many of them can easily take for granted. They are surrounded by this ever-changing pictorial view that alters with every season. Are they able to identify the three rivers that meet at the Point? Do they know why Pittsburgh is called the "City of Bridges"? Do they ever think about how people got around in the 1700's before the first bridge was erected, or even earlier when the Indians like the Delaware and the Iroquois lived here? Can they imagine what the scene may have looked like when the French trappers were looking for fur? Do they have a clue where the first bridge was and do they know it was a covered bridge? Do they know which one burned down in the great fire of 1845? Do they ever think about who designs the bridges and who plans where to locate them? Do they wonder why the designs vary or even know what they are called? Do they have any clue as to how many years bridges last or what kind of upkeep they require? Can they identify whom and what bridges connect? Are they aware that one city planner recently proposed that Pittsburgh showcase the bridges by painting them different colors such as lavender, apricot, and yellow? Can they explain why the bridges contributed to the economic growth of western Pennsylvania? These are facts that I want my students to think about and reflect upon as they plan to create art that has meaning and interest for them. I would like them to be inspired, just as John Haines was when he said, "To live by a large river is to be kept in the heart of things." This unit will provide students with new knowledge that will encourage increased awareness and stimulate creativity as it enhances and influences the children's own individual creativity and art production.

I recall, when I was a young girl, occasional car trips with my family to the big city from our small hometown seventy miles north of Pittsburgh. Whereas my recollection is of tall smoke stacks with billowing clouds, bright pink skies and steel mills lining the riverfront, it is quite a contrast to today, when students go to school, look out, and see a clear view that is truly "grand". Grand, just like the name of their school, Grandview. The children whom I teach have grown up with the river- the ice floating on the surface in the winter, the barges, small boats, and the fancy Gateway Clipper. They can easily count numerous bridges in both directions up and down the Monongahela River.

Since examining art and visual images is appealing, exciting, and inspirational to me, I plan to use photographs, paintings, folk art, and murals to draw students into the past to gain an historical perspective. My goal is to expand the knowledge that my students have of the rivers and bridges in Pittsburgh and examine how they have impacted our culture. Just as this popular quote from the *Wind in the Willows*, by Kenneth Grahme, projects an interesting point of view:

“ ‘So-this-is-a-River’? ‘The River,’ corrected the Rat. ‘And you really live by the river? What a jolly life!’ ‘Its brother and sister to me, and aunts, and company, and food and drink, and (naturally) washing. It’s my world, and I don’t want any other. What it hasn’t got is not worth having, and what it doesn’t know is not worth knowing ”.

Initially in Pittsburgh, there is some evidence that designers wished to incorporate some element of visual art to the structure of a bridge. There is other evidence to suggest a real lack of concern to do so. Originally, bridges were private and tolls were charged to use them up until 1896. It has been inferred that tension existed between the engineers who stressed objectivity and the architects who emphasized beauty in a large and conspicuous construction (Kidney 19). Additions would be made that had no bearing to the integration of the structure. Architects were compelled to decorate the entrances of bridges to “through” trusses and arches, typical of rivers. A local member of the Pittsburgh History and Landmarks Foundation recently proposed that the city planners consider painting the Pittsburgh bridges colors in the spectrum of the rainbow.

The appearance of the bridges was to impress the public in many instances. It wasn’t as if these were necessary. An example of this is the Liberty Bridge (1928). It had mighty looking piers, rising even above the deck level. They had no purpose for anything above the spring lines of the cantilevers. Other features such as capitals and rustications cast in concrete, bridges are representative of architecture that was imposed on engineering, or where engineers were simply trying to be like architects. According to an expert in the field, a few details commonly expected to be decorative-piers and abutments to some extent, railings, lamps, plaques belong to the engineer’s pure art (Kidney 20).

In the 19<sup>th</sup> century, Pittsburgh was well known as an industrial center and a transportation center. Located in the headwaters of the Ohio River, Pittsburgh is about 1000 river miles from the Mississippi and Missouri River system, and therefore has access to the middle of North America. It was the gateway to the West. Pittsburgh had a natural path to the Great Plains, the Pacific Northwest, and to the Gulf of Mexico via New Orleans. People who came to Pittsburgh in the 18<sup>th</sup> and 19<sup>th</sup> centuries floated down the Allegheny River from New York or

down the Monongahela River and its tributaries. There is some controversy about where the Lewis and Clark's riverboat was built. The family of the descendants of the boat builders says that it was built in Elizabeth, Pa.; however, a letter from Meriwether Lewis to Thomas Jefferson said that it was built in Pittsburgh. Their expedition began a hundred years ago in 1803. The reason was to explore land purchases by President Thomas Jefferson. Fifteen years later Pittsburgh's first bridge crossed the Monongahela, at Smithfield Street in 1818, and immediately carried covered wagons and pioneers heading west (Gangwere 2).

As research of the rivers takes place, folklore will be a key component. The two great rivers most vital arteries of communication and trade flowed together at Pittsburgh's point and contributed a significant boost to the town's development. The Allegheny, coming from the north, connected northern Pennsylvania with the southern part of the state, while the Monongahela, flowing from the south, tapped the commerce of northern Virginia and the eastern corner of western Pennsylvania. This is where the overland transportation with goods being brought in Conestoga wagons, met the river transportation with goods being transported on riverboats, and shipped down the Ohio to the Mississippi (Lorant 48). This was the scene in the last decades of the eighteenth century.

The Allegheny River's origin is a spring on a farm near Colesburg, Pennsylvania and flows to Coudersport, and then flows north in a large u shape direction in New York. It flows past Olean, the town of Alleghany, continues west, and eventually flows into the Allegheny River reservoir near Warren, Pennsylvania. This is the Kinzua Dam. It turns south. It flows through forests, emptying into streams, through open country, down to Pittsburgh to Point State Park, where it joins the Monongahela River to form the Ohio River. Finally, at Cairo, Illinois, the Ohio joins the Mississippi. In early writings the Allegheny was referred to as the Ohio, derived from the Indian term "O-hee-yo", meaning beautiful river. Later, the French explorers named the river, La Belle Rivera, *the Beautiful River*. Allegheny is the main headwaters to the Ohio (Garbarino 1). The river carried timber after the American Revolution. It carried petroleum downriver until the 1889's. Today, it is used extensively for recreational vehicles more so than the Monongahela and the Ohio, primarily because it flows through beautiful scenic landscapes and is good for fishing. The river has much to do with historical events that have influenced the development and expansion of our American civilization. About ten thousand years ago, hunting and gathering people known as Archaics inhabited Pennsylvania. Next came transitional people, who relied heavily on the waterway (Garbarino 4). The best known were the "Mound Builders", living throughout the Ohio Valley. They were known for their bound burial grounds and manufacture of tools and ornaments out of copper and stone (Garbarino 5). The Upper Allegheny had the Hopewell people; the lower river had the Adena. Later, we find evidence of the Monongahela, McFate, and Owasco groups. The early settlers were successful in taming the wilderness,

although along the way, they confronted those who were willing to fight for their “Allegheny.”

The pioneer village grew steadily. Where the Monongahela joined the Allegheny seemed to be an ideal place. In less than a generation, the virgin forests gave way to rows of homes, spreading factories, and bustling business establishments. The idyllic picturesque landscape was fading and the wilderness was being cut back as the city took shape (Lorant 47).

The European farming was oppositional to the Indian hunting and gathering. The conflict resulted in a struggle for control of the land. This occurred from 1649 to 1795 (Garbarino 2). The Allegheny was a key waterway for transportation of people and goods to New York. It played a significant role in the War of 1812. All types of vessels have been built along its banks. The river became the settlers’ greatest resource. The Iroquois began the Beaver wars, invading the Allegheny and upper Ohio River Basin chasing out and eliminating the Erie and other tribes. There was practically no Indian population left after the Iroquois invaded. The Allegheny was very important for fishing and hunting since the river valley was now valued as a vital economic resource (Garbino 13). In 1753 and 1754, the French built forts between Lake Erie and the Allegheny River.

Navigation on the river began with the Indians. The boat used was a dugout or a vessel made of elm or other bark. When the snow began to melt, people ventured down the Allegheny on flatboats. In the summer, mostly low water existed. Later, the Allegheny was the birthplace for many large ocean vessels. Two war galleys were in Pittsburgh when it became such a problem, for safety reasons, to go down the Mississippi. In 1779, two war ships were launched, *President Adam* and *Senator Ross*. Travel and commerce developed quickly, and there were many flatboats, arks, steamboats, keelboats, and eventually steamboats (Garbino 59). Flat-bottomed boats were used for hauling their families and goods. They came in various sizes to meet the needs of the traveler. Flatboats increased in size to carry larger loads. In 1830, the *Pittsburgh Gazette* printed the following:

We are informed by good authority that between Waterford and Bemus on French Creek, a distance of twenty two miles, from ninety one to one hundred flat boats are started or are about to start for Pittsburgh. These boats were built by farmers and transported freight such as hay, oats, potatoes, produce, and building materials. The average weight of these boats is 27 tons, with an average value of \$300 (Garbino 63-64).

River traffic went up and down stream. In 1790 the keelboats came into use. They transported butter, milk, and cheese. In the 1820’s, the

steamboats began traveling up the Allegheny River. The Albion is believed to be the first to travel up the river and opened up possibilities for trade in the future.

In addition to river traffic, there was extensive use of canals. From the earliest days of civilization along the Allegheny River, through the building of the canals, in western Pennsylvania, the Allegheny Civilization moved west. Farmers took advantage of traveling the rivers west. Settlements were established and commerce flourished. Steamboats eventually followed the keelboats and flat boats. Pittsburgh was a major area for the construction of steam engines for the western rivers. The Allegheny eventually became the modern river system that we know it as today. It is complete with locks, dams, flood control dams, and sports, lots of recreation and commercial business. If the Allegheny could speak, it could tell many stories highlighting folklore that encompassed excitement, tragedy, and joy (Garbino 73).

There are fascinating stories associated with the construction of the bridges in Pittsburgh. From Native Americans to Europeans to Asians to Africans, those building men have changed the landscape of our continent forever. Their blood, sweat, courage, and tears have left a permanent mark on American history (Johnson n.p.). To be a bridge builder, you need to possess the skills and the qualities of a scientist, architect, environmentalist, innovator, and historian. The story of bridges is the story of people who have a vision and work to make it a reality. It is the story of how beauty and strength combine in structures that help us connect our lives with each other across expanses of water and land. Bridge building is a story of the past and the present. Steel and concrete materials give engineers the ability to make bridges with a tremendous capacity. Careful observation shows that the simple bridges of long ago actually do look like the bridges of today, mainly because all parts are the same. The reasons they stand, the forces at work, and the designs are the same. A historical perspective reveals that people have used three basic bridge designs to successfully travel and transport goods over rivers and gorges: the arch, the beam, and the suspension (Johmann n.p.).

Some of the pupils' families, grandparents, and relatives have depended on these rivers as a source of livelihood and recreation for decades, and this impacts them today. With this in mind, one can reflect upon a quote by Leonardo da Vinci, which is, "When you put your hand in a flowing stream, you touch the last that has gone before and the first of what is still to come."

The Monongahela River runs north from the confluence of the West Fork and Tygart Rivers at Fairmont, West Virginia. It flows through coalfields as well as mountains in West Virginia and Pennsylvania and joins the Allegheny to form the Ohio in Pittsburgh. Along the Monongahela, boat building was popular. The boat that Lewis and Clark used was built along the Monongahela. The westward

migration to Ohio flourished with the boatyards and timber. After the Revolutionary War, the river was used to ship farmers' goods to New Orleans. It was a one-way trip. Today, the Mon has nine locks and dams, which are responsible for carrying tonnage just, like the Rhine and Thames Rivers.

The Monongahela is a characteristic mountain trough. From four or five hundred feet, it falls in sharp steeps, to a narrow alluvial bench, to a wide beach of shale and pebble; the slopes are broken, with shadowy ravines, bearing muddy contributions to the flood (Thwaites 33). Either bank is filled with railways. There are miner's hamlets. There are many deserted mining villages. As far as we could see down the Monongahela, the air was thick with the glow of the smoking chimneys. and the pulsating whang of steel-making plants and rolling mill made the air tremble (Thwaites 36). There are, in the course of the summer, so many sorts of people traveling by river: steamboat passengers, campers, fishers, houseboat folk, and what not. The houseboats, or scrows, or flats, greatly differing in size, with low-ceiling cabins, built upon them, sometimes of one room, sometimes of half a dozen, and varying in character from a mere shanty to a well appointed cottage (Thwaites 50-51). Half a dozen steamboats passed up and down breathing like dragons. Leaving behind them foamy wakes, which loudly broke upon the shore. She disappears as she came. Remember, our forefathers were pioneers. So are we. They built a new city where these rivers meet, and died victorious over the outward (Long 9).

“ Once I came home to Pittsburgh, in September, came from the west and looked across the river at the city in the smoke and ninth-month fog. Smoke stacks, bubbles flowing into the water from pipes, and steadily flowing south. Across the unseen river was my city: bridge-spans, and gaunt black gables, hills, churches, the paths of life are interwoven words. Now we are all explorers, and exploring for a vision of life, what is a city? Pittsburghers, what is Pittsburgh? It is the total of the relationships of us who live in Pittsburgh: is nothing else, now and forever ”(Long 70).

With the rivers in Pittsburgh came bridges. It is hard to imagine the city without them. It would be isolated valleys, hillsides, river plains and neighborhoods. The bridges provide access and connection. A bridge connects. A bridge can be an awesome work of structural art. Over 1,600 bridges bind our city and county together, making places accessible that otherwise would not be accessible and resulting, in many cases, in ingenious engineering structures full of color and drama. Pittsburgh has been and continues to be a place of extraordinary architecture and engineering (Kidney x1). Every road in and out of the city requires a bridge. The rivers were used for shipping timber, oil, glass, iron, and steel for two hundred years. With railroads, Pennsylvania became the busiest

industrial state in America. Pittsburgh had large supplies of coal (Gangewere 2). The settlers established a trading post, a military establishment, a countryside and a market town, a river port, a growing chain of industrial towns, and neighborhoods, all draped over plains, hills, and ravines with differences of level as great as 500 feet, and divided by rivers. Development was synonymous with bridges: 50 feet above the water, 100-200 feet above the valley floors. Eventually the bridges dominated the landscape (Kidney 6).

Pennsylvania has a rich tradition of bridge building. By the 1930's, Pittsburgh had more bridges than any comparable place in the world. The place with more bridges, although much smaller, was Venice, Italy (Gangewere 2). The people faced terrestrial crust floating around, a great westward-flowing river that formed a delta where Pittsburgh now is, events in plate tectonics that cut off the river, the formation of new rivers, and two ice ages that shoved the rivers around through glacial action (Kidney 6). Pennsylvania has so many bridges because water has been draining from the Allegheny Mountains creating a plateau for thousands of years. The water that flows into rivers and streams flows to the Gulf of Mexico. Back then the rivers were very wide. The towns and cities were actually built in the flood plains of sand and gravel. Spring flooding is an annual occurrence. The bridges had to be built to withstand the flood damage (Gangewere 2).

The unit will highlight the poetry in *Those Building Men* by Angela Johnson since she presents a beautiful tribute to the men who gave their strength, sweat, courage, and vision to the building of America's bridges, as well as railroads, skyscrapers, and more. In order to do the type of work they do, and face the dangers that can exist, it requires teamwork and sacrifice. Students will recognize and gain more appreciation for the men whose hard work and dedication led to architectural masterpieces and for the history surrounding them. Strength and safety are key concerns, but so is beauty. Sailors were often hired for bridge construction because they were accustomed to tall heights since they worked on the masts of tall ships. They were able to hang on since they were acclimated to heights.

Another impressionable story concerns the architect of the Smithfield Bridge, John A. Roebling. A brilliant engineer who was fascinated by bridges, he left his home country of Germany and moved to the United States in 1831. He built bridges and canals all over the country. He had his own wire company that supplied the entire country in 1941 (Mann 33). After his tragic death, which resulted shortly after a ferry crushed his foot when he couldn't react quick enough to get out of the way, his son Washington took over, and his wife, Emily Warren learned along with him. When speaking about the sacrifices people endured, students can learn about risks such as caisson disease. This was a constant danger for workers who spent long hours in the caisson and didn't realize that the transition from high pressure beneath the river and the normal pressure outside

caused harmful effects such as pain and even paralysis. Today this is known as the bends which deep sea divers sometimes get it when they surface from a dive too rapidly. Today it is preventable and curable (Mann 20 & 26). Although Roebling did numerous things in his lifetime, his claim to fame is being the designer of the Brooklyn Bridge.

The City of Pittsburgh, just like Allegheny County, has saved several bridges of the past for future generations. These are now considered historic landmark bridges. Two examples are the Schenley Park and Panther Hollow Bridges of 1897. In need of repair after one hundred years of use, the decks of these steel bridges were reconstructed with the latest technology of reinforced concrete. Preserving them was a positive step for the beauty and aesthetic value of architecture in Pittsburgh, especially since it would have been cheaper to simply demolish them and replace them with much less interesting or artistically appealing plate or box-girder spans. Over time, bridges face changes, including adding pedestrian walkways, being strengthened for heavier loads, accommodating the flow of traffic and the increased rates of speed. In the 1960's, engineers never guessed that people would be walking over the Roberto Clemente Bridge to go to Pittsburgh Pirates and Pittsburgh Steelers games!

In the early 1900's, industrial Pittsburgh and Allegheny County had produced many purely utilitarian bridges with no distinctive detail and chaotic trusswork. Fortunately the leaders in the county took an interest in beautifying all the new bridges under construction. The Pittsburgh City Arts Commission began recommending contests for features such as bridge ornamentation. This was initially for the Manchester Bridge (1913-1970), but as a result of this competition, sculptor Charles Keck of New York designed large bronze sculptures for the portals of the bridge. Some examples include people from Pennsylvania's past: Indian scout Christopher Gist, Indian Chief Guyasuta, the infamous steel worker Joe Magarac, and coal miner Jan Volkanik. Although the bridge was torn down, these were preserved for the next century. Perhaps a city planner or a landscape architect will be able to incorporate them in a river park on the waterfront in the future. This will be symbolic of Pittsburgh's colorful past and continue to keep Pittsburghers focused on a vision for the future.

When students have successfully been provided with a framework to understand the art, architecture, and the local environment, they will gain an appreciation for the natural resources in addition to the manmade structures that have a formal purpose. After exploring the topic of rivers and bridges extensively, students will sketch and paint a mural in the local neighborhood community park. This mural will feature the Monongahela River, several bridges, and the city skyline. This unit will broaden the students' understanding of Pittsburgh's history, and encourage and inspire them to imagine and envision the future.

**To trace the history of a river or a raindrop, as John Muir would have done, is also to trace the history of the soul, the history of the mind descending and arising in the body. In both, we constantly seek and stumble upon divinity, which like the cornice feeding the lake, and the spring becoming a waterfall, feeds, spills, falls, and feeds itself over and over again.** (Koch n.p.)

## **Objectives**

My overall goal for students is that they will have opportunities to broaden their perspective about the Pittsburgh's rivers and bridges. In the process, they will acquire a broader sense and appreciation for what is in their own backyard as they analyze multiple ways the natural landscape and architectural marvels have been painted and photographed. This keener awareness and new knowledge will impact and influence the creative process, development, and expression of their own art.

Students will demonstrate their ability to explain and discuss their knowledge about the three rivers in Pittsburgh. Learning the river names, their meanings, and their locations, where they originated, where they flow, and facts unique to each river will satisfy Citizen Content Standard 2.

Students will analyze and discuss how the environment shaped and influenced the culture in Western Pennsylvania. Recognizing that many people's livelihoods were connected to the river will align with Citizen Content Standard 1. Discovering why Pittsburgh was the Gateway to the westward ship expansion and discussing Lewis and Clark's expedition that began with their boat being constructed along the Monongahela, as well as the current one hundred year anniversary, will align Citizen Content Standard 2. Observing and retracing how the Point in Pittsburgh, where the three rivers meet, the availability of coal, and the easy access to shipping along the Monongahela River and the Allegheny River to the Ohio River, eventually flowing into the Mississippi River down to the Gulf of Mexico via New Orleans, will align with these also.

Students will demonstrate that they can describe, sketch, record, and explain several aspects that make Pittsburgh's waterways and bridges distinguishable in this second largest inlet port in the United States. Comparing and contrasting several bridges in reference to when they were constructed and the style selected for their construction will satisfy Art and Humanities Content Standards 1 & 4; Citizenship Content Standard 2; Reading, Writing, Speaking and Listening Contents Standards 1 & 2; and Environment and Ecology Content Standard 3.

Students will look at bridges in western Pennsylvania and compare them to others in the United States such as the Golden Gate Bridge and the Brooklyn Bridge, as well as others around the world including the Tower Bridge in London, England, and the Ponte Sant 'Angelo in Rome, Italy. Identifying styles from covered bridges to suspension bridges, and recognizing and comprehending that Pittsburgh has every type of bridge represented except for a drawbridge, will align with Citizenship Content Standard 2; Reading, Writing, Speaking and Listening Content Standards 2 & 3; and Arts and Humanities Content Standards 2 & 3.

Students will expand their vocabulary and demonstrate their comprehension of it as they compare and contrast the types of bridges. Becoming familiar with the parts of a bridge such as the span, pier, cable, etc. and seeing how builders, ironworkers, city planners, architects, and engineers plan bridges and discuss piers, trusses, etc. and explaining it will align with Art and Humanities Content Standard 1 and Reading, Writing, Speaking and Listening Content Standards 1, 2, 3 & 6.

Children will learn about the lives of some designated few bridge designers such as John Roebling, a famous bridge engineer who designed the Brooklyn Bridge in New York and the Sixteenth Street Bridge in Pittsburgh. This will coincide with Reading, Writing, Speaking and Listening Content Standards 1 & 2 and Art and Humanities Content Standard 3.

Students will demonstrate understanding of the elements and principals of art when they analyze structure, function and the artistic beauty of many bridges in Pittsburgh. Comparing and contrasting the architectural style of bridges such as the Three Sisters on Pittsburgh's North Side will satisfy Art and Humanities Content Standards 1 & 3.

Students will use effective research to be exposed to both factual information and anecdotal stories about the waterways and bridges. Reading personal accounts by a variety of people including Frederick Way, the river captain who sailed the Allegheny in a 400-foot boat from its headwaters down to his home in Sewickley, will align with Reading, Writing, Speaking and Listening Content Standard 1.

Students will become familiar with works of art featuring the bridges in western Pennsylvania. Analyzing samples of folk art, paintings, photographic images, images found in the Pittsburgh's Carnegie Museum and Heinz History collections, using the elements and principles of art, will satisfy Art and humanities Content Standard 1.

Students will become acquainted with artists such as John Kane, Nat Youngblood, Robert Thwaites, and John Banvard, who painted, sketched, and photographed river landscapes, boats, barges, and activity on the waterways. Demonstrating knowledge about artists and their lives will satisfy Art and

Humanities Content Standard 2 and Reading, Writing, Speaking and Listening Content Standards 1 & 2.

Students will create meaningful artwork that demonstrates their knowledge about the river landscape and activity, particularly that along the Monongahela River. Planning, sketching scenes, bridges and water vessels, and painting a mural aligns with Art and Humanities Content Standard 4 and Citizenship Content Standards 6 & 8.

## **Strategies**

In an art classroom I will introduce a variety of teaching methods in order to accommodate students with various needs and with a variety of learning styles. First, I will present a brief historical perspective of the rivers and then the bridges. Since using an interdisciplinary approach proves exciting and successful, I will collaborate with other teachers. The librarian will instruct the children in research gathering skills and collecting information from a variety of sources. She will share examples of folklore about river life and activity. The librarian will use aerial maps and teach students how to use them. The music teacher will teach the students some of the songs that I collected about the rivers. They will sing these selections for the entire school at the end of the project. The science teacher will be accompany children on *The Voyager*, an old coast guard boat that has been converted into a floating classroom which cruises the Allegheny, Monongahela, and the Ohio Rivers. The social studies teacher will reinforce information about the city focusing on the past and present life surrounding the Three Rivers.

In addition to studying the fish and testing the water quality, the students pass under numerous bridges and see the structures up close using binoculars. In the art room, I will collect prints, photographs, paintings, and postcards featuring the rivers and bridges in Pittsburgh and design an exhibit in the art room.

I will provide a variety of texts in addition to those circulated by the librarian for students to read and review the texts, pictures, and photographs as they do research and gather information. The selection will include historical texts, art books, photographic albums, literature and poetry all related to the river theme and the history of Pittsburgh's bridges. Children will be equipped to visualize the past and compare it to the present era of Pittsburgh's river life, landscape, and recreational and commercial activity. Pupils will be divided into small groups of three and given specific topics to research and share orally with the class. Students work in cooperative learning groups and do research on specific topics to gather and collect information about floods, bridges, and boats on the rivers.

Students will be directed to use Internet sites such as the Pittsburgh Historical Landmarks to learn about the Three Sister Bridges on the Allegheny, the Sixteenth Street Bridge that replaced a covered bridge, and the Hot Metal Bridge.

I will establish interactive web sites for the children to utilize in their information gathering on the names and types of bridges on the rivers. I will show clips of *The River to Nowhere* and the *Al, the Mon and the O* so that students gain a vivid visual impression.

I will display pictures of flatboats, skiffs, steamboats, and vessels including the gateway Clipper. I will collect artifacts related to rivers including rocks, fossils, and coal. I will include pictures of the wildlife, fish, birds, and fauna native to this region. I will display pictures from the 1880's to the present that depict activity on and along the rivers. Materials and posters about the Lewis and Clark expedition and reenactment will be available since their boat that was built on the Monongahela.

Students will individually sketch, record, and photograph the Monongahela River, which can be seen from the classroom. They will keep individual art journals to draw in and record ideas. I will take students outside to the adjoining park to sketch from observation. I will teach the children to use the digital camera so that have the opportunity to record images that they can enlarge in the classroom for reference.

Students will look at paintings, murals, and photographs. I will share information from a personal interview with national artist Nat Youngblood who painted scenes of the rivers in Pittsburgh as well as views from Mount Washington and the Point. I will introduce children to this artist who painted beautiful paintings of the Pittsburgh Rivers that include several bridges. Youngblood painted these scenes for three decades in Pittsburgh almost fifty years ago. He was an art director for the local *Pittsburgh Press*, and each Sunday, he had a color reproduction printed. I will display many of his reproductions. I will share examples of his work, facts I learned from a personal interview with the artist, and photos of him in his studio in a town called Little Washington.

I will present historical photographs taken by Reuben Thwaites in 1894 with an early Kodak camera when he and three family members, including his wife, his ten-year old son, and his brother-in-law sailed down the Monongahela and the Ohio River in a keelboat. I will circulate landscape paintings featuring landmarks including the Homestead Bridge and Panther Hollow, by John Kane, a transplanted Pittsburgher who was a Scotland native who worked many trades including those of carpenter and self-taught artist.

I will share a series of published sketches from an actual sketchbook that depict life on a river barge. This includes sketches of the interior and exterior of barges. The drawings capture the landscape surrounding the river. Although these are from barges in other places in the world, they are very similar to scenes that could appear along the Monongahela, the Ohio, and the Allegheny River.

Students will discuss jobs that people hold on the barges, steamboats, as well as the many careers involved in designing and constructing bridges.

I will use interactive websites to present conclusive information and outstanding photographs of the bridges, to relay facts about them, and to learn about current and future events related to them.

Since learning about occupations and careers is stressed in the Pittsburgh Public Schools, when we discuss the design and construction of bridges, I will explain various jobs and occupations that are related to bridges from the engineer to the safety inspector. I will compile a list of these for students to refer to for discussion and inquiry.

### **Classroom Activities**

Students will look at the displays of prints, photographs, and paintings in the art room and they will make a list with two columns, “Things I Know About Pittsburgh’s Rivers” and “Things I Want to Know”. This can be done with the entire class using the overhead and a transparency or a large poster board.

Children will assemble an art sketchbook/journal where they will be able to collect sketches and record thoughts and information. It will be a place to write reflections.

They will be divided into groups and given a specific topic to research using the books collected in the art room. They will use interactive Internet sites to gather information and knowledge. They will analyze photographs and paintings paying particular attention to the structure and function of bridges as architectural forms. They will analyze sketches and paintings by artists that are displayed in centers in the room and read about them from more than one source.

Students will select five suggestions from a list of subjects to sketch in their individual art journals including boats, barges, skiffs, steamboats, etc. They will write a brief description of each.

Students will compile a list on a word wall that will feature as many words as possible that are connected bridges. They will discuss and point out examples of these throughout the project.

A timeline for showing the eras when historical bridges were built, will be made in collaboration with the librarian to make connections with world events. In art, the students will create pictures for the timeline that will be displayed in the hall.

A poster containing a list of jobs and occupations related to bridge design, construction, and maintenance will be made. As students learn additional ones, they will add them.

Students will observe and analyze aspects of the river life and the bridges that connect people and places. Students will sketch segments of the Monongahela River over a period of time. They will look out the art room window and also walk a short distance to a nearby park for a different perspective of the river and the city. They will identify the bridges that are visible in the area by name and create pencil renderings. They will research and record the type of bridge construction in their journal sketchbooks. Students will have opportunities during class time to make observational sketches of the river with its boats, barges, bridges, and landscape. Students will be paired off, given individual instruction on how to use the digital camera, and then photograph the river. These images can later be used in a PowerPoint presentation. Back in the room, in small cooperative learning groups, they will study drawings and build simple bridge constructions out of cardboard to illustrate concepts of support and tension. Students will divide into teams for a simple contest of tug of war to illustrate the concept of tension. Students will discuss historical perspectives and make short oral presentations in front of the class. The class will compile sketches, select ones they want to use, and plan a mural. After enlarging the drawing to scale, they will paint a collaborative student/teacher mural showcasing the view of the Monongahela River in Pittsburgh in Grandview Park.

As a culminating activity, students will unveil their mural for the entire school, their parents, and the neighborhood, complete with music and a visual display of their work as it progressed. They will sing river songs to set the stage. Student representatives will be tour guides to explain and point out interesting facts about the rivers and the city of bridges. The teacher and a small group will prepare a simple regional recipe from *The Three Rivers Cookbook* for their art opening. Children will go on an excursion on the Rubber Ducky Tours to see the rivers through “new eyes”.

### **Annotated Adult Bibliography**

Bakewell, Mary E. *Of Long Ago* Pittsburgh. University of Pittsburgh Press, 1949.

Interesting recollections of what it was like when the big flood came every year and there was no school, crossing the covered bridges, and going to the Southside.

Bissell, Richard. *The Monongahela* N. Y. Rinehart & Company, Inc. 1940.  
A deckhand, mate, and pilot’s narrative about having the Monongahela in his blood.

A saga of men, boats, and the way of life for a river man.

Church, Samuel Hardin. *Short Story of Pittsburgh 1758-1908* New York. Divine Press, 1908.

Corbett, Scott. *Bridges* New York. Four Winds Press, 1978.

Useful for showing nice ink sketches depicting structural work that is easily viewable including brick work for false arch and true arch, semicircular arch, segmental arch, lateral thrust, king post, queen post, town lattice truss, home truss, a covered bridge, a cloverleaf. There are ink drawing of the Roman Bridges of Alcantara, Pont du Gard at Nimes, Waterloo Bridge, Menai Strait Bridge, Britannia Bridge, Railroad Trestle, Firth of Tay Bridge Firth of Forth Bridge, Eads Bridge over the Mississippi, the Brooklyn Bridge, and the Galloping Gertie, and Box Girder Bridge.

Caimer, Carl, editor. *Songs of the Rivers of America* New York. Farrar & Rinehart, Inc., 1949. Contains sheet music for one song about the Allegheny River and ten songs about the Ohio River. Contains a forward and notes about the music.

Gangewere, Robert J. *The Bridges of Pittsburgh and Allegheny County* Pittsburgh. The Science and Technology Department, Carnegie Library of Pittsburgh, 2001. Contains information about the bridges from western Pennsylvania's rich tradition of bridge building. Focuses on technological change, basic types, bridges engineers, and the influence of the Pittsburgh Art Commission. Includes photographs of bridges and bridge builders. Contains a chart listing Pittsburgh bridges, their length, location, main span type, year erected, and locations where they cross.

Garbarino, William. *Along the Allegheny* Midway, Midway Publishing, 2000. Useful introduction to bridges with an emphasis on western Pennsylvania's rich tradition of bridge building complete with black and white photographs.

Hadley, S. Trevor. *Only in Pittsburgh* Cincinnati. Educational Publishing Resources, 1994. Anecdotes about Pittsburgh. Chapter 6 Washington's Landing, Another Lost Opportunity? (1753-1989); Chapter 7 "Pittsburgh's Forgotten Islands (1795-1885); Chapter 9 "Pittsburgh's Canal"; Chapter 12 "Controversy on the Mon-Was the Smithfield Bridge Too Low? (1871-1890)"; Chapter 20 "Deep Waters Run Still: The Underground River (Glacial Age to Present). These contain interesting anecdotes with local color.

Hampster, John W. *Western Pennsylvania Historical Survey Western Pa* Pittsburgh. University of Pittsburgh Press, 1938. Contains collection of pen and ink drawings of early Pennsylvania.

Harrison, Francis R. *Flood Tides Along the Allegheny* Pittsburgh. Massy Harbison Chapter, DAR, 1941. Contains an illustrated map of the flood plains.

Useful for learning about the settlements along the headwater region and the factors that unified them. Pittsburgh symbolized this country.

Kidney, Walter. *Pittsburgh's Bridges* Pittsburgh. Pittsburgh History and Landmark Foundation, 1999. Excellent collection of photographs of bridges from the Allegheny, the Monongahela, and the Ohio. Much information about the architecture and design. Includes maps of the bridges. Useful index.

Kidney, Walter. *Pittsburgh's Landmark Architecture* Pittsburgh. Pittsburgh History and Landmark Foundation, 1997. Useful chapter on the original Pittsburgh that helps give a view of the past. Includes several plates of river landscapes at the turn of the century in 1905.

Kidney, Walter. *The Three Rivers* Pittsburgh. Pittsburgh History and Landmarks Foundation, 1982. Useful collection of black and white photographs of river scenes, steel mills, riverbanks, and variety of vessels that navigated the Ohio, the Allegheny, and the Monongahela Rivers.

Koch, Maryjo. *Pond, Lake, River and Sea* New York. Smithmark Publishers, 1998. Useful collection of colored drawings in a sketchbook format, depicting life on a riverbank and in the water. Contains list of resources in the United States and outside the United States.

Miller, Edward K. *Pittsburgh's Many Landscapes* Western PA History, Spring 2002. Contains examples of colorful folk art containing river landscapes.

Oxade, Chris, Jeremy Pyke and Martyn Chillmaid. *Canals and Waterways* New York. F. Watts, 1994. Gives pictures and descriptions of canals and waterways. Points out some of the more interesting ones.

Parker, Arthur. *The Monongahela, River of Dreams, River of Sweat* University Parks. The Pennsylvania State University Press, 1999. A Keystone Book. A history of the river and the industries that grew along and on it. Includes an account of its progress during post-industrial times. Includes photographs and maps.

*Pittsburgh Revealed: Photographs Since 1850* Pittsburgh. Carnegie Museum of Art, 1997. Collection of photographs that is useful for looking at early Pittsburgh.

Roak, Elizabeth. *Western Pennsylvania History "Picturing Pittsburgh, The Catherine R. Miller Collection at Chatham College"*. Winter 2001-2002. Useful for information about a local collection of art depicting some river scenes.

Reid, Robert L. and Dan Hughes Fuller. *Essays, Pilgrims in the Ohio, The River Journey & Photographs of Rueben Gold Thwaites 1894* Indianapolis. Indiana Historical Society, 1997. Excellent collection of black and white photographic plates taken by Thwaites as he, his wife, brother-in-law, and ten year old son went down the Monongahela to the junction of the Ohio at the Mississippi in a 15- foot rowboat in 1894. Excerpts of his journal with personal anecdotes are included.

Stefan, Lorant. *Pittsburgh, The Story of An American City* Pittsburgh. Esselmont Books, LLC, 1999. Fifteen chapters on the history of Pittsburgh. Complete with color photographs. Includes a chronology of events focusing on two hundred years of Pittsburgh's history, from 1717 to 1999.

Richter, K. Daniel. *Facing East from Indian Country* Cambridge. Harvard University Press, 2001. Six chapters on Native Peoples in the New World. Includes maps and illustration. Detailed notes.

Edited by Readers Digest. *Through Indian Eyes. The Untold Story of Native American Peoples* Pleasantville. Readers Digest Association, Inc., 1998. This is a native history of early America is a scholarly synthesis. It contains information about Fort Pitt and Fort Duquesne.

Schafer, Jim and Mike Sajna. *The Allegheny Rivers, Watershed of the Nation* University Park. The Pennsylvania State University Press, 1992. Contains background information about the history of the river and an account of its comeback in the post-industrialization period. Contains useful photographs.

Thomssen, Lee. *A Picture Book of Songs and Ballads* York. The Robert Schmertz Book, 1976. Includes renditions of songs accompanied with sketches and simple flat colored plates that have a crayon effect depicting folk art. Unique because it contains songs relating to Pittsburgh Rivers.

Thwaites, Reuben Gold. *Afloat on the Ohio, a Historical Pilgrimage of a Thousand Miles in a Skiff, from Redstone to Cairo* Carbondale. Southern Illinois University Press, 1999. Personal accounts of Thwaites' historical pilgrimage of a thousand miles in a skiff, from Redstone to Cairo on the Ohio River. Originally published in 1897. It is the text that goes with his river journey and photographs from 1894 published in *Pilgrims on the Ohio*.

Whitmer, T. Carl. *The Three Rivers* Pittsburgh. Volkwein Brothers, 1959. Contains sheet music with lyrics.

## **Annotated Children's Bibliography**

Adkins Jan. *Bridges: From My Side to Yours* Brookfield. Roaring Brook Press, 2002.

Useful because it contains storytelling, striking pen and ink illustrations, and varied designs that are eye catching for young students. Contains a glossary of bridge terms for children.

Agle, Nan Hayden, Joseph Papin and Atchinson Bacon. *The Ingenious John Banvard* New York. The Seabury Press, 1966. Contains a glossary of bridge terms for children. A true story of an artist from Philadelphia who recorded his travels down the Ohio. Shows pen and ink sketches and contains personal accounts.

Balderose, Nancy Ward. *Pittsburgh, Our City* Pittsburgh. School District of Pittsburgh, 1991. Useful for background information on Pittsburgh since this is used in the social studies curriculum.

Bender, Lionel. *River* Part of the Story of the Earth series. New York. Franklin Watts, 1988. Describes the voyage of a typical river from source to ocean, discusses vegetation along the rivers, and points out types of landscapes formed by rivers. Includes colored photographs and drawings.

Boyd, Varna G. and Kathleen A. Furgerson. *The Mystery of the Monongahela Indians* Harrisburg. Greenhorne & O'Mara, Inc., 1999. Paperback book with photographs, sketches, activities, and terms related to the Monongahela Indians.

Bushey, Jerry. *The Barge Book* Minneapolis. Carolrhoda Books, 1984. Describes barges traveling the Mississippi, shows how they are loaded and unloaded, how they are operated, how they enter and exit locks.

Doherty, C.H. *Bridges* New York. Meredith Press, 1969. Useful for simple diagrams of various bridge structures as well as drawings of famous bridges throughout the world. Emphasis on science and know-how. Interesting chapter on the London Bridge is Falling Down.

Fowler, Allan. *Living Near a River* New York. Children's Press, 2000. A Rookie Read- About Geography book. Describes why people settled near rivers, which are sources of power and irrigation.

Johmann, Carol A. and Elizabeth J. Reith. *Bridges* Charlotte. Williamson Publishing Co., 1999. A Kaleidoscope Kids Book. Contains ten chapters containing information on how to build amazing structures to design, build, and test. Excellent source for problem solving hands with on activities. Contains a list of bridges by state. Excellent for teaching vocabulary related to bridge construction and style.

Johnson, Angela. *Those Building Men* New York. The Blue Sky Press, 2001. A poetry text. Beautiful collection of illustrations featuring the men who worked long hours and displayed much courage and strength as they built America's bridges, railroads, skyscrapers, and more. Useful for class discussing building occupations and careers. Includes Native Americans, Europeans, Asians, and Africans.

Kingston, Jeremy. *How Bridges are Made* New York. Threshold Books Limited, 1985. Useful chart on the timetable for building a bridge (Matadi Bridge in Zaire) and a chart for the various careers involved in building a bridge.

Levy, Constance. *Splash! Poems of Our Watery World* New York. Orchard Books, 2002. Thirty -four short poems with imagery of the mystery and magic of water. Radiant watercolor illustrations by Davis Solomon depict celebration of the beauty and significance of water.

Mann, Elizabeth. *The Brooklyn Bridge* New York. Mikaya Press, 1996. Beautifully colored illustrations of the Brooklyn Bridge and the people who built it. Contains rare historical photographs and informative diagrams of how the bridge was designed and built. Tells the story in an adventurous way with the idea that the story is a bridge above water and a bridge across generations.

Mulherin, Jenny. *Rivers and Lakes* New York. Aladdin Books, Ltd., 1984. Covers river formation, stages in the life of a river. Contains, photographs, maps, and drawings. A useful picture atlas of rivers from each continent. Contains a page of interesting facts and a glossary.

Sandak, Cass R. *Bridges* New York. Franklin Watts, 1983. Useful for colored photographs, diagrams, and very simple, easy to read language. Contains two pages of vocabulary.

Scarry, Huck. *Life on a Barge, A Sketchbook* Englewood. Prentice-Hall, Inc. 1982.

Excellent for the art classroom since it is a sketchbook and journal. Written in a conversational manner, it contains outstanding pencil sketches, with detailed

labeling. Depicts life inside and outside of the barge, water scenes as well as landscape.

Silverberg, Robert. *Home of the Redman* Philadelphia. Macrae Smith Company, 1966. Contains twelve chapters describing the way bridges evolved, beginning with log, stone, and creeping vine constructions that have become the beam, arch, and suspension bridges of today. Discusses trial and error as builders learned more about design, materials, and stress.

Sturges, Philemon. *Bridges are to Cross* New York. G. P. Putnam's Sons, 1998.  
Contains 17 exquisite paper cutout illustrations of bridges ranging from a covered bridge to a rainbow.

Watson, Aldren Auld. *The River, a Story Told in Pictures* New York. Holt Rinehart and Winston, Inc., 1963. A small wordless book that shows the path of a pristine river inhabited by animals, through farm country, past an industrialized city, and into a port with ocean-going vessels.

## **Student Resources**

Schanzer, Rosalyn. *How We Crossed the West, The Adventures of Lewis and Clark* Washington D.C. National Geographic Society, 1997.

Price, Olive. *Three Golden Rivers* Pittsburgh. University of Pittsburgh Press, 1999.

### Web Sites

<http://www.pit.edu/~press/goldentrianglebooks> for Three Golden Rivers

<http://www.pghbridges.com/> Useful to view numerous structures categorized by location, design, name, and use

<http://www.carnegielibrary.org/exhibit/> Online hypertext exhibit of 600 historical photographs, images accompanied by text of Pittsburgh, its bridges, and its neighborhoods

### Videos

Sebak, Rick. *The Al, the Mon, and the Ohio* Written, directed, and produced by Rick Sebak. Pittsburgh. QED Communications, 1993. Sixty minutes. Color

with black and white. History, stories, workers, people engaged in recreation, and uses of Pittsburgh's three rivers.

### Sound Recordings

Dear Friends. *Roll on, Monongahela: River Songs from Pennsylvania and Beyond Pittsburgh*. Thomas Studios, 1995. Nineteen songs and instrumental pieces, some composed by

## **Appendix A**

### **Standards**

#### Arts and Humanities

1. All students describe the meanings they find in various works from the visual and performing art and literature on the basis of aesthetic understanding of the art form.
2. All students evaluate and respond critically to works from the visual and performing arts and literature of various individuals and cultures, showing that they understand important features of the works.
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.
4. All students produce, perform or exhibit their work in the visual arts, music, dance or theater, and describe the meanings their work has for them.

#### Citizenship

1. All students demonstrate 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, landmasses and nations, and describe the relationships between geography and historical, economic and cultural development.
8. All students demonstrate that they can work effectively with others.

## Environment and Ecology

3. All students think critically and generate potential solutions to environmental issues.

## Career Education and Work

1. All students explore the multiple purposes of work and the range of career options, including entrepreneurship, and relate them to their individual interests, aptitudes, skills and values.

## 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 informational texts and use the information and ideas to make decisions and solve problems.
6. All students exchange information orally, including understanding and giving spoken instructions, asking and answering questions appropriately, and promoting effective group communications.
8. All students compose and make oral presentations for each academic area of that is designed to persuade, inform or describe.