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## Carrie Furnace: Yesterday, Today, and Tomorrow



Rising out of the forest like a prehistoric beast, Carrie Furnace represents an age of gigantic industries and fearless workers who forged the modern nation we live in today. The end of that era is so recent that many people who worked in the mills are still alive to tell their stories. And yet these massive blast furnaces seem to harken back to a time that is long ago and far away.

This lesson will focus on one small part of a vast network of industrial businesses that once covered the landscape of Western Pennsylvania. By the middle of the 20<sup>th</sup> century, this region had made the United States the richest and most powerful nation on earth. Providing endless types of modern industrial products and resources, this area was a huge part of the “Arsenal of Democracy” that powered the Allied victory in World War II.

The sudden collapse of those industries in the late 20<sup>th</sup> century has forced the people of this region to reinvent themselves for a new world. Showing the same kind of determination that forged their earlier success, they are doing just that. Today it is education, entertainment, and medicine that are the economic engines of this region. Tourism and creative arts are part of that winning formula and Carrie Furnace is taking a unique new place in that world.

The following activities will provide a look at the old and the new identities of this iconic landmark and how it is making that transition.

The activities that follow are connected to the overall theme but can easily be done as separate lessons depending on the needs of the teacher. There is no unit time frame for how this should be done. Time needed for individual lessons may also vary, but an effort was made to keep each one relatively short to provide maximum flexibility.

Middle school students should be able to easily handle this material. The resources provided make it possible to lessen or add to the difficulty.

Geography, History, Art, and Science standards should be available for each activity. Due to the wide variety of expectations, teachers should refer to the standards documents for their state and school district.

Specific science items were not included but lesson ideas can easily be found on the Rivers of Steel website. Carrie Furnace is a fantastic resource for interdisciplinary unit planning and especially for STEAM education.

Questions are included with most activities along with an answer key at the end. Instructors should preview each lesson to create their own key and become familiar with the materials. There are many other tangents that students may follow beyond what is provided here and it is hoped that time will permit those explorations.

An internet connection is a key requirement for this plan. The plan materials were created in MS Word so that modifications are easily made if needed. Each item is designed to be copied as a handout but can also be completed directly online. The only other materials for handout completion would be paper, colored pencils, and rulers.

Unless otherwise specified, all images included here are from the collections of **Rivers of Steel** and all rights to their use should be limited to this lesson. The work of this organization in preserving and promoting the history of Western Pennsylvania, and in particular the steel industry, cannot be overstated. Carrie Furnace and many other priceless reminders of our heritage would already be lost without their tireless efforts.

Any teacher who wants more information should contact the staff at Rivers of Steel.

**Special Thanks for their invaluable assistance with this lesson plan:**

**Ron Baraff** – Director of Historic Resources & Facilities

**Suzi Bloom** – Director of Education

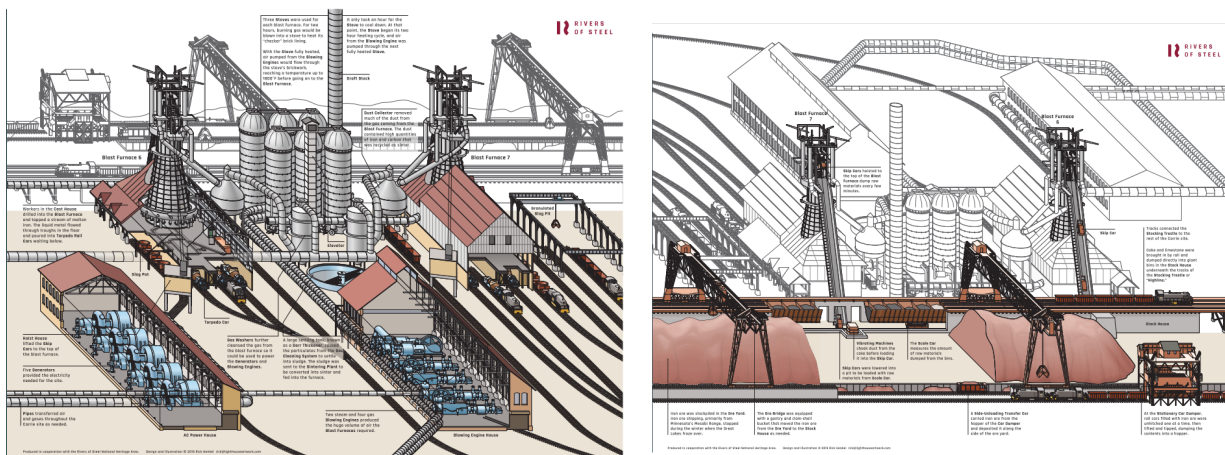
**Ryan Henderson** – Interpretive Specialist & Grant Writer



## Carrie Furnace Yesterday: Activity #2

These two images show what Furnaces #6 and #7 would have looked like when they were still operating. On the left is a front view with some of the roof cut off of three buildings so you can see inside. The back of the diagram is not in color but rather a shadow in grey.

The diagram on the right shows the rear of the site with the front area now in shadow. It may help to imagine you are flying a drone and first looking down at the front of the factory. Then you fly your drone to the back and look forward. It is the same factory from opposite sides.



Mountains of raw materials are stored at the rear and transported over to each furnace. Then carts take these loads to the top of the stack where they are carefully dumped into the furnace to be melted into “pig” iron (a name that comes from the mold they are poured into). The pigs will be sent to other mills and made into finished steel products.

Left image: 1. What was produced in the long building on the left?

Left image: 2. What was produced in the long building on the right used?

Left image: 3. What are the six tall structures in the middle and what do they make?

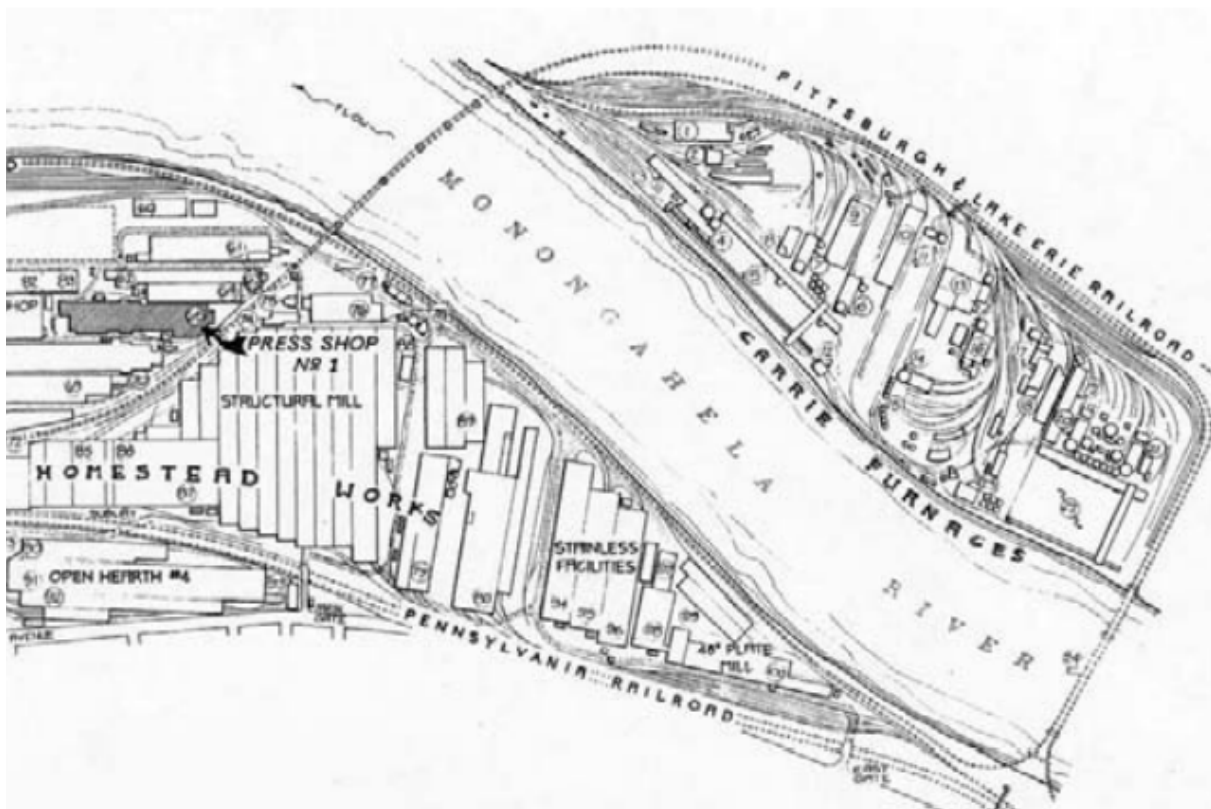
Left image: 4. How long was the air heated and how hot did it get?

Right image: 5. What two resources were brought to the ore yard?

Right image: 6. What carries the ore from the yard to the stack house?

Right image: 7. What moves the ore to the top of the stack?

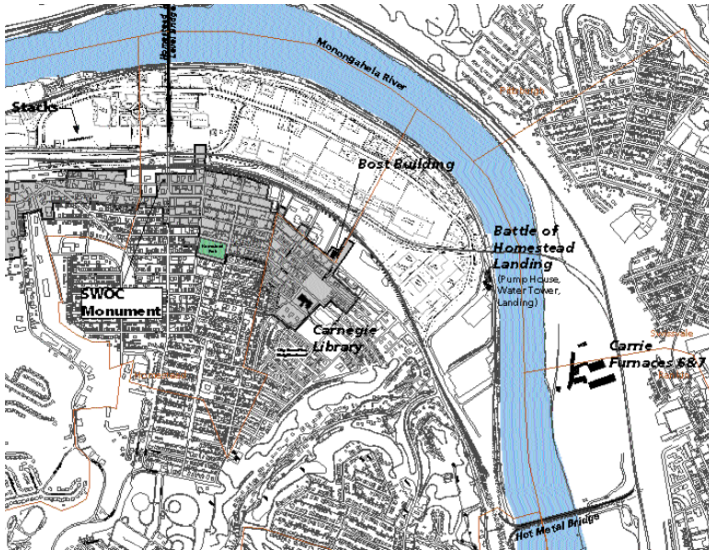
## Carrie Furnace Yesterday: Activity #3



This photo and map show two large factories on either side of the Monongahela River.

1. What railroad line is behind the Homestead Steel Works?
2. What railroad line is behind the Carrie Furnace?
3. What is used to move iron from Carrie Furnace to Homestead Steel Works?

## Carrie Furnace Today: Activity #4



This map shows the Homestead Steel Works site and Carrie Furnace after the factories were shut down and the Homestead mill demolished as shown in the photo. Today the mill site is a large retail development called “The Waterfront”

Map – National Parke Service - Special Resource Study, September 2002, page 6

1. What is the name of the bridge that carried molten ore across the river from Carrie Furnace?
2. What remaining part of the Homestead Works appears on both the map and photo?
3. What other historic locations are shown on the map?

- A.
- B.
- C.
- D.
- E.

Corporate logo for The Waterfront





## Carrie as a Canvas: Activity #6

When factories or buildings of any kind are abandoned, they begin to fall apart. Another problem that frequently occurs is vandalism of the property. That happened at Carrie Furnace for several years before the Rivers of Steel was formed to preserve and protect this landmark from further damage.

Along the way, a very important relationship was created. Artists had found these furnaces very attractive for creating giant art installations from the debris scattered around the site. In addition, many graffiti artists were attracted to the large blank walls.

After the first sculpture was taken down, a second and larger more permanent sculpture was created. Now known as The Carrie Deer, it changed how everyone viewed the site. Rather than fight to keep them out, the leaders of Rivers decided to strike a deal with the artists. As a result, Carrie Furnace is a leader in building connections to the larger community through art.



Carrie Deer was allowed to remain because it was located between the blast furnaces in an area that did not damage the existing structures. In the same way graffiti artists were encouraged to limit their painting to a long wall along the empty ore field beginning in 2012



Examples of these fabulous murals are shown on the following page.





As you can see, many artists have taken their inspiration from the workers, machinery, and buildings at the Carrie Furnace. It is time for students to try their hand at telling a story with “paint” (or in this case - colored pencils).

Lettering is another large element in many graffiti creations. If you want to try your hand at lettering the Rivers of Steel has a video that you may find helpful

<https://www.youtube.com/playlist?list=PLhMGYkHkmrOOnYTkQU8OtIGbrzmcN9A1E>

There are many other aspects of this program that you may want to examine as well.

<https://riversofsteel.com/programs/education/virtual-education-programs/virtual-arts-programs/>

On the following page you will find an example of lettering and a blank version to practice your coloring (tagging) techniques.



## Carrie Furnace Tomorrow: Activity #7

The preservation of Carrie Furnace, or any large, abandoned landmark, is an incredibly difficult and costly process. From the time this factory closed in 1978 until public tours began in 2012 the journey was long and filled with many disappointments.

An excellent overview of this struggle was presented by Ron Baraff in September 2021 to the Squirrel Hill Historical Society. The video tells the story of Carrie and the people who are dedicated to preserving it for future generations.

<https://squirrelhillhistory.org/the-story-of-carrie-furnace-by-ron-baraff/>

One of the biggest challenges is raising the money that is needed to repair and maintain large sites like Carrie. Rivers of Steel has developed many programs and projects since the organization was formed in 1988. “Heritage Tourism” has become a large source of income for historic properties in recent years and Carrie was able to quickly take advantage of this opportunity. In 1996 the eight counties around and including Pittsburgh were included in the Rivers of Steel National Heritage Area. A variety of programs are now offered by Rivers of Steel. You can find more information on the last page of this lesson and also at their main page:

<https://riversofsteel.com/>

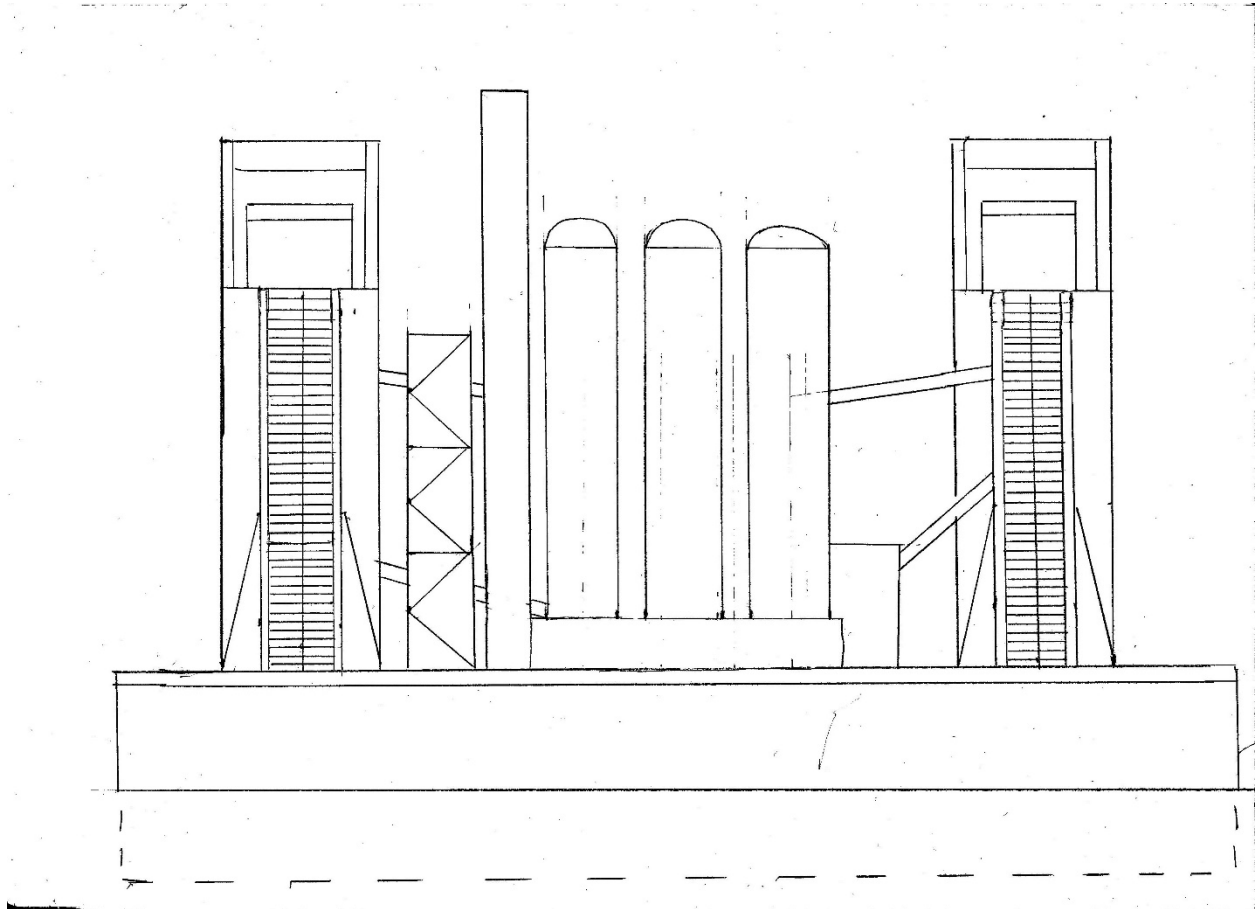
Looking to the future a recent article announced a truly epic reimagining of the Carrie Furnace site. Read the story and answer the questions that follow.

<https://nextpittsburgh.com/city-design/hollywood-of-appalachia-carrie-furnace-gets-7-6-million-for-movie-studio/>

1. What movie was recently made in Pittsburgh and who directed it?
2. How much money did our region gain from the movie making industry in 2021
3. How much money is being given by the state government to build a movie studio at Carrie.
4. What does the purple area on the map represent?
5. Which side of the furnace will the studio be located?
6. If you are on a tour boat coming from Pittsburgh, will you see the furnace or the studio first?
7. Which towns will benefit from the jobs created by a movie studio?
8. (opinion) Can you think of any problems that this new movie studio might create?

## Carrie Furnace - As You See It: Activity #8

Time to get creative. Color this image in any way that you like. Consider what you learned earlier about graffiti art and include patterns and colors inspired by the “writers” who make those fantastic images at Carrie. Or look at photos to make your Carrie as close as possible to the real thing.



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If you want to make your furnace 3D you can cut along the dotted lines and fold that part under to allow the furnace to stand up on this “base”. Depending on the weight of the paper it may need a large base. Other options to think about: Cut out two images and put them back-to-back which would make them stand up better. Color one side realistic and the other one could be a graffiti version. Let your imagination be your guide.

# 2022 Program Guide for Rivers of Steel

NATIONAL HISTORIC LANDMARK



## AT THE CARRIE BLAST FURNACES

801 Carrie Furnace Boulevard, Pittsburgh, PA 15218

**INDUSTRIAL TOUR** Connect with Pittsburgh's steel heritage on this guided tour of the Carrie Blast Furnaces! Hear stories about the site's technology and get to know the culture of its workers. Learn about the iron-making process, from the movement of raw materials to the tapping of the furnaces that produced fiery, molten iron. Experience for yourself the magnificent scale and legacy of this industrial cathedral!



**ARTS & GROUNDS TOUR** While iron production may have stopped onsite in 1982, the era of Carrie as an artistic muse was just beginning! Discover how creatives, from guerrilla artists and graffiti writers to curators and designers, have been inspired by—and left their mark on—this revered landscape. Highlighting contemporary art installations, graffiti murals, the *Iron Garden*, and the famous Carrie Deer, the *Arts & Grounds Tour* invites you to experience this historic landmark from a post-industrial perspective.

**IRON GARDEN WALK** On the eastern edge of the Carrie Furnaces site, there exists a wild garden where nature has reclaimed space scarred by industry. The *Iron Garden Walk* is more than a path through the lush greenspace; it is a botany-focused tour that shares the story of this unique and resilient landscape. Experience the beauty of the Iron Garden.

Carrie Blast Furnaces tours are offered May through November. Check [riversofsteel.com](http://riversofsteel.com) for dates and times.



## ON THE EXPLORER RIVERBOAT

Rivers of Steel Dock, Pittsburgh's North Shore, 15212

**UNIQUELY PITTSBURGH SIGHTSEEING TOUR** Hop on board the *Explorer* riverboat for a 90-minute excursion that seeks to answer the question "What makes Pittsburgh, Pittsburgh?" Traveling on the Ohio, Monongahela, and Allegheny Rivers, this narrated tour shares the big stories—and lesser-known tales—of our region's past as it explores a sense of place. Sit back, enjoy the skyline, and see the sights as you discover how Pittsburgh's unique history shaped the city we have today!

**THE HARDEST WORKING RIVER TOUR** Once known as the "Hardest Working River in the World," the Monongahela River was responsible for much of Pittsburgh's progress. Join Rivers of Steel for a special three-hour excursion up the Mon, as it's known locally. Along the way, you'll hear stories of the region's development through the lens of industry and commerce on this waterway as you take in impressive scenery—both natural and built. Offered seasonally in the spring and fall.

Proceeds from sightseeing tours help to underwrite Rivers of Steel's STEM-based education programs for students throughout southwestern Pennsylvania.

Sightseeing tours are offered April to October. Check [riversofsteel.com](http://riversofsteel.com) for dates and times.

TICKETS AND INFORMATION [RIVERSOFSTEEL.COM](http://RIVERSOFSTEEL.COM) OR CALL 412.464.4020

# Carrie Furnace Activities Answer Key

## Activity #1

1. 6 including Carrie Dorothy Furnace at Duquesne would make 7 but is not shown
2. Neville Island, Edith, Isabella, Lucy, Eliza, Carrie
3. Many were named for women. Stories vary as to why that was done. Some claim they were named for relatives of owners or managers as an honor. Some say it was a carryover from ships which were often named for women because they took care of the sailors. Others claim it was because these furnaces were temperamental and had to be treated with great respect.

## Activity #2

1. Electricity to power all the equipment and machines on the site
2. Huge amounts of air to blow into the furnaces to raise the temperature
3. Gas furnaces to provide the heat for the blast furnace to melt the iron
4. Every two hours it reached 1800 degrees Fahrenheit
5. Iron and limestone
6. A clam shell basket on the ore bridge
7. Skip cars

## Activity #3

1. The Bessemer and Lake Erie Railroad
2. The Pennsylvania Railroad
3. A railroad bridge across the Monongahela River

## Activity #4

1. Hot Metal Bridge
2. The Stacks
3. A. Carnegie Library, B. SWOC Monument, C. Bost Building,  
D. Battle of Homestead Landing, E. Carrie Furnaces 6 & 7

## Activity # 5

1. Three of the gas furnaces
2. The ore yard in the back of the furnaces
3. The size and height (13 stories) of the furnaces

## Activity # 7

1. Anything's Possible Billy Porter from Pittsburgh
2. \$330 million
3. \$7.6 million
4. The location of the proposed studio
5. The left side or north side
6. The furnace
7. Rankin, Braddock, and Swissvale
8. (opinion) Students might discuss how this might take away from the unique image and appeal of the furnace for artists and visitors. They may have other ideas, or perhaps see no problem