TEACHER GUIDE TO STUDENT WORKSHEET 1

QUESTIONS ABOUT THE CURVE

1. Why do you think J. Edgar Thomson wanted to build the curve? *Thomson sensed the trend for development of the country westward. Early on, he began to buy out smaller railroads in "the west"—Ohio, Indiana, Illinois. The Curve may have been part of his vision to expand west. Thomson also had an interest in ultimately creating a transcontinental railroad system. The Curve may have been a small part of this larger vision for the country's railroads. [See ExplorePAhistory's J. Edgar Thomson, Behind the Marker Page] Although it would cost to build it, Thomson seemed to understand the long-term economic benefits of its construction.*

2. How did the addition of Horseshoe Curve change transportation in Pennsylvania?
It allowed passengers to travel from Pittsburgh to Philadelphia in 13 hours rather than three days.

3. There are other horseshoe-shaped railway curves in the United States. What makes this one significant historically*? Student answers may include: (1) its massive size in a beautiful setting set it apart; (2) built in 1854, the workers faced dual challenges of primitive tools—pick and shovel--and difficult terrain to create it; its existence has come to represent the achievement possible through hard work, perseverance, and determination. (3) When it opened in 1854, it significantly reduced the amount of travel time to transport people and materials over the Alleghenies. This contributed further to the movement of American Westward Expansion. (5) It was a remarkable engineering feat which has endured through time.*

4. What are some points of engineering significance associated with Horseshoe Curve?
Statistics: 220-degree curve that is 2, 375 feet long, 1, 800 feet wide and has a radius of 637 feet, 122 feet of elevation at a rate of 1.8 feet per 100 feet of track

The surveyor located the path to make the climbing of the mountain possible. The 1.8% grade was feasible for trains to climb. This was creatively designed by using the sides of two mountains that formed a valley, and the nose of yet another mountain. Fill was used between these three points. (Perhaps drawing this geography layout or creating a 3-D visual representation would be helpful for students to better visualize the structure.)

It is the only place on earth where one single train can go both east and west (or vice-versa) at the same time!

It has allowed for expansion over the years and stood the test of time.

5. What significance does the Curve hold in our popular culture?
(1) In 1879 Pennsylvania Railroad developed a visitors' park and garden at the Curve. Visitors came from all over to take day rail excursions. A resident watchman was employed (and a small shelter created for him) to look after passenger safety and take care of the grounds. Today the Curve is a National Historic Landmark and a Historic Civil Engineering Landmark. And, with help from recent funding from the National Park Service, the Curve is equipped to handle an increased volume of tourist.

(2) The Curve can also be seen as a source of cultural pride. Its existence has come to represent the achievement possible through hard work, perseverance, and determination.

6. If you were a United States enemy at war, would you target the Pennsylvania Railroad's Horseshoe curve in Altoona, Pennsylvania? Explain your answer in terms of geography and economy. *If the United States used the Curve to transport a large amount of war materials and supplies, I could consider it a target to disrupt manufacturing and shipment of wartime goods. It is vulnerable because it would be difficult for the United States to repair quickly and improbable to find a similar route crossing the challenging terrain of the mountains. Other structures where terrain would present a challenge to repair—i.e. bridges—would also be a consideration.*