

TEACHING AMERICAN HISTORY PROJECT
Lesson Title - "The Transportation Revolution"
From Steve Turgeon

Grade – High School

Length of class period – 56 Minutes

Inquiry –

- How can the Industrial Revolution be considered an era of progress?
- How did advances in technology and industry shape the path of the Transportation Revolution?
- How did innovations in technology and transport shape U.S. history from the Industrial Revolution period to the present?

Objectives –

- Students will explore the nature of progress during the Industrial Revolution
- Students will use and produce maps/charts to explain and interpret critical events and turning points in the Industrial Revolution.
- Students will form, articulate, and support a position of the Transportation Revolution based on historical evidence
- Students will relate the content of this lesson to their own experiences with transportation and progress.

Materials –

- Transportation Revolution Activity Worksheet
- Supplemental documents:
 - “Innovative Transportation” – brief overview of the types of transportation innovations during the Industrial Revolution
 - “Turnpike Trusts” “Canals” and “Railways” – supplemental information about each type of transportation industry.
 - Blank, enlarged version of the map on the Worksheet

Activities –

- The teacher will hand out the Transportation Revolution Activity Worksheet and the Supplemental handout.
- The teacher should then split the class into three equal groups, and assign each group a role (per the activity’s directions). One group will represent turnpikes and wagons, one group canals, one railroads.
- The teacher should then pass out a worksheet and supplemental information packet to each student. They should then walk through the directions with the students and field any procedural questions they might have.
- While students are working, the teacher should also patrol the classroom and assure students are on task and participating.
- The students should be encouraged to ask any questions they have about the assignment, and then revisit the materials (readings, supplemental information) to form their arguments and complete the activity.
- When finished, each student should submit their completed worksheets, and each group should submit their finished proposal
- OPTIONAL, TIME PERMITTING: Allow each group of students 3-5 minutes to make a presentation about their form of transportation, advocating for it.

- OPTIONAL, RECOMMENDED: Discuss outcomes as a group the following class period.

How will you assess what student learned during this lesson?

- Informally – checking to see if students are on task and following along with the assignment during independent work time.
- Formally – By assessing student answers to the questions on the worksheet and each groups' proposal for content understanding.

Connecticut Framework Performance Standards –

High School GLEs covered by this lesson based on the proposed standards here:

http://www.eastconn.org/tah/socialstudiesfrmwk_10-6-09-3.pdf

Content #10 – Analyze the impact of technology and scientific discovery on American society.

Content #27 – Explain how technological developments have changed our perception and understanding of location and space in the modern world.

Literacy #12 – Create relevant visual social studies materials to support an essay or oral report

Application #1 – Use evidence to develop an interpretation of a historical event

Application #5 – Develop criteria for judging the actions or policies of an individual or group in the past.

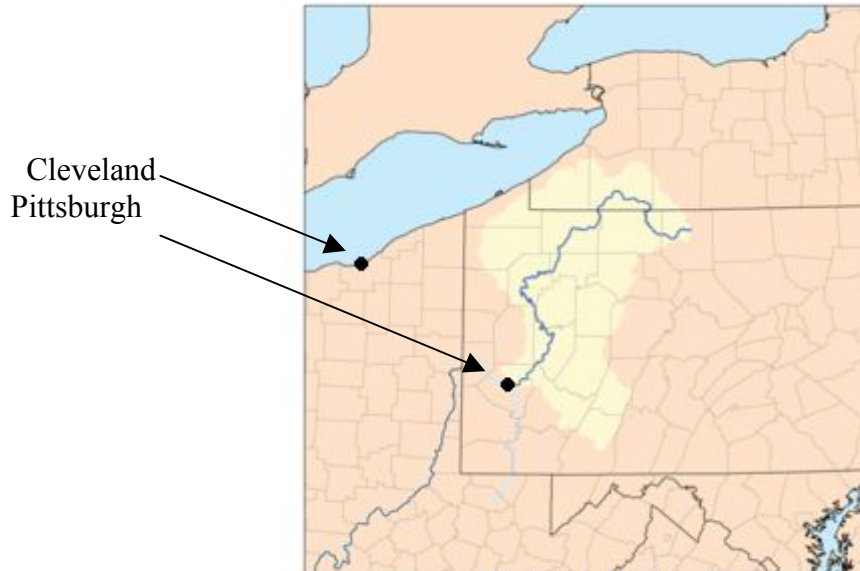
Name: _____

Date: _____

Group Members: _____

Transportation Revolution Activity

The Situation: It's 1840. The wealthy industrialist Robert U. Blind ("Rob" for short) owns a **fishing and canning business** in **Cleveland, Ohio**. He just recently found out there's a **huge demand** for pickled trout in **Pittsburgh, Pennsylvania**. He wants to figure out the **best way to transport** his trout **from Cleveland to Pittsburgh**, and is willing to pay lots of money to the company that comes forward with the best proposal.



Your Task: You and your group represent one of the following companies, all based in Cleveland:

1. **Trailblazers, Inc.** – a company specializing in the creation of **turnpikes, roadways, and covered wagon transport**.
2. **Big Al's Canals** – a company specializing in the creation of **canal waterways and steamboat transport**.
3. **Rails and Trails, LLC.** – a company specializing in the **laying of railways and railroad transport**.

With your group (assigned to you by your teacher), you will **draft a short (1-2 page) proposal** (on another sheet/sheets of paper) to send to Mr. Blind. The proposal should include all of the following:

- An **explanation of why your company's means** of transport **would work best** for Mr. Blind's needs. Why is road, canal, or rail transport the best way to ship goods? Is it fast? Cheap? More safe? Any other reasons?
- An **explanation of why competing companies' means** of transport would **NOT** be as good as your company's. Why is your way better than the ways of the other two groups? Are their ways more dangerous? More expensive? More time-consuming? Any other reasons?
- Mr. Blind is a very skeptical man, so he wants all parts of your group's proposal to include **EVIDENCE**. Specific figures, facts, and dates might be helpful in convincing him. You should use maps, atlases, the readings, and any other materials that you think might be helpful in preparing your proposal.
- Your group should consider including **at least ONE diagram**, such as a **chart or map**, with your proposal draft. You will be provided with an enlarged image of the blank map above.

When you are finished with your proposal, please make sure that your name is on this sheet. Then, please answer the questions on the back of this sheet. You should then turn in this sheet at the same time as your group's proposal.

Please write one SPECIFIC contribution that you made to your group's proposal:

Based on the evidence you've read and the research you've looked into for your proposal, which method of transportation would have been most effective by the 1840s? What made it most effective?

In recent history (in your lifetime), recall at least one revolution in transportation that you've seen (or even experienced). In what ways did it improve the way that people or things are transported?

Innovative Transportation

In the late eighteenth century, primitive methods of travel were still in use in America. Waterborne travel was uncertain and often dangerous, covered-wagon and stagecoach travel over rutted trails was uncomfortable, and all types of travel were very slow. Americans were aware that a transportation network would increase land values, stimulate domestic and foreign trade, and strengthen the American economy.

In 1794, a private company completed the Philadelphia-Lancaster Turnpike, a broad, paved highway that was similar to the good European highways at that time. It was called a “turnpike” because as drivers approached the tollgate they were confronted with a barrier of sharp spikes that was turned aside when they paid their toll. The completion of the Lancaster Turnpike resulted in a turnpike-building boom that lasted nearly 20 years. By 1821, nearly 4,000 miles of turnpikes had been completed, mostly connecting eastern cities. Money needed to build the new turnpikes was coming primarily from state governments and in some cases from individuals.

Constructing decent roads over the Appalachians and in the west was a more difficult task than building those in the east. Although states’ rights proponents regularly blocked spending federal funds for internal improvements, one notable exception was the Cumberland Road. In 1811, the federal government began to construct a turnpike—Cumberland Road, also called the “National Road”—which stretched 591 miles from Cumberland, in western Maryland, to Vandalia, in Illinois. The project was completed in 1852 with a combination of federal and state aid, with different states receiving ownership of segments of the highway.

Americans benefited from the new turnpikes; however, it was not yet economical to ship bulky goods by land across the great distances in America. Businessmen and inventors began concentrating on improving water transportation. In 1807, Robert Fulton sent the first commercially successful steamboat, the *Clermont*, from New York City up the Hudson River to Albany. Skeptics initially thought the project would never work and nicknamed the boat “Fulton’s Folly.” The *Clermont* made the run of 150 miles at about five miles an hour, proving that it was an efficient vessel. Thereafter, use of the steamboat spread rapidly, with steamers making the run from New Orleans as far north as Ohio. By 1830, there were more than 200 steamers on the Mississippi.

As early as the 1820s, the successes of the steamboat were clear. Steamboats played a vital role in opening the west and south to further settlement. They stimulated the agricultural economy of the west by providing better access to markets at a lower cost. Farmers quickly bought land near navigable rivers, because they could now easily ship their produce out. Villages at strategic points along the waterways evolved into centers of commerce and urban life. In the 1830s and 1840s, the port of New Orleans grew to lead all others in exports.

Steamboats were also much more comfortable than other forms of land transportation at the time. The *General Pike*, launched in 1819, set the standard for luxurious steamers with marble columns, thick carpets, ornate mirrors, and plush curtains. Luxury steamers evolved into floating palaces where passengers could dine, drink, dance, and gamble as they traveled to their destinations.

While steamboats were conquering western rivers, canals were under construction in the northeast to further improve the transportation network. In 1817, the New York legislature endorsed Governor DeWitt Clinton’s plan for connecting the Hudson River with Lake Erie—the Erie Canal. Completed in 1825, the canal ran 363 miles from Albany to Buffalo. The completion of the canal reduced travel time from New York City to Buffalo from 20 days to six, reduced the cost of moving a ton of freight from \$100 to \$5, and

moved the country a step closer to linking the Mississippi Valley and the Atlantic Ocean. The canal also provided a water route from New York to Chicago, via the Great Lakes, and marked the beginning of Chicago's rapid growth.

The Erie Canal was immediately a financial success, paying for itself within seven years. The success of the "Big Ditch" sparked a canal-building mania that lasted for more than a decade and resulted in around 3,000 miles of waterways by 1840. Ohio built the Ohio and Erie Canal, running from the Ohio River to Cleveland, and Indiana built the Wabash and Erie Canal. Both were feeders that supplied farmers west of the Appalachians with water connections to the east.

The Erie Canal had broad economic implications. The value of land along the route increased, new cities in New York such as Rochester and Syracuse sprang up, industry in New York boomed, and farming in the Old Northwest attracted thousands of newcomers who could now easily ship their goods to market on the east coast.

Both the turnpike and the canal contributed to the emerging national economy, but the most significant development was the railroad. Railroads were faster and cheaper than canals to construct, and they did not freeze over in the winter. Since many states had overextended by borrowing heavily to finance their canals, much of the early railroad growth was developed by private investors.

In 1828, development of the first railroad began in Baltimore, and four years later the Baltimore and Ohio (B&O) Railroad reached 73 miles. By 1833, the Charleston and Hamburg Railroad extended 136 miles west of Charleston. The Panic of 1837 slowed railroad construction, but by 1840 the United States had over 3,000 miles of tracks, nearly double the mileage in all of Europe. And by 1860, the U.S. saw development of over 30,000 miles of railroad tracks, three-fourths of which were in the industrializing north. There were several southern railway lines, but no one single southern railway system.

Early railroad pioneers faced several challenges: Tracks with steep grades and sharp curves required more powerful locomotives, sparks from wood-burning engines caused fires, brakes were ineffective, and wooden rails topped with iron straps wore out quickly and broke loose, causing dangerous crashes. The intent of most early railroad builders had been to monopolize the trade of certain districts, not to establish connections with competing centers, so few of the tracks were coordinated into railroad systems. Frequently, railroads went so far as to use tracks of different widths to prevent other lines from using their tracks.

Eventually, all of these railway obstacles were overcome. Modifications in locomotive design enabled trains to negotiate sharp curves, engines that could burn hard coal appeared, better brakes were developed, and the iron T-rail combined with cross-ties increased durability of the tracks. Rail gauges also gradually became standardized, linking the various rail lines together.

Water travel was generally more comfortable than the train, but railway travel became the most popular form of transport because it was economical, reliable, and fast. Trains traveled more than twice as fast as a stagecoach and four times as fast as a steamboat.

The development of so many railroads changed American society. The railroad provided indirect benefits by encouraging settlement and expansion of farming, thus transforming agriculture. Much more of the fertile prairie could be developed because the farmers now had access to national markets via the train. American cities were also influenced by railway development. Eastern seaports, along with other intermediate centers like Cincinnati, benefited from an increase in exportable goods.

Other forms of transportation were also working to bind the United States together and to the rest of the world. In 1845, the first clipper ship, the *Rainbow*, was launched. Clipper ships were long, narrow, and built for speed. With their taller masts and numerous sails, they could outrun a steamer if there was a good breeze. While in operation, clippers carried highly demanded tea from China to America and transported goods to the prospectors in California. Clippers lasted less than two decades because, although they were fast, they did not have much cargo space.

In 1860 in the far west, the Pony Express was established as a form of transportation for carrying mail. Daring pony riders carried mail from Missouri to California in ten days—an amazing feat for the times. The riders changed horses at stations every 10 miles, and rode summer or winter, day or night, good weather and bad. The Pony Express only lasted 18 months, succumbing to Samuel Morse's telegraph machine.

The transportation revolution in the United States had been spurred by the desire of the Easterners to tap into all that the west had to offer. Turnpike, canals, steamboats, and railways forged a truly continental economy. Transportation innovations cut the cost and increased the speed of moving goods, helping to create a national market and provide a stimulus for regional specialization. Westerners, with their boundless prairies and swiftly growing population, became important producers of commercial agriculture, supplying both the North and the South with food. Northerners supplied the West and the South with textiles and other manufactured goods. Southerners supplied the North with cotton, the raw material they needed to produce their textiles.

The movement of goods over long distances to the various regions required a supporting infrastructure, which stimulated the growth of market towns where merchants, bankers, warehousemen, retailers, and other middlemen provided the services needed to move the goods from producers to consumers. More extensive markets increased competition, pushing manufacturers to produce better and cheaper products in order to capture a larger share of the market.

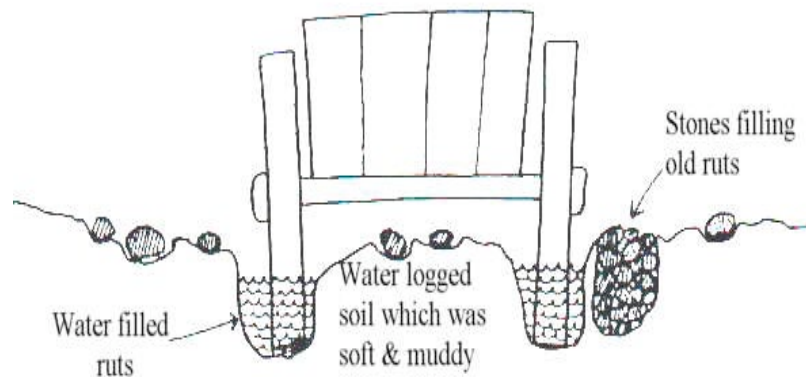
Transportation innovations encouraged a new sense of connectedness among Americans, encouraging a deeper sense of nationalism. The transportation revolution pushed nineteenth-century America through the process of integrating an entire continent into a single cultural and economic entity.

(Source: <http://www.apstudynotes.org/us-history/topics/the-transportation-revolution/>)

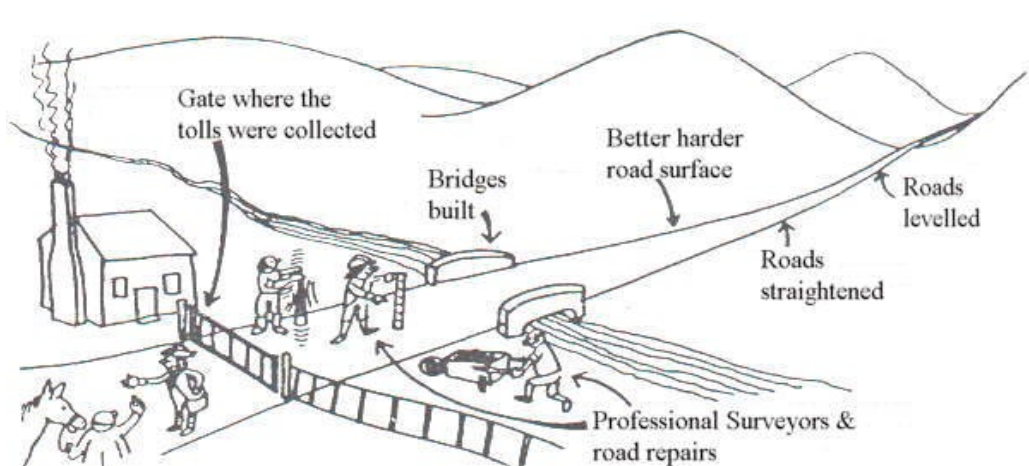
The Turnpike Trusts

Turnpike trusts were local companies that were set up to maintain roads. They were toll roads, where the user had to pay a **fee (a toll)** to make use of the road. These trusts were needed because the government did not finance things such as roads at the time.

Turnpike trusts would need to raise quite a lot of money to make improvements to the roads. The image below shows you what roads were like in the days before tarmac and regular repairs to roads.



Roads such as these were not really suitable for transporting fragile goods along. Industrialists needed flat and hard wearing roads to enable larger wagons to be able to make use of them safely. Turnpike trusts enabled this to happen. The diagram below shows what the outcome of Turnpike trusts was for roads.

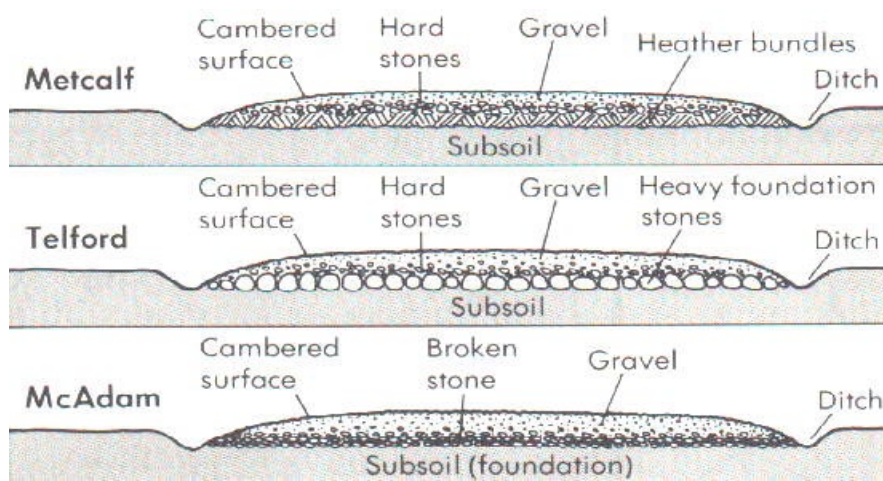


Not everybody was pleased with turnpike Trusts however. Lots of people were very angry that they had to pay money to use roads that had previously been free. In

some places there were violent protests about the roads and toll houses and toll gates were the target of angry mobs.

As the Industrial Revolution continued and other forms of transport, such as the Canal and the Railway systems evolved, the need for Turnpike Trusts was reduced. Eventually the government and local authorities took responsibility for making roads. Further improvements were made, by British and American engineers such as Telford, MacAdam and Metcalfe.

These men used a range of ideas, not too dissimilar to those that the Romans had used two thousand years earlier, to make roads flatter, smoother and more hard wearing. The diagram below shows the way in which each of these engineers designed their roads, making use of a variety of types of material.



(source: <http://www.schoolshistory.org.uk/IndustrialRevolution/transport/roads.htm>)

Canals

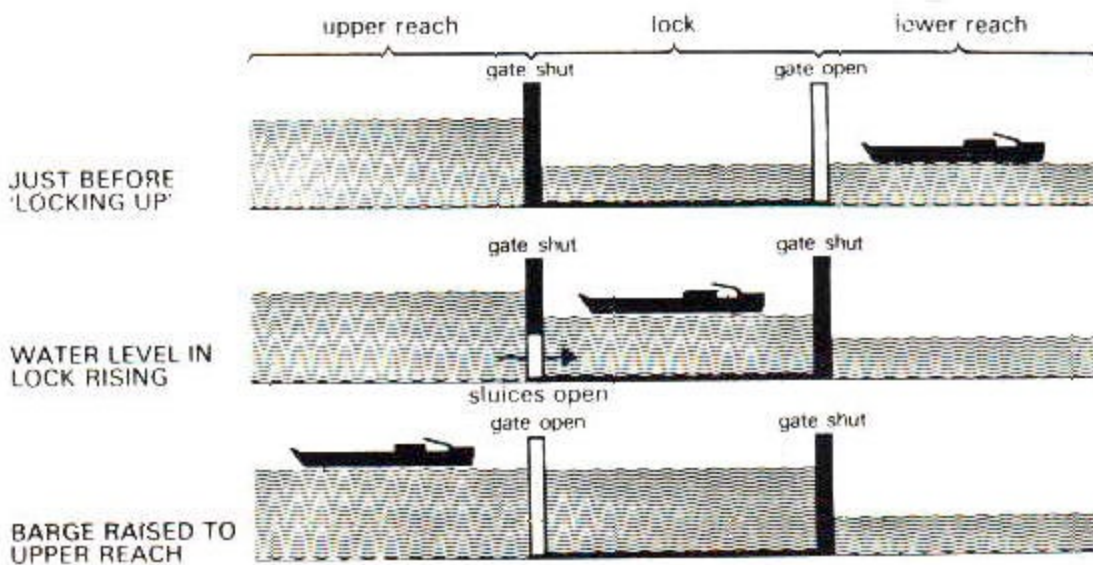
Canals are manmade waterways. They were built during the Industrial Revolution to allow industrialists to move large quantities of raw materials and goods to and from their factories.

A canal has several big advantages over using roads. (Remember that roads at the time were not as good as they are nowadays).

Firstly a boat, or barge, on a canal is not going to have a bumpy journey so fragile goods are much less likely to smash on route. Secondly a canal barge is much larger than a horse drawn wagon and so it can be used to carry much more than wagons on Turnpike roads could be expected to. The third major advantage of canals is that, once they are built, they are very cheap to use. If a barge can carry 50 tons of coal and it only takes two men to look after the barge consider how much has been saved in wages if the largest wagon on the road could only carry 2 tons. There's also less breakage so the factory has more goods to sell.

Industrialists soon realized that Canals were a very good idea and invested heavily in the construction of this new form of transport. By the end of 'canal mania' it was just about possible to use inland waterways to get goods from most cities to any of the major ports.

The engineers who designed Canals were very capable men. One of the basic problems with using water for transport purposes is that water doesn't go up and down hills in the way that roads can.



Using a system of gates on a hill the canal builder could create a system where-by the people working the barge could open and shut gates in the order demonstrated above to move the barge uphill.

Barges were powered initially by horses. A tow path can be found on one side of all canals. This was for the horses that dragged the barges up and down the canals. In tunnels however there was no tow path, the horse would be walked over the hill to the other side. To get through a tunnel the men working the barge would have to

lay on top of the barge and use their feet of the side of the tunnel to 'walk' the barge through the tunnel. this process, illustrated below, was called legging.

Canal building stopped with the invention and development of the steam engine. Most of the canals of the industrial age are still navigable (boats can use them) and are used by thousands of people each year for barging holidays. Some canals are being redeveloped and reopened to recognize the importance that canals have in our heritage and to promote tourism in some areas. (Most barges now have engines as well, so you'd not HAVE to go through tunnels on foot: although some people still do it this way!)

(source: <http://www.schoolshistory.org.uk/IndustrialRevolution/transport/canals.htm>)

Railways

Railways developed quickly following the early successes of the western pioneers. This new technology was the result of the invention and subsequent development of the steam engine. Steam could be used to power motors and had been used in mines to help bring coal and tin to the surface quicker. This idea was transferred to the notion of pulling wagons along rails and eventually Stephenson took the idea one stage further and built the steam engine into a wagon.

This first 'train' was very slow and initially scared a lot of people but soon the early railway lines between major cities were accepted and people began to realize that Rail had a lot to offer industry and society in general.



The railways spread across the country at an amazing rate as companies were established to build and run the new lines. Many were financed by industry, eager to have quicker delivery of goods and wider sales reach.

The impact of the railways was great. Industry benefited as goods could now be transported faster and in even greater quantities than before, reducing costs and creating bigger markets. The construction of the railway network also fueled demand for coal and steel. Ordinary people saw the benefits too. They could now get around the country much quicker and for the first time vacations out of the city were a possibility. Communications in general improved as well. Newspapers could now be sent from the major cities in which they were printed to towns across the country. The postage system also became much quicker, and movement of workers became a more realistic prospect.

One of the most noticeable consequences of the growth of the Railways was the rapid development of a number of towns. Many towns in the west today sprang up originally due to their location on the railway network.

(Source: <http://www.schoolshistory.org.uk/IndustrialRevolution/transport/railways.htm>)

Blank Map for Activity:

