Teaching the Unit
Unit 11: Big Factories and New Industries, 1820–1920

Unit Summary

The transformation of New Hampshire from a rural society to an industrial one brought enormous changes in a relatively brief period of time. The wholescale adoption of the factory system changed almost every aspect of people's lives: how they earned their living and spent their time, where they lived, roles within the family, and their connection to the wider world. New Hampshire was an industrial leader, building more factories, particularly textile factories, than other states and transitioning to an industrial economy earlier than other states as well. But the changes that came to New Hampshire would mirror the economic and societal revolution that would eventually sweep across the rest of the country.

Full Educator Overview

The Big Picture

New Hampshire's industrial era in the 19th and early 20th centuries transformed the state from a collection of quiet, rural, agricultural communities to an economic powerhouse on the world stage. The Granite State's industrial heritage left its imprint on New Hampshire for decades after manufacturing's decline.

- New Hampshire was one of the earliest states in which large-scale manufacturing developed, in part because of the prevalence of waterways. The state's many rivers, most of which had mighty waterfalls, powered the machines that fueled the Industrial Revolution.

- Although many industries flourished in New Hampshire, the state's three main manufacturing enterprises were textiles, shoes, and lumber. Enormous factory complexes developed all over the state to produce goods on a large scale that were then shipped all over the world.

- Industrialization resulted in the expansion of transportation networks and the development of new forms of communication, like the telegraph and telephone.

- Working in factories dramatically changed the way the people of New Hampshire lived. The factory system imposed far more regulations and routine on their lives than had farming. People working in the factories—men, women, and children—began to live by a strict schedule marked by the ringing of bells indicating when they should awaken, eat meals, work, take breaks, and go to bed. The labor they undertook was repetitive and sometimes dangerous.

- The rise of factories around the state led to the development of cities and urban areas, as workers moved to manufacturing centers. Life in the cities required more organization and urban planning but also offered greater opportunities for recreation and entertainment.

- The reorganization of society to accommodate so many people conducting business with one another led to the introduction of greater standardization in things like time (the implementation of time zones), currency (the widespread use of federally backed money), and measurement (greater uniformity of weights, lengths, and sizing).

The Industrial Revolution in New Hampshire

What was the Industrial Revolution?

In the second half of the 19th century, the United States experienced an economic expansion that became known as the Industrial Revolution. Across the country, rural agricultural villages and artisan workshops gave way to big industrial cities. Rather than small, water-powered mills, industry became characterized by big factories, machine-driven manufacturing, and mass production.

This era came early to New Hampshire, because New England's textile mills were the birthplace of American industry. (For more on early industry in the state, see Unit 8: Building a State.) By the time large-scale industrialization reached the rest of the country in the mid-19th century, it was already well established and flourishing in New Hampshire.

The growth of industry brought with it the development of transportation and communication networks. Railroads were particularly important to the Industrial Revolution. They were used to bring raw materials to the factories and then to transport manufactured goods to cities and towns all over the country, creating new markets for products. The first railroads came to New Hampshire in the late 1830s and 1840s, by which point large-scale manufacturing was spreading rapidly throughout the state. It is no coincidence that the earliest rail lines connected mill towns like Nashua and Manchester with Boston, cutting the time it took for textile goods to travel to market from an entire day to just a few hours.

Industrialization brought several major technological advancements in addition to railroads. The development of reliable sources of power was critical to fueling the factories. Although water power initially ran the factories, it was replaced by the 1860s with steam power, which could be maintained more consistently and was less subject to environmental conditions such as rainfall and snow melt. Steam power was in turn replaced by gasoline and then electricity by the early 20th century. Innovations in communication like the telegraph, telephone, and typewriter also contributed to economic growth and connected Americans to one another in new and unprecedented ways.

New Hampshire's Major Industries

Which industries thrived in New Hampshire during the Industrial Revolution?

The first factories in New Hampshire were textile mills, powered by water mills located along the state's waterways, which began springing up in the southern part of the state in the early 1800s. These mills supplemented other small-scale industries like shipbuilding, sawmills and gristmills, and mining that had existed in New Hampshire since the colonial period. By mid-century, New Hampshire's textile mills had grown into major industrial complexes and other manufacturing ventures had emerged as well to shape the state's economy. Nearly all of these industries were located along New Hampshire's rivers, which, until the turn of the 20th century, powered the machines that made the Industrial Revolution possible.

Textiles. Manchester was the center of New Hampshire's textile industry, although many other communities such as Nashua, Dover, and Rochester also had large textile factories. By the 1840s, Manchester was dominated by the Amoskeag Manufacturing Company, which gradually bought up almost every other factory in the city during the second half of the 19th century. The Amoskeag Company became the world's largest textile plant when it reached its peak during World War I. In

its heyday, the mill complex in Manchester employed 17,000 workers, making it the largest employer in the state, and produced 50 miles of woven cloth per hour. Not only did it have 40 textile mills and 8 million square feet of floor space, it also owned its own print shops, machine shops, and dye houses, mechanical and electric departments, steam power plants, and a hydroelectric power station. Few people living in the Merrimack Valley were untouched by the Amoskeag Company and its influence. In other communities and on a smaller scale, textile manufacturing was just as important. Mills typically were the economic lifeblood of a community, and nearly everyone living in a textile mill town was affected by the company or companies that ran them.

Textiles, which had been created slowly and by hand in 1800, were produced in enormous quantities in New Hampshire by 1850. This shift in textile production from homemade cloth to a factory-produced commodity occurred in the early days of the state's Industrial Revolution. (See Unit 8: Building a State.) The mills produced textiles made from both wool and cotton. The wool was produced locally, gathered from farmers throughout New England, but the raw cotton came from the American South, grown and harvested by millions of enslaved people and, after the Civil War, by sharecroppers. As the demand for cotton for the mills grew, it fueled the expansion of the slave economy into new territories and states like Mississippi, Louisiana, Arkansas, and Texas. Those southern slaveholding states were in turn a large domestic market for the finished textile goods produced in New Hampshire's mills. The textile boom thus linked New England's economy to the South and to westward expansion.

By mid-century, the state's textile industry had gained an international reputation for both the high quality of the fabric produced and the wide variety of fabrics on offer. Cloth produced by the Amoskeag mills was even honored at the Great Exhibition in London in 1851 and the *Exposition Universalle* in Paris in 1855. The reach of New Hampshire's textile industry extended across the globe. In the 1880s and 1890s, for example, transcontinental railroad routes brought cloth manufactured in Nashua's mills to ports on the west coast of the United States. It was then loaded onto steamships and transported to Shanghai, where it was finished into clothing.

Shoes. The shoemaking industry in New Hampshire is an excellent example of the shift from craft industry to mechanized production during the 19th century. In 1800, shoes were made in local communities almost exclusively by cordwainers (craftsmen who made shoes, while cobblers repaired shoes). Parts of the manufacturing process were even farmed out to others in the community who provided both skilled and unskilled labor. By 1900, most shoes were produced in factories. The invention of different machines to cut leather, shape the uppers, punch holes, and sew the pieces together streamlined the process of making shoes and meant that it could all take place in a single factory under one roof, rather than different workshops located throughout the countryside. By the end of the 19th century, nearly every part of the shoemaking process was done by machines, and those machines were powered by steam engines, rather than by hand.

Shoe factories were concentrated in the southern part of New Hampshire. The first shoe factory in Nashua opened in 1874, Newport got its first shoe factory in 1887, and Manchester got its first in 1892. The shoe industry grew so rapidly in Manchester that by the turn of the 20th century the city had become known as the "city of shoes."

Logging. Like textiles and shoes, logging in New Hampshire changed to a factory industry in the second half of the 19th century. Logging mills became more numerous, larger, and more mechanized, and produced an exponentially greater amount of timber and wood products.

Although the state had always had a fair amount of logging, even during its colonial days when New Hampshire supplied ships' masts for the British navy, industrialization drove a demand for lumber, which was used to build factories, worker housing, rail ties, and railroad cars and stations. Wood was also used to fuel steam engines. In 1852, the Berlin Mills Company, located in the heart of the North Country, established a large sawmill to take advantage of the enormous power produced by the 17-foot drop of the falls in Berlin. The following year, a railroad connected Berlin to Portland, Maine, making it faster, easier, and cheaper to transport lumber boards from the sawmills to markets in Portland and beyond. It was still difficult to transport the raw material timber from interior forests to the sawmills, but even that had changed by the end of the century. When the railroads reached the interior of the North Country in the 1880s, they opened up the region to intensive logging. Logging companies built dozens of their own short railroad lines to connect logging campsites directly to the main rail branches.

At the same time, the logging industry shifted from producing timber as a source for construction and manufacturing and started using it for paper production. For centuries, paper had been made from cotton rags. Producing it was an expensive and labor-intensive process, and it was difficult for paper manufacturers to acquire enough cotton rags to keep up with increased demand, especially after the steam-powered printing press was invented in the mid-19th century. By 1870, a chemical process was developed to make paper from wood pulp. The first wood pulp paper mill in New Hampshire opened in 1877. In the next decade, the Berlin Mills Company began its transition from a large lumber mill to a large manufacturer of wood pulp and paper.

The paper industry in New Hampshire grew rapidly between 1890 and 1900. By the early 20th century, the Berlin Mills Company was the world's largest chemical paper pulp mill, and the biggest producer of newsprint in the world. It invested in research and development, inventing a number of products, including kraft paper, the coarse brown paper used for packaging, mailing, and industrial uses.

Farm Time and Factory Time
How did industrialization change the way people worked in New Hampshire?

For the tens of thousands of workers who left farming and took jobs in New Hampshire factories, industrialization radically changed the nature of work. Agricultural work was physically demanding and labor-intensive, but most people worked on their own farms and made their own decisions about how to spend their efforts. At the mercy of nature and the weather, farm work was organized around natural rhythms, seasonal changes, and family life. And although life on a farm was by no means secure, most farmers in New Hampshire were fairly independent and self-sustaining, even if they and their families were just getting by. There were periods of intense labor on a farm, particularly during planting and harvesting seasons, and periods of relative calm, such as during the winter when many farmers filled their days and earned extra money by engaging in a craft trade, like making furniture.

For workers in the mills, however, life in the factory was very different. Factories and mill yards were enormous—almost cities unto themselves—with vast buildings and huge crowds of workers streaming in when the gates opened each morning. Industrial machinery was intensely noisy, not to mention dangerous, and workrooms were hot and dirty. The work was monotonous, and rigid work schedules were governed by a series of bells. Typical shifts were 12 hours per day, 6 days per week, and the work was not seasonal. It continued year-round regardless of the weather. The idea of a vacation was not introduced until the end of the 1800s, and then usually only for the

management class. Vacations did not become widespread among the working class until well into the 20th century.

The nature of work was different in the factories as well. Gone was the variety of tasks needed to run a farm. Workers in factories were generally tied to a small set of well-defined duties. There were skilled and unskilled workers, with men tending toward the skilled jobs, such as mechanics, and women and children more likely to be engaged in unskilled jobs. Men were also far more likely to hold management positions in factories, which naturally elevated their status and their income. For most workers, the work itself was monotonous, with employees undertaking just a few tasks in their part of the production process. Some of those tasks required skilled labor, but as the 19th century progressed, more and more tasks were unskilled, with machinery completing a large part of the production process. Workers were still needed to tend the machinery, though.

Initially the textile mills utilized a new workforce, young women from New England farm towns who often lived in company-owned housing and worked for a few years until they married. They were known as New England mill girls. They arrived in New Hampshire cities from their families' farms, where their labor was not as valued as their brothers'. Before the production of textiles moved into a factory setting, it was traditionally done at home by young women working with spinning wheels and foot-powered looms. It was hardly surprising then that when much of this work started to move into factories, women followed the work. Textiles were, after all, one of the most important and time-consuming goods to produce, but they had myriad uses at this time, most notably clothing and bedding. Yarn and thread was such a valued commodity in the early 19th century that it was actually used as currency in some places in New Hampshire.

Most of these New England mill girls were in their teens or early twenties, and the experience of leaving home and living without the supervision of their parents was a novel one. Before the advent of factories, these girls would only have left their parents' household when they married, but suddenly, hundreds of young women were living on their own in growing urban centers. Initially, the factory owners established a very structured environment for the mill girls. They lived in boardinghouses where they were expected to adhere to strict codes of conduct, overseen by a matron, who was typically an older widow with little prospect of remarriage. Meals were provided, and all forms of entertainment, like lectures, concerts, and church services, were carefully screened to ensure moral standards. Factory owners even signed written contracts with the girls' parents promising to act *in loco parentis* in exchange for their labor.

Nevertheless, it must have been a heady experience, with the girls having more opportunities to form friendships, meet people outside of their families' typical social circles, and enjoy a greater degree of freedom than they could have at home. Inevitably, some girls came to bad ends, as the men who came to the growing cities were not always honorable. Girls who had been overly familiar with men lost their jobs and were sent home in disgrace. The working conditions were often unpleasant, as girls were expected to labor six days a week for 10-12 hours per day. Their wages, which were typically just a few dollars a week, were often sent home to their parents. Industrial accidents were common, and little provision was made for the girls' general health and safety. But on the whole, most girls seemed to feel the experience was a positive one, as their letters home often convinced their friends and sisters to join them in factory work. As mill girls got older, they tended to marry and return to the countryside to raise their families.

As the factories expanded, this labor source became insufficient. There simply weren't enough New England mill girls to staff the state's ever-growing roster of factories. Beginning in the late 1840s,

the farm girls were replaced by immigrant labor, notably Irish and then French Canadians. The Amoskeag mills, for example, aggressively recruited workers from Quebec, and by 1910, French Canadians made up 35% of their workforce. Many families refused to let their daughters work in the mills once large numbers of immigrants arrived. They believed the immigrants would have a corrupting influence. As immigrants poured into New Hampshire's cities, the girls from better families left, although many poor New England mill girls had no other choice than factory work. The carefully constructed program created to supervise the mill girls disappeared, though, and factory owners rarely felt responsible for their workers on their off-hours. The mill girls were often left to fend for themselves in crowded, bustling cities.

By the second half of the 19th century, immigrants from all over Europe were flooding into New Hampshire seeking employment in the state's industries. (For more on the immigrant experience in New Hampshire, see Unit 12: Immigration in the Industrial Age.) Given the poverty of many of these new arrivals, it was not uncommon for entire immigrant families to work in the factories.

If factory work was dangerous and overwhelming for the adult men and women who worked there, it was even more so for child workers. In New Hampshire, as in other industrialized areas of the United States, many children worked in mills and factories, particularly in the textile industry. Although they were at the bottom of the job-pecking order, child labor was seen as necessary to keep the factories functioning smoothly. The children's size allowed them to crawl under the looms and into machinery to make minor repairs, and their little fingers were much more capable of performing the delicate work involved in the spinning of thread and the weaving of cloth. Children worked as spinners, doffers, or sweepers. Spinners were often girls, and this job involved walking up and down the aisles amidst the machinery to clear away lint and watch for breaks in the thread. If a thread broke, the spinner would fix the string. Doffers were usually boys who would remove the bobbins when they were filled with thread and replace them with empty ones. Accidents were all too common, and many children lost fingers, hands, or arms in the high-powered machinery. There were also health dangers from breathing in the lint floating in the air in most textile factories, which caused a host of lung ailments.

In 1846 New Hampshire became one of the first states to pass a child labor law. This legislation required that child workers complete a certain amount of schooling each year, and subsequent laws regulated the minimum age of employment and maximum working hours for children. However, there were no enforcement mechanisms, and no systematic inspection of factories to ensure that companies were complying with the laws. Many young children continued to work long hours in dangerous conditions, including overnight shifts, at the expense of their health, education, and well-being. In 1908 photojournalist and social reformer Lewis Hine, working for the National Child Labor Committee, traveled throughout New Hampshire as part of his nationwide project to document child labor abuses. Thanks in part to Hine's work and the efforts of reformers on the state level, including organized labor and women's clubs, New Hampshire passed a more comprehensive and effective child labor law in 1910.

Like their fellow workers in other industries and other states, New Hampshire's workers organized formally and informally to improve their working conditions, workplace safety, and wages, although these efforts were sporadic. The first female-led strike in the country occurred at the Dover Cotton Mills in 1828, when roughly 400 women organized for better wages. Women workers in the Manchester Print Works launched a strike in 1855 in response to an increase in the workday. These strikes were unusual, though. The 1880s may have been a period of labor unrest in the United States, but New Hampshire's industries did not experience a lot of strife during this time. Unions

did not make significant inroads in most Granite State industries, and labor disruptions were minimal, with the exception of a short strike in the Amoskeag mills led by the Knights of Labor in 1885.

Many workers derived a strong sense of identity from their employment at a company, an identity that was shaped by and often strengthened family ties. Older family members hired younger relatives, often in the same shop or mill. Entire family groups or immigrants from the same neighborhood worked in the same print shop or weaving room together. This sense of company loyalty was particularly prevalent at the Amoskeag Manufacturing Company. In the 1910s, for example, Amoskeag launched a corporate welfare program that provided a range of benefits to its employees, including social and recreational activities, a dental service, technical training, and a home-ownership program. These efforts were designed to prevent unionization, socialize new immigrant arrivals to industrial work, and instill loyalty to the company. This strong sense of identity and loyalty to the company was a key factor in generally positive relations between management and labor in many New Hampshire industries, and it was not uncommon for employees to spend their entire working life laboring for the same company. It was not until the 1920s, as industries across New Hampshire began to decline, that labor unrest came to the state. (For more on the decline of the mills, see Unit 15: Forging a Modern Identity.)

Life in the Big City
How did industrialization change the way people lived in New Hampshire?

The growth of industry and the technological changes that went along with it combined to drive the growth of cities in New Hampshire. The big factories and new industries needed workers, and the expansion of transportation networks, including electric rail and streetcars, made it cheaper and easier for people to move around. The availability of steady employment drew more and more migrants to cities.

By the 1840s New Hampshire's urban population was growing rapidly, and urban growth accelerated even more dramatically through the rest of the 19th century. In 1840, 10% of New Hampshire's population lived in urban areas; by 1900, nearly 50% of the people in New Hampshire lived in urban areas.

The most dramatic gains in urban population occurred in the Merrimack Valley corridor of Nashua-Manchester-Concord and in Berlin, all of which were industrial centers. City dwellers came from rural farms and small towns in New Hampshire as well as other countries, like Canada, Ireland, Germany, Russia, or Greece, to work in factories. The rural villages of Derryfield and Dunstable became densely populated cities, renamed Manchester and Nashua, respectively. They even got their names from industry—the colonial-era town of Derryfield had been renamed after the industrial city of Manchester, England, in 1810, and in 1837 Dunstable was renamed Nashua to reflect the predominance of the Nashua Manufacturing Company. Manchester saw spectacular growth during this period, going from a population of roughly 2,000 people in 1840 to 14,000 just 10 years later. The succeeding decades would see similar growth in what quickly became New Hampshire's largest urban area.

New Hampshire's cities needed all sorts of technology and infrastructure to serve their growing populations, from gas-powered and eventually electric lights, to bridges, roads, trolley and streetcar systems, and government buildings like schools and post offices. As more people moved to the cities for work, the cities also required more housing and more businesses like grocers,

dressmakers and tailors, and banks to provide services for them. The manufacturers themselves tried to address some of these needs, often investing in constructing worker housing. Many of these dwellings became overcrowded, though, and what was originally planned as comfortable living arrangements degenerated into broken-down tenements with insufficient water and sewage facilities. Single workers often lived in boardinghouses, which afforded them little privacy. Factory managers usually received decent housing as part of their compensation, leading to the development of middle-class neighborhoods in most New Hampshire cities. The factory owners built for themselves lavish homes situated in graceful neighborhoods such as Manchester's North End.

Most of New Hampshire's major towns and cities made at least some attempt at city planning, laying out streets and parks and configuring adequate water, power, and sewage systems. Factory owners, who were almost always community leaders, played a major role in these efforts, ensuring that the needs of their industries were well met by urban planning.

The massive influx of foreign workers gave New Hampshire's urban centers an international flair. Just as immigrants clustered in similar occupations as their extended families or people they knew from their home country, they also often settled in the same neighborhoods. These city neighborhoods provided social and cultural ties to the old country with ethnic businesses, churches, schools, and cultural centers. Grocers in French-Canadian neighborhoods like Manchester's west side, for example, carried traditional Quebecois foods, the local tavern was a gathering place for the French-Canadian community, and the nearby Catholic church offered services in French and language classes in both French and English for the children of immigrants. Even today this neighborhood retains French-Canadian characteristics. (For more on immigrant communities in New Hampshire, see Unit 12: Immigration in the Industrial Age.)

New Hampshire's cities boasted not just ethnic variety but cultural variety of all types. Church organizations and secular clubs presented opportunities to meet like-minded people and pursue various hobbies or interests. Theaters and taverns offered entertainment choices for the more adventurous. By 1900, there were even amusement parks in places like Manchester and Salem to entertain Granite Staters.

Retail districts of restaurants and shops offered city dwellers an opportunity to partake of various products created in the country's factories and shipped into the state's big cities via the railroads. Mass production had created not just a greater variety of products but also made them cheaper and more accessible. Thus handmade luxury items—things like glassware, ceramics, furniture, and books—that would have been available only to the wealthy in 1800 became cheaper and more prevalent when machine-made and produced in large numbers in 1900. People of all social classes began to acquire and accumulate more stuff—clothes, shoes, bedding, housewares, toys, etc.

The rise of cities and the increase in regional and national commerce highlighted the need for greater standardization throughout the country. Establishing a uniform method of keeping time is one example of this type of standardization. Before the spread of railroads, most people kept time based on the position of the sun in the sky. Railroads, however, developed timetables and set schedules, which required people living at great distances from one another to coordinate their clocks. In 1883 the United States adopted a system of four time zones that stretched across the continent and allowed railroads to better keep to set schedules of service. The following year, the United States, along with many other countries in the world, adopted Greenwich Mean Time as the worldwide standard. The world's "official" time would henceforth be maintained by the Greenwich

Observatory in England and replace more informal, and imprecise, measures of time done at the local level.

Currency was another area that saw greater standardization during this period. Before the Civil War, American currency was a hodge-podge of state and federal coinage and bills. In 1863, the U.S. government introduced a system that replaced state currency with a single federal currency, popularly known as greenbacks because of the green ink used to print the federal bills. Coinage likewise became more standard, as the federal government began minting pennies, nickels, dimes, and quarters to serve as legal tender. Although it took many decades for older currencies (like the half penny) to pass completely out of usage, the changes made in currency during the late 19th century moved Americans toward one system, which was necessary to facilitate business and commerce across state lines and between the various regions of the country.

A standard system of weights and measures in the United States was slower to be adopted and would not be fully implemented until the middle of the 20th century, but Americans began to move toward more common units of measurement (inches, feet, yards) during the late 19th century as well as weights (ounce, pound, ton), which was again made necessary by the need to conduct business over large geographic areas. Regional business traditions impeded national commerce and were replaced. Unsurprisingly, this modernization in the way people lived and conducted business was more apparent in cities than rural areas, which held to more traditional ways well into the 20th century.

More Change for New Hampshire Farms
How did industrialization affect life in New Hampshire's farm communities?

The quiet, custom-bound life found on New Hampshire's farms simply could not compete with the bustle and opportunity of the state's urban centers. It is unsurprising then that the growth of cities was accompanied by a decline in the rural population, even as New Hampshire's total population increased. Although groups like the New Hampshire State Grange, founded in 1867, attempted to bolster community life by hosting social events and agricultural fairs, the state's rural communities could not convince young people to stay in the country when all the amenities of city life beckoned.

The nature of farming changed in New Hampshire during this period as well. By mid-century, railroads were bringing not just raw materials to the factories but also large quantities of foodstuffs from the Midwest, where it was easier to grow grains like wheat and barley. There was also more room in the Midwest to raise livestock like cattle. Even factoring in transportation costs, New Hampshire farmers were undersold by Midwest competitors, who supplied sustenance for the state's rising urban population. Many New Hampshire farms were abandoned in the second half of the 19th century. The farmers who remained shifted to dairy farming and cultivating produce like apples and berries, serving the market for perishable goods in northeastern cities like Boston and New York. Even these markets suffered in the early 20th century when the use of refrigerated rail cars became widespread and produce could be shipped from the west coast.

Conclusion
In 1914, on the eve of World War I, New Hampshire was a state pocketed with highly industrialized areas set amidst struggling rural communities and stunning natural beauty, which drew thousands of tourists on an annual basis. A decade later, it had become clear that the Granite State's Industrial Revolution was over and New Hampshire would be forced to create a new economy to support the people who lived here. The legacy of the factories and mills that once thrummed with

industry in the state would caste a long shadow over New Hampshire, though, and present untold challenges for its future as the 20th century unfolded.

Course Essential Questions

Essential questions are designed to be answered repeatedly throughout the entire curriculum. This unit particularly addresses the following essential questions:

- How has New Hampshire come to be the way it is?

Unit Focus Questions

Lessons in this unit are geared towards students answering the unit focus questions comprehensively through a variety of methods. This unit's focus questions are:

1. How did industrialization change the way people worked in New Hampshire?
2. How did people change the way they lived because of industrialization in New Hampshire?
3. How did New Hampshire modernize because of industrialization?

Lesson Plans

In the "Big Industries and New Factories" unit, two lessons start laying the groundwork to understand the Industrial Revolution by exploring the systems that changed the way the world worked: hydropower, steam power, and the factory system. One lesson focuses on the industries in New Hampshire that helped define the economy at this time. Three lessons examine the changes industrialization brought to people's lives through child labor, urbanization, and modern inventions like electricity and standard currency. The final lesson is a summative assessment project where students demonstrate their learning through teaching about the Industrial Revolution.

Lesson Plan 1: Water Power

Through an experiment and curriculum resources, students investigate hydropower and steam power and how they changed New Hampshire's industries and towns.

Lesson Plan 2: Bells and Conveyor Belts

After exploring the cottage industry, students participate in a simulation to understand the experience of working in a factory.

Lesson Plan 3: New Hampshire's Industries

Students create a booklet and business plan about historic industries using primary sources and information about the factors of production.

Lesson Plan 4: Children in the Factories

Through analyzing primary and secondary sources students examine child labor, then participate in a simulation to negotiate working conditions.

Lesson Plan 5: Growing Cities

Students use data from a graph and a map to understand the word "urbanization," then use secondary sources about positives and negatives to form an opinion of urbanization.

Lesson Plan 6: Modernization

After looking for evidence of modernization in historical photographs, students complete stations to investigate how the innovations and changes of the Industrial Revolution affected society.

Lesson Plan 7: Kids Teach the Industrial Revolution Summative Assessment

Students choose to create an alphabet book, explainer video, or illustrated narrative to show their learning about industrialization.

Unit Vocabulary

assembly line	(noun) An arrangement of machines, equipment, and workers in which work passes from station to station in a direct line until the product is complete
canal	(noun) A manmade waterway
capital	(noun) 1 The money and goods that a person owns 2 One of the four factors of production; the human-made items used to make a product, like factories and machines
child labor	(noun) Paying children to work; in the modern day, there are laws in some countries to make sure it is not too physically, mentally, or socially dangerous or that it stops children from going to school
city	(noun) An area where many people live close to one another; cities are generally larger than towns. Cities have lots of buildings, containing things like stores, restaurants, churches, apartment buildings, houses, factories, office buildings, museums, and theaters
cloth	(noun) Another word for fabric or material, such as the fabric used to make clothing or bedding
communication network	(noun) A system where information passes from one person or group to another; information can pass over telephone lines, telegraph lines, or other ways of communicating
consumer	(noun) Someone who buys products or goods
cottage industry	(noun) Making products to sell when people work in their own homes and use their own equipment
cotton	(noun) A plant grown in warm climates that has a soft, fluffy material around the seeds; this material is spun into thread and yarn; then the thread or yarn is woven into cloth
currency	(noun) Money in any form
dam	(noun) A wall built to hold back water in order to raise the level of the water; when rivers are dammed, they turn into lakes or ponds
efficiency	(noun) The ability to accomplish a job in a short period of time and with little effort
electricity	(noun) A form of energy from positive and negative charges that can be carried by wires; used for heating, lighting, and giving power to machines
entrepreneurship	(noun) 1 Setting up a business 2 One of the four factors of production; the people and systems that connect the other three factors and help them grow
ethnic	(adjective) Referring to the shared culture and traditions of a group of people
fabric	(noun) Another word for cloth or material, such as the cloth used to make clothing or bedding
factors of production	(noun) Four economic resources necessary to create a successful product: capital, entrepreneurship, labor, land
factory	(noun) A building designed to house machines and other technology
garment worker	(noun) A person who works making items of clothing
gristmill	(noun) A building next to a river that uses water power to move large stones that grind grain into flour
hydropower	(noun) Using water to power machines and other technology

immigrant	(noun) A person who moves from one country to live in another country
immigration	(noun) The act of moving to a new country to live permanently
industrialization	(noun) The shift to making many products on a large scale, using machinery and factories
Industrial Revolution	(noun) A period of major change in the economy focusing on the change from making things at home to making things in factories
industry	(noun) 1 Making products by using machinery and factories 2 A group of businesses that provide a particular product or service
labor	(noun) 1 Work, especially hard physical work 2 One of the four factors of production; the human workers needed to make a product
labor union	(noun) An organization that workers join to protect their rights and interests
land	(noun) One of the four factors of production; the natural resources needed to make a product
leisure	(noun) Using free time for enjoyment
logging	(noun) Cutting trees down and making them into usable boards or pieces
lumber	(noun) Wood that has been processed from a tree into usable boards or pieces
manufacturing	(noun) Making products, especially with machines in factories
mass production	(noun) Making goods in large numbers, usually by machinery
mechanization	(noun) Replacing human workers with machinery and other technology
modernization	(noun) When society, people, and activities change to include recent technology or information
picket	(verb) To protest or demonstrate outside a location
product	(noun) An object made by labor, either by hand or by machine
raw material	(noun) Material that has not yet been processed or manufactured into a final form
rural	(adjective) An area of land that is primarily used for farming, where there are no large towns or cities
sawmill	(noun) A building along a river with a machine to cut logs into timber
standardize	(verb) To measure items or activities based on one measurement of the item or activity
steam engine	(noun) A machine that uses water that is boiled, evaporated, and then condensed in order to create power
steam power	(noun) The use of water condensation to power machines and other technology
strike	(noun) When a group of workers organize together and stop working in order to force their employer to agree to their demands, usually for higher pay, shorter hours, or safer working conditions
tenement house	(noun) Crowded living apartments, usually unsafe with poor sanitation
textiles	(noun) Types of cloth or fabric
town	(noun) An area where people live close to one another; towns tend to be larger than villages but smaller than cities. Towns in New England usually have a town hall or central meeting place, churches, schools, a post office, and sometimes businesses like restaurants or stores

transportation network	(noun) A system where goods or people pass from one place to another; transportation can be provided by animals (like horses) or machines (like railroads or cars). Transportation networks usually include roads, bridges, rail lines, canals, and other manmade improvements to the land
urban	(adjective) A large town or city, where there are lots of buildings and people
urbanization	(noun) The growth of cities as a response to more and more people moving from the countryside into cities
wage	(noun) A payment made to a worker by an employer for work completed
water power	(noun) Using moving water to power machines
waterwheel	(noun) A wheel that is moved by water; the force of the water moving over the wheel, makes the wheel move; the wheel's movement provides power to the machines
wood pulp	(noun) Very small pieces of wood crushed into a spongy, thick material that is used to make paper
wool	(noun) Soft curly hair cut from a sheep or other animals that has been spun to make yarn or thread

Using the Student Content Readings

The student content for this curriculum is designed to be used in many ways. Here are suggestions for reading activities and strategies that support independent and guided reading at different stages of each unit. Please note that some lessons in this unit use the student content in their learning activities.

- Introducing Units: Preview the student content before diving into lesson plans and activities. Ask students to skim the text by looking for key design elements. What are the headings? What do they tell us about the big ideas of the unit? Look for words in bold. What are the important vocabulary words used in this unit? Which are familiar? Which are not? What kinds of graphics or images are used in this content? Which important ideas do they illustrate?
- Developing Understanding: Some lesson plans direct you to specific sections of the student content, but the student content should be revisited throughout completion of a unit. Students can create visual representations of specific sections, summarize paragraphs, or complete jigsaw chunking and present their section summaries to other students.
- Reviewing Concepts: After lessons, return to the student content to look for evidence of the concept explored in the lesson. Students can create timelines, cause and effect charts, mind maps, and Venn diagrams using the information provided in each section.
- Extending Comprehension: Students can develop a review quiz for fellow students by writing their own questions about the information in each section. Translating the content into data that can be displayed on a map or graph is another way to extend comprehension of the text.

Additional Resources

Format: Website
Title: Tsongas Industrial History Center
Author/Creator: UMass Lowell
Audience: For Students and Educators.
Description: Excellent resource linked to the Tsongas Industrial History Center and Lowell National Historical Park. Resources tab provides diverse offering of lesson plans, resources, and multimedia for teaching the Industrial Revolution.
Website: www.uml.edu/Tsongas/

Format: Website
Title: Rivers: Bringing New Hampshire to Life
Author/Creator: Children's Museum of New Hampshire
Audience: For Educators.
Description: Extensive lesson plans with excellent primary sources for upper elementary students in two sections: River Life & Ecosystems and People & Industry Along the River.
Website: www.childrens-museum.org/media/uploads/RiversCurriculum.pdf

Format: Website
Title: History, People, and Milestones
Author/Creator: NH PBS
Audience: For Students and Educators.
Description: Selection of multimedia, lesson plans, and resources specifically curated about the Industrial Revolution.
Website: nhpbs.pbslearningmedia.org/subjects/engineering--technology/history-people-and-milestones/industrial-revolution-1760-1840/

Format: Website
Title: Tables Illustrating the Spread of Industrialization
Author/Creator: Modern History Sourcebook
Audience: For Educators.
Description: European-focused tables exploring the spread of industrialization, such as distribution of manufacturing and rise of literacy, which provide data showing changes in society.
Website: sourcebooks.fordham.edu/mod/indrevtabs1.asp

Format: Book
Title: *The Bobbin Girl*
Author/Creator: Emily Arnold McCully
Audience: For Students.
Description: Historical fiction appropriate for upper elementary about a young girl working in a noisy, dangerous factory—and considering joining the strike.

Format: Book
Title: *Ox Cart Man*
Author/Creator: Donald Hall
Audience: For Students.
Description: Beautifully illustrated book demonstrating the cottage industry that existed prior to the Industrial Revolution.

Format: Book
Title: *Brave Girl: Clara and the Shirtwaist Makers' Strike of 1909*
Author/Creator: Michelle Markel
Audience: For Students.
Description: Historical fiction book narrating why life in a factory necessitated a strike and how conditions actually changed.

Format: Book
Title: *The Industrial Revolution: Investigate How Science and Technology Changed the World with 25 Projects*
Author/Creator: Carla Mooney
Audience: For Students and Educators.
Description: Introduces the dynamic individuals who led the Industrial Revolution and how their innovations impacted the lives of everyone, rich and poor, city-dwellers and farmers alike. Elements of history, biography, civics, science, and technology combine with activity-driven enrichment projects that kids can do with minimal supervision.

Format: Book
Title: *Child Labor and the Industrial Revolution: The 20th Century*
Author/Creator: Harriet Isecke
Audience: For Students.
Description: Historical fiction about two sisters who work in a linen mill under horrible conditions. Years later, the girls, now women, are about to receive an honor for an interview with the National Child Labor Committee.

Format: Book
Title: Standing at Armageddon: A Grassroots History of the Progressive Era
Author/Creator: Nell Irving Painter
Audience: For Educators.
Description: Covering the United States from reconstruction to World War I, looking at how industrialization changed every facet of American society.

Format: Book
Title: New Spirits: Americans in the Gilded Age
Author/Creator: Rebecca Edwards
Audience: For Educators.
Description: A close look at how America became a modern industrial nation and a world power.