

Farm to Factory

LILE I

Theme

The Industrial Revolution brought about dramatic changes in 19th century America, and had a profound impact on the lives of the American people. This period of history has enduring relevance to our lives today.

Objectives

After using the activities in this guide and participating in the ranger-led LILE I program students will be able to:

- explain the significance of the Merrimack River in the development of Lowell's mills.
- define the term Industrial Revolution.
- list three reasons why farm girls left their homes to work in the Lowell mills.
- list at least three differences between life on the farm and life on the corporation.
- list, sequentially, four primary steps necessary for the production of cloth on both the farm and in the factory.
- list three differences between the production of cloth on the farm and in the factory.
- describe at least three ways in which the Industrial Revolution has changed the way people live today.

Program Description

Farm to Factory is a 90 minute program which focuses on the transition from an agrarian society to an industrial society, as experienced by a young woman who leaves her New England farm to work in a Lowell mill. Two members of the class dress in 19th century reproduction clothing, and each member of the class has the chance to pick, card and spin wool. A ranger leads the discussion on how the weaving process was done in the mills, and the changes it brought about in people's lives. The program culminates with students weaving cloth on small looms. The program is recommended for 4th and 5th graders.

Why Lowell ?

What happens when you put your hand under a running water faucet? Or under water coming over a waterfall? You can feel the force of the water hitting your hand and pushing it down. It is this force that made Lowell, MA an important part of history and led to the American Industrial Revolution.

Using the River

Before 1826 most of what is Lowell today was called East Chelmsford. It was a small farming village. The people who lived there worked hard growing crops and raising animals for food. The Merrimack River flows through the area which was once East Chelmsford. The river begins in Franklin, New Hampshire and flows 116 miles to Newburyport, Massachusetts.

In 1826 the river was being used for transportation. Loggers cut down trees in the New Hampshire forests, tied the logs together and floated them down the river like rafts to Newburyport. In Newburyport the logs were bought and made into ships.

Building Canals

The journey from New Hampshire to Newburyport was dangerous. The worst part was at the Pawtucket Falls in East Chelmsford where the river drops 32 feet over a mile of rapids. To get around the falls the men took their logs out of the river, and dragged them across land using horses or oxen. Once past the falls they put the logs back in the river and continued to Newburyport.

This land crossing took a great deal of time and energy. Some of the merchants in Newburyport wanted to shorten the trip. They wanted to receive their logs more quickly. These merchants visited the falls, and in 1792 joined together and hired local farmers to dig a **canal** around the falls. This canal was one and a half miles long. It was named the Pawtucket Canal. It had four lock chambers which let the log rafts and boats drop 32 feet safely.

Canals were a good way to transport goods. Soon after the Pawtucket Canal was opened, the Middlesex Canal was built. It started on the Merrimack River just north of the Pawtucket Canal. It was a direct route to Boston, where business was better than in Newburyport. When the Middlesex Canal opened in 1803, business on the Pawtucket Canal dropped. Within a few years the Pawtucket Canal was hardly being used. The Middlesex Canal became the new transportation route.

Developing Industry

Meanwhile, a young Boston merchant named Francis Cabot Lowell travelled to England. He went there to find out more about machines used in **textile** mills. He wanted to learn how to build a machine called a power loom. A power loom is a machine that weaves cloth. His dream was to build textile factories in America.

Seeing the power looms at work in England prepared him to build his own. Upon returning to Boston he got help from mechanic Paul Moody. Together they built a power loom. Their loom worked! After making more power looms they built a mill in Waltham, Massachusetts. They called their mill the Boston Manufacturing Company. This mill was on the Charles River where the river drops ten feet. The force of the falling water was used to turn large water wheels and power the machines.

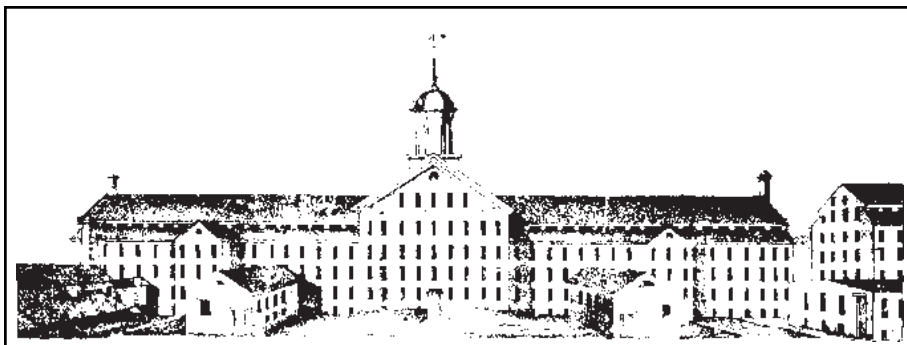
The Boston Manufacturing Company soon became famous. It was the first mill in the world where all the steps of making cloth by machine were done in one place. The raw cotton was taken in at one end of the mill, and after several different steps it came out as finished cloth ready to be sold. More and more people began buying cloth from the Boston Manufacturing Company. Soon a larger mill was needed to keep up with the demand. The 10 foot drop on the Charles River was not enough power to run more mills.

Powering the Mills

It was at this time that Patrick Tracy Jackson, Nathan Appleton and others came to visit the Pawtucket Falls. They walked along the water ways and drew a map of the area to show others. They knew there was enough water power there. A 32 foot drop could power all the mills they could build! They also knew it would be easy to ship the finished cloth to Boston by the Middlesex Canal. In February of 1822 the Merrimack Manufacturing Company was formed. Work on a new mill began.

Two things had to be done to power the new mill. First, the old Pawtucket Canal had to be rebuilt. It was widened and deepened, and the locks were rebuilt to improve transportation. Then the Merrimack Canal, a **power canal**, was dug to carry water to the newly built Merrimack Mills. .

The first mill opened in 1823. It was a success! More mills and power canals were built, and in 1826 East Chelmsford became the town of Lowell. Ten years later, Lowell became the third city in the Commonwealth of Massachusetts. By 1848, Lowell was the largest industrial center in America. Fifty thousand miles of cotton cloth - *enough to circle the globe twice* - were produced there each year. The American Industrial Revolution was well under way.



Labelling and Reading a Map

Step One: Student Material

Give each student a copy of the 1848 map of the Lowell Canal System on page 27.

Step Two: Directions

Post the following map tasks.

Have each student complete these on his/her copy of the map.

- On the compass label south, east and west.
- Color the Concord and Merrimack Rivers BLUE
- Circle the Pawtucket Falls.
- Color all 5.6 miles of canals BLUE.
- Outline the Hamilton Mill in YELLOW.
- Circle the other mill complexes in RED.
- Color the Moody Street Feeder PURPLE.

Step Three: Reading and Discussing the Map

Have students read their map and answer the following questions.

Discuss their answers in class.

- Where does the canal system originate? (Merrimack River)
- What are the names of the eight canals on this map? (Northern, Lawrence, Western, Pawtucket, Merrimack, Lowell, Hamilton, Eastern)
- Where does the water from the Pawtucket Canal empty? (Concord River)
- How many water powered companies are on this map? (12)
- Which canal carries water to the Hamilton Mills? (Hamilton)
- Which mill complexes depend on water from the Northern Canal?(Suffolk, Tremont and Lawrence)
- What are the names of the upper canals? (Pawtucket, Northern, Western, Merrimack, Hamilton)
- What are the names of the lower canals (Lawrence, Pawtucket, Eastern, Lowell)

Challenge

In the 1800s the mills shut down every Sunday. On that day the canals were drained and cleaned. Why do you think the canals were cleaned? How do you think the water was drained from the canals? (CLUES: What direction does the water flow? Where does the water come from? Where does the water end up once it has passed through the canal system?)

Making a Water Wheel

Step One: Collecting Your Materials

You will need the following things to make your water wheel:

- scissors
- aluminum pie plate
- pencil (5 inches or longer with ridges)
- 2 spools or magic marker tops
- piece of string
- small stone or weight

Step Two: Making Your Pattern

Draw a pattern like the one shown on a sheet of paper. The circle should be 3 and 1/2 inches in diameter. See figure 1.

Step Three: Using Your Pattern

- Trace the pattern onto the center of the pie plate.
- Cut out the circle along the solid lines.
- Bend the cut part back less than half way to make the blades of the wheel. See figure 2.

Step Four: Assembling the Pieces

- Push the pencil through the center of the water wheel to make the shaft.
- Tie a piece of string to a small stone or weight. Tie the other end to the shaft.
- Put each end of the shaft into a spool.

Step Five: Testing Out Your Water Wheel

- Turn on the faucet so there is only a thin stream of water.
- Holding the wheel by the spools, place the wheel under the water.
- Try increasing and decreasing the water.
- Try bringing the wheel closer to and farther away from the faucet.

Discuss the answers to these questions as a class.

What happens to the water wheel?

What happens to the string?

What happens to the stone?

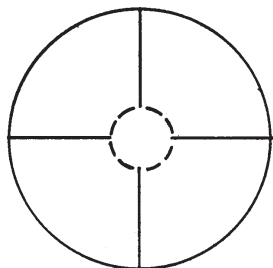


figure 1

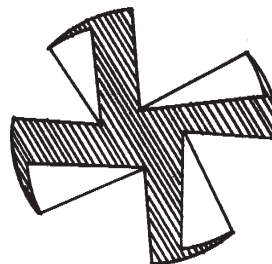


figure 2

Before Factories: Life on the Farm

Close your eyes for a minute and try to remember what you did before coming to school this morning. What time did you get out of bed? How did you know when to get up? You probably washed your face, dressed, combed your hair and grabbed a bite to eat. Maybe you even watched a bit of television, or listened to the radio while brushing your teeth. Nothing special - just the usual morning routine.



Did you ever stop to think about what life might have been like before clocks and indoor plumbing? Before factories, plastic, and brightly colored combs? Most of what we take for granted today didn't exist 170 years ago. In 1820 there were few clocks, and no cars or televisions. Nobody had ever heard of television, and the invention of the computer was years away. Girls and boys growing up in America before the Industrial Revolution lived in a very different world.

Farm and Family

If you had grown up in 1820 you probably would have lived on a farm. On the farm, families worked long and hard growing crops and raising animals. Most of what they grew and raised was used to feed and clothe the family. Some things were traded with neighbors for tools and supplies, or in exchange for help in the fields.

Most farming families were large. It was not unusual for a child to grow up with six, eight, or even ten brothers and sisters. Children were needed to help with farm work. They were taught at a young age what chores were expected of them. Children learned quickly that they had to work for the family to survive. Chores left unfinished could mean less food on the table, or fewer clothes for the winter. Both boys and girls contributed to life on the farm in different, but equally important ways.

Sunup to Sundown: Following the Four Seasons

Life on the farm ran according to the sun and seasons. The day began at sunrise and ended at sundown. Without electricity to light the home, nightfall meant bedtime. Some chores were done year round, others changed with each season.

In early spring, with snow still on the ground, New England families tapped maple trees for sugar. Later, fields were plowed and crops planted. Spring was the time to clean house too. Carpets were taken up and beaten, floorboards scrubbed, curtains washed, and stoves scoured. Last year's spring clothes were brought down from the attic and altered to fit new bodies. Winter clothes were mended, washed, and tucked away until the next frost. Spring was also the season when the long task of making cloth began.

Summer was spent preparing for the long winter. The hay harvest began in July and continued until all the hay was stored safely in the barn. From May through October long hours were spent in the kitchen preserving fruits and vegetables to store for winter.

Fall brought the harvest. Corn was picked and potatoes dug up and stored. Grains like wheat and barley were taken to a grist mill and ground into flour. Animals were slaughtered, smoked, and hung in the cellar or smokehouse. By the end of fall the pantry shelves were lined with jars of fruits and vegetables, nuts and berries. In the cellar barrels of flour, bags of potatoes, dried fish and meat, and pots of honey could be found. All of this food was needed for the winter when it would be almost impossible to get new food. Days grew shorter and nights colder. Again, the house was cleaned from top to bottom in preparation for the cold days ahead.

Tasks changed with the approach of winter. More time was spent indoors. Men and boys rose early to break ice from the pump, haul water, and feed the animals. Older boys were sent out to free livestock from snow drifts and ice. Women and girls tended the fire, cooked meals, made soap and candles, and cared for children. Many hours were spent spinning yarn and weaving cloth. Stories and songs were shared on cold winter evenings around the fireplace. Those who could, read books and newspapers aloud to others. A young girl might be found stitching a sampler. A boy might whittle wooden figures or pegs.

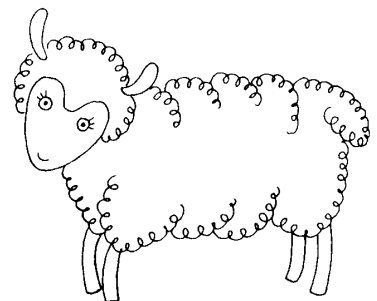
School Days

Winter was the one season during the year when not all the children were needed on the farm at all times. Those who were lucky were allowed to go to school. Some communities had their own one-room school house. Other communities held classes in a church or family home. Students as young as four and as old as twenty were sometimes taught together by one teacher. It was often difficult to find a teacher. Some students knew almost as much as their teacher. School lasted about eight weeks. Illness and poor weather caused unexpected school closings. Some children missed school because they were needed at home. Children who could not go to school were taught in the home.

Life on the Farm: Good Times and Bad

The farmhouse was the center of activity for both adults and children. Though work took up a lot of time, people found time to play. Work itself was often festive. Families joined together to build barns and houses. Women shared news and stories while piecing together quilts. Spring brought neighbors together for maple sugaring. The fall harvest was another opportunity for people to gather and help one another. Music, dance, sharing food, and storytelling all helped to lighten the work load.

Despite the festive times, farming the rocky soil of New England was very difficult. Large families and limited land meant only one or two sons might inherit a piece of land. There were few choices for the other children. Many children left the farm when given the chance. Jobs created by New England's new factories in the early and mid 1800s attracted many in search of a better way of life.



Keeping a Diary

Step One: Taking On a Role

It is 1835. Pretend you are a farm girl or a farm boy. Think about how old you are, who you are, and the things you like and dislike doing.

Step Two: Imagining

Imagine you are part of a large farm family. You have many chores, and have been keeping a diary of your daily activities.

Step Three: Writing About Your Life

Write four one-paragraph diary entries describing one day in January, April, July and October. Your diary should answer some of the following questions:

- What kinds of chores do you do?
- What do you do for fun?
- What is hard about farm work?
- What is the weather like?
- What is your family like?
- What are your dreams for the future?

Step Four: Sharing Your Writing

To share your work with others you may want to do one or several of the following:

- Exchange your diary entry with a classmate who has chosen a similar role.
- Choose one diary entry and draw a picture describing what you've written.
- Read your diary entries aloud to the class.
- Post each diary entry by season on the classroom bulletin boards.
- Compare your diary entries with things you do in each season today.
- Discuss as a class things you liked and disliked about your life in 1835.

Weaving Workshop

This activity will allow you to make your own woven pattern. To do the activity you will need: paper, scissors, and a ruler.

Step One: Selecting your Colors

Select two pieces of 8" x 10" colored construction paper (see figures 1 a & b).

Step Two: Marking the Width of Warp and Weft

Mark lines one inch apart down the long side of each sheet of paper (see figures 2 a & b).

Step Three: Setting up the Warp and Frame

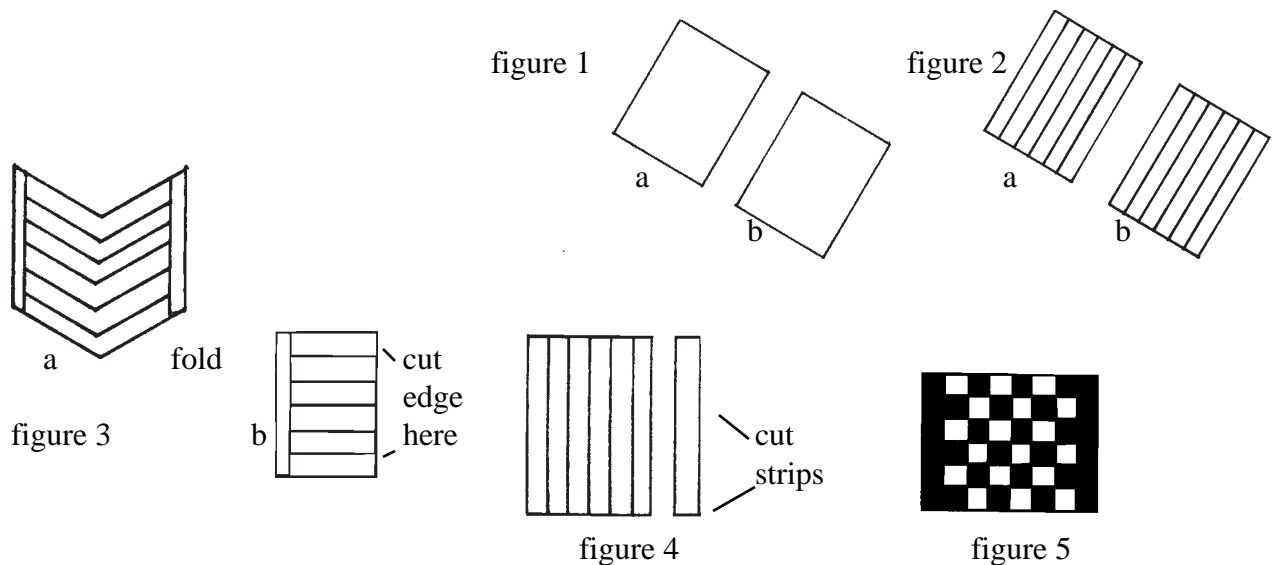
Fold one sheet in half. Beginning at the fold, cut along lines leaving a one inch margin uncut at the edge of the page (see figures 3 a & b)

Step Four: Preparing the Threads

Cut the other sheet into one inch strips (see figure 4).

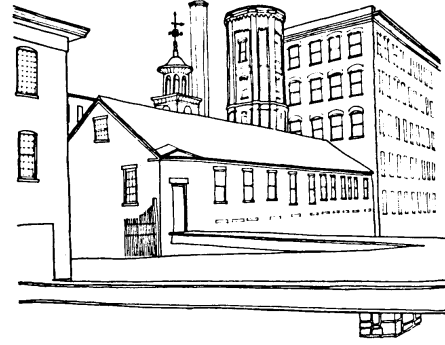
Step Five: Weaving

Weave the individual strips one at a time into the other page - over, under, over, under, ...repeat until the pattern is completed (see figure 5)



Factory Life in the 1800s

It was 4:30 a.m. when Eliza Adams woke up to the ringing of the bell on Monday morning. How she longed to stay in her dream world! She was dreaming about the picnic with Susan and Harriet out in Dracut the day before. But the bell meant that it was time to get up and go to work. This was not at all the way that it had been only last year back on her parents' farm.



Walking to the Mill Yard

Soon she was walking out the door of her boardinghouse with her two friends. They were heading for the entrance of the Hamilton Mills, it was only a little more than a hundred yards away.

The first two buildings they saw as they came around a corner were long, low brick buildings. The one on the left was the store house. Both raw cotton and finished cloth were stored here. The one on the right was the counting house. The mill offices were in the counting house, and it was also where Eliza was paid at the end of each month. She liked that. Last month Eliza had earned almost \$10.00, after paying room and board.

Around the store house and the counting house stood enormous red, brick buildings. They were shining brightly in the light of the rising sun. There were eight of them, and each was five stories high. The whole group of buildings formed a huge rectangle. In the center was a courtyard about the size of a football field. It was inside those five-story buildings that Eliza and her friends made the famous Lowell cloth.

Eliza, Susan and Harriet walked across a bridge over the Hamilton Canal at 5:30 that morning. The canal delivered the water to power the machines in the mill. On the far side of the canal, between the store house and the counting house, was a large iron gate. The gate was closed each morning at 5:35. If you were late to work you had to go through the countinghouse, and be in trouble. Eliza was proud that this had never happened to her.

Nathan Picks

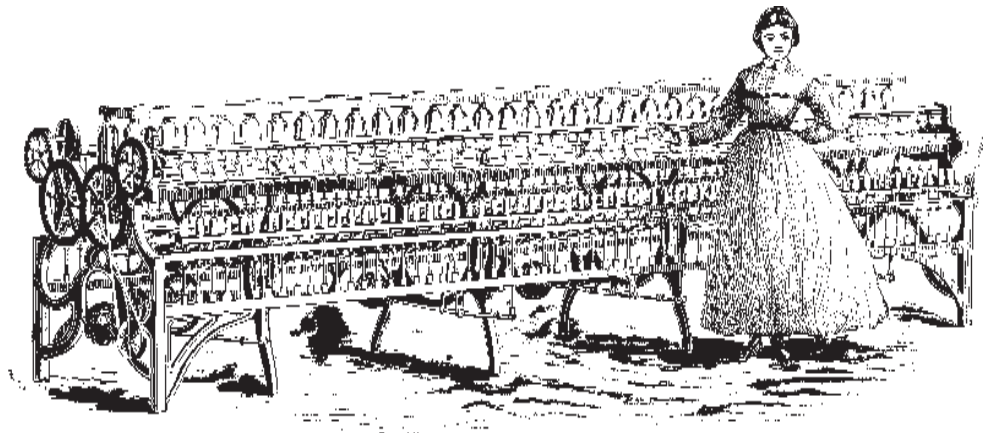
As they walked past the gate, Eliza looked to her left at another large building. This was the **picking house**, where her brother Nathan worked. Huge bales of cotton are brought from the store house and opened there. **Picking** is the first step in making cloth from cotton. The cotton from the bale is all tangled up, with a lot of dirt and debris mixed in. Nathan worked at a machine called a **picker**. He fed the cotton into the machine, which has large metal spikes on rollers. This picks the cotton apart, while an air current blows the loosened cotton into the air. This way, the dirt and twigs fall to the ground. Small wonder, thought Eliza, that Nathan looks like a rag doll at the end of the day. The last part of Nathan's job was to wind the clean loose cotton onto wooden spools. The cotton ends up in sheets 3 to 4 feet wide called laps.

Susan Cards

The three young women entered the courtyard, and headed in separate directions. They promised one another they would meet back at the boardinghouse at noon for dinner. Susan headed for a mill on the left, number two, where she worked as a **carder**. She almost ran into Nathan, who was pushing a cart into the mill. There were 6 or 8 of the laps Nathan had made hanging from the cart. Susan helped Nathan unload the laps next to the machine where she worked. It was called a **card**. Susan studied the carding machine in front of her. It was really not one machine at all, she decided, but a series of rollers with fine metal teeth. Susan picked up a lap from the cart, and slowly fed it into the rollers. She was very careful not to get the sleeve of her dress caught in the teeth. She knew that if her sleeve got caught, her arm would be gone before they could turn the machine off. This very thing had happened to Ann Graham just last month. Susan shuddered at the memory.

Susan watched the metal teeth on the rollers as they brushed and straightened the cotton fibers. It reminded her of brushing her hair. After the cotton went through one set of rollers, it entered another set, and then another. It looked softer and smoother after each brushing. The fleecy sheet formed a soft, untwisted cord about the size of light rope. This was called a sliver. She watched as the sliver slowly came off the end of the card into a round can about three feet high.

Susan picked up a piece of sliver and pulled lightly. It broke easily in her fingers. She knew that these soft cords were not strong enough to be used in weaving. The slivers would be taken next to a machine which would combine several pieces into one even piece. This piece, called **roving**, would also be stretched out, so that it was thinner than sliver. But that was not Susan's job. She went back to the front of the card and carefully fed another lap into it.



Harriet Spins

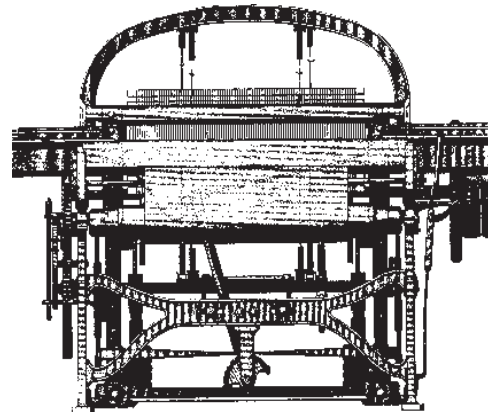
As Susan continued her work, Harriet was busy a short distance away in mill number four. Harriet worked as a **spinner**, and tended two **spinning frames**. Harriet had been a carder once, but after Ann Graham's accident, she decided to get a different job. She had been happy to get a job spinning because the pay was higher.

Harriet looked carefully at a spinning frame and shook her head slowly. She could not believe how

rapidly it spun the roving into thread. The machine had several rows of spindles, and on each spindle was a bobbin. As the machine ran, the roving was twisted at high speed, and then wound onto the bobbin as finished thread. As the bobbins were filled, she replaced them with empty ones. Harriet knew that the bobbins would next be taken into the room next door. There they would be wound onto spools and used to weave cloth. That wasn't her job, though. She went back to loading roving on the frame, and daydreamed about the picnic in Dracut the day before. She could still taste Eliza's deep dish apple pie!

Eliza Weaves

Eliza was *not* thinking about apple pie just then. She was in Hamilton mill number six, across the courtyard from Harriet. She was looking with dismay at the **power loom** in front of her. The warp threads were a tangled mess! Eliza worked as a **weaver**, tending four power looms. The looms wove together the threads which Harriet had so carefully spun. But the looms did not work when the **warp** threads were crossed, like they were right now.



Eliza decided that she had better calm down, or she would never get her threads straightened out. She looked around the noisy weave room. There were nearly 300 looms, and they made a frightful racket! It was hard to think straight, but Eliza could see that there was not a loom fixer anywhere in sight. She would have to fix the loom herself.

Eliza looked carefully at the loom. There were 2000 warp threads coming off a large round spool called a warp beam. Each one passed through a little hole, like the eye of a needle. The loom made the threads go up and down. When half of the threads were up and half of the threads were down, there was an opening between them. The loom automatically threw a piece of wood called a shuttle between the two sets of warp thread. The shuttle carried a single strand of thread called the **weft** thread. Back and forth went the shuttle. Up and down went the warp threads. As if by magic, finished cloth appeared on the other side. It was kind of like the hand loom Eliza had at the farm, but so much faster and so much noisier.

How could she straighten her warp threads? Eliza had seen other weavers run their fingers carefully through the threads, 3 or 4 at a time, and she decided to do the same thing. The first time she did it, one of the threads broke, so she had to tie it together. But after a few tries, the loom was ready to go. Eliza felt very pleased with herself. "I don't need Mr. loomfixer, after all," she thought.

Noontime finally came. The bells rang loud and clear. Thousands of machines fell silent, and hundreds of women and men stopped work and headed toward their boardinghouses. The smell of freshly cooked meats, potatoes and vegetables filled the air. Eliza hurried along with the rest. She couldn't wait to tell her friends about her accomplishment.

Design Your Own Mill

Step One: Materials Students should do this activity in pairs. Each set of partners will need:

- a black crayon or marker
- five different colored crayons or markers
- a red crayon or marker
- a large piece of light colored construction paper
- pencils and paper
- a ruler (optional)

Step Two: Gathering Information

Read “Factory Life in the 1800s” on pages 10 - 12. As you read, look for clues about what the factory buildings that Eliza and her friends worked in looked like. For example, what shape were they? Were they big or small? How many stories high were they? Do you think they had doors and windows? Write this information on a sheet of paper.

Now look at “Factory Life in the 1800s” again. Look for descriptions of the types of jobs in the mill. How many different jobs are described? Make a list (hint: you should be able to find at least five).

Step Three: Planning Your Design

Compare your two lists with those of your partner. Do they match? If not, combine the information.

Plan what your mill will look like from the outside. Use the information you gathered in Step Two. Use your pencil to lightly sketch the outline on your construction paper. Use a ruler for straight lines, if you have one. Be sure not to fill *all* of the paper. When you are satisfied with your design, trace over the pencil sketch with your black crayon or marker.

Now plan what your mill will look like inside. How many stories high will it be? Where will you put the different machines? Think about this for awhile before you decide. You should be able to think of a reason for putting certain machines in certain places. Use your pencil to lightly sketch the floors and write where the different machines will go. Lastly, plan where your doors and windows will go.

Step Four: Drawing Your Design

Draw a *cross section* of the inside of your mill. To do this, measure a space about eight inches wide in the center of the building. Draw lines from top to bottom to highlight this space. You are going to show the inside of your mill in this space. The areas on each side will show what the outside of the mill looks like. Color the outside *red*, and draw in windows and doors in *black*.

In the center space, sketch in the floors in pencil, then highlight them in black. Take out your five crayons or markers. Match each color with a type of machine. For example, green could be for looms, or yellow could be for cards. Color in the part of your mill where you want to put looms with the color you have chosen for looms. Repeat with other kinds of machines.

Make a *key* to your design in the upper right hand corner of your paper. Make five small rectangles, one on top of the other. Color each with one of your five colors. Write the name of the machine that matches each color about half an inch to the right of the rectangle. Write “Key” above it.

When completed, share your designs with the rest of the class.

Farm to Factory Matching

The lives of young women changed when they left their farms to work in the textile mills of Lowell. Can you match the words and phrases which were a part of farm and factory life?

- | | |
|--|------------------|
| _____ mill girls' supervisor (boss) | A. boardinghouse |
| _____ City of Spindles | B. agriculture |
| _____ the wool removed from sheep | C. mill |
| _____ filler thread | D. carding |
| _____ dormitory where mill girls lived | E. industry |
| _____ machine which produces cloth | F. overseer |
| _____ farm animals | G. bell tower |
| _____ alarm clock for mill girls | H. spinning |
| _____ rules | I. weft |
| _____ process of removing debris from cotton or wool | K. regulations |
| _____ large scissors used on sheep | L. livestock |
| _____ process of combing cotton or wool | M. shears |
| _____ lengthwise thread | N. loom |
| _____ process of twisting cotton or wool into thread | O. warp |
| _____ manufacturing activity | P. picking |
| _____ factory | Q. fleece |
| _____ farming | R. Lowell |

The Mill Girls' World

The first Lowell textile factory was completed in 1823. Workers were needed. Mill owners hired people called recruiters to find workers. Many of the workers they found were the daughters of New England farmers. You may wonder why young women were hired for factory work. There are several reasons. One is the fact that sons were needed to help farm the New England soil. Another reason is that the daughters already knew how to weave. Mill owners felt the young women would learn how to tend power looms quickly. Also, they wouldn't have to pay women as much as men. Many young women left the farm so the family would have one less mouth to feed. Some women sent the money they earned in Lowell home to help pay bills.



From Farm to Factory: Deciding to Move

Life in Lowell sounded wonderful to many of the daughters of Yankee farmers. On the farm the daughter was responsible for helping to cook, clean, make candles and soap, care for younger brothers and sisters, weave cloth, and make, mend, and alter clothes. They did these chores seven days a week, and didn't earn a cent. In Lowell, girls worked six days a week, twelve hours a day, and they were paid. Most girls earned about \$3.25 each week. Room and board cost \$1.25, but the rest was theirs to keep or spend as they wished.

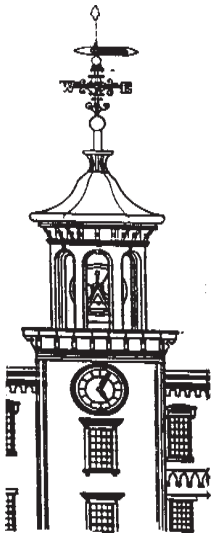
Time outside of work could be spent in any number of ways. Lowell had churches, a library, theatres, dances, a museum, shops, and travelling speakers. Very few of these things were available on the farm. Another highlight of Lowell was the chance to make friends with other women.

Boardinghouse Life

Lowell's mill girls lived in boardinghouses. Boardinghouses were large, long brick buildings owned by the factories. If you were a mill girl for the Hamilton Manufacturing Corporation you lived in a Hamilton boardinghouse. The boardinghouse was kept up by a woman called the boardinghouse keeper. She was hired by the factory to make sure her boarders were well fed and well behaved, in bed by 10:00 pm, and at church on Sundays.

Life in the boardinghouse had its ups and downs. Each young woman was expected to share her bed with another mill girl. Most bedrooms had two or three doublebeds. In the attic beds were lined up side by side and women slept three to a bed. If you were the last girl to come to the boardinghouse in search of a place to stay - more than likely you'd be sent to the attic.

Life on the Corporation



A typical day on the corporation began early. The bells on top of the mills began ringing at 5:00 in the morning to wake everyone up. At 5:30 am they began ringing again to tell the workers to report to their work rooms. The mill girls had until 5:35 am to get inside the mill courtyard. If they were late the gates closed in front of them, and they were forced to walk through the counting house. A man in the counting house took down the names of those who were late. If you were late too often, you might get fired.

Once at your work station you took orders from the overseer on your floor. If you were a weaver you were responsible for keeping bobbins full, threads straight, and machinery running smoothly. You did not need to know exactly how your machine ran - that was the job of the loom fixer. If your machine stopped running for some reason, you had to call the loom fixer to get it started again. If you relied on the loom fixer too much - he might take his time getting to your machine. This was a punishment. If your machine wasn't working - you weren't making cloth. If you weren't making cloth - you weren't making money, and could lose your job. Weavers were paid by the amount and quality of the cloth they produced.

Mill girls generally worked from 5:30 until 7:00 in the morning. At 7:00 am the bells rang again to signal breakfast. The girls dashed to grab their cloaks, then ran to their boardinghouses. They had until 7:30 am to eat, and until 7:35 am to get back to work. They then worked until noon, stopped work for a thirty minute dinner break, then continued to work until 7:00 in the evening. Supper was hastily eaten at the end of the work day. After supper the girls could do what they wished until the keeper called them to bed at 10:00 pm.

After Hours

After supper young women liked to read, sew, tell one another stories, and write letters around the parlor stove. On some evenings a pedlar selling satin bonnets or fancy shoes, or a gentleman caller might stop by. Some of the women took classes in the evening, attended lectures, or went to the theatre. Others took time to stroll the streets, looking in shop windows at jewelry and fancy dresses. Most girls bought new clothing and bonnets once they had saved enough money. In the city there was a lot of pressure to wear fashionable clothing.

Working Conditions

Working conditions were less than perfect. The average temperature of a weave room on a summer day was often as high as 115 degrees. In the winter it could get as hot as ninety degrees. The windows were never open. It was important to keep the air in the weave room warm and moist. A breeze from an open window might cause threads to snap. Broken threads meant poor cloth. To give the room extra moisture, steam was pumped in through pipes. Cotton dust, or cotton fly, filled the air making it difficult to breathe. Many women died from cotton dust getting trapped in their lungs.

Enough is Enough

Even though working conditions were dangerous, most women enjoyed the fast pace of Lowell in the early years. But by 1840 conditions had gotten bad. Women who had tended two machines were now required to watch three or four. The machines were running faster, and the young women were working as long as 13 hours each day. To make matters worse, the cost of living in a boardinghouse had risen, and the pay had been lowered.

Many women would not work under these conditions. Some returned to the farm, some got married, others found new jobs. Some women refused to give up their jobs, but would not work under the bad conditions. These women went on strike. They walked off the job and refused to work until the hours were shortened and the conditions improved. Their strikes were not successful. Many left the mills and were replaced by Irish immigrants.

Writing About Life in Lowell

Step One: Pretending

Pretend you are fourteen years old. You have just left your family's farm to work and live in Lowell.

Step Two: Developing your Character

To find out more about yourself as a fourteen year old, ask these questions:

- Why did I move to Lowell?
- What did my family think of me coming to Lowell?
- What do I expect of my days in Lowell?
- Do I miss my family?
- Do I know anyone in Lowell?

Step Three: Writing About Your Feelings

Write a one-paragraph diary entry about your first week in Lowell. Make sure to include three terms from the list of terms on page 26, and answer some of the following questions.

- Where do you live?
- Do you like the people you live with?
- Where do you work?
- What do you do at work?
- Do you like your job?
- What do you like about living in Lowell?
- What don't you like about life in Lowell?
- What do you hope to accomplish in Lowell?

Step Four: Sharing Your Imaginary Self

Share the imaginary life you have created. Do this in one of the following ways:

- Post your diary entry on a bulletin board.
- Exchange your diary entry with a classmate.
- Read your entry aloud to the class.
- As a class, discuss the similarities and differences between one another's diary entries.

Dear Florena

Complete this letter from a mill girl to her sister back on the farm.

Dear Florena,

How I miss all of you. Now that _____ is over, I'm sure that you will have time to rest. There are so many fascinating things to tell you about living in _____ . I work in the Hamilton _____. We make calico cloth out of _____ which is shipped from the south. Thanks to the invention of Mr. Whitney's _____, the seeds are already removed. Large machines _____ or comb the cotton, straightening the fibers. Then to make them strong someone has to _____ the threads. Next comes weaving; that's my job. A long sort of needle, called a _____ passes in and out of the threads making cloth. We work about _____ hours a day, and get paid about _____ dollars a week!

I live in a _____ with many other girls. An older woman watches over us. There are many _____, like a 10 o'clock curfew. Every Sunday we must go to _____. There are so many interesting things to do in Lowell, like attending _____, or taking books out of the _____. You certainly could never do these things on a farm!

What great changes are taking place! Why don't you come to Lowell and join me?

Your Sister,

Barilla Taylor

Barilla

Word Choices:

library
mills
harvesting
Lowell
spin

shuttle
boardinghouse
cotton
card
rules

three
twelve
church
lectures
cotton gin

Barilla, Ema, and the Lilies

Ema sat catlike on the large boulder. She drew her knees in close and hugged them to chase away the early morning chill. Even though it was mid July, the Maine mornings brought a cool dew with them, and left a damp chill in the air until close to noon.

Ema loved this place. She was told that many years ago it had been the family's farm. It didn't look much like a farm to her. She wondered how they could have farmed the hilly land. And it was so rocky - her bare feet were covered with scrapes and bruises to prove that. Ah well, her grandmother had said they had farmed, and that was that.



Ema was on her rock. It was a huge boulder which she had to climb up on very carefully. She was a good climber. The best in the fourth grade, her friends said. The rock was her lookout tower and her place to lie back undisturbed: a place to dream her dreams. The rock was in a grove of pine trees high on the hill overlooking some tumbled down outbuildings that had been part of the farm. Surrounding the rock and throughout the pine forest were lilies.

Ema loved lilies. They were tall plants, and each had a bright trumpet-like flower that seemed to crane its neck upward, proudly as though boasting its beauty. And each plant was laced with berries. The berries were tempting to pick, but they were poisonous. Her grandmother had told her that. She said, "Ema, I know you play among the lilies. It's fine if you admire their flowers, but never pick those berries. They're certain to poison you, and we sure don't want that!" So Ema admired them from a distance.

Just thinking about those lilies brought back a flood of memories. Oh, not things she actually remembered happening, but stories she'd heard from her grandmother about a girl name Barilla. Barilla was her great great aunt. She was no longer alive. It was sort of a sad story, but it was because of Barilla that the farm had so many lilies today. Ema was thankful for that.

Ema stretched out on the rock and let the sun warm her. She let her mind wander back to the evening her grandmother had taken her on her lap in front of the big fireplace and told her the tale of Barilla Taylor. She'd said, "Ema, when I was your age my grandmother took me on her lap just like this and told me the tale of her sister Barilla. Now it's my turn to tell it to you."

"Barilla wasn't much older than you are when she and her family decided it was time for her to leave the farm. She was 14 and the year was 1843." Ema's grandmother said, "Oh, believe me my grandmother said it was a hard decision to make. But after a lot of family talk, they decided to send Barilla to Lowell to work in the textile factories."

"But how could they just make her go to Lowell? My parents would never do something like that." cried Ema.

Ema's grandmother looked at her with a warm smile and said, "Well, Ema, that's exactly what I said when I first heard the story. But my grandmother assured me that Barilla wanted to go. You see, in Lowell

she could make money, and send some home to help pay the bills. She and my grandmother were just two of twelve children. The farming wasn't good, and the family was having a hard time making ends meet. So off to Lowell Barilla went with two other girls from Roxbury, Maine."

Ema slipped off her grandmother's lap and picked up her cat Moonshine before curling up once again in the folds of her grandmother's arms. "But how did they even know about Lowell? That city is a long way from here." asked Ema.

"That's a smart question. You see they'd heard about a wonderful place called the City of Spindles from a man who was travelling through the area. Well, it didn't take long for someone to ask exactly where this City of Spindles was. As it turned out, the city this man spoke of was really Lowell. According to my grandmother he went on and on about Lowell's schools and libraries. And he talked of the money that could be made, and the men who could be met. My grandmother, who was 17 at the time, admitted it all sounded quite exciting."

"What happened to Barilla once she got to Lowell? Where did she work? What did she do? Did she have any friends?" asked Ema, wide-eyed.

"Barilla got a job as a weaver in the Hamilton Mills. Her job was to tend the power looms weaving cotton cloth. She had to make sure the bobbins were full and the threads were straight. Imagine! Working in a factory all day long listening to the roar of machines! I'd much prefer the quiet of the farm to that! But at first Barilla didn't seem to mind."

Ema thought about that for a minute, then frowned and said, "But where did she live?"

"She boarded at one of the Hamilton Mills' boardinghouses, and she liked it. The keeper was very good, and knew how to serve satisfying meals."

"Oh, that doesn't sound half bad!" laughed Ema.

"No it doesn't." replied her grandmother. "But unfortunately, Barilla's friend Else didn't get along with her roommates, so the girls moved. According to Barilla, their new keeper was cross and lazy. She wrote home that the keeper served them day old coffee, a little dry bread, and a couple of crackers for dinner. She ended up staying there for three months, but then got so ill she could not go to work. A week after she was able to work again she moved in with the Elstons. She said they were 'first rate' folks.

"Barilla loved the Elstons. They fed her as much as she could eat. And walking to and from work she passed by all sorts of fancy goods shops. She told Florena, that's my grandmother, that her favorite store was George Tebbets' Fancy Goods, where gold beads glistened in the window. "

"Barilla must have really loved Lowell then, didn't she?" asked Ema.

"Well Ema, at first I think she really did like Lowell, but over time she became ill. She began writing letters home saying that she wanted to move west. If she hadn't gotten sick that's probably what she would have done." answered Ema's grandmother.

“How did she get sick? And why did she stay if she didn’t like it after a while?” asked Ema.

“The air in the weave room was hot, moist, and stale. They never opened the windows - never. And the hours were long - sometimes 14 hours a day. That’s how Barilla got sick. But she stayed because she liked the hours after work.

“She loved window shopping, picnics, and chatting with other girls. She had an admirer, Pliny Fidd, who sent her valentines. And one July her brother came down with some of his friends and took her and a whole group of her friends to Boston to see the Fourth of July fireworks.

“She also liked to spend money. In Lowell she bought two new dresses, a new bonnet, a cloak, and several pieces of jewelry. My grandmother told me she also bought a lily which she brought home to her mother in the summer of 1844. The lily was the family’s favorite flower, and her mother planted it outside where it grew almost up to the eaves of the house. When her mother wrote Barilla how high the lily had grown, Barilla had been delighted. She vowed she’d go home soon to see it.”

“Did she?” asked Ema. “Did she go home and see the lily?”

“No, Barilla never made it home. The cotton dust and damp, warm air of the mills set into her lungs and she became very ill. She developed a cough she couldn’t shake. The Elstons wrote home and begged her mother to come, but her mother was needed at home. In August of 1845 my grandmother’s oldest brother came to her. He lifted her spirits, but could do no more. Barilla died on August 22, 1845. She had been in Lowell two and one half years. She was 17 years old.”

And that was the story.

Ema sighed at the thought of poor Barilla dying almost alone there in Lowell. She sat up and gazed at the field of lilies - their faces bobbing in the wind. She wondered if Barilla had ever sat here. She wondered if Barilla knew just how many flowers her one lily had made.

In many ways, Ema thought, the lilies were like Lowell: beautiful to look at, but if you got too close to them the berries could poison you - just like the mill air of Lowell poisoned Barilla. It was kind of sad. But Ema knew that if Barilla could see how much the family appreciated the sight and scent of the field of lilies - she would not be disappointed.

As Ema got up to leave she took one final look around. She didn’t need anyone to tell her that Barilla had sat on the rock. She could feel deep down that someone long ago had used this very rock as a day dreaming spot. It made her feel warm all over. Ema smiled. She bent and picked a lily. Then she dashed through the flowers and out into the field. She was late for lunch with grandmother. The lily would be their centerpiece.



The character of Barilla is based on the real life of Barilla Taylor of Roxbury, Maine. Special thanks to Virginia Taylor for sharing family letters and spending hours of time with park staff. Her generosity helped this story come alive.

The Value of a Dollar

Barilla and her friends lived in Lowell in the early 1840s. Many of them earned \$3.25 each week, and paid \$1.25 for room and board. Listed below are some of the items they may have purchased with the remaining \$2.00. Note the prices of these ordinary items. Estimate what you would pay for a similar item today and write the amount in the right hand column.

	1840s prices	1991 prices
1. rent (per week)	\$1.25	_____
2. shawl	\$2.25	_____
3. bonnet	\$1.50	_____
4. mittens	.25	_____
5. shoes	\$1.50	_____
6. comb or brush	.20	_____
7. one sheet of paper	.01	_____
8. pencil	.01	_____
9. postage for a letter	.01	_____
10. library fee	.25	_____
11. pocket knife	.20	_____
12. Nashua to Lowell train fare	.50	_____
13. one pound of beef	.13	_____
14. one bushel of potatoes (about 40 lbs.)	.75	_____

Challenge

Pretend it is 1840. What would you buy with two dollars? Why?

Farm or Factory?

Step One: Dividing the Class

Have your teacher divide the class into two groups. One group will be the Farm Group, the other group will be the Factory group.

Step Two: Imagining You Are...

Farm Group: Pretend it is 1836. Think back to what you learned about life when reading “Before Factories: Life on the Farm.” You may also want to think about things you learned about farming in “Ema, Barilla, and the Lilies.”

Factory Group: Pretend it is 1836. Think back to what you learned about factory life when reading “Factory Life in the 1800s” and “The Mill Girls’ World.” You may also want to think about things you learned about factory life when reading “Ema, Barilla, and the Lilies.”

Step Three: Thinking About Farm and Factory Life

Get together with the members in your group and think of all the things you like about your life. Make a list of the things you like about the farm or the factory.

With your group think about what you don’t like about the other group’s way of life. Make a list of your ideas.

Step Four: Turning Ideas into Posters

On your own, think about something you particularly like about your pretend lifestyle, or something you don’t like about the other group’s lifestyle. Draw a poster which shows your feelings. You will be using this poster to try to convince people in the other group to join your group. *Make your poster snazzy!*

Step Five: Stating Your Case

Get together with the members of your group. Look at and discuss the different posters in the group. Think of a way each of the posters can be used to convince people in the other group to join your’s. Then, bring your posters to the front of the room to show members of the other group. Each person should hold up his/her poster and explain it to the class.

Step Six: Discussing Both Lifestyles

As a class discuss the things you like and dislike about both farm and factory life. Take a poll to find out how many people would have left the farm like Barilla did.

Other Suggested Activities

- Have students turn the story “Ema, Barilla, and the Lilies” into a poem.
- Talk about health today and ask students to think about which they feel was healthier, farm life or factory life. Have them work in small groups to present their cases to the class.
- Have students take on the role of recruiters. Each should make a poster encouraging young women to go to the “City of Spindles.”
- Have students write a tribute to Barilla.
- As a class, brainstorm what the world would be like without the Industrial Revolution. Make a list of the students’ ideas on the chalk board. Then have each student draw a picture of something they really like to do today, which they could not have done before the Industrial Revolution. Have them write a short paragraph describing their picture and explaining why the Industrial Revolution is important to them.
- As a class, discuss the things one would have seen in Lowell in the 1840s. Ask the students to think about what they learned about Lowell in “Factory Life in the 1800s” and “The Mill Girls’ World.” Using the class’ ideas, have students work together making a bulletin board depicting 19th century Lowell.
- Have students put on a play based on “Ema, Barilla, and the Lilies.” Students should role-play different parts. Characters might include Barilla; Barilla’s mother, father, brothers and sisters; the recruiter; Barilla’s friends from Roxbury, Maine; the boardinghouse keepers; the Elstons; Barilla’s overseer; a shop owner, etc.



Farm to Factory Terms

bell system - system using bells developed by mill owners to control workers' schedules

boardinghouse - long, large brick buildings built and owned by mill corporations; provided housing for mill girls

canal - human-made waterway used for transportation or power

carding - combing cotton or wool to straighten the fibers in preparation for spinning

corporation - a number of mills owned by one group of people

drop spindle - hand tool used to spin fibers into thread or yarn

fleece - wool from a sheep

Industrial Revolution - change from a society based on handmade production of goods on the farm to a society dependent on mass production of goods using machines in factories

loom - machine used to make cloth

manufacture - to produce a finished product (cloth) from a raw material (cotton)

Merrimack River - river which drops 32 feet over a mile long stretch of fall and rapids in the area known as Lowell today; was used as a source of both power and transportation

mill - factory building

mill girls - New England farm women (generally 17-35 years old) recruited to work in Lowell's early mills; also called operatives

operative - factory worker responsible for tending machines

picking - removing dirt, sticks, and stems from cotton or wool

shearing - cutting fleece from sheep

shuttle - the part of the loom which carries the weft thread through the shed

strike - turn-out or walk-out; a form of protest used by early mill workers

textiles - woven cloth

warp - lengthwise (long) threads on a loom

weaving - locking threads together to form cloth

weft - crosswise threads carried by shuttle

water wheels - early device used to harness water power; 40% - 60% efficient

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