



Teaching Guide

SEGMENT 1, WEBISODE 4

Please note: Each segment in this Webisode has its own Teaching Guide



Segment Overview

At the end of the eighteenth century, citizens of the newly established United States of America wanted to enjoy their newfound and newly won personal freedoms. With the era of colonial British rule behind them, these new United States citizens desired what we all enjoy and take for granted today: time-saving household devices; spices to flavor foods; machinery that promoted economic growth and enhanced agricultural production; fabrics and clothing not made by hand; improved systems of communication; and speedier transportation that moved goods swiftly across the nation. It was now time to create an infrastructure to serve the new citizenry.

However, another revolution loomed, involving no guns and no warfare. The beginning of the nineteenth century brought with it the Industrial Revolution. To protect their economic advantage, the British did not share innovative inventions, and so Americans became a “do-it-yourself” society. Our own industrial revolution originated in part with the introduction of Eli Whitney’s cotton gin. The United States Patent Office, established during Washington’s presidency, became a very busy place. Factories sprung up in populated areas. Americans delighted in their Yankee ingenuity and new systems of mass producing goods that made their lives a bit easier.

Teacher Directions

1. Share the following information with students.

During early colonial times, most Americans had to be entirely self-sufficient. Prior to the Revolutionary War, colonial Americans depended upon receiving imported goods primarily manufactured or shipped from England. The colonists supplied the raw materials, and the British supplied the technology to make needed items. However, that exchange system stopped at the beginning of the Revolutionary War. America had no choice but to become more self-reliant.

Soon, Americans began selling their raw materials to other foreign markets and inventing items that would make lives easier, promote trade, permit cross-country communication; and increase the speed of production.

2. Students work in small teams. Distribute one of the three Student Sheets: *Daily Living*, *Food Costs and the American Farmer*, and *Two Samuels and One Eli* to each team.
3. In their teams, the students read the Student Sheets and discuss their team’s topic.



Let's Discuss



History Sleuth

4. The teams report on their topics during a class discussion.
5. During the discussion, emphasize the differences between life in the eighteenth and nineteenth centuries with that of today. Personal freedoms were vastly different then from what they are today – an important aspect of this class activity.

Teacher Directions

1. The goal and purpose of this assignment is divided into two parts. First, students need to understand the importance of getting a patent if you are an inventor who has created something unique and useful.

Stress that Eli Whitney invented the cotton gin, but he had problems getting his own device patented. Several other people copied his invention. Writers use copyright law, and inventors use patent law to protect their creations.

2. The second part of “History Sleuth” concerns the use of Morse Code. Students will have fun experimenting with the Morse Code exercises.
3. Students use Student Sheet: *Can I Patent My Dog? Can I Copyright my Cat?* for Part I above and Student Sheet: *Samuel Morse and His Magic Decoder Machine* for Part II.
4. Once students have completed one or both of these assignments, they share results as a class.

Teacher Directions

1. Share with students the biography of Samuel Slater, who has been called the “Father of the Industrial Revolution” in the United States.

Explain to them that textile mills make clothing and fabrics. When Slater opened his first mill in Rhode Island in the late eighteenth century, he created an entire village for his new company, including homes for his employees, grocery stores, and even churches. However, in exchange for being given a place to live, Slater required that all members of these families work in his mill—including children. By 1830, 55 per cent of all mill workers were children.

2. Describe for your students life in the mills.

These huge mill buildings were very cold in the winter and blazingly hot in the summer. Lint particles in the air caused breathing problems. The machines were dangerous to operate. Many workers lost fingers, arms, and even scalp hair to one of these monsters. Everyone worked twelve to



What do you Think?

What Do You Think,
Continued.

fourteen hours a day, six days a week. If children did not get their work done, they were paddled. On Sundays, children were taught to read and write in church Sunday schools.

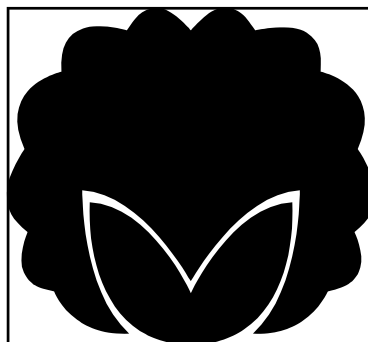
3. Discuss with students that even on farms, children were required to do chores. Poor families and farmers depended upon the work and wages of their children.
4. In their teams, students discuss the following questions.
 - Was it wrong for Slater to expect children to work in factories?
 - Are there still places in the world today where children work long hours?
 - What sorts of chores are you required to do on a regular basis in your own homes? Do you consider yourself more fortunate than the Slater Mill children? Why?

Teacher Directions

1. Explain to the students that historians discuss the effect of the invention of the cotton gin on the institution of slavery. Explain that the goal of the Moving Toward Freedom tasks is to encourage them to discuss the impact of the cotton gin in a number of ways.

Task One: Distribute one cotton ball and 5-6 poppy seeds to each student. Ask the students to embed the poppy seeds into the centers of each cotton ball. Ask students to imagine being a slave whose job was handpicking each seed from every boll of cotton. Students remove each of their 5-6 poppy seeds, timing themselves as they work on that one small ball.

Task Two: Students read the Transparency: *How Much Cotton Can a Cotton Gin Clean?* Next, using Think-Write-Pair-Share, students respond to the questions on the Transparency: *The Importance of the Cotton Gin*. Conclude with a class discussion.



*How quickly can you
hand-pick the seeds
from a boll of cotton?*





Connections

Math — Each student imagines that he or she is a textile mill worker in the 1830s and earns \$3.60 a week. After paying \$1.50 to rent a room, how much money remains to buy food? Students use the Student Sheet: *Food Costs and the American Farmer*. Students list the items and amounts for each that they can buy.

Music — Students locate spirituals sung by slaves. Students discuss the words used and the themes presented in the spirituals. Students listen to or sing spirituals.

Language Arts — Students listen to spirituals and study the lyrics. Students create poems that mirror the spiritual. Topics can be drawn from child labor, slavery, the major inventions of Morse, McCormick, and Deere, or food and agriculture.

Art — Students bring several household kitchen utensils, such as an egg beater, a washboard, a potato masher, – older ones if possible – to class. They choose one or several and do line drawings of them as though they were going to submit these items for patents.

Science — Students use the library and/or Internet and report on one of the following: reapers, threshers, the telegraph machine, steel plows, how tin cans are made, or any other related invention.

Language Arts — Students “invent” something that would be useful to them or others or make everyday life easier. They give that object a made-up name, like a “Mudworp” or a “Dinglet.” They draw pictures of their objects and write a paragraph about how it works and why it should be patented.

Topic I: Food Costs and The American Farmer

Read the following and then discuss the questions.

Food Costs: 1796-1820

Bushel of apples	\$	2.50
Pound of butter	\$.14
Bushel of corn	\$.62
Barrel of fish	\$	9.00
Barrel of flour	\$	5.50
Bushel of peas	\$	1.50
Loaf of bread	\$.03
Pound of tea	\$	1.00
Dozen eggs	\$.12
Large box of salt	\$.19

From an early Ohio newspaper

1. During the eighteenth century and early nineteenth century, farmers used oxen, horses, and crude wooden plows. They sowed seed by hand; hoed the fields by hand; and cut their grains with a sickle.
2. John Deere, the inventor of the steel plow, discovered that the cast-iron plow invented in 1797 by Charles Newbold would not work in rich soil, which clogged the plow. The farmer had to stop often and remove clumps of dirt. In 1837, Deere created a smooth, steel plow that cut through the dirt with ease. Deere's invention made the lives of farmers easier.
3. In 1834, Cyrus McCormick patented his reaper, an instrument to harvest grain. People have said that McCormick's reaper helped the United States to expand westward because it made the work of farmers so much easier.

Questions for Discussion

- As a group, brainstorm how much these same products would cost today. What items are missing from this list of ordinary household items?

Example: Why isn't lettuce listed? Or milk? Or rice?

- How long do you think it would take an American ancestor farmer to sow an entire field of wheat? If your family has a garden, how long does it take to weed it?
- There were problems with the cast iron plow. What problems might have happened if a farmer were using a wooden plow? If you have tried to dig a hole in your backyard, what problems have you encountered?
- What does the John Deere Company make today? How important do you think Deere and McCormick's inventions were for the American farmer?

Topic II: Two Samuels and One Eli

Read the following and then discuss the questions.

Samuel Slater has been called the "Father of the American Industrial Revolution", yet he actually was born in England. He came to the United States in 1789 knowing how to build and operate water-powered textile machines that allowed our infant country to mass-produce fabrics and clothing. He built his first plant in Pawtucket, Rhode Island, near Providence, where he employed entire families including children. His workers lived in company housing, attended company schools, and purchased needed items at company-owned stores.

Another Samuel was Samuel Morse, a brilliant man who invented the first successful electric telegraph that allowed people in our new country to send messages to one another. Relatives and friends no longer had to depend upon riders on horseback to exchange mail and information. Not only did this Samuel invent the telegraph, he also invented a code to go with it. The Morse Code is still used today by ham radio operators and by the military if other systems of communication happen to fail.

A third important inventor was Eli Whitney who invented the cotton gin. Cotton was a major crop in the southern United States. Prior to Mr. Whitney's invention, slaves picked the prickly seeds from the cotton bolls, a tedious and time consuming process. Whitney's new gin used a set of rollers that pulled the lint, or the cotton itself, through a set of teeth, thus removing the seeds. And, while Eli's invention greatly helped Southern plantation owners, he unknowingly promoted a reliance on slavery because cotton growing became enormously profitable.

Questions for Discussion

- How did our colonial ancestors make their own clothing? Where does wool come from? What is a spinning wheel? Have you ever seen one? What is a loom? Have you ever seen a loom? What machines do we use today to make clothes? Where do we go today to buy fabrics to make those clothes? Why is cotton clothing so much in demand today? As you read these questions, are you wearing cotton or wool?

- Do you have a cell phone? Do you get E-mail? Do you pick up the telephone and talk to relatives and friends in other states? Discuss what it must have been like to send a letter to someone across the country in the year 1830. How long would it take for the letter to get there? How long would it take for you to get a response?
- Discuss what a code is. Did you and a friend ever create a secret code? What did it look like? The Morse Code was based on a series of tapping sounds, with different taps representing letters of the alphabet.
- People have said that the invention of the cotton gin prolonged slavery.

Can I Patent My Dog? Can I Copyright My Cat?

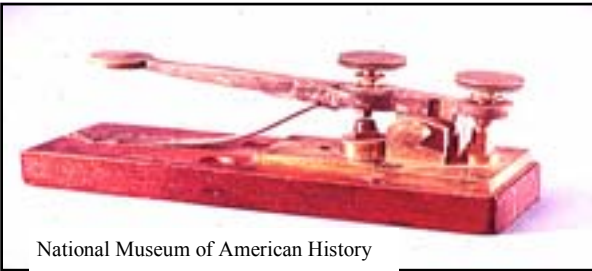
The patent bill of 1790 (written when President George Washington was in office) stated that the government could patent "any useful art, manufacture, engine, machine, or device, or any instrument thereon not before known or used." Congress also passed the first copyright law in 1790 to protect authors of original works, such as music, books, plays, art, and other intellectual works from being used without the creator's permission.

Important Things to Know about Patents

- The item that you invent has to be useful. You cannot patent a "Pet Rock."
- You cannot patent something that does not work!
- You cannot patent an idea.
- United States patents do not apply in Europe.
- A patent grants the inventor the right to keep others from making, using, or selling his or her invention.
- A patent is good for twenty years.
- You cannot make a minor change in an already patented item and get a patent of your own. Your invention has to be very, very different from a similar one.
- Today, the United States Patent Office publishes 3,500 applications a week!
- To get a patent, the inventor has to be able to describe his or her creation in clear language, demonstrate how it works, and provide pictures of it.

Do the following activities.

- Open one of your textbooks to the title page. Look at the back of the title page and see if you can find out when your book was copyrighted.
- What if you invented a mechanical dog that did all sorts of tricks. What would you have to do to get a patent on your toy?
- What if you have an amazing cat named Harry and you wrote a story about Harry's antics? Would you try to get a patent or a copyright?
- Working with a partner, brainstorm to create a long list of items in your homes or classrooms that might be patented, then discuss whether those items would be patented or not, or whether the patents might have expired. (Remember! Patents are only good for twenty years.)



Samuel Finley Breese Morse and His Magic Decoder Machine

Samuel Morse was a very busy man. During his lifetime (1791-1872), he invented a pump for fire engines; a tool that could cut through marble, and the telegraph machine, which he patented in 1837.

A telegraph machine sent messages over electric wires. Morse created a code for each letter of the alphabet. The code was actually a series of sounds that could be tapped over the wires. Of course, people had to know how to use and translate the code. But how wonderful it was to be able to send messages all over the country—FAST! By 1851, there were over fifty telegraph companies in the United States.

The sounds that were tapped over the telegraph were a series of dots and dashes. A dash would be held for the count of 3.

Let's try it! Take a pencil or a pen and make 3 very fast taps: dot dot dot
Now, tap once and keep your pencil tip on the table.
Count to 3: dot -1-2-3; dot -1-2-3; dot -1-2-3.
You have created a dash!
Next, make three more very fast taps: dot dot dot

What you have just tapped out in Morse Code is "SOS". SOS means "Save Our Ship." When the *Titanic* sank in 1912, the telegrapher sent out the SOS Morse Code message many times.

Try this exercise! Tap out the word HELLO to a partner in your class using Morse Code.

- H:** 4 dots (brief pause)
- E:** 1 dot (brief pause)
- L:** dot dash dot dot (brief pause)
- L:** dot dash dot dot (brief pause)
- O:** dash dash dash (brief pause)

How Much Cotton Can a Cotton Gin Clean?



How the Cotton Gin Worked

Raw cotton bolls were cranked through rollers containing wire teeth, which tore the green seeds away from the cotton itself. Iron slits let the cotton pass through, but not the seeds. Another cylinder of brushes removed the cotton that was stuck to the wire teeth.

Some Facts

The cotton gin could produce 50 pounds of cleaned cotton per day. After the invention of the cotton gin, the yield of raw cotton doubled every ten years. With more and more cotton available, more and more machines were made to spin and weave it. Textile mills grew up across many parts of the United States.

Even though the cotton gin reduced the labor of removing the seeds, planters could now grow more cotton. Thus, more slaves were needed to grow and pick the cotton. Cotton growing became so profitable for Southern planters that more and more slaves were needed to work the fields.

One slave wrote, "The hands are required to be in the cotton fields as soon as it is light in the morning...and they are not permitted to be a moment idle until it is too dark to see, and when the moon is full, they often labor til the middle of the night."

The Importance of the Cotton Gin: Points to Ponder

Use Think-Write-Pair-Share

1. Think about your responses to the following questions.
2. Write your answers to each question in paragraph form.
3. Share your paragraph with your partner. Read each other's paragraphs. Identify places where you agree or disagree.
4. Report your findings during a class discussion.

Question 1:

How important do you think the invention of the cotton gin was for American society and the growth of the industrial revolution? What impact did it have on the lives of ordinary Americans?

Question 2:

Some people have said that without the invention of the cotton gin, the institution of human slavery in America would have died out and disappeared. Do you agree or disagree? Explain.