



King Cotton

Suggested Grade Level: 6-8

Time: Two 45-minute class periods

Subject: English Language Arts, Writing, Speaking and Listening, Social Studies, Agricultural Innovations, Enslavement and Abolition, Agriculture, Cotton, Fiber & Fabric

Overview: In this lesson, students will explore the history of cotton, from its cultivation and harvesting to its processing and use. They'll compare hand separation of cotton bolls to the cotton gin and learn how the gin increased the demand for enslaved labor, contributing to the Civil War. Students will also learn how technology has changed cotton production and explore its modern-day applications in everyday life.

Objectives:

1. Identify and describe the parts of a cotton boll.
2. Compare cotton processing before and after the invention of the cotton gin.
3. Evaluate the effects of the cotton gin's invention by identifying its role in expanding the cotton industry and slavery.
4. Describe the role of cotton in the modern world, including its economic, environmental, and technological significance.

Background Information:

Humans have cultivated cotton for thousands of years, with archaeological evidence of cotton fibers and textiles dating back 7,000 years. Valued for its soft yet durable qualities, cotton has long been a preferred material for fabric and clothing. Although it originated in regions such as the Near East and Central America, cotton is now one of the world's most widely produced and utilized natural fibers. Its cultivation and trade have played a significant role throughout history, influencing economies, shaping global trade routes, and contributing to the development of many nations (Barnhardt). From ancient farming techniques to today's mechanized harvesting, cotton's impact extends beyond agriculture into culture, industry, and global commerce. Its legacy continues to evolve as production methods become more efficient and sustainable.

For years, harvesting cotton was backbreaking work that relied heavily on enslaved labor, especially in the South, where cotton was abundant and highly profitable. Things changed in 1793 when Eli Whitney invented the cotton gin, which significantly accelerated the process of separating cotton from its seeds. Cotton production took off and, unfortunately, so did the demand for enslaved workers. According to author John Steele Gordon, what could once be hand-ginned in three weeks could now be ginned in one day. The cotton gin led to a significant increase in cotton production, rising from

around 88 million pounds in 1810 to nearly two billion pounds by 1860 (NBC). After the U.S. government officially abolished slavery, producers struggled to cut down on manual labor. While there were many failed attempts to automate cotton picking, the Rust brothers ultimately succeeded. In the early 1930s, John and Mack Rust developed a one-row cotton picker that utilized a smooth, moist spindle—it was the first significant step toward mechanized cotton harvesting, although it wasn't very efficient. Many criticized the brothers at the time for throwing many people out of work during the Great Depression. However, their invention proved easier, faster, and cheaper than manual labor over time (Holley).

Today, cotton pickers can harvest six to eight rows at once using either spindle or stripper systems, depending on the region and crop. With modern cotton pickers, the process is faster and more efficient than it was in the past. Once picked, the cotton is pressed into big, weather-resistant modules and hauled to the gin by truck. Some of today's high-capacity gins can turn out as much as 30,000 pounds of clean cotton fiber in one hour (Spielmaker). Once the seeds and plant residue are removed from the cotton lint during the ginning process, the cleaned cotton is compressed into bales, each weighing slightly less than 500 pounds. These bales then undergo a process called classing, where the cotton is graded based on key fiber qualities such as staple length, strength, fineness (micronaire), color, and trash content. Classing is typically performed using high-volume instrumentation, ensuring consistency and quality in the cotton supply chain. Cotton classification is directly linked to quality and price (Cotton). After classing, the cotton bales are sold to textile mills, where the fibers are spun into yarn and woven or knitted into fabric for use in clothing and other products.

Kansas Connections:

Cotton is a relatively new crop in Kansas, with the earliest significant harvest in the late 1990s. Cotton is grown in Southwest Kansas as an alternative to corn due to its ability to thrive in hot temperatures (O'Hara). Most of the cotton varieties grown in Kansas are upland cotton, a common source of fiber for denim clothing. In Kansas, cotton is planted in May or early June, reaching maturity in approximately 120 days. Unlike many Kansas crops, cotton can stand in the field for weeks before harvest without damage. Nationally, Kansas ranks 14th in cotton production, and production is on the rise (National). As of 2019, over 400 cotton growers and four cotton gins were available in Kansas. Kansas gins are located in Moscow, Anthony, Pratt, and Winfield — in Stevens, Harper, Pratt, and Cowley counties (Stroop).

More Kansas farmers are getting in on cotton. Cotton acreage in Kansas grew from 16,000 to 200,000 from 2015 to 2020. According to KSN.com, "Experts believe the increase (in cotton production) is due to the worldwide demand for the product as well as the crop's higher resistance to drought, making it an appealing option for Kansas farmers" (Batman). Cotton hasn't been around in Kansas for long. The boll weevil, which preys on cotton, has not been spotted here yet. Our state has taken preventive measures to keep it that way. To reduce the risk of an infestation, it is illegal to grow

cotton in home gardens. Small, unregulated cotton plants could attract the weevils, threatening commercial crops. By restricting cotton growth outside of regulated farms, Kansas aims to protect the agricultural industry from potential damage caused by this invasive insect (O'Hara).

Materials:*Activity*

Per student

- The Invention of the Cotton Gin, Before and After Worksheet (provided)
- Cotton Boll Kit <https://agclassroomstore.com/cotton-bolls/> (or one boll per student)
- Linking History and Technology (provided)
- Cotton Gin Diagram (provided)
- One pair of jeans, any size
- Scale

Instructional Format:

- Review background information.
- Conduct engagement exercise.
- Lead a class discussion.
- Complete the activities.
- Conduct assessment exercise.

Engagement: To introduce this lesson, write this question on the board or post it somewhere students can see it: "How did cotton impact the history and culture of the United States?" Then, have students get into small groups to discuss it. Reconvene the class and take answers from each group.

Procedures:*Discussion*

1. Play this YouTube video for your class. My Footage: 1940s Labor Picking Cotton <https://www.youtube.com/watch?v=okmKG1zbC3g>.
2. Ask the students if they have ever picked seeds out of cotton. Clarify that cotton, a standard fabric for our clothing, comes from a plant.
3. Explain the parts of a cotton boll. Each boll contains seeds surrounded by fibers, and once the lint is removed, the remaining fuzzy short fibers are called linters. The outer casing of the cottonseed is called the hull, and the inner part is the kernel.
4. Explain that when the cotton is harvested from a cotton boll, the seeds must be separated from the cotton fiber through a process called ginning, which can be done by hand or using a cotton gin.
5. Discuss the challenges of picking cotton by hand. Explain the following:
 - After hand-picking cotton in the fields all day, enslaved people would join the elderly, infirm, and children to gin the cotton by hand.

- Enslaved people were required to remove as much lint as possible from each cottonseed. The more fiber removed from the cottonseeds, the more profit a farmer could make from each boll.
- An enslaved person would typically hand gin about one pound of cotton (about 120 cotton bolls) daily.
- Some enslaved people were expected to fill a shoe with cotton seeds before going to bed at night.

Activity

1. Pass out the cotton bolls and have students separate the seeds, lint, and cotton.
2. Ask the students to consider the work of filling a shoe with ginned cotton seeds.
3. Give each student a copy of the Cotton Gin Diagram.
4. Instruct them to write a description of how Eli Whitney's cotton gin worked on the back of the diagram. Then, have your students place the cotton and seeds they ginned onto the diagram.
5. Watch this short YouTube video. NBC News Learn: Eli Whitney's Invention <https://www.youtube.com/watch?v=LiuYxA7JDx4>. Then, discuss why cotton growth and the need for slaves exploded after the invention of the cotton gin.
6. Have students complete the "The Invention of the Cotton Gin, Before and After" worksheet.
7. When they are finished, share the answers to the worksheet and discuss as a class.
8. Ask students how other innovations have changed how farmers harvest cotton. Take a few volunteer answers. Then, show them the following two videos:
 - The Produce Nerd: California Cotton Harvest and Ginning https://www.youtube.com/watch?v=H_jg72RQYEK.
 - Business Insider: How Cotton is Processed in Factories | How It's Made <https://www.youtube.com/watch?v=QHgNoSYlhYs>
8. After watching the video, explain that cotton ginning is now managed by professionals called Cotton Gin and Warehouse Managers. Discuss the Career Information section and ask students to consider how this role compares to cotton processing in the past.
9. Then, watch this short video: texasfarmbureau: Original Oil | Cottonseed Oil <https://www.youtube.com/watch?v=YrSltygVNSA>. As students watch, pass out a few cottonseeds. Have your students squeeze or roll the seeds to see if they can feel the oil.
9. Discuss how students use cotton in their lives. Then, display Linking History and Technology. Discuss the question, "*What can you make from a bale of cotton?*" with the class.
10. Explain to your students that cotton is the main component of many items. Note the number of students wearing jeans or denim, if any.
11. Then, ask your students to guess how many cotton bolls are needed to produce one pair of jeans. (Answer: approximately 360 bolls)

12. Have the students weigh the fibers from one bale and compare them to those of jeans. Explain that the jeans are almost 100% cotton, except for the zipper and buttons.

13. Finally, explain that cotton is crucial to many industries.

- 60% of women's clothing and 75% of men's clothing is made from cotton.
- Cotton is also used in a variety of products, including diapers, bed sheets, towels, underwear, and home decor items.
- Cottonseed oil is used in cosmetics, bath products, and plastics, as well as in livestock feeds and fertilizers.

Vocabulary:

- **Boll:** the rounded capsule of the cotton plant surrounding the seeds and the fibers attached to the seeds. Cotton seeds are planted in the ground. In Kansas, this occurs around mid-May. It takes between 5 and 10 days for germination and sprouting to occur.
- **Burr:** the dried cotton boll and attached brown casing after the lint and seed are removed—the outer coverings of cotton seeds separated from the kernel by screening.
- **Lint:** Long cotton fiber (1 to 1.75 inches long) cleaned, straightened, and spun into thread or yarn.
- **Linters:** The short fibers (fuzz) attached to the cottonseed, used in a wide variety of consumer and industrial products. These products include: yarns, felts, paper goods, medical-grade cotton, and food casings.
- **Cottonseed:** The seed of the cotton plant and the source of cottonseed oil.
- **Hull:** The outer covering of the cottonseed
- **Kernel:** The center of the seed left after the hull has been removed.
- **Cotton Gin:** A machine that quickly and easily separates cotton fibers from their seeds.
- **Gin/Ginning:** The process of using a cotton gin to separate cotton fibers (lint) from the seeds. Ginning prepares cotton for textile production and helps sort fiber for quality and use.

Kansas Standards:

History, Government, and Social Studies:

Standard 1: Choices have consequences.

1.2 The student will analyze the context and draw conclusions about choices and consequences.

1.3 The student will investigate and connect examples of choices and consequences with contemporary issues.'

Standard 3: Societies are shaped by the identities, beliefs, and practices of individuals and groups.

3.3 The student will investigate and connect how societies are shaped by the identities, beliefs, and practices of individuals and groups with contemporary issues.

3.4 The student will use their understanding of how societies are shaped by the identities, beliefs, and practices of individuals and groups to make a claim or advance a theory using evidence and argument.

Standard 4: Societies experience continuity and change over time.

4.1 The student will recognize and evaluate continuity and change over time

Language Arts

6th Grade

Writing

Text Types and Purposes

W.6.1 Write arguments to support claims with clear reasons and relevant evidence.

Research to Build and Present Knowledge

W.6.7 Conduct short research projects to answer a question, drawing on several sources and refocusing the inquiry when appropriate.

W.6.9 Draw evidence from literary or informational texts to support analysis, reflection and research.

Language in Writing

W.6.10 Demonstrate command of and use knowledge of the conventions of standard English grammar and usage when writing.

W.6.11 Demonstrate command of the conventions of standard English capitalization, punctuation and spelling when writing.

Speaking and Listening

Comprehension and Collaboration

SL.6.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups and teacher-led) with diverse partners on sixth grade topics, texts and issues, building on others' ideas and expressing their own clearly.

SL.6.2 Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text or issue under study.

7th Grade

Writing

Text Types and Details

W.7.1 Write arguments to support claims with clear reasons and relevant evidence.

Research to Build and Present Knowledge

W.7.9 Draw evidence from literary or informational texts to support analysis, reflection and research.

Language in Writing

W.7.10 Demonstrate command of the conventions of standard English grammar and usage when writing.

W.7.11 Demonstrate command of the conventions of standard English capitalization, punctuation and spelling when writing.

Speaking and Listening

Comprehension and Collaboration

SL.7.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups and teacher-led) with diverse partners on seventh grade topics, texts and issues, building on others' ideas and expressing their own clearly.

SL.7.2 Analyze the main ideas and supporting details presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how the ideas clarify a topic, text or issue under study.

8th Grade

Writing

Text Types and Details

W.8.1 Write arguments to support claims with clear reasons and relevant evidence.

Research to Build and Present Knowledge

W.8.7 Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

W.8.9 Draw evidence from literary or informational texts to support analysis, reflection and research.

Language in Writing

W.8.10 Demonstrate command of the conventions of standard English grammar and usage when writing.

W.8.11 Demonstrate command of the conventions of standard English capitalization, punctuation and spelling when writing.

Speaking and Listening

Comprehension and Collaboration

SL.8.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups and teacher-led) with diverse partners on eighth grade topics, texts and issues, building on others' ideas and expressing their own clearly.

National Agricultural Literacy Standards:

Plants and Animals for Food, Fiber, and Energy

- Describe the differences in plants and animals used for food, clothing, shelter, and fuel before and after European settlement of the United States (T2.6-8 a.)
- Explain the role of ethics in the production and management of food, fiber (fabric or clothing), and energy sources (T2.6-8 b.)

Food, Health, and Lifestyle

- Identify sources of agricultural products that provide food, fuel, clothing, shelter, medical, and other non-food products for their community, state, and/or nation (T3.6-8 i.)

Science, Technology, Engineering, and Mathematics

- Compare and contrast historical and current food processing and systems (T4.6-8 a.)
- Explain how and why agricultural innovation influenced modern economic systems (T4.6-8 e.)
- Identify specific technologies that have reduced labor in agriculture (T4.6-8 h.)

Supporting Resources:

Clothes on the Grow <https://www.agclassroom.org/matrix/lesson/486/>

Cotton Byproducts Poster

<https://ksagclassroom.org/supporting-resources/cotton-byproducts/>

Cotton Counts cotton.org/pubs/cottoncounts/upload/Cotton-Counts.pdf

Cotton Education Kit <https://www.agclassroom.org/matrix/resource/764/>

Cotton Fun Facts Poster <https://ksagclassroom.org/supporting-resources/cotton-fun/>

Kids Connection Cotton Craze <https://ksagclassroom.org/resource-center/connection/>

National Agriculture in the Classroom DVDs

<https://agclassroomstore.com/secondary/?sort=alphaasc&page=3>

Assessment: Have students write a one-paragraph answer to the introductory question: "How did cotton impact the history and culture of the United States?"

Career Connections: Cotton Gin and Warehouse Manager

Cotton gin and warehouse managers oversee the entire cotton ginning process, cooperate with USDA Cotton Classing offices, connect with producers, and manage storage and marketing. They also ensure compliance with industry regulations and maintain equipment efficiency to guarantee high-quality output and smooth operations.

Author: Adapted by Amy Benz, retired middle school technology teacher from St. Marys, KS, from a lesson Growing a Nation Era 1b: Cotton's American Journey by Debra Spielmaker, Rose Judd-Murray, Lynn Wallin, and Andrea Gardner, and edited by Marissa Cook, Secondary Education Major at KSU, KFAC intern.

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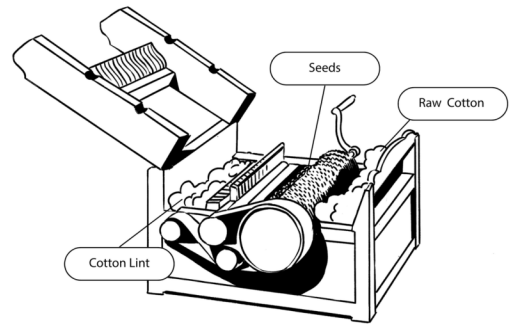
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Linking History and Technology

Understanding the Cotton Gin

1. Cotton bolls, made up of fiber and seeds, are fed into the cotton gin. The diagram labels show the path of cotton through the gin.
2. As the handle is turned, the cylinder and brushes rotate.
3. Wire teeth catch the cotton bolls and pull them through narrow wire slots.
4. The seeds that are too large to pass through the slots fall to the bottom of the gin.
5. Rotating brushes pull the cleaned cotton from the wire teeth and sweep it out of the gin.



Cotton Gin, Illustrated

What can you make from a bale of cotton?

One bale of cotton weighs 450lbs and is about the size of your refrigerator.

From that bale, you can make:

215 pairs of jeans

409 men's sport shirts

690 bath towels

765 men's dress shirts

1,217 men's t-shirts

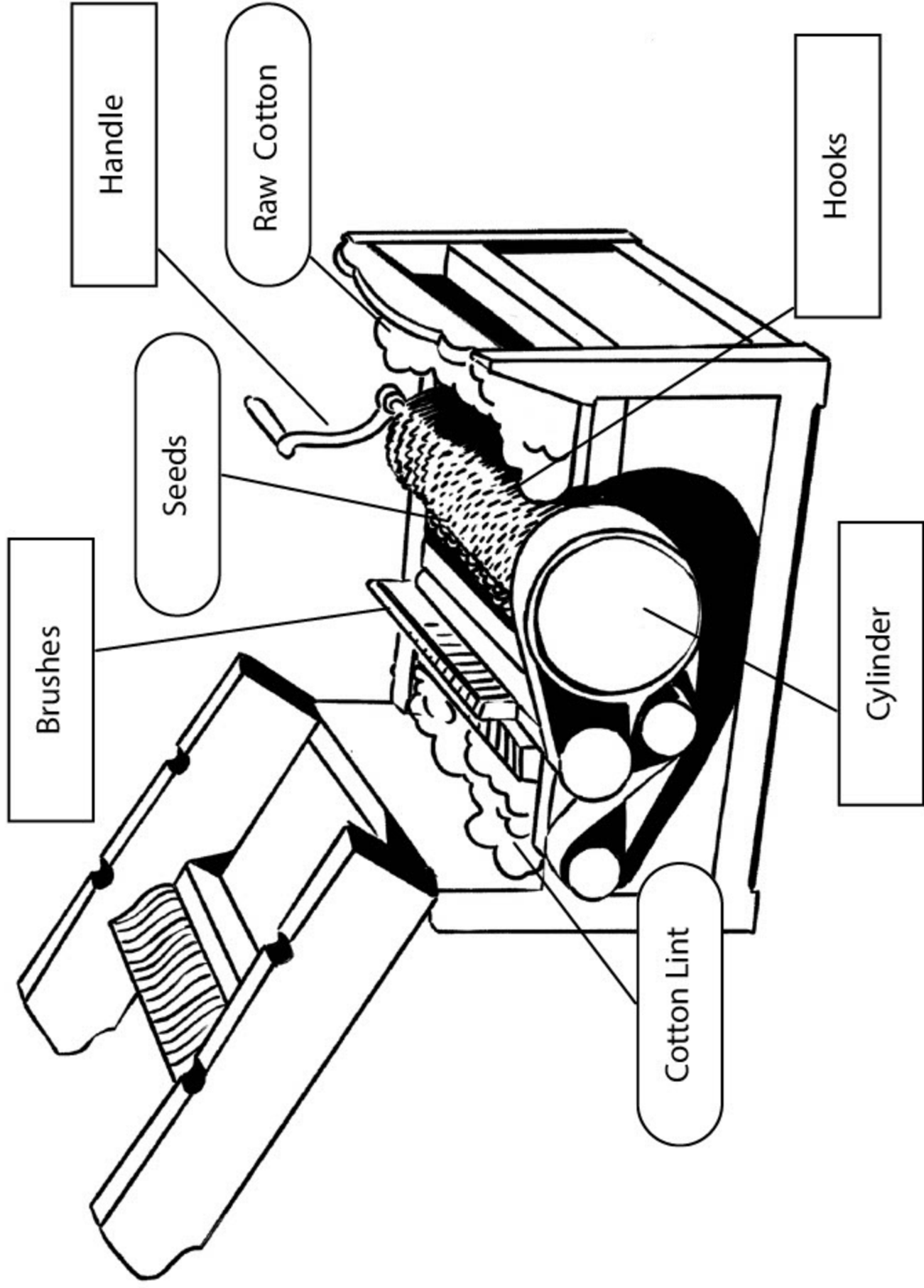
3,085 diapers

4,321 mid-calf socks

313,600 \$100 bills



Cotton Gin Diagram



The Invention of the Cotton Gin

How did the invention of the cotton gin transform the cotton industry?

Before

After

The Invention of the Cotton Gin

Cut and glue the answers into the "Before" and "After" boxes.

Cotton farms were profitable.

100,000 bales of cotton were produced each year.

Cotton farms were not very profitable.

3,000 bales of cotton were produced each year.

There were nearly 70,000 slaves in the United States.

Cotton exceeded the value of all other American products combined.

There were nearly 1 million slaves in the United States.

George Washington, Thomas Jefferson, and many others believed the end of slavery was near.

Removing the seeds from cotton bolls was tedious and time consuming.

Large cotton plantations were established.