

Cotton

Information compiled by the California Foundation for Agriculture in the Classroom

How Produced – In early spring, seeds are planted one to three inches deep, by mechanical planters, in seedbeds. Plants are irrigated, fertilized and weeded, as needed, during the 25 week growing cycle. The first true leaves appear after two to four weeks with the bud, also known as a "square," appearing about five to seven weeks after planting. The white blossoms become pollinated, turn light pink and then wither at about nine weeks, letting the cotton boll develop, producing the fibers and seeds that are harvested. The cotton bolls open naturally over time and a defoliant chemical is applied by ground or air to ensure top quality. This helps the leaves dry and fall off and any remaining closed bolls to open.

A mechanical cotton harvester moves through the field picking the cotton, which is then packed into truckload sized "modules" and taken to the gin. The gin separates the cotton fibers from the seeds. Cleaning equipment removes twigs and other debris. The fiber, now called lint, is packed into 500-pound bales and then transported to textile mills. The cotton is carded or combed, making all of the fibers run parallel, and then spun into thread. Some whole cotton seed is fed to cattle. Some seed is further processed. The fine "linter" fibers are removed and the seed is pressed and cooked, producing cottonseed oil and meal.

Uses – Like lumber, cotton comes in many varieties and qualities, each suitable for different purposes. The long lint fibers are used for many things, most of which begin with a thread, yarn, or cotton fabric. Clothing and bedding items are common products. The smaller cotton fibers, known as linters, are removed from the seed and are used as stuffing for furniture and components of linoleum, plastics, and insulation. Cotton seed oil is used in foods and cosmetics. Cotton seed hulls are eaten by cattle.

History – The oldest cotton fibers and boll fragments, dated from around 5000 B.C., were discovered in Mexico. In 5 B.C., the Greek historian Herodotus reported of a plant that "bore fleece." Cotton has been worn in India and Egypt for over 5,000 years. Cotton was grown by Native Americans as early as 1500. In England in the 1700s, it was against the law to import or manufacture fabric made of cotton since it was a threat to the sheep and wool industry.

American colonists were able to grow lots of cotton, but processing was difficult. It was not until the 1700s that the cotton industry flourished in the United States. It was then that Samuel Slater, an Englishman, built the first American cotton mill. These mills converted cotton fibers into yarn and cloth.

In 1793, Eli Whitney developed the cotton gin, which mechanically separates the seed from the lint fiber. Whitney named his machine a "gin," short for the word "engine." Technology has improved over the past centuries making cotton growth and production much more efficient.

Varieties – There are five main cottons varieties grown throughout the world—Egyptian, American Pima, Sea Island, Asiatic, and Upland. The most prominent types of cotton grown in California are Upland, whose fiber lengths are $\frac{13}{16}$ inches to $1\frac{1}{4}$ inches in length, and American Pima, whose fiber lengths are $\frac{15}{16}$ inches to $1\frac{1}{2}$ inches. Seventeen states in the

nation produce cotton with roughly 12 million acres of cotton planted annually.

Commodity Value – Cotton is a leading cash crop nationally, ranking behind corn, soybeans, and wheat. In California, cotton and cottonseed rank 5th and 4th in terms of value of sales by commodity group. In 2015, California's cotton and cottonseed crop value was over \$336 million.

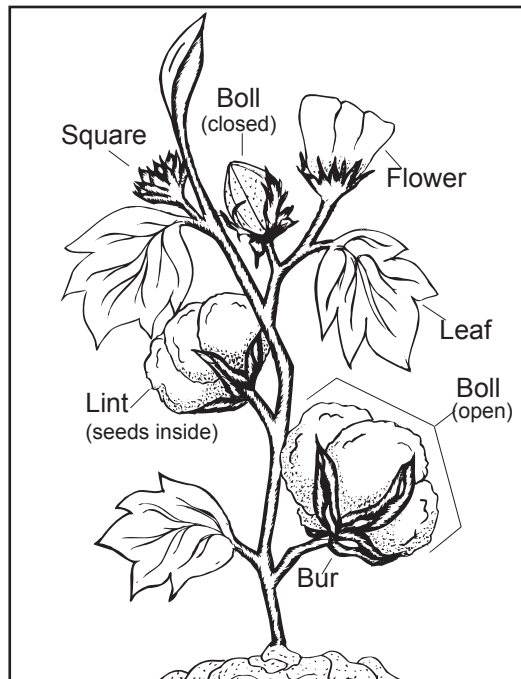
Top Producing Counties – The majority of cotton is produced in the cotton belt of the United States, ranging along the southern part of the nation from California to Florida and Virginia. In 2015, the top five cotton producing counties in California include Kings, Fresno, Merced, Kern, and Tulare.

For additional information:

National Cotton Council

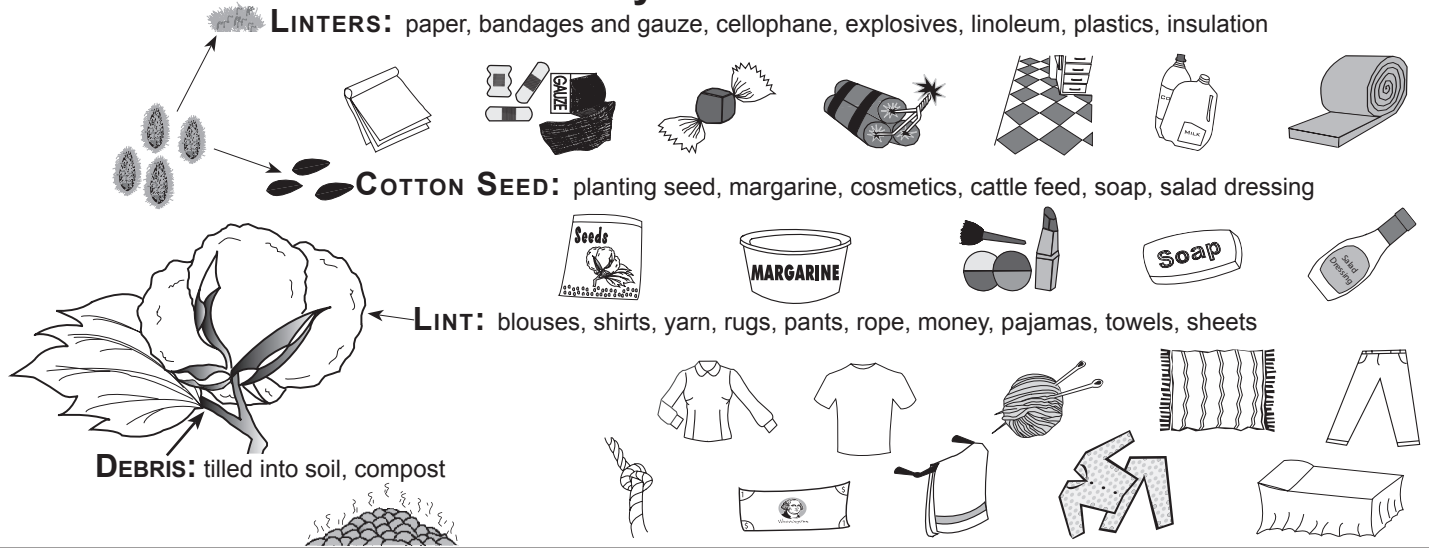
Website: www.cotton.org

Website: cottonsjourney.com



Cotton Activity Sheet

The Many Uses of Cotton



Lesson Ideas

- Closed cotton bolls are sweet to the taste. Using your own knowledge about photosynthesis, develop a hypothesis explaining this mystery.
- Determine the origins of cotton and wool. Create a list of products that are derived from each commodity.
- Examine clothing labels. How many of the clothes contain cotton? Discuss how cotton is grown and processed into fabric.
- Discuss the history of American cotton. Make a timeline out of cotton rope that is labeled with key events.
- Write biographical essays on Eli Whitney and Samuel Slater.
- Create a model of a universal density bale, whose dimensions are 55" x 21" x 26". Determine its volume and density if a standard bale is 480 to 500 pounds.

Fantastic Facts

1. A universal density bale of cotton weighs between 480 and 500 pounds.
2. 325 pairs of jeans can be made from one bale of cotton.
3. Cotton gins separate seeds from the lint fibers.
4. Eli Whitney invented the first cotton gin.
5. When a cotton flower has been pollinated, the petals turn from white to pink.
6. The oldest cotton fibers were found in Mexico. They were over 7,000 years old.
7. The tiny fibers around a cotton seed are called linters.
8. Textile mills convert cotton fibers to yarn.

Lesson Plan: A Bit of Cotton History

Introduction: Today cotton is grown worldwide and its fibers are incorporated into thousands of products. Historically, its production shaped significant events in American history and its processing contributed to the Industrial Revolution.

Objective: Students will research a cotton-related topic, write an informative text, and create a visual display.

California Standards: W.3-12.2,5,7; SL.3-12.4,5

Materials: Access for student use of the Internet and library, display boards or butcher paper, markers and other supplies of your choosing.

Procedure:

1. Divide students into teams of two or three. Have each group select from one of the following topics: cotton and the Civil War; Eli Whitney and the cotton gin; Samuel Slater and cotton milling; the history of cotton songs; the many

uses of cotton; cotton bales; cotton production in California; the cotton plant; cotton fabrics; cotton's journey from field to home; other topics of your choosing.

2. Have students explore literature and websites to learn about their cotton topic and record their information. Websites may include cottonsjourney.com and www.cotton.org.
3. Students will create an informative research report on their topic. Supporting references should be cited and the document should be revised and proofed for accuracy and grammar.
4. Have the students take the information they learned and create a visual display that educates their classmates.
5. Share the displays with the school or public.