What's Growing On IN VIRGINIA

AGRICULTURE IN THE CLASSROOM • FALL 2022 / VOLUME NO. 1

THIS ISSUE

Quality cotton

Whether it's found in the clothes you're wearing, the sheets you sleep on or the money you spend, the cotton products we use every day start on farms.

For more than 30 years Cotton Incorporated has promoted cotton as "The Fabric of Our Lives®," and it's easy to see why.

Loved universally for its softness, breathability and durability, cotton can be found everywhere we look. The fiber is used in over 60% of all apparel and home furnishings that are sold in the American consumer market.

That means whenever you pull on a T-shirt, put on a pair of jeans or layer up with a cozy sweater, there's a good chance your favorite clothes started out on a farm. The same goes for your bed sheets and pillow cases, towels, washcloths and the sofa in your living room. In fact, cotton even makes up about 75% of the paper money consumers use to buy cotton goods.

Before cotton can be made into everyday items, it takes hard work from farmers to grow the crop. Virginia is one of only 17 states that produces cotton in the U.S., with 247 farms growing the crop in 2017.

Virginia's production is modest compared to other Cotton Belt states, but cotton still ranks as the state's 14th largest agricultural commodity, ahead of apples, peanuts and pumpkins. Cottonseed, a byproduct of cotton, is used to feed livestock and produce cottonseed oil and is Virginia's 19th largest commodity.

And, while American production was projected to decrease nationally in 2022, Virginia farmers were expected to increase their harvest this year to 172,000 bales. To put that figure in context, one bail weighs about 480 pounds. That means Virginia's cotton producers expect to grow over 41,000 tons of cotton this year, enough to make 34.4 million pairs of jeans or 206.4 million T-shirts!

Cotton is planted in Virginia as early as late April, and typically is harvested in October and November. Cotton is primarily grown in southeastern areas of the state, with Isle of Wight County, Southampton County and Suffolk leading the way as the state's top-producing localities.

Recently, Virginia Agriculture in the Classroom was invited to tour the headquarters of Cotton Incorporated and its research facility in Cary, North Carolina. Here, AITC's educational staff visited the innovative laboratories for fiber processing, dyeing and finishing, product development and product evaluation. Additionally, staff also toured a local textile mill to see how cotton is processed and manufactured into commercial products.

Having learned plenty from the field trip, Virginia AITC is excited to share more information with students through lessons and activities about how cotton moves from Virginia farms and into their daily lives.

Cotton Fun Facts

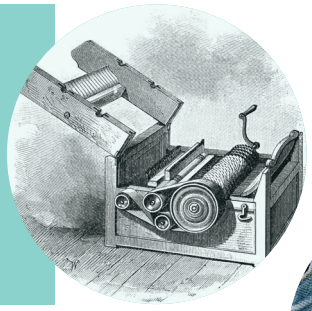
The makeup of American **paper currency**, or bills, is comprised of about 75% cotton.

There are about 150 yards of cotton found in a regulation-sized **baseball.**

Cotton's properties make it a good material for **clothes for all seasons** because cotton keeps the body cool in summer and warm in winter. Cotton also is stronger when it's wet and can soak up about 30 times its own weight in water.

Cotton is weighed in bales, and a single bale of cotton weighs about 480 pounds. More than 200 pairs of pants or 1,200 T-shirts can be made from a single **bale of cotton**.

Unlike polyester materials made from petroleum, cotton is a **sustainable fiber** that will break down naturally.



Eli Whitney invented the **first cotton gin** in 1794 during the Industrial Revolution. Whitney's invention changed the cotton industry—and textile manufacturing—forever.

German immigrant Levi Strauss and his business partner, a Latvian tailor named Jacob Davis, received a patent to manufacture cotton work pants reinforced with metal rivets in 1873. The patent made way for blue jeans as we know them today. The Levi's denim brand is named after Strauss.

The average American owns seven pairs of **blue jeans**. Jeans are made weaving vertical threads (warp) and horizontal threads (weft).

The **first light bulb** invented by Thomas Edison in 1879 produced light using carbonized cotton filaments and burned for 13½ hours.

Did you know?

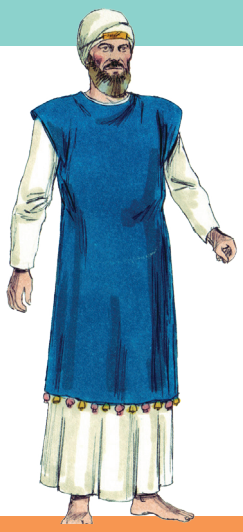
Dating back to ancient civilizations in the Americas, Asia and the Middle East, cotton has been grown and harvested for fabric for at least 7,000 years. Cotton is believed to have been grown commercially in the New World as early as 1556, when Spanish explorers planted the crop in what is now Florida. Cotton was first commercially grown in Virginia in 1607 following the arrival of colonists at Jamestown.

Cotton comes from the Arabic word "qutun," which initially meant "linen" during medieval times. The word "cotton" eventually entered the English language around 1300.

There are more than 45 species of cotton, but only four are grown commercially around the world. Upland cotton accounts for 90% of all cotton produced globally and 97% of cotton produced in the United States. This species is native to Central America, South America and the West Indies. The remaining U.S. production utilizes Pima cotton, a species native to Ecuador and Peru.

Cotton is both a fiber and a food crop. This means that not only do we wear cotton, but we also can feed it to livestock. In fact, in America, cotton is regulated as a food crop. Scientists also have developed ways for cotton to be used for human consumption.

Where did the T-shirt get its name? The first T-shirts were issued to members of the United States Navy in the late 1800s. The garments got their name from their resemblance to the letter "T" when laid out on a flat surface.



Ancient Egyptians grew cotton, but only high priests were permitted to wear cotton garments. Egyptian cotton is still highly regarded in modern times due to the length of its fiber.

Lesson Plan 1

Cotton Life Cycle

Background Knowledge

In Virginia, cotton is typically planted in late April through late May. Green sprouts may be visible by June. After sprouting, the cotton develops leaves called cotyledons. Next, buds will appear and open into blossoms. The blossoms start as white and then darken to yellow, pink and, eventually, red. When the blossoms fall off, they leave cotton bolls. Bolls are small, green, football-shaped pods that hold cotton seeds inside. The boll will ripen and turn brown revealing the cotton fiber. In the fall the bolls open, and the cotton is ready to be harvested.

Cotton is harvested using machinery to cut it from the field, then stacked and stored in large rectangular mounds called modules. Next, the cotton is sent to a gin where the fiber is pulled from the seeds. After being ginned, the fiber is called lint, and is pressed into large bales. Then the seeds that were removed can used for animal feed, paper, plastics or cottonseed oil.

CONTENT AREA

SOL: Science 2.4, 2.8, 3.8, 4.4, 4.9

Objective

For students to –

1. Sequence the steps in the life cycle of a cotton plant.

2. Identify the parts of a cotton plant.

Materials:

- Printed template (see QR code in blue box on page 5)
- Scissors
- Crayons or markers
- White paper plates (one-and-a-half per student)
- Yarn
- Tape
- Brown construction paper
- Cotton balls
- Stapler
- Glue

Procedure

1. Tell students they will be making a model of the life cycle of a cotton plant.
2. Hand out the printed templates, scissors and crayons or markers.
3. Tell students to label, color and cut out the five patterns. Seeds should be colored brown; bolls, buds and leaves, green; and flowers, pink.
4. Hand out one-and-a-half plates to each student.
5. Instruct students to put plates together, with the half plate forming a pocket on the back of the full plate.
6. Distribute yarn to each student.
7. Instruct students to sequence then tape the parts to the yarn in order: seed, leaf, bud, flower and boll, Label first, second, third, fourth and fifth.
8. Attach the yarn to the back of the paper plates. The seed should be positioned so it is the first piece to emerge from the pocket.
9. Instruct students to cut out several triangles from the brown paper, then glue or staple the bottom of the triangles along the bottom edge of the paper plate.
10. Instruct students to fold back the top half of the triangles so they stick out from the plate.
11. Give each student a handful of cotton balls.
12. Instruct the students to glue the cotton balls to the plate, above the folded-back triangles.
13. Tell the students that this depicts what a cotton boll looks like after it has opened.
14. After all the cotton cycle models are completed, have students place all of the cotton parts in the pocket formed by the half plate.
15. Demonstrate how this model shows the life cycle of a cotton plant.
    a. Pull the seed apart, and tell students that a cotton plant begins life as a seed.
    b. Pull out the leaf, and tell the students that the plant then develops leaves.
    c. Pull out the bud, and tell students that the plant develops buds after leaves.
    d. Pull out the flower, and tell students that buds develop into flowers.
    e. Pull out the boll, and explain that after the flowers bloom and die, then bolls form.
    f. Pointing to the cotton boll, explain that the bolls open showing the cotton.
16. Using their models, ask students to demonstrate the cotton life cycle to a partner.
17. After, ask students review questions:
    - What are all the parts of cotton's life cycle from beginning to end?
    - Why is cotton important?

Lesson Plan 2

From Bolls to Bolts

Background Knowledge

Cotton, Virginia's 14th largest agricultural commodity, is harvested in the fall. Most cotton is harvested by machine, and after it is harvested it is loaded on trailers and trucks to be carried to cotton gins.

At cotton gins, powerful pipes suck the cotton through machines that remove compost material, dirt and leaf residue. Then, circular saws with small, sharp teeth pull the fiber from the seeds. Once ginned, the fiber is called lint. The cotton lint is pressed into 480-pound bales, which are sold to merchants who then sell them to textile mills in the U.S. and abroad.

At textile mills, machines spin the cotton fibers into thread. The threads are then woven on looms into cloth. The rolls of cloth that come off the looms are called bolts. Clothing manufacturers buy bolts of cloth to cut into jeans, shirts, dresses and other clothing items.

Procedure

1. Instruct students to raise their hands if they are wearing blue jeans. Point out that jeans are just one example of the many products made with cotton. Explain that many procedures and resources are involved in producing jeans, or any cotton clothing, for consumers.

2. Have 12 students stand in a circle. Give each student one of the 12 index cards that represent one step in producing jeans.

3. The student holding the card with "blue jeans" written on it begins the activity by rolling the ball of yarn to any of the other students standing in the circle. The student who receives the ball will then say what is written on their card, explain why it is needed to make blue jeans, and then identify whether their component of producing jeans is capital, human or natural.

4. Continue this process until each student holding a card has had a turn.

5. Point out that students now have created a web of resources needed to produce blue jeans for consumers.

6. Next, instruct students holding the index cards to pass their cards to a student who did not participate in the circle exercise. These students will work together to sequence themselves at the front of the classroom to display the correct order their role plays in creating blue jeans.

CONTENT AREA

Objective:
For students to –

1. Identify the natural, human and capital resources involved in moving cotton from the farm to consumers.

2. Correctly sequence the steps in the production of jeans.

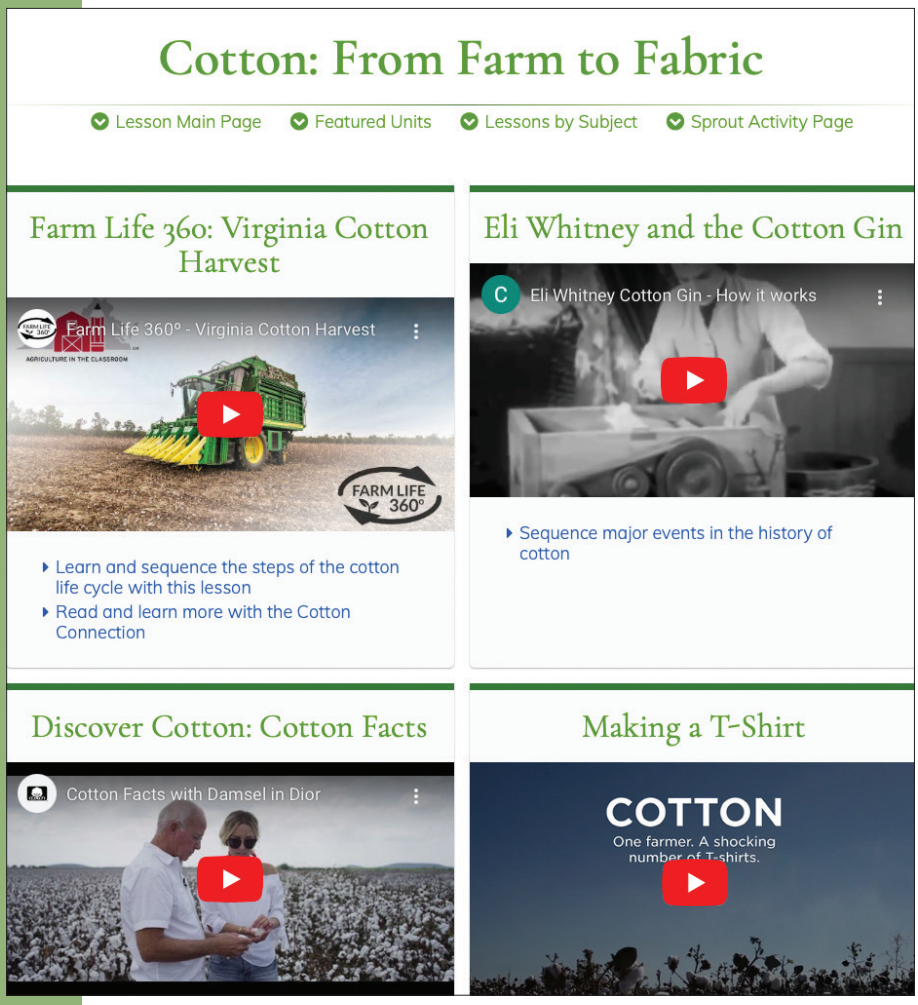
Materials:

- Ball of string or yarn
- Twelve index cards written with the following words:

  Blue jeans
  Cotton plant
  Factory
  Factory worker
  Farmer
  Mall
  Sewing machine
  Soil
  Tractor
  Truck
  Truck driver
  Water

Program Highlights

To find more lessons, resources and videos connected with Agriculture in the Classroom's cotton multimedia unit, visit: **virginia.agclassroom.org/teachers/multi_cotton** or scan the QR code below.

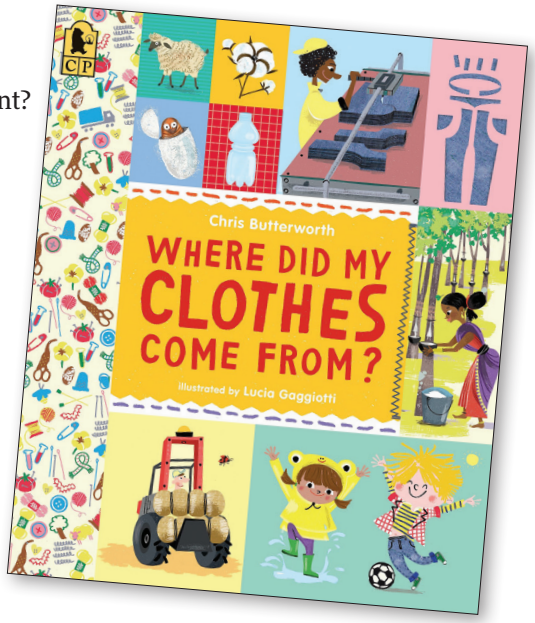


From dirt to shirt, take a quick walk through cotton's journey, and discover the many ways we use cotton every day! Scan the QR code below for a video in which Stacy Gorman, Director of Communications for The Cotton Board, explains how cotton products are made.

Book Spotlight

Where Did My Clothes Come From?

by Chris Butterworth



Did you know that the cotton in your shirt or pants was picked from a plant? How did the colorful wool in your sweater go from a sheep's body to a ball of yarn? Where did your soccer uniform, rain boots and fleece jacket come from? And, lastly, what does recycling have to do with making clothing?

In *Where Did my Clothes Come From?* by Chris Butterworth, readers will take a journey to farms, forests and factories all over the world to learn more about how everything they wear has a story behind it. Fabrics detailed in the book include cotton, wool and synthetic materials, and features suggestions on how to recycle or re-purpose old clothes.

Activity Suggestion: Read the story aloud to your class and have students identify and list all of the capital, human and natural resources mentioned in the book.

Teachers and volunteers read books like ***Where Did My Clothes Come From?*** to engage students in Virginia agriculture.

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What's Growing On In Virginia
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Virginia is one of only 17 states that produce cotton. The crop is grown on almost 250 farms in the commonwealth.

About the Newsletter

What's Growing On in Virginia? is a semiannual publication for Virginia educators and those who want to connect children with agriculture through education.

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For additional information and activities, visit our website at **AgInTheClass.org** or call **804-290-1143**

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