ALABAMA

Ag in the Classroom

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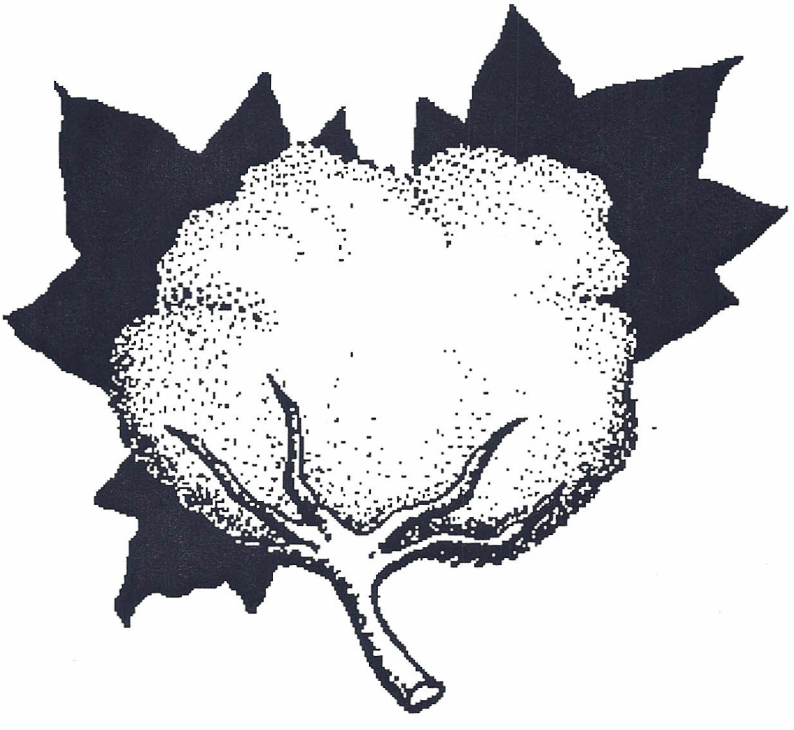


Cotton Unit

Cotton. . . Touching Us Daily

Objective: The students will learn the steps cotton goes through to become the clothes we wear.

Grade Levels K - 6

Materials and Equipment:
"Countdown to Cotton' Booklets
Miniature Cotton Gin

1. Introduce new vocabulary:

Grades K - 6		Grades 4 - 6
gin	lint	processing
bale	linters	module
textile		loom
boll		
Eli Whitney		

2. Have students look at each others shirt tags and count how many are wearing cotton shirts. Show students other things made from cotton such as cotton balls, shoe strings, Q-Tips, etc. Have students name other products made from cotton.
3. Grades K-3: Highlight selected parts of the "The Story of Cotton" and read to students, emphasizing vocabulary words.
   Grades 4 -6: Have the students read each section of the "The Story of Cotton" and discuss.
4. Have students complete booklet "Countdown to Cotton" using pictures and production steps included in lesson.
5. On the U.S. map have the students locate and color the Cotton Belt states.

Extension

1. Ask a cotton farmer to speak to your class.
2. Request the miniature cotton gin.
3. Have students research and report on the historic significance of cotton in the U.S.
4. Have students research the contribution made by Eli Whitney to the cotton industry.

THE STORY OF COTTON

Nature's Food & Fiber Plant

History of Cotton

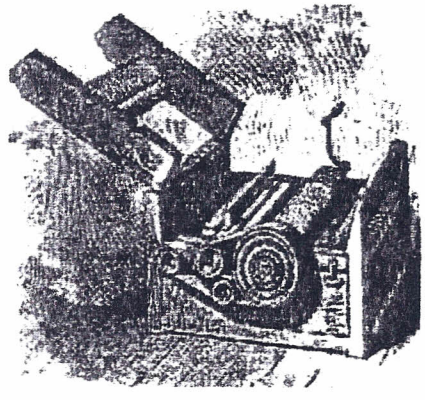
No one knows exactly how old cotton is. Scientists searching caves in Mexico found bits of cotton bolls and pieces of cotton cloth that proved to be at least 7,000 years old. They also found that the cotton itself was much like that grown in America today.

In the Indus River Valley in Pakistan, cotton was being grown, spun, and woven into cloth 3,000 years before the birth of Christ. At about the same time, natives of Egypt's Nile Valley were making and wearing cotton clothing.

Arab merchants brought cotton cloth to Europe about 800 A.D. When Columbus discovered America in 1492, he found cotton growing in the Bahama Islands. By 1500, cotton was known generally throughout the world.

Cotton seed are believed to have been planted in Florida in 1556 and in Virginia in 1607. By 1616, colonists were growing cotton along the James River in Virginia.

Cotton was first spun by machinery in England in 1730. The industrial revolution in England and the invention of the gin in the United States paved the way for the important place cotton holds in the world today.



Eli **Whitney**, a native of Massachusetts, got his idea for the **cotton gin** while watching workers on a plantation in Georgia separate the fiber from the seed by hand. In 10 days, he built a machine that did the work 50 times faster. He called it a "gin" - short for engine - and secured a patent on it in 1793.

His invention made it possible to supply large quantities of cotton fiber to the fast-growing **textile** industry. Within 10 years, the value of the U.S. cotton crop rose from $150,000 to more than $8 million.

THE IMPORTANCE OF COTTON

Today, the world uses more cotton than any other fiber, and cotton is a leading cash crop in the United States. At the farm level alone, the production of each year's crop involves the purchase of more than $4 billion worth of supplies and services. This stimulates business activities for factories and enterprises throughout the country. **Processing** and handling of cotton after it leaves the

farm generates even more business activity. Altogether, business revenue stimulated by cotton is estimated at 122.4 billion–the greatest of any U.S. crop.

Cotton is a part of our daily lives from the time we dry our faces on a soft cotton towel in the morning until we slide between fresh cotton sheets at night. It has hundreds of uses, from blue jeans to shoe strings. Clothing and household items are the largest uses, but industrial products account for many thousands of bales.

All parts of the cotton plant are useful. The most important is the fiber or **lint**, which is used in making cotton cloth. **Linters**–the short fuzz on the seed–provide cellulose for making plastics, explosives and other products. Linters also are incorporated into high quality paper products and processed into batting for padding mattresses, furniture and automobile cushions.

The cotton seed is crushed in order to separate its three products–oil, meal and hulls. Cotton seed oil is used primarily for shortening, cooking oil and salad dressing. The meal and hulls that remain are used either separately or in combination as livestock, poultry and fish feed and as fertilizer. The stalks and leaves of the cotton plant are plowed under to enrich the soil.

Some cotton seed also is used as a high-protein concentrate in baked goods and other food products.

WHERE COTTON GROWS

Cotton grows in warm climates and most of the world's cotton is grown in the United States, the Soviet Union, the People's Republic of China, and India. Other leading cotton-growing countries are Brazil, Pakistan, and Turkey.

In this country, the 14 major cotton-producing states are: Alabama, Arizona, Arkansas, California, Georgia, Louisiana, Mississippi, Missouri, New Mexico, North Carolina, Oklahoma, South Carolina, Tennessee, and Texas. Some cotton also is produced in Florida, Kansas, and Virginia.

The yield in the United States now averages approximately 1 1/3 bales per acre. A U.S. **bale** weighs around 500 pounds. This yield is about twice as much as in 1950 and is due to better land use, improved plant varieties, mechanization, fertilization, and irrigation. It also is a result of much better control of disease, weeds, and insects. A major part of the credit for this progress goes to scientists working at experiment stations and in laboratories, and to agricultural extension workers who bring the findings to farmers.

HOW COTTON IS GROWN

After cotton has been harvested in the fall, the stalks are cut down and turned under the soil. In the spring, the land is plowed again and the soil is broken up

and formed into rows. Farmers in south Texas plant cotton as early as February. In Missouri and other northern parts of the Cotton Belt, they plant as late as June.

Seeding is done with mechanical planters which cover as many as 10 to 12 rows at a time. The planter opens a small trench or furrow in each row, drops in the right amount of seed, covers them, and packs the earth on top of them.

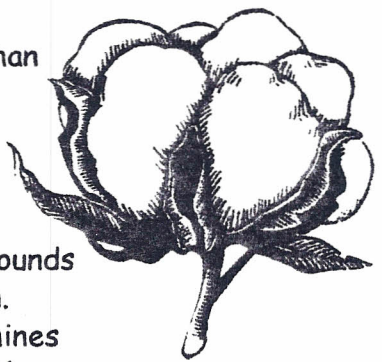
The seed is planted at uniform intervals in either small clumps ("hill-dropped") or singularly ("drilled").

Machines called cultivators are used to uproot weeds and grass, which compete with the cotton plant for soil nutrients, sunlight, and water.

About two months after planting, flower buds called squares appear on the cotton plants. In another three weeks, the blossoms open. Their petals change from creamy white to yellow, pink and, finally, dark red. After three days, they wither and fall, leaving green pods which are called cotton **bolls.**

Inside the boll, which is shaped like a tiny football, moist fibers grow and push out from the newly formed seeds. As the boll ripens, it turns brown. The fibers continue to expand under the warm sun. Finally, they split the boll apart and the fluffy cotton bursts forth. It looks like white cotton candy.

The crop is harvested by machines which gather cotton 50 times faster than workers used to pick by hand.



HOW COTTON IS GINNED AND MARKETED

After harvesting, cotton is either stored at the edge of the field in big mounds called "**modules**" or loaded on trailers or trucks and transported to the gin. Powerful pipes suck the cotton into the building and through cleaning machines that remove the "trash" such as burs, dirt, stems, and leaf material from the cotton. Then it goes to the gin stand where circular saws with small, sharp teeth pull the fiber from the seed.

From the gin, fiber and seed go different ways. The ginned fiber, now called **lint**, is pressed together and made into great bales weighing about 500 pounds. To determine the value of the cotton, samples are taken from each bale and classed according to fiber length (staple), strength, width, color, and cleanness. Growers usually sell their cotton to a local buyer or merchant who, in turn, sells it to a textile mill either in the United States or a foreign country.

The seed usually is sold by the grower to the gin. The ginner either sells the seed for feed or to an oil mill where the **linters** (downy fuzz) are removed in an operation very much like ginning. Linters are baled and sold to the paper, batting, and plastics industries, while the seed is processed into cottonseed oil, meal, and hulls.

HOW COTTON IS SPUN AND WOVEN

At the textile mill, the bales are opened by machines, and the lint is mixed and cleaned further by blowing and beating. The short lint that comes out usually is separated and sold for use in other industries. The best part of the lint consists of fibers about 1 inch to 1 3/4 inches long.

The mixed and fluffed up cotton goes into a carding machine which cleans the fibers some more and makes them lie side by side. A combing machine finishes the job of cleaning and straightening the fibers and makes them into a soft, untwisted rope called a sliver (pronounced *sly-ver*).

Two more machines - a drawing frame and a slubber - pull the soft rope thinner and give it the first twist. When the fiber leaves the slubber, it is called roving and goes through other machines which twist and pull it some more. Finally, it reaches the spinning frame which gives a last pull and twist. The fiber leaves the spinning frame wound on bobbins as cotton yarn.

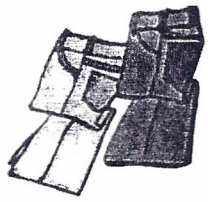
Machines called **looms** weave cotton yarns into fabrics the same way the first hand-weaving frames did. Modern looms work at great speeds, interlacing the lengthwise yarns (warp) and the crosswise yarns (filling). The woven fabric, called gray goods, is sent to a finishing plant where it is bleached, pre-shrunk, dyed, printed, and given a special finish before being made into clothing or products for the home.

This, then, is the story of cotton - where and how it is grown, marketed, processed, and manufactured into the many useful products that have served the world so well for so long. It is a never-ending story, as scientists continue to develop better ways to produce and use one of the world's oldest fibers - cotton.

Courtesy of National Cotton Council

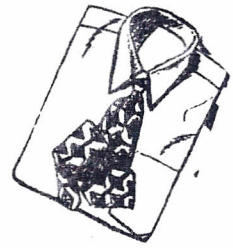
What Can You Make From a Bale of Cotton?

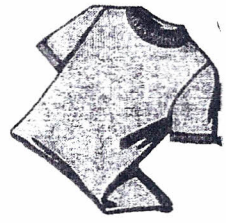
A bale of cotton weighs about 480 pounds. One bale of cotton can make 1,217 men's T-shirts or 313,600 $100 bills. Here are some things that are made from a bale of cotton.

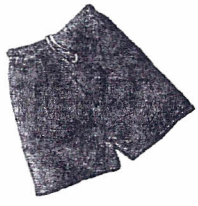


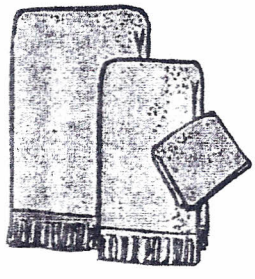
Women's	
Handkerchiefs	21,960
Dresses	274
Brassieres	6,460
Knit panties	6,436
Jeans	249
Skirts	409
Mid-calf socks	4,321
Woven blouses	773
Sweaters	379
Nightgowns	780
Woven slacks	415
Shorts	733

Men's	
Handkerchiefs	8,347
Woven dress shirts	765
Woven sport shirts	906
Work shirts	543
Boxer shorts	2,104
Jockey shorts	2,419
Sleeveless undershirts	1,943
Dress and sport trousers	484
Work trousers	374
Work gloves	1,918
Mid-calf socks	3,557
Jeans	215

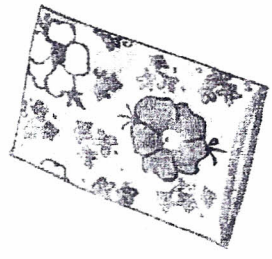




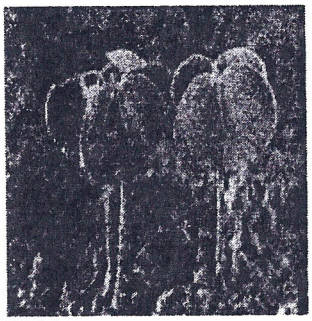




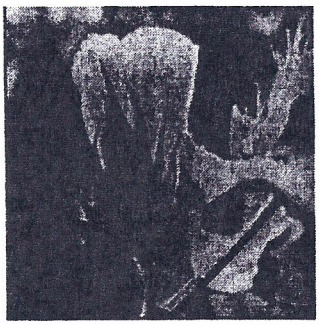
Home	
Diapers	3,085
Sheets	249
Pillow cases	1,256
Terry bath towels	690



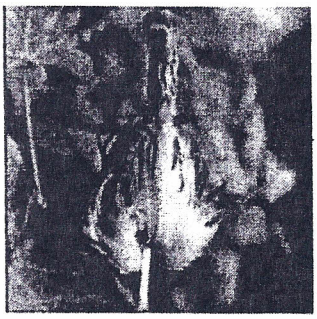
Cotton —From Field to Fabric



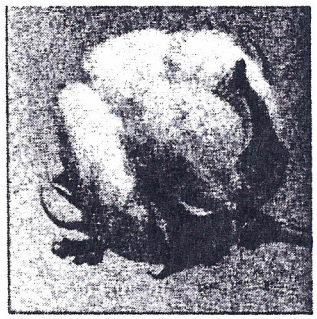
Seedling Cotton Plants



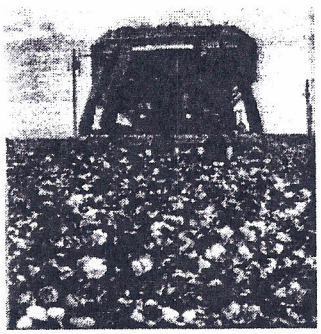
Cotton Bloom



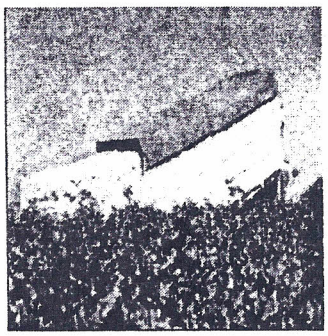
Cotton Boll



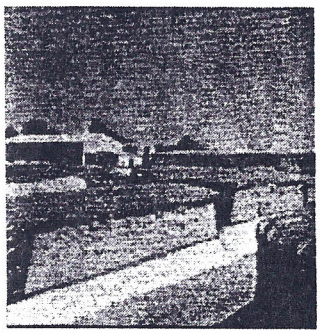
Open Boll of Cotton



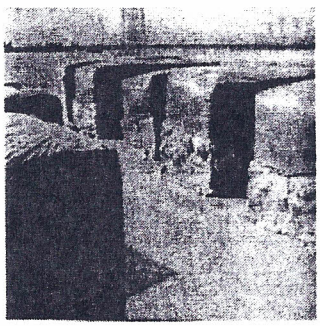
Harvesting Cotton with a Stripper



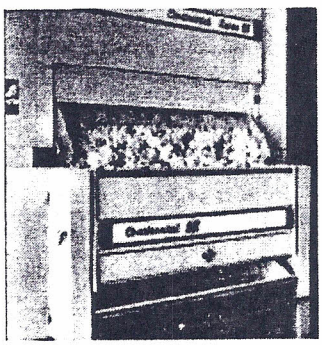
Cotton is pressed into Modules



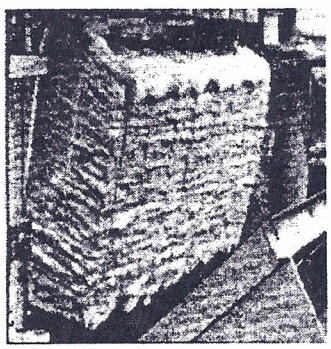
Modules are Stored Until Ready to be Ginned



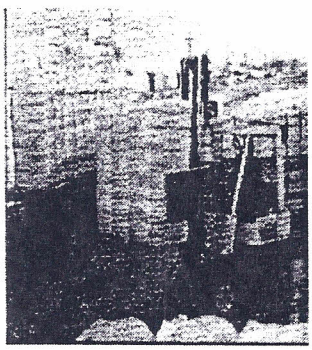
Modules Waiting to be Ginned



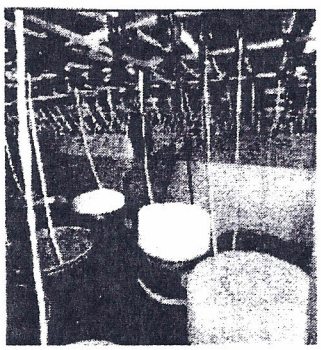
Revolving Circular Saws Pull Lint from Seed in the Ginning Process



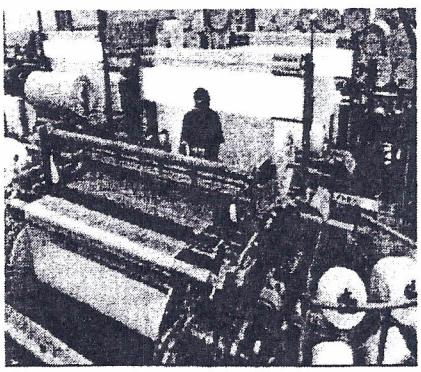
Lint is Pressed into 480 Pound Bales



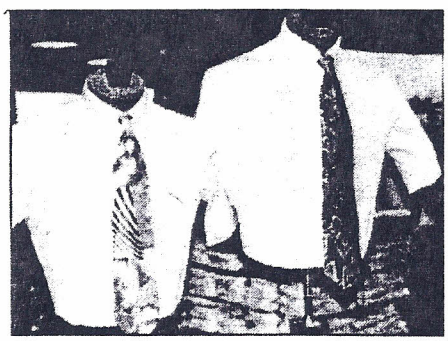
Bales are Wrapped and Delivered to Textile Mill

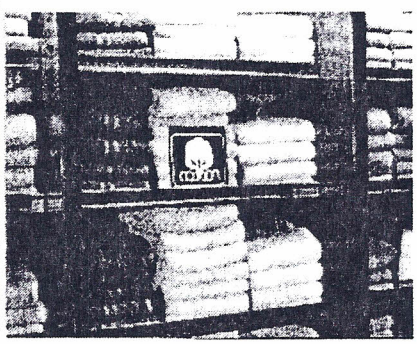


At Textile Mill Lint is Drawn into Yarn



Looms Weave Yarn into Cloth





Cotton - The Fabric That Touches Us Daily

Countdown to Cotton

Production Steps Scramble

Place the following sentences in the correct order, then use them to complete your "Countdown to Cotton" Booklet.

Cotton is stored in the field in large modules.

At the gin revolving circular saws separate the cotton lint from the seed.

Cotton flower develops into a boll, which opens to form a fluffy lock.

The cloth is made into jeans, shirts, towels and other cotton products we use every day.

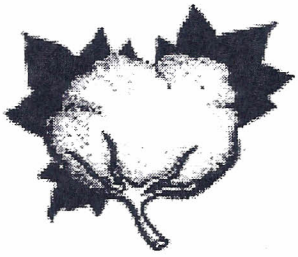
The lint is pressed into 480 pound bales.

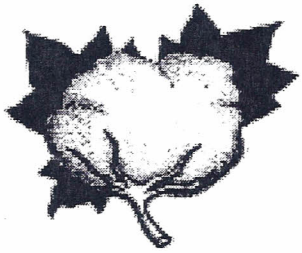
The bales are delivered to a textile mill where the cotton is cleaned, washed and spun into yarn.

When all the bolls have matured the cotton locks are harvested using a cotton stripper.

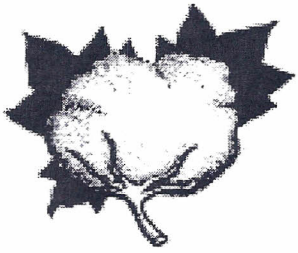
Large looms weave the yarn into cloth.

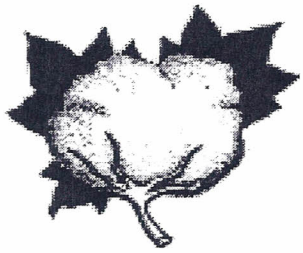
The modules are transported to the cotton gin.





Countdown to Cotton





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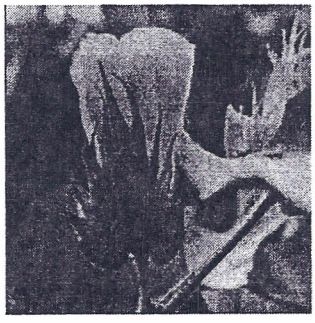

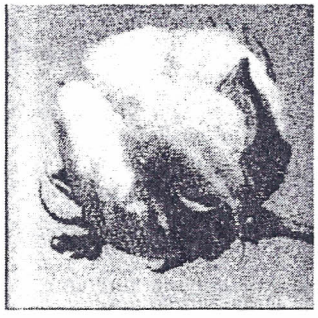

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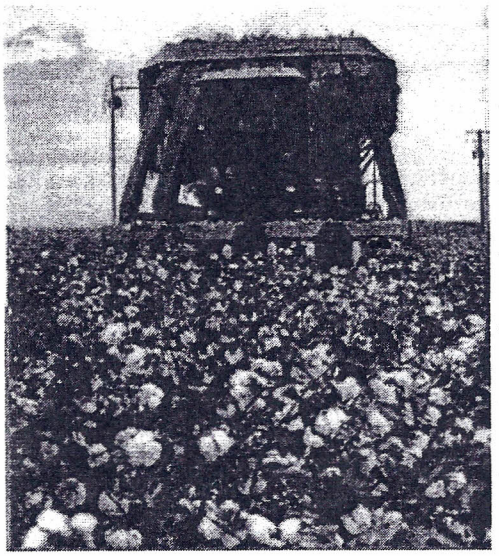

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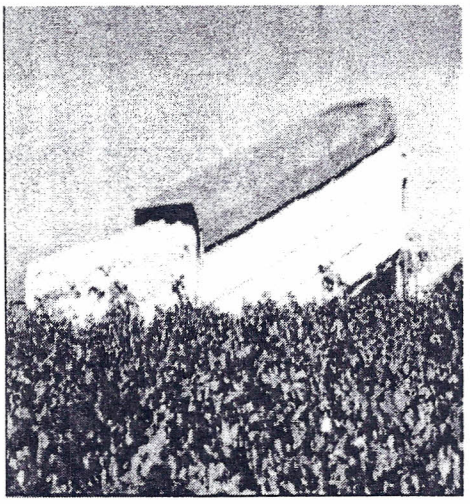

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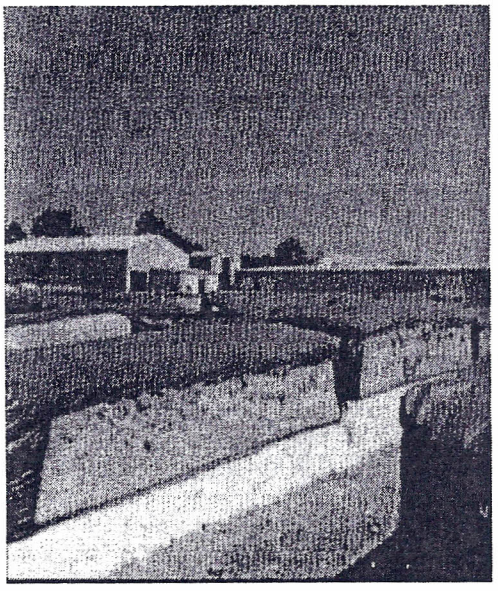

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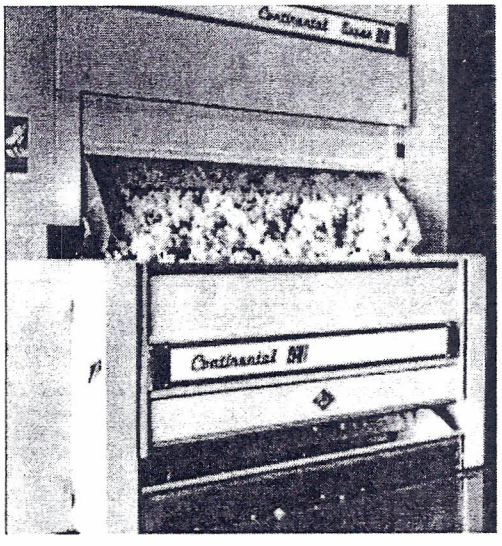

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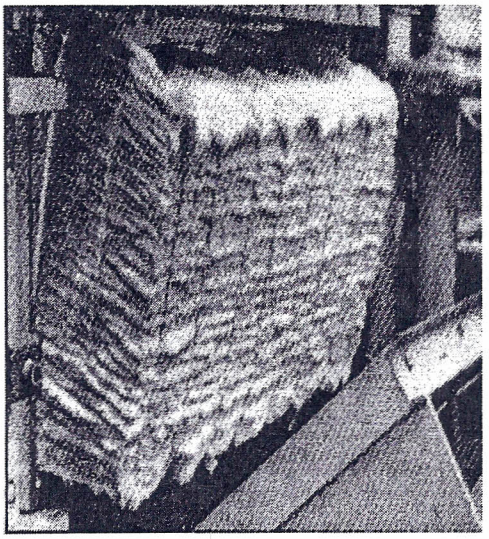

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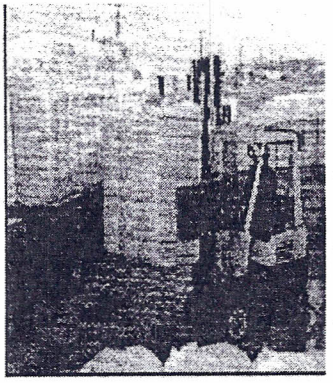

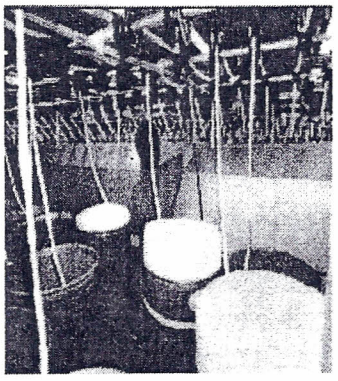

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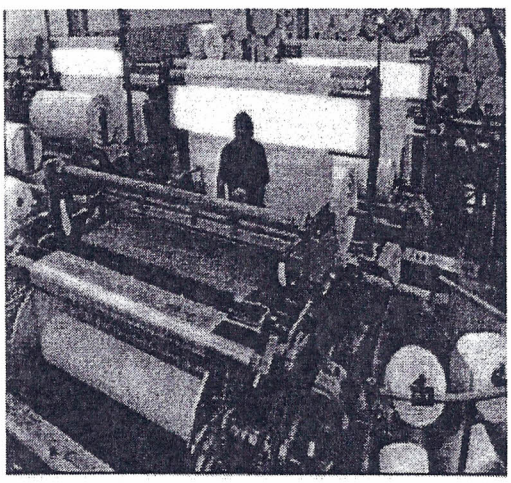

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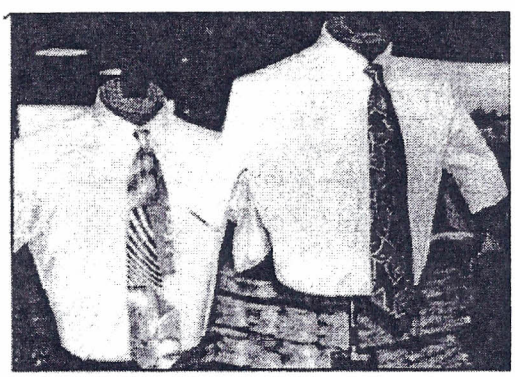
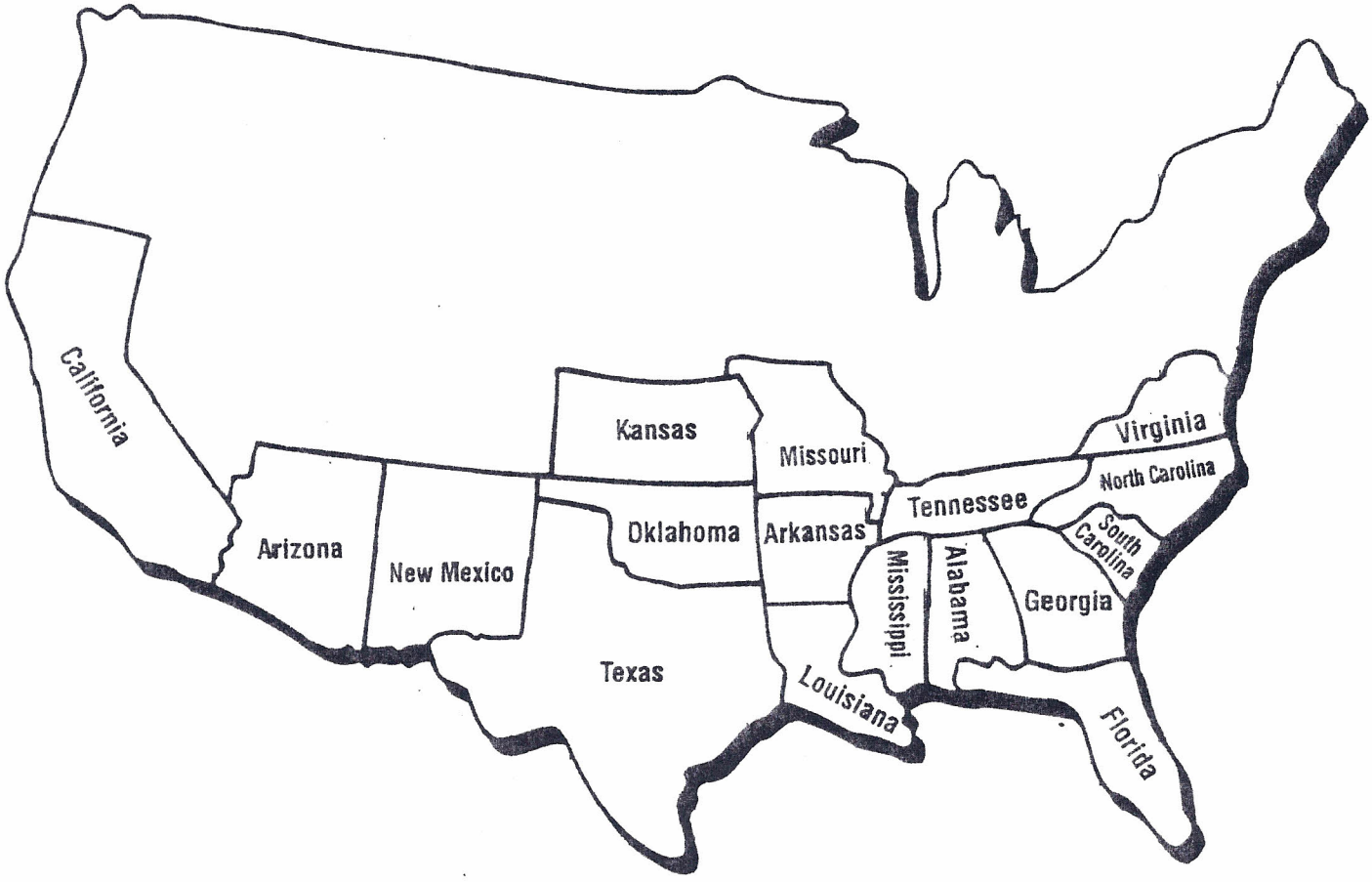


Cotton is now grown in 17 states called the Cotton Belt. Cotton grows in these states because of the warm climate and fertile soils. Can you name them?



1536 Wild cotton growing in Louisiana & Texas
1540 Cotton grown by American Indians in New Mexico & Arizona is recorded by Cononado Expedition
1556 First U.S. cotton crop planted by Spaniards in Florida
1607 Cotton planted in the Virginia colony
1621 West Indies cotton seed planted by English settlers in Virginia
1664 Cotton grown by a colony of English in the Province of Carolina
1734 Cotton planted in Georgia with seed from England
1736 Cotton grown as a garden crop in Maryland
1739 Georgian takes first sample of cotton to England
1767 Father Ames plants cotton seed at California Mission
1768 First cottonseed oil produced in U.S. and presented to the American Philosophical Society
1787 First New England cotton factory extablished in Beverly, Mass.
1788 First trial of Sea Island cotton in South Carolina
1790 Slater builds first successful U.S. cotton mill in Pawtucket, R.I.
1793 Eli Whitney patents the first saw gin
1795 Barclay builds Mississippi's first cotton gin
1803 First cotton-goods factory in New Hampshire built
1806 Mississippi grower smuggles cotton seed into U.S. from Mexico
1814 Lowell estabishes first factory with automatic cotton weaving & spinning machines in Massachusetts
1814 North Carolina cottonseed de-huller is patented
1826 Waring of South Carolina produces oil from cotton
1828 Thorpe invents the ring spindle
1829 Williams builds machine to produce cottonseed oil in South Carolina
1834 First commercial cottonseed crushing mill built in Mississippi
1847 First steam powered cotton mill opens in Massachusetts
1850 Cotton denim jeans made in California by Levi Straus
1850 A cotton picking device is patented in Tennessee
1863 Congress distributes cotton seed to the Union States
1865 First cotton material made in California at Rector Mills
1869 1869 Louisiana Cotton Manufactory was formed to spin & weave local cotton
1870 New York Cotton Exchange organized
1871 Louisiana Cotton Exchange formed in New Orleans
1882 Texan developes suction method for unloading cotton from wagons
1892 First boll weevil found in the U.S. enters from Texas border
1892 first boll weevil found in the U.S. enters from Texas border
1903 Wright Bros. Use cotton to cover wings of the "Kitty Hawk" in North Carolina
1929 Rust Bros. Of Miss. Experiment with cotton picking machine
1949 Irrigation research begins on cotton in New Mexico
1969 Astronauts returning from the moon wear all cotton isolation suits
1972 Development of the cotton module storage system in Texas
1974 Universal density bale is used across the Cotton Belt
1986 Genetic breeding of commercial colored cotton begins in California
1987 First modern West Coast textile mill established in Calif.
1988 Disposable diaper constructed entirely of cotton is introduced in North Carolina
1989 Construction of Texas experimental cage gin
1990 Coupled lint cleaner tested for commercial use in Mississippi
1991 Recyclable covering of cotton bale tested in Texas

Cotton Cycle Model

You'll Need: paper plates
patterns (attached)
construction paper (brown, green, pink)
green yarn (5 - 12" pieces)
scissors
stapler
hole punch
cotton balls

Directions:

1. Trace the patterns onto construction paper or have copies run on colored card stock. Cut out.
2. Make a hole on each X with the punch.
3. Staple paper plates together (top sides facing) halfway around. Use the punch to make a hole in the top edge of one paper plate.
4. Use yarn to fasten the pieces of the cotton cycle together in the correct order (seed, leaf, square, blossom, boll).
5. Tie one piece of yarn through the hole in the paper plate, attaching the other end through the hole in the boll.
6. Cut eight - 4"x$\frac{1}{2}$" strips of brown paper. Glue along the bottom edge of the paper plate. Trim to fit. Attach cotton with glue to one of the plates.

OPTIONAL: Attach pictures of cotton products to the back of one plate.

Cotton

Alabama Course of Study Objectives Science - Grade 1 Standard 4, Grade 2 Standard 5, Grade 3 Standard 7, Social Studies Grade K Standards 2 ,4 and 7, Grade 1 Standard 5, Grade 2 Standard 6, Grade 3 Standards 5 and 7, Grade 4 Standards 1,6,7,8 and 9, Grade 5 Standards 5, 6 and 12. Grade 6 Standard 7

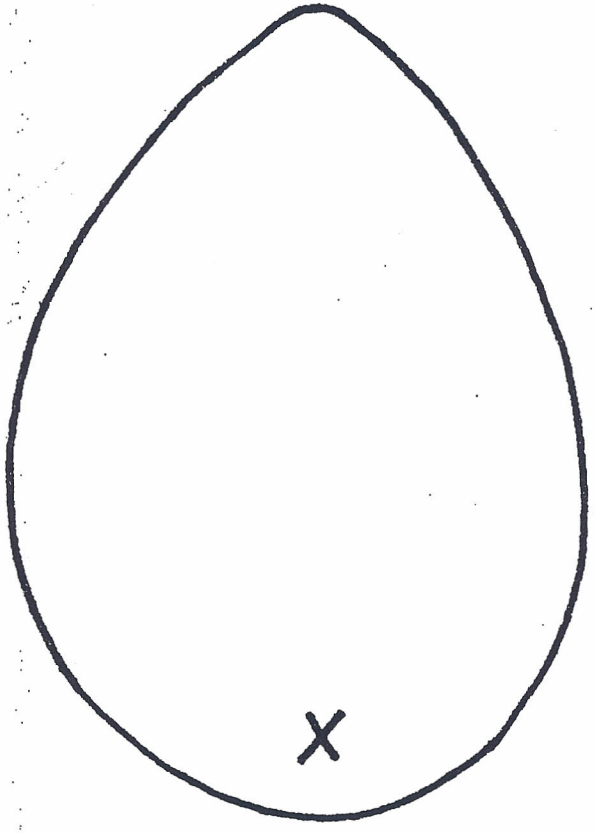
Cotton Cycle Model

Materials: 2 white paper plates (per student), construction paper (green, white, brown, pink), scissors, hole punch, yarn (five - 12" pieces)

Directions:

1.) Trace patterns onto construction paper or duplicate on colored card stock. Cut out.
2.) Use a punch to make a hole on each x.
3.) Staple paper plates together (top sides facing) halfway around. Use the punch to make a hole in the top edge of <u>one</u> paper plate.
4.) Use yarn to fasten the pieces of the cotton cycle together in the correct order (seed, leaf, square, blossom, boll).
5.) Tie one piece of yarn through the hole in the paper plate, attaching the other end through the hole in the boll.
7.) Cut eight - 4"x $\frac{1}{2}$" strips of brown paper. Glue along the bottom edge of the paper plate. Trim to fit. Attach cotton with glue to one of the plates.

<u>OPTIONAL</u>: Glue pictures of cotton products on one of the paper plates.



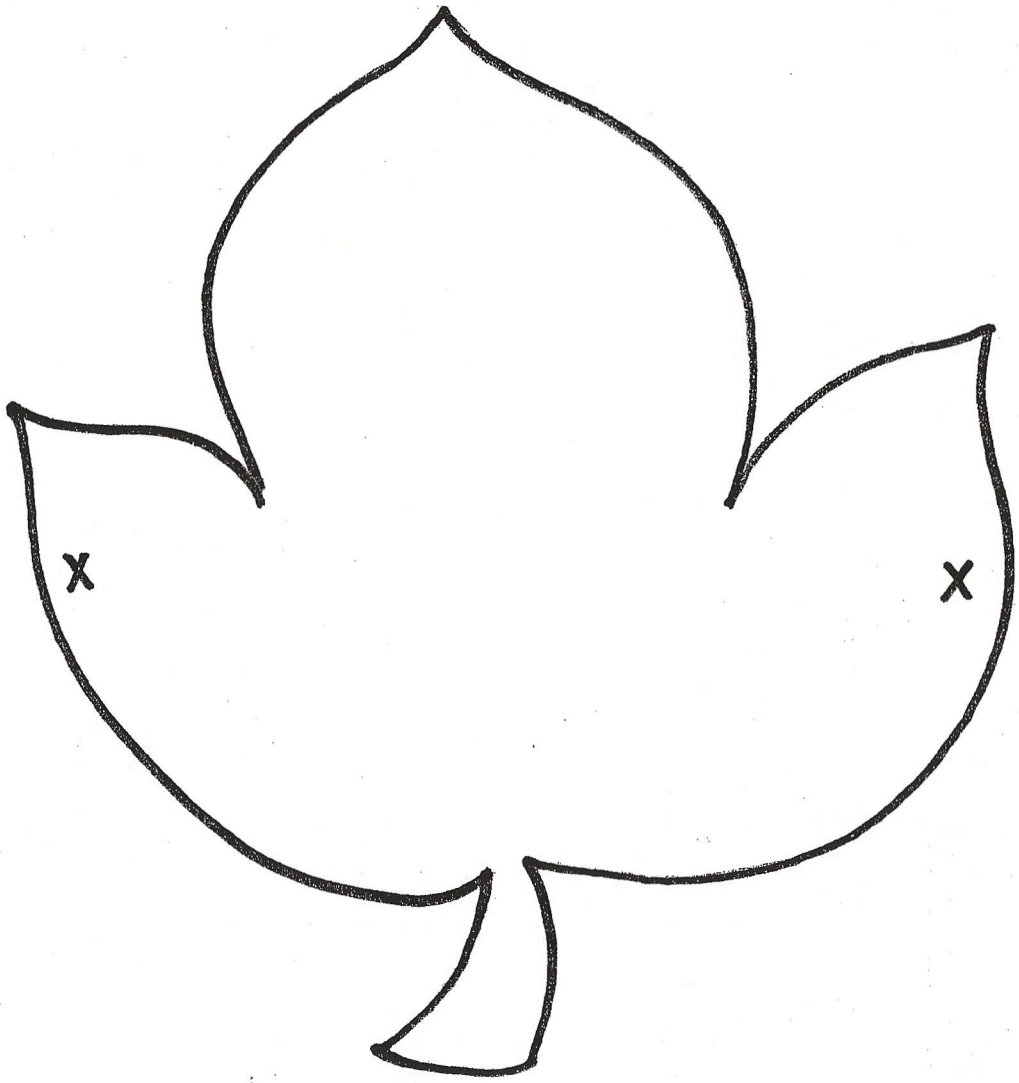
seed - step #1
brown

Cotton Cycle Patterns

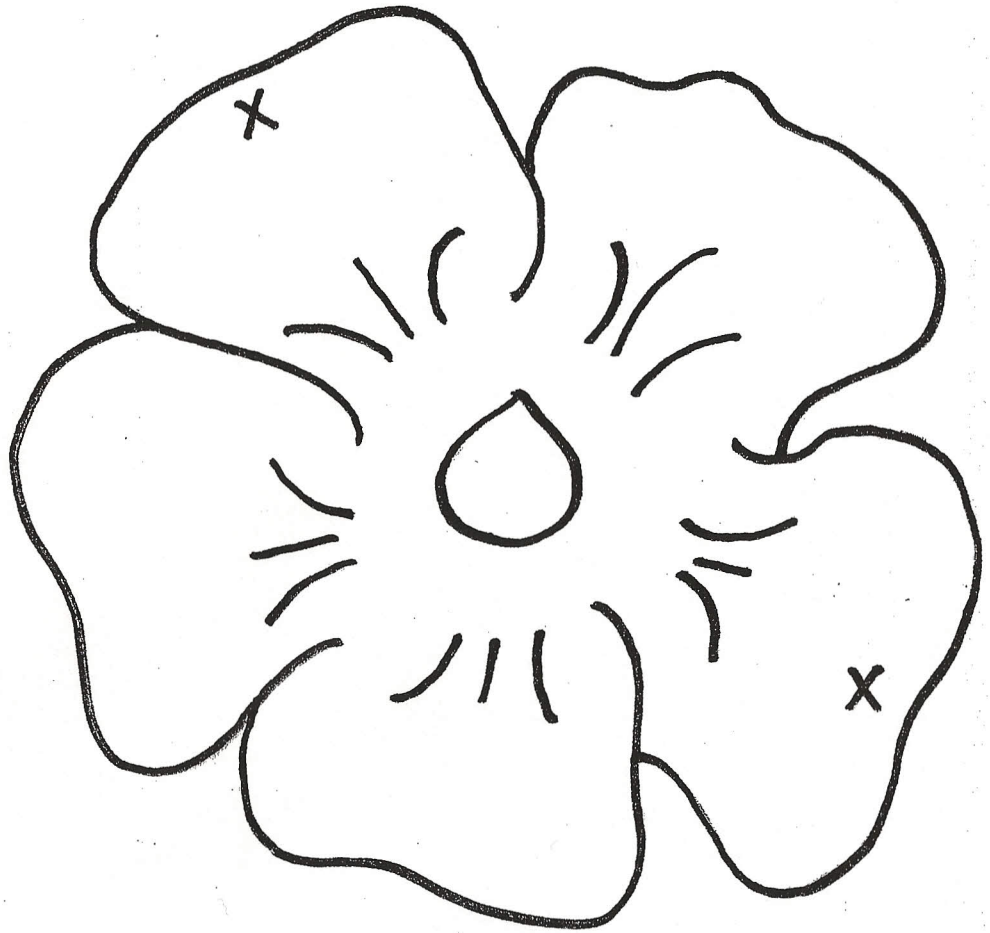
bud -step #3
green

boll - step #5
green

Cotton Cycle Patterns



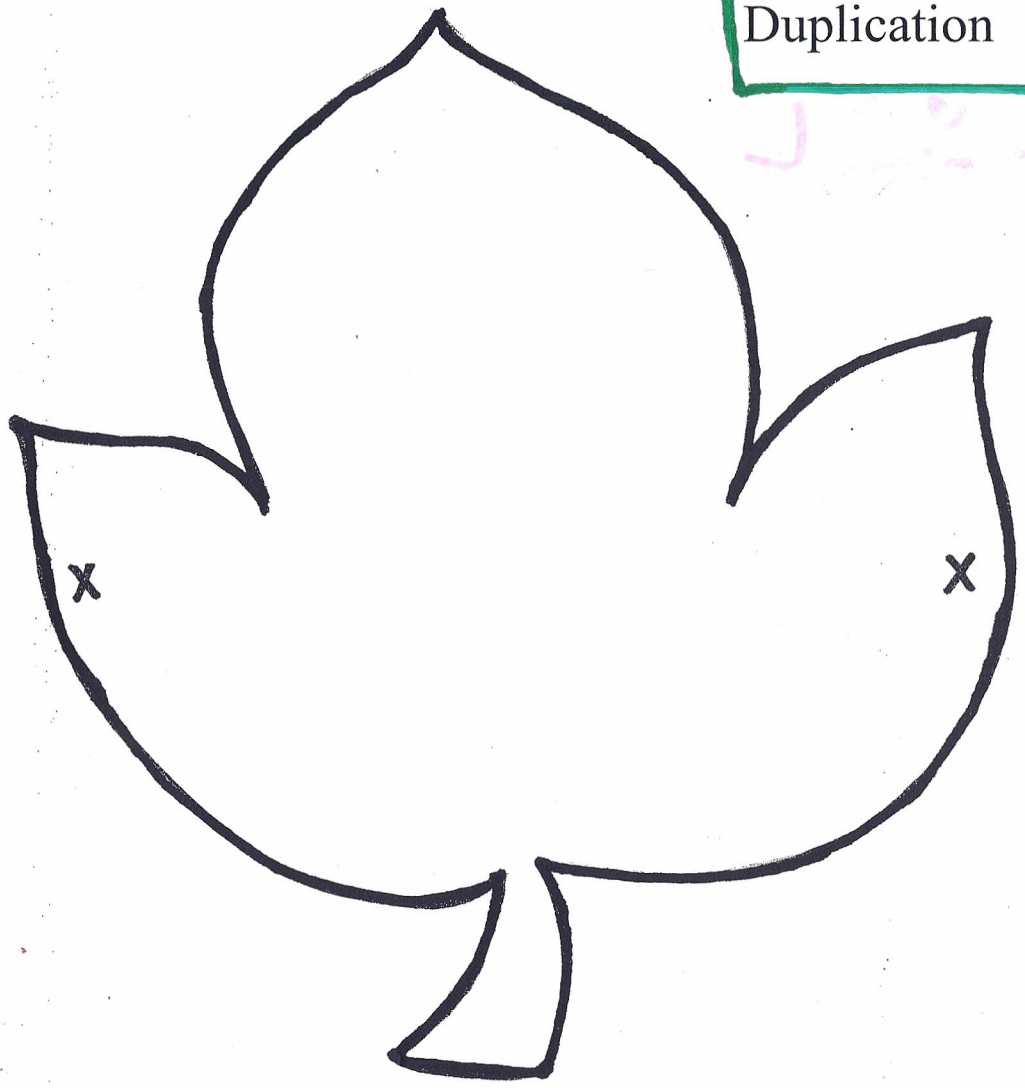
leaf - step #2
green



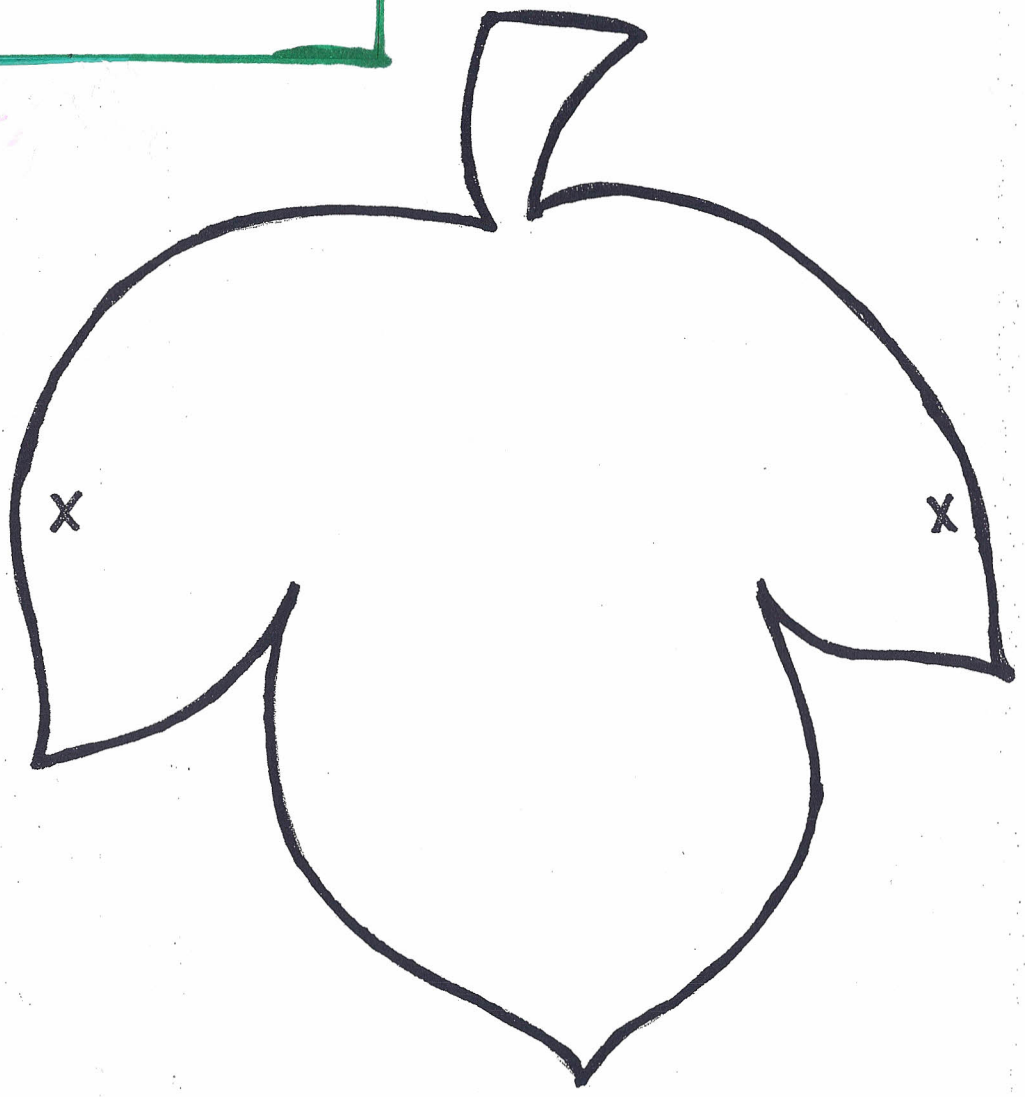
flower - step #4
creamy white

Cotton Cycle Patterns

Multiple Patterns Arranged for Duplication



leaf - step #2
green



leaf - step #2
green

Cotton Cycle Patterns

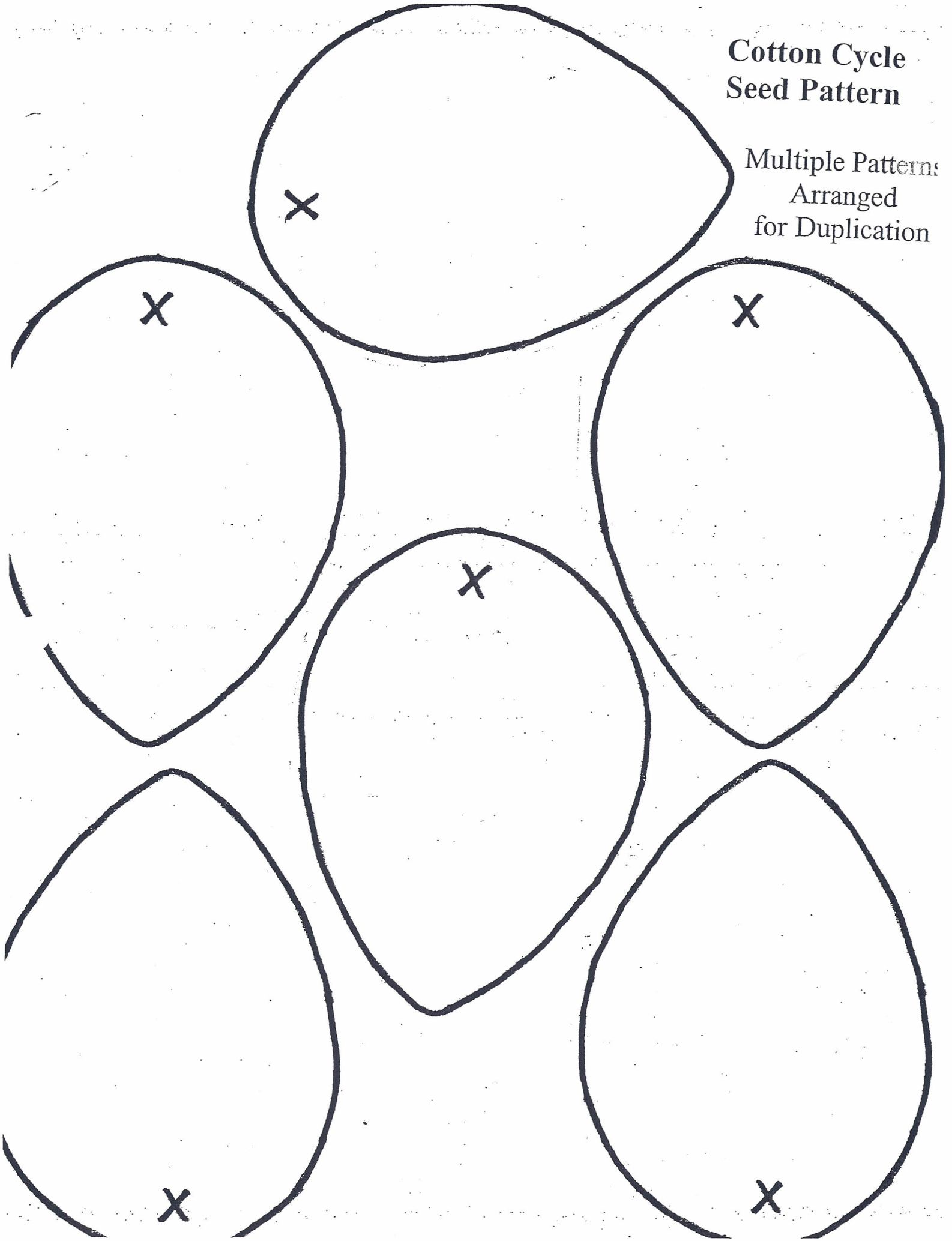
Multiple Patterns Arranged for Duplication

flower - step #4
creamy white

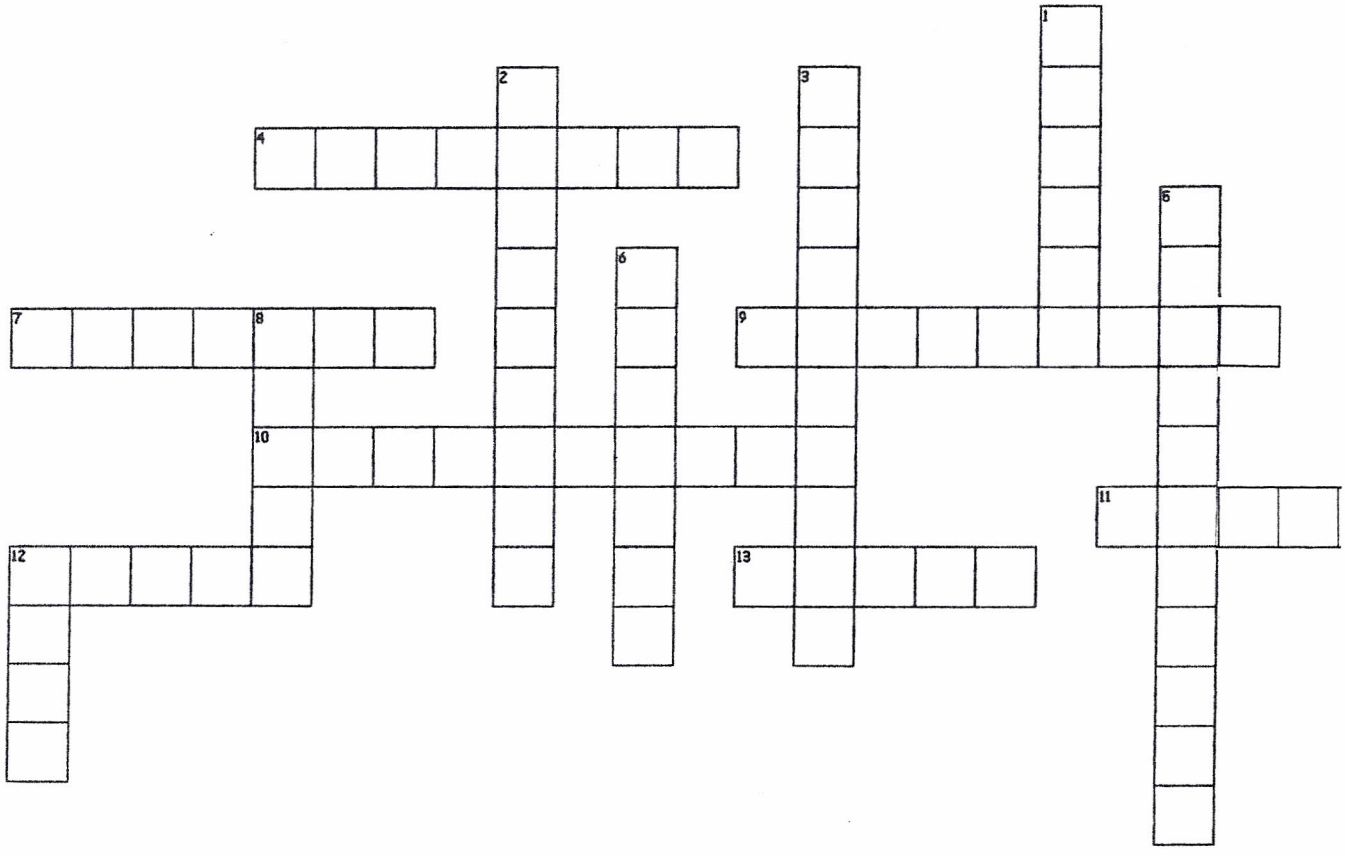
flower - step #4
creamy white

Cotton Cycle Seed Pattern

Multiple Patterns Arranged for Duplication



Cotton - Touching Us Daily Crossword Puzzle



Across
4. Cellulose from cottonseed linters is used to make paper _____.
7. Cottonseed is _____ to make oil.
9. 1900's cotton crop destroyer: _____ _____ (2 words)
10. Cotton filament was used in _____ _____. (2 words)
11. Creates about 50,000 _____ for Alabama.
12. Cotton is packed in _____ for use in textiles.
13. Cotton Gold Rush Garment:_____

Down
1. Gin is the shortened word for _____.
2. A gin does this: _____fiber or lint from seed.
3. Oil is made from _____.
5. Cotton's in harmony with our _____.
6. Cotton is stored at the edge of a field in big mounds called _____.
8. Livestock feed is made from meal and _____.
12. Part of cotton plant that holds fiber: _____.

environment
currency
bales
separates
boll
engine
modules
jobs
cottonseed
levis
crushed
light bulbs
boll weevil
hulls

Cotton - Touching Us Daily Word Search

T U O I V Z Z G N Q E R T E E

B H X Q J P Y Q M I C M O L L

P O R Z H K H Q J R G O L I A

W K R E S T C A Z W E D M T B

L I N T A J H S M N L U D X S

D G B T Z D R M N A A L L E K

G N I S S E C O R P B E O T S

R Y A Q T S D E E S V A F B X

U J R N N Z Y S J V N A L N C

G I I C O T T O N R B V H A O

I L P I C B N E A R L L P M Y

N U J G T R D Y I E Q N N L Q

G M E R Q W O C N P I S U U H

Q Q K Y I R F P C I W M E Y T

W Z Q N E L M N R Q Z Y E G Y

ALABAMA
BALE
BOLL
COTTON
CROP
FABRIC
GIN
LINT
LINTERS
MODULE
PROCESSING
SEEDS
TEXTILE
THREAD
YARN

The Cotton Plant

Name_____

Cotton Boll	Cotton Lint	Cotton Linters	Cottonseed	Cotton Fabric
This is the way the cotton looks in the field. After the cotton boll opens the cotton plant is defoliated to remove the leaves. The cotton harvesting machine removes the lint and seed but leaves the flower like boll behind. 	Lint are the long fibers that grow on the cotton seeds inside the cotton boll. The lint and seeds are harvested by the picking machine. The seeds and lint are separated at the cotton gin. The lint is used for making cotton fabrics. 	Linters are the short fibers that are left on the seed after the lint is removed at the cotton gin. The seed is shipped to a cottonseed mill where the linters are removed from the seed. Linters are used in many products including: furniture padding, cotton balls, writing paper, plastics, paint, and gun powder. 	The cottonseed is left after the lint is removed. The seed can be fed to cattle as a high protein feed or sent to the cottonseed mill. The mill removes the linters and seed hulls. They process the cottonseed into oil and meal. Hulls and meal are used for cattle feed or mulch. The cottonseed oil is used as a vegetable oil in foods or soaps, plastics, and other products.	The cotton fiber is separated at the cotton gin, then cleaned and spun into thread or yarn. The thread is woven or knitted into cotton fabric. Cotton fabric is absorbent and can be dyed easily. It can also be treated to be fire-resistant, waterproof and wrinkle-resistant. 
Cotton Boll	**Cotton Lint**	**Cotton Linters**	**Cottonseed**	**Cotton Fabric**
Draw a cotton boll.	Paste cotton lint.	Paste cotton linters.	Paste cottonseed.	Paste fabric sample or draw something made from cotton.

Cotton Activities

Cotton Art -Have the students create a cotton plant by tearing brown paper and gluing the paper to a blue paper creating the cotton plant stems. Have the student glue their cotton from their cotton boll onto the end of each branch of the plant. The cotton plant is defoliated before harvest. This plant with stems and cotton bolls is the way the plant looks at harvest. Put the "plants" on the bulletin board with the title "How Our Shirt Grew in the Field".

Cotton Boll Art - The cotton boll after the cotton is removed looks like a flower. These bolls make a corsage when painted and decorated. The students might ass colored cotton ball centers on the "flowers". Pipe cleaners and fake leaves are possibilities.

Seed Prediction Graphing - Before the students "harvest" their cotton have them predict how many cottonseeds are in their boll. Graph results.

Cottonseed Research - Have the students look in their kitchen cabinets and refrigerator. Make a list of all of the items that list cottonseed oil as one of the ingredients.

Cotton Handkerchief Doll - Materials needed: 1 cotton handkerchief, lace for trim and bonnet, cotton thread, small ribbon, fabric paint or marker, cotton for stuffing head, fabric glue. From the center take the top of handkerchief and stuff enough for the head. Wrap thread around the head and tie. Make the face with the fabric paint or marker. Glue the lace around the head for the bonnet. Glue the lace on the bottom. Tie knots in the end of top corners. Then go half way down and wrap thread to make the sleeves. Glue ribbons on bonnet and dress for trim.

PAPER BAG PUPPET

Grades K-6

OBJECTIVE: Students will make a puppet bag puppet and list facts about cotton on the back. Teacher may choose to have facts listed or placed in a paragraph. With younger students the teacher may want to use sentence statements.

MATERIALS: From Plant To Blue Jeans, and other cotton literature books. Chart paper, lined paper, pencil, one paper bag per child, glue, scissors, crayons or markers, white cotton balls and pattern for cotton boll.

PREPARATION: (two or three 30 minute lessons)

- Read book, From Plant to Blue Jeans, dealing with facts about cotton, then brainstorm facts about cotton. List these facts on the chart paper or board.
- Students record facts about cotton. Then write a paragraph as it the cotton boll is talking. Cut the paper to fit the back of the bag before students start writing.

ACTIVITY: Cut the boll out and then cut into half. Place one piece with the straight edge on the lip of the bag and the other tucked underneath so that the two pieces will look like a cotton boll talking. Then cut out the stem and color green and glue below the cotton boll. Finally finish up by adding a mouth, nose, and eyes to the cotton boll. Decorate with cotton balls. Glue the written paragraph or facts on the back pf the bag. Students then practice having their puppets talk.

ASSESSMENT: Younger students need to list 3-5 facts about cotton on the back of their paper bag puppet. Older students need to place facts in paragraph form.

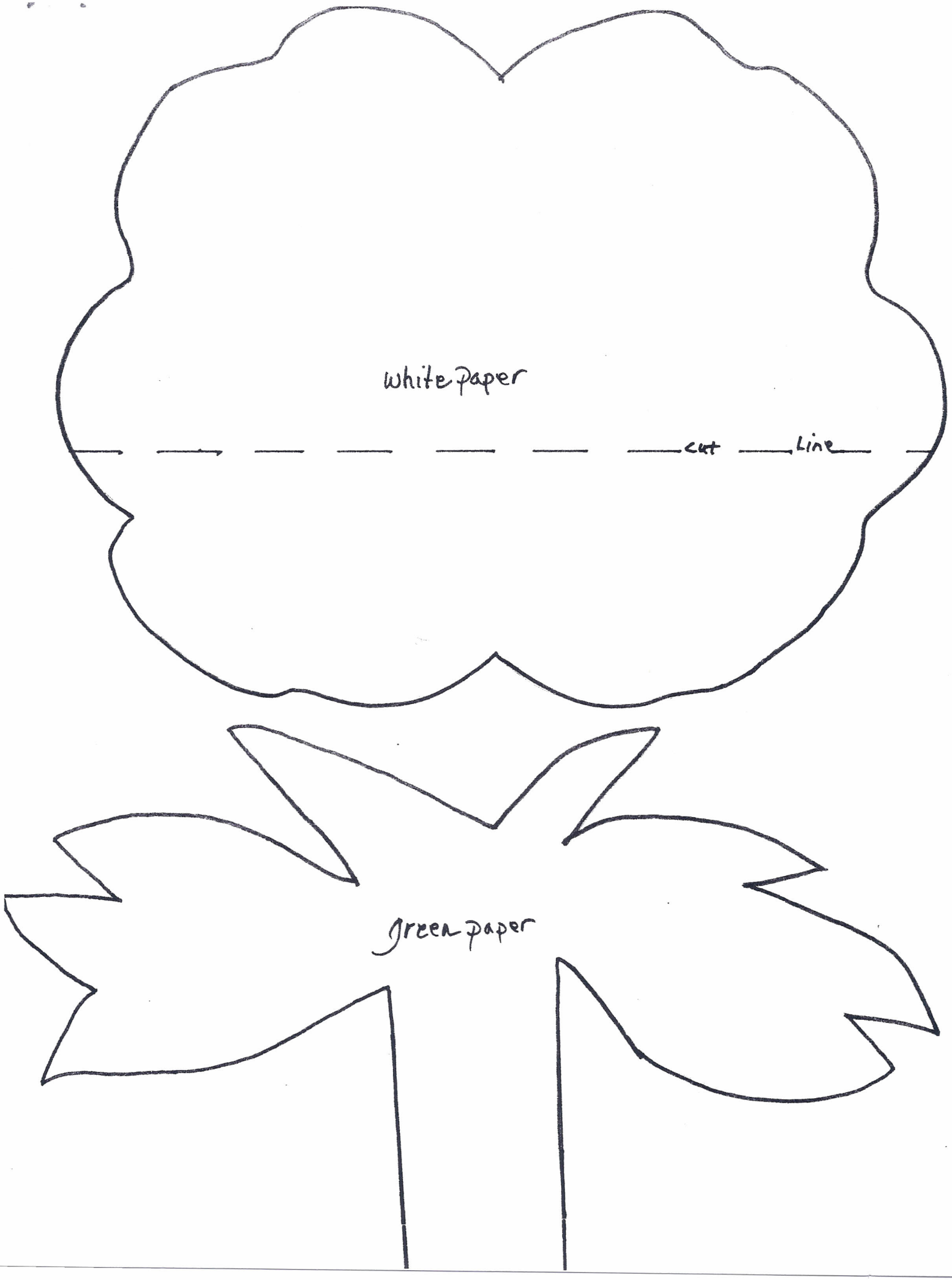
SUGGESTIONS:

- Sample Paragraph:

Hello, me name is Cotton. I am grown in almost every part of Alabama. You might be wearing something made from me today. It might be your T-shirt, jeans, dress, sweater, jacket or even your shoes. Let me tell you how I grow. I am planted in the spring as a seed. I need sunlight, water, fertilizer, and time to grow. After about two months you will see little flower buds called squares. These blossoms will open and the flower will change from creamy white to yellow, then pink and finally red. The blossom falls off and you will see the cotton boll. The boll is tiny but grows and grows. Inside the boll there are seeds with cotton fibers growing on them, finally they grow big and split open. You see cotton that looks like big fluffy white cotton candy. The machines pick the cotton and take it to the cotton gin where the cotton is separated from the seeds. The cotton then is put into big bales and sent to a factory where it is spun and then woven into many things. Now you know how I grow. Don't forget to check and see if you are wearing something made from me.

- Sentences for younger children.

Hello, my name is Cotton.
I grow in almost every part of Alabama.
I am planted in the spring.
I need water, sunlight, fertilizer, and soil to grow.
I start out as a seed then I grow into a plant.
My plant has flowers on it.
The flowers change color.
When the flowers fall off they leave a boll.
Inside the boll the fibers are growing into fluffy cotton.
I am picked in the fall.
My seeds and cotton are separated.
The cotton is then made into yarn or thread and spun into cloth.
You might be wearing something made from me today.


White Paper
cut Line
Green paper

FROM BOLLS TO BOLTS

SUBJECTS: Language Arts

STUDENT SKILL: The student will use common organizational structures for providing information in writing, such as chronological order.

OBJECTIVE: The student will read statements about cotton manufacturing and place them in chronological order.

BACKGROUND

Cotton farmers plant cotton in the late spring. They use mechanical planters that can plant seed in as many as eight rows at a time. During the growing season scouts go out into the fields to count harmful insects. If there are too many, the farmer will use pesticides to control them.

About two months after planning, flower buds, called squares, appear on the plant. Three weeks later the blossoms open. The petals change colors as they mature. First they are creamy white. Then they turn yellow, then pink, and, finally, dark red. After three days the red flowers wither and fall, leaving green pods called cotton bolls. The boll is shaped like a tiny football. Moist fibers grow and push out from the newly-formed seeds. As the boll ripens, it turns brown. The fibers continue to expand in the warm sun. Finally they split the boll apart, and the fluffy cotton bursts out

Cotton is harvested in the fall. Most of the cotton is harvested by machine. After the cotton is harvested it is stored at the edge of the field in big mounds or loaded on trailers or trucks and carried to the cotton gin.

At the cotton gin powerful pipes suck the cotton into the building and through cleaning machines that remove burs, dirt and leaf trash. Then circular saws with small, sharp teeth.pull the fiber from the seed. The ginned fiber is called lint. The lint is pressed into 480-pound bales, about the size of a refrigerator. The bales are sold to cotton merchants who sell them to textile mills in the U.S. or in foreign countries. At the textile mills huge machines spin the cotton fibers into cotton thread. The thread is then woven into cloth on looms. The rolls of cloth that come off the looms are called bolts. Clothing manufacturers buy bolts of

MATERIALS

cotton bolls

articles made from cotton (cotton balls, cotton shirt, pair of jeans, cotton thread, cotton swabs, towels, etc.)

cloth and cut jeans, shirts, dresses, and other items of clothing from them to sew.

ACTIVITY

1. Ask your county Extension office to help you acquire some cotton bolls, and bring them to class. Show the cotton bolls to your students, and have them guess what they are and what they are for. Let students feel the cotton and try to pull the cotton lint from the cotton boll.
2. Bring a variety of articles to class that were made from cotton (cotton balls, a cotton shirt, a pair of jeans, cotton embroidery or crochet thread, cotton swabs, towels). Share the background material
3. Discuss time order words with your students. Hand out student worksheets. Instruct students to read the sentences on the worksheet and place them in the proper order, using the time order words as clues.

VOCABULARY

cotton bolls
fiber
cotton gin
lint
textile
bolts

ADDITIONAL ACTIVITIES

1. Purchase unbleached muslin at a fabric store. If possible, buy the end of a bolt, and bring it to class so students can see what a bolt of cloth looks like. Have students tear the cloth into bandanna-sized squares to tie-dye. Show students how to tie up the cloth to create designs. The cloth may be knotted, rolled, twisted, folded, or bunched. Tie the cloth as tightly as possible so the dye will not soak inside. Purchase commercial dye, and follow the instructions on the package. Dip the cloth into the dye, and stir gently. The longer you leave the cloth in the dye, the darker the color. Take the cloth out of the dye, and rinse it thoroughly in cold water. Untie the cloth, and rinse again. Squeeze out the excess water, and drain the cloth on newsprint that has been spread flat. Display the creations, using clothes pins and clothes line stretched along the hallway or across the classroom.

EXTRA READING

Ushinsly, Konstantin, How a Shirt Grew in the Field, Clario n, 1992.

Willams, Shirley Anne, Working Cotton, Harcourt, Brace, Jovanovich, 1992.

EVALUATION

An answer key is provided.

Oklahoma Ag in the Classroom is a program of the Oklahoma Cooperative Extension Service, 4-H Youth Development, in cooperation with the Oklahoma Department of Agriculture, Food and Forestry, and the Oklahoma State Department of Education.

Oklahoma Ag in the Classroom
Oklahoma 4-H Programs
205 4-H Youth Development
Oklahoma State University
Stillwater, OK 74078
405-744-8889
http://www.agclassroom.org/ok

Name _____

From Bolls to Bolts

Words like "first," "next," "then," and "last" are order words. Order words show where the sentence goes in the paragraph. They are often used in directions or in recipes. Number the following sentences to show their order. Put your numbers inside the cotton bolls. Then write the paragraph on the lines at the bottom of the page. Don't forget to indent.


At the gin, saws with sharp teeth pull the fibers from the seed.


Second, the cotton fiber bursts open.


Now the thread is woven into cloth.


Finally, the bolts are cut into jeans, shirts, dresses, towels and many other things to sew.


First, the farmer plants the cotton and waits for it to grow.

At the textile mill, fibers are spun into cotton thread.

Next, the farmer loads the cotton into a truck and takes it to the cotton gin.


After that, the cotton is pressed into bales.

Produced by Oklahoma Cooperative Extension Service, Division of Agricultural Sciences and Natural Resources, OSU, in cooperation with the Oklahoma Department of Agriculture, Food, and Forestry and the Oklahoma State Department of Education, 2002

Name _____

From Bolls to Bolts (answers)

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Name _____

From Bolls to Bolts

VOCABULARY

square—The flower bud of a mature cotton plant.

cotton boll—The rounded seed pod or capsule of the cotton plant.

fiber—A natural or synthetic filament, as of cotton, wool or nylon, capable of being spun into yarn.

cotton gin—A machine that separates the seeds, seed hulls and other small objects from cotton fibers.

lint—The mass of soft fibers surrounding the seeds of unginned cotton; fuzz.

textile—Fiber or yarn for weaving or knitting into fabric.

bolt—A large roll of cloth of a definite length, as it comes from the loom.

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Muffy, Mike and the Cotton Field

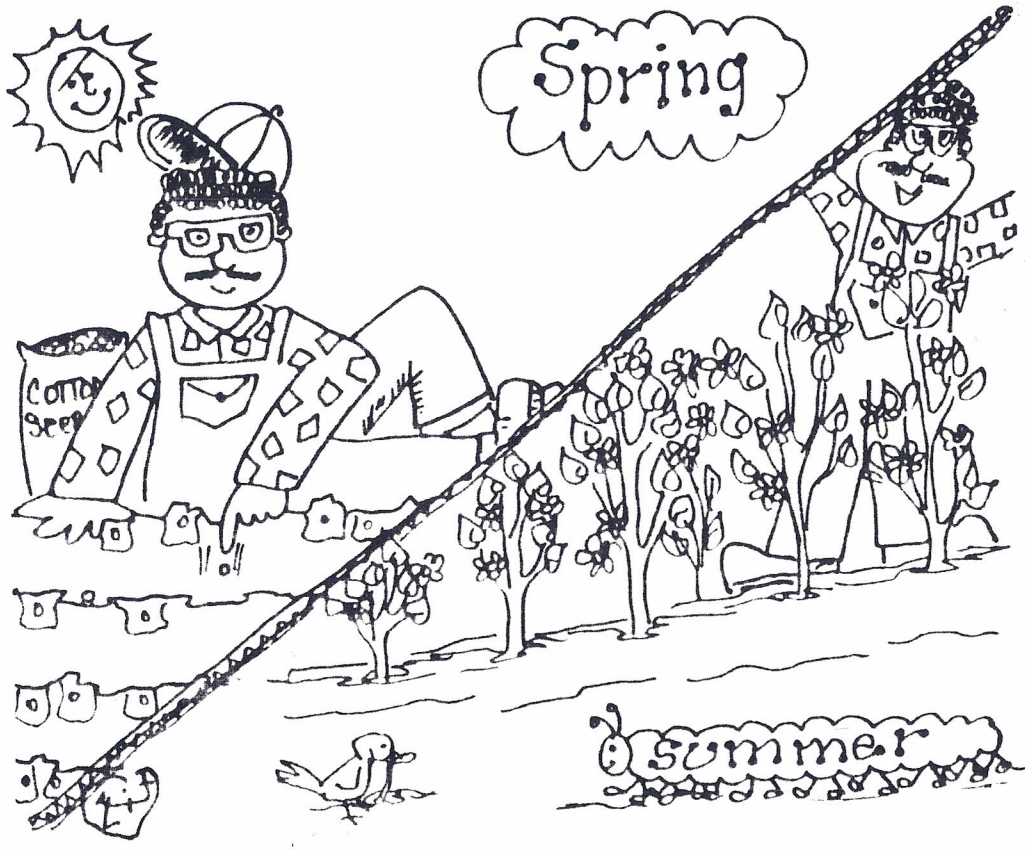
Muffy was thinking about the treasure.

"We haven't searched a cotton field yet," she told Mike so they decided to visit Mr. Milton's cotton field.

"Look, there it is!" shouted Mike when the children saw a field filled with cotton plants.

Muffy and Mike ran to the middle of the field and began squeezing the round white balls on each plant.

"The cotton is soft," Mr. Milton said, "but it has a lot of seeds in the middle. The seeds have to be taken out before the cotton can be used."



Mr. Milton told Muffy and Mike that he had planted the seeds in the spring. The plants bloomed in the summer for two or three days. After the flowers fell off, a round, brown pod was left. He called the pod a *boll*, and the cotton formed inside of it.

The children learned that cotton is picked by a machine and taken to a special place called a gin to have the seeds removed. The cotton is then packed into bales and sent to factories.

"Let's see how many things we can find that are made from cotton," Muffy suggested.

The Boll Worm

Once I was rotten
Eating up the farmer's Cotton.
Then I got a classy look,
Working to teach in your book.

Teaching you about cotton,
I may not be so rotten.
Cotton is fiber and food
Now that you are in the mood.

String me together one by one
Counting can be fun.
Soft and cuddly I will be
Just you wait and see.

Supplies needed
Pipe cleaner
Cotton pompoms
White cotton balls can be used
Eyes
Glue

Miniature Cotton Gin

Diversified Designs
of
Weatherford, Inc.
1601 Ranger Hwy
Weatherford, Texas 76088
817-596-5055