

Cotton

Activities for K-5 Classroom

Alabama Agriculture in the Classroom
May 2002
Xris McMillin Blonk

Cotton

Background Information

Cotton plants require a long, sunny growing period with at least 160 frost-free days, good soil, and an adequate water supply. Seedlings emerge 5-10 days after planting and seedling leaves called **cotyledons** appear. These provide food to the young cotton plant. The first real leaves form 2-4 weeks after planting. Five to seven weeks after planting the first flower bud appears. It is called a **square** and is surrounded by leaf-like parts called **bracts**. Several weeks later (8-10 weeks after planting) the square opens into a white flower that will pollinate itself within three days and fall off the plant. A green pod containing seeds and fibers is left in its place. This pod slowly turns brown as it ripens, finally splitting open exposing the cotton fibers inside. Twenty-five weeks after planting, the cotton is ready to harvest.

All parts of the harvested cotton are used. Many uses have been developed for the fiber, cottonseed, and linters (small pieces of cotton attached to the seeds). Bales of cotton are delivered to textile mills where they are transformed into cotton fabric through a complex series of steps that include: **carding** or lining up the fibers; **combing** to remove impurities; **twisting** to improve strength; **spinning** to turn the fibers into yarn; and **weaving** to transform the yarn into fabric.

Major cotton producing countries include the United States, China, India, Pakistan, and the Republic of Uzbekistan. Other producers include Argentina, Australia, Brazil, Egypt, Greece, Syria, and Turkey. The main cotton producing states in the United States are: Virginia, North Carolina, South Carolina, Georgia, Tennessee, Alabama, Mississippi, Louisiana, Missouri, Arkansas, Oklahoma, Texas, Arizona, and California.



Classroom Cotton



With a few readily available materials and the cotton seeds provided, you can turn your science center into a nursery for young plants.

Objective: Students will observe and record the stages of plant development.

You'll need:

- potting soil
- containers -milk, juice, yogurt or margarine containers
- cotton seeds
- water
- science journals

Procedure:

1. Fill containers with soil to within 1" of top.
2. Place 3-4 seeds in container and cover with soil. Place in direct light if possible.
3. Check moisture daily and add water as necessary. Keep soil moist but not wet.
Seedlings will emerge in 7-10 days.
4. To transplant: Cut the top off of a one-gallon milk carton and fill with moist potting soil 4-5 inches deep. Gently remove the young plants from their container and place in the large carton. Fill the area around the plant with potting soil.
5. Place the carton in sunlight and rotate a quarter of a turn daily.
6. Measure plant growth twice a week and record all data in science journals. Be certain to include illustrations of the young cotton plants.

Extending the Activity

1. Experiment with growing conditions. Try different soil types, vary the amount of moisture received, or expose the plants to differing amounts of sunlight.
2. Germinate cotton seeds on a wet paper towel in a Ziploc bag to give students a first-hand look at what occurs below the soil line.
3. Research pests that can harm the developing cotton plants.
4. Start a bulletin board on cotton and cotton products. Encourage students' participation by asking them to add to the display (photographs from magazines are a good source).

Mini Greenhouses for the Classroom

Mini Greenhouse #1

Materials (per student):

- 1 clear plastic disposable cup
- 1 plastic lid (from butter, sour cream container)
- 1 peat pellet
- seeds
- water
- permanent marker

Procedure:

1. Using permanent marker label each cup with student's name and date.
2. Soak peat pellet in warm water until it reaches full size. Plant 3 seeds in pellet.
3. Place wet pellet on plastic lid and cover with inverted plastic cup.
4. Place in indirect sunlight and observe. Add a few drops of water if it gets too dry.
5. When plants are several inches tall, thin to one plant per greenhouse pellet. When young plants reach the top of the plastic cup, they can be transplanted.
6. Have students record their observations in a science journal.

Mini Greenhouse #2

Materials:

- clear plastic disposable containers with lids
(found at salad bars; tomato containers)
- peat pellets
- seeds
- water
- permanent marker

Procedure:

1. Divide students into cooperative groups.
2. Using the permanent marker, label each plastic container with students' names, type of seeds planted, and date.
3. Soak peat pellets in warm water and plant 3 seeds in each one.
4. Place pellets in clear plastic container and close lid.
5. Place in indirect sunlight and watch moisture level. Add a little water, as needed. Thin plants when they are several inches tall.
6. When seedlings reach the top of the container, they can be transplanted.
7. Have students record their observations in a science journal.

Cotton Products



Kernel

fertilizer
fish bait
cosmetics
insecticides

feed for livestock
shortening
waterproofing
soap

salad and cooking oil
margarine
rubber
mayonnaise

Hulls

livestock feed

mulch and soil conditioner

synthetic rubber

Lint from Seeds

plastics
toothpaste
cushions
mops
cotton swabs
currency
transparent tape

fingernail polish
paint
twine
comforters
fine writing paper
plastic outdoor signs
clothing

hair care products
ice cream
rugs
mattresses
filter papers
x-ray film
plastic pens & pencils

Cotton Fiber

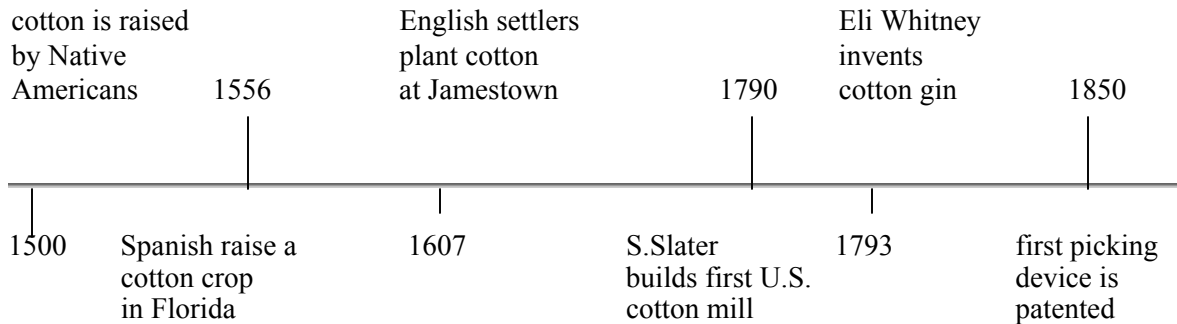
clothing
socks
dishtowels
gloves

sheets
jackets
blankets
hats

towels
rugs
pot holders
napkins

Cotton in the Americas

Objective: Students will be able to read and interpret a time line.



1. Who first raised cotton in the Americas?
2. When and where did English settlers first plant cotton?
3. How many years after the Spanish raised a cotton crop in Florida did Samuel Slater build the first U.S. cotton mill?
4. What two major achievements in the eighteenth century made the production of cotton goods easier?
5. Which occurred first -the building of the first U.S. cotton mill or the growing of cotton by English settlers?
6. How many years before Eli Whitney developed the cotton gin did Samuel Slater build the first U. S. cotton mill?

Extension: Assign students the task of developing a time line of their life in words and pictures.

Historical Facts

- 📖 **Scientists have found cotton fibers 7,000 years old in Mexico.**
- 📖 **It is believed that cotton was first cultivated in India about 5,000 years ago.**
- 📖 **Archaelologists have found cotton fragments in the Indus Valley of India (Pakistan) dating back to 3000 B.C.**
- 📖 **Cotton was used by ancient Egyptians, Chinese, and North and South Americans.**

Answers: 1) Native Americans; 2) Jamestown, 1607; 3) 234 years; 4) 1st cotton mill & cotton gin; 5)growing of cotton; 6) 3 years.

Cotton Calculations for the classroom

Objective: Students will develop critical thinking skills and practice basic math skills

After the cotton fiber is separated, it is pressed into bales. Most bales of cotton produced in the United States are of a universal density. They are 55 inches tall, 26 inches wide, and 21 inches thick. These bales weigh between 485-500 pounds.

One bale of cotton can be used to produce many of the items we wear or use each day. The chart below lists typical items produced from cotton, tells how many can be created from one bale, and the number of pounds of cotton required to manufacture an individual item.

<u>manufactured goods</u>	<u># produced per bale</u>	<u>pounds per item</u>
adult sweatshirt	500	1.0
diapers	3,000	.16
jeans	325	1.5
ladies' blouses and shirts	850	.58
men's shirts	540	1.0
pillowcases	1,210	.4
towels	1,230	.4

1. A universal bale of cotton can be used to produce 325 pairs of jeans or 540 men's shirts. How many more shirts than jeans can be produced from one bale of cotton?
2. 1,230 towels can be manufactured from one bale of cotton. How many towels can be produced from three bales?
3. It takes 1 1/2 lbs. of cotton to make a pair of jeans. How many pounds are required to produce 8 pairs of jeans? 20 pairs?
4. A bale of cotton can be used to produce 850 ladies' shirts or 540 men's shirts. How many more ladies' shirts than men's can be produced? Why do you think this is so?
5. 500 adult sweatshirts can be manufactured from one bale of cotton. How many can be made from 1/2 a bale? 3 1/2 bales?

ANSWERS: 1.) 215 more shirts than jeans; 2.) 3,690 towels from 3 bales; 3.) 12 lbs., 30 lbs.; 4.) 310 more ladies' shirts than men's; 5.) 250 sweatshirts, 1750 sweatshirts.