

# UNIT FOUR: EXPANSION AND REFORM

## LESSON 10

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# RISING LIVING STANDARDS IN THE NEW NATION

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### LESSON DESCRIPTION

The students participate in a simulation that demonstrates an increase in productivity. They discuss ways in which productivity can be increased; then they learn how technology, exemplified by Eli Whitney's cotton gin (1793), increased productivity in cotton, which in turn had widespread effects on many aspects of American society early in the nineteenth century.

### MYSTERY

From the end of the American Revolution to the beginning of the Civil War, the population of the United States grew from approximately 4 million people to 32 million. It is not surprising that, with more people able to work at making more things, the economy would grow. The puzzling thing is that the output of goods grew faster during this time than the population did. The standard of living of the average American in 1860 was double what it had been at the end of the Revolution. That is, the average person had more and better goods in 1860 than he or she had owned when the American Revolution ended. How can an economy grow faster than the population of the society in which it develops?

### ECONOMIC HISTORY

The American economy experienced rapid economic growth after the Revolution. Part of this increase can be explained by growth in available productive resources, including the supply of workers. The birth rate was high at the time, and, after the 1820s, a rising tide of immigration also contributed to population growth. In addition, the westward expansion of the United States brought new lands into cultivation.

But a rising standard of living depends on something more than an increase in productive resources; it depends primarily on increasing the *productivity* of these resources. Productivity is the amount of output (goods or services) produced from a given amount of inputs — of natural, capital and human resources. Following the Revolution, productivity rose, bolstered by new developments in technology and better production

methods. The factory system, introduced in New England, raised productivity by utilizing new machinery and arranging the work force efficiently. Productivity also rose in agriculture. Farmers moving west found flatter and more fertile land to till; even more important, however, was the new advantage many farmers found in access to improved tools and machinery, from iron and steel plows to mechanical reapers. All these developments had, by 1860, doubled the amount of goods available, on average, to each American.

### CONCEPTS

- Division of labor
- Productive resources
- Productivity
- Profit
- Scarcity
- Standard of living

### OBJECTIVES

Students will:

1. Distinguish between an increase in productivity and an increase in output.
2. Explain how increases in productivity decrease costs of production and increase living standards.
3. Identify several methods of raising worker productivity.

### CONTENT STANDARDS

#### Economics

- Productive resources are limited. Therefore, people cannot have all the goods and services they want; as a result, they must choose some things and give up others. (NCEE Content Standard 1)
- Investment in factories, machinery, new technology, and the health, education and training of people can raise future standards of living. (NCEE Content Standard 15)

## History

- How the industrial revolution, increasing immigration, the rapid extension of slavery, and the westward movement changed the lives of Americans and led toward regional tensions. (Era 4, Standard 2, National Standards for History)

## TIME REQUIRED

45 Minutes

## MATERIALS

- A transparency of Visuals 10.1, 10.2, 10.3, 10.4, 10.5 and 10.6

## PROCEDURE

1. Explain that the purpose of this lesson is to examine a mystery: Why did the American standard of living grow so rapidly after the Revolution? Display Visual 10.1 and point out how much more comfortable the lives of most Americans became in a relatively short time. Ask the students why they think this happened. They may answer that factories were being built in America for the first time. If they do, tell them that they are on the right track. Factories and related developments led to increases in productivity.
2. Introduce the relationship between living standards and productivity: In order for average living standards to rise, productivity must increase. Display Visual 10.2. Tell the students that all goods and services are produced using productive resources. These include (a) natural resources (sometimes called “gifts of nature”), such as land, edible plants and animals, or minerals that are used to produce goods and services; (b) capital resources, such as buildings, machinery and equipment; and (c) labor resources, which includes human efforts used in production. All of these productive resources are scarce: Not enough is available to produce all the goods and services that human beings would like to have. Still, when productivity increases, humans can have more goods and services than before. Productivity increases explain the rising standard of living in the United States, in the past and now.
3. Use the following simulation to illustrate the concepts of productivity and productivity increases:
  - A. Draw four large circles spaced horizontally across the chalkboard. Select one student to be a worker and another student who has a watch with a second hand to be the timer. Give the worker a piece of chalk and tell him or her to make as many marks in the four circles as possible in a time period of 10 seconds, with the constraint that the student must make one mark in each of the four circles before starting a second round of marks. In other words, an equal number of marks must be made in each circle during the 10-second period. When the student has finished, calculate the labor cost of each unit (mark) by dividing the number of marks into a hypothetical wage of \$5.00. For example, if the student makes 20 marks, the unit labor cost of each mark is 25 cents.
  - B. Now have four other students come to the board; tell them that they will be performing the same task, but that you will arrange for them to do their work more productively. Assign each of the four students to an individual circle, telling each to make as many marks as possible in that circle in a 10-second period. Because these workers do not have to move back and forth, they will average two or three times as many marks as the first student. Calculate the labor cost for each of the four workers by dividing the number of marks that each person produced into \$5.00.
  - C. Tell the students that *productivity* can be defined as the output per worker in a given time period. Use the concept to explain the simulation your students conducted: Productivity increased with the second group of workers because work was organized more efficiently. Because

the unit labor cost went down when productivity increased, it would be possible to sell marks at a lower price than before and still make a good profit. This example clarifies a key point in U.S. history: Decreases in price levels do not indicate a decline in our standard of living when they are accompanied by equal or greater increases in productivity, such as occurred in the early 1800s. When production costs come down, prices to consumers are almost always reduced as producers compete to attract more customers, or lower their prices to avoid losing customers to their competitors.

4. Ask the students to imagine some other ways in which productivity could be increased in mark-making. Suggestions might include giving each worker a second piece of chalk or a tool that would hold several pieces of chalk (adding capital resources), paying the workers for each mark produced (using incentives to increase human effort), sending workers to college to get a degree in chalk-marking (worker training and education to enhance human capital), or doing research on better ways to make chalk marks (another use of human resources). In each case, point out that people would pursue such measures because they expected to be rewarded financially or in some other way.
5. Tell the students that the late eighteenth and early nineteenth centuries offer many examples of productivity increases that stimulated economic growth. One good example can be found in the career of Eli Whitney. Eli Whitney (1765 – 1825) was a young Yale graduate when he went to Georgia in 1792 as a guest of Catherine Greene, widow of Revolutionary War General Nathanael Greene. Whitney became friends with several planters and listened to their complaints about the unprofitability of raising cotton. At that time, commercial cotton growing was confined to coastal areas of Georgia and the Carolinas. Planters there raised Sea Island cotton, a variety with long, soft

fibers that could easily be separated from the cotton seeds. Other varieties of cotton could be grown in interior areas of the South, but processing cotton was very labor-intensive; it took one slave a full day to remove the seeds from a single pound of cotton. Whitney knew that developing an efficient machine to separate seeds from cotton would allow planters to produce more cotton at a lower cost per unit. Moreover, he believed that gaining a patent on such a device would make him a rich man.

6. Display Visual 10.3. Explain that Whitney devised a cotton gin, a wooden box that contained a cylinder with metal spikes that separated the raw cotton from the seeds so efficiently that a single worker could clean about 50 pounds of cotton per day. The use of Whitney’s cotton gin quickly spread throughout the South, and “King Cotton” became the South’s most important crop.
7. Display Visual 10.4 and Visual 10.5. Explain that at about the same time, in Great Britain, the production of cheap cotton cloth had become the leading industry, stimulated by such inventions as the flying shuttle (1733), the spinning jenny (1764), the water frame (1769) and the mechanical loom (1785). Competition among textile producers drove prices down, which greatly expanded the market for cotton cloth. British demand for cotton increased accordingly, making cotton the most valuable export of the United States by 1810.
8. Display Visual 10.6. Explain that reductions in the cost of producing clean cotton had powerful effects on American society. Large planters and small farmers spread westward into western Georgia, Mississippi, Alabama and other Southern states in search of new land on which to grow cotton. They pressured the federal government into removing the Cherokee, Choctaw, Creek and Chickasaw people from their traditional lands in the South to a newly formed “Indian Territory”

(today Oklahoma) beyond the Mississippi River. As new land went into production, the value of slave workers rose.

9. Explain that cheap cotton also stimulated the textile industry in New England. The first successful cotton mill had been established by Samuel Slater and his partners in Rhode Island in 1793. The industry grew rapidly after Jefferson's Embargo of 1807 and the War of 1812 cut off the supply of British textiles to the American market. Average Americans could soon afford to buy more new clothes. Moreover, since cotton was washable, cleaner clothes and more frequent changes ushered in significant health benefits.
10. What happened to Eli Whitney? He patented his gin, but it was so easy to copy the gin that others began to manufacture and sell gins like the one Whitney designed. Whitney spent most of the profits he had made in unsuccessful lawsuits aimed at defending his patent. In 1798 he built a factory in Connecticut to manufacture muskets. He built machinery that could make interchangeable musket parts — that is, each part of the musket was made to such precise measurements that muskets could be assembled by a group of men, each adding one part to the musket and passing it on to the next worker — a simple form of assembly line production. Whitney's use of interchangeable parts and division of labor illustrate another way of increasing productivity — rearranging the work process so that more muskets could be produced without increasing labor hours.

## CLOSURE

Explain that a more precise definition of *productivity* is the amount of output from each unit of input. For example, agricultural productivity increases when output per acre of farmland increases. Ask the students to give several examples of how output per acre might be increased.

*(Possible answers: better farm machinery, new ways of farming, such as crop rotation, or the use of fertilizers, weed killers and so on.)*

Remind the class that the productivity simulation at the beginning of the lesson showed that the overall standard of living can increase even as the unit cost of labor is decreasing. The gain in productivity reduces costs to producers and consumers. This increase in efficiency improves the overall standard of living. Tell the students that forces influencing productivity are still at work in today's economy. Most noteworthy are the changes brought about in almost every industry by the use of computers.

## ASSESSMENT

### Multiple-Choice Questions

1. Which of the following is an example of increasing productivity?
  - A. A farmer buys an additional 10 acres of land and is therefore able to increase the amount of wheat grown.
  - B. A shoemaker hires an assistant and is therefore able to make more shoes than before.
  - C. A weaver gets a new and better loom and is therefore able to produce more cloth every day than he did before.**
  - D. A carpenter can work longer hours in the summer when the sun goes down later and therefore gets more work done in summer than in winter.
2. Profit is the difference between the money earned by selling a product and the cost of making the product. How did Eli Whitney's cotton gin increase the profits of Southern cotton planters?
  - A. It reduced the amount of labor needed to remove the seeds from a pound of cotton.**
  - B. It increased the amount of cotton that could be grown on each acre of land.
  - C. It made it possible to grow cotton in the interior of the South.
  - D. It made it possible to grow cotton in the North.

### ESSAY QUESTIONS

1. What is an increase in productivity, and how does it raise living standards?

*(Possible answer: Productivity increases when more output is produced without increasing the natural, capital or human resources used to produce that output. This reduces the average cost of producing each unit. Therefore, producers can afford to reduce prices without reducing their profits. Especially where there is competition, producers will reduce their prices in order to attract more customers or to avoid losing customers to their competitors.)*

2. What are several ways in which the productivity of workers can be increased?

*(Possible answer: Workers can be encouraged to work harder by increased pay or some other reward. They can be given better tools and machinery to work with. They can be trained or educated to do their job in a better way. Research can be done on how to improve production in their industry.)*

VISUAL 10.1

**THINGS CHANGED FOR AMERICANS AFTER THE REVOLUTIONARY WAR**

**BETWEEN 1789 AND THE 1830s . . .**

- the number of wooden chairs per household almost doubled.
- most of the upper-middle class had upholstered sofas and chairs.
- most people in cities and villages had replaced open fireplaces with cook stoves and parlor stoves.
- many houses had larger windows because window glass was cheaper.
- farm families owned more candlesticks, and oil lamps were becoming common in cities and villages.
- one household in four or five owned a carpet, and houses in most cities and villages had window curtains.
- most households owned at least one clock.

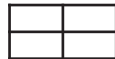
Source: Jack Larkin, *The Reshaping of Everyday Life, 1790 – 1840* (New York: Harper & Row, 1989), pp. 139 – 143.

## VISUAL 10.2

# PRODUCTIVITY AND PRODUCTIVE RESOURCES

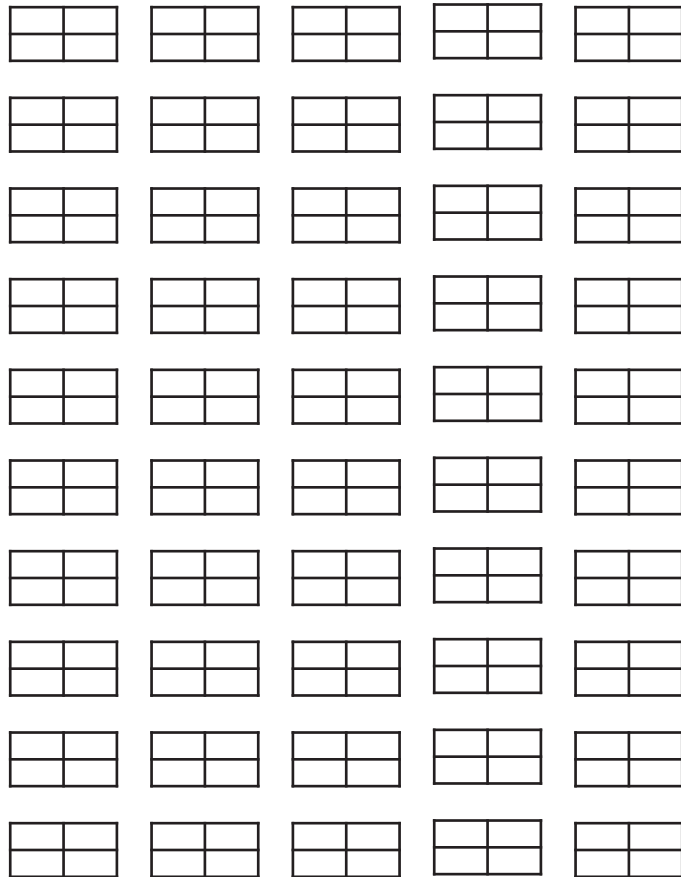
- Productivity is the amount of a good or service that can be produced with a given amount of productive resources.
- Productive resources include natural, capital and human resources.
- Productive resources are scarce.
- Productivity increases when:
  1. more goods or services are produced with the same amount of productive resources, or
  2. the same amount of goods or services is produced with fewer productive resources.

**VISUAL 10.3**  
**BEFORE THE COTTON GIN**



**1 MAN = 1 POUND OF CLEAN COTTON**

**AFTER THE COTTON GIN**



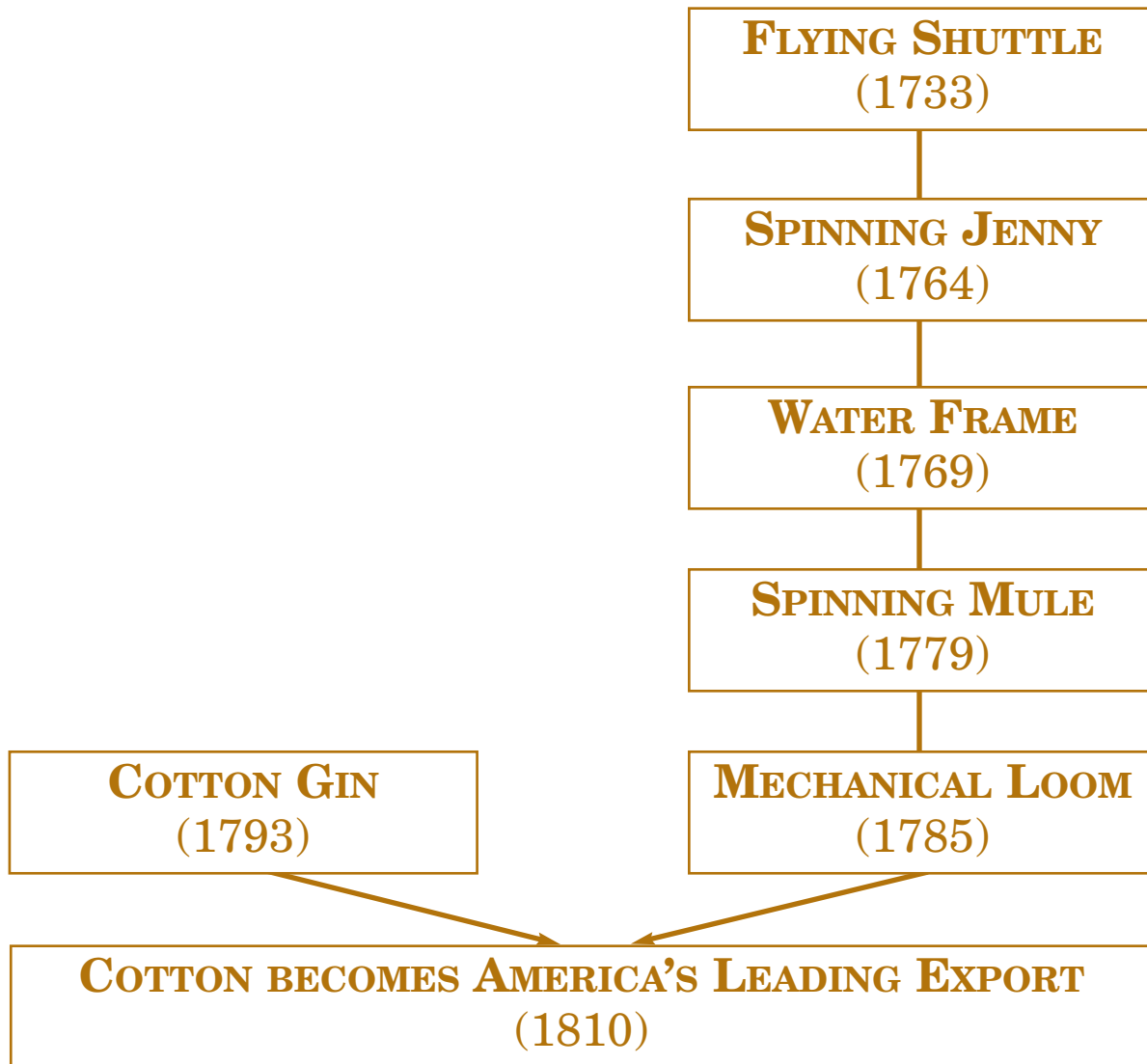
**1 MAN = 50 POUNDS OF CLEAN COTTON**

VISUAL 10.4

**TECHNOLOGY AND THE RISE OF KING COTTON**

**THE AMERICAN SOUTH**

**ENGLAND**



VISUAL 10.5

**TECHNOLOGY IN TEXTILE PRODUCTION**

**FLYING SHUTTLE**

For centuries, handloom weaving involved using a device called a shuttle to hold the yarn. The weaver would pass the shuttle from one hand to the other. In 1733 John Kay patented his flying shuttle; it dramatically increased the speed of this process. A weaver using Kay’s flying shuttle could produce much wider cloth at faster speeds than before.

**SPINNING JENNY**

In 1764, James Hargreaves built what became known as the Spinning Jenny. The machine used eight spindles onto which the thread was spun from a corresponding set of rovings. By turning a single wheel, the operator could spin eight threads at once. Later, improvements were made that enabled the number to be increased to eighty.

**WATER FRAME**

Richard Arkwright and his colleagues produced the Spinning-Frame. This device produced yarn that was far stronger than yarn made by the Spinning-Jenny. But the Spinning-Frame was too large to be operated by hand. Arkwright eventually used water power to run the machine, and it became known as the Water Frame.

**SPINNING MULE**

In 1775, Samuel Crompton produced the Spinning Mule. It combined the features of the Spinning Jenny and the Water Frame. The mule produced a strong, fine and soft yarn which could be used in all kinds of textiles, but was particularly suited to the production of muslins.

**MECHANICAL LOOM**

In 1785, Edmund Cartwright patented the first mechanical loom to manufacture cloth. A loom is a device that combines threads to make cloth. The power loom was a steam-powered, mechanically-operated version of a regular loom.

VISUAL 10.6  
**THE IMPACT OF COTTON**

**COTTON BECOMES AMERICA'S LEADING EXPORT  
(1810)**

**THE AMERICAN SOUTH**

- Increased settlement of southern interior
- Increased demand for slave labor
- Removal of Native Americans

**NEW ENGLAND**

- Development of the New England textile industry