Building an Economy
The Texas Experience
BUILDING AN ECONOMY -
THE TEXAS EXPERIENCE

Table of Contents

Lesson 1 Understanding the Free Enterprise System

Lesson 2 Texas Native American Groups: Economic Patterns

Lesson 3 European Exploration of Texas: Economic Motivation

Lesson 4 Early German Immigration to Texas: Economic Patterns

Lesson 5 Anglo-American Colonization in Texas: Economic Motivation

Lesson 6 Scarcity and Invention: Barbed Wire comes to Texas

Lesson 7 Transportation in Texas: The Role of the Railroad

Lesson 8 From Windmills to Wind Farms: Harnessing the Texas Wind

Lesson 9 Cotton Industry in Texas

Lesson 10 Boomtowns: A Result of Oil Discovery

Lesson 11 Food and Fiber - Making a Living in Texas through Agribusiness

Lesson 12 Flying High: Aeronautics and Aerospace Industries of Texas

Lesson 13 Technology in the 21st Century and the Texas Economy

Lesson 14 Imports and Exports: Texas and the World

Glossary
LESSON 1
UNDERSTANDING THE FREE ENTERPRISE SYSTEM

INTRODUCTION
It can be a challenge for fourth grade children to understand the concept of a free enterprise economic system. Although this concept is introduced to Texas school children in grade 2 and is reinforced in grade 3 children need clear examples and lots of repetition in the fourth grade classroom to solidify their understanding of the characteristics of a market economy. This same concept will be addressed again and again as children move from one grade level to another in Texas schools, with each grade level adding to the complexity and types of examples given.

In this lesson, students will study the characteristics of free enterprise, or a market economy, and will be given scenarios of various economic activities in Texas. They will be asked to identify those situations that fit the characteristics of free enterprise and those that do not.

ECONOMIC REASONING
Economic concepts affect many parts of a person's life - their jobs, where and how they live, deciding how they will use money and the many goods and services that are provided for them. Every country has an economic system. The three basic types of economic systems are traditional, command and market economies. Although our system in the United States is a mixed economy (because the government regulates some of our economic activities), it is basically one of capitalism or a market economy. It is important that people understand the concept of a free enterprise system or a market economy. The "market" in a market economy is not just referring to the place where an economic exchange takes place (like a farmer's market). A market economy refers to the actions of buying and selling and includes both people (buyers and sellers) and the actions of a market (exchanging of a product or service).

Buyers and sellers in a market economy make important decisions. Most people cannot meet their own needs for material goods or services. They must work because they need money to live and they meet their needs by buying goods and services with the money they make. Both buyers and sellers can compete in the market place by promoting their own best interests. There is a flow of money in a market economy. The resources that producers need, such as labor, land, and capital goods, are exchanged for pay or money. Individuals or groups of individuals provide resources to those who are producers. Producers, in turn, provide money for the resources. When something is produced with the resources, these products or services are exchanged for money. Entrepreneurs play a role because they organize and operate a business that tries to meet a need for the consumer (buyer) in order to make a profit. These people play an important role in the free enterprise system.

The features, or characteristics, of a market economy include ownership of private property, practicing economic freedom (free choice), making exchanges on a voluntary basis, and working to make a profit. Any society must answer four basic economic questions. The market economy practiced in our country helps people answer these four
questions: What goods and services will be produced? How will these goods and services be produced? How many goods and services will be produced? Who will get what is produced?

TEXAS ESSENTIAL KNOWLEDGE AND SKILLS

4.12A Describe the development of the free enterprise system in Texas
4.12B Describe how the free enterprise system works in Texas
4.12C Give examples of the benefits of the free enterprise system in Texas
4.23A Use social studies terminology correctly
4.22B Analyze information by sequencing, categorizing, identifying cause-and-effect relationships, comparing, contrasting, finding the main idea, summarizing, making generalizations and predictions, and drawing inferences and conclusions

ECONOMIC CONCEPTS
Free Enterprise, Market Economy, Goods and Services, Producers and Consumers, Price, Entrepreneur, Voluntary exchange, Private Property, Profit

CRITICAL QUESTIONS
1. What is meant by “free enterprise”?
2. What are the characteristics of a market economy?
3. What are some examples of free enterprise in Texas?
4. How important is the free enterprise economy to Texas?
5. What role does an entrepreneur play in a free enterprise system?

LESSON DESCRIPTION
In this lesson students will study definitions and characteristics of the free enterprise system. They will analyze examples of economic activities in Texas and determine if they fit the characteristics of a market economy. They will discuss the role of entrepreneurship in a free enterprise system. It is suggested that new scenarios be introduced at later times during the year to reinforce the concept of free enterprise and to help children remember the basic characteristics.

TIME REQUIRED
One to two class periods

MATERIALS
Transparency Master 1 — Definition of Free Enterprise
Copies of Student Handout 1 for all students – Characteristics of a Free Enterprise System
A copy of the Teacher Resource page — Scenarios of Economic Activities in Texas — can be read aloud by the teacher or copies can be made for the students' use. Additional examples can be added by the teacher or by members of the class.

Answer Key to Economic Scenarios for teacher use.

A set of three decision cards (Agree, Disagree, and ?) for each student will be needed. These can be copied and laminated for extended use and can be used with other activities throughout the year. It is suggested that each card be done in a different color for some of the practice activities. The teacher can better spot students with questions as they hold up their cards.

PROCEDURE

1. Introduce the lesson by asking the students to think about recent events in which they would have spent money. Ask if that activity or activities included any choice on their part? Discuss the fact that all people make choices when they are purchasing a product of some kind (candy, a new bike, etc.) or a service (baby sitting, watering plants, walking the dog, etc.) Stress the differences between goods and services.

2. Discuss the issue of choice in our economy. People can work at the jobs that they choose, can decide where they will rent an apartment or buy a house, and can decide what products they will buy when they go to the grocery store. Explain that all people around the world don't have free choice with their economic activities. Explain that, in the United States, we have a free enterprise system or a market economy. Tell them that they will learn about this system in this lesson and they will be able to identify the characteristics of a free enterprise system.

3. Make a copy of Transparency Master 1 – Definition of Free Enterprise. Go over this definition and explain the meanings of the critical vocabulary (supply, demand, prices) and the four basic economic questions. Provide concrete examples from their own home, school and community in day to day living.

4. Distribute copies of Student Handout 1 – Characteristics of a Free Enterprise System. Allow time for the students to read through the handout and then discuss each point with the class. Stress the role of an entrepreneur in a free enterprise system. The economic freedoms we have allow individuals to develop and sell new products or services.

5. Tell students that they will use the information provided in the handout when they do the next activity. Give each student the three cards – Agree, Disagree, and the question mark. The teacher will read each scenario and have the students hold up the "Agree" card if the situation represents a component of the free enterprise system. They should hold up the "Disagree" card if the example does not reflect the free enterprise system. They should hold up the "?" card if they are undecided. The teacher will be able to see the level of class responses quickly and can explain the characteristics of the free enterprise system as they relate to the specific scenario. Adjustments can be made based on the level of understanding reflected in student responses. At the end of the activity, teachers may want to review the scenarios that DID NOT fit the characteristics of a free enterprise system and have the class explain
why they did not fit.

6. Ask students to write six new scenarios using the information about the free enterprise system in Texas. They should do three that reflect a free enterprise system and three that do not. They should be prepared to discuss each one, giving the reasons why their situation fits the appropriate category.

7. Discuss with the class the many benefits of having a free enterprise system in Texas. Give students current examples from the local community of the free enterprise system.

CLOSURE

Provide the following writing prompt: The benefits of a free enterprise system in Texas are . . . ? Students should complete a well-written paper of at least two paragraphs giving specific examples of benefits from the class experiences or daily life.

EXTENSION

Over a period of two weeks, ask students to look in the daily newspaper for their community or area and bring examples of the free enterprise system to class. Make a class bulletin board. Daily news accounts from television or the radio may be used as well.
DEFINITION OF FREE ENTERPRISE

A free enterprise economy or system is the same as a market economy. In a market economy, individuals depend on supply, demand, and prices to determine the answers to the four economic questions of "what to produce," "how to produce," "how much to produce," and "for whom to produce." The system has four characteristics: economic freedom, voluntary exchange, private property and the profit motive.
CHARACTERISTICS OF A FREE ENTERPRISE SYSTEM

The first characteristic of a free enterprise economic system is economic freedom. Both the producers of goods and services and workers have economic freedom. They are free to choose whatever jobs they wish. People are free to own businesses and they are free to compete in the marketplace by introducing new products, lowering their prices, etc. Competition leads to new and better ideas and better prices.

A second characteristic of free enterprise is voluntary exchange. The individual or business that produces a product or service is free to sell for the price they wish. People who buy these goods and services can refuse to buy. The actions of consumers influence the price of goods.

A third characteristic of free enterprise is private property. In a market economy, most of the resources we need to produce both goods and services are privately owned. Individuals can own land, personal property, business property and money. They may buy, sell, and use their property any way they wish. People may also enter into contracts, or agreements, with other individuals or businesses.

A fourth characteristic is a profit motive. Individuals act to take care of their own best interests. People are free to sell their goods and services for the highest prices they can get. People who buy the goods and services (consumers) are free to shop around to find the lowest prices. Workers are free to ask for better working conditions or higher wages.
SCENARIOS OF ECONOMIC ACTIVITIES IN TEXAS

1. You are a settler living in San Antonio in 1848. You have built a mill for grinding corn and are advertising with a poster at the general store. You are allowing people to pay for your services with a portion (part) of their ground corn. You can then sell your corn for a profit to people in the town with no corn.

2. You are a settler in the Dallas area in 1843. Wild mustang horses roam in this part of Texas at this time. You are capturing the horses, training them and selling them to the Army and to settlers for a profit.

3. You live in a house close to the town’s only baseball field. Games are played in the late afternoon in April, May and June. You decide to set up a lemonade stand and sell cups of lemonade for profit.

4. You live in South Texas after the Civil War (1874). You have numerous cattle that you have raised on your land. The price of cattle in South Texas is very low, but the price in northern states is high. You decide to round some of your cattle up and take them to market to sell.

5. You live next to the Trinity River in Dallas in 1862. You have the best place to cross the river at your property and you want to build a ferry to help people cross. Dallas County officials will allow the ferry to be built only if they run it and charge the fees they want, giving you almost no profit or income.

6. You live in a suburb in a large Texas city. Your area has several banks, but the city government officials have told you that you can only do business at one bank in the area. No other choices are allowed.

7. You are a farmer in West Texas in 1878. Trail bosses have been driving their cattle across your land. You decide to charge each group a toll or fee for crossing your property.

8. You are an inventor and hear that there is a lack of wood in the West (Great Plains area). You decide to design a special fence that would be made out of wire that could hold animals in. You set up a demonstration to help sell your fence to the people in the area.

9. You live in Kilgore in the 1930s. Oil has been discovered in your town and thousands come to see and work in the oil fields. There are few places to eat and sleep so you decide to rent out your living room and your front porch. You will provide cots to the people renting for $5 per night.

10. You are a settler living in Texas in 1828. You have a number of milk cows and have extra milk you could sell. The Mexican government ruled that you could only sell two gallons of milk a week even though you have much more to sell.

11. You live in the forest region of East Texas in 1880 and own a lumber mill. Because many immigrants are moving into the north central region of Texas (the Dallas – Fort Worth area) and need housing, you can cut lumber and take it to the area of need to sell for a profit. However, the county government has ruled that you cannot take the lumber out of the county for use elsewhere.
12. You have invented a new kind of windmill that uses wind power to pump water from deep in the ground. You have had requests from four families in a West Texas county for this new invention. The county will only allow you to build two of the windmills and the county government officials will decide which two families will have the new windmill.

13. You live in Texas in 1920 in Austin. You build wagons for a living, but business has been very slow because more and more people are buying cars. Since your shop is in a good location on a main road, you decide to open a gas station to sell gas for all of the new automobiles coming to town.

14. You live in a small town in the central Texas area in 1915. The railroad has recently come to town and three new businesses have opened in the last month. You decide to start a weekly newspaper and start selling subscriptions and advertisements to residents of your town.

15. You are a carpenter by trade and you have moved from town to town in the last few years. You want to settle down and start a business in a new town that you have just visited. The town’s city council has ruled that only one carpenter can locate there and the town already has one carpenter. You have to move on to a different place.

16. You own a bicycle shop and business has been slow lately. You have noticed that many of the children in your neighborhood are now riding on skateboards and scooters. You decide to specialize in selling and repairing skateboards and scooters to improve your business. You take out an advertisement in the local newspaper.

17. You own a cattle ranch in the Panhandle of Texas. You moved to the area 10 years ago and worked to build up your herd. You have been very successful and have a number of cows to sell. You decide to sell your stock at a cheaper price, taking out a special ad in the local newspaper. The county judge has told you that you cannot sell your cows for a cheaper price because it would be unfair competition for other cattle ranchers in the area.

18. You have recently moved into a new neighborhood. You love animals and you had a dog walking business in your old neighborhood. You have been talking to people in your new neighborhood, telling them about your willingness to walk their dog(s) every day after school for a fee. You find out that someone else already has the same business. You decide to charge people less in order to get your business started and give the other person some competition.

19. It is 1920 and you live in a growing city in Texas. You have recently purchased a new Ford Model T car. You have started a taxi business for people in your area, but the county officials have told you that they will not allow you to do this and charge a fee for your services.

20. It is 1942 and World War II is going on in Europe. Many products are hard to get and very expensive. You have a number of beehives that produce honey. Because of the rationing of sugar during wartime, people are using honey instead of sugar. You decide to increase your price of honey.
ANSWER KEY
Scenarios of Economic Activities in Texas

The correct answer to each scenario is presented below with the key characteristic(s) of a free enterprise system noted.

1. **Agree — Free Enterprise – Voluntary exchange**
The mill owner allowed farmers to exchange a portion of their corn to pay for the cost of grinding. There is also an issue of economic freedom. The mill owner is free to set up any business he chooses.

2. **Agree — Free Enterprise – Profit Motive**
The settler can capture the wild mustangs, train them, and make a profit by selling the horses to the Army or to settlers.

You are free to set up a lemonade stand in your front yard (on private property) to sell lemonade to those attending the games. Those attending the games are free to buy or not to buy the lemonade. This is also an example of entrepreneurship.

4. **Agree – Free Enterprise – Profit Motive**
The owner of the cattle in South Texas can make more money by delivering the cattle to the northern markets.

5. **Disagree – Economic Freedom denied**
The owner of the property on the Trinity River could build a ferry, but county officials would set the fees and run the ferry – which prevents the owner from making the best profit. A second issue is voluntary exchange – the property owner could not set the best fee for the service.

6. **Disagree – Economic Freedom denied**
The person wishing to open a bank account would be required to bank at a certain place, taking away personal choice. Another issue would be voluntary exchange. Although all of the banks in the area would offer services, only one could be used by that individual. Both the customers and the banks would have restrictions.

7. **Agree – Free Enterprise – Private Property**
The property that the cattle drives were crossing was privately owned. Therefore, the farmer (land owner) had a right to charge a toll for crossing the land.

8. **Agree – Free Enterprise — Economic Freedom**
The inventor here was to solve a problem with a special fence that he invented. The inventor hopes to sell the special fencing by demonstrating that it works and is free to do so. The people of the area would be free to buy the fence or not – freedom of choice. Designing and selling something to meet a special need is also an example of entrepreneurship.

9. **Agree – Free Enterprise – Profit Motive**
The owner of the home sees that many people need a place to sleep and sees a chance to make money by renting sleeping space. A profit can be made while the need is so great. There are also issues of voluntary exchange. The homeowner
doesn't have to rent sleeping spaces and the customer doesn't have to stay in the home. They are free to go somewhere else.

10. Disagree – Economic Freedom denied
The Texas settler is denied the freedom to sell as much of the milk as he wants to sell.

11. Disagree – Economic Freedom denied
You have lumber to sell but can only sell it within the county (local area). This would also impact your profits, because the area needing lumber is away from your local county. Selling your lumber in an area where the need is great would increase your profit.

12. Disagree – Economic Freedom denied
The issue of voluntary exchange would be denied in this case. The government would decide which two families would get the new windmill and the businessman could sell only two, not the four that are requested.

The wagon maker could change the kind of business on his property (private property). This also addresses the issue of economic freedom; the individual is free to stop making wagons and open a gas station.

In this case the individual is free to start a weekly newspaper in the town. The people can choose to buy or not buy subscriptions to the paper.

15. Disagree – Economic Freedom denied
There is denial of economic freedom in this case. The government ruled that the town needed only one carpenter and therefore the second carpenter could not settle and open his business in the town.

The owner of a bicycle shop has the freedom to advertise and promote a change in the business – in this case, repairing skateboards and scooters.

17. Disagree – Voluntary Exchange Denied
In this case the owner of the cattle is denied the right to sell at a cheaper price.

18. Agree – Free Enterprise – Voluntary Exchange
This individual has decided to give others in the area some competition by dropping the price of the dog walking services. They have the economic freedom to do that in a free enterprise system.

19. Disagree – Economic Freedom denied
The characteristic of free enterprise that is denied in this case is voluntary exchange. The individual is not allowed to provide the service (taxi) for a fee.

20. Agree – Free Enterprise – Profit Motive
The demand for honey is greater during this time, so the individual can increase the price and make a greater profit.
LESSON 2

TEXAS NATIVE AMERICAN GROUPS: ECONOMIC PATTERNS

INTRODUCTION

Who were the Indians of Texas? In the Handbook of Texas Online, the article on Indians states: "Ethnologists have identified hundreds of groups of Texas 'Indians,' as the first European explorers to arrive called the peoples they found. Some of these were true tribes, accumulations of families or clans with social customs, traditions, and rules for order; these were occasionally quite large. At the opposite extreme, some were merely small family groups whose names or ethnic designations were taken for 'tribal' names by the Spanish and French and in subsequent secondary literature."

Archaeologists generally separate Texas prehistory into several different time periods. The actual time period when the first humans arrived in Texas to stay is still under debate, and as more artifacts and information becomes available, the timeline will most likely change. A general timeline for human habitation in what is now Texas usually begins around 10,000 BC. Research has divided the Texas archaeological record into four general periods: Paleo-Indian (about 10,000 BC to about 6000 BC); Archaic (6000 BC to the beginning of the Christian era); Late Prehistoric (to about 1600); and Historic (beginning with European exploration and settlement in Texas to present time).

The varied Indian groups in Texas had their own economic patterns. Some were totally self-sufficient and their economic system existed only within their own cultural group. Hunters and gatherers moved to locate food and to survive the elements. Some groups used bartering, while other tribal groups used forms of "money" in their trading practices, such as animal skins, shells, beads, and pottery. There are some tribal groups who set up distinct trade routes for sharing goods among various native groups. There is archaeological evidence from the late prehistoric period of long distance trading practices; artifacts of obsidian have been found at archaeological sites in Texas, although obsidian does not occur naturally in Texas. This evidence has led archaeologists to believe that some native Texas groups developed trading networks which included established routes reaching as far away as central Mexico, Wyoming, and Idaho.

Among the Historic period groups in Texas, the Caddo lived quite well. They were established farmers and produced many goods such as pottery, cloth, and jewelry. They traded with other tribes to get goods they wanted but did not have available to them, such as shells, turquoise, and copper. The Jumanos of West Texas were farmers, and supplied corn, dried squashes, beans, and other produce from their farming villages to other groups in exchange for pelts, meat, and other buffalo products, and foods they did not have, such as piñon nuts, mesquite beans, and cactus fruits. Because of their skills as traders, the Comanches controlled much of the commerce of the southern plains during the eighteenth and nineteenth centuries. They bartered buffalo products, horses, and captives for manufactured items and foodstuffs.
ECONOMIC REASONING:

Students should understand that people or groups often move from one location to another for economic reasons. Economic patterns that develop depend on the way of life of the cultural group. They also should understand that the various Indian tribes of Texas did not necessarily have similar economies, and that economic patterns developed differently, depending on whether the tribes were hunters, gatherers, or farmers. Some groups were self-sufficient and shared goods and services only within their own cultural group, others used bartering of goods between groups, and some used types of "money" in their economic systems. Still others developed trade routes to exchange goods. (See economic terms in the glossary for more information about the concepts listed above.)

TEXAS ESSENTIAL KNOWLEDGE AND SKILLS

4.10A Explain the economic patterns of various early Native-American groups in Texas and the Western Hemisphere

4.1A Identify Native-American groups in Texas and the Western Hemisphere before European exploration and describe the regions in which they lived

4.1B Compare the ways of life of Native-American groups in Texas and the Western Hemisphere before European exploration

4.6A Apply geographic tools, including grid systems, legends, symbols, scales, and compass roses, to construct and interpret maps

4.22C Organize and interpret information in outlines, reports, databases, and visuals including graphs, charts, timelines, and maps

4.22A Differentiate between, locate, and use primary and secondary sources such as computer software; interviews; biographies; oral, print, and visual material; and artifacts to acquire information about the United States and Texas

ECONOMIC CONCEPTS

Economics, Goods, Services, Bartering

HISTORICAL CONCEPTS

Native Americans in Texas

CRITICAL QUESTIONS

1. What economic patterns did various tribal groups have in early Texas?
2. What factors led some tribal groups to move around Texas?
3. How extensive was trading among early Texas tribal groups?
LESSON DESCRIPTION
Students will use a selection about early Texas native groups to discuss different economic practices of Texas tribes, how goods were shared, and also will complete a map showing how far away some Texas tribes traded.

TIME REQUIRED
One - two class periods

MATERIALS
Student Handout 1 – Texas Indians – Economic Activities
Map of North America (provided by teacher/student)
Yarn pieces for each student (provided by teacher)
Student Activity Sheet 1 – Map of North America Where Goods Were Exchanged

PROCEDURE
1. Complete an introductory chart together to discover what background knowledge students already have about early native groups who lived in Texas.
2. Distribute copies of Student Handout 1. Read together and discuss the varied ways native groups in Texas used economics in their lives. Use the teacher background information and the glossary of terms to explain the economic concepts involved.
3. Have each student find the locations described in the handout on a map of North America. Use pieces of yarn to demonstrate the patterns of movement developed by native people in Texas when trading with other locations in North America.
4. Distribute copies of Student Activity Sheet 1. Have students complete the map to review how far away some Texas groups traded.

CLOSURE
Ask students how goods and services affect their own lives. Have them share practical examples such as when they go shopping for school supplies at a store, purchase gasoline, or get a haircut. Discuss examples of modern trade routes in their part of Texas, such as Interstate highways, port cities, and airports used for transporting freight.

EXTENSION
1. Research early civilizations of the United States, Mexico and Central America (Anasazi, Mound Builders, Olmec, Toltec, Maya, Aztec) to see what their economies were like and how they shared goods and services within their civilization and with other groups.
2. Research how cocoa beans used to be used as a type of money by civilizations in Mexico and Central America.
3. Research what other tribes in different parts of the United States used as forms of money when trading.

**SUGGESTED ADDITIONAL RESOURCES**


There have been hundreds of groups of Texas “Indians,” as the first European explorers to arrive called the people they found. Archaeologists, scientists who study items (called artifacts) left by people who lived long ago, are not exactly sure when the first people moved to the Texas area to live, but it was probably about 10,000 BC. Most of the earliest Texas groups were gatherers, who moved around to collect the food they needed. Others became mainly hunters. These people also moved around, following the animals they hunted as the animal herds moved. Many of these groups hunted the millions of bison that then roamed the plains of Texas. Some later groups in Texas became farmers. They built villages and did not have to move to survive, since they produced their own food. Many of these groups also developed more goods than did some of the migrant (moving) groups, since they had more time to develop goods. Some Native Texas groups developed trading networks, which included routes reaching as far away as central Mexico, Wyoming, and Idaho. Some groups of Texas Indians used bartering, while other tribal groups used forms of “money” in their trading practices, such as animal skins, shells, beads, and pottery.

The Caddo of eastern Texas lived in an area with good precipitation levels and where the soil was fertile. They became farmers and also produced many goods such as pottery, cloth, and jewelry. They traded with other tribes to get goods they wanted, such as shells, turquoise, and copper. Even though the Jumanos of West Texas lived in an arid region, they used irrigation to farm. They supplied corn, squash, beans, and other produce from their farming villages to other groups in exchange for furs, meat, and other buffalo products, and foods they did not have, such as piñon nuts, mesquite beans, and cactus fruits. Another tribe, the Comanche of the plains region, was skilled both in buffalo hunting and trading. They controlled much of the commerce of the Southern Plains during the eighteenth and nineteenth centuries. They bartered buffalo products, horses, and even captives for manufactured items and foodstuffs.

References:


*Handbook of Texas Online*: keywords Caddo, Comanches, Indians, Jumano, Pottery, Prehistory

Use information from Handout 1 and a North American map to carefully complete this map activity.

After you have read and discussed how some of the early native groups in Texas used trading to exchange goods as part of their economy, you can complete this map to show where some goods were exchanged. Find the following locations on a map of North America and then label the locations that are numbered.

Reference for map: http://jan.ucc.nau.edu/~alew/maps/na-base.gif

Location for 1

Location for 2

Location for 3

Location for 4
LESSON 3

EUROPEAN EXPLORATION OF TEXAS: ECONOMIC MOTIVATION

INTRODUCTION

The Spanish and the French both laid claim to the land that is now Texas. What was their economic motivation? GOLD, GLORY, and GOD are the key words often used to describe this part of Texas history. SETTLEMENT also is a key word applied to later exploration.

During the fifteenth and sixteenth centuries, several European countries vied for important trading routes with Asia, where they traded for valuable minerals, gold, spices, and silk. European explorers, looking for a faster, safer, and less expensive method of reaching Asia from Europe, searched for the fabled Strait of Anian, the reputed open waterway in the New World that led straight to Asia. They also wanted to claim land for their nation’s rulers, and win glory for themselves as successful explorers and conquistadors. Later exploration groups also included friars, monks, and priests, as the Europeans, especially the Spanish, believed they needed to not only conquer the “savages” who lived in the lands previously unknown to the Europeans, but also convert them to God and Christianity.

Some of the earliest Spanish to travel near or in Texas were the sea captain Alonzo Álvarez de Piñeda in 1519, conquistador Pánfilo de Narváez and explorer Álvar Núñez Cabeza de Vaca in 1528, the explorer/priest Fray Marcos de Niza in 1539; and the conquistadors, Francisco de Coronado in 1540 - 1542; Luis de Moscoso Alvarado in 1542, and Juan de Oñate in 1595. Like Mosco and Coronado, Oñate was not successful finding gold in the Texas area. The Spanish government therefore decided to stop exploring Texas and concentrated their efforts on locating gold farther south in Mexico, Central America, and South America. They did not send another major expedition to Texas for more than seventy-five years.

However, in 1685, a Frenchman, René Robert Cavelier, Sieur de La Salle, landed at Matagorda Bay. French exploration of Texas was mostly for commercial reasons; they wanted to establish settlements in Texas to hold their claim on the land. The French interest in Texas spurred the Spanish into new military, economic, and religious exploration of coastal and East Texas in the late 1600s. The French rivalry with the Spanish proved to be a big advancement for exploration, as both sides fought for information, trade, and control of Texas.

References:


Handbook of Texas Online: keyword Exploration

ECONOMIC REASONING

Students should understand that people or groups often travel from one location to another for economic reasons. The European explorers wanted to expand their nation's trade routes to acquire more goods to sell and more land for their rulers. They also wanted to locate more gold, since there were limited resources of this valuable material, and the European nations needed the gold to support their economy. (See economic terms in the glossary for more information about the concepts listed above.)

TEXAS ESSENTIAL KNOWLEDGE AND SKILLS

4.11A Identify the economic motivations for European exploration and settlement in Texas and the Western Hemisphere

4.2A Summarize reasons for European exploration and settlement in Texas and the Western Hemisphere

4.2B Identify the accomplishments of significant explorers such as Cabeza de Vaca; Christopher Columbus; Francisco Coronado; and René Robert Cavelier, Sieur de la Salle and explain their impact of the settlement of Texas

4.22B Analyze information by sequencing, categorizing, identifying cause-and-effect relationships, comparing, contrasting, finding the main idea, summarizing, making generalizations and predictions, and drawing inferences and conclusions

4.22C Organize and interpret information in outlines, reports, databases, and visuals including graphs, charts, timelines, and maps

4.22A Differentiate between, locate, and use primary and secondary sources such as computer software; interviews; biographies; oral, print, and visual material; and artifacts to acquire information about the United States and Texas

ECONOMIC CONCEPTS

Trade, Goods, Wants and Needs, Limited Resources, Scarcity

HISTORICAL CONCEPTS

Spanish Exploration in Texas, French Exploration in Texas

CRITICAL QUESTIONS

1. What economic motivation did explorers from Spain and France have when they traveled in early Texas?

2. What factors led the Spanish to return to Texas for more exploration and settlement?

3. What lasting effect did the exploration period have on Texas?
LESSON DESCRIPTION

Students will use a selection about early Texas explorers to discuss economic motivations during the exploration period, and then will complete a chart summarizing various explorers and their accomplishments.

TIME REQUIRED

One - two class periods

MATERIALS

Student Handout 1 – Reasons for Early Exploration — Background
Student Activity Sheet 1 – Chart of Explorers in Texas

PROCEDURE

1. The teacher may wish to pre-teach some of the vocabulary words used in this lesson before distributing Student Handout 1. Suggested examples for vocabulary are: scarcity, expeditions, resources, convert, conquistador, pelts, strait, interior.

2. Distribute copies of Student Handout 1. Read together and discuss the economic reasons explorers came to Texas. The explorers’ names will be unfamiliar to the students, so the explorers’ “common names” are underlined as they are usually used in reference materials. Whenever one of the underlined key words (gold, glory, God, settlement) is used, have all the students say the word together. Use the teacher background information and the glossary of terms to explain the economic concepts involved.

3. Distribute copies of Student Activity Sheet 1. Have students complete the chart to categorize and summarize facts and accomplishments of various explorers.

CLOSURE

Ask students what goods the earliest explorers were hoping to find when they explored Texas. What were their wants and needs? Review the different explorers and their main economic motivations. Compare and contrast the primary economic purposes of the Spanish and French. Summarize the lasting effect of each group on the exploration and settlement of Texas.

EXTENSION

1. Research other explorers to the Texas area such as the African slave Estevanico, Fray Agustín Rodríguez, Gaspar Castaño de Sosa, Francisco Leyva de Bonilla and Antonio Gutiérrez de Humaña, the Martín-Castillo expedition, the expedition of Diego de Guadalajara, Fray Damián Massanet and Fray Francisco Hidalgo, Henri de Tonti or the Rivas-Iriarte expedition.

2. Write a journal entry in the character of one of the explorers in this lesson.
ADDITIONAL RESOURCES:

Chipman, Donald. *Explorers and Settlers of Spanish Texas*. Austin: University of Texas Press. (0-29271-231-6) *Explorers and Settlers of Spanish Texas* is intended for elementary readers. These biographies demonstrate how much we have in common with our early forebears. Some of the people profiled are Alvar Núñez Cabeza de Vaca; Francisco Vázquez de Coronado; Alonso de León; Domingo Terán de los Ríos/Francisco Hidalgo; Louis St. Denis/Manuela Sánchez; Cavaller and His Bride; Antonio Margil de Jesús; Marqués de San Miguel de Agayao; Felipe de Rábago y Terán; José de Escandón y Elguera; Athanase de Mézières; Domingo Cabello; Marqués de Rubí/Antonio Gil Ibarbo; Bernardo Gutiérrez de Lara/Joaquín de Arredondo.

Clendenin, Mary Joe. *Gonzalo: Coronado’s Shepherd Boy*. Eakin Press, 1990. (1-57168-007-1) This is a historically accurate novel about a fictional character, a young boy who might have accompanied Coronado in his adventurous life.


Nardo, Don. *Sieur de la Salle*. New York: Children’s Press, 2002. (0-53116-581-7) In 1682, Rene’-Robert Cavelier, Sieur de La Salle was the first European to traverse the length of the Mississippi River. Explore his life and remarkable deeds from that first epic journey in 1682 to his tragic return to the Mississippi years later when members of his own expedition killed him.

Wade, Mary Dodson. *Estevan: Walking Across America*. Colophon House, 1994. (hard copy 1-882539-11-7; paperback 1-882539-12-5). Estevan, an enslaved person from Morocco, went on an expedition to Florida in 1528. This journey was just the beginning.

The Spanish and the French both laid claim to the land that is now Texas. What was their economic motivation? GOLD, GLORY, and GOD are the key words often used to describe this part of Texas history. SETTLEMENT also is a key word applied to later exploration.

During the 1500s and 1600s, many European countries, especially Spain and France, wanted to find a new trading route to Asia, where they traded for valuable minerals, gold, spices, and silk. Because it is a limited resource, there is a scarcity of gold, and that makes it very valuable. The countries needed the gold to help run their countries' economies. Explorers hoped to find a faster, safer, and less expensive method of reaching Asia from Europe, and thought they might find this route by sailing west, as Christopher Columbus had done. They hoped to find an open waterway that led straight to Asia. The explorers also wanted to claim land for their nations' rulers, and win glory for themselves as successful explorers. Later exploration groups also included friars, monks and priests, because the Europeans, especially the Spanish, believed they needed to not only conquer the "savages" who lived in the lands previously unknown to the Europeans, but also convert them to God and Christianity.

The earliest Spanish explorer to travel near Texas was Alonzo Álvarez de Piñeda in 1519. He was a Spanish sea captain who sailed along the Gulf of Mexico coastal areas from Florida to New Spain (what is now Mexico). The purpose of his voyage was to explore the coast, hoping to find a strait to the Pacific Ocean. In 1528, the conquistador Pánfilo de Narváez led an expedition to what is now Florida. The leaders of Spain wanted him to claim all the lands along the Gulf of Mexico for Spain. After being stranded in Florida, some of his men tried to sail to New Spain. Many drowned, including Narváez, when a storm near Texas wrecked their rafts. Only four of the original 300 explorers in the Narváez expedition made it safely back to New Spain, nearly seven years later. Álvar Núñez Cabeza de Vaca, one of Narváez's men, landed on Texas soil in 1528. Because of his journals, historians believe Cabeza de Vaca was the first European merchant in Texas. He traded seashells and mesquite beans with inhabitants of the inland parts of Texas and returned to the coastal areas with pelts. He wrote in his journal of legends that the natives told about a group of cities that were made of gold. When the journals were published in New Spain, this caused a lot of interest. The Spanish government became excited about the stories of gold, and sent expeditions to look for it.

In 1539, a priest and explorer named Fray Marcos de Niza led an expedition to look for gold. His group, which included priests to help teach about God to any natives they met, explored that area that is now New Mexico and Arizona. They returned to New Spain with stories about seeing one of the Seven Cities of Cibola, which reportedly were made of gold. This launched the first huge Spanish exploration of the interior of North America, led by the conquistador Francisco de Coronado from 1540 - 1542. His goal was to locate gold for the king of Spain and teach about God to any natives his expedition conquered. Success would bring glory and great wealth also for Coronado and his group of explorers. They explored and mapped areas all the way through the Texas Panhandle and into what is now Kansas. Unfortunately, the expedition did not find any gold, and they returned to New Spain without the good news the King of Spain wanted.
During this same time period, another conquistador entered Texas from the east. Luis de Moscoso Alvarado had traveled with Hernando De Soto’s expedition to explore Florida and to look for gold there. After his leader’s death in 1542, Moscoso led the group of explorers into Texas. His goal was to find a land route back to New Spain. He also was to look for gold, but again, this expedition did not find any riches. Juan de Oñate led another expedition to lands north of New Spain in 1595. His plan was to build a settlement but also he still hoped to find gold. Like Moscoso and Coronado before him, Oñate was not successful finding gold in the area. The Spanish government therefore decided to stop exploring Texas and concentrated their efforts on locating gold farther south in Mexico, Central America, and South America. They did not send another major expedition to Texas for more than seventy-five years.

In 1685, a French explorer, René Robert Cavelier, Sieur de La Salle, landed by mistake at Matagorda Bay in Southeast Texas. The French exploration of North America was mostly for commercial reasons; they wanted to establish settlements in Texas. La Salle’s original plan was to start a settlement in Louisiana near the Mississippi River to help protect French claims to the land from their enemies, England and Spain. The English had many settlements northeast of French territory, and the Spanish had built many settlements in New Spain. Although La Salle’s landing in Texas was an error, he did begin a settlement there called Fort St. Louis. This settlement was not successful, but the French interest in Texas worried the Spanish. To protect their economic interests and the land they had already claimed in the Texas area, the Spanish began new military, economic, and religious exploration and settlement of coastal and eastern Texas in the late 1600s. The French rivalry with the Spanish proved to be a big advancement for exploration, as both sides fought for information, trade, and control of Texas.

References:


*Handbook of Texas Online*: keywords Explorers, Piñeda, Narváez, Cabeza de Vaca, Fray Marcos, Coronado, Moscoso, Oñate, La Salle
Use information from Handout 1 to carefully complete this chart.

SOME IMPORTANT EXPLORERS WHO IMPACTED SETTLEMENT IN TEXAS

<table>
<thead>
<tr>
<th>WHO?</th>
<th>WHAT? (country explorer was from)</th>
<th>WHERE? (route taken - location of exploration)</th>
<th>WHEN? (years of exploration)</th>
<th>WHY? (was it for gold, glory, God, settlement?)</th>
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<tr>
<td>Alonzo Álvarez de Piñeda</td>
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<td>Pánfilo de Narváez</td>
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<td>Álvar Núñez Cabeza de Vaca</td>
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<td>Fray Marcos de Niza</td>
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<td>Francisco de Coronado</td>
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<td>Luis de Moscoso Alvarado</td>
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<td>Juan de Oñate</td>
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<td>René Robert Cavelier, Sieur de La Salle</td>
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28
LESSON 4

EARLY GERMAN IMMIGRATION TO TEXAS:
ECONOMIC PATTERNS

INTRODUCTION

During the nineteenth century, citizens from many areas in Europe left their homelands and sought better lives in the Western Hemisphere. Many of these immigrants chose Texas as the location to improve their economic status. People from such diverse cultural groups as the English, Czechs, Polish, Jews, French, Greeks, Hungarians, Swiss, Swedes, Austrians, and Germans moved to Texas to look for stronger economic opportunities.

Author John L. Davis noted that Germans made up the greatest number of the European immigrants to Texas in the nineteenth century. “Texans of German birth made up one of the largest ethnic groups in the state. By 1850 they numbered five percent of the total population—a conservative count. The 1990 census listed more than 17 percent of the population, nearly three million individuals, claiming German heritage. Germans who chose Texas as a home were, in the migrations from 1830 to 1900, anything but a uniform group. Early migration came from a land of provinces and duchies, not a unified Germany, and from many backgrounds.”

The Handbook of Texas Online states that most of the Germans who settled in Texas were middle-class peasants, and many had not been financially destitute in Europe. The immigrants included farmers, artisans, academicians, and professionals. Some were not “first born sons” who would inherit land under German law, and so believed that their full economic potential could not be realized in Europe. They knew they would give up a lot of their old life by moving across the Atlantic, but they were ambitious and hard working individuals who believed their economic future was best served by leaving their homeland and moving to build a new future in Texas. Most began their lives in Texas as farmers, but also brought with them their skills as artisans so many also began small businesses to further advance themselves economically.

The first Germans moved to Texas in the early 1830s. They were encouraged by German entrepreneurs who wrote letters and advertised about the benefits of the economy, fertile and inexpensive land, and opportunities for economic growth in Texas. During the early 1840s, a group of minor noblemen in the German states organized the Society for the Protection of German Immigrants in Texas, also called the Adelsverein, to encourage Germans to move to Texas for a better economic future. This group established goals to provide economic relief for German settlers and to build a supply market economically for German industry in Texas. The Adelsverein also hoped to increase the German maritime business and to find new sources for raw materials that could be used commercially in Germany.

Many of the first German colonists moved to Texas in small groups and settled together in the same small groups, becoming farmers and establishing villages in the northwest corner of what is now Austin County, such as Industry, Cat Spring, and Rockhouse. Some of the later groups stayed in cities such as Galveston, Houston, and San Antonio, while others settled in the hill country of central Texas and began towns including New Braunfels and Fredericksburg. During the American Civil War, German immigration ceased, but then
doubled after the conflict ended. Later German immigrants headed for the larger cities of Texas and also into north central, northern, and western Texas, although in these areas, there was less German identification than in the hill country area. One particularly ethnic town started in North Texas, however, is Muenster. By 1900 Texas Germans were living in most areas of Texas and participating in nearly every occupation in the state.

References:


*Handbook of Texas Online: keywords Adelsverein, Germans*

**ECONOMIC REASONING**

Students should understand that economic reasons often exist when people move from one location to another and that there are economic patterns they follow that result in **economic growth and development**. They also should understand that there is an **opportunity cost** involved in such a move. In addition, they should understand that **entrepreneurs** were involved in German immigration patterns in Texas. (see economic terms in the glossary for more information about the concepts listed above)

**TEXAS ESSENTIAL KNOWLEDGE AND SKILLS**

- 4.10B  Explain the economic patterns of early European immigrants to Texas and the Western Hemisphere
- 4.11A  Identify the economic motivations for European exploration and settlement in Texas and the Western Hemisphere
- 4.13C  Analyze the effects of immigration, migration, and limited resources on the economic development and growth of Texas
- 4.6A   Apply geographic tools, including grid systems, legends, symbols, scales, and compass roses, to construct and interpret maps
- 4.8A   Identify clusters of settlement in Texas and explain their distribution
- 4.22C  Organize and interpret information in outlines, reports, databases, and visuals including graphs, charts, timelines, and maps
- 4.22A  Differentiate between, locate, and use primary and secondary sources such as computer software; interviews; biographies; oral, print, and visual material; and artifacts to acquire information about the United States and Texas

**ECONOMIC CONCEPTS**

Economic growth and development, Entrepreneurship, Opportunity cost

**HISTORICAL CONCEPTS**

Immigration to Texas - 19th century, Influence of Adelsverein in Texas
CRITICAL QUESTIONS

1. What factors led to German immigration to Texas?
2. What settlement patterns did the Germans have once they were in Texas?
3. How did entrepreneurs help convince the Germans to move to Texas?
4. What was life like for early German settlers in Texas?

LESSON DESCRIPTION

Students will use a paragraph about German immigration to Texas, plus primary source documents from early German immigrants, to answer questions, complete a timeline and a map.

TIME REQUIRED

Two class periods

MATERIALS

Student Handout 1 - background information
Student Handout 2 - excerpts from early German immigrants (primary sources)
Student Activity Sheet 1 - comprehension questions
Student Activity Sheet 2 - timeline and map activity
Texas road map (provided by teacher)

PROCEDURE

1. Ask students how many of them were born in Texas. Explain that they are considered “Native Texans.”
2. How many of them have parents who were born in Texas? In the United States? In another country?
3. Distribute and read Student Handouts 1 and 2 together and discuss German immigration to Texas during the nineteenth century. Use the teacher background information and the glossary of terms to explain the economic concepts involved.
4. Distribute Student Question Sheets and have students answer the questions about the materials read on Student Handouts 1 and 2.
5. Distribute the Student timeline and Map Activity Sheets and have students complete the timeline and map activity.

CLOSURE

Ask students if they would like to have been settlers or entrepreneurs in Texas in the nineteenth century. Review what risks they would have had to take and what changes they would have had to make in their lives. How might they have made an economic living then?
EXTENSION

1. Consider and discuss what opportunity costs they would have if they became immigrants to another country now.

2. Research to discover whether the area in which they live has had recent economic growth or development. Share what is learned with the class.

3. Interview a modern entrepreneur to find out what risks he/she had to take when beginning a new economic venture. Share the interview with the class.

SUGGESTED ADDITIONAL RESOURCES

These historical fiction novels work well at the fourth grade level concerning the topic of German immigration to Texas. The first novel shares the adventures of an immigrant family in Texas beginning in 1844, and the two sequels follow Mina, the female protagonist, as she grows up in Texas. The books also incorporate economic factors, such as how two immigrants combined their money to purchase a wagon, and how and why the father in the story became a teamster to earn money.

All three novels are by Janice Shefelman and are published by Eakin Press:

A Paradise Called Texas ISBN 0-89015-409-0

Willow Creek Home ISBN 0-89015-535-6


A website that might be useful for additional extension activities: http://www.ourtimelines.com. This site can be used to tie in historical events while creating personal timelines.
During the nineteenth century, many people left their homes in Europe to seek better lives in the Western Hemisphere. Many of these immigrants chose Texas as the location to improve their economic status. People came from many different countries, but the largest number came from Germany.

Some of the people who moved to Texas had been farmers back in Germany, but others were shopkeepers, weavers, cobblers, tailors, teachers, or worked in other types of small businesses. They gave up their homes and the lifestyle they knew to move across the Atlantic to a new life, hoping to increase their economic situation.

The first Germans who immigrated to Texas arrived in the early 1830s. In 1831, a German entrepreneur, Johann Friedrich Ernst, received a 4,000 acre land grant in Stephen F. Austin’s colony. He wrote very persuasive letters to friends in Germany, describing the area as having no winters, with fertile land and an abundance of game and fish. He claimed the land was an “earthly paradise.” The first German immigrants arrived on ships into Galveston and settled in Austin County, near San Felipe de Austin. These settlers established villages such as Industry, Cat Spring, and Rockhouse. Some of the new settlers moved to the developing cities of San Antonio, Houston, and Galveston.

In 1842, a group of noblemen in Germany organized the Society for the Protection of German Immigrants in Texas, also called the Adelsverein, to encourage Germans to move to Texas for a better economic future. The first Germans the Adelsverein sponsored arrived at Matagorda Bay in December of 1844. Most of these immigrants established towns in the hill country of central Texas, including New Braunfels in 1845 and Fredericksburg later the same year. These towns still have a “German flavor” today. Another town that was started by German immigrants in 1889 is in north Texas. Muenster still holds a “Germanfest” party every spring to celebrate its heritage. By 1900 Texas Germans were living in most areas of Texas and participating in nearly every occupation in the state.

References:
Davis, John L. *Texans Owe and All.* San Antonio: University of Texas Institute of Texan Cultures, 1998.
*Handbook of Texas Online:* keywords Adelsverein, Germans
Primary Source Documents

These are excerpts written by early German immigrants to Texas. The entire journals are available in The Golden Free Land: The Reminiscences of Women on an American Frontier, by Crystal Ragsdale (Austin: Landmark Press, 1976).

Excerpts from the memoirs of Caroline Ernst von Roeder von Hinueber, who moved to Texas in 1831 with her parents, Louise and Friedrich Ernst...

When my father came to Texas, I was a child of eleven or twelve years. He was by profession a bookkeeper. My father was the first German to come to Texas with his family. While on our way to our new home, we stayed in San Felipe for several days at Whitehouse Tavern. Our first home was a miserable little hut, covered with straw and having six sides, which were made out of moss. The roof was by no means water-proof, and we often held an umbrella over our bed when it rained at night, while the cows came and ate the moss. Our shoes gave out, and we had to go barefoot in the winter for we did not know how to make moccasins. Our supply of clothes was also insufficient, and we had no spinning wheel, nor did we know how to weave like the Americans. It was twenty-eight miles to San Felipe, and besides, we had no money. When we could buy things, my first calico dress cost fifty cents a yard. We were better supplied than our neighbors with house and farm utensils, but they knew better how to help themselves. At first, we had very little to eat, nothing but corn bread at first; later we began to raise cow peas, and afterwards my father made a fine vegetable garden. The [area] was very thinly settled...in consequence, there was no market for anything we could raise, except cigars and tobacco, which my father was the first in Texas to put on the market...but this was several years after we settled...afterwards, my father kept a boardinghouse, and had a large building constructed for the purpose. He tore down the six-cornered [house]. Many German immigrants came to our house.

Excerpts from the letters of Ida Kappell Kapp to her sister. Mrs. Kapp moved to Texas in 1849 with her husband Ernst, when they were both forty-one years old. Moving with them were their five children and two other teenage boys who were family friends...

At Galveston we purchased a cooking stove with pipe and utensils for $17 or $18. I don’t believe I will like this one as much as my dear little one in Minden. It has open holes and is quite small...

In all of Braunfels, no [house] was available that had more than one room, and they all leaked. One was recommended to us in Comaltown, fifteen minutes from Braunfels, and we took it. Was that a road to travel on [to get to our home]! Six oxen we had hitched to the wagon and we trembled and shook twice through water, Comal Creek and Comal Springs [River], and then over stumps and boulders. On these roads one needs nerves like the ropes on oxen harness...
We perform all the work from A to Z ourselves...I now have the courage to tackle any and all things and if we start a new settlement and live for a year like this, I know now that everything will be all right; hopefully a better life will follow. Living is furiously dear here. The five cent piece is the smallest coin used in Texas, and everything here costs a bit (twelve and a half cents). Naturally that which is the most difficult to import is the highest priced and that is food. For one bit you get nine eggs. Butter costs thirty cents a pound. Corn meal and meat are cheap. For a dollar you get 80 to 100 pounds of corn meal in comparison to 14 pounds of wheat flour. Beef costs three cents, and pork five cents. Clothes are not as expensive as one imagines in Europe. Calico cloth is coarse and comes in dull patterns, priced at 15 to 20 cents a yard, which is not unreasonable...

I envy all the young people of seventeen and eighteen years of age who come here. Even if they come with little or no cash, I firmly believe they can be independent within five to six years, if they manage well. All artisans and all men capable of working who came on the same ship with us, found profitable employment with good wages immediately.
Use Student Handouts 1 and 2 to answer these questions carefully. 
Use complete sentences. Proofread your work.

1. When did the first German immigrants move to Texas?

2. What jobs did many of the immigrants have back in Germany?

3. Name at least four villages or towns the German immigrants established in Texas:

4. How did German entrepreneurs convince the immigrants to move to Texas?

5. According to the primary source documents, what were two difficulties the new Texas settlers had to face?

6. How did Caroline’s father make a living in Germany? How did he make a living in Texas?

7. Explain at least two reasons Ida Kapp believed that “everything will be all right” and that “a better life will follow.”
Use information from a Texas road map to carefully complete this map activity.

Although this is not the shape Texas had in the early nineteenth century, you can use it to show the patterns of where certain German settlements were established. Locate these villages and towns on a Texas road map: Industry, Cat Spring, New Braunfels, Fredericksburg, Muenster. Notice the numbers listed on the map below. Write the name of each town by the appropriate number to show its approximate location in Texas.

1. ___________  2. ___________  3. ___________
4. ___________  5. ___________

Complete this timeline to show events that happened concerning German patterns of settlement in Texas during the nineteenth century. Use information from Attachment 1 to help you.

1831  1842  1844  1845  1889

____________________  __________________  __________________
LESSON 5
ANGLO-AMERICAN COLONIZATION IN TEXAS:
ECONOMIC MOTIVATION

INTRODUCTION

The colonization of Texas by people emigrating from the United States began in earnest in 1821, just after Mexico won its independence from Spain. The following is a short summary of the economic motivation behind the colonization movement. Spain had a lot of financial difficulties during the eighteenth and early nineteenth centuries. Moses Austin had financial problems in Missouri. In 1820, his problems caused him to lose his farm since he could not pay his bills. He decided to become an entrepreneur and ask permission from the Spanish government in Mexico to start a colony in Texas as an empresario. An empresario was a land agent or land contractor who encouraged others to move to Texas and to establish farms and ranches there. Spain had an economic reason to want people to settle in Texas. Although the Spanish government controlled it, the area of Texas was not very well populated, and Spain was concerned that it could lose control of the region to other nations. Moses Austin traveled to San Antonio, met with the Spanish governor there, and eventually received permission to begin a colony. He became sick on the way back to Missouri, however, and before his death, he asked his son, Stephen Fuller Austin, to take over his plan to lead families from Missouri to Texas. Stephen agreed. He met with the Spanish governor and was given permission to continue his father’s plans. In 1821, Stephen F. Austin chose a location along the Brazos River to begin his colony, but during that same time period, Mexico earned its independence from Spain, so Austin had to get new permission to colonize from the new Mexican government. This new government no longer had the backing of Spain, so Mexico’s economy was in ruins. It had to develop its own economic system. In addition, Mexico really needed to protect its most northern region, Texas, from United States expansion, but lacked enough Mexicans who were able to settle the area.

The Mexican government passed a law to encourage Anglo-Americans to move to Texas. The new nation decided to encourage European and American immigration to the region to act as a defense against both Indians who lived there and foreign powers who might want to take over the area. The government also was interested in encouraging ranching and farming and to facilitate commerce, or trade routes, through the region. After receiving permission from the new Mexican government, Austin was given a contract to establish a colony with 300 families. During the next few years, the Mexican government gave land grants to more than 25 empresarios, who each promised to bring in a certain number of families to Texas. Some of the strongest empresarios were Austin, Green DeWitt and Martin de León. For each 100 families an empresario brought to Texas, he would receive for himself five leagues (one league was 4,428 acres of grazing land) and five labors (one labor was 177 acres of farmland).

Why did so many Americans decide to move to Texas? Economics was the primary reason. Land there was fertile, plentiful, and very inexpensive. Undeveloped land in the United States was becoming scarcer, and land cost $1.25 an acre for a minimum of 80 acres ($100). It also had to be paid for at the time of purchase. In Texas, however, each head of a
family, male or female, could claim a "headright" of 4,605 acres, consisting of one league - 4,428 acres of grazing land, and one labor - 177 acres of farm land, for a cost of only about four cents an acre (a total of $184). Another advantage was that the cost was payable over six years, rather than having to pay it all at once when the land was purchased.

A second reason some Americans moved to Texas was to avoid having to pay off debts (money owed to someone else). Farming in the United States during the early 1800s was not very profitable, and so many farmers were unable to pay their bills. Moving to Texas was an opportunity to start a new life and gain economic success. The colonization of Texas was quite successful. By 1830, Texas had a population of about 15,000, with Anglos outnumbering Hispanics by a four to one margin. By 1836, there were about 30,000 Anglo-Americans living in Texas, plus 5,000 slaves.

References:


Handbook of Texas Online: keyword Anglo-American colonization


ECONOMIC REASONING:

Students should understand that people or groups often travel from one location to another for economic reasons. The Mexicans needed Americans to colonize Texas both to increase their economy and to provide protection of the area. The Anglo-Americans wanted to improve their chances to make money and were excited about the inexpensive land they could purchase in Texas, compared to the limited resources and high cost of land in the United States. The empresarios were entrepreneurs who were willing to take some economic risks because they would get land for themselves by bringing in settlers to Texas. (see economic terms in the glossary for more information about the concepts listed above)

TEXAS ESSENTIAL KNOWLEDGE AND SKILLS

4.11B Identify the economic motivations for Anglo-American colonization in Texas

4.2D Identify the accomplishments of significant empresarios including Moses Austin, Stephen F. Austin, and Martin de León and explain their impact on the settlement of Texas

4.8A Identify clusters of settlement in Texas and explain their distribution

4.8B Explain patterns of settlement at different time periods in Texas

4.8D Explain the geographic factors that influence patterns of settlement and the distribution of population in Texas, past and present

4.22A Differentiate between, locate, and use primary and secondary sources such as computer software; interviews; biographies; oral, print, and visual
material; and artifacts to acquire information about the United States and Texas

4.22B Analyze information by sequencing, categorizing, identifying cause-and-effect relationships, comparing, contrasting, finding the main idea, summarizing, making generalizations and predictions, and drawing inferences and conclusions

4.22F Use appropriate mathematical skills to interpret social studies information such as maps and graphs

4.23B Incorporate main idea and supporting ideas in verbal and written communication

**ECONOMIC CONCEPTS**
Wants and Needs, Limited Resources, Scarcity, Empresario, Entrepreneur

**HISTORICAL CONCEPTS**
Anglo-American Colonization, Moses Austin, Stephen F. Austin, Martin de León

**CRITICAL QUESTIONS**
1. What economic motivation did Mexico have to encourage settlers from the United States to move to Texas?
2. What economic motivation did the empresarios have to persuade settlers to move to Texas?
3. What economic motivation did Anglo-Americans have to move to Texas?
4. What lasting effect did the Anglo-American colonization period have on Texas?

**LESSON DESCRIPTION**
Students will read information about Mexican rules for getting land in Texas and will use the handout to answer questions. They also will read and discuss primary source documents to learn what life was like for some of the earliest settlers in Texas and complete a follow up written assignment.

**TIME REQUIRED**
Two class periods

**MATERIALS**
Student Handout 1 - Excerpts from land grant rules
Teacher Attachment 1 - Directions for grid activity
Student Handout 2 - Quotations from early Texas settlers
Student Activity Sheet 1 - Questions to go with Student Handout 1 (and answer key)
PROCEDURE

1. Distribute copies of Student Handout 1. Read together and discuss the rules for Texas settlers about how much land they could purchase. Notice how the rules changed for different time periods. Why might the government have changed the rules?

2. To help students understand the differences in amounts of land offerings the rules permitted during different time periods, create grids using masking tape on a large floor surface. See Teacher Attachment 1 for how to use this part of the lesson.

3. Distribute copies of Student Activity Sheet 1. Have students work together in small groups to answer the questions for each scenario. Ask them to show all work and justify all answers. Discuss results together.

4. Distribute copies of Student Handout 2. Read together and discuss the comments the settlers to early Texas made. Were these comments positive or negative about Texas? Do you think they would persuade Anglo-Americans to move to Texas? Did anyone write anything that would make you feel you could have a better economic life in Texas?

5. Pretend you were living in one of the empresario’s colonies in Texas in the 1830s. Write a letter to friends back in the United States and try to convince them to move to Texas. Be sure to include economic factors that would make them want to move.

CLOSURE

Ask students to review the economic motivations the Mexican government, the empresarios, and the Anglo-Americans had concerning Anglo settlement in Texas. What were their wants and needs? Compare and contrast the economic purposes each group had. Summarize the lasting effect the empresarios and Anglo-Americans had on the settlement of Texas.

EXTENSION

Research other empresarios such as Sterling Robertson, Benjamin R. Milam, David G. Burnet, Haden Edwards, Robert Leftwich, Lorenzo de Zavala, and William S. Peters. Find out what economic reasons they used to encourage settlers to move to their colonies. Summarize your findings by creating advertisements they might have written to persuade Anglo-Americans to move to their colonies.

Land in Texas in 1830s was very inexpensive. A person could purchase land for only about 4 cents an acre. Look up the price of land in your community. How much does an acre of land cost there now?
ADDITIONAL RESOURCES:

Baker, Charlotte. *The Trail North*. Eakin Press, 1992. (0-890157-01-4) Winner of the Texas Institute of Letters Juvenile Award; tells the history of Texas through nine short stories that focus on the perspectives of young people or animals. The chronology begins with prehistory and ends in the present day. Use the portion of this book that deals with the Anglo American settlement period during this lesson.

Suffler, R. Henderson. *Texas and the American Revolution*. San Antonio: Institute of Texan Cultures, 1975. (0-933164-23-8) The history of the American Revolution is contrasted with events in Spanish Texas during the same time period. The influence of the philosophy and the pioneering, freedom-loving spirit of the Anglos who migrated west and the Mexicans who had won independence from Spain is shown in events leading to the Texas Revolution.
Excerpts from Land Grant Rules

**Class 1 unconditional:**
arrival by March 2, 1836

- A married man with a family may receive a league (4,428.3 acres) plus a labor (177.1 acres) for 4 cents per acre
- A single man over 17 may receive 1/3 league (1,476.1 acres).

**Class 2 conditional:**
arrive between March 3, 1836 and Sept., 20, 1837

- The head of a family may receive 1,280 acres
- Single men may receive 640 acres

**Class 4: arrive after Oct. 1, 1838 and before Jan. 1842**

- Married people may receive 640 acres
- Single people may receive 320 acres

Reference: http://www.gonetotexas.com
Read the following primary source documents. They are quotations written by early settlers in Texas:

“The settlers have now nothing to fear, there is no longer any cause for uneasiness, they must not be discouraged at any little depredations of Indians, they must remember that American blood flows in their veins, and that they must not dishonor that noble blood by yielding to trifling difficulties. I shall adopt every possible means for their security and defense.... Let every man do his duty, and we have nothing to fear...” - from a letter Empresario Stephen F. Austin wrote to people in Missouri to encourage them to settle in Texas

“They too drank of the waters of the “Old Blue Guadalupe” and thought it a good place to live despite the wilderness and the marauding Indians” - written by Elizabeth Davis, immigrant to Texas, 1831

“At De Witt’s Station we were kindly received by Colonel De Witt, his family and settlers. Here I made the acquaintance of Hon. James Kerr...the ground thus prepared and planted will yield twenty-five or thirty, sometimes forty, bushels [corn] per acre. ...as to meat, game was abundant...Indians were assured of the peaceful and friendly disposition of the colonists...were invited to the station, and there feasted on bread, meat and milk...Karankawa Indians...a noble looking race of men...best bowmen in America” - written by Frank Johnson, a settler in San Felipe de Austin, Stephen F. Austin’s colony, 1831
Use Student Handout 1 to answer these questions.
Be sure to show all your math thinking!

1. If a married man with a family moved to Texas and was provided land under Class 1 rules, how many total acres of land could he receive?

2. Under Class 1 rules in 1835, how many more acres of land could a married man with a family get than a single man?

3. Using Class 4 rules, if you moved to Texas as a single person and you had three unmarried brothers who moved with you, how many total acres could the four of you qualify for?

4. If six families moved to a colony in 1837, using Class 2 rules, how many acres could all six families purchase?

5. How many more acres could a married person purchase under Class 2 rules, compared to Class 4 rules?

6. How many more acres could a single person purchase if he moved to Texas in 1837 instead of waiting until 1840?

Extension question:

How much would a married man with a family pay to purchase one league plus one labor of land (using Class 1 rules)?
Use Student Handout Sheet 1 to answer these questions.  
Be sure to show all your math thinking!

1. If a married man with a family moved to Texas and was provided land under Class 1 rules, how many total acres of land could he receive? 
4,428.3 acres (called a league) + 177.1 acres (called a labor) = 4,605.4 acres

2. Under Class 1 rules in 1835, how many more acres of land could a married man with a family get than a single man? 
4,605.4 acres - 1,476.1 acres = 3,129.3 acres

3. Using Class 4 rules, if you moved to Texas as a single person and you had three unmarried brothers who moved with you, how many total acres could the four of you qualify for? 
320 acres + 320 acres + 320 acres + 320 acres = 1,280 acres or 320 acres x 4 unmarried people = 1,280 acres

4. If six families moved to a colony in 1837, using Class 2 rules, how many acres could all six families purchase? 
1,280 acres x 6 families = 7,680 acres

5. How many more acres could a married person purchase under Class 2 rules, compared to Class 4 rules? 
1,280 acres - 640 acres = 640 acres

6. How many more acres could a single person purchase if he moved to Texas in 1837 instead of waiting until 1840? 
640 acres - 320 acres = 320 acres

Extension question:

How much would a married man with a family pay to purchase one league plus one labor of land (using Class 1 rules)?
4,428.3 acres + 177.1 acres = 4,605.4 acres x $.04 per acre = $184.22
Teacher Attachment 1

Use the data about land grant acreage permitted (see Student Handout 1) to demonstrate how the government laws at first allowed a larger portion of land to be purchased by a family or individual, but that as more settlers arrived in Texas, the families and individuals were permitted to purchase less land. Do not try to use exact proportions – estimates are more appropriate for students in grade 4.

Start the activity by using masking tape to create a large grid divided into four quarters. Have one “family” of students stand in three of the sections and an “unmarried settler” stand in the fourth section. Discuss why the laws were written to allow families to purchase approximately three times as much land as unmarried settlers.

![Diagram of a 2x2 grid divided into four quarters]

Have the students step back out of the grid after each part of the demonstration so that new students can also have a turn to demonstrate.

Next, use colored tape or yarn to subdivide the original large grid to demonstrate how the land grant rules changed as more people moved to Texas.

Use the tape or yarn to subdivide the large grid to show that the Class 2 rules only permitted a family to purchase between \( \frac{1}{3} \) and \( \frac{1}{4} \) as much land as earlier rules. Have another “family” stand in the newly purchased land. Also demonstrate that single people could purchase less than half the original permitted number of acres, and have a “single settler” stand in the appropriate area.

Discuss why the government might have changed the guidelines. Why were settlers permitted to purchase less land for each farm?

Finally, continue to subdivide the large grid (using a different color tape or yarn) to show that a family (under class 4 rules) could only purchase about \( \frac{1}{8} \) as much land, and that a single person could purchase only about \( \frac{1}{4} \) as much land (under class four rules), compared to the original class one guidelines. Again have student “families” and “single settlers” move to the smaller areas to show the differences in land purchases.

Discuss: Why did the land purchase allowances become smaller yet again? Why might single people’s allowances not have “shrunk” as much proportionately as the family amounts?
LESSON 6

SCARCITY AND INVENTION:
BARBED WIRE COMES TO TEXAS

INTRODUCTION

The cattle industry became one of the most significant industries in Texas following the Civil War. After the mid-1870s, the destruction of the buffalo and the removal of hostile Indian tribes to reservations made it easier and more profitable to settle the expansive areas of West Texas. Also critical to the settlement of this part of Texas were the expansion of the railroad westward and the invention of the windmill that created a needed method of getting essential water. Cattlemen first ran stock on the open range, or public land, but began to purchase large areas or sections when the land areas were opened for sale. Cattle ranching in Texas expanded and became a huge business. The small farmer, or “nester,” also began to move westward into some of the same areas. Both groups had problems because of the lack of wood for fencing.

This wood shortage helped to slow the movement of settlers westward. The invention of barbed wire, which was patented in 1874, provided at least a partial solution to the problem of the lack of wood. This invention allowed both cattlemen and farmers to begin fencing their lands. It revolutionized the economic activities of Texas and was especially important to the West Texas region within a short period of time. At first many people were reluctant to use barbed wire for fencing. However, they soon realized that it was economically advantageous to do so. Having the cattle fenced in reduced the number of cowboys needed to manage the herd; having the herd more confined also made it easier at round-up time. Fencing for farmers allowed them to keep cattle off their land, resulting in increased crop production.

J. F. Glidden, a farmer from DeKalb, Illinois, invented barbed wire in 1873. Henry B. Sandborn, a salesman for the wire company, brought the product to Texas. Soon the use of barbed wire spread throughout the state, and by 1880 much of the open range in West Texas was enclosed. The invention and distribution of barbed wire is one more example of how the free enterprise system worked in Texas!

References:
Handbook of Texas Online: keyword barbed wire

ECONOMIC REASONING

An important economic concept for students to understand is scarcity. Scarcity happens when the needs and wants of a society or group are larger than the available resources, goods, or services that are wanted or needed. In order for scarcity to occur, the people who want products or services must be unable to buy them. Students need to understand that what is scarce can be different at different times in history and at different places. Scarcity can also involve an individual or group choosing among a variety of uses for a particular resource.
Students need to know that there are different types of resources. **Natural resources** include such things as air, water, plants, animals, minerals (oil and gas), and other raw materials—things we find in nature. **Man-made resources** (capital resources) are such things as tools, machines, and factories—things made by people that are used to make other products. **Human resource** is the labor to make things (goods) or provide a service. Our economic choices involve deciding how to use the resources we have.

Students need to understand that there are different kinds of economic activities in different regions. What may be in scarce supply and in great demand at one place, may be plentiful in another. The characteristics of the geography of a place play a role in the kind of economic activities that are found in that region. For example, the West Texas region has few trees. This geographic factor led to problems in settlement and, in seeking solutions to this problem, barbed wire was invented.

**TEXAS ESSENTIAL KNOWLEDGE AND SKILLS**

4.13B Explain how geographic factors have influenced the location of economic activities in Texas

4.13F Explain the impact of American ideas about progress and equality of opportunity on the economic development and growth of Texas

4.14A Identify ways in which technological changes have resulted in increased interdependence among Texas, the United States, and the world

4.8D Explain the geographic factors that influence patterns of settlement and the distribution of population in Texas, past and present

4.9A Describe ways people have adapted to and modified their environment in Texas, past and present

4.21A Identify famous scientists such as Gail Borden, Joseph Glidden, and Patillo Higgins and their contributions

4.22A Differentiate between, locate, and use primary and secondary sources such as computer software; interviews; biographies; oral, print, and visual material; and artifacts to acquire information about the United States and Texas

4.22B Analyze information by sequencing, categorizing, identifying cause-and-effect relationships, comparing, contrasting, finding the main idea, summarizing, making generalizations and predictions, and drawing inferences and conclusions

**ECONOMIC CONCEPTS**

Natural Resources, Man-made (capital) Resources, Human Resources (labor), Scarcity, Supply and demand

**HISTORICAL CONCEPTS**

Settling West Texas, Importance of the invention of barbed wire,
CRITICAL QUESTIONS

1. What is scarcity?
2. How does the scarcity of a product affect prices?
3. How did the invention of barbed wire help to meet a shortage of a natural resource in Texas?
4. What role did barbed wire play in the settlement of West Texas?
5. What are the differences between natural resources, man-made resources and human resources?

LESSON DESCRIPTION

In this lesson students will look at the West Texas region geographically (geographic factors in patterns of settlement) and understand that there was a critical lack of wood (a natural resource) that made it very difficult to build houses, fences, etc. The invention of barbed wire (man-made resource) helped both farmers and ranchers have an inexpensive way of fencing and helped people settle the West Texas regions more rapidly. As with any human settlement, the people moving into this part of Texas modified their environment and sought innovative ways to solve their problems. Students will look at the role of technological advances (in this case, barbed wire) in changing the economic activities of a region. They will examine cause-and-effect relationships of these changes and understand that the world is economically interdependent. Students will use the introduction of this new invention in Texas as an example of American ideas about progress and the role of creativity in the marketplace. Our society still values progressive ideas and inventiveness today.

TIME REQUIRED

Two to three class periods

MATERIALS

Transparency Master 1 – Cause and Effect Model – Lack of Wood
Transparency Master 2 – Price of Barbed Wire, 1874 - 1897
Student Handout 1 - Impact of Barbed Wire
Student Activity Sheet 1 – Cause and Effect Model – Invention of Barbed Wire
Student Handout 2 - Devil's Rope and Sweet Sounds of Barbed Wire
Page of examples of barbed wire

PROCEDURE

1. To demonstrate to students the concept of scarcity, play the game of musical chairs. Place 9 chairs in a circle and select 10 students to participate. They are to march around the chairs while music is played. When the music stops, they are go sit down in the closest available chair. One person will be left without a chair. Go through this
process twice and discuss the concept of scarcity with the class. Relate the lack of chairs to situations where the wants and needs of a people (demand) exceed the supply of a product or service that is needed.

2. Use a wall map of Texas or a map from the students' textbook or atlas that shows the vegetation regions of Texas. Discuss the regions of Texas that would have had the greatest number of trees growing during the time of colonization and settlement. Have them find the areas where getting a supply of wood would not be a problem. Identify those geographic areas of Texas where the lack of wood and water would be a problem. Ask: Which area might be settled first? Why? Reinforce the ideas of scarcity and discuss the role of wood and water in selecting a place to settle, stressing the importance of both. Also, discuss the role of geographic factors when deciding on a place to settle.

3. Model the relationship of cause-and-effect by using Transparency Master 1, which uses the lack of wood (cause) and the problems this factor led to: (1) slowing settlement in West Texas; (2) lack of materials for buildings and fences; (3) higher prices for wood to be shipped into the area.

4. Show the page of barbed wire samples. Stress to students that there were over 500 different examples of barbed wire invented. The examples here are only a few, but note the different types of twisted wire to make the barbs. If possible, bring in samples of barbed wire for students to examine.

5. Following the graphic model (Transparency Master 1), have students use the information of Student Handout 1 and complete the graphic organizer on Student Activity Sheet 1, using the invention of barbed wire as the cause and the resulting changes of this invention as the effects. Review appropriate answers stressing that economic activities change as new technologies are introduced.

6. Use Transparency Master 2 and ask students to show this information in a different way in a line graph, practicing transfer skills. Also, lead the students to see that as more and more people produced and sold barbed wire, the price dropped. They should understand that as the supply of wire increased and more people had their needs for wire met, then the price went down.

**CLOSURE**

Ask students to write a concise two paragraph paper completing the following statement: The kinds of business that would have developed around the selling and installing of barbed wire fences include . . .

**EXTENSION**

1. Ask students to do research on other inventions that were important to the Texas economy. Use the information provided in Student Handout 2 to motivate students to find out other information on the invention and use of barbed wire.

2. Ask students to discuss with a partner and report to the class how else the people of West Texas could have used barbed wire as a demonstration of American ingenuity.
ADDITIONAL RESOURCES


www.tsha.utexas.edu/handbook/online/articles/view/BB/aob1.html  Handbook of Texas Online: Barbed Wire

www.barbwiremuseum.com  Devil’s Rope Barbed Wire Museum

http://www.ourtimelines.com  Timeline website. Teachers can look at other events taking place when barbed wire was invented.
IMPACT OF BARBED WIRE

By the 1870s the movement of settlers westward had slowed because of lack of fencing materials.

Joseph Glidden invented barbed wire in 1873 and was granted a patent in 1874.

Many people began to use barbed wire for fencing on both farms and ranches.

Charles Goodnight, a pioneer and major landholder in West Texas, fenced in his ranch changing the open ranch. Other ranchers followed his example.

The use of barbed wire helped to end long cattle drives because it closed the open range.
CAUSE-AND-EFFECT MODEL – LACK OF WOOD

CAUSE

Supply of wood low

EFFECT

Slowed Settlement

Made it difficult to build houses or fences

Shipping wood to areas of need very expensive
THE PRICE OF BARBED WIRE

The price of barbed wire also is of interest in its bearing on the problem of cheap fencing, so necessary in the Great Plains. In 1874 the wire sold at $20 a hundred pounds. In 1880 at $10, in 1885 at $4.20, in 1890 at $3.45, and in 1897 it reached the low mark of $1.80 a hundred.

CAUSE-AND-EFFECT MODEL
INVENTION OF BARBED WIRE
DEVLİS ROPE

The value of Joseph Glidden’s invention of barbed wire was immediately apparent. It inspired a frenzy of creativity that produced over 500 patents for variations on Glidden’s original barbed wire. Some of the styles had such vicious barbs, and caused such painful injuries to the animals, that they earned the name of “Devil’s Rope”.

Barbed wire was heavily promoted. In an effort to prove the economic benefits of using barbed wire over conventional fencing, one hardware store owner in Texas offered to replace his customer’s rail fences with barbed wire fencing for free, with the stipulation that he keep the fence rails.

THE SWEET SOUNDS OF BARBED WIRE

Barbed wire may be famous for the fencing-in of Texas, but in the early 1900s, the steely stuff also served as telephone lines between ranchers in the Panhandle. Using mail-order telephone boxes, far-flung ranchers hooked up to the top strand of wire along fences. The fences connected every ranch, and with the turn of a crank, neighbors living miles apart could suddenly share the latest gossip or communicate about the hot, dry weather. Each telephone box along the line was assigned a specific sequence of short and long rings as its individual number. Where gates interrupted the barbed-wire fence and threatened to break the circuit, ranchers build tall fence posts and ran the wire overhead.

Early types of Barbed Wire

1. GLIDDEN'S TWISTED OVAL LINE WIRE
   PAT. AUG. 22, 1876

2. C. H. SALISBURY. PAT. MAY 23, 1876

3. R. EMERSON. PAT. APRIL 25, 1876

4. M. W. COLWELL PAT. APRIL 4, 1876

5. TWISTED TWO STRAND HORSE WIRE
   PAT. J. B. CLEAVELAND. MARCH 20, 1894

LESSON 7

TRANSPORTATION IN TEXAS: THE ROLE OF THE RAILROAD

INTRODUCTION

After the close of the Civil War and after millions of cattle had been driven north to markets, railroads became a major economic force in Texas. When this building boom was underway, steel rails reached into many areas of Texas, making cities of some small towns and causing other towns to disappear completely. By 1900 the most significant part of this railroad boom had passed, leaving almost 10,000 miles of track on Texas soil. In the next 10 years, an additional 4,500 miles of track were laid.

The coming of the railroad changed the way people lived and worked in Texas. Goods could be transported more easily both into, and out of, the state. In 1860, there were only 400 miles of railroad line in Texas. At that time, the state was sparsely settled and it was difficult to make this new business pay for investors. The major means of transportation were on foot, on a horse, by wagon, stagecoach, or steamboat. The roads were nonexistent or poor, and were impossible during times of heavy rain. The rivers in Texas were not deep enough to support major shipping. An early occupation was “freighting” or hauling products to and from markets. Freight charges were very expensive and only two principal markets were available – Galveston and Jefferson. The average rates for freight hauling was $1.00 per 100 pounds per 100 miles. It usually took two to three months to go to market and back. The new means of transportation changed how people and products moved across Texas. Railroads have influenced the Texas economy since their beginning.

The early efforts to establish railroad lines were along the gulf coast. The first railroad line was known as Buffalo Bayou, Brazos and Colorado. It was started in 1852 and had reached 55 miles by 1855. In the beginning the lines were short and built close to ports. Realizing the economic importance of this new technology, the state legislature and some of the cities and counties, gave bounties of land to the companies to encourage more building. They were showered with favors in all regions. The state government gave railroad companies 32,150,000 acres of public land. By 1891, several railroad systems were in Texas, including Southern Pacific, Texas and Pacific, Gulf, Colorado and Santa Fe, the International and Great Northern and the Missouri, Kansas and Texas. The new lines connected every city of 4,000 people or more, with the exception of Brownsville. Railroad lines reached El Paso by 1883.

During the 1860s and 1870s, as railroads expanded, the population of Texas grew as well. New settlers could now ride into Texas more cheaply than before. Farmers could ship their products to market faster and cheaper and ranchers no longer had to drive cattle to points north of Texas to market. The push westward was on. New towns grew up along the lines in rapid succession. The coming of the railroad made urbanization possible. The railroad companies sold land received from the state to new settlers; the more people who moved into Texas, the greater the benefit economically to the railroad. Thus railroad companies promoted immigration in a big way. Towns grew up along the lines about every thirty miles. In some cases, towns turned the railroad away – forcing the company to move in another direction. Some of those towns no longer exist because the people followed the
rail lines to form new settlements. The railroad proved to be the key to progress and prosperity. The comment “the railroad builder is the advanced agent of civilization” was heard. The population of Dallas grew from approximately 3,000 in 1870 to 38,067 in 1890. The population of Fort Worth changed from 500 in 1870 to 23,076 in 1890. This pattern was repeated in other cities across Texas as well.

Over time, the number of rail passengers dwindled. After 1920, a highway system was put into place and buses and trucks gave the railroads competition. Later the development of airlines added to the pull away from railroad traffic. Few people traveled by passenger train after 1960. The peak of railroad activity took place in 1931. The amount of freight hauled by railroads began to decline after that year. In 1992, the Association of American Railroads reported that 11,285 miles of track were actively used in Texas, which was a decrease of 33% since 1931. Chemicals accounted for 30% of railroad tonnage originating in Texas.

Today Texas has the greatest amount of track in the nation and employs the largest number of workers. Railroads are still an important mode of transportation in the state, and they also serve a major economic role with millions of dollars in products moving along the rails on a yearly basis. The main cargo is made up of coal, chemicals and agricultural products. Products are shipped to Texas ports and then to the rest of the world. Trains are an important player in economic interdependence.

References:
Handbook of Texas Online: keyword railroads
(See also: Railroad Commission; Public Aid to Railroad Construction)

ECONOMIC REASONING

So much of business and industry consists in moving materials (and sometimes information and ideas) from one place to another. Therefore, transportation plays an important economic role in our world. Think of transportation systems like the veins and arteries of the human body. The development of many industries in Texas would have been impossible without inexpensive transportation. In the early history of Texas, markets were restricted to local areas, when each community was almost self-sufficient. When transportation methods were slow and expensive, business development was slow to progress. Better transportation removed the barriers between communities and markets. It provided state wide, nation-wide, and worldwide markets in which businesses could sell their wares. The development of better methods of transportation helped to answer the four basic economic questions: What goods and services will be produced? How will these goods and services be produced? How much will be produced? Who will get what is produced? The railroads provided a cheaper and better means of transportation – answering a need that Texans had.

Different kinds of raw materials are sometimes needed to make a certain product. Texas faced limited resources in many areas. At times these materials needed to be brought long distances. Without cheap transportation, production is limited or possible only with great
expense. For example, without cheap transportation, large cities would depend on the meat that was grown within relatively short distances. Animals would have to be slaughtered near each center of consumption. Both producers and consumers could make different economic choices because the railroad was built to new places.

Market bargaining occurred as a result of the coming of the railroad to Texas. Market bargaining helps to settle economic problems. The people in many communities wanted the railroad to come to their town and they were willing to allow this particular business (railroad) to pay less tax in order to persuade them to come. Many towns gave the railroad favors by providing free land to the railroad companies or a reduction in the taxes owed—called tax incentives. In addition, the state government gave the railroad thousands of acres of land for their use. The railroad company, in turn, sold the land to settlers for a profit. This was a government economic action that benefited a privately owned company. This was done to promote the economic well being of the people of Texas. Farmers and ranchers benefited because they could now get their products to market faster and cheaper. Texans in general benefited because they could travel faster and cheaper. The state now had many more people coming to Texas to settle—which helped all aspects of the economy.

Historically water transportation developed first. Great cities were located where there were transportation advantages. Land transportation began to develop next and then man found wheeled vehicles much better than using beasts of burden to carry products. The development of the railway was a significant economic event in history. It paralleled the movement of people westward in the United States and did so much to promote the economic development of communities, regions and states. It had a great influence on urbanization in Texas and the growth of particular areas like the panhandle and the valley. (See economic terms in the glossary for more information about the concepts listed above)

TEXAS ESSENTIAL KNOWLEDGE AND SKILLS.

4.13E Explain how developments in transportation and communication have influenced economic activities in Texas

4.13F Explain the impact of American ideas about progress and equality of opportunity on the economic development and growth of Texas

4.14A Identify ways in which technological changes have resulted in increased interdependence among Texas, the United States, and the world

4.14B Identify oil and gas, agricultural, and technological products of Texas that are purchased to meet needs in the United States and around the world

4.4C Identify the impact of railroads on life in Texas, including changes to cities and major industries

4.22A Differentiate between, locate, and use primary and secondary sources such as computer software; interviews; biographies; oral, print, and visual material; and artifacts to acquire information about the United States and Texas

4.22B Analyze information by sequencing, categorizing, identifying cause-and-effect relationships, comparing, contrasting, finding the main idea, summarizing, making generalizations and predictions, and drawing inferences and conclusions
4.22D Identify different points of view about an issue or topic

**ECONOMIC CONCEPTS**
Limited resources, Economic choices, Tax incentives, Government action

**HISTORICAL CONCEPTS**
Development of the railroad in Texas, Settling West Texas

**CRITICAL QUESTIONS**
1. How was the move of settlements from east to west in Texas influenced by the development of railroads?
2. How important was the railroad to the development of towns and cities in Texas?
3. What impact did the railroad have on improving life in Texas?
4. What incentives were provided to the railroad companies to get them to build more tracks?

**LESSON DESCRIPTION**
In this lesson, students will study the need for better transportation in Texas and the economic impact that the growth and development of the railroad industry had on the state. They will look at the development of the railroad and the changes that communities faced as a result. Using population information and miles of railroad track for the same time periods, students will discuss the connection between the growth of the railroad and increased population. They will use oral history interviews to examine different points of view about the benefits of the railroad business.

**TIME REQUIRED**
Two to three class periods

**MATERIALS**
Student Handout 1 – The Railroad Comes to Texas
Transparency Master 1 – Total Population of Texas
Transparency Master 2 – Texas Railroad Mileage
Transparency Master 3 – Maps of Railroads in Texas, 1870 and 1890
Copies of Student Handout 2 - Oral History Interview – Mrs. George Fowler
Copies of Student Handout 3 - Oral History Interview – Tom Simmons
Copies of Student Handout 4 - Story: Iron Horse Comes to Denton
Copies of Student Handout 5 - Population of Dallas
PROCEDURE

1. Begin the lesson by asking students to imagine what Texas was like after the Civil War was over. Ask them to imagine how they would travel from one place to another. Record brainstorming results. (Note: You might use cities or communities in your own area to get the students to relate the circumstances to their own part of Texas.)

2. Ask students to think about the problems that might have existed for the people at that time. Was life in the rural areas better than that of the city? Why or why not? What kind of occupation did most of the people of Texas have? Did they do a lot of trading far away from their own community or farm? Why or why not? Teachers can use the information in their text to explore information about transportation during this time.

3. Distribute copies of Student Handout 1 and ask students to read through it (or read it with them). See if some of the ideas about transportation were mentioned when students did their brainstorming. Use a wall map of Texas to stress where early settlements were located and where Texas was still sparsely populated after the Civil War. Discuss the second part of the handout – the results of the coming of the railroad. Ask students to relate to the class how each result listed would have a connection to the railroad.

4. Show a transparency of the population of Texas, 1850 – 1900 (Transparency Master 1). Have students make a line graph of this information on their own paper. Now show the transparency master of the growth of railroad tracks in Texas during the same time period (Transparency Master 2). Can they see a parallel? Give them time to study both sets of information and then stress that the growth of the railroad brought more and more people to settle here. (Note: The growth of the population of Dallas is provided in Handout 5. Teachers may want to compare similar data from other cities in Texas for the same period.)

5. Discuss the issue of “favors” provided to the railroad in order to get them to build their lines through a particular town or city. Introduce the concept of a tax incentive and explain to the students that, in most cases, both sides would benefit with such an arrangement. People in the towns would have benefited by having the railroad right at hand and the railroad would benefit by paying less taxes to the state, county and/or city government. Also explain to students that the railroads were given large amounts of land by the state for building more tracks across Texas.

6. Distribute copies of the two oral history interviews – Student Handouts 2 and 3. Allow time for the students to read these people’s views and discuss key points with them. Then ask them to examine the point of view of each person about the issue of the coming of the railroad. Did they think this was a good thing or a bad thing? Why? Did they approve of giving favors to the railroad to build in their town? Why? Did they think that the business activities would change as a result of the coming of the railroad?

7. Show a copy of Transparency Master 3 giving a map of Texas in 1870 on the top and a map of Texas in 1890 on the bottom. Stress to students the tremendous growth of the railroad system in that 20-year period. Ask: Based on the data, where would the
greatest amount of economic activity (business) be taking place by 1890? Where would the largest population centers be? Is there a connection? Why or why not? Why were there fewer rail lines in the western part of Texas?

8. Distribute copies of Handout 4. Allow time for students to read and discuss the story. Have students sequence the events of the coming of the railroad. (Consider addressing appropriate language arts skills with this activity.)

**CLOSURE**

Ask the students to individually generate a list of economic activities that would change in a town as a result of the coming of the railroad. Generate a master class list by getting examples from all the students’ ideas. Ask: What activities might be brand new now that the railroad was in town? What activities might stop completely as a result of the railroad? Predict what might happen to railroad activity now if suddenly people could not use cars or airplanes. Would the railroad business change? In what way would it change? Have the students respond to the following writing prompt: In what way was the coming of the railroad important to the Texas economy?

**EXTENSION**

1. Have students complete research on the history of their own community and examine the role of the railroad in the growth of the local area. Ask students to interview older people to determine how many had experienced riding on train in their lifetime, and what riding on a train was like. Ask them to record the interview and then share with the class.

2. Create a class book of the interviews.

3. Invite a member of the City Council or someone who works for the city government or the local railroad to visit the class. Ask them to tell about economic incentives that are provided to various businesses.

**ADDITIONAL RESOURCES:**


The Railroad Comes to Texas
Need for a Better System of Transportation in Texas

- There were few good roads in Texas at the time of annexation. This continued to be a problem for a long time
- Most of the roads were in the south along the coast and in East Texas
- Roads were not useable at all during heavy rains
- To haul people or products over these roads was expensive and took a great deal of time
- Rivers in Texas were not deep enough for large boats to travel inland

Results of the Railroad Coming to Texas

- Products could be shipped out of Texas to market faster and more easily
- Products could be shipped into Texas faster and more easily
- People could travel from one place to another faster and more inexpensively
- Many immigrants could travel to Texas and settle more open territory to the west
- Railroads encouraged larger numbers of settlers to move to Texas
- Railroads improved the cattle industry in West Texas. Cattle could be shipped to market without long cattle drives
- Fewer cowboys were needed as a result of the cattle being shipped by railroads
- Growth of railroads allowed more people to move into larger cities contributing to the urbanization of Texas
- Economic activities changed as a result of the coming of the railroad
# TOTAL POPULATION OF TEXAS 1850-1900

<table>
<thead>
<tr>
<th>YEAR</th>
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<td>1900</td>
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From: Texas Almanac, 1994-95, Dallas Morning News
## TEXAS RAILROAD MILEAGE

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<td>8700 miles</td>
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<td>1900</td>
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Texas railroads in 1870 and 1890


Oral History Interview – Mrs. George Fowler
McLennan County, Texas,

"I was born in [Green?] County Mississippi in the year 1848 and came with my father and mother from this state to Texas in the year 1866. . . .

"We first settled in Limestone County, on the Navasota River, we called it the "Navasot". Then we lived between the little village of Horn Hill and Old Springfield, which was the first county seat of Limestone County. . . .

"Then in 1869 rumors reached the settlement that the Houston and Texas Central railroad was to be built thro' Springfield! This road was building an inland road to connect with the shipping port of Galveston, At last Springfield was coming into its own!, when the agent arrived the settlers were so enthused over it that they donated the land for the road-bed, but after he had gone the people began to feel that they should be paid for the land, since it had to come thro' the town and they had fought the wilderness for it. Suddenly the land took on so much value that the railroad officials decided to lay its roadbed two miles east of Springfield.

"The settlers began to divide, some moved to the new town of Grosbeck and others to the new town of Mexia, and so Old Springfield, the town that was first thought to be the metropolis of this part of Central Texas became a ghost town, a town of memories, stories and legends of the days of the early settlers and the Indian's. . . . And the railroad towns became the center of population."

Oral History Interview – Tom Simmons
Tarrant County Texas

Tom Simmons, 77, living at the Westbrook Hotel, Fort Worth, Texas was born Aug., 4, 1861 in the State of Mississippi, where he received his education and studied law. After he was graduated, he came to Texas, which was in 1884, to establish a law practice. He settled in the Town of Decatur, Wise County, where he practiced his profession until the Ft. W. & D.C. railroad built through the town. . .When Tom Simmons arrived at Decatur, the town was a thriving frontier business center. Cattlemen and settlers living in the territory extending for more than 100 miles west and north of town came there to trade. He saw freight wagons numbering into the hundreds coming and leaving the town each day. He has seen hundreds of cattle herds that were driven through the town on their way to the ranges and the markets. He has seen and observed the difficulties the ranchers and early settlers had to meet.

“I located in Decatur, Wise County, in 1884 and put up a sign. Clients began to engage me within a few days after I opened my office, and it was not long until I had an excellent practice. . . .

“When I settled in Decatur there was no railroad running through the town. Fort Worth, was the nearest railroad town. Before the railroad entered Decatur it was a thriving frontier town.

“Decatur was the trade center for a territory extending for more than 100 miles north and west of the town. There were ox and mule hauled freight wagons arriving and departing in large numbers steadily each day. Often one would see a 100 or more freight wagons at one time in the wagon yard. Some brought commodities and some were loading with goods for the western and northern sections.

“Almost each hour of the day, one could look to the north or south and see a cloud of dust arising into the air, which was caused by herds of cattle approaching or leaving the town. Some of these cattle were being transferred to the ranges north and were being driven to the markets.”

When the Denver railroad built through Decatur and traversed the trade territory of Decatur, I perceived it would have an adverse effect on the town’s business, because the road would eliminate the need of the population north and west of Decatur coming to the town for their commodities. I decided to move.

I was not opposed to the coming of the road. In fact, I made a trip to Chicago, as a representative of Wise County citizens, to urge the location of the road through the town. In behalf of the citizens, I offered the company free right-of-way through the county.

Some of my personal friends . . . argued against me leaving the town for a new location. However, I followed my own idea about the matter, and moved to Fort Worth. It was not long until many of my friends followed me . . . because of lack of business.

The business that came to Decatur, prior to receiving the railroad, went to the numerous towns which were built along the railroads route.”

Adapted From: Library of Congress, American Life Histories: Manuscripts from the Federal Writers’ Project, 1936-1940, District 7, FC 240. Interview with Tom Simmons, Fort Worth, Tarrant Co., Texas.

72
The Iron Horse Comes to Denton

Here is one woman’s story of the first railroad that came to her town.

"I can remember the first time I ever saw a train. It was the most exciting thing that had ever happened to me.

"Denton was only a small town then. Farmers brought their corn and oats to town to sell them to buyers from large companies. The buyers had a lot of trouble getting the crops to Dallas to the big market. Then we heard that the railroad was coming.

"Surveyors came with their chains and poles and telescope-like things. Soon, a trail of stakes ran for miles across the farms and through town. The farmers had to build new fences so the tracks could come through their land. Some did not like having to sell their land one bit. But most people were happy.

"Weeks later we all rode out of town to see the hundreds of workers laying track. Men by the dozens built up a ridge of gravel and earth. Other men carried heavy wood ties into place. When ties were in a straight row, twenty straining men carried shiny steel rails into place. . . .

"The track came closer and closer to town. A train depot and a water tower were built. Wood for the engines was cut and stacked in high rows. A new grain elevator was built so that corn and oats could be loaded on the train.

"The track through Denton was soon finished. One day, early in the morning, we all heard the sound of a long whistle blast far away. Everyone in town rushed down to the train station to watch for the first train. Men, women, and children came hurrying on foot, in wagons, and on horses. Again, we heard the whistle echo from far away. It was a strange sound many of us had never heard. It was a lonesome, eerie sound.

"Before long, a boy on top of the water tower yelled and waved his cap. He had spotted the train coming! Everyone crowded close to the tracks, very excited. Someone saw black smoke coming, and we heard the train chugging toward us. Some of the horses jumped and whinnied, scared by the strange, steaming iron beast.

"Suddenly, it was there – a big, black engine with a cowcatcher poking out front and a big smoke stack on top belching smoke. Flatcars loaded with railroad ties and rails were behind the engine. Men hung onto the cars, smiling and waving to us as the cars came by.

"We began to cheer and clap. The train came to a stop. Steam blew from it in several places; making a loud hissing sound and making the people jump back. I held my hands over my ears to keep out the noise."

Adapted from: Beamer, Charles; Cox, Bertha Mae and Frantz, Joe B. The Texans! Tejas to Today. Austin: Graphic Ideas, Inc., 1972.
# POPULATION OF DALLAS

<table>
<thead>
<tr>
<th>YEAR</th>
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</tr>
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<tbody>
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<td>38,067</td>
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Lesson 8

FROM WINDMILLS TO WIND FARMS:
HARNESSING THE TEXAS WIND

INTRODUCTION

In the move west, water was a critical factor for locating a place to settle. Land was unsuitable for settlement without a consistent source of water. People and animals could not survive without this critical natural resource; early settlements were established along rivers and creeks out of necessity. In the beginning of Texas colonization, the eastern and southern portions of the state were settled first. The more western portions could only be settled with the pumping of water. One of the key factors in settling the west was the use of windmills for this purpose.

Historically, windmills have been used for hundreds of years. Dutch and German immigrants developed the first windmills used in Texas; they were at first primarily used for grinding grains. Later, they were used more extensively for pumping water. Windmills were an inexpensive way of getting water for the railroad steam engines and many windmills were built along the routes as the lines moved into the western portions of Texas. By 1873, windmills were also an important supplier of water for those settlers who came with the railroads. Large ranches, such as the XIT ranch in West Texas, also began using windmills after the use of barbed wire became widespread. The containment of cattle into designated spaces required water in many different pastures across the landscape and using windmills to secure this water solved a critical problem.

Windmills became more prevalent in Texas during the late 1870s, 1880s and 1890s. By 1900, windmills were common across Texas, making the remote areas of Texas habitable. Despite the extensive use of windmills, there were few windmill manufacturing companies in Texas. The manufacturing of windmills peaked in 1928. During that year, 99,050 units were sold and fifty percent of those were sold in Texas. Windmills are still used across the state today and they remain an important supplier of water.

In the 1970s Texans began to turn to windmills for a source of energy in addition to using them for pumping water. Texans began to use wind power to convert to electricity. About 98% of today’s electricity in Texas comes from fossil fuels and nuclear power — fuels that are non-renewable and cause pollution. Wind power is a renewable resource that is readily available and is pollution free. Using wind power as a source for electricity has become more important to consumers because it is more environmentally friendly.

Texas produces more wind energy (converted to electricity) than any other state besides California. The best areas for wind power are found in the Panhandle, South Plains region, and the Davis Mountains area. There is a consistent wind speed of over 15 miles an hour at 50 feet above ground, a common height for wind turbines. Wind generators can be built rather quickly (in as little as six months), especially when compared to regular generators (taking two to three years to complete). One critical problem is getting the electricity from wind farms to where it is needed in large urban areas. The wind farms have to be built where the wind is right and the transmission to needed areas can be problematic.

A megawatt of electricity (about a million watts) can provide electricity for about 300 houses over a one-year period. Texas is planning more wind farms in the future to help
provide energy to more homes and businesses. In 1999, the Texas Legislature passed Senate Bill 7 that asked for additional electricity to be provided by wind power – a capacity of 2,000 MW of renewable energy in Texas by 2009. More use of wind power in Texas is likely in our future.

*Handbook of Texas Online: keyword windmills. (See also Solar Energy)*


**ECONOMIC REASONING**

Students should understand that the need for water was critical for settlers during the days of Texas' development. The use of windmills allowed water, a **scarce natural resource** for some parts of Texas, to be pumped to the surface and allowed settlers to move into more remote regions promoting the economic growth of Texas. Students need to understand the law of **supply and demand** as it relates to our natural resources, both past and present. In addition, students need to understand that electricity consumption is an important part of our day-to-day living and the **production** of electricity is an important economic activity in Texas. Because we must find better ways of protecting the environment, using wind power is an important avenue to explore. In today's world, **consumers** are demanding a greater use of **renewable resources**, as well as a greater effort to protect the environment. Consumers are interested in electricity generated by wind power because it is more environmentally friendly than that generated by burning fossil fuels.

Students also need to understand that different types of economic activities take place in different parts of Texas and that these activities are closely related to the geographic factors of the areas. There are areas in Texas where wind farm locations are more appropriate than others. Students should also be able to compare the impact of technological advances past and present and technology's role in the economic developments of the future. (See economic terms in the glossary for more information about the concepts listed above.)

**TEXAS ESSENTIAL KNOWLEDGE AND SKILLS**

- **4.13B** Explain how geographic factors have influenced the location of economic activities in Texas
- **4.9A** Describe ways people have adapted to and modified their environment in Texas, past and present
- **4.13C** Analyze the effects of immigration, migration, and limited resources on the economic development and growth of Texas
- **4.13F** Explain the impact of American ideas about progress and equality of opportunity on the economic development and growth of Texas
- **4.21B** Describe how scientific discoveries and technological innovations have benefited individuals, businesses, and society in Texas
- **4.22A** Differentiate between, locate, and use primary and secondary sources such as computer software; interviews; biographies; oral, print, and visual
material; and artifacts to acquire information about the United States and Texas

4.22B Analyze information by sequencing, categorizing, identifying cause-and-effect relationships, comparing, contrasting, finding the main idea, summarizing, making generalizations and predictions, and drawing inferences and conclusions

ECONOMIC CONCEPTS
Scarcity, Supply and Demand, Natural Resource, Renewable Resource, Nonrenewable Resource, Production, Consumers

HISTORICAL CONCEPTS
Settling West Texas, Technological advances/change

CRITICAL QUESTIONS
1. What is scarcity?
2. How did the use of the windmill help to settle the more remote regions of Texas?
3. What is the connection between the geographic factors of a region and economic activities?
4. How has the use of the windmill changed over time?
5. What kind of impact does our concern for the environment have on the Texas economy?

LESSON DESCRIPTION
In this lesson students will study the impact of the use of windmills in Texas, both past and present. They will compare the use of this invention during the late 19th century to secure water for advancing settlements west with the use of windmills (turbines and wind farms) today to produce electricity. Students will explore the spread of the windmill across West Texas with the coming of the railroad and barbed wire. They will study the influence of geography as they determine why the use of windmills solved a critical problem to the early settlers and will examine where most of Texas' wind farms are located today. The impact of this invention, both past and present, will be used as an example of American ideas about progress and inventiveness and how both play a role in the Texas economy.

TIME REQUIRED
One to two class periods

MATERIALS
Student Handout 1 – Keeping the Windmills
Student Handout 2 – West Texas Wind Power
PROCEDURE

1. Introduce the lesson by drawing students' attention to the concept of scarcity. Teachers can use balls or other types of children’s toys during recess as examples. Ask students to try to decide how to effectively share one soccer ball for 25 students on the playground or how to share one set of Old Maid cards during free time. Teachers could also use food as an example – i.e., one apple to share with the class, etc. Stress the concept of scarcity and the importance of having an adequate amount of a product to meet the demands of a group or a society.

2. Do a direct teach about the use of the windmill from the early days of the settlement of Texas through 1930 (see the introduction to this lesson). Use the information in the student textbook as well as other resources to establish how important water was to any settlement and how surface water was very scarce in the western parts of the state. Discuss the role of railroads and how railroads built windmills along the tracks so they could use water. Stress the spread of windmills for individual farms and ranches, etc. The railroads brought more settlers and the spread of windmills allowed valuable water to be pumped to the surface. Use a map of Texas to stress the locations where the natural supply of surface water would be limited.

3. The use of windmills became prevalent on large ranches across Texas after barbed wire became a major part of the Texas landscape. The increased number of fenced large pastures, which allowed the reduction in the number of cowboys, enabled ranchers to keep their cattle under control in confined spaces. However, this process required a source of water in each pasture area. Windmills pumped the needed water and required someone to keep the windmills in good working order. These ranch hands were called “windmiller”. Distribute copies of Student Handout 1 and ask the students to read the passage or read it with them. Ask: Why was it necessary for the “windmiller” to have his own chuck wagon? Why did he move from place to place? (The size of the ranches prohibited the cowboys from working out of one central place; there were often hundreds of windmills on one large ranch needing constant repairs.) How important was this job? (The cattle would die if they lost their source of water.) Point out that the water was also an important resource for the farmers in the western part of Texas.

4. Show students pictures of windmills from the Library of Congress web site. Go to http://lcweb.loc.gov/. Select “American Memories”, click on “Search” and type in “windmills in Texas”. You will get 11 items containing the words “windmills in Texas” near each other. Several of the pictures are from the Farm Security Administration – Office of War Information Photograph Collection. There are several good pictures from which to choose. The picture entitled “Windmill on farmstead on the high plains. Gaines County, Texas (1940)” will show the landscape of West Texas and teachers can stress the isolation and lack of vegetation in this region. Other choices might be: “Windmill and watering trough on large farm near Ralls, Texas. Wife of day laborer is drawing water (1939)”, “Windmill propellers, Dumas, Texas
"Windmill, watering trough and barn on SMS Ranch near Spur, Texas (1939)." Copies of the pictures can be printed from this web site and circulated for closer examination or used on a bulletin board. Students can also use the Library of Congress web site for individual research.

5. Introduce the use of wind turbines in Texas today on wind farms and discuss the importance of using wind power to generate electricity. Provide a copy of Transparency Master 1 – The Advantages of Using Wind Power for Electricity. Discuss each point with the class.

6. Provide copies of Student Handout 2 – West Texas Wind Power and ask students to find the locations mentioned on a Texas map. Teachers can use road maps of Texas, laminated desk maps, Texas maps in the textbook, or use a classroom wall map for this activity. If the maps are markable and washable, ask students to place an X where the major wind farms are located. Discuss the geography of these areas. Ask: why would the wind in these areas of Texas be stronger than in other areas of Texas? Compare these wind farm locations with a population map of Texas in the textbook and lead students to see that some of these locations are remote and have few people living there. Ask: What kind of impact would the wind farms likely have on the economy of these areas? What problems might develop by having the generation of electricity where there are few people and the need for electricity in large cities where there are many people? Will the wind farms cause an increase in the population of these isolated communities? Why or why not?

7. Provide a model of a Venn diagram and ask students to draw one of their own. At the top of one circle should be the words “wind to pump water” and at the top of the other circle should be the words “wind to provide electricity”. Have them complete the diagram, looking at these two specific uses for windmills. Have them place the similarities in the middle section where the two circles overlap.

8. Ask students to think about the impact that this technology has had economically for Texans over time. What major changes in the development of the western part of the state did windmills allow in the late 1800s? What major changes are taking place today? Predict what changes might take place in the future.

CLOSURE

Ask students to look at the long-term impact of using wind power to generate electricity. Suggested writing prompt: Consumers are demanding more electricity generated with wind power (renewable energy source). Do you agree or disagree that Texas should use more wind power for this purpose? Defend your position.

EXTENSION

1. Ask students to do research on wind farms in other parts of the world. Are more consumers demanding a cleaner environment? Is wind-generated electricity cheaper? Why or why not?

2. Have students build a small wind turbine model. See Transparency Master 2- A and B for pictures. Directions: Look at the model to see how to build the wind turbine.
Start by putting the cork to the flower stick, which will be the shaft of the wind turbine model. Then put on a block of wood, a washer, the straw, the second washer and the second block (in that order). The wooden blocks should be glued to the flower stick.

Make a rotor from a piece of paper by following the instructions shown on Transparency Master 2—B. Fix the rotor to the cork using a pin and some glue. Finally attach the sewing thread to the flower stick. Bend the nail to form a hook and tie it to the end of the string.

**Materials needed for the wind turbine model:** A thick drinking straw, 18 cm. long; a flower stick, approximately 3—5 mm wide, 25 cm long; sewing thread; paper; 1 cork; 2 wooden blocks of 2x2x2 cm; 2 washers, of a size fitting the flower stick; a drawing pin; a thin nail, approximately 40 mm long; glue.

Class members who complete a wind turbine can have a competition to see which turbine can lift the greatest amount of weight.

**Additional Resources:**

National Ranching Heritage Center, Lubbock, TX
http://www.ttu.edu/RanchingHeritageCenter/

Handbook of Texas Online
http://www.tsha.utexas.edu/handbook/online/

Provides background information for teachers.


KEEPING THE WINDMILLS

"Each division kept one or two "windmillers," whose only duty was the care of the mills. These "windmillers" lived upon a never-ending journey that carried them in a circle from one mill to another. They lived in the open the year around. A personal chuck wagon supplied with tools was their only home. They camped where night overtook them as they moved from mill to mill, repairing where attention was needed and passing on where it was not. About once a month they swung in by headquarters, replenished their store of provisions, repaired their tools, and reported to the foreman any neglect in greasing the mills on the part of the line-riders. Then they were off again in summer heat and winter blizzard."

## WEST TEXAS WIND POWER

### Wind Generating Electricity Facilities

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<th>Name</th>
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<th>Megawatts (MW) Produced</th>
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<tr>
<td>Kind Mountain Wind Ranch</td>
<td>Upton County</td>
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<tr>
<td>Trent Mesa</td>
<td>Abilene</td>
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ADVANTAGES OF USING
WIND POWER
FOR ELECTRICITY

Using wind turbines is a big attraction for arid and dry counties that can’t get big industries to locate there.

Wind farms can go into rural areas where there isn’t water to cool generators (used in coal-burning plants).

Economic boost by providing jobs in more remote areas

Landowners get money for lease and royalty payments
Building a Small Wind Turbine Model
LESSON 9

COTTON INDUSTRY IN TEXAS

INTRODUCTION

Cotton has been a major part of our economy since the days Texas was first colonized. The free or inexpensive land, good soil and water, and dreams for better opportunity drew colonists to Texas from the beginning. Before the Civil War, many settlers were plantation owners or small farmers who wanted to produce cotton as a main crop. After the Civil War, thousands of additional immigrants poured into Texas seeking access to better and cheaper land. Farming continued to be the foundation of the Texas economy. As time passed, farmers who pushed into the more arid region of West Texas discovered that, with the improvements in technology, they could produce profitable crops. The “dry farming” method was used in these areas and windmills were used to pump water to the surface for both household and crop use. These technological advances helped to increase settlement of West Texas and allowed cotton to become a major crop for that region of Texas.

The most important crop grown in post-Reconstruction Texas was cotton, with production spreading rapidly throughout the state. As with other industries, the arrival of the railroad had an impact on the production of cotton in Texas. Farmers were provided a cheap and efficient means of getting the cotton to market. Before the Civil War, slaves provided a source for cheap labor in Texas; after the war, a system of tenant farming developed, providing a different system for labor. Cotton continued to play a major role in the Texas economy and is still featured today.

Geographic factors in Texas are favorable for the growth of cotton. The climate and soil, in addition to an available labor force, result in a profit for Texas farmers. The size of the state and the changes in growing seasons allow migrant workers to start the harvest in South Texas, where the weather is warmer, and move north to finish in the high plains region, when the weather warms there.

Today Texas leads the nation in the growth of cotton, providing about 25 percent of the total grown in the United States. More than 5 million acres across Texas produce cotton; it is grown in almost every region of the state, although more is grown in some regions than in others. It is the third largest agricultural crop (behind the beef and nursery industries) in Texas. Just under half of the Texas crop is exported out of the United States, which was worth about $425.7 million in 2002.

Cotton is the state’s largest cash crop, generating $1.6 billion annually for farmers. According to a 2000 report by the Agriculture Program at Texas A&M University, Texas’ cotton crop generates about $5.2 billion annually when all of the supporting industry is taken into consideration – those businesses connected with harvesting, transporting, processing and marketing cotton.

There are two types of cotton grown in Texas. Pima cotton, which produces long fibers, is grown primarily around El Paso and in West Texas, and upland cotton, which is the most common type of cotton grown in the United States. Pima cotton is more difficult to grow and is more expensive to produce. Most of the cotton produced in Texas is upland cotton. Geographically, the area surrounding Lubbock produces 60 percent of the state’s cotton
crop. The biggest challenges to cotton growers include insects, weather, and the value of the dollar – all are out of the grower’s control.

References:
Handbook of Texas Online: keyword Cotton. See also Cotton Ginning, Cottonseed Industry.

**Economic Reasoning**

One of the most important economic resources is human labor. Natural resources are included in the production of goods and services people buy, but human labor and skills are necessary for production. People’s energy, ideas, training and specialized skills are critical to an effective economy.

There is a connection between the geographic factors (landforms, water sources, soil, and weather patterns) of an area and the type of economic activities taking place, past and present. Geographic factors are important especially in the production of agricultural products across the state. In this lesson, the production of cotton from an historical perspective is used to stress the degree of human labor needed during the early days of Texas history. Cotton has played such an important part of the Texas economy since early settlement and it is one of the main exports today. There is also a connection from one region of the country to another and from one part of the world to another. Students will examine how different parts of the country and the world are economically connected and interdependent. (See economic terms in the glossary for more information about the concepts listed above.)

**TEXAS ESSENTIAL KNOWLEDGE AND SKILLS**

4.13A  Explain how people in different regions of Texas earn their living, past and present

4.13B  Explain how geographic factors have influenced the location of economic activities in Texas

4.14B  Identify oil and gas, agricultural, and technological products of Texas that are purchased to meet needs in the United States and around the world

4.22B  Analyze information by sequencing, categorizing, identifying cause-and-effect relationships, comparing, contrasting, finding the main idea, summarizing, making generalizations and predictions, and drawing inferences and conclusions

4.22C  Organize and interpret information in outlines, reports, databases, and visuals including graphs, charts, timelines, and maps
ECONOMIC CONCEPTS
Supply and Demand, Goods and Services, Economic Region

HISTORICAL CONCEPTS
Role of cotton production in the history of Texas

CRITICAL QUESTIONS
1. How important is cotton production to the economy of Texas?
2. How has the production of cotton changed in Texas from past to present?
3. What role does cotton production play in economic interdependence?
4. What role does the climate and soil play in where cotton can be grown?
5. What economic concepts apply to the production of cotton?

LESSON DESCRIPTION
In this lesson, students will examine where cotton is grown in Texas and will look at the role of geographic factors (soil, climate) and human resources (workers) in its production. Students will compare the levels of human labor, past and present, in cotton production and understand the importance of this crop to the Texas economy. They will be provided opportunities to analyze charts and maps, and draw inferences and conclusions, with print and visual information on the cotton industry in Texas.

TIME REQUIRED
One to two class periods

MATERIALS
Student Handout 1 – Process of Producing Cotton in Early Texas
Handout 2 – Picking Cotton
Transparency Master 1 – What Can be Produced from a Bale of Cotton?
Transparency Master 2 – Values of Cotton Harvests in Texas
Transparency Master 3 – Cotton in Texas: Profiles
Transparency Master 4 – Map of Texas Cotton Production 1909 and 1929

PROCEDURES
1. Introduce the lesson by asking a few class volunteers to look at the tag on the back of their shirts or blouses to see how many are wearing something that is made of cotton. Have students who are wearing jeans to stand; stress that most jean material is made of 100% cotton. Note how many students are wearing socks, etc. Teachers may want to have students generate charts reflecting the data collected. Students need to understand the degree of cotton use and the importance of cotton in day-
to-day living. Point out the important use of the cotton plant in food production (cottonseed oil).

2. Using the textbook or other resources, have students examine a product map of Texas showing where cotton is grown. Ask them to compare the product map with the physical map in their text. Based on the physical features of the state, where would cotton grow easily? Why? What area of Texas would be the least likely to grow cotton? Why? (Note: Teachers will need to review the geographic factors important to agricultural production. Stress to students the role of these geographic factors in the economic activities of an area.) When possible, show students what cotton bolls look like – both before and after opening.

3. In the early days of Texas history, one acre of land could produce one 500-pound bale of cotton. Show students Transparency Master 1—*What Can be Produced from a 500 lb. Bale of Cotton?* Discuss the importance of the products listed; discuss with students that there are also many other products generated by cotton. Ask: What would happen if we didn’t produce cotton?

4. Distribute copies of Student Handout 1. Ask students to read through the information and discuss critical factors with them. Ask students to carefully look at the sequence of events in the cotton production outlined here. Have them count and report the number of times human labor is required from planting to market. Use the reading “picking cotton” (Student Handout 2) to stress again the difficulty and the amount of labor required for cotton production. Ask: How is it harvested today? What are the differences?

5. Show students Transparency Master 4 which gives the areas of Texas cotton production in 1909 and in 1929. Ask them to study the two maps and identify the differences. (They should notice that more counties in West Texas and in the Rio Grande Valley were producing cotton by 1929.) What changes were taking place that would have caused cotton to be produced in these areas?

6. Ask students to consider cotton production in today’s world. What might they predict to be the process of planting and harvesting cotton now? How might the economic activities differ? What role has technology played in the changes from past to present? How has the role of human labor changed over time?

**CLOSURE**

Use Transparency Master 2 of the table: Values of Cotton Harvests in Texas. Allow time for students to study the information. Ask the following questions: Have the number of acres harvested in cotton increased or decreased since 1999? Has the number of bales produced increased or decreased? Did farmers make more money or less money in 2000 than they did in 1999?

**EXTENSION**

1. Create a multiple bar graph using the information on Transparency Master 2 or the information on Transparency Master 3.

2. Review the goods noted on Transparency Master 1. Then look through your home
and record all the goods you can locate that are made from cotton. Do not limit yourself to just clothing.

3. Look at what impact the use of cottonseed oil has on the food industry.

4. Consider planting cotton seed in the classroom or on the school grounds. Watch the plants as they develop and link the activities with science as much as possible.

**SUGGESTED ADDITIONAL RESOURCES**


[www.cotton.org](http://www.cotton.org) National Cotton Council of America

[www.agr.state.tx.us/](http://www.agr.state.tx.us/) Texas Department of Agriculture

[www.cottonsjourney.com](http://www.cottonsjourney.com) — Cotton’s Journey – The Story of Cotton


[www.cottoncounts.net](http://www.cottoncounts.net) Cotton Counts

**Suggested Children’s Books:**


The Process of Producing Cotton in the Early Days of Texas

"The process of planting, tending, harvesting, ginning, and marketing cotton took a full year to complete. Beginning in late February or early March, planters along the Brazos and Colorado rivers directed their slaves to plow the cleared fields into furrows; East Texas planters began in late March. Because of the uncertainty of the weather, no more than half the crop was planted early in the spring; the remainder was planted a few weeks later.

"On plantations, one team of slaves used plows to open the furrows, a second team planted seeds by hand, and a third team covered the seeds with earth. On smaller farms, one laborer used a hoe to open the furrow, another placed the seeds in the ground, and a third covered the seeds...

"As soon as the new cotton plants reached a few inches in height, slaves used hoes to chop out grass and weeds that could smother the young plants. Once the seedlings gained several inches in height, the plants themselves were chopped, or thinned, leaving clusters of two or three plants that were separated by about six inches...A few weeks later the plants would be thinned again, leaving them about two feet apart...

"Slaves were set to work in the fields, picking the cotton from the bolls and stuffing it into willow baskets or into long bags, the tops of which formed loops or straps and were slung over their shoulders. The bottoms of the heavy bags dragged along the ground behind the workers.

"When the slave's basket or bag was full, it was weighed on a field scale, the weight recorded, and the cotton dumped into a wagon. The slave then returned to the field with the empty basket or bag. Wagons full of seed cotton was taken to the gin houses or to the slave quarters for further cleaning. Roughly fifteen hundred pounds of seed cotton filled each wagon, and a wagon load usually equaled one bale. At that time, normal cotton production was defined as one bale per acre.

"Before the cotton could be ginned, it had to be free of extraneous stick, burrs, leaves and other trash. The early gin stands were designed to separate the seeds from the fibers, not to clean the cotton; that had to be done manually, usually at night after the worker had spent a long tedious day in the field..."

Picking Cotton

"Finally, after all our summer labor in the cotton patch, late September and early October brought the cotton picking. The bolls popped open and the cotton fibers, with the seeds imbedded in them, began to hang in clumps. The boll opens in five sections, and each section of the hull culminates in a sharp point. To pluck out the cotton, the picker lowered his thumb and fingers so that each rested over a lock of cotton, then he pressed his fingers together and pulled out the cotton. But if he hit the points of the hull with his fingers very often he would be punished for his inaccuracy with sore fingers.

Picking cotton was perhaps the most arduous part of raising the crop. A good cotton picker could pick three or four hundred pounds in a day. But his hands had to be busy from daylight to dusk, and he spent most of the day walking on his knees dragging a heavy cotton sack. The cotton sack (homemade on all the small farms) was constructed of light canvas. It was about eight feet long, and it was a little over two feet wide. A strap, made of several layers of sacking stitched together, about three inches wide, was attached to the mouth of the sack and went over the shoulder of the picker. The last six feet or so of the sack had an extra layer of cloth, a kind of flap on the bottom, to keep the sack from wearing itself out as it was dragged along the ground. . . .

If a person picked five hundred pounds a day he could pick a bale in three days, but that could be done only in good cotton. A bale of cotton weighs roughly five hundred pounds, but it takes about fifteen hundred pounds of seed cotton to render a five-hundred-pound bale of fiber. . . ."

WHAT CAN BE PRODUCED FROM A 500 LB. BALE OF COTTON?

215 ........... Jeans
249 ........... Bed sheets
409 ........... Men’s Sport Shirts
690 ........... Terry Bath Towels
1,217 .......... Men’s Dress Shirts
3,085 .......... Diapers
4,321 .......... Mid-calf socks
313,600 ........ $100 bills
VALUES OF COTTON HARVESTS IN TEXAS

<table>
<thead>
<tr>
<th>Year</th>
<th>Cotton Harvested (in millions of acres)</th>
<th>Cotton Produced (in millions of bales)</th>
<th>Value of Production (in millions of dollars)</th>
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<tbody>
<tr>
<td>2003</td>
<td>4.40</td>
<td>4.00</td>
<td>*</td>
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<tr>
<td>2002</td>
<td>4.50</td>
<td>5.04</td>
<td>$919.2</td>
</tr>
<tr>
<td>2001</td>
<td>4.25</td>
<td>4.26</td>
<td>580.7</td>
</tr>
<tr>
<td>2000</td>
<td>4.40</td>
<td>3.94</td>
<td>868.0</td>
</tr>
<tr>
<td>1999</td>
<td>5.10</td>
<td>5.05</td>
<td>993.8</td>
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</table>

*Estimate not available.
COTTON IN TEXAS: 
PROFILES OF A RESOURCEFUL INDUSTRY (1997)

<table>
<thead>
<tr>
<th>SECTOR</th>
<th>NUMBER OF BUSINESSES</th>
<th>NUMBER OF JOBS</th>
<th>REVENUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FARMS</td>
<td>11,237</td>
<td>48,943</td>
<td>1,763,328,000</td>
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<tr>
<td>Gins</td>
<td>369</td>
<td>11,996</td>
<td>253,279,310</td>
</tr>
<tr>
<td>Merchants</td>
<td>87</td>
<td>651</td>
<td>1,700,986,000</td>
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<tr>
<td>Warehouses</td>
<td>64</td>
<td>2,804</td>
<td>5,355,000</td>
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<tr>
<td>Cottonseed Oil Mills</td>
<td>12</td>
<td>467</td>
<td>339,889,584</td>
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<tr>
<td>Textile Mills</td>
<td>39</td>
<td>3,136</td>
<td>270,100,000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>11,808</strong></td>
<td><strong>67,998</strong></td>
<td><strong>$4,332,937,894</strong></td>
</tr>
</tbody>
</table>
TEXAS COTTON PRODUCTION

Cotton Production in 1909

Cotton Production in 1929
LESSON 10

BOOMTOWNS: A RESULT OF OIL DISCOVERY

INTRODUCTION

One of the most significant economic discoveries in Texas history began on January 10, 1901 with the eruption of the oil well drilled on a hill called Spindletop, near Beaumont in southeastern Texas. Anthony Lucas drilled this well on land owned by Patillo Higgins. The enormous impact of the potential capacity of this well, estimated at from 35,000 to 100,000 barrels per day, challenged the imagination. A new era had dawned in the oil industry and this discovery moved Texas from a rural state with an agricultural base into the petroleum and industrial age. The rush was on to make new discoveries throughout the state; the "boom" was on!

Other major oil discoveries were made in Texas following the one in Beaumont. The Electra Field was discovered in 1911, on the W.T. Waggoner Ranch when they were drilling for water. The Ranger Field in Eastland County was discovered in 1917 and the Burkburnett Field was discovered in 1919. Another major exploration was begun when oil was discovered in the Panhandle in 1921. More oil discoveries were made through the 1920s and the big discovery by C. M. (Dad) Joiner in 1930 took place in Rusk County in East Texas. As these other major oil fields were discovered, many established Texas towns flourished with incredible growth and new towns were also developed. The discovery of oil triggered a flood of speculation in the area. The "boom" included the rush of hundreds of wildcatters looking for a piece of the action and thousands of people looking for jobs. This onslaught of humanity was followed by the need for a huge increase in services, supplies of all kinds, and oil-related manufacturing and industries – pipelines, oil-field equipment, storage facilities, refineries and transportation. The economy of Texas would never be the same.

The majority of the "boom" areas were small farming communities near oil discoveries and the infrastructures of these communities were inadequate to handle the demands of population increases with such major proportions. There were few lodging establishments available and few places to eat. People lived in hastily constructed shacks or slept in their cars. There were long lines everywhere – and the opportunities for economic gains (profits) were plentiful. Many new economic activities developed as a result of these discoveries.

References:


Handbook of Texas Online: keyword oil.

**Economic Reasoning**

This lesson will examine the law of supply (the ability and willingness of industries to produce products) and demand (the desire and ability of consumers to buy products) using the boomtown (a city of rapid economic growth attracting many new residents) phenomena resulting from the discovery of oil as a base. Students will discuss economic terms such as goods, services, and profit. They will explore motivations that lead to entrepreneurship and study the relationship between demand for goods and services and the rise in prices. (See economic terms listed in the glossary for more information on the concepts above.)

**TEXAS ESSENTIAL KNOWLEDGE AND SKILLS**

4.12B Describe how the free enterprise system works in Texas
4.13C Analyze the effects of immigration, migration, and limited resources on the economic development and growth of Texas
4.13A Explain how people in different regions of Texas earn their living, past and present
4.14B Identify oil and gas, agricultural, and technological products of Texas that are purchased to meet needs in the United States and around the world
4.4B Explain the growth and development of the cattle and oil industries
4.5A Identify the impact of various issues and events on life in Texas such as urbanization, increased use of oil and gas, and the growth of aerospace and other technology industries
4.21A Identify famous inventors such as Gail Borden, Joseph Glidden, and Patillo Higgins and their contributions
4.22A Differentiate between, locate, and use primary and secondary sources such as computer software; interviews; biographies; oral, print, and visual material; and artifacts to acquire information about the United States and Texas
4.22B Analyze information by sequencing, categorizing, identifying cause-and-effect relationships, comparing, contrasting, finding the main idea, summarizing, making generalizations and predictions, and drawing inferences and conclusions
4.22D Identify different points of view about an issue or topic
4.22E Identify the elements of frame of reference that influenced participants in an event
4.23C Express ideas orally based on research and experiences

**ECONOMIC CONCEPTS**

Supply and Demand, Goods and Services, Boomtown, Price, Production, Profit, Entrepreneur
HISTORICAL CONCEPTS
Economic impact of the oil industry, Migration of population, Patillo Higgins

CRITICAL QUESTIONS
1. What are limited resources?
2. Why was the discovery of oil so important to the economy of Texas?
3. What is the relationship between supply and demand and the increase/decrease of prices?
4. How does an economic problem—i.e. an increase in demand for a product or service—impact people’s creativity and entrepreneurship?
5. What happened to the population of an area after oil was discovered?

LESSON DESCRIPTION
In this lesson, students will examine events from “boomtown” experiences following the discovery of oil in Texas communities. Students will look at the factors of increased demand on limited supplies of goods and services and examine the relationship between price and quantity. They will analyze photographs of early oil communities to understand the enormous growth that the oil industry produced.

TIME REQUIRED
One to two class periods

MATERIALS
Student Handout 1 — Description of Beaumont after Spindletop and Oral History Interview
Student Handout 2 — Description of Beaumont after Spindletop and Houston Daily Post Excerpt
Student Handout 3 – Excerpt from Galveston Daily News and Oral History Interview
Transparency Master 1 – Three Pictures – Towns after the oil boom
Transparency Master 2 — Lucas Gusher blew on January 10, 1901

PROCEDURES
1. Ask students to brainstorm what goods and services would be needed in a community that was experiencing tremendous population growth in a very short amount of time. Students should list essential things like food, shelter (housing), water, etc. Use the following data to stress that some Texas communities grew very rapidly in a very short amount of time.
   • After the discovery of Spindletop, the town of Beaumont grew from a city of 9,000 to a population of 50,000 within three months.
• Before oil was discovered in Breckenridge, the population was around 600 (1918). By mid-1919, the population had grown to 30,000 people.

• In February of 1931, Longview had a population of 5,000. After the first oil discovery, the population doubled within two months.

Discuss the term “Boomtown”.

2. Have the students identify those things on their brainstorm list that would be considered goods (things we can use, touch, and see). Then ask them to identify things that would be considered services (activities people perform for others). After the students’ lists have been generated, ask them to rank order those items from each list that they would consider most important.

3. Show the students the photos on Transparency Masters 1 and 2 to help the class visualize Spindletop and the large number of oil rigs found in “Boomtowns” in Texas. Additional pictures of Texas towns with oil discoveries can be downloaded from the Library of Congress web site. Go to http://lcweb.loc.gov/. Select “American Memories”, click on “Search” and type in “oil fields in Texas”.

4. Divide the class into three groups. Give each group handouts of the readings from the boomtown experiences (Student Handouts 1, 2 and 3). Note: Each student can examine two of the readings and share information with other group members. Teachers may want to introduce some of the vocabulary in advance.

5. Using the information provided, each group will answer the following questions:
   a. Based on the readings, what evidence do you see of goods or services that have a limited supply?
   b. What factors caused an increased demand for goods and services?
   c. What occupations developed as a result of the sudden increase in population after the discovery of oil?
   d. Examine the lists generated by the class of the most important goods and services that are needed. Are the important goods and services listed by the class the same as those indicated in the readings?
   e. Give examples from the readings of entrepreneurship. Can you find examples of profit motives in the readings? If so, what?

CLOSURE

Review the definitions of supply and demand and the relation with rising and falling prices. Ask students to think about the role of the oil industry in Texas. Explain in a class discussion the continued importance of oil in our state.

EXTENSION

1. Ask students to research the history of specific communities during the boom periods after the discovery of oil. A good source of information is the Handbook of Texas online — http://www.tsha.utexas.edu/handbook/online/ /index.new.html Communities that might be included: Beaumont, Sour Lake, Batson, Saratoga, Longview, Kilgore, Tyler, Gladewater, Joinerville, Corsicana, Ranger, Breckenridge,
Cisco, Desdemona, Wichita Falls, Electra, Burk Burnett, Borger, Pampa, Amarillo, Snyder, Colorado City, San Angelo, Mexia, Midland, Odessa, Kermit, Wink, McCamey, or other boomtowns.

2. Have students create a map labeling the oil discoveries in Texas.

3. Research the role of the oil industry in Texas today. Discover how much business in Texas is related to the oil industry.

SUGGESTED ADDITIONAL RESOURCES


Handbook of Texas Online  http://www.tsha.utexas.edu/handbook/online/


Description of Beaumont after Spindletop

"Beaumont looked like circus day, every day, with map vendors and peddlers of souvenir bottles filled with oil crying their wares; ...."

Lines in front of cafes were a block long; grocery stores never closed; in fact, night and day meant little, for men would set out at midnight with lanterns to search for "gas bumps" and indications of oil. Unable to find a place to sleep, two men bought a mattress and placed it on the sidewalk on the principal street. A man, flipping through a roll of $100 bills, came across a "ten-spot," which he tore up with the remark, "Small change, what are you doing here?" A woman who owned a little truck patch and a few hogs for which she hauled slop from town in two barrels on a dilapidated wagon leased her land for a fortune. ...."


Excerpt from: Oral History Interview, H. P. Nichols.

"Those who were at Beaumont in the early days will recall the trouble of finding a place to rest. My first three nights in Beaumont left an indelible impression upon my mind. I paid three dollars per night to sleep in the loft of Broussard's livery barn. The bed consisted of a limited amount of straw, covered with a tarpaulin. It was a democratic bunch of men that roosted in Broussard's stable. Millionaires and working men tried to get a few hours of sleep. . . .

In visiting the joints, I met a young fellow by the name of James, and he suggested that I talk with his mother about a roosting place. I made a deal with Mrs. James. I could sleep in her back hall at two dollars per night, if I would furnish cot and so forth, fold it, and store the cot . . . on the back porch each morning. No extra charge was made or credit granted for the horde . . . of mosquitoes. I had to go to a neighborhood barbershop each morning to wash my face, but to eliminate this slight inconvenience; I invested in towels and washed under the outside city water tap.

The city water of Beaumont back in those days was soupy. Its odor clearly indicated the presence of alligators, bullfrogs, and fish. Everyone soon learned if the water was used for drinking purposes that it caused severe stomach cramps, or what was locally known as Beaumonts. Toilet facilities being limited, a bad case of Beaumonts called for biddings as high as fifty centers for the immediate use of a toilet. We didn't have pay toilets in those days. Most of them were outside. Later, I bought water for drinking purposes. My recollection is that water was brought into Beaumont by barge, from some point up the Neches River.

Description of Beaumont after Spindletop

"Men walked the streets or slept in the sawdust piles at the mills because they could find no other accommodations. Every one of the squalid little hotels was filled to capacity. No man had a room alone. Every hotel room had from four to twenty cots, and the halls and lobbies were lined with cots or bare mattresses. Men slept on pool tables, in barber chairs, on rooftops, in pup tents . . . and in lean-to shacks made of flimsy lumber. They slept on porches, in store windows, and wherever they could find a place to lie down.

There might have been a dozen baths in Beaumont’s hotels, but no one recalls them. Men who had been reared to fastidious surroundings went for weeks without bathing rather than use the filthy tubs in barber shops.

Beaumont’s cistern water was not potable. Doctors warned the thirsty to drink whisky or boiled water. This led to a new business. On street corners vendors were selling boiled water out of washtubs for a nickel a drink and gallon jugs for $1.

... Many families opened soup kitchens on their porches.”


Excerpt from: “The Sour Lake Oil Field,” Houston Daily Post, June 7, 1903.

... Property in the “Old Townsite” has advanced with wonderful strides within the past ninety days. City lots could have been bought in this tract some eighty or ninety days ago for from $300 to $500. Those fortunate enough to hold on are reaping the benefit of the high prices at $3,000 per lot, measuring fifty by ninety feet, and there is a strong probability of all this property coming in as proven territory, the prices will doubtless reach as high as $10,000 or more per lot.

... Owners of property on the boulevard are renting the ground to merchants for the purpose of erecting stores at $700 per annum, payable in advance and reserving the right to eject the renters from their premises and moving the houses to make room for the derricks without warning ....

**Excerpt from: “Sour Lake Doings,” Galveston Daily News, July 24, 1903.**

“...It is interesting to see how these men can adapt themselves to the conditions that be, while waiting for better facilities, accommodation and conveniences. The tents supplanted the open-air camps. Now clean buildings are taking the place of tents and a little later on, more expensive structures will knock the cheap buildings out and each change in the methods of living and doing business has been an improvement. In certain sections of town, the numerous places which furnish sleeping apartments and shelter, restaurants, law and real estate offices, eating stands, dry goods stores, etc., look somewhat like a military encampment. In the streets also are many novel sights, such as piles of lumber, portable lunch wagons, all kinds of vehicles [that is, carriages, wagons and buggies], trash, debris, etc., and of course, those that come to see the crowds of people that swarm here day and night . . . can appreciate the real situation and understand why board, rents, and everything else have been so high . . .

...As the freight train comes in, it looks like some big curiosity shop as it discharges its loads of lumber, iron safes, household and kitchen furniture, dry goods, groceries, fruits, melons, chickens and various other articles too numerous to mention. In short, the whole situation is one of interest and the scene of one of rushing activity.


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**Excerpt from: Oral History Interview, James Donohoe.**

“The Caledonia Boarding House was a two-story house. It was run by a Scotsman by the name of Simpson. There was some ten or twelve rooms for sleeping, and the rooms were about twelve feet long and about eight feet wide and the furniture consisted of two cots, and it you had a suitcase and other things, you had to put it under the bed. Then, if it was a bad rainy night or daytime, you would lay there in bed and dodge the raindrops from the leaks. There was mud in the front of the boardinghouse and all around, and when they went to sweep the floor, they taken a hoe and raked the mud out of the dining room.

Twenty-six dollars a month was the regular rate for room and board. I was drawing ninety dollars a month. And I might say the buying power of a dollar then was much greater than now. They served good, substantial food for workingmen, but I cannot say as to how well cooked and how clean it was. It was not.

And the sanitary conditions was terrible. No sewers, nothing. And I have seen in the ditches and along the pathways and wherever low places would be water, and that water would lay there until a green scum would come over it. I have often wondered why we all didn’t die of the cholera. And no screens, and flies by the billions. No protection at all.”

Burkburnett, Texas, January 20, 1919

Ranger, Texas (May 14, 1919)

West End, Burkburnett Oil Field, 1919
The Lucas Gusher blew on January 10, 1901, on Sour Springs Mound in the now famous Spindletop oil field.
LESSON 11

FOOD AND FIBER - MAKING A LIVING
IN TEXAS THROUGH AGRIBUSINESS

INTRODUCTION

Cotton, sorghum, rice, wheat, corn, rye, oats, barley, sugar cane, hay, peanuts, soybeans, sunflowers, flaxseed, onions, carrots, potatoes, cantaloupes, honeydews, cabbage, broccoli, watermelons, tomatoes, bell peppers, sweet potatoes, spinach, cucumbers, beans, grapefruit, oranges, peaches, apples, pears, apricots, plums, blackberries, strawberries, blueberries, avocados, pecans, sheep, cattle, goats, horses, hogs, poultry, eggs...all these products are grown or raised somewhere in Texas, making Texas one of the leading and most diverse agribusiness states in our nation.

Although Texas is an urban state, agriculture has always been, and currently remains, important to the state’s economy. Some of the early Native American tribes developed agricultural practices, which allowed them to become permanent residents of an area, rather than relying on hunting and gathering for survival. This was particularly true in the Jumano tribe of West Texas, and the Caddos of eastern Texas. The Spanish and Mexicans who moved to Texas when it was under Spanish, and later Mexican, control, were mostly farmers or ranchers. The first European and American settlers in the nineteenth century primarily made their living in agricultural businesses - either growing crops, raising livestock, or transporting agricultural products to market. The inexpensive, fertile land offered by land grant empresarios lured the first Anglo settlers to Texas. These immigrants to Texas became agricultural entrepreneurs themselves. Initially, corn was the primary crop for both man and livestock. If the weather cooperated, farmers were able to harvest two crops a year. The prospects of raising cotton also attracted settlers to Texas early in the nineteenth century. The cotton-plantation system, concentrated in south central Texas on the lower Colorado, Brazos, and Trinity rivers, generated much of the state’s agricultural production before the Civil War. Cotton production rose from 58,000 bales in 1850 to over 431,000 bales in 1860. Numbers of slaves grew from 58,161 to 182,566 in the same period, while the total population approximately tripled, from 212,592 to 604,215. However, although slaves made up one-third of the Texas population in 1860, the impact on farm development was still limited, since only five percent of the population owned slaves, and 60 percent of those planters controlled less than six slaves. Nearly half of all slaves worked for about 2,000 planters, who made up ten percent of all slave owners. The primary export during this time period was cotton; cattle were second. In northern Texas and along the western frontier, settlers began to grow wheat. Gulf Coastal farmers began growing sugar cane; cotton farms continued to thrive and grow. The cattle industry and raising sheep also grew in the mid nineteenth century.

During the Civil War, agricultural growth halted, but again developed strength toward the end of the nineteenth century. Technological advancements such as the invention of barbed wire and the introduction of railroads throughout Texas helped advance the cattle industry immensely.

With the spread of railroads, and later the development of a road system, marketing agricultural products to other areas became viable, and agriculture in Texas began changing
from a system that was mainly subsistence, to one that was primarily commercial. Author Garry Nall states that from 1870 to 1930 “technological and scientific advances increased the productive potential on farms over the state. Improvements of animal-drawn plows, planters, drills, cultivators, headers, and binders, as well as the introduction of steam and gasoline tractors, added to the amount of acreage an individual farmer could handle. The distribution of improved seeds and plants heightened crop yields. Along with the extension of railroads, the construction of roads and highways as automobiles and trucks became available expanded transportation opportunities.”

Farmers continued to grow corn and cotton, but other crops also were grown in different parts of Texas. Oats, sorghum, sugar cane, and wheat were started as commercial crops. Commercial production of rice began in southeastern Texas in 1886, and by 1912, Texas was the second largest rice-growing state in the nation. In South Texas land promoters began campaigns to attract financial investors to the lower Rio Grande Valley. With mild winters, fertile soil, and available irrigation water from the Rio Grande, the area became one of the state’s most productive farm regions. The development of agribusiness in “the Valley” increased quickly after the introduction of irrigation in 1898 and the building of railroads in the area in 1904. Oranges, grapefruit, and other citrus fruits began being grown commercially in the lower Rio Grande Valley, and “truck farming” - the growing of vegetables for commercial sale - also developed, both in the lower Rio Grande Valley and also in eastern Texas. Potatoes, onions, tomatoes, lettuce, beets, and spinach were among the truck crops that became economically valuable for farmers. The development of other orchards began in the late nineteenth century as well. Orchards of peaches, apples, and other fruits grown in eastern Texas became possible economically after the invention of the railroad refrigerator car in 1893. Pecan orchards developed in central Texas, and this area quickly became a leading pecan-growing region in the nation.

Although the depression years and the Dust Bowl era brought hardships to Texas farmers as well as all industries, agribusiness continued to be important to Texas economy. Although the trend currently is fewer farm units and a much smaller rural population, the average size of a farm unit is now much larger, and due to increased mechanization and technology, crop and livestock earnings have increased. The combine, capable of doing the work of many machines while harvesting crops, helped increase wheat, grain, sorghum, corn, and soybean production in Texas, and also greatly increased farmers’ efficiency. In addition, machines for harvesting hay, spinach, potatoes, beans, sugar beets, pecans, peanuts, and other crops reduced a lot of the labor requirements for farmers. The use of mechanical cotton harvesters beginning in the 1940s also represented a major breakthrough in production. Increased use of fertilizers, the use of irrigation where needed, and use of herbicides and pesticides to control weeds and insects all have contributed to higher crop yields.


Handbook of Texas Online: keyword Agriculture


Economic Reasoning

Students need to understand that agribusiness is still a major source of economic revenue in Texas. Although the earliest farmers were subsistence farmers, agribusiness now is primarily commercial. Because of the use of technological advances and efficient use of the natural resources of Texas, the state still exports many crop and livestock products today. (see economic terms in the glossary for more information about the concepts listed above)

TEXAS ESSENTIAL KNOWLEDGE AND SKILLS

4.13A Explain how people in different regions of Texas earn their living, past and present
4.13B Explain how geographic factors have influenced the location of economic activities in Texas
4.13E Explain how developments in transportation and communication have influenced economic growth of Texas
4.14B Identify oil and gas, agricultural, and technological products of Texas that are purchased to meet needs in the United States and around the world
4.9A Describe ways people have adapted to and modified their environment in Texas, past and present
4.9B Identify reasons why people have adapted to and modified their environment in Texas, past and present, such as the use of natural resources to meet basic needs
4.22B Analyze information by sequencing, categorizing, identifying cause-and-effect relationships, comparing, contrasting, finding the main idea, summarizing, making generalizations and predictions, and drawing inferences and conclusions
4.22C Organize and interpret information in outlines, reports, databases, and visuals including graphs, charts, timelines, and maps
4.22A Differentiate between, locate, and use primary and secondary sources such as computer software; interviews; biographies; oral, print, and visual material; and artifacts to acquire information about the United States and Texas

ECONOMIC CONCEPTS

Exports, Natural resources, Entrepreneur, Subsistence, Commercial

HISTORICAL CONCEPTS

Settlement periods of Texas, Rural life in Texas, Development of Agribusiness in Texas
CRITICAL QUESTIONS
1. What are the primary crops and livestock grown and raised in Texas?
2. In which regions of Texas are these crops and livestock grown and raised?
3. What natural resources in various parts of Texas were important in choosing which crops or livestock to grow or raise?
4. How did agribusiness develop in Texas over time?
5. Why were farmers able to change from being subsistence farmers to commercial farmers?
6. What technological and mechanical advancements helped to increase agricultural output and profit?

LESSON DESCRIPTION
Students will learn about the diversity of agricultural products grown and raised in Texas. They will compare special purpose maps of Texas regions and agricultural products to draw conclusions about why certain crops are grown where they are. They will read and interpret charts about various agricultural products to determine the changes in agriculture in Texas over time.

TIME REQUIRED
Two to three class periods

MATERIALS
Student Handout 1 - list of crops and livestock raised in Texas
Student Handout 2 - Texas Agriculture Facts
Student Handout 3 - Texas Crop Production Facts
Student Handout 4 - Changes in Texas Agriculture over the Years
Student Handout 5 - An Unusual agribusiness opportunity in Texas
Transparency Master 1 - Why Agriculture is Important in Texas
Student Activity Sheet 1 - Summarizing learning

PROCEDURE
1. Ask students to brainstorm crops and livestock they think are currently grown or raised in Texas. Record student responses. Distribute Student Handout 1 for students to use to compare their list with actual crops grown in Texas. Be certain students understand the wide variety of crops grown in our state. It may be necessary to help some students learn what certain crops look like and are used for.

2. Use the following website to locate more information on crops that are grown in Texas, and locations where they are grown: http://www.lib.utexas.edu/maps/atlas_texas/agricultural_regions_tx.jpg
3. If available in your student textbooks or on a large wall map of Texas, you can also use special purpose maps to obtain information about crop distribution. Help students to connect and understand the reasons certain crops were grown in different regions of Texas. Connect natural resources, natural vegetation, precipitation levels, availability of water from rivers to irrigate, etc. to the development of various crops.

4. Use the information given in the introduction section of this lesson to discuss with students the importance and development of agribusiness in Texas over the years. Read and discuss the quotation on Transparency Master 1 and the data on Student Handouts 2 and 3 with the students to help them understand the importance of agriculture to Texas' economy.

5. Discuss the difference between subsistence farming and commercial farming. Using information in the introduction section of this lesson, discuss the changes that technological and mechanical advances brought to agribusiness in Texas. Create a chart of these changes together as they are discussed.

6. Use the following website to show the changes in agribusiness population from 1930 to 1970: http://www.lib.utexas.edu/maps/atlas_texas/agricultural_employment_jpg.

7. Read and discuss the information in the chart on Student Handout 4 to help students understand more about changes in agriculture over time.

**CLOSURE**

Ask students to use the resources from this lesson to summarize their learning and complete the answers to the questions on Student Activity Sheet 1. Read and discuss answers together following completion.

**EXTENSION**

1. Research fruit and vegetables grown in Texas. A good site for students is the Kid's Corner site at the Texas Department of Agriculture's website: http://www.agr.state.tx.us/picktexas/kc/kc_bios_2.htm. At this site, students can learn interesting facts about many Texas fruit and vegetable crops. Ask students to choose a crop, read about it on this website, and then report to the class by creating a poster advertising the benefits of the crop and some of its interesting facts as well.

2. Have students create their own product maps of crops grown in Texas.

3. Write a paragraph from the point of view of a Texas farmer who has been farming since the 1940s. Explain changes that have been made in the farming procedures from the 1940's to the present.

4. Read the information on Student Handout 5 about alligator farming. Research and report to your class about other unusual farming opportunities in Texas.
Suggested Additional Resources

These two children's books are very good to help students understand how agricultural economics affects the daily life of rural people:

Locker, Thomas. *Family Farm*. NY: Dial Books, 1988. The family farm has encountered economic difficulties so the family uses the idea of selling pumpkins and flowers to supplement their income and milk sales.

TEXAS AGRICULTURAL PRODUCTS

Apples               Oranges
Apricots            Peaches
Avocados           Peanuts
Barley             Pears
Beans              Pecans
Blackberries      Peppers
Cantaloupes       Plums
Carrots           Potatoes
Cattle            Poultry
Corn              Rice
Cotton           Rye
Cucumbers        Sheep
Eggs              Shrimp
Fish             Sorghum
Flaxseed         Soybeans
Goats            Spinach
Grapefruit       Squash
Grapes           Strawberries
Hay              Sugar Cane
Hogs             Sunflowers
Honeydew Melons  Sweet Potatoes
Horses           Tomatoes
Lettuce         Watermelons
Oats             Wheat
Onions

References:

TEXAS AGRICULTURE FACTS

• In 1940, approximately 23 percent of Texans were producers on farms and ranches and 17 percent were employed in agricultural processing and distribution.

• In 1995, 2.4 percent were producers on farms and ranches and 20 percent were involved with agricultural marketing or services.

• From 1970 to 1998, the only sector to lose jobs in Texas was farming. However, this decline is in part the result of improvements in technology and farm management practices which has resulted in the need for fewer workers.

• In 1997, there were 129,620,045 acres of land in farms. The number of farms increased from 1992 to 1997 from 180,644 to 194,301.

• The number of full time farmers decreased by 3 percent from 85,937 full time farmers in 1992 to 83,284 full time farmers in 1997.

• The average size of a Texas farm in 1992 was 725 acres, in 1997 the average size was 676 acres.

• According to a study conducted in 2000 by Texas A&M University, approximately 80 percent of Texas farms and ranches are less than 500 acres, and the state is losing farms and ranches between 500 and 2,000 acres —these “mid-size” farms and ranches are responsible for “bread and butter” agriculture production in the state.

# SELECTED TEXAS CROP PRODUCTION IN 2000
Adapted from page 595, Texas Almanac, 2003

<table>
<thead>
<tr>
<th>Crop</th>
<th>Harvested Acres (in thousands*)</th>
<th>Yield per Acre</th>
<th>Unit</th>
<th>Production (in thousands*)</th>
<th>Value (in thousands*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn</td>
<td>1,900</td>
<td>124</td>
<td>Bushels</td>
<td>235,600</td>
<td>$506,540</td>
</tr>
<tr>
<td>Upland</td>
<td>4,400</td>
<td>431</td>
<td>Pounds</td>
<td>3,950</td>
<td>$974,544</td>
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<tr>
<td>Cotton</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Hay</td>
<td>4,120</td>
<td>2.16</td>
<td>Tons</td>
<td>8,880</td>
<td>$607,560</td>
</tr>
<tr>
<td>Oats</td>
<td>100</td>
<td>43</td>
<td>Bushels</td>
<td>4,300</td>
<td>$6,665</td>
</tr>
<tr>
<td>Peanuts</td>
<td>250</td>
<td>2,700</td>
<td>Pounds</td>
<td>675,000</td>
<td>$153,225</td>
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<tr>
<td>Potatoes</td>
<td>17.1</td>
<td>304</td>
<td>Hundred weight</td>
<td>5,196</td>
<td>$52,277</td>
</tr>
<tr>
<td>Rice</td>
<td>214</td>
<td>6,700</td>
<td>Pounds</td>
<td>14,342</td>
<td>$82,467</td>
</tr>
<tr>
<td>Sorghum</td>
<td>2,350</td>
<td>3,416</td>
<td>Pounds</td>
<td>80,276</td>
<td>$258,030</td>
</tr>
<tr>
<td>Soybeans</td>
<td>260</td>
<td>27</td>
<td>Bushels</td>
<td>7,920</td>
<td>$30,537</td>
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<tr>
<td>Sunflowers</td>
<td>45</td>
<td>778</td>
<td>Pounds</td>
<td>35,000</td>
<td>$3,616</td>
</tr>
<tr>
<td>Sweet</td>
<td>5.1</td>
<td>45</td>
<td>Hundred weight</td>
<td>230</td>
<td>$4,117</td>
</tr>
<tr>
<td>Potatoes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Winter Wheat</td>
<td>2,200</td>
<td>30</td>
<td>Bushels</td>
<td>66,000</td>
<td>$168,300</td>
</tr>
</tbody>
</table>

*This means to add three zeroes to the numbers to get the real numbers

Example #1: the chart says 1,900. That means 1,900,000 acres. Example #2: $506,540 means $506,540,000.

Example #3: 66,000 means 66,000,000 bushels
CHANGES IN AGRICULTURE IN TEXAS

"THEN"

Mules and horses used to sow and plow

Human manpower used to pick cotton

Crops used primarily by those who grew them (subsistence farming)

Cattle taken to market on long cattle drives

Any irrigation used was taken from nearby rivers or streams

In 1935: 501,014 farms in Texas

In 1935: 59% of Texas population is rural

In 1935: average size of a Texas farm = 275 acres

In 1940: crop and livestock sales = $367 million

"LATER"

Tractors used to sow and plow

Mechanical pickers used to harvest cotton

Crops grown primarily to sell to other people (commercial farming)

Cattle taken to market in railroad cars or by truck

Irrigation widespread, using water pumps that draw water from underground sources

In 1980: 186,000 farms in Texas

In 1980: 17% of Texas population is rural

In 1980: average size of a Texas farm = 744 acres

In 1980: crop and livestock sales = $10 billion

DID YOU KNOW?

Would you like to be an entrepreneur in agribusiness but have a different type of farm than most other Texans in the agribusiness industry?

Why not become an alligator farm owner!

Did you know that alligators have NOT been considered endangered or even threatened since 1983? Texas is home to about 200,000 alligators living in the wild.

Did you know that Texas has the third largest number of alligator farms in the country? Only Louisiana and Florida raise more alligators than Texas!

Did you know that Texas had 29 licensed alligator farms in 2003? These farms had over 44,000 alligators in captivity!

Did you know that alligator farming is a $10 million dollar business in Texas? Alligator farmers sell alligator hides and products made from the hides, such as boots, purses, belts and other items.

Did you know that the first Texas alligator farm was started in Rockport in 1986? In 2001, Texas alligator farmers sold hides from 20,806 alligators, while in 2000, 28,775 alligator hides were sold. The number in 2001 was lower because two large alligator farmers decided to make their farms better, decreasing production for a few years while they improved and modernized their facilities.

### Texas Alligator Farms

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Alligator Hides Sold</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>20,806</td>
</tr>
<tr>
<td>2000</td>
<td>28,775</td>
</tr>
<tr>
<td>1999</td>
<td>28,349</td>
</tr>
<tr>
<td>1998</td>
<td>24,017</td>
</tr>
</tbody>
</table>

WHY AGRICULTURE IS IMPORTANT IN TEXAS

Texas agriculture is a powerhouse of production. Texas is the nation’s second-leading state in agricultural production. The state’s agricultural industry is as diverse as the land that produces our supply of grains, fruits, vegetables, natural fibers and livestock. Agriculture in Texas is also an important mainstay of the economy. One in five working Texans is employed in some form of agriculture. Agricultural products add about 14 billion dollars to the state’s economy, making agriculture the second largest industry in Texas. For every dollar spent on agricultural products, more than three dollars are pumped into other parts of the economy – generating 80 billion dollars a year. Texas is the nation’s leader in the production of cotton, cattle, sheep, goats, wool, mohair and hay. It is also one of the nation’s major exporters of agricultural products. Texas ranks sixth among the states in the value of its agricultural exports. It exported 2.5 billion dollars’ worth of agricultural products in 1999 and created 39,000 jobs in the state.

Reference: Texas Department of Agriculture Website: http://www.agr.state.tx.us/about/intern/adm_ag_info.htm
Use the information your teacher and classmates have discussed, plus the information on your handouts from this lesson. Answer the questions carefully. Be sure to proofread!

1. Texas produces (makes, raises, or grows) a lot of products! Farmers in Texas grow or raise more of several products than any other state! Name at least two agricultural products that Texas leads the US in producing:

2. What are two reasons that Texas farmers can produce more products now, even though there are less farmers than there used to be in our state?

3. What is subsistence farming?

4. What is commercial farming?

5. What replaced mules and horses as the way to plant and plow fields of crops?

6. According to the information on Student Handout 3, which Texas crop had the highest sales value?

7. According to the information on Student Handout 3, which Texas crop had the most harvested acres?
LESSON 12

FLYING HIGH: AERONAUTICS AND AEROSPACE INDUSTRIES OF TEXAS

INTRODUCTION

During the last half of the twentieth century, Texas changed from a rural and agricultural state to an urban, industrial one. Enterprises that developed strongly in Texas included the aeronautics and aerospace industries. All types of aircraft, from small one-man planes to vehicles capable of landing on the moon, have been manufactured in Texas, and several major commercial airlines have started in our state. Long before the space age began in 1957, Texas played an important part in the development of American military aviation and aircraft technology. In 1910, a Frenchman named Louis Paulhan made the first airplane flight in Houston, Texas. Several people built their own airplanes and several flights took place in the state before World War I. Two women from San Antonio, sisters Marjorie and Katherine Stinson, became well known pilots. When the United States entered World War I, many military flight schools were located in Texas. Texas had good weather and level ground, which made it a good choice for training sites. A complex of army airfields, later called air force bases, surrounded San Antonio, and Randolph Field was known as the "West Point of the Air." During the war, other military installations were built in the state. For example, the United States Air Force School of Aviation Medicine at San Antonio grew into the nation’s outstanding acromedical center and became a center for the new field of space medical research and applications.

New technology brought airplanes and airports to Texas. Love Field in Dallas had begun as a World War I pilot-training field. After the war, barnstormers occupied the field, and National Air Transport, now United Airlines, began to transport airmail from it in 1926, and passengers in 1927. Dallas took over the airport two years later and built a terminal for passengers. This pattern was typical of the larger cities as air transportation began to spread across the state. Commercial airlines such as Braniff Airways and American Airlines were soon added. Passenger service among Dallas, Fort Worth, San Antonio, Houston, and Galveston started as early as 1928.

World War II really launched industrialization in Texas. The state's climate, its powerful leaders in the Democratic party, and its abundance of petroleum encouraged the location of military posts, the growth of the construction business, and the rise of defense industries. During World War II fifteen military bases were constructed in Texas, as well as forty airfields, plus a naval air station at Corpus Christi. North American Aviation in Dallas and Convair in Fort Worth employed 60,000 people to construct B-24 bombers. As a result of all of this the state population jumped 20 percent and the large cities - Houston, Dallas, Fort Worth, San Antonio - doubled in population. In the 1940s Austin, with nearby Bergstrom Air Force Base, also doubled in population.

Although aircraft manufacture did not begin in Texas until 1940, World War I repair shops operated in the state and successfully rebuilt airplanes. In May 1939 the Southern Aircraft Corporation was established in Houston, and in July 1940 this plant completed its first plane, a biplane designed for use as an army trainer. During the same year, the Hall-Aluminum
Aircraft Corporation announced plans for a $5 million plant to be constructed near Dallas, the Bennet Aircraft Company opened a plant near Fort Worth, the Worth Garment Company bought and moved to a plant near Fort Worth the equipment of the Roos Aircraft Company of Kansas City, work began at Hensley Field, Dallas, on the $7 million North American Aviation factory, and Southern Aircraft began building a plant near Garland. In 1941 they moved from Houston and began production of military primary-training planes. Also in 1941 the Consolidated Aircraft Corporation announced plans for the construction of a $10 million plant near Fort Worth to construct four-motor bombers. This was, at the time, one of the largest factories of any kind in the world, and more than doubled the number of industrial wage earners in the Fort Worth area.

By the close of 1941 six companies supplied parts and equipment for aircraft factories in the Dallas-Fort Worth area. The Hughes Tool Company at Houston manufactured bomber parts for nationwide distribution. Workers at these plants came from all over the nation. Industrial-training schools emphasizing aircraft techniques were operated at Texas colleges and universities as well as at factories themselves. In 1944 the United States Army established an Air Defense Center for guided missiles at Fort Bliss near El Paso. The missile center and its test range were subsequently used to test German rockets, mainly V-2 missiles, captured at the end of the war.

Some decreases in Texas aircraft manufacture occurred in the immediate postwar years, as most aircraft factories and supplemental equipment companies were converted to peacetime production on a smaller scale of operation. Chance-Vought, one of the four divisions of United Aircraft, Incorporated, took over the North American plant in May 1949 to produce and experiment with jet aircraft. The Texas Engineering and Manufacturing Company was organized to use the facilities of what by then had become one of the world’s largest centers of aircraft production, and in 1950 Lawrence Bell established Bell Helicopters, the world’s first plant specifically designed to manufacture helicopters.

In the 1950s, millions of federal dollars were funneled to Texas in development and fabrication contracts to such firms with large Texas plants as the General Dynamics Corporation, the Boeing Company, and Texas Instruments. During this decade the space industry came to Texas in the form of manufacture for military rocket projects, ballistics research, and testing at the United States Navy’s Daingerfield Ordnance Test Facility and research into the psychophysiological conditions of space flight at San Antonio. Aircraft manufacture added significantly to the Texas economy.

The growth of air travel for both passengers and freight helped the state’s economy. Houston Intercontinental Airport opened in 1969. Dallas-Ft. Worth International Airport began serving passengers and freight planes in 1974. The new technology surrounding air travel allowed people to travel more cheaply and faster. The industry also provided employment for thousands of employees.

By the 1960s aircraft manufacturing had grown tremendously and was located chiefly in North Texas, particularly in the area of Grand Prairie, Richardson, Hurst, Euless, Arlington, and Fort Worth, an area that ranked second only to the entire state of California in aircraft production. Other aircraft-manufacturing enterprises or their subsidiaries could be found in Bexar, Cameron, Harris, Harrison, Hunt, Kerr, McLennan, Medina, Stephens, and Young counties. Aircraft manufacture in the 1960s ranked sixth in the state in number of employees, sixth in payroll accounts, and eighth in value added by manufacturing. In 1967
sixty aircraft-manufacturing establishments operated in the state, employing 58,000 workers; 50,900 workers were employed in aircraft manufacturing in 1986.

The National Aeronautics and Space Administration decided in September 1961 to locate its Manned Spacecraft Center in Houston. The center was planned as the command post for the national effort to send men to the moon, and marked the culmination of the growing identification of Texas with the development of atmospheric and extra-atmospheric transport. The first impact of the center was felt by industry primarily in the Houston area, but cities all over the state have benefited from the attraction this facility has for supporting industries. In the 1990s NASA cooperated with other agencies to explore outer space, firms like Space Services Incorporated in Houston developed privately funded rocket launchers and other innovations, and area universities developed programs relating to needs of the industry. These included the Rice University Department of Space Physics and Astronomy and the University of Houston Space Vacuum Epitaxy Center and Institute for Space Architecture, working to support the space shuttle mission and establish the nation’s first permanent space station.

Manufacturing is not the only aspect of the aeronautics economy supporting Texans. The service side of aeronautics is also very important to the economy of Texas. Air transportation is a vital part of Texas’ economy, and the state’s airport system is one of the busiest and largest in the country. There are over 50,000 active pilots in Texas. In 1999, service at 27 Texas airports served over 66 million passengers. Some major airports are Dallas/Ft. Worth International, Dallas Love Field, Houston George Bush Intercontinental, and Houston William B. Hobby Field. These four airports account for over 80 per cent of all flights in and out of Texas. San Antonio and Austin also have large numbers of air related employees.

Several Texans have been influential in the development of the aeronautics industry. Bessie Coleman, nicknamed Brave Bessie or Queen Bess, was the world’s first licensed black pilot. Born in Atlanta, Texas, on January 26, 1892, Bessie grew up in Waxahachie. In 1920 Coleman, acting on a lifelong dream of learning to fly, traveled abroad to attend aviation school in Le Croy, France, after she discovered that no American school would accept African Americans. After several years of touring the East and West coasts, she traveled back to Texas and established her headquarters in Houston in 1925. She became a daredevil stunt pilot. Her first performance in Texas took place in that city on June 19, 1925. On April 30, 1926, she died during a test flight before a show sponsored by the Negro Welfare League in Jacksonville, Florida.

Kathryn Cochran Cravens, a radio personality and actress, was born in Burkett, Texas, on October 27, 1898. In 1937, in an attempt to disprove criticism that the airline industry was unsafe, she traveled throughout the country for broadcasts and articles and was subsequently dubbed “the Flying Reporter.”

Although not born in Texas, sisters Marjorie and Katherine Stinson moved to San Antonio and became well known as early pilots in the United States. In fact, Katherine became the fourth American woman to earn a pilot’s license, and later became a stunt pilot, was the first person of either gender to fly an airplane at night, the first pilot to perform night skywriting, the first woman to fly in the Orient, and the first woman to be commissioned as a mail pilot. She and her sister ran an aviation company in San Antonio.
Howard Hughes was born in Houston in 1905 and inherited a fortune when he was orphaned at the age of eighteen. In 1938, he and a four-man crew landed their specially equipped Lockheed 14 in New York City, having circled the globe in three days, nineteen hours, and seventeen minutes. Along the way, they cut in half Charles Lindbergh’s record for crossing the Atlantic. Hughes formed the Hughes Aircraft Company in the 1930s as a division of Hughes Tool Company and set two speed records as a pilot. In the 1940s, he landed several contracts to produce military aircraft.

In 1967, Rollin King, entrepreneur and cofounder of Southwest Airlines, met with his cofounder, Herb Kelleher, to discuss a new business venture. Instead of flying to small towns, King suggested serving the three largest cities in Texas, offering low fares, convenient schedules, and a “no-frills” approach that was completely contrary to the standards of the established airlines. The two entrepreneurs had to go as high as the United States Supreme Court to get permission to begin their new airline. December 7, 1970, the date of the Supreme Court decision, is considered by many to be the beginning of deregulation in the airline industry. By the early 1990s, Southwest had grown to be the nation’s seventh-largest airline, with over 35 million customers a year, annual revenues exceeding $2 billion, and more than 15,000 employees in a largely unionized workforce. Southwest is considered one of the top ten companies to work for in America.

References:


Handbook of Texas Online: keywords Aeronautics and Aerospace Industry, Bessie Coleman, Kathryn Cravens, Katherine Stinson, Southwest Airlines


ECONOMIC REASONING

Students need to understand that the economy of Texas is supported by many industries. The oil and gas industry, agribusiness, manufacturing, and transportation industries are all important aspects of the economy. In the transportation arena, the aeronautics and aerospace industries employ many Texans. The development of the aeronautics industry helped Texas transform from a rural state to one that is predominantly urban. Many cities in Texas grew dramatically as airplanes were produced through mass production to support the United States during World War II, and Texas has since developed specialized industries related to both the aeronautics and aerospace industries. Both the manufacturing and service parts of the aviation industries employ many Texans. (See economic terms in the glossary for more information about the concepts listed above.)

TEXAS ESSENTIAL KNOWLEDGE AND SKILLS

4.13D  Describe the impact of mass production, specialization, and division of labor on the economic development and growth of Texas

4.13E  Explain how developments in transportation and communication have influenced economic growth in Texas
4.13A Explain how people in different regions of Texas earn their living, past and present
4.13F Explain the impact of American ideas about progress and equality of opportunity on the economic development and growth of Texas
4.14A Identify ways in which technological changes have resulted in increased interdependence among Texas, the United States, and the world
4.14B Identify oil and gas, agricultural, and technological products of Texas that are purchased to meet needs in the United States and the world
4.5A Identify the impact of various issues and events on life in Texas such as urbanization, increased use of oil and gas, and the growth of aerospace and other technology industries
4.22A Differentiate between, locate, and use primary and secondary sources such as computer software; interviews; biographies; oral, print, and visual material; and artifacts to acquire information about the United States and Texas
4.22B Analyze information by sequencing, categorizing, identifying case-and-effect relationships, comparing, contrasting, finding the main idea, summarizing, making generalizations and predictions, and drawing inferences and conclusions
4.22C Organize and interpret information in outlines, reports, databases, and visuals including graphs, charts, timelines, and maps

ECONOMIC CONCEPTS
Manufacturing, Specialization, Mass production, Rural, Urban, Goods, Services

HISTORICAL CONCEPTS
20TH century Texas, Aeronautics and Aerospace Industries

CRITICAL QUESTIONS
1. How did the aeronautics and aerospace industries develop in Texas?
2. In what ways did these industries contribute to the urbanization of Texas?
3. What are examples of goods and services that are part of the aeronautics and aerospace industries found in Texas?
4. How important are these industries to the Texas economy today?

LESSON DESCRIPTION
Students will learn about and discuss the importance of the aeronautics and aerospace industries in Texas. They will discuss how these industries helped Texas cities grow, and how they contributed to the urbanization of the state. They will analyze charts to generalize and draw conclusions, based on the data studied.
TIME REQUIRED
Two to three class periods

MATERIALS
Student Handout 1 – Information about Aeronautics and Aerospace Industries
Student Handout 2 - Passengers by Airport and Top Ten Texas Cities with Airports
Transparency Master 1 - Goods and Services in the Aeronautics and Aerospace Industries
Answer Key for Transparency master 1
Student Activity Sheet 1- Summarizing Learning
Answer Key for Student Activity Sheet 1

PROCEDURE
1. Ask how many students in the class have ever been to an airport, ridden in an airplane, or seen an airplane flying overhead. Ask them to guess how many people ride on airplanes each year. Ask them to make a prediction: Is the airplane business important in Texas? In this lesson they will find out the answer to that question.

2. Teach specialized vocabulary: aeronautics, aerospace, mass production, specialization, goods and services, rural, urban

3. Read and discuss the information on Student Handout 1. Help students to understand some reasons why cities grew during and after World War II that are related to the aeronautics industry.

4. Discuss the difference between service economy and the manufacturing of goods. Ask students to give examples of how the aeronautics and aerospace industries have components of both in Texas.

5. Show Transparency Master 1. Have the students determine whether each stated activity is one that provides goods or services. If you would rather not use the “hands on head, hand in lap” method of checking student accuracy, you could create cards (use two different colors) that say goods and services and have students hold up the appropriate card for each activity.

6. Distribute copies of Student Handout 2. Compare and analyze the data to determine which airports are the largest, whether the airport activity went up or down for each time period, and how many people the airports transported each year.

CLOSURE
Summarize with students that today Texas is still a major location for building airplanes, learning to fly them, and traveling on them. Texas is also of major importance in the aerospace industry because of NASA in Houston. Ask students to use the resources from this lesson to summarize their learning and complete the answers to the questions on Student Activity Sheet 1. Read and discuss answers together following completion.
EXTENSION

1. Interview a commercial pilot or flight attendant about his or her job. Find out what it is like and report back to the class.

2. Visit an airport in the area. Take notes on all the job opportunities you see there that contribute to the economy of Texas. Do not limit yourself to only pilots and flight attendants.

3. Create a triple bar graph depicting the information on the first chart on Student Handout 2.

4. Create a pie graph depicting the percentage of passengers leaving each of the top ten cities in Texas, according to the date on the second chart on Student Handout 2.

5. Research the lives of famous people related to the aviation industry, such as Katherine Stinson, Bessie Coleman, Kathryn Cravens, Howard Hughes, or Herb Kelleher. Create a project cube with facts about the person's life that you researched. Share the cube with your classmates.

SUGGESTED ADDITIONAL RESOURCES


FLYING HIGH: AERONAUTICS AND AEROSPACE INDUSTRIES OF TEXAS

During the last half of the twentieth century, Texas changed from a rural and agricultural state to an urban, industrial one. The aeronautics and aerospace industries developed strongly in Texas. All types of aircraft, from small one-man planes to vehicles capable of landing on the moon, have been manufactured in Texas, and several major commercial airlines have started in our state as well.

In 1910, a Frenchman named Louis Paulhan made the first airplane flight in Houston, Texas. Several people built their own airplanes and several flights took place in the state before World War I. Two women from San Antonio, sisters Marjorie and Katherine Stinson, became well known pilots. When the United States entered World War I, many military flight schools were located in Texas. Texas had good weather and level ground, which made it a good choice for training sites.

Love Field in Dallas began as a World War I pilot-training field. Mail delivery began from the airport in 1926, and passenger service started in 1927. Air transportation began to spread across the state. Commercial airlines such as Braniff Airways and American Airlines were soon added. Passenger service among Dallas, Fort Worth, San Antonio, Houston, and Galveston started as early as 1928.

World War II really launched industrialization in Texas. The state's climate, its government leaders, and the available petroleum encouraged the location of military posts, the growth of the construction business, and the rise of defense industries. During World War II, fifteen military bases were built in Texas, as well as forty airfields, plus a naval air station at Corpus Christi. City populations grew rapidly as a result of the new industries. The state population jumped 20 percent and the large cities - Houston, Dallas, Fort Worth, and San Antonio - doubled in population.

After the war, more industrial plants were built in the Dallas and Ft. Worth area to manufacture airplanes. Other companies were also started in Texas that supplied parts and equipment for the aircraft factories. In 1950 Lawrence Bell established Bell Helicopters, the world's first plant specifically designed to manufacture helicopters.

By the 1960s aircraft manufacturing had grown tremendously and was located mainly in North Texas, especially in the area of Grand Prairie, Richarsdon, Hurst, Euless, Arlington, and Fort Worth, a region that ranked second only to the entire state of California in aircraft production. Other aircraft-manufacturing enterprises could be found in Bexar, Cameron, Harris, Harrison, Hunt, Kerr, McLennan, Medina, Stephens, and Young counties. Aircraft manufacturing in the 1960s ranked sixth in the state in number of employees, sixth in payroll accounts, and eighth in value added by manufacturing. In 1967 sixty aircraft-manufacturing establishments operated in the state, employing 58,000 workers; 50,900 workers were employed in aircraft manufacturing in 1986.

Houston Intercontinental Airport opened in 1969. Dallas-Ft. Worth International Airport began serving passengers and freight planes in 1974. The new technology surrounding air travel allowed people to travel more cheaply and faster. The industry also provided
employment for thousands of employees.

NASA, the National Aeronautics and Space Administration, decided in September 1961 to locate its Manned Spacecraft Center in Houston. This center led the way for the effort to send man to the moon, and later for the space shuttle program and the International Space Station. The aerospace program helped Houston grow economically and many cities all over the state have also benefited from industries connected to the space program.

Manufacturing is not the only aspect of the aeronautics and aerospace economy supporting Texans. The service side of these industries is also very important to the economy of Texas. Air transportation is a vital part of Texas' economy, and the state's airport system is one of the busiest and largest in the country. There are over 50,000 active pilots in Texas. In 1999, service at 27 Texas airports served over 66 million passengers. Some major airports are Dallas/Ft. Worth International, Dallas Love Field, Houston George Bush Intercontinental, and Houston William B. Hobby Field. These four airports account for over 80 per cent of all flights in and out of Texas. San Antonio and Austin also have large numbers of air related employees.
## Passengers by Airports

<table>
<thead>
<tr>
<th>City/Airport</th>
<th>1995</th>
<th>1997</th>
<th>1999</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amarillo</td>
<td>454,536</td>
<td>450,432</td>
<td>434,110</td>
</tr>
<tr>
<td>Austin</td>
<td>2,658,039</td>
<td>2,948,701</td>
<td>3,298,729</td>
</tr>
<tr>
<td>Beaumont</td>
<td>108,520</td>
<td>112,456</td>
<td>99,343</td>
</tr>
<tr>
<td>Corpus Christi</td>
<td>511,841</td>
<td>471,914</td>
<td>474,027</td>
</tr>
<tr>
<td>Dallas Ft. Worth</td>
<td>27,013,761</td>
<td>28,152,220</td>
<td>29,965,777</td>
</tr>
<tr>
<td>International</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dallas Love Field</td>
<td>3,355,238</td>
<td>3,413,519</td>
<td>3,409,920</td>
</tr>
<tr>
<td>El Paso</td>
<td>1,835,162</td>
<td>1,634,578</td>
<td>1,664,890</td>
</tr>
<tr>
<td>Harlingen</td>
<td>489,082</td>
<td>461,619</td>
<td>469,214</td>
</tr>
<tr>
<td>Houston/Bush</td>
<td>10,165,671</td>
<td>13,212,686</td>
<td>16,447,012</td>
</tr>
<tr>
<td>Houston/Hobby</td>
<td>4,111,175</td>
<td>3,949,236</td>
<td>4,222,032</td>
</tr>
<tr>
<td>Lubbock</td>
<td>602,680</td>
<td>592,101</td>
<td>570,452</td>
</tr>
<tr>
<td>Midland/Odessa</td>
<td>566,904</td>
<td>527,760</td>
<td>487,533</td>
</tr>
<tr>
<td>San Antonio</td>
<td>3,058,274</td>
<td>3,343,818</td>
<td>3,522,946</td>
</tr>
</tbody>
</table>

Reference: Texas Almanac: Aviation in Texas

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## Airports - Top Ten Texas Cities - 1999

<table>
<thead>
<tr>
<th>City listed by rank</th>
<th>Number of passengers</th>
<th>Percentage of total (rounded to nearest percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Dallas-Ft. Worth</td>
<td>33,375,697</td>
<td>50 %</td>
</tr>
<tr>
<td>2. Houston</td>
<td>20,918,820</td>
<td>32%</td>
</tr>
<tr>
<td>3. San Antonio</td>
<td>3,522,946</td>
<td>5%</td>
</tr>
<tr>
<td>4. Austin</td>
<td>3,298,729</td>
<td>5%</td>
</tr>
<tr>
<td>5. El Paso</td>
<td>1,664,890</td>
<td>3%</td>
</tr>
<tr>
<td>6. Lubbock</td>
<td>570,452</td>
<td>1%</td>
</tr>
<tr>
<td>7. Midland/Odessa</td>
<td>487,533</td>
<td>1%</td>
</tr>
<tr>
<td>8. Corpus Christi</td>
<td>474,027</td>
<td>1%</td>
</tr>
<tr>
<td>9. Harlingen</td>
<td>469,214</td>
<td>1%</td>
</tr>
<tr>
<td>10. Amarillo</td>
<td>434,110</td>
<td>1%</td>
</tr>
</tbody>
</table>

Reference: Texas Almanac: Aviation in Texas
GOODS AND SERVICES IN THE AERONAUTICS AND AEROSPACE INDUSTRIES

Decide if each of these jobs provides goods or services.
- Put your hands on your head if the job provides goods.
- Put your hands in your lap if the job provides services.

1. A pilot flying for American Airlines from Dallas to Houston
2. A restaurant chef at an airport
3. An assembly line worker putting parts on a Bell helicopter
4. A person who runs the machine that attaches jet engine parts to a new airplane
5. A luggage handler at the airport
6. A specialist in designing and building space shuttle parts
7. An employee of a computer company making computer components for a new jet
8. An air traffic controller who decides when it is safe for planes to land
9. A worker who attaches the passenger seats in a new airplane
ANSWER KEY FOR TRANSPARENCY MASTER 1

1. services
2. services
3. goods
4. goods
5. services
6. goods
7. goods
8. services
9. goods
Use the information your teacher and classmates have discussed, plus the information on your handouts from this lesson. Answer the questions carefully. Be sure to proofread!

1. What are some examples of goods and services provided by the aeronautics and aerospace industries in Texas?

2. What does NASA stand for? Where is it located? Tell a little about what NASA does and why it helps Texas economically.

3. What part of Texas has the most airplane manufacturing?

4. Name the four largest airports in Texas that employ a lot of people and are used for passenger travel.

5. Which cities in Texas have airports where passenger travel went up from 1995 to 1997 and again went up from 1997 to 1999?

6. Which cities in Texas have airports where passenger travel went down from 1995 to 1997 and again went down from 1997 to 1999?

7. Which airport in Texas serves about half off all the passengers of all Texas airports?

8. Dallas-Ft. Worth and Houston airports together serve about what percentage of all the passengers in Texas?

9. What was the total number of passengers who traveled in 1999 from the Dallas-Ft. Worth and Houston airports?

10. How many more passengers traveled from Dallas-Ft. Worth than from Houston in 1999?

11. How many more passengers traveled from San Antonio than from Austin in 1999?

12. Find the total number of passengers who traveled from the bottom five cities located on the chart titles “Airports - Top Ten Cities - 1999.” Was this total more or less than the total number of passengers who traveled from San Antonio the same year?
1. The aeronautics industry is involved in designing, constructing, monitoring and flying airplanes and helicopters and also service positions related to the industry, such as jobs at airports. The aerospace industry is involved in designing, constructing, monitoring, and flying crafts that go high in the Earth's atmosphere and into space beyond and also service positions related to the industry.

2. NASA stands for National Aeronautics and Space Administration. It is located in Houston, TX. NASA supported getting American astronauts to the moon, and also supported the Space Shuttle program and the International Space Station. These programs provide lots of jobs to Texans.

3. The north part of Texas, near the Dallas-Ft. Worth area, has the most airplane manufacturing.


5. Passenger service went up in the cities of Austin, Dallas (at Dallas-Ft. Worth International) Houston (at Bush) and in San Antonio.


7. The airport in Texas that serves about half of all passengers at Texas airports is Dallas-Ft. Worth International Airport.

8. About 82% of all passengers in 1999 traveled through Dallas-Ft. Worth or Houston.


10. 12,456,877 more passengers traveled from Dallas-Ft. Worth than from Houston in 1999.

11. 224,217 more passengers traveled from San Antonio than from Austin in 1999.

12. Total of five bottom cities on chart = 2,435,336 passengers. This is less (by 1,087,610) passengers than traveled from San Antonio.
LESSON 13

TECHNOLOGY IN THE 21ST CENTURY
AND THE TEXAS ECONOMY

INTRODUCTION

From the time it was settled until now in the 21st century, Texas has often led the way in new advancements in technology. In the nineteenth and early twentieth centuries such technological advances as the use of barbed wire, railroads, irrigation, and windmills led to major changes in the lifestyles and economic lives of Texans. In the late twentieth century and continuing now, technology became almost synonymous with the development and use of computers. Texas companies such as Tandy, Texas Instruments, Dell Computers, Compaq Computers (now merged with Hewlett-Packard), and Electronic Data Systems have developed and helped Texas' economy change and become more specialized in many ways.

Students in elementary school now are very familiar with computers and related technology such as wireless cell phones and the Internet system, and do not remember life without such technology. To help students understand how computers and related technology have affected the Texas economy, some background information is given here.

In Texas, 25% of those who work in manufacturing are now in technology, or high tech, industries. This means they invent, build, and use computers or other electronics. One of the best resources for this industry is the workers' knowledge! Dallas ranks second in the U.S. as a high-tech business center. The entire North Texas region is one of the fastest-growing high-tech regions in the nation. It is home to hundreds of leading-edge companies, with more than 230,000 people employed in technology-related fields. The Dallas INFOMART is the nation's first successful business technology market center. It is home to more than 100 high-tech companies. The INFOMART also annually hosts more than 1,000 trade shows. Texas Instruments (TI) has more than 11,000 employees in the North Texas area. Electronics Data Systems (EDS) has more than 120,000 worldwide employees; it has its headquarters in Dallas, and many of its employees live and work in Texas. Tandy Radio Shack began in Ft. Worth Texas, and is a consumer electronics specialty retailer of wireless communications, electronic parts, batteries and accessories as well as other digital technology products and services. Dell Computers has its headquarters in the Austin area. It has about 22,000 employees in the United States, many of whom are located in Texas.

The communication and computer industries are and will continue to be among the fastest growing sectors of the Texas economy. Growth in wireless services is one example of how economics is affected. The cost to consumers for wireless services is lower now than it was ten years ago, and, of course, the use of Internet services has grown tremendously in the past decade as well. Computers and calculators cost less now, and have stronger features than just 10 years ago.

Jack Kilby of Texas Instruments invented the microchip in 1958. This breakthrough made computers what they are today. Mr. Kilby was also the co-inventor of the first electronic handheld calculator. He was chosen for the National Inventors Hall of Fame in 1982, and earned a Nobel Prize in Physics in 2000 for his part in the invention of the integrated circuit, which has helped with electronic sending and receiving of information.
An example of how limited resources and supply and demand can be explored with students concerns pocket calculators, a technological device students take for granted now. The transition from electromechanical calculators to completely electronic models is an amazing story. In 1966, The hand-held pocket calculator was invented at Texas Instruments, Incorporated (TI) by a development team which included Jerry D. Merryman, James H. Van Tassel and Jack Kilby. This represented the beginning of a series of landmark developments at Texas Instruments directly relating to miniature calculators. TI first introduced the handheld pocket calculator as a consumer product in 1971. The same year the company received the first patent on a microprocessor, a true "computer on a chip." Unlike dedicated integrated circuits, the first microprocessors, produced that year by TI and another company named Intel, were flexible and small enough to serve in a wide variety of electronic applications. Texas Instruments (TI) remains an important producer of such technology today and is still a major employer of technology workers in the Dallas area.

In 1966, many of the first electronic desktop calculators cost over $2,000. Their price was determined by the cost of raw materials, the brand new technology used to create the devices and the assembly cost time. Workers who built these devices were very specialized in training, and it took many man-hours to create each device, so the price was high. Smaller sized calculators were accessible to the public by the early 1970's, but a simple four-function model could still cost between $300 and $500. The early electronic calculator business was highly competitive and prices were closely linked to the cost of raw materials. As the cost of raw materials fell, calculator prices dropped and profit margins shrank. Within a few short years dozens of upstart calculator companies were unable to remain profitable and ceased to exist. Pre-integrated circuit electronic models used thousands of components and required huge amounts of assembly cost time. The introduction of the first integrated circuits had an immediate effect on overall price. In 1969, the cost of just the integrated circuits needed to build a calculator was still about $300. The typical electronic desktop calculator of 1969 used about 15 integrated circuits, which ate up almost 40% of the retail cost of the machine. Other components like gas-filled display tubes were not cheap either. Fortunately, in addition to the integrated circuit, the development of the light emitting diode (LED) display was another major breakthrough. In 1972 LED displays could be bought in quantity for about $2 per digit. By 1972, manufacturers could purchase the single integrated circuit “calculator on a chip” in quantity by manufacturers for about $10-$15, and the pocket calculator price fell below the $100 barrier. By the 1980's four-function calculator prices sold for under $10. This would have seemed impossible a decade earlier.

In 1977, a Texas company, Tandy Radio Shack, produced one of the first home computer systems that was reasonably priced for consumers, called the TRS 80. Since the development of new technology, home computer systems have become much more reasonably priced, and many elementary children today cannot imagine life without access to a computer, either at school or at home. Michael S. Dell, then only an eighteen-year-old freshman at the University of Texas at Austin, founded Dell Computers in 1984, during the early stages of the personal-computer industry. Dell Computers, located in the Austin area, remains a strong employer of technology workers in Texas today. Another large technology company in Texas is Electronic Data Systems (EDS), a company involved with the management of information technology. EDS has headquarters in Dallas. The company designs, installs, and operates data-processing systems for the automotive,
communications, energy, financial, government, health-care, insurance, transportation, utility, and manufacturing industries, as well as for retail distributors.

References:
Handbook of Texas Online: keywords Dell Computer Corporation, Tandy Corporation, Texas Instruments, Electronic Data Systems
http://www.idealfinder.com/history/inventions/handcalculator.htm
http://inventors.about.com/library/weekly/aa121598.htm

ECONOMIC REASONING

Students need to understand that developments in communication have changed economic life in Texas, especially recently. Although manufacturing is definitely a part of this industry, the most important resources used in communications and technology industries are human resources (labor). Scarcity of materials and knowledge, when new technology first is introduced into the economy, mean higher prices, but as the technology becomes more available, then prices come down. Supply and demand also is important as more companies offer similar products to consumers. (See economic terms in the glossary for more information about the concepts listed above.)

TEXAS ESSENTIAL KNOWLEDGE AND SKILLS

4.13A Explain how people in different regions of Texas earn their living, past and present
4.13E Explain how developments in transportation and communication have influenced economic growth of Texas
4.14A Identify ways in which technological changes have resulted in increased interdependence among Texas, the United States, and the world
4.14B Identify oil and gas, agricultural and technological products of Texas that are purchased to meet needs in the United States and around the world
4.22B Analyze information by sequencing, categorizing, identifying cause-and-effect relationships, comparing, contrasting, finding the main idea, summarizing, making generalizations and predictions, and drawing inferences and conclusions
4.22C Organize and interpret information in outlines, reports, databases, and visuals including graphs, charts, timelines, and maps
4.22A Differentiate between, locate, and use primary and secondary sources such as computer software; interviews; biographies; oral, print, and visual material; and artifacts to acquire information about the United States and Texas

ECONOMIC CONCEPTS

Manufacturing, Supply and Demand, Prices, Human Resources, Scarcity, Consumers
HISTORICAL CONCEPTS
Technological developments in the 20th and 21st Centuries

CRITICAL QUESTIONS
1. What technology industries developed in Texas?
2. In what ways did these industries contribute to the economy of Texas?
3. Why have prices for technology products become less expensive over time?
4. What are examples of goods that are part of the technology industries found in Texas?
5. How important are these industries to the Texas economy today?

LESSON DESCRIPTION
Students will learn about recent technology advancements, especially those in calculator and computer technology, and how these are important to the Texas economy today. They will compare prices of early calculators to more recent prices to see how prices drop as products have more competition and become more easily available on the market. They will compare this to the same activity used in the barbed wire lesson about prices dropping over time.

TIME REQUIRED
One to two class periods

MATERIALS
Transparency Master 1 - price of calculators over time
Transparency Masters 2 - 8 - examples of calculator advertisements
Recent newspaper or magazine advertisements (supplied by teacher)

PROCEDURE
1. Conduct a simple survey in the classroom. Create a chart tallying how many calculators are in the classroom and how many calculators the students have in their homes. Also tally how many computers are in the classroom and how many computers are at the homes. Ask how many parents of classmates use a computer in their jobs. The students will most likely not find these numbers unusual, since they are growing up in a technological era. Help students to realize that calculators and computers are relatively new technological advances, and that only a few years ago, students did not have easy access to these products. Share your experiences about your first calculator and home computer. If you are a young teacher and have always had access to calculators and computers, you might ask a neighboring teacher who has been teaching more years to share his or her experiences with the students. Teachers who began teaching before the 1980s have some really different
memories than those with less experience concerning the use of technology in the classroom!

2. Ask students to find out if their parents or grandparents remember when they got their first hand held calculator and what functions it performed. How did this calculator compare to the ones used today? What about home computers? Do their parents or grandparents remember what the first computers they used were like? Although not everyone has a home computer, most students at grade 4 level do have access to computers at least in school, their public library etc. How do the computers used today differ from those used by parents and grandparents when they began using such technology?

3. Use the background information in this lesson to teach students how expensive calculators first were when they came into production, and that prices came down when technology became more available. Use Transparency Master 1 to show prices changing over the years. Review what the students learned in the barbed wire lesson about prices dropping over time as production increased and the wire was more readily available.

4. Use the background information in this lesson to teach students about several important companies in Texas that contribute strongly to this part of the Texas economy. Help them understand that most industries and jobs are very dependent on computers and other technology today, and that even in rural parts of Texas, this technology is important to daily life.

5. Ask the students to brainstorm and list all the ways they can think of that computers and other technology (cell phones, Internet etc.) are used in daily life. Create a chart showing the ways students come up with - for example, computerized cash registers, bar coding of products, computerized inventories, registries for brides and baby showers, computerized agricultural machinery, etc. Help the students think beyond the actual computers in the classroom to see how important this industry is to the economy of Texas, the USA, and the world. Stress the interdependence of the economy ties to technology.

6. Supply the students with circulars and advertisements that have calculators, cell phones, computers etc. for sale. Ask the students to compare and contrast prices for various products. Be sure they realize that different products have different features, and that the products with more features may cost more, especially if the features are very new to the market.

**CLOSURE**

Summarize with students that today Texas is a major location for technology industries, and that technology is a major part of our state’s economy. Ask students to use the resources from this lesson to summarize their learning and write at least two paragraphs explaining the changes technology has had on the lives of Texans over the past forty years.

**EXTENSION**

1. Do additional research about Texas technology companies in Texas such as Dell, TI, or EDS and report to classmates. Share your research by creating a PowerPoint
1. Create a visual presentation, poster, mobile, or project cube to summarize your learning.

2. Write a bio-poem about the life and accomplishments of Jack Kilby or Michael S. Dell.

3. Use the Internet to find other examples of "vintage" calculator and computer advertisements. Use a search engine to search for old advertisements from many technology companies.
### PRICES OF CALCULATORS OVER TIME

<table>
<thead>
<tr>
<th>Year</th>
<th>Price</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1966</td>
<td>Often over $2000</td>
<td>Electronic desktop calculator</td>
</tr>
<tr>
<td>1968</td>
<td>About $1000</td>
<td>Electronic desktop calculator</td>
</tr>
<tr>
<td>1970</td>
<td>About $300 - $500</td>
<td>First real hand held electronic calculator</td>
</tr>
<tr>
<td>1971</td>
<td>Just under $300</td>
<td>Not quite pocket sized yet</td>
</tr>
<tr>
<td>1972</td>
<td>About $100</td>
<td>Still not pocket sized but getting smaller</td>
</tr>
<tr>
<td>1977</td>
<td>About $25</td>
<td>Pocket sized now available</td>
</tr>
<tr>
<td>1980</td>
<td>About $10</td>
<td>Solar powered now available</td>
</tr>
</tbody>
</table>
A calculator ad from 1966

FIVE YEARS AHEAD of its time

Instant Sterling/Decimal conversion — NOW

ANITA Mk. 10 Electronic Desk Computer

Designed to meet the special requirements of the British market, ANITA Mk. 10 will calculate and give answers direct in £s.d., or in whole numbers and decimals with instant conversion to sterling. Price £450. Rental terms available.

Sumlock Comptometer Ltd

22 St. James's Street, London, SW1

Telephone: HYDE PARK 1331 & 1332

A calculator ad from 1968

THE MINI-COMPACT CALCULATOR
THAT CARRIES LIGHT
AND WORKS LIKE THE DEVIL

Model CS-22A
*14 digits, 6 decimal places
*Memory register
*Rounding-off device
*Double-set protection keys
*4kg (8.8lb)

Our CS-22A is instant, silent and dependable. It's
stream-line convenient. 82 MOS ICs helped us drasti-
cally reduce overall size, yet improve performance.
Calculations up to 14 digits and 6 decimal places.
Even has a memory register to store intermediate
answers for continued calculations. Rounding-off
device, overflow error lamp, and double-set protec-
tion keys—everything to assist the beginner and
accommodate the professional.

For the man who wants IC electronic calculator
convenience on a smaller budget, we made the
CS-17B. Its 12 digit, 6 decimal capacity takes care
of practically every calculating task.

Choose a little devil to go to work on your cal-
culating problems.

Model CS-17B
*12 digits, 6 decimal places
*Double-set protection keys
*4kg (8.8lb)

A calculator ad from 1970

A calculator ad from 1971

WE JUST CUT THE ELECTRONIC CALCULATOR DOWN TO SIZE. AGAIN.

THE SHARP EL-8

$299

18 OUNCES, 3¼" X 5¼"

You always wanted something a little smaller, then you aren't a huge going-gyrene type. After all, you know you're only doing these calculations for fun.

Our new EL-8 helps you do more than just add, but it's a lot like our other models as much as $200 a year in time savings, which is always important if you're going to be doing calculations for fun.

New, this 3⅛" X 5⅛" calculator also has a memory and a clock so you can save time doing them. For example, you can just type in a number, press the memory button, and then type in the next number and it will be added together. You can also set the clock to a specific time and it will automatically add the next number to the previous number.

Although the EL-8 answers all the requirements of a small business, it also makes a fine accessory to a large company, calculating every week for big calculations.

Where do you get this 18 ounce gizmo? The coupon will bring you a free sample. Talk free at 1-800-555-5555 (Ontario 1-899-212-5555).

December 22, 1971

A calculator ad from 1972

The **Texas Instruments** electronic calculator... a pocketful of miracles.

Take the worry out of being close with the new Texas Instruments TI-2500 Datamath. With this pocket-size beauty your figures will never be close. They're always right on the money.

**Datamath** adds, subtracts, multiplies and divides, does mixed or constant calculations. Also, **Datamath** offers an 8-digit display and full floating decimal. An AC adapter/charger is included to recharge built-in power pack. Operates 4-6 hours without recharging and also may be used from standard outlets.

Texas Instruments unconditionally guarantees **Datamath** for one year. Order now for personal or business holiday giving (personal check). American Express, Diners Club. **Datamath**—the Cadillac of calculators. From Texas Instruments at just $19.95 with carry case.

A calculator ad from 1974

Texas Instruments SR-II.
The electronic press button instant slide rule.

For most slide rule functions, the new Texas Instruments SR-II electronic calculator makes the manual slide rule seem like the Stone Age! The SR-II means greater speed and greater accuracy for your engineering calculations. Adding, subtracting, multiplying, dividing. Plus more complex calculations using squares, square roots, reciprocals, constants, and π. All carried out in the time it takes to enter the data.

The answer is before you instantly, in clear red figures. And the 12 digit display allows an almost 200-decade range in scientific notation. Like a slide rule, the SR-II goes with you anywhere. You can plug it into your household mains, or use the quick-charging batteries that provide up to six hours continuous use.

The Texas Instruments SR-II complete with compact adapter, charges in 1 hour, costs just $55.95 including VAT.

It's available now from TI Supply, the specialist sales division of Texas Instruments that caters for the business equipment needs of commercial and industrial customers.

Contact your nearest TI Supply office. They'll be glad to give you full details of the SR-II electronic slide rule calculator and of the TI5000, TI8000, TI4000 and SR-10 calculators that complete the Texas Instruments range. Or just fill in the coupon.

A calculator ad from 1980

Sharp PC-1211 Pocket Computer, also sold as the Tandy TRS80 PC-1

Display - 24-digit alphanumerical dot matrix Liquid Crystal Display, with yellow filter. In calculator mode it can display in scientific format 10 digits mantissa and 2 digits exponent.

Lesson 14

IMPORTS AND EXPORTS: TEXAS AND THE WORLD

INTRODUCTION

Economics is about producing and consuming goods and services. We all are involved in selling and buying these goods and services. Economics is about almost everything we do. In the process of producing and consuming goods and services, we often have a good supply (even sometimes a surplus) of certain materials or services. On the other hand, we may need a product or service that we don't have and we seek ways of securing these things. Texas trades with other areas in the United States and other countries in the world through importing the products we need and exporting products that Texans have produced. The relationship of imports and exports to economic growth is important.

It would be very challenging today if someone tried to be totally self-sufficient and not engage in any type of trade or exchange. A person would have to build his own house, make his own clothing (including growing the cotton and weaving the cloth), grow all of his own food, build his own source of transportation, take care of all of his own medical problems, etc. The quality of life would be far less than it is now. People would have so many jobs that they would not be good at any of them. By specializing, a society improves the standard of living.

By specializing in the production of things that Texas can make more efficiently with the resources we have, we can be a great deal more successful than we could if we tried to be totally self-sufficient. People are better off if they specialize in producing what they do best. They are also better off if they exchange the products and services that they do best for other things produced by people from other places who also specialize in what they do best. For example, the United States does not have the right resources for producing coffee or bananas. Countries in South America have ideal resources for producing coffee and they are the world’s largest coffee producers. Ecuador has perfect growing conditions for bananas. Some countries have large oil reserves and other coastal nations have rich fishing grounds off their coasts. The United States has a labor force that is highly skilled as well as a great deal of technological knowledge. We also have large quantities of capital goods and we are well suited for producing major complex manufactured products. The United States is also a major food exporter because of good soil and good growing conditions. By working together, people can establish trade practices that are beneficial to all involved.

This lesson addresses the definitions of imports and exports and establishes a basic understanding for the principles of international trade. When people in different countries import and export goods and services, they become interdependent. Students need to better understand how the world economy operates.

ECONOMIC REASONING

Students should understand that a single state or nation is able to produce more when individuals or companies specialize in what they do best. They should understand that there are differences in the resources that various nations have. They need to know what imports
and exports are and that establishing trade with others can be beneficial to all involved. Trade is established by one country to gain needed products and services from other places. Countries engage in international trade and by engaging in this exchange, the total output of a country's economy is increased. (See economic terms in the glossary for more information about the concepts listed above.)

TEXAS ESSENTIAL KNOWLEDGE AND SKILLS

4.14A Identify ways in which technological changes have resulted in increased interdependence among Texas, the United States, and the world
4.14B Identify oil and gas, agricultural, and technological products of Texas that are purchased to meet needs in the United States and around the world
4.14C Explain how Texans meet some of their needs through the purchase of products from the United States and the rest of the world
4.13F Explain the impact of American ideas about progress and equality of opportunity on the economic development and growth of Texas
4.22A Differentiate between, locate, and use primary and secondary sources such as computer software; interviews; biographies; oral, print, and visual material; and artifacts to acquire information about the United States and Texas
4.22B Analyze information by sequencing, categorizing, identifying cause-and-effect relationships, comparing, contrasting, finding the main idea, summarizing, making generalizations and predictions, and drawing inferences and conclusions

ECONOMIC CONCEPTS
Imports, Exports, Trade

CRITICAL QUESTIONS
1. What are exports?
2. What are imports?
3. How is the Texas economy interdependent with other states and nations?
4. Why is it important that Texas has several ports along the Gulf Coast?

LESSON DESCRIPTION
In this lesson students will study the terms imports, exports and trade. They will understand that Texas, as well as the rest of the nation, is involved in international trade and a global economy. The importance of Texas' ports will also be stressed.
TIME REQUIRED
One to two class periods

MATERIALS
Student Handout 1 - Imports and Exports: A Home Scavenger Hunt
Transparency Master 1 - examples of Texas’ exports
Student Handout 2 - imports and exports for the top 4 countries trading with the United States
Transparency Master 2 - top 10 U.S. ports with the Texas ports in bold

PROCEDURE
1. Tell the students: Imagine that your family has an old family recipe for banana nut muffins. You are baking a batch of your special muffins when your best friend, who lives down the street, drops by and smells what you are baking. Your best friend takes a sample, hot out of the oven, and LOVES your muffins! Your friend realizes that your muffins are great. He would love to bake some of his own, however, he doesn’t have all the ingredients to make your muffins: flour, sugar, eggs, bananas and pecans, etc.

Your friend asks you to bake your special muffins for him/her and he/she will pay you for your time, the special ingredients for the muffins, and your labor. You agree to this arrangement because you know how to make them, you have the ingredients and the equipment, and making more will be easy.

2. Now tell the students: Think about this same process – only consider that the situation involves two countries, not two friends. When one country (or a state like Texas) produces something special like the muffins and the other country or state doesn’t have the ingredients or labor to produce the muffins – the second country agrees to purchase the item from the first country or state. The country that is selling the special banana nut muffins is called the exporter and the country that purchases the muffins is called the importer. The product that is purchased – in this case banana nut muffins – is called the import.

3. When one country produces a special product to sell to another and that other country sells different products to the first, the buying and selling of the products is what makes trade. This works when both parties feel that the exchange or trade has improved them economically some way. This trade does not always involve a natural resource - like oil or gas. Sometimes the products are things that are made - like special banana nut muffins. Sometimes the products are things that are special to only certain countries of the world, like coffee or bananas.

4. Ask students to look up the definitions of imports and exports. Students can use their textbooks, dictionaries, or Internet databases for this activity. Stress to the class that they will need to know the differences between these two words. Add the word trade and have them study this as well. Distribute copies of Student Handout 1 – A Home Scavenger Hunt. Allow students time to do this assignment at home. As
an alternative, teachers could divide the class into groups and ask each group to hunt for a couple of categories. Then the teacher can collect the data from each group, showing the results on the overhead. Stress to students the concept of interdependence.

5. Show students a copy of Transparency Master 1 showing Texas' exports with three different types of products (Agricultural Products, Furniture and Fixtures, and Paper) and the dollar amounts (value) of these exports over two different time periods (2000 and 2003). The countries used for these charts are Mexico, Japan and Canada. Ask the following questions:

a. Look at the chart on Agricultural Products. Are we sending more agricultural products to Mexico than Japan? Why? Did we send more products to Canada in 2003 than we did in 2000? Did we send less agricultural products to any of the three countries in 2003? If so, which country?

b. Look at the chart on Furniture and Fixtures. Does Texas send more of these products to Mexico or to Canada? What country received less in 2003 than they did in 2000?

c. Look at the chart on Texas' paper exports. What two countries reflected a decrease in value between 2000 and 2003? What country showed an increase?

d. What country would likely need more products from Texas? Why? (What country has the smallest population?)

6. Distribute copies of Student Handout 2 showing both imports and exports for the top 4 countries trading with the United States during the first part of 2004 based on the U.S. Census bureau's figures. Ask students to determine for each country if the United States is exporting more products or importing more from that individual country.

7. Discuss with the class the importance of the ports of Texas in being able to trade with other countries. Show the class Transparency Master 2 showing the top 10 U.S. ports with the Texas ports in bold. Stress the importance of having so many good ports to the Texas economy.

**CLOSURE**

Ask students to do an analysis of products that they have in their homes to determine from which country more of the items originated. They could look at products like TVs, DVD players, cameras, kitchen and bathroom appliances, articles of clothing and food, etc. Teachers may wish to divide the class into groups and have each group do a different type of product research. Collect the data and, as a group, determine the top countries that are represented in the local community households. Have students create charts reflecting the data collected.

**EXTENSION**

1. Have students do research on specific kinds of products made in Texas. Using the Internet, ask students to research at least five major products made in Texas and to
find data about how much of each product is produced. Create a bar graph depicting the information collected.

2. Use the Internet to find out at least five products imported by the United States. Find out how much is imported by the United States each year and from where the products are imported. Research what resources are needed to grow or manufacture the products. Based on what you know about climate, landforms, and vegetation, draw conclusions as to why the United States does not produce enough of the five products and therefore imports them.

**Additional Resources:**

Imports and Exports: A Home Scavenger Hunt

Name: ________________________________

Part I: Imports

Look in and around your house or apartment to find goods that were produced in other countries or goods that are made in the United States from resources imported from other countries. For example, orange juice produced in the United States may be made from oranges grown in South America. (Note: If a product is imported, according to U.S. law, its country of origin will be identified on the product's label.)

List the imported products you find in each "Products to Look For" category under "Texas Imports." Then find the "Country of Origin" for each product in the second column.

<table>
<thead>
<tr>
<th>Products to Look For</th>
<th>Texas Imports</th>
<th>Country of Origin</th>
<th>Texas Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Product</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machine/Tool</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clothing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toy or Game</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Part II: Exports

Look throughout your house or apartment to find goods that were produced in Texas or produced by businesses located in Texas. List these under "Texas Products" on the chart. These are products that are, or could be, exported from Texas to other countries.
# TOTAL TRADE (GOODS)
## JANUARY – MARCH, 2004
### TOP 4 COUNTRIES TRADING GOODS WITH THE UNITED STATES

<table>
<thead>
<tr>
<th>Country</th>
<th>Exports</th>
<th>Imports</th>
<th>Percent of Total Trade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>44.8</td>
<td>60.3</td>
<td>19.9%</td>
</tr>
<tr>
<td>Mexico</td>
<td>25.9</td>
<td>36.4</td>
<td>11.8%</td>
</tr>
<tr>
<td>China</td>
<td>9.0</td>
<td>39.2</td>
<td>9.2%</td>
</tr>
<tr>
<td>Japan</td>
<td>13.2</td>
<td>31.3</td>
<td>8.4%</td>
</tr>
</tbody>
</table>

(Note: Data is based on Goods only, on a Census Basis, in billions of dollars.)

Source: US Census Bureau, Foreign Trade Statistics
### TEXAS EXPORTS — SELECTED COUNTRIES — AGRICULTURAL PRODUCTS
(Noted in Dollar Amounts)

<table>
<thead>
<tr>
<th>Country</th>
<th>2000 ($)</th>
<th>2003 ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mexico</td>
<td>1,005,318,382</td>
<td>1,082,424,511</td>
</tr>
<tr>
<td>Japan</td>
<td>17,841,468</td>
<td>10,308,255</td>
</tr>
<tr>
<td>Canada</td>
<td>94,025,779</td>
<td>116,920,484</td>
</tr>
</tbody>
</table>

### TEXAS EXPORTS — SELECTED COUNTRIES — FURNITURE AND FIXTURES
(Noted in Dollar Amounts)

<table>
<thead>
<tr>
<th>Country</th>
<th>2000 ($)</th>
<th>2003 ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mexico</td>
<td>110,095,664</td>
<td>64,060,065</td>
</tr>
<tr>
<td>Japan</td>
<td>2,492,317</td>
<td>789,550</td>
</tr>
<tr>
<td>Canada</td>
<td>27,630,359</td>
<td>30,308,759</td>
</tr>
</tbody>
</table>

### TEXAS EXPORTS — SELECTED COUNTRIES — PAPER
(Noted in Dollar Amounts)

<table>
<thead>
<tr>
<th>Country</th>
<th>2000 ($)</th>
<th>2003 ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mexico</td>
<td>934,860,656</td>
<td>862,568,471</td>
</tr>
<tr>
<td>Japan</td>
<td>25,260,800</td>
<td>11,275,169</td>
</tr>
<tr>
<td>Canada</td>
<td>76,886,280</td>
<td>102,860,555</td>
</tr>
</tbody>
</table>

Source:
U.S. PORTS RANKED
BY TONNAGE 2001
(X 1000)

1. S. Louisiana  212,565
2. Houston      185,050
3. New York     137,484
4. New Orleans  85,628
5. Beaumont     79,131
6. Corpus Christi  77,576
7. Huntington, WV  76,670
8. Long Beach    67,644
9. Texas City    62,270
10. Baton Rouge  61,415

GLOSSARY OF ECONOMICS TERMS

Bartering - The direct exchange or trading of goods and services without the use of money

Boomtown - A town experiencing a very fast economic or a population growth due to some industry or production nearby, such as oil boomtowns in Texas

Capital Resources - Resources made and used to produce goods and services, for example, tools and machinery

Cash crop - a crop people raise to sell to others, in hopes of making a profit

Coin - A flat, typically round, piece of metal with an official stamp, used as money

Commercial - Relating to goods that are produced and distributed in large quantities for use by industry, or are sold to others in hopes of making a profit

Consumer - A person who uses goods and services

Development - The process of improving the quality of all people’s lives within an area

Division of Labor (from TEA - grade 4) - Dividing work so that each worker does only part of a larger job is called division of labor. Factory workers are trained in only one area of the assembly line process. They depend on workers in other areas to do other jobs. This contributes to efficiency in mass production situations but does not result in a highly skilled job force. To change production is challenging where a division of labor is in place.

Economic Growth - An increase in the production levels of goods and services. If measured in monetary terms, the increases must occur after adjustments for inflation have been made.

Economic Systems (from TEA - grade 3) - Economic systems are organized sets of procedures used within communities or between communities to govern the production and distribution of goods and services. Economists identify three types of economic systems: traditional (customs, habits, laws, and religious beliefs control decisions), command (government regulates economic activity), and market (individuals control production and distribution resources and make decisions based on the market in which they function). A mixed economy combines elements of these systems. The economy of the United States is considered a market economy though aspects of a command economy influence major segments of the nation’s economy such as transportation.

Economics - The study of how people provide and use goods and services

Economy - The way people of a state, region or country use resources to meet their needs

Empresario - A person who received land as a gift from the Mexican government and could develop it and sell it to others

Entrepreneurs - People who finance and invest in projects and use resources to produce goods and services that they hope people will buy and/or use; entrepreneurs take risks in that they may not receive enough in return to cover their initial investment costs
Export - a product produced in one country and then shipped to another country to be sold

Free enterprise system (from TEA - grade 2) - A free enterprise economy or system is the same as a market economy. In a market economy, individuals depend on supply, demand, and prices to determine the answers to the four economic questions of “what to produce,” “how to produce,” “how much to produce,” and “for whom to produce.” The system has four characteristics: economic freedom, voluntary exchange, private property and the profit motive. Also called a market economy.

Goods - Products people purchase and sell to meet their wants and needs, such as food and clothing

Government Economic Action – An action taken by a city, county, state or federal government that benefits a business or group of businesses. Such actions can include allowing a business to operate and pay fewer taxes than other businesses would pay in order to get this business to build in a certain area or to provide a certain service.

Human Resources - Quantity and quality of human efforts directed toward producing goods and services

Immigration (from TEA - grade 4) - Immigration is the process of people moving to a new place to stay permanently or at least for a long time. Those leaving one region or country to settle in another are emigrants. Those arriving in the new region or country are immigrants.

Import - a product brought in from another country to be sold

Industry - Businesses that create a type of product or provide a type of service

Interdependence (from TEA - grade 3) - Few communities are self-sufficient. Residents in communities in areas with rich farmland may devote their time to market gardening. Down the road in an industrialized area, residents may not have land to raise gardens. As a result, they depend on each other for goods and services. A system of interdependence results, based in free exchange. When one crop is scarce, residents may grow more of another crop to satisfy the demand. If one community increases prices, the other community may counter with the same strategy to maintain a balance between the mutual dependencies that exists between the two.

Limited Resources (from TEA - grade 4) - When there is a fixed supply of a resource, the resource is limited. The supply of any non-renewable natural resource such as oil is limited. Other natural resources such as cotton or peanuts may be limited during one growing season, but renewable over a period of years. This affects price and availability. Human resources are also often limited because the number of people possessing a certain skill may be limited, or funds to pay laborers may be limited. When there is a fixed supply of a resource, the resource is limited. The supply of any non-renewable natural resource such as oil is limited. Other natural resources such as cotton or peanuts may be limited during one growing season, but renewable over a period of years. This affects price and availability. Human resources are also often limited because the number of people possessing a certain skill may be limited, or funds to pay laborers may be limited.
Manufacturing - To make or process materials into finished products, especially by means of a large-scale industrial operation

Market (from TEA - grade 1) - A market is a physical location such as a shopping district in a town or state, or a mechanism such as telephones, the telegraph, or the Internet which brings buyers and sellers together. Markets serve local, regional, national, or global regions.

Market economy - a synonym for free enterprise system

Mass production (from TEA - grade 4) - Making many of the same things is termed mass production. Usually mass production depends on technology, standardized parts, an assembly line process, a labor force, factories to house machinery and workers, a transportation network to get the supply from the factory to the consumers, a marketing campaign to convince people to buy the supply, and a price that meets the demand of customers. Henry Ford made mass production possible through the use of the assembly line to build the Model T. In 1909 his car cost $950 but by 1916 it cost only $360. Mass production of one product may encourage growth of other industries. In order to finish a car, the Ford Motor Company used steel, rubber, glass, and upholstery. Increasing numbers of cars on the road affected urban and suburban development, the need for gas stations and motels and the care and surfacing of roads. Mass production can cause an economy to grow. At the same time, mass production can lead to a decline in the number of things made by hand by artists and crafts people. It can increase pollution and can reduce variation in society.

Migration (from TEA - grade 4) - Migration is the process of moving from one place to another place intending to stay permanently or at least for a long period of time. Pull factors draw migrants from their original location. These include social, economic, and environmental attractions. Push factors are the social, economic, and environmental forces, which drive people from their original location and cause them to seek a new one.

Money - Anything widely accepted as final payment for goods and services

Natural Resources (from TEA - grade 3) - Natural resources are items provided by nature from which people produce goods and provide services. Some examples of natural resources include water, soil, trees, and oil as well as minerals and metals such as gold and iron ore. Even abundant fish can be a natural resource.

Needs - The desire for goods or services that are generally considered required for everyday life, such as food, housing, education, medicine

Nonrenewable resource - a natural material that cannot be made again by nature or people within a reasonable length of time, such as oil or natural gas

Opportunity Cost - What someone gives up something in order to get something else; whenever someone chooses to purchase a good or service, there is always some type of opportunity cost

Price - The amount as of money or goods, asked for or given in exchange for something else

Private property - land, equipment, buildings etc. that a person or group of people own, that is not owned by the government
Producer - A person who makes goods or provides services

Production - The creation of value by making goods and services. The total output created is called the production.

Profit - money left over in a business after all the expenses have been paid

Profit motive - when individuals or businesses act to take care of their own best interests - producers are free to sell their goods and services for the highest prices possible, and consumers are free to shop around to find the lowest possible prices for the goods and services they want. Workers are free to ask for better wages or working conditions

Public land - land that people of a state or country own

Renewable resource - a natural material that can be made again by nature or people in a reasonable length of time, such as trees

Rural - related to the country (as opposed to the city); relating to farming; agricultural

Scarcity - The condition of being hard to find; smallness of quantity in proportion to the wants or needs; deficiency; lack of plenty; short supply; ex: a scarcity of grain or wood

Services - Activities that someone does for others, who pay for such activities, that do NOT include manufacturing of products; examples are having the lawn cut, being served in a restaurant, having shoes repaired, legal services, medical services, entertainment, etc.

Specialization (from TEA - grade 4) - Specialization concentrates research, design, and production on a particular good or service. Mass production depends on specialized parts made by machines created to produce just one size or type of good. In an industrial setting workers often learn specialized skills suited to one task or series of related tasks in the assembly process. Specialization also applies to non-industrial patterns of work. Students learn to be teachers, investment bankers, curators, journalists, or engineers. As people become more experienced, they often become more specialized. The oil industry in Texas requires the specialized services provided by geologists, petroleum engineers, and lawyers and specialized industries such as refining. It is often more practical to focus research, design, and production on one good or service, especially when natural resources, population distribution, or economic patterns encourage it. For instance, doctors specializing in heart or cancer treatments establish practices in urban area while those trained to work in oil fields labor where the oil resources exist.

Subsistence - raising of crops to be used by the producer, not for sale or for profit making

Supply and Demand (from TEA - grade 3) - Economic systems are organized sets of procedures used within communities or between communities to govern the production and distribution of goods and services. Economists identify three types of economic systems: traditional (customs, habits, laws, and religious beliefs control decisions), command (government regulates economic activity), and market (individuals control production and distribution resources and make decisions based on the market in which they function). A mixed economy combines elements of these systems. The economy of the United States is considered a market economy
though aspects of a command economy influence major segments of the nation’s economy such as transportation.

**Tax incentives** - when a government (such as a town, city, or county) reduces the amount of taxes owed by a business as a way to get the business to come to land under the government’s area of control

**Technology** - The way people use new ideas to create tools and machines

**Trade** - To engage in buying and selling for profit; to make an exchange of one product for another

**Urban** - related to the city (as opposed to the country)

**Voluntary exchange** - when an individual or business that produces a product or service is free to sell for they price they wish to charge

**Wants** - Desires that can be satisfied by consuming a good, service, or leisure activity