

Lesson A2–1

Determining the History of Agriculture

Unit A. Agricultural Literacy

Problem Area 2. Recognizing the Role of Agriculture in Society

Lesson 1. Determining the History of Agriculture

New Mexico Content Standard:

Pathway Strand: Plant Systems

Standard: III: Apply fundamentals of production and harvesting to produce plants.

Benchmark: III-A: Apply fundamentals of plant management to develop a production plan.

Performance Standard: 1. Identify and select seeds and plants. 2. Manipulate and evaluate environmental conditions (e.g., irrigation, mulch, shading) to foster plant germination, growth and development. 3. Evaluate and demonstrate planting practices (e.g., population rate, germination/seed vigor, inoculation, seed and plant treatments). 4. Evaluate and demonstrate transplanting practices. 5. Prepare soil/media for planting. 6. Control plant growth (e.g., pruning, pinching, disbudding, topping, detasseling, staking, cabling, shearing, shaping). 7. Prepare plants and plant products for distribution.

Student Learning Objectives. Instruction in this lesson should result in students achieving the following objectives:

1. Define agriculture and explain agriculture industry.
2. Identify important agricultural developments that occurred in early American history.
3. Explain the major technological developments that have occurred in agriculture.

List of Resources. The following resources may be useful in teaching this lesson:

Recommended Resources. One of the following resources should be selected to accompany this lesson:

Herren, Ray. *Exploring Agriscience*. Albany New York: Delmar Publishers, 1997.

Morgan, Elizabeth M., et al. *AgriScience Explorations*, Second Edition. Danville, Illinois: Interstate Publishers, Inc., 2000. (Textbook, Chapter 1)

Other Resources. The following resources may be helpful to teachers and students:

Drache, Hiram M. *History of U.S. Agriculture and Its Relevance to Today*. Danville, Illinois: Interstate Publishers, Inc., 1996. (Units I–V)

Lee, Jasper S. and Diana L. Turner. *AgriScience*, Third Edition. Danville, Illinois: Interstate Publishers, Inc., 2003. (Textbook and Activity Manual, Chapter 1)

List of Equipment, Tools, Supplies, and Facilities

Writing surface

Overhead projector

Transparencies from attached masters

Copies of Student Lab Sheets

Terms. The following terms are presented in this lesson (shown in bold italics):

Agriculture industry

Agriculture

Agribusiness

Aquaculture

Biotechnology

Domestication

Farming

Forestry

Inventions

Natural resources

Ornamental horticulture

Suburban farming

Technology

Interest Approach. Use an interest approach that will prepare students for the lesson. Teachers often develop approaches for their unique class and student situations. A possible approach is given here.

Have students conduct a survey throughout the school. Have them ask three individuals what is the first thing they think of when agriculture is mentioned. Chances are that most people think of farming when agriculture is mentioned. Use the survey results as a basis for a discussion on how far-reaching agriculture is. Use the discussion as a starting point in helping the class to understand that agriculture is far more than farming. It is a high-tech industry that is responsible for a large number of jobs throughout the world.

Summary of Content and Teaching Strategies

Objective 1: Define agriculture and explain agriculture industry.

Anticipated Problem: What is agriculture? How does the agriculture industry influence the lives of the world's citizens?

- I. **Agriculture** is the science of growing crops and raising animals to meet the needs of humans.
 - A. The **agriculture industry** includes all of the activities needed to provide people with food, clothing, and shelter. It includes farm and nonfarm operations.
 1. **Agribusiness** is all of the nonfarm work in the agriculture industry. The two main areas of agribusiness are:
 - a. Supplies and services
 - b. Marketing and processing
 2. **Farming** is using the land and other resources to grow crops and raise animals. Examples of farming include:
 - a. **Suburban farming** is using small areas of land in residential and business areas to produce crops and animals.
 - b. **Aquaculture** is farming in water. Aquaculture is not limited to just raising fish. It also includes the production of plants such as water cress and water chestnuts.
 - c. **Forestry** is the production and use of trees.
 - d. The agriculture industry also includes items that make the lives of people better.
 - (1) **Ornamental horticulture** is producing plants for their beauty.
 - (2) **Natural resources** are all of the things found in nature, including living organisms, minerals, soil, water, and air.

Many techniques may be used to help students master this objective. Students should be provided with the appropriate text materials. Have them read Chapter 1 in Exploring Agriscience or Chapter 1 in AgriScience Explorations. Lead the class in a discussion of the importance of the agriculture industry. Use student comments to help the class develop an understanding of the differences between agriculture, agriculture industry, and farming.

Objective 2: Identify important agricultural developments that occurred in early American History.

Anticipated Problem: What important early developments in agriculture helped influence life today?

- II. Early agriculture in what became the United States was influenced by two groups of people.
 - A. Native Americans included Indians, Hawaiians, and Eskimos. The early agriculture of these people consisted mainly of hunting and gathering to meet their food, clothing, and shelter needs.
 - 1. Around 7000 B.C. Indians began simple farming.
 - 2. By 1000 A.D. corn was grown in large plots.
 - B. Colonists were mostly people from Europe who came to America to help settle the new land. They learned successful agriculture practices from the Native Americans.
 - 1. In 1611, a shipment of livestock arrived in the colony of Jamestown, Virginia. This shipment became the foundation for livestock production in colonies of the south-east.
 - 2. The colonists brought about the domestication of animals. **Domestication** refers to the taming, confinement, and breeding of animals for human use.

Many techniques may be used to help students master this objective. Students should be provided with the appropriate text materials. Have them read Chapter 1 in either Exploring Agriscience or AgriScience Explorations. Lead the class in a discussion of the agricultural developments that occurred early in American history. Summarize the comments on the writing surface. Use student responses to form the bases for any concepts that need to be retaught.

Objective 3: Explain the major technological developments that have occurred in agriculture.

Anticipated Problem: What have been the major technological developments in agriculture?

- III. There have been many important technological developments in agriculture throughout history. These developments have drastically changed the agriculture industry.
 - A. In the mid 1700s, 90% of the people were farmers. Because of technology, now only 2% of the American population are engaged in production agriculture. **Technology** is the use of inventions in working and living. An **invention** is any new device or product or a new way of doing work.
 - B. Important technological advancements in American agriculture between 1607 and 1901 include:
 - 1. 1607—The Indians show the Plymouth Colonists how to grow crops such as corn, pumpkins, squash, and beans.
 - 2. 1700s—Charles Townshend develops the first crop rotation systems.

3. 1700s—Jethro Tull develops a planting machine.
 4. 1793—The cotton gin is invented by Eli Whitney.
 5. 1834—Cyrus McCormick invents the reaper.
 6. 1837—John Deere designs a one-piece wrought iron plow in Grand Detour, Illinois.
 7. 1800s—Gregor Mendel, a botanist, discovers the basic principles of heredity.
 8. 1850—Joseph Glidden develops barbed wire for use by cattle ranchers.
 9. 1862—The Morrill Act creates land-grant universities. The USDA is established.
 10. 1869—Transcontinental railroad is completed.
 11. 1901—First successful gasoline engine tractor is built.
- C. Important advancements in the 20th century include:
1. Improved varieties of corn were developed. These varieties were more resistant to pests and diseases.
 2. The development of new chemicals to control insects, diseases, and weeds.
 3. Genetic engineering and other advanced methods of improving crops and livestock were implemented.
 4. Computers were developed and began to be widely used in agriculture.
 5. **Biotechnology**, the science to change organisms or their environment or to get products from organisms, began to be used.

A number of techniques may be used to help students understand this objective. Provide them with copies of the suggested references. Have them read Chapter 1 in either AgriScience Explorations or Exploring Agriscience. Use TM: A2–1A to help the class become aware of important technological advancements and inventions used in agriculture. Identify which advancements had the most direct impact on agriculture in your state.

Review/Summary. Focus the review and summary of the lesson around the student learning objectives. Call on students to explain the content associated with each objective. Use their responses as the basis for determining any areas that need reteaching. Questions at the end of each chapter in the recommended textbooks may also be used in the review/summary. Use the lab activities in reviewing and reinforcing student learning.

Application. Application can involve one or more of the following student activities using attached lab sheets:

Agriculture History Crossword Puzzle—LS: A2–1A

Inventor Information Sheet—LS: A2–1B

Evaluation. Evaluation should focus on student achievement of the objectives for the lesson. Various techniques can be used, such as student performance on the application activities. A sample written test is attached.

Answers to Sample Test:

Part One: Matching

1=h, 2=a, 3=b, 4=c, 5=f, 6=d, 7=i, 8=g, 9=e

Part Two: Completion

1. food, fiber, shelter
2. 90 % and 2%
3. John Deere
4. Ornamental horticulture

Part Three: Short Answer

1. Suburban farming is using small areas of land in residential or business areas to produce crops and animals.
2. The two major areas of agribusiness are supplies and service and marketing and processing.

Test

Lesson A2–1: Determining the History of Agriculture

Part One: Matching

Instructions. Match the term with the correct response. Write the letter of the term by the definition.

- | | | |
|-------------------|----------------------|-------------------|
| a. agriculture | d. natural resources | g. Joseph Glidden |
| b. Gregory Mendel | e. forestry | h. USDA |
| c. domestication | f. aquaculture | i. agribusiness |

- _____ 1. The United States Department of Agriculture.
- _____ 2. The science of growing crops and raising livestock.
- _____ 3. Botanist who discovered the basic principles of heredity.
- _____ 4. The taming, confinement, and breeding of animals for human use.
- _____ 5. Farming in water.
- _____ 6. Living organisms, minerals, soil, water, and air.
- _____ 7. Nonfarm work in the agricultural industry.
- _____ 8. Developed barbed wire.
- _____ 9. The production and use of trees.

Part Two: Completion

Instructions. Provide the word or words to complete the following statements.

1. The agriculture industry includes all of the processes involved in getting _____, _____, and _____ to the consumer.
2. In the mid 1700s, _____% of the population were farmers. Today, only _____% of the American population are engaged in production agriculture.
3. _____ designed the one-piece wrought iron plow in Grand Detour, Illinois.
4. _____ is producing plants for their beauty.

A History of American Agriculture, 1776-1990

by Economic Research Service

Farm Machinery and Technology

16th-18th Centuries	18th Century—Oxen and horses for power, crude wooden plows, all sowing by hand, cultivating by hoe, hay and grain cutting with sickle, and threshing with flail
1776-99	1790s—Cradle and scythe introduced 1793—Invention of cotton gin 1794—Thomas Jefferson’s moldboard of least resistance tested 1797—Charles Newbold patented first cast-iron plow
1800 1810 1820	1819—Jethro Wood patented iron plow with interchangeable parts 1819-25—U.S. food-canning industry established
1830	1830—About 250-300 labor-hours required to produce 100 bushels (5 acres) of wheat with walking plow, brush harrow, hand broadcast of seed, sickle, and flail 1834—McCormick reaper patented 1834—John Lane began to manufacture plows faced with steel saw blades 1837—John Deere and Leonard Andrus began making steel plows 1837—Practical threshing machine patented

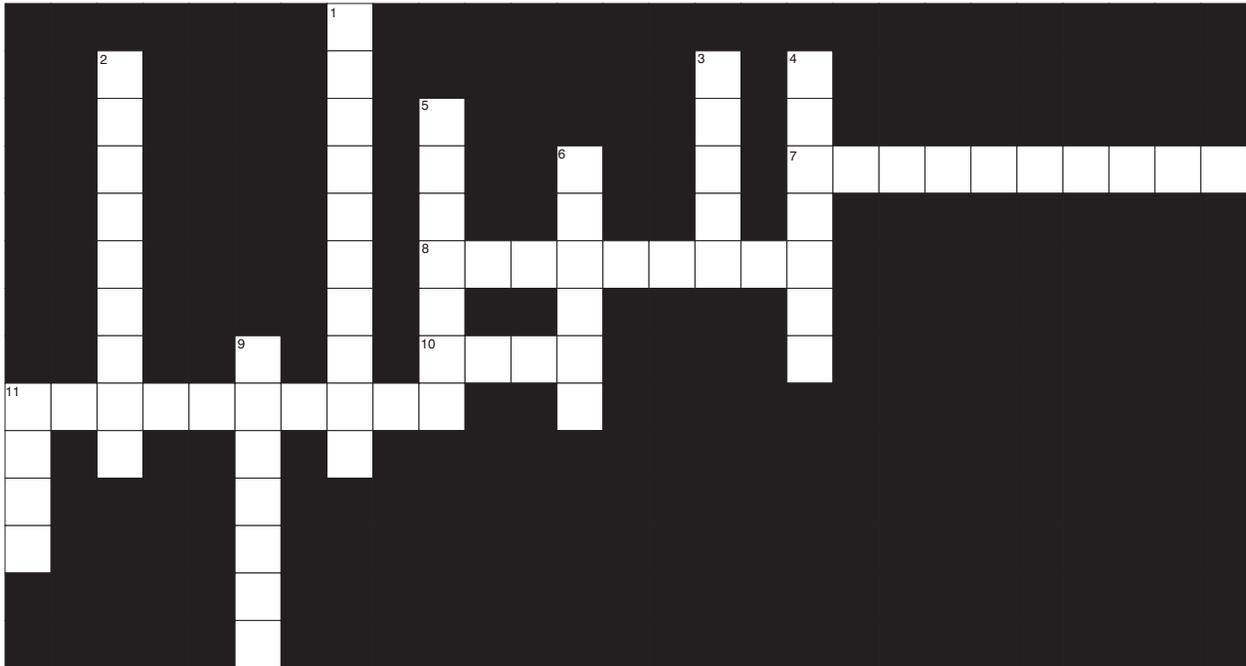
1840	<p>1840s—The growing use of factory-made agricultural machinery increased farmers' need for cash and encouraged commercial farming</p> <p>1841—Practical grain drill patented</p> <p>1842—First grain elevator, Buffalo, NY</p> <p>1844—Practical mowing machine patented</p> <p>1847—Irrigation begun in Utah</p> <p>1849—Mixed chemical fertilizers sold commercially</p>
1850	<p>1850—About 75–90 labor-hours required to produce 100 bushels (2½ acres) of corn with walking plow, harrow, and hand planting</p> <p>1850–70—Expanded market demand for agricultural products brought adoption of improved technology and resulting increases in farm production</p> <p>1854—Self-governing windmill perfected</p> <p>1856—2-horse straddle-row cultivator patented</p>
1860	<p>1862–75—Change from hand power to horses characterized the first American agricultural revolution</p> <p>1865–75—Gang plows and sulky plows came into use</p> <p>1868—Steam tractors were tried out</p> <p>1869—Spring-tooth harrow or seedbed preparation appeared</p>
1870	<p>1870s—Silos came into use</p> <p>1870s—Deep-well drilling first widely used</p> <p>1874—Glidden barbed wire patented</p> <p>1874—Availability of barbed wire allowed fencing of rangeland, ending the era of unrestricted, open-range grazing</p>
1880	<p>1880—William Deering put 3,000 twine binders on the market</p> <p>1884–90—Horse-drawn combine used in Pacific Coast wheat areas</p>

<p>1890</p>	<p>1890–95—Cream separators came into wide use</p> <p>1890–99—Average annual consumption of commercial fertilizer: 1,845,900 tons</p> <p>1890s—Agriculture became increasingly mechanized and commercialized</p> <p>1890—35–40 labor-hours required to produce 100 bushels (2½ acres) of corn with 2-bottom gang plow, disk and peg-tooth harrow, and 2-row planter</p> <p>1890—40–50 labor-hours required to produce 100 bushels (5 acres) of wheat with gang plow, seeder, harrow, binder, thresher, wagons, and horses</p> <p>1890—Most basic potentialities of agricultural machinery that was dependent on horsepower had been discovered</p>
<p>1900</p>	<p>1900–1909—Average annual consumption of commercial fertilizer: 3,738,300 tons</p> <p>1900–1910—George Washington Carver, director of agricultural research at Tuskegee Institute, pioneered in finding new uses for peanuts, sweet potatoes, and soybeans, thus helping to diversify southern agriculture</p>
<p>1910</p>	<p>1910–15—Big open-g geared gas tractors came into use in areas of extensive farming</p> <p>1910–19—Average annual consumption of commercial fertilizer: 6,116,700 tons</p> <p>1915–20—Enclosed gears developed for tractor</p> <p>1918—Small prairie-type combine with auxiliary engine introduced</p>

<p>1920</p>	<p>1920–29—Average annual consumption of commercial fertilizer: 6,845,800 tons</p> <p>1920–40—Gradual increase in farm production resulted from expanded use of mechanized power</p> <p>1926—Cotton-stripper developed for High Plains</p> <p>1926—Successful light tractor developed</p>
<p>1930</p>	<p>1930–39—Average annual consumption of commercial fertilizer: 6,599,913 tons</p> <p>1930s—All-purpose, rubber-tired tractor with complementary machinery came into wide use</p> <p>1930—One farmer supplied 9.8 persons in the United States and abroad</p> <p>1930—15–20 labor-hours required to produce 100 bushels (2½ acres) of corn with 2-bottom gang plow, 7-foot tandem disk, 4-section harrow, and 2-row planters, cultivators, and pickers</p> <p>1930—15–20 labor-hours required to produce 100 bushels (5 acres) of wheat with 3-bottom gang plow, tractor, 10-foot tandem disk, harrow, 12-foot combine, and trucks</p>

Lab Sheet

Agriculture History Crossword Puzzle



ACROSS

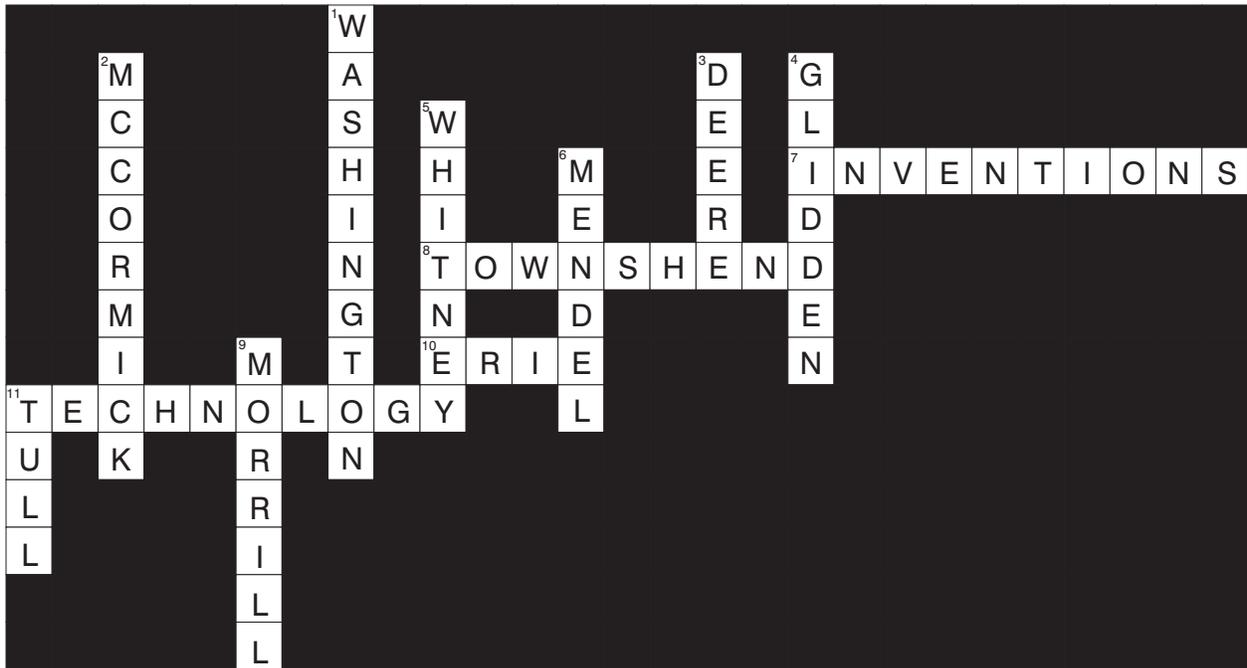
- 7. Any new device or product, or a new way of doing work.
- 8. Developed the first crop rotation system.
- 10. This canal opened in 1825.
- 11. The use of inventions in working and living.

DOWN

- 1. Established an experimental farm at Mt. Vernon.
- 2. Invented the reaper.
- 3. Designed the one-piece wrought iron plow.
- 4. Developed barbed wire.
- 5. Developed the cotton gin.
- 6. Discovered the principles of heredity.
- 9. This Act created land-grant universities.
- 11. Developed the planting machine.

Lab Sheet Key

Agriculture History Crossword Puzzle



Lab Sheet

Inventor Information Sheet

Inventor's Name: _____

Name of the Invention: _____

Date of Invention: _____

Explain the impact this invention had on agriculture:

Is this invention still being used today? _____

What improvements have been made to the invention or replaced the invention? Explain.