

## Lesson A6–1

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# Understanding Agriscience and Technology

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### **Unit A.** Agricultural Literacy

**Problem Area 6.** Determining the Role of Research and Development in Agriculture/Horticulture

### **Lesson 1.** Understanding Agriscience and Technology

#### **New Mexico Content Standard:**

**Pathway Strand:** Agribusiness Systems

**Standard:** V: Utilize technology to accomplish AFNR business objectives.

**Benchmark:** V-A: Use technology and information technology strategies for business improvement.

**Performance Standard:** 1. Utilize leading technology; (e.g., Global Positioning System (GPS), Geological Information System (GIS), Personal Data Application (PDA), cellular). 2. Create and use documents using word processors, spreadsheets, databases, and electronic mail. 3. Conduct research using the Internet. 4. Conduct oral/visual presentations using presentation software.

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

1. Explain the meaning of agriscience and technology.
2. Identify the major areas of agriscience
3. Explain the benefits of research in new areas of agriscience.

**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:

Cooper, Elmer E. *Agriscience Fundamentals and Application*. Albany, New York: Delmar Publishers, 1997. (Textbook, Unit 3)

Lee, Jasper S. and Diana L. Turner. *AgriScience*, Third Edition. Danville, Illinois: Interstate Publishers, Inc., 2003. (Textbook and Activity Manual, Chapter 2)

**Other Resources.** These resources may be of use to students and teachers:

Morgan, Elizabeth M., et al. *AgriScience Explorations*, Second Edition. Danville, Illinois: Interstate Publishers, Inc., 2000. (Textbook Chapter 12)

Osborne, Edward W. *Biological Science Applications in Agriculture*. Danville, Illinois: Interstate Publishers, Inc., 1994. (Chapters 1 and 2)

## List of Equipment, Tools, Supplies, and Facilities

Overhead projector

Writing surface

Transparencies from attached masters

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

*Agriscience*

*Agronomy*

*Aquaculture*

*Biotechnology*

*Entomology*

*Environmental science*

*Forestry*

*Genetic engineering*

*Horticulture*

*Life science*

*Mathematics*

*Mechanical technology*

*Olericulture*

*Ornamental horticulture*

*Physical science*

*Pomology*

Precision farming  
Remote sensing  
Social science  
Technology

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

*Ask students to define agriscience, agriculture, and technology. Record some of the more common definitions on the classroom writing surface. Use the definitions as a basis for a discussion of the role that the sciences and their practical use play in providing students with food, clothing, and shelter. Ask the class to provide examples of the use of science and technology in various agricultural practices.*

## Summary of Content and Teaching Strategies

**Objective I:** Explain the meaning of agriscience and technology.

**Anticipated Problem:** What are agriscience and technology?

- I. Agriscience and technology are extremely important in the ability to produce more plants and animals to meet the increasing world population.
  - A. **Agriscience** is the use of science in producing food, fiber, and shelter. It involves four major areas of science.
    1. **Mathematics** is the science of numbers.
    2. **Physical science** is the study of nonliving matter. Examples include chemistry and physics.
    3. **Life science** is the study of living things. This is also commonly referred to as biology.
    4. **Social science** is the study of human behavior. Examples include psychology and sociology.
  - B. **Technology** is the practical use of science. In this definition, the word practical is stressed. Technology deals with putting science to good use.

*Provide students with copies of the suggested resources. Have them read Unit 3 in Agriscience Fundamentals and Applications or Chapter 2 in AgriScience. Use TM: A6–1A to illustrate the difference between agriscience and technology. It will also be of use in demonstrating the fact that agriculture is a science. Use the transparency to generate discussion of examples of how the four major areas of science are used in agriculture.*

**Objective 2:** Identify the major areas of agriscience.

**Anticipated Problem:** What are the major areas of agriscience?

- II. Agriscience is made up of several areas of applied science (science in action).
  - A. **Agronomy** is the study of plants and how they relate to soil. It deals with the production of crops and grasses and the improvement and conservation of soil.
  - B. **Horticulture** is the science of growing plants for food, comfort, and beauty.
    - 1. **Ornamental horticulture** involves growing and using plants for their beauty. It includes floriculture, landscape horticulture, and interiorscaping.
    - 2. Food crop production involves two main areas:
      - a. **Olericulture** is the growing of vegetables.
      - b. **Pomology** is the production of fruits and nuts.
  - C. **Forestry** is the science of growing and using trees.
  - D. **Entomology** is the branch of zoology that deals with insects and related small animals.
  - E. Animal science is the study of the production of animals for food.
  - F. Poultry science is concerned with raising chickens and related fowl, like pheasants, ducks, and emu.
  - G. **Aquaculture** is the science of farming in water. It deals with growing both plants and animals.
  - H. **Environmental science** involves ways of wisely using and protecting the things around us. Emphasis is on natural resources.
  - I. **Mechanical technology** is the use of machines and equipment to do work.

*Provide students with copies of the suggested resources. Have them read Unit 3 in Agriscience Fundamentals and Applications or Chapter 2 in AgriScience. Use TM: A6–1B to illustrate the major areas of agriscience. Help students understand that these areas involve the practical use of science to meet the needs of humans.*

**Objective 3:** Explain the benefits of research in new areas of agriscience.

**Anticipated Problem:** What role does research play in emerging areas of agriscience?

- III. Research in agriscience is providing exciting results for both consumers and producers. It is allowing producers to raise more plants and animals with fewer inputs. For consumers, this research helps to insure that their needs for food, clothing, and shelter will continue to be met.
  - A. **Biotechnology** involves using biology to develop new products or processes. Examples include new vaccines for the protection of animals and the development of “waste-eating” bacteria that protect the environment.

- B. **Genetic engineering** is an advanced form of biotechnology. It involves changing the nature of living organisms. Through genetic engineering, crops that resist insect damage have been developed.
- C. **Precision farming** is using cropping practices that improve yields based on the needs of the land. It allows crop inputs to be more closely controlled.
- D. **Remote sensing** allows data to be gathered and recorded from great distances. This technology enables better detection of crop diseases and improved weather forecasting.
- E. New areas of agriscience have raised issues that previously did not have to be debated. Some of these issues include:
  - 1. Food safety
  - 2. Pollution
  - 3. Human rights
  - 4. Conservation of resources

*Provide students with copies of the suggested resources. Have them read Unit 3 in Agriscience Fundamentals and Applications or Chapter 2 in AgriScience. Display TM: A6–1C to the class. Use it in discussing the new areas of agriscience.*

**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.

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

## **Answers to Sample Test:**

### **Part One: Matching**

1=e, 2=a, 3=c, 4=b, 5=d

### **Part Two: Completion**

- 1. mathematics, physical science, biological science, social science
- 2. agriscience
- 3. Technology
- 4. nonliving

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# Test

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## Lesson A6–1: Understanding Agriscience and Technology

### Part One: Matching

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

- |                          |                          |               |
|--------------------------|--------------------------|---------------|
| a. horticulture          | c. agronomy              | e. entomology |
| b. environmental science | d. mechanical technology |               |

- \_\_\_\_\_ 1. Branch of zoology that deals with insects.
- \_\_\_\_\_ 2. Science of growing plants for food, comfort, and beauty.
- \_\_\_\_\_ 3. Study of plants and how they relate to soil.
- \_\_\_\_\_ 4. Involves wisely protecting the things around us.
- \_\_\_\_\_ 5. Using machines and equipment to do work.

### Part Two: Completion

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

- 1. The four major areas of science are \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_.
- 2. The use of science in producing food, fiber, and shelter is known as \_\_\_\_\_.
- 3. \_\_\_\_\_ is the practical use of science.
- 4. Physical science is the study of \_\_\_\_\_ matter.

# **Agriscience and Technology**

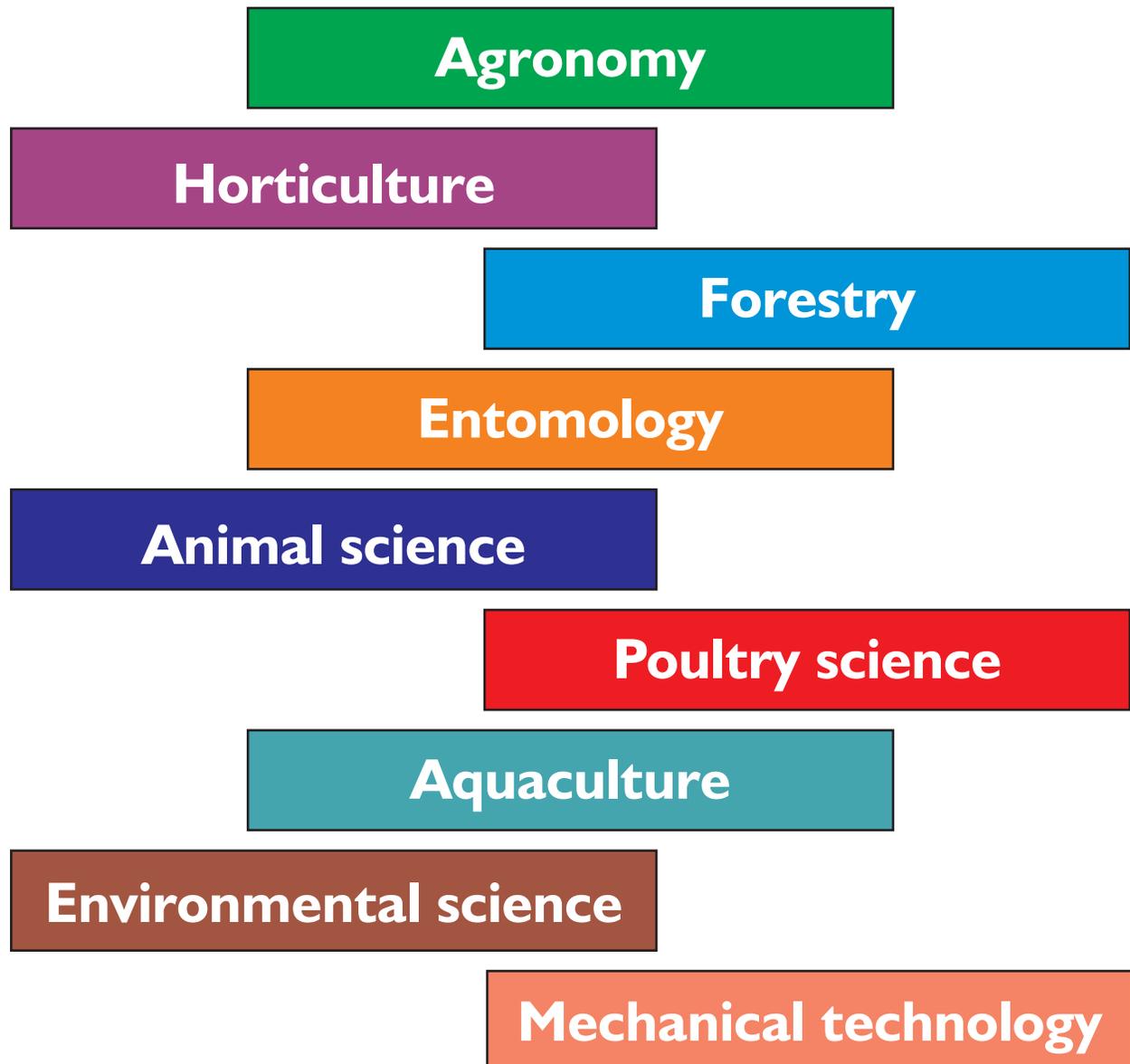
**Agriscience—the use of science in producing food, fiber, and shelter.**

**Agriscience involves:**

- **Mathematics**
- **Physical science**
- **Life science**
- **Social science**

**Technology—the practical use of science.**

# Major Areas of Agriscience



# New Areas of Agriscience

**Biotechnology**

**Genetic Engineering**

**Precision Farming**

**Remote Sensing**