

REFERENCES AND BIAS TOWARDS AGRICULTURE IN A MIDDLE GRADE
SOCIAL SCIENCE TEXTBOOK

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REFERENCES AND BIAS TO AGRICULTURE IN
A MIDDLE GRADE SOCIAL SCIENCE TEXTBOOK

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REFERENCES AND BIAS TOWARDS AGRICULTURE IN A MIDDLE GRADE SOCIAL SCIENCE TEXTBOOK

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ABSTRACT

The central purpose of this study was to assess the degree of bias toward agriculture within a middle grade social science textbook. Literary formats used to reference agriculture within the text were also assessed.

A content analysis was used to identify all references to agriculture within the textbook. All references were categorized according to the agricultural literacy areas as defined by Frick, Birkenholz, and Machtmes (1995). Text references were coded as reports, inferences, judgments, and others and were assigned a numerical score based on the assigned code. This allowed an overall bias score of the textbook, in regards to text references to agriculture, to be established.

A total of 561 references to agriculture were found within the textbook. An overall bias score of 1.04 was determined.

CHAPTER I

INTRODUCTION

Agriculture is a very important part of American society. Although many people are not aware of it agriculture is all around us. Many people in the United States are not aware that agriculture has such a large effect on our society. According to the National Research Council (1988), United States agriculture has fed, clothed, and provided building materials for millions of Americans and many residents of other countries. Although America also has the lowest per capita food cost of any country in the world; much of the general public is unaware of where and how their food was produced (National Research Council, 1988).

In Agricultural Education, it is important to let as many people know about agriculture no matter what age. It is important for all agricultural educators to ensure that all Americans are agriculturally literate. It is important for students to be agriculturally literate because they are our future. They will be voting on different legislation that involves agriculture in life and need to have a basic knowledge of it. According to Frick, Kahler, and Miller (1991) agricultural literacy can be defined as processing knowledge and understanding of our food and fiber system. “An individual processing such knowledge would be able to synthesize, analyze, and communicate basic information about agriculture” (p.54). The National Research Council (1988) reported that agriculture was not taught in elementary schools and has been segregated into vocational

agriculture courses at the secondary level. Agricultural Educators are trying to expand this concept of agriculture only being taught at the secondary level to grades below the secondary level (National Research Council, 1988). The use of core area textbooks could be a possible context in which to integrate agricultural concepts into other disciplines.

Textbooks have played a large part in education in our society for many years. The definition of a textbook may be as general as to include other books made and published for educational purpose, or even any book used in the classroom (Johnsen, 1993). Textbooks are mostly used for classroom instruction. Both historical and recent reports indicate that from 75% to 90% of classroom instructional time is structured by textbook programs (Johnsen).

Textbooks are important in guiding teachers and students to the information that must be learned in a particular area. Textbook quality is very important because it can affect what the students are supposed to learn (Johnsen 1993). If students and teachers depend on textbooks, then the quality of textbooks and accompany materials directly affects the quality of teaching (Johnsen).

Russell (1990) suggested that agricultural concepts could be infused into core subject areas such as mathematics, reading, science, and social science. Textbooks are one way that agriculture can be infused into the core subjects quite easily, without students realizing that they are learning about agriculture in their core subject lessons. Elementary and middle school core subject textbooks have never been scrutinized in terms of agricultural concepts.

History of Agriculture in the United States

Early America according to Berson (2003), between 7,000 and 4,700 years ago, ancient Indians began to plant seeds and grow their own food. This change marked the beginning of agriculture in America. Native Americans raised many agricultural crops and used fish for fertilizer. The Native Americans taught many farming practices to the European settlers when they first came to America (Hillison, 2005). Although Plymouth, Massachusetts was considered to be the first white settlement, it was actually Jamestown, which was settled in 1607 (Hillison). Jamestown was an excellent location, as it was close to the Atlantic Ocean and was an effective location for military protection. However, according to Hillison it was a poor area for growing crops Jamestown was densely forested which hid sunlight.

The citizens of Jamestown were mostly aristocrats; they were not farmers (Hillison, 2005). Since the settlers in Jamestown were not farmers and the land was not suited for agriculture, they received help from Native Americans led by chief Powhatan. This tribe provided Jamestown with enough food to avoid starvation (Wessel, 1977). One of the first crops the colonists raised themselves was corn. Slowly, the colonists learned to raise enough crops to feed themselves (Hillison). The Europeans used the broadcast method of crop production. Basically, they just threw seeds out on the land and hoped that they would germinate and grow (Hillison). After advice from the Indians, the Europeans soon learned that row crop farming was more efficient (Hillison).

Eventually settlers in found that the geography of Virginia proved to be favorable for growing agricultural crops. There were many internal rivers that provided transportation, and water for irrigation (Hillison, 2005). Virginia also had soil that was

compatible with growing different crops, which sustained different types of livestock. The farmers in Virginia had a habit of raising continuous crops, such as tobacco, that wore out the soil. This practice caused many of the farmers to move to other lands west of their farms (Hillison). Tobacco played a significant role in agriculture in Virginia, mostly because tobacco was the crop that farmers could get the fastest return on their money. Since Virginia was slower to industrialize than the northeast, agriculture played a more prominent role in the area (Hillison).

In 1620, the Pilgrims arrived in Plymouth, Massachusetts (Hillison, 2005). Just as it was at Jamestown, the Native Americans taught the Pilgrims the basics of planting corn. Squanto was largely responsible for teaching the Pilgrims the arts of New World agriculture. However, the pilgrim's failure to master these techniques forced them to purchase food from successful Native American farmers (Wessel, 1977). The pilgrims soon realized that food for the settlement was not the only thing they learned from the Indians. Four years after their arrival at Plymouth, the Pilgrims profited from Indian agriculture and formed relationships that would last for more than two hundred years (Wessel). The fall of 1625 was significant for the pilgrims and Governor William Bradford. It was then that the governor sent a boat full of corn up the Kennebec River to trade with other tribes in that area for furs. Later, Massachusetts further developed its fur trade and raised its own corn crop for export (Wessel). The fur trading industry was very important to the Indian tribes as well as the white settlers. By 1630, the majority of the fur trading in the northeast was dominated by the Huron Indian tribe from Canada. Eventually, the Hurons came to rely on trading and abandoned their own agricultural labors (Wessel).

Indian agriculture products, particularly maize, provided a universal exchange in trade between all ethnic groups (Wessel, 1977). In many cases, the agricultural Indian tribes acted as middlemen between white traders and nomadic hunters. The arrival of the white traders in the plains enhanced the value of the agricultural villages. Soon, these villages became the link between the hunter and the trader (Wessel).

Agriculture, in the first two hundred years of the United States consisted of woodlands farming. The pioneer farmers thought since there were few trees on the prairie it was not fertile (Wessel, 1977). While the notion was wrong, it would be many years before pioneer farmers did not have the capital or the equipment to work through the dense soil and the tall grass. Later, the frontier farmers arrived with the equipment and skills to work the land. By the 1730's most of the agricultural tribes had moved further west and therefore, did not get the advantages of the new technology (Wessel).

Toward the end of the 1700's, the federal government was slowly taking away the Indians' land. There were many treaties that were formed to eventually take away everything that the Indians had. After 1804, these treaties contained provisions for employment of government farmers to teach the Indians many agricultural skills (Wessel, 1977). This practice was somewhat ironic because the white farmers often knew less about farming than the Indians. The main purpose of this program was to give the Indians the idea that they did not need to hunt and they needed to use the more modern ways of agriculture (Wessel). Slowly, Indians had fewer and fewer acres of farmland. The European settlers eventually forced them from their land and their homes (Wessel).

Western Expansion

The West had large area of grasslands, which attracted many cattle ranchers. According to Berson (2003), large-scale cattle ranches began in Texas in the early 1800's. After the Civil War, the demand for beef increased, especially in the East. These cattle sold for ten times the amount that they were sold for in Texas (Berson). In the beginning, ranchers drove their cattle to the larger port cities such as Galveston, Texas and Shreveport, Louisiana for shipment to the East. Berson stated this method was slow and costly, but by the 1860's a cheaper faster method became available when the first railroads were built in the West. During these long cattle drives, ranchers followed trails such as the Sedalia Trail to Sedalia, Missouri and the Chisholm Trail. Along these trails, through what is now Oklahoma, the towns that ranchers came to along the railroad were known as "cow towns." In each town the cattle were loaded onto the railroad and sent to cities in the East such as Chicago (Berson).

The Homestead Act of 1862 was one of the most important pieces of legislation in the United States, according to the National Park Service (NPS), (2005). This act turned over large amounts of public land to private citizens. Eventually, over 270 million acres of land was claimed under this act (NPS). The act gave away 160 acre parcels of land that people could take advantage of. The NPS also noted the requirements of the Homestead Act, were that persons were to be at least 21 years of age and must live and farm on the land for at least five years.

There were also many drawbacks to these free parcels of land. According to Berson (2003), the land that was given away in the Homestead Act was not suitable for farming. The soil in the west was hard and could not be worked with the tools that they

had (ushistory.com, 2006). Due to an extended drought in the West there were many dust storms and prairie fires. Many insects also infested the area. In 1874, millions of grasshoppers flocked to the area and ate everything that was green (Berson). People also lived in sod houses that were very difficult to keep clean. Dirt would often fall from the sod ceiling onto the furniture (Berson). The West was considered a treeless wasteland and many people were disappointed with the land that they received (Berson).

Western expansion stimulated the development of many agricultural inventions. One of the most important was the steel plow that was invented by John Deere in 1837 (Massachusetts Institute of Technology, 2004). The steel plow could cut through the tough soil of the West that people had such a difficult time farming (Berson, 2003). Farmers also used new versions of windmills to pump water. People learned that they could plant other crops such as Russian wheat, which required less water (Berson). According to the Virginia Agricultural Experiment Station (2004), the mechanical reaper (a later invention of the earlier reaper) was invented in 1857 by Cyrus McCormick to harvest wheat more quickly and efficiently. The mechanical reaper had an automatic rake that swept cut grain in neat pile on the ground ready to be bound into bundles by the hand binders (Virginia Agriculture Experiment Station, 2004).

According to Berson (2003), farmers and ranchers had a difficult time communicating with one another. They found it difficult to grow crops and raise cattle on adjacent land. In order to keep cattle out of the crops, wire with steel points or barbed wire was used (Berson). Berson went on to say that even though barbed wire helped keep cattle out of the farmers' crops, it also created many problems. Fences often kept farmers from reaching the water that they needed for their crops while at the same time keeping

cattle from necessary water. These problems started “range wars” as farmers and ranchers started shooting each other (ushistory.com, 2006). The range wars lasted through the 1880’s until ranchers were told they had to move their cattle off the government land (Berson).

Great Depression and the Dust Bowl

The roaring twenties were not the best of times for farmers (Berson, 2003). Since World War I was over, the demand for crops had fallen (ushistory.com, 2006). Consequently, farmers fell deep into debt (ushistory.com). This chain reaction resulted in the organization of political groups such as the American Farm Bureau Federation (Hillison, 2005). Groups such as the Farm Bureau supported laws that would boost crop prices, which would lower the debt that the farmers had accumulated during the war (Berson).

In 1919, the Farm Bureau was organized by a group of farmers from thirty states. According to the American Farm Bureau, their main goal was to speak for themselves and they soon became the national voice of agriculture. The Farm Bureau’s purpose was to make the business of farming more profitable, and the community a better place to live (Farm Bureau, 2006). According to members of the Farm Bureau in 1920, the Farm Bureau should provide an organization in which members may secure the benefits of unified efforts in a way which could never be accomplished through individual efforts (Farm Bureau).

When the stock market crashed in 1929 and the Great Depression sank in, farmers still had the same debt from the twenties and fell deeper into debt during this time (ushistory.com, 2006). During the Great Depression, life in the Great Plains got even

worse when the Dust Bowl hit. This was a time when the climate was dry and the wind blew soil right off the farms (ushistory.com). The states that were affected the most by the Dust Bowl were the panhandle of Texas, Oklahoma, Kansas, Colorado, and New Mexico (Berson, 2003). Dust storms were so bad that many farms were buried and the dust blackened many towns. Dust covered everything, including smothering farm animals and clogged farm machinery (Berson). People slept with washcloths on their faces to protect them from the dust. Some people even died from too much exposure to the dust (ushistory.com). The farmers could not use the land to farm anymore and thousands of farms went out of business. In some dust bowl states almost one-third of workers were unemployed (Berson).

Several people living in the dust bowl states left to find a better life. Most of them headed to California where they had heard there was work (ushistory.com, 2006). Families packed their cars full of everything that they owned. When they arrived in California, many dreams of work were shattered (Berson, 2003). In many towns and at large farms, most of the families were greeted with signs that said “No Work”. Instead of finding a better life, most dust bowl farmers only found more hardships (Berson). However, some farmers did find work in California’s San Joaquin Valley picking fruit or cotton in the fields (ushistory.com).

With Franklin D. Roosevelt’s New Deal, new programs to get Americans back to work. One program included in the New Deal to help American farmers was the Agricultural Adjustment Act or the AAA (Berson, 2003). This act helped farmers get higher prices for their products. This goal would be achieved cutting farm production by about thirty percent and by taxing companies that bought farm products to process them

into food and clothing (ushistory.com, 2006). In addition, the government offered payments to farmers if they did not grow certain crops (Berson). These crops included wheat, corn, rice, and cotton. The premise behind this idea was to reduce the supply of certain crops to increase demand and prices (ushistory.com).

In 1933, the Tennessee Valley Authority Act was passed to help farmers in the Tennessee River Valley (Berson, 2003). The act created an agency that was called the Tennessee River Authority that cleared the river where sandbars had kept boats from sailing (Berson). The act also built dams along the river to help control flooding that had damaged area farms. Electric plants were also a result of dam construction (ushistory.com, 2006). Electricity was provided the region and many farmers could use electric lights and appliances for the first time (Berson). The Rural Electrification Administration was also established during this time (Berson). This program was designed to make electricity available in hard-to-reach rural areas (Berson).

Current Agriculture

Today there are many challenges concerning the environment and natural resources. There has been much damage done to the land, water and even wildlife have been affected (Berson, 2003). Americans have made an effort to conserve some of these resources. Berson stated that to help save the endangered birds laws have been passed to ban certain types of chemicals that were entering the water supply. Another way that Americans have attempted to conserve our natural resources is through recycling (Berson).

Biotechnology is becoming a more important part of agriculture everyday. Biotechnology provides farmers with tools that can make production of agriculture less

expensive and more manageable (USDA, 2005). For example, developing genetically engineered insect-resistant cotton has allowed for a significant reduction in certain pesticides that contaminate the groundwater (USDA). Agricultural Biotechnology has been used to protect crops from devastating diseases. Even though there are many benefits there are also many safety concerns about biotechnology being used in the agriculture industry. One of these concerns is ensuring that the environment is protected. For example, crops have to be tested properly and studied to make sure that they pose no significant threat to the environment or consumers (USDA). Biotechnology is being used to make agriculture more efficient more and more everyday, and will continue to be used in the future.

Statement of the Problem

No investigations have been conducted to examine references to agriculture and bias towards agriculture in core area textbooks.

Statement of Purpose

The purpose of this study was to assess the agricultural references made in a selected middle school social science textbook and determine if there is any bias towards agriculture in those references.

Objectives of the Study

The following research objectives were developed to accomplish the purpose:

1. Identify each instance where agriculture is referenced in a selected textbook used for social science instruction in the middle grades.
2. Assess the literary formats used in each reference to agriculture in the textbook.
3. Categorize the references to agriculture found in the textbook according to category of agricultural literacy.
4. Determine what bias, if any, exists in the references to agriculture in the textbook.
5. Determine what time periods in history contain the most agricultural references within the textbook.

Significance of Study

In order to make sound decisions about a subject one must have baseline knowledge about that subject. However, only 5% of today's students are enrolled in a traditional agriculture education course. Therefore, an extreme majority of students are not receiving specific instruction regarding the agricultural issues that affect them everyday leading to misinformed decisions. To generate baseline data regarding the exposure level to agriculture non-agriculture students are exposed to in core academic courses this study was conducted to determine what agriculture concepts are referenced in a middle grade social science textbook. Results of this study will provide information to be used to develop core area textbooks that will be used as context to teach students about agriculture concepts.

Scope of the Study

The scope of the study was all of the agricultural references within the *Glencoe The American Journey* (2005) textbook. The references were categorized according to agricultural literacy and literary format.

Assumptions of the Study

The content analysis portion of this research was conducted under the following assumptions:

1. “Report” sentences are more likely to be perceived as objective rather “inference” or “judgment” sentences.
2. Textbooks are a main source of information in schools to middle grade students.

Limitations of the Study

The following limitations were considered when collecting information for this study:

1. Since only one textbook was used for this study , the results cannot be generalized to the population (all middle grade social science textbooks).
2. The average student does not use the narrow definitions of reports, inferences, and judgments that were used in this study

Definitions

To assure common understanding for the purpose of this study, the following terms were operationally defined:

Agricultural Literacy – “Understanding and possession of knowledge needed to synthesize, analyze, and communicate basic information about agriculture” (Frick, Kahler, & Miller, 1991, p. 49).

Auxiliary Materials – Any written materials that accompany a textbook and include workbooks, worksheets, study questions, and project ideas (Britton, Woodward, & Brinkley, 1993).

Bias – “A mental leaning or inclination; partiality; bent” (Neufeldt & Guralnik, 1988, p. 135).

Inference – “A statement about the unknown based on the known” where a writer or speaker “draws an inference from some set of observable data” (Hayakawa, 1978, p. 24).

Judgment – A statement that contains “expressions of the speaker’s approval or disapproval of the occurrences, persons, or objects he is describing” (Hayakawa, 1978, p. 25).

Middle grades – Educational classes between grades five through eight (National Center for Educational Statistics).

Report – A statement that is “verifiable... exclude as far as possible, inferences, judgments, and the use of ‘loaded’ words” (Hayakawa, 1978, p. 23); can be proven either accurate or inaccurate (Hayakawa, 1978).

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

The purpose of this chapter is to present and familiarize the reader with information pertinent to this research topic. Through the presentation of related research, the chapter examines the role and influence of textbooks, content analysis of textbooks, objectivity and bias in textbooks, and agricultural literacy. Literature reviewed included dissertations, papers from conference presentations, articles from professional magazines and journals, books, teaching materials, and other sources.

Agricultural Literacy

If someone is literate, Merriam-Webster Dictionary (1994) indicates that he or she is “1) educated; 2) able to read and write; 3) polished” (p. 433). With this in mind, Wright noted, (1992) “If literacy is the condition or quality of being literate, and if the definition knowledgeable or educated is used, then literacy is the condition or quality of being knowledgeable or educated” (p. 15). Using definition as a theoretical framework, the National Research Council (1988) indicated that someone who is agriculturally literate understands the food and fiber system, including its current economic, social, and environmental significance to all citizens. Furthermore, an agriculturally literate person has “some knowledge of food and fiber production, processing, and domestic and international marketing” (p. 1). This concept was built upon the notion that an

agriculturally literate person's knowledge should include "enough knowledge of nutrition to make informed personal choices about diet and health" (p. 2).

Many agricultural education scholars took on the charge of attempting to define agricultural literacy. Russell, McCracken, and Miller (1990) noted that a definition of agricultural literacy should include, "historical understanding, social significance, economic contributions, scientific understanding, and awareness and understanding of agricultural careers"(p.). Frick and Spotanski (1990) explained that "agricultural literacy concerns an understanding of the impact of agriculture on society and on the daily life of individuals as consumers and citizens" (p. 13). Leising (1990) also included career awareness in his definition and noted, that agricultural literacy is an "opportunity to integrate agricultural knowledge across the curriculum in an effort to create a truly agricultural literate population and motivate more students to pursue agricultural careers" (p. 4).

Until 1991, all definitions of agricultural literacy were the product of the authors who wrote the articles in which the definitions appeared. However, in 1991 Frick, Kahler, & Miller attempted to develop a universally accepted of definitions of agricultural literacy and identify those subject areas that fall within the framework of agricultural literacy. This research utilized a Delphi study that included representatives of the agricultural industry throughout the nation to help in the development of the definition. The definition that was finally agreed upon stated was:

Agricultural literacy can be defined as possessing knowledge and understanding of our food and fiber system. An individual possessing such knowledge would be able to synthesize, analyze, and communicate basic

information about agriculture. Basic agricultural information includes: the production of plant and animal products, the economic impact of agriculture, its societal significance, agriculture's important relationship with natural resources and the environment, the marketing of agricultural products, the processing of agricultural products, public agricultural policies, the global significance of agriculture, and the distribution of agricultural products. (p. 52)

Terry, Dunsford, & Lacewell (1996) explained that average Americans need to be knowledgeable about agriculture "...because of the role citizens play in policy decisions, people need to understand the impact of agriculture upon society, the economy, and the environment" (p. 215). Substantiating this point were Brown and Coffey (1992) when they specified that people need a high level of agricultural literacy as it is "imperative that consumers and government policy-makers alike understand the role of science in agriculture so that they may utilize scientific facts rather than emotions in making decisions concerning food" (p. 169). Frick and Elliot (1995) proposed a conceptual framework in an attempt to explain the factors that contribute to knowledge and opinions about agriculture. Illustrated in Figure 1, their framework includes three factors: personal factors, participation in agricultural activities, education.

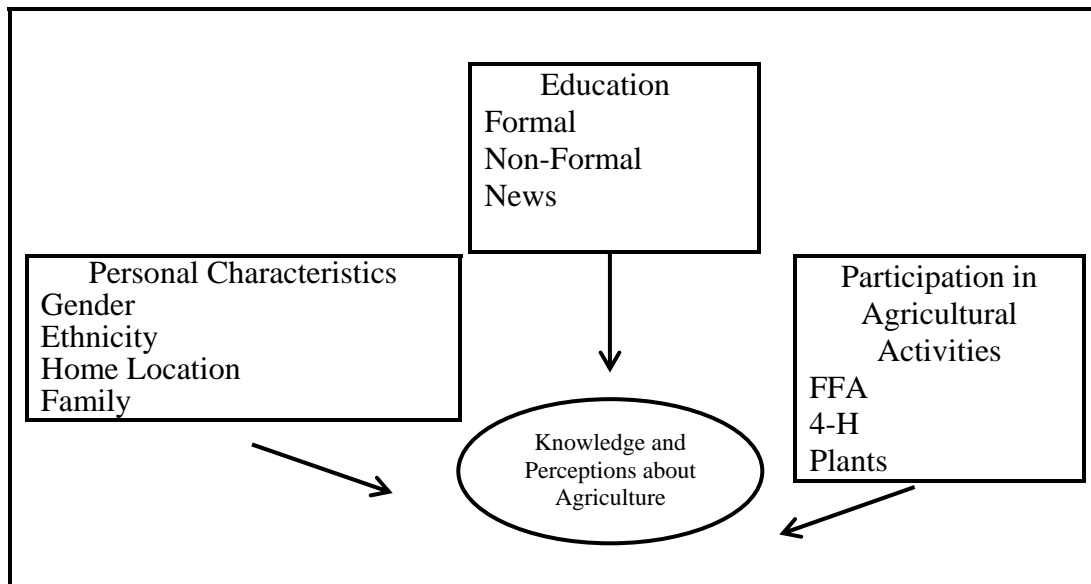


Figure 1. Conceptual Framework for Agricultural Literacy. Source: Flood and Elliot, 1994.

Terry and Lawver (1995) stated that American society is agriculturally ignorant. This assertion was confirmed Mawby who noted (1984) “...many negative decisions affecting food production can be traced to a general lack of understanding of agriculture” (p. 72). That point may be deep-rooted in notion that the American population has been ninety percent non-farm for over thirty years (Douglass, 1985).

The previous statements have been established through several studies that have been conducted to assess the agricultural knowledge level of various groups and populations including: university teachers (Frick & Elliot, 1995), elementary and secondary teachers (Igo, Leising, & Frick, 1999; Trexler, 2000; Terry, Herring, & Larke, 1992), adults (Frick, Birkenholz, & Machtmes, 1995a), news reporters (Terry, 1994), university students (Flood & Elliot, 1994), elementary and secondary students (Pense & Leising, 2003; Leising, Pense, & Igo, 2001; Frick, Birkenholz, Gardner, & Machtmes, 1995; Wright, Stewart, & Birkenholz, 1994; Williams & White, 1991; Horn & Vining, 1986), and 4-H members (Frick, Birkenholz, & Machtmes, 1995b). In each study the

researchers found that the populations investigated were not considered to be “agriculturally literate.”

Researchers have concluded that various groups in this country are agriculturally illiterate. What has caused this lack of knowledge about agriculture? Bricker (1914) noted that early American farmers fatigued the soil and lacked the skills needed to feed more than their immediate families. Harris (1993) explained that as a result of more efficient agricultural practices, it became less important for everyone to understand how to raise crops and livestock. Sorenson (1987) noted that as a result of urbanization the average Americans are less likely to have any contact with farms or farmers. Furthermore, because American agriculture has become so successful, typical citizens simply have not needed to worry about a quality food supply (Terry, 1990).

According to Frick (1990) the categories of agricultural literacy are defined as by the following information. The plant science category contains information about the use and care of plants, agronomic practices, greenhouse and gardens, biotechnology, biology and genetics, profit and society. The animal science category contains information about animal husbandry, the uses and roles of various animal species, biotechnology and genetics, and consumer concerns. The global and societal significance of agriculture contains information about society’s lack of awareness, agriculture’s effect on society, rural life, social benefits, and food efficiency, global food economics, global food and hunger distribution and global politics and sociology. The marketing and distribution category contains information about marketing plans and strategies, global marketing, agriculture’s functions in a market-oriented economy, the distribution system and its importance, cost of distribution, efficiency of distribution, and distribution sector

employment. The public policy of agriculture category contains information about government policy impact the industry, the unaware public, and the governments role and limitations regarding agricultural policy. The processing of agricultural products category contains information about product development and technology, food safety, importance of processing and value added products, and the steps and complexity of agriculture processing. The agriculture's relationship with the environment category contains information about the effect of agriculture on the environment, positive and negative effects of agriculture on the environment, the agriculturalist's role in protecting the environment, chemicals, agriculture's close relationship with the environment, and sustainable agriculture. These topics cannot only be taught in traditional agriculture education courses, but could be contextualized through the use of core area textbooks to reinforce or introduce these topics.

Textbooks

Textbooks are a type of literature for use by teachers and students (Johnsen, 1993). Although in some cases, the terms textbooks and schoolbooks are used interchangeably, there is a difference (Johnsen). According to Johnsen, textbooks are books written, designed and produced specifically for instructional use. They include exercises, study questions, and practice materials (Deighton, 1971).

Textbooks represent the image of information of special groups of educated people (Altbach, 1991). In many instances, textbooks become the core curriculum that is used by teachers and students throughout classrooms everyday (Altbach). Wade and Moje (2001) noted that teachers rely on textbooks to structure content, organize lessons, and provide ideas and materials for teaching and assessments.

To support learning, a well written textbook must be comprehensible to the reader, must represent a superb curriculum, and support student-centered education (Cunningham, Duffy, & Knuth, 2000). Furthermore, understandable textbooks contain linkages that join sentences, paragraphs, and sections into a logical whole which enables a reader to “flow” through the literature, thus increasing comprehension (Chambliss & Calfee, 1998). Additionally, textbooks should provide anchored instruction (Cognition and Technology Group at Vanderbilt, 1990), or supply functional context instruction (Sticht & Hickey, 1988).

To represent an excellent curriculum, a textbook must address learner and societal needs and the appropriate domain, or subject-matter (Chambliss & Calfee, 1998). As a supplement to Cunningham, Duffy, & Knuth (2000), Chambliss and Calfee argue that a well-written textbook addresses student-centered learning by including the four elements of effective instruction, designated by the acronym CORE. Chambliss and Calfee proposed:

Effective instruction *connects* to student knowledge, *organizes* new content for student, provides opportunities for students to *reflect* strategically, and gives students occasions to *extend* what they have learned to new contexts (p.54).

This is illustrated in Figure 2.

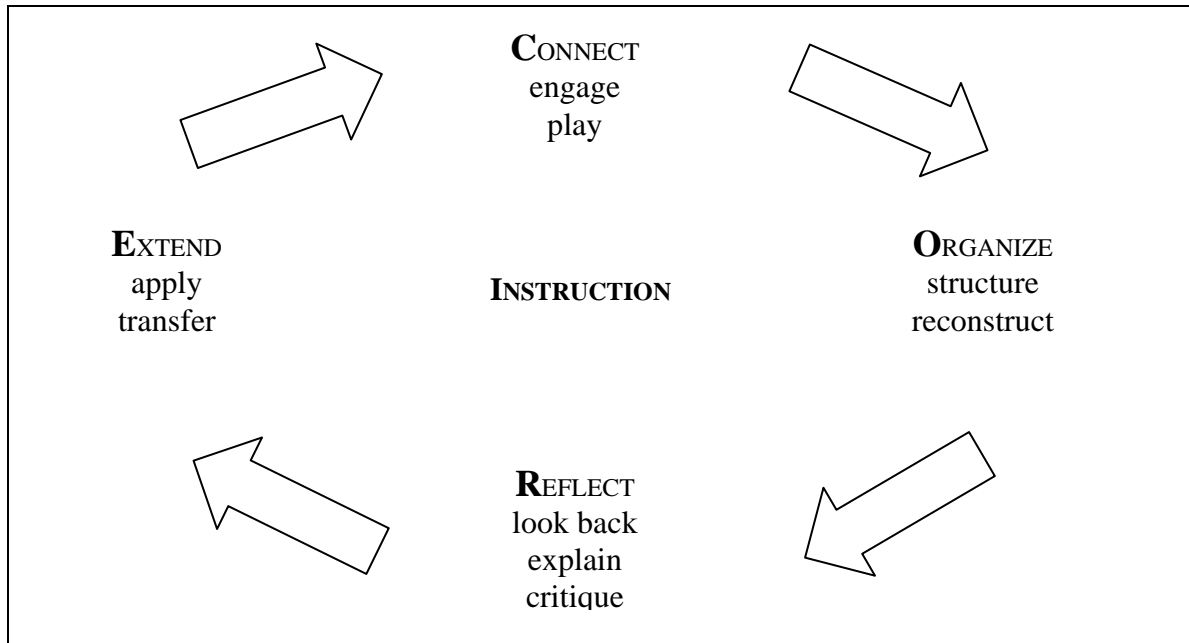


Figure 2. A Model of Student-Centered Instruction. Source: Chambliss and Calfee (1998).

Textbook Bias

Content analysis studies have been conducted to assess bias towards agriculture in news media by Terry, Dunsford and Lacewell (1996), Whitaker and Dyer(1998),Whitaker and Dyer (2000). The Hayakawa-Lowry (Lowry, 1971) method was used to determine the bias of each of these studies. The conclusions of these articles were similar. Terry, Dunsford and Lacewell (1996) concluded that agriculture receives very little coverage in the three most popular national news magazines. According to Whitaker and Dyer (1998), bias occurs in the reporting of environmental and food safety issues to a great extent in news magazines. When compared to articles of other subject areas (i.e., government, politics, business), Terry, Dunsford and Lacewell (1996), found that agriculturally based articles were found to be more negatively biased.

Politics have a direct or indirect influence on the subject matter published in current textbooks (Kirst, Anhalt, & Marine, 1997). Spring (1991), noted the political

conflicts of the twentieth century forced textbook publishers to censor topics that might be considered radical or insulting to any major social group. Biases found in textbooks can be attributed to a secular and liberal attitude in the educational world (Vitz, 1986). Shribman (1989) noted that special interest groups such as women's and partisan organizations, and religious groups play an influential role in determining the content in textbooks.

According to the People for the American Way (2006), religion and family values are common exclusions in textbooks. The "religious right" lobbied to include the doctrine of creationism with the theories of evolution in science textbooks (People for the American Way, 2006). This topic influenced textbook companies to make compromises like providing "evolution supplements" to textbooks or to include disclaimers, which suggest evolution is no more or less valid than other theories about life (DeFattore, 1992).

Content Analysis

When someone reads some type of literary work, he or she performs at least an informal version of content analysis (Stempel & Westley, 1989). Berelson (1952) defined content analysis as "a research design technique for the objective, systematic, and quantitative description of the manifest content of communication" (p.18). Content analysis is objective when the categories used are defined in a manner that would enable multiple researchers to reach the same conclusions when applied to the same content (Stempel & Westley, 1989). Roberts (1997) argued the need for a definition that best combines all definitions of content analysis. Roberts further proposed content analysis is "any systematic reduction of a flow of text (or other symbols) to a standard set of

statistically manipulable symbols representing the presence, the intensity, or the frequency of some characteristics relevant to social science” (p. 14).

Several specific uses of content analysis have been identified and documented (Budd, Thorp, & Donohew, 1967; De Sola Pool, 1959; Holsti, 1969; Roberts, 1997; Robson). Robson acknowledged that content analysis has been used in efforts to describe biases in school textbooks. Roberts pointed out that content analysis could be used to analyze themes in manuscripts such as, newspapers, letters, and poetry. Holsti and Robson noted that content analysis has been used to analyze qualitative interview and questionnaire data. De Sola Pool and Roberts suggested that content analysis be used to describe texts through frequencies as well as draw inferences from texts. On a more extensive scope Budd, Thorp, & Donohew suggested content analysis should be used to study all types of communication, from texts to magazines to advertising.

Theoretical Framework for the Study

The theoretical base for this study was developed from a review of the literature. The purpose of this review was to assess the need for every student to learn about agriculture, examine the history of agriculture in the United States, discuss the role of textbooks in school, and bias towards agriculture in a middle grade social science textbook.

According to the National Research Council, Americans know very little about agriculture, its social and economic significance in the United States and particularly, its links to human health and environmental quality. In 1988, the National Research Council’s committee on Agricultural Education in Secondary Schools proposed that an agriculturally literate person would understand the food and fiber system in relation to its

history, economic, social, and environmental significance. The National Research Council's committee also recommended that all students should receive at least some systematic instruction about agriculture beginning in kindergarten or first grade and continuing through the twelfth grade. In addition to teaching students about agriculture throughout their schooling, Law and Pepple (1990) argued that agricultural concepts should be integrated into core area subjects including science, mathematics, social studies, and language arts.

A way in which to integrate agriculture in the core subjects is through textbooks. Altbach (1991) noted that textbooks are not only used as a resource by teachers, but have become the curriculum in which educators so heavily rely. The textbook and its ancillary materials serve multiple functions that reinforce its central role in determining curriculum content. Textbooks also provide enterprise, are "time savers" and provide security for both teachers and students in outlining content scope and sequence (Deighton, 1971)

Bias can be defined as simply as, the collective influences of the entire context of a message (Cline, 2005). Bias exists in textbooks (Sargent, 2002; Vitz, 1986) and the news media (Cline, 2005; Rongstad, 2001). It has been documented that agriculture is not immune to bias (Terry, Dunsford & Lacewell, 1996; Whitaker & Dyer, 1998; Whitaker & Dyer, 2000). These researchers also noted that the news media is often negatively biased in its portrayal of agriculture.

Popular and historical concentration on the dramatic horseman of the plains has clouded the significance of agriculture in Indian history (Wessel, 1977). When Indian agriculture received attention, most dismissed it as a form of gardening or horticulture and thus unworthy of further consideration. According to Wessel, from the earliest

meetings between Europeans and Indians north of the Rio Grande agriculture played a fundamental role linking the Indians and white destinies on this continent. Indian crops and farming techniques sustained the early settlements and provided the United States and a good portion of the world with its most prolific feed grain.

In summary, according to previous studies, many Americans do not have adequate knowledge of agricultural concepts and the history of those concepts. Also, negative bias exists toward agriculture in the public sector. Therefore, to ensure the general public's knowledge of agriculture and its history is sufficient, incorporating agricultural concepts in core area textbooks can be an effective format to improve these inadequacies.

Summary of Literature Review

In this review of literature, the underlying concepts of agriculture literacy were evaluated. Educational textbooks, content analysis, bias, and agricultural literacy were outlined. The role, use, and design of textbooks and the uses and procedures of content analysis were established. An analysis of bias was performed, as well, the areas where bias influences the world we live in were documented. Finally, the definitions of agricultural literacy were examined and the need for an agriculturally literate society and the educational programs used to increase the agricultural knowledge of students were acknowledged.

Textbooks are literature assembled by several sources for educators to use to teach students. This form of compiled information has been used by teachers for several decades. These books have become a self-contained curriculum in which today's schools rely upon heavily. They employ a variety of graphic devices to organize and display

ideas, theories, and other information for teachers and students to utilize. Textbooks are used in the transmission of knowledge from teacher to student as well as a resource from which students interpret the information and construct their own ideas.

Content analysis is a technique used to analyze the substance of a message. Content analysis has been used to perform quantitative analyses of newspaper articles, measure themes in stories and letters, and assess bias in school textbooks. Various researchers have documented two basic methods of text analysis, conceptual analysis and relational analysis. Conceptual analysis can be defined as a breakdown of concepts within a selected text. Relational analysis is an examination of the relationships among various concepts in a text.

The abilities for humans to think, feel, and draw personal conclusions about various topics creates decisions that may create bias. Bias occurs in a variety of formats. Textbooks can be biased towards a diverse group of topics such as religion, ideologies, and whole societies or populations. In addition to textbooks, newspapers, magazines, and other forms of media can take on a biased tone towards different concepts, including agriculture.

There always has been and always will be a need for society to have an understanding of agriculture. Agricultural educators have developed a variety of definitions of what agricultural literacy is. However, a basic definition can be derived from the multitude of descriptions of this concept: one who is agriculturally literate should have a basic understanding of the production, processing, distribution, marketing, and consumption of the products of the food and fiber system.

Several programs have been developed to promote agricultural literacy. Education

consortiums, governmental agencies, and agricultural organizations have developed a wide array of programs to teach children about agriculture. Food, Land & People, Ag in the Classroom, and Food and Fiber Systems Literacy have been developed and promoted as programs to develop the perceptions and knowledge of agriculture of children. These programs have been designed in such a manner so that they may be modified to fit the needs of students in various educational and geographic settings. Furthermore, these programs were developed so that they may be included in the general curriculum without much modification. They have also been noted to enhance other disciplines while teaching agriculture.

This review of literature yielded no evidence of research on the exposure of students to agriculture through core subject area textbooks. Furthermore, no research was found that documented any bias toward agriculture in these same textbooks. Therefore, as a result, it was concluded that research was needed to assess the exposure level of agricultural concepts to students within a core area textbook and to determine what bias, if any, existed towards references to agriculture.

CHAPTER III

METHODOLOGY

Introduction

This chapter introduces the basic methodology that was used to achieve the purposes of the study, including the design of the research, procedure to select an appropriate textbook, collection of data, and establishment of validity and reliability. The purpose of this study was to assess the agricultural references made in a middle school social science textbook and determine if there is any bias towards agriculture in the text.

The following objectives were developed to accomplish the purpose:

1. Identify each instance where agriculture is referenced in a selected textbook used for social science instruction in the middle grades.
2. Assess the literary formats used in each reference to agriculture in the textbook.
3. Categorize the references to agriculture found in the textbook according to category of agricultural literacy.
4. Determine what bias, if any, exists in the references to agriculture in the textbook.
5. Determine what time periods in history contain the most agricultural references within the textbook.

Research Design

The research design that was employed in this study was content analysis. Content analysis is a research technique for the objective, systematic, and quantitative description of the manifest content of communication (Berelson, 1952). Additionally, content analysis can be used to detect the existence of propaganda and to identify the intentions, focus or communication trends of an individual (Berelson).

Case

The Social Studies textbook that was chosen for the study was *Glencoe The American Journey (2005)* published by Glencoe/McGraw-Hill. First, utilizing the Internet textbook companies that wrote and/or published social science textbooks were identified. Glencoe/McGraw-Hill, Harcourt/Holt, Houghton Mifflin, Oxford, and Pearson/Prentice Hall (N=6) publishing companies were identified as those companies which wrote or published social science textbooks. Second, the companies that produced middle grade social science textbooks were identified. Glencoe/McGraw-Hill, Harcourt/Holt, Houghton Mifflin, and Pearson/Prentice Hall (N=6) were identified. Oxford was eliminated as it only produced books for higher grades. Finally, Glencoe/McGraw-Hill was selected as its textbook contained the broadest range, in years, of American history. Harcourt/Holt, Houghton Mifflin, and Pearson/Prentice Hall were eliminated due to the conservative number of years covered within the textbook. Through personal contact with Robert Brooks on May 2, 2004, regional middle school social science sales representative, *The American Journey* had 40% market share in 2004 of the total social science textbooks sold in conjunction with Glencoe/McGraw-Hill. Finally, the student version of the textbook was chosen due to the fact that the student version is what

students come into contact with on a daily basis.

Data Collection

The methods utilized to collect and analyze data, and establish validity and reliability for this study were adopted from Swafford's (2005) study that assessed agriculture references in a middle grade science textbook. *The American Journey* (2005) had 953 pages of text, pictures, activities etc.

Data regarding text bias were collected using the Hayakawa-Lowry method (Lowry, 1971). S. I. Hayakawa developed a system to categorize incidences of based upon a trichotomy of sentences discussed in *Language in Thought and Action* (Hayakawa, 1978). Hayakawa defined the three basic categories of sentences as reports, inferences and judgments (1978). "Reports adhere to the following rules: first, they are verifiable; second; they exclude as far as possible, inferences, judgments, and the used of 'loaded' words" (Hayakawa, 1978, p.23). According to Hayakawa (1978), an inference "is a statement about the unknown based on the known" where a writer or speaker "draws inference from some set of observable data" (p. 24) Hayakawa (1978) defined judgments as "expressions of the writer's approval or disapproval of the occurrences, person, or objects he is describing." (p. 25)

While conducting a content analysis of television news during the Richard Nixon presidency, Dennis Lowry (1971) expanded on Hayakawa's work. His work developed into the Hayakawa-Lowry News Bias Categories (Lowry, 1971). Later, Lowry (1985) developed more specific definitions of reports, inferences, and judgments. He wrote, "Reports sentences are factual and verifiable ... Inference sentences are subjective and are not immediately verifiable," and, "Judgment sentences contain expressions of the

writer's or speaker's favorable or unfavorable opinions about whatever is being described" (Lowry, 1985).

The Hayakawa-Lowry news bias categories are:

1. Report sentence/attributed;
2. Report sentence/unattributed;
3. Inference sentence/labeled;
4. Inference sentence/unlabeled;
5. Judgment sentence/attributed/favorable;
6. Judgment sentence/attributed/unfavorable;
7. Judgment sentence/unattributed/favorable;
8. Judgment sentence/unattributed/unfavorable; and
9. All other sentences.

Lowry, 1985 p. 574

In order to conduct this study the researcher read the 953 pages of the text. The textbook took two months to read and analyze the information. The researcher took many breaks while reading the text. The text was only read five days a week for one hour time periods. The researcher first reviewed the text and highlighted the references to agriculture and then went back and categorized the references into categories of agricultural literacy.

The table of contents of the textbook was broken up into time periods or eras. For example the book was in sections such as the revolutionary and the industrial eras. The text was organized by time period and the significance of the events in history. The first part of the chapters consisted of timelines of what was to be learned in the

chapter, followed by the text or information and finally the assessment questions. The textbook was on an eighth grade reading level.

Validity and Reliability

Validity refers to measure that accurately reflects the concept it is intended to measure (Babbie, 2002). To establish construct validity of the Hayakawa-Lowry news bias categories, Lowry (1985) used a two-part study conducted at Liberty University and Ohio University.

The assumptions underlying the Hayakawa-Lowry category system were twice put to the test, and a group of subjects ranging from college freshmen to Ph.D. professors...for the most part evaluated the news stories and sentences as predicted. Thus, the results strongly suggest that the differences measured by researchers in content analysis studies are differences that do indeed make a meaningful difference to news consumers. (Lowry, 1985, p. 580)

Establishing validity and reliability for this study were done using traditional content analysis methods. Reliability refers to the quality of a measurement method that suggests that the same data would have been collected each time in repeated observations of the same phenomenon (Babbie, 2002). Reliability for this study was established using the aid of check-coders. Check-coders are individuals, in addition to the researcher, who will read, identify, and classify instances of agricultural references (Babbie). Two check-coders assisted the researcher to identify, and classify all agricultural references. In this particular study, the check-coders read one hundred pages. Since this was done to ensure reliability it was only necessary to have the check-coders only read a specific portion of

the textbook. The pages that were to be read were randomly selected.

The check-coders for this study were not randomly selected. They were selected based on various criteria. Check-coder one was a Psychology student. Furthermore, check-coder one was selected because this person did not have an agricultural background, contributing to objectivity in data collection.

Check-coder two was a nursing student. Check coder two was chosen due to their unfamiliarity with agriculture. Finally, due to their course of study, check-coder two was able to provide a science perspective when analyzing the textbook.

Finally, the researcher was an Agricultural Education student. The researcher chose to do this study based on her interest in agricultural literacy and United States history. The researcher was able to provide her knowledge in agricultural literacy.

Data Analysis

While conducting a content analysis of *Glencoe The American Journey* (2005) textbook, a frequency count was taken of all references made to agricultural topics. The agricultural literacy topic areas were defined by Frick, Birkenholz, and Machtmes (1995a). The categories include: 1) Societal and Global Significance of Agriculture, 2) Policy in Agriculture, 3) Agriculture's Relationship with the Environment and Natural Resources, 4) Plant Science, 5) Animal Science, 6) Processing of Agricultural Products, and 7) Marketing and Distribution of Agricultural Products (Frick, Birkenholz, & Machtmes, 1995a). In addition to being coded according to agricultural literacy topic area, references were categorized according to their literary format. The literary formats used in the textbook included pictures/diagrams, text, student activities, and assessment components. To achieve Objective 4, each text reference was coded using the Hayakawa-

Lowry news bias categories:

1. Report sentence/attributed;
2. Report sentence/unattributed;
3. Inference sentence/labeled;
4. Inference sentence/unlabeled;
5. Judgment sentence/attributed/favorable;
6. Judgment sentence/attributed/unfavorable;
7. Judgment sentence/unattributed/favorable;
8. Judgment sentence/unattributed/unfavorable; and
9. All other sentences.

Lowry, 1985 p. 574

Two “check-coders,” in addition to the researcher, coded the textbook to ensure coder reliability. Prior to coding the textbook, the check-coders were trained by the researcher. The check-coders were educated about the agricultural literacy categories and what topics were included in each. Second, the literary formats that existed within the textbook were described and examples from other textbooks were used to give the check-coders experience identifying them. Finally, the check-coders were trained to code text references using a modified version of the coding manual developed by Lowry. The coding manual can be found in Appendix I. The researcher and each assistant coded all references. The two initial coding sets were compared and all discrepancies were noted. The percent agreement between the check-coders and the researcher can be found in Appendix H. The check-coders and researcher reviewed the discrepancies until a consensus was reached on the code assigned to each reference. The check-coders along

with the researcher, looked at each agriculture reference. In the event that there was a discrepancy on what category a reference belonged, the reference would be discussed. Then, the researcher and the check-coders would decide based on previous knowledge what category the reference belonged.

Descriptive statistics were calculated for each variable. To determine a mean score (level of objectivity) for each reference, the researcher valued all report sentences as “1,” all inferences as “2,” and all judgment sentences as “3.” Therefore, according to Hayakawa’s procedures, the higher the mean, the less objective the textbook (more biased). The sentences were group according to their assigned agricultural literacy category and an objectivity mean was calculated for each. The resulting frequencies and corresponding percentages were used to determine the level of bias in order to meet objective 4.

CHAPTER IV

ANALYSIS OF DATA

This chapter discusses the findings of the study as they relate to the objectives. The purpose of this study was to assess the agricultural references made in a middle school social science textbook and determine if there is any bias towards agriculture in the text.

The following research objectives were developed to accomplish the purpose:

1. Identify each instance where agriculture is referenced in a selected textbook used for social science instruction in the middle grades.
2. Assess the literary formats used in each reference to agriculture in the textbook.
3. Categorize the references to agriculture found in the textbook according to category of agricultural literacy.
4. Determine what bias, if any, exists in the references to agriculture in the textbook.
5. Determine what time periods in history contain the most agricultural references within the textbook.

Findings Related to Objective One

Objective 1 was to identify the frequency of instances of agricultural references within a selected textbook used for social science instruction in the middle grades. Five hundred sixty-one agricultural references were identified within the 953 pages of the textbook. These references can be found in Appendices A through G.

Findings Related to Objective Two

Objective 2 was to assess the literary formats used to reference agriculture in the textbook. Of the 561 agricultural references 469 (83.6%) were labeled as text references, 19 (3.4%) were classified as an assessment component, 62 (11.0%) were identified as a picture/diagram, 11 (2.0%) were labeled as student activities, and there was none in the unit background category. These data are illustrated in Table 1.

Table 1

Instances of Agricultural References by Literary Format

Literary Format	Frequency	Percent
Text	469	83.6
Picture/Diagram	62	11.0
Assessment Component	19	3.4
Unit background information	0	0.0
Student Activity	11	2.0
Total of all references to agriculture	561	100.0

Findings Related to Objective Three

Objective 3 was to categorize the references to agriculture found in the textbook according to category of agricultural literacy, as defined by Frick, Birkenholz, and Machtmes (1995a). Of the 561 references 239 (42.6%) were classified as plant science and 114 (20.3%) were animal science. One hundred and three (18.4%) were societal and global significance of agriculture, 54 (9.7%) were public policy in agriculture. Thirty-one (5.6%) were marketing and distribution of agricultural products, 11 (1.8%) were processing of agricultural products, and nine (1.6%) were classified agriculture's relationship with the environment and natural resources. These data are illustrated in Table 2.

Table 3 provides further details regarding Objective 3. Found in Table 3 is each agricultural literacy category and number of agricultural references within each literary format. There were 239 assigned to the Plant Science category. Two hundred and ten were text, 19 were picture/diagram, five were student activities, and five were assessment components. One hundred and fourteen references were found in the Animal Science category with 77 as text, 35 picture/diagrams, one student activity and one assessment component. The Societal and Global Significance of Agriculture category contained 103 references. Eighty-nine were text, four were picture/diagrams, four were student activities, and six were assessment components. Public Policy in Agriculture contained 54 references, 45 of which were text, two were picture/diagrams, and seven were assessment components. Thirty-one references were classified as Marketing and Distribution of Agricultural Products. Of these 31 references 29 were text and two were picture/diagrams. Of the eleven references

coded as Processing agricultural products all eleven were text. Nine references were classified in Agriculture's Relationship with the Environment and Natural Resources category with eight as text, and one student activity.

Table 2

Frequency of Agricultural References According to Agricultural Literacy Categories

Agricultural Literacy Category	Frequency	Percent
Plant science	239	42.6
Animal science	114	20.3
Societal and global significance of agriculture	103	18.4
Public policy in agriculture	54	9.7
Marketing and distribution of agricultural products	31	5.6
Processing of agricultural products	11	1.8
Agriculture's relationship with the environment and natural resources	9	1.6
Total of all agricultural references	561	100.0

Table 3

Literary Format of Agricultural References according to Agricultural Literacy Category

Agricultural Literacy Category	Text	Picture/Diagram	Unit Background Information	Student Activity	Assessment Component	Total
Plant Science	210	19	0	5	5	239
Animal Science	77	35	0	1	1	114
Global Significance	89	4	0	4	6	103
Public Policy	45	2	0	0	7	54
Marketing & Distribution	29	2	0	0	0	31
Processing Products	11	0	0	0	0	11
Relationship Environment	8	0	0	1	0	9
Total	469	62	0	11	14	561

Findings Related to Objective Four

To determine an objectivity level, all sentences were coded according to Hayakawa's (Hayakawa, 1978) original categories: reports, inferences, and judgments. Sentences coded as a "report" were given a value of "1." Sentences coded as an "inference" were given a value of "2." Sentences coded as a "judgment" were given a value of "3." Sentences coded as "other" were not considered in this portion of the analysis because they were not in Hayakawa's original categories and were determined to be neutral. In reference to a continuum of objectivity, with a report sentence being more objective than an inference sentence and an inference sentence being more objective than a judgment sentence, the codes were used as numerical values to calculate a mean objectivity to all text references. In considering the objectivity mean for the textbook, a lower mean indicates more objective writing. Equally, a higher mean represents less objective writing.

Table 4 presents data regarding the objectivity level of the text within each agricultural literacy category. Eighty-nine sentences were classified within the global significance of agriculture category. Eighty-eight sentences were reports and 1 was classified as an inference, creating an objectivity level of 1.01. There forty-five sentences noted in the public policy in agriculture category. Forty-two were reports and 3 were inferences thus, leaving an objectivity level of 1.07. Agriculture's relationship with the environment contained 9 sentences, all of which were reports, therefore, an objectivity level of 1.00 was determined. A total of two hundred ten sentences were categorized as plant science. One hundred ninety-eight were reports, 12 were inferences, and consequently, a 1.06 objectivity level was reached. Animal science contained 77

sentences, 73 reports, 4 inferences, and an objectivity level of 1.05. A total of eleven sentences were categorized under processing agricultural processing. All sentences were classified as reports, leaving an objectivity level score of 1.00. There were 29 sentences classified in the marketing and distribution of agricultural products. Twenty-eight were reports and 1 was an inference, therefore an objectivity level of 1.03 was determined.

Within the textbook 470 sentences pertaining to agriculture were identified. Four hundred forty-nine were reports, 21 were inferences, thus, an overall objectivity level of 1.14 was reached.

Table 4

Objectivity Levels for Text References

Agricultural Literacy Category	Frequency of Sentences in Each Hayakawa Bias Category				Total	Objectivity Level (Mean)*
	Report	Inference	Judgment	Other		
Global Significance	88	1	0	0	89	1.01
Public Policy	42	3	0	0	45	1.07
Relationship with Environment	9	0	0	0	9	1.00
Plant Science	198	12	0	0	210	1.06
Animal Science	73	4	0	0	77	1.05
Processing Products	11	0	0	0	11	1.00
Marketing & Distribution	28	1	0	0	29	1.03
Total	449	21	0	0	470	1.04

*Note: 1=report; 2=inference; 3=judgment.

Findings Related to Objective Five

Objective five was to determine what time periods in history contain the most agricultural references within the textbook. From 1492 to 1592 a total of 60 references were identified. Sixteen were classified as global significance of agriculture, 34 were

plant science, 5 were animal science, 4 were processing of agricultural products, and 1 was agriculture's relationship with the environment and natural resources. During the span of 1593 to 1692 a total of 29 references were identified. One was classified as global significance of agriculture, 23 were plant science, 2 were animal science, 1 was processing of agricultural products, 1 was marketing and distribution of agricultural products, and 1 was agriculture's relationship with the environment and natural resources. Forty-one references were found from 1693 to 1792. Seventeen were classified as global significance of agriculture, 6 were public policy in agriculture, 13 were plant science, 3 were animal science, and 2 were marketing and distribution of agricultural products. From 1793 to 1892 a total of 280 references were identified. Twenty-six were classified as global significance of agriculture, 31 were public policy in agriculture, 123 were plant science, 76 were animal science, 1 was processing of agricultural products, and 23 were marketing and distribution of agricultural products. A total of 151 references were found from 1893 to the present. Forty-three were classified as global significance of agriculture, 17 were public policy in agriculture, 53 were plant science, 20 were animal science, 5 were processing of agricultural products, 6 were marketing and distribution of agricultural products, and 7 were agriculture's relationship with the environment and natural resources. These data can be found in Table 5 and Figure 3.

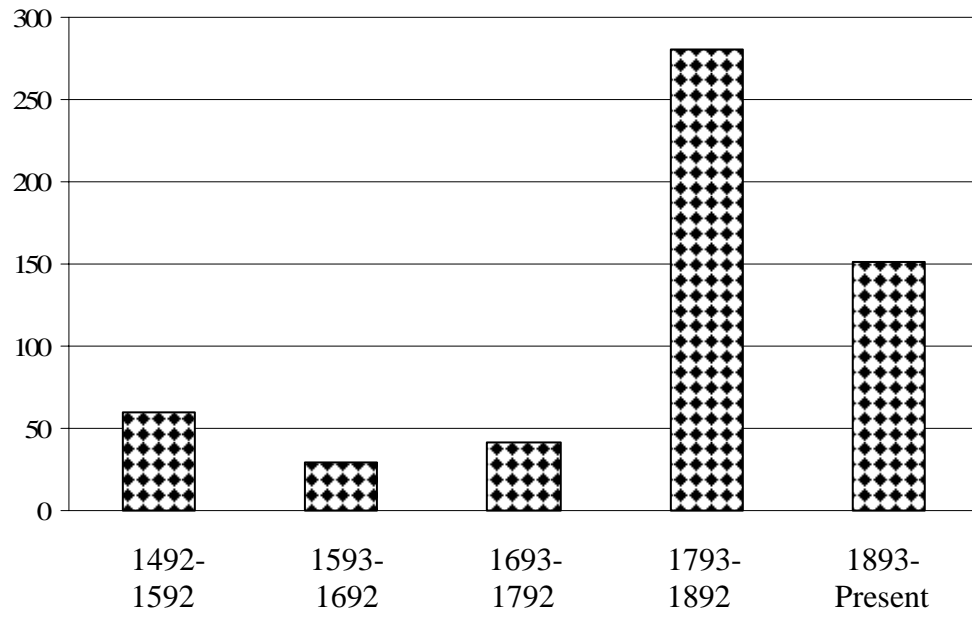
Table 5

Timetable of Agricultural References

Agricultural Literacy Categories	1492- 1592	1593- 1692	1693- 1792	1793- 1892	1893- Present	Total References
Global Significance	16	1	17	26	43	103
Public Policy	0	0	6	31	17	54
Relationship with Environment	1	1	0	0	7	9
Plant Science	34	23	13	123	53	246
Animal Science	5	2	3	76	20	106
Processing Products	4	1	0	1	5	11
Marketing & Distribution	0	1	2	23	6	32
Total	60	29	41	280	151	561
Percent of Total	10.7	5.2	7.3	50.0	27.0	100

Figure 3

Agricultural References According to Century



CHAPTER V
SUMMARY, FINDINGS,
CONCLUSIONS, AND RECOMMENDATIONS

Summary of Methodology

This study of agricultural references and bias in a middle grade social studies textbook was conducted during the fall of 2004. The case was *The American Journey*, published by Glencoe/McGraw-Hill. The student edition was used so that the references came from what the book that the student was learning from.

A content analysis of the textbook was used to collect information to complete the study. The textbook was analyzed to determine amount of exposure of middle grade social studies students, using the textbook, to agricultural concepts. The agricultural concept areas were defined by Frick, Birkenholz, and Machtmes (1995) and include 1) Societal and Global Significance of Agriculture, 2) Public Policy in Agriculture, 3) Agriculture's Relationship with the Environment and Natural Resources, 4) Plant Science, 5) Animal Science, 6) Processing of Agricultural Products, and 7) Marketing and Distribution of Agricultural Products.

Following the techniques of Swafford's 2005 study, finally, all text references were coded according to sentence type. The sentence types were defined by Hayakawa (1978). These sentence types include reports, inferences, judgments, and other. Once all text references were assigned to a sentence type a bias score for each sentence could be

determined. When all sentences were coded an overall bias score for the text, in regards to agricultural concepts, could be established.

All text references were coded according to sentence type. The sentence types were defined by Hayakawa (1978). These sentence types include reports, inferences, judgments, and other. Following the techniques of Swafford's 2005 study, once all text references were assigned to a sentence type a bias score for each sentence could be determined. When all sentences were coded an overall bias score for the text, in regards to agricultural concepts, could be established.

The resulting data were compiled and analyzed by the researcher and are presented and discussed in Chapter IV.

The purposes of this study were to evaluate a middle grade social studies textbook with reference to agricultural literacy. The objectives were as follows:

1. Identify each instance where agriculture is referenced in a selected textbook used for social science instruction in the middle grades.
2. Assess the literary formats used in each reference to agriculture in the textbook.
3. Categorize the references to agriculture found in the textbook according to category of agricultural literacy.
4. Determine what bias, if any, exists in the references to agriculture in the textbook.
5. Determine what time periods in history contain the most agricultural references within the textbook.

This study implemented a content analysis of the *Glencoe McGraw-Hill The American Journey* (2005) textbook. Five hundred sixty-one references to agriculture were identified in the study. All references were labeled according to Categories of Agricultural Literacy (Frick, Kahler, & Miller, 1991). Additionally, all references were labeled according to their literary format. Four hundred and sixty-nine references were identified as text references and were coded according to the Hayakawa-Lowry news bias categories (Lowry, 1985).

Frequencies and percentages were calculated from the resulting data and used to meet the study's previously mentioned objectives. A summary of the major findings is presented in the following sections.

Findings Related to the Identification of References to Agriculture

Objective 1 was to identify the instances of references to agriculture in a selected textbook used for teaching social studies in the middle grades.

1. A total of 561 references to agriculture were identified in the textbook.

Findings Related to Literary Formats Used to Reference Agriculture

Objective 2 was to assess the literary formats used to reference agriculture in the textbook.

1. The majority of the agricultural references (83.6%) were coded as text references.
2. Pictures and diagrams were the formats used for 11.0% of the

agricultural references.

3. Assessment components, and student activities made up only 5.4% of all references.
4. Unlike Swafford's (2005) study, that found that a middle grade science textbook uses unit background information to reference agriculture, it was found that *Glencoe McGraw-Hill The American Journey* (2005) textbook did not use this literary format to reference agriculture.

Findings Related to Agricultural Literacy

Categories of Coded References

Objective 3 was to categorize the references to agriculture found the in the textbook according to category of agricultural literacy.

1. The majority (42.6 %) of the references were coded in the plant science agricultural literacy category.
2. References coded in the animal science category were 20.3%.
3. A third (33.7%) of agricultural references were coded in the societal and global significance of agriculture, public policy in agriculture, and marketing and distribution of agricultural products categories.
4. References in the processing of agricultural products and agriculture's relationship with the environment and natural resources categories made up 3.4% of all references.

Findings Related to Bias

Objective 4 was to determine what bias, if any, exists in the references to agriculture in the textbook.

1. An overwhelming majority (95.5 %) of the sentences were report sentences.
2. There were more inference sentences (4.5%) than judgment sentences (0.0 percent).
3. Text references coded in the public policy in agriculture literacy category were the most biased (1.07 objectivity score).
4. The categories of agriculture's relationship with the environment and natural resources and processing agricultural products were the least biased (1.00 objectivity score).
5. The overall objectivity score of all text references was 1.04.

Findings Related to Historical Time Periods

Objective 5 was to determine what time periods in history contain the most agricultural references within the textbook.

1. The time period of 1593 to 1692 contained only 29 references to agriculture.
2. Nearly half (49.9%) of the agricultural references within the textbook were found in the time period from 1793-1892.
3. An overwhelming majority (78%) of the references in the category referring to agriculture's relationship to the environment and natural resources were found in the time period from 1893 to the present.

Conclusions

Based on the findings of this study, the following conclusions have been reached:

1. Due to the number of references found, students using the textbook are exposed to agricultural concepts approximately once every two pages.
2. Written text, pictures, and diagrams are the most common formats used to reference agriculture. These formats made up 94% of all references within the textbook.
3. Written text is the most common way to incorporate references to agriculture's relationship with the environment.
4. The agricultural references tend to focus on plants, animals, and the global significance of agriculture, as they made up 81% of the references within the textbook.
5. This textbook is not an effective medium to reference agriculture's relationship with the environment and natural resources.
6. This textbook is not an effective medium to reference agriculture's relationship with agricultural processing.
7. The agricultural text references were mostly report style in nature. Reports made up 95% of all text references.
8. As compared to studies that focused on agricultural bias in the news media, the textbook is generally unbiased in its portrayal of agricultural concepts.

9. This study is consistent with Swafford's (2005) study that noted a middle grade science textbook is generally unbiased in its portrayal of agriculture.
10. Key inventions such as the steel plow and the cotton gin, coupled with western expansion between 1793-1892 provide ample opportunity to reference agriculture during that time period within the textbook.

Recommendations

The following are general recommendations are based on the findings and conclusions:

1. Agricultural educators should contribute to the development of history and social science textbooks to ensure accurate and appropriate references to agriculture are included.
2. Agricultural references should be presented in a greater variety of formats including auxiliary materials, student activities, and assessment components.
3. To incorporate agriculture with critical thinking skills, more open-ended assessment questions should be included in the textbook.
4. References to agriculture in social science textbooks should be "reports" in nature to guard against biased statements toward or against agriculture.
5. Extensive historical research should continue to be conducted when developing history textbooks to ensure that references to agriculture are accurate.
6. Teacher development program for social science teachers to teach about agriculture.

Recommendations for Further Research

The following are general recommendations are based on the findings and conclusions:

1. Replicate this study using other middle grade history textbooks so that all texts can be compared.
2. Replicate this study using textbooks from other core education areas such as, mathematics, and English/literature.
3. Research should be conducted to investigate the relationships between agricultural references in textbooks and students' knowledge and perceptions of agriculture.
4. Investigations of state and national history education frameworks should be conducted to ensure that agriculture is adequately represented in this academic area.
5. Due to the recent advancements in technology and the fact that agriculture in the United States is the largest industry an investigation should be conducted to determine why such little time is devoted to this industry in recent years in history textbooks.
6. Since history teachers are not certified to teach agriculture, this topic is found in the curricula they teach. Research should be conducted to determine the agricultural knowledge levels and perceptions about agriculture of history teachers to determine what assistance is needed so that they can present accurate information to students.
7. Study agricultural literacy of social science teachers in middle and high schools.

REFERENCES

- Altbach, P.G. (1991). *Textbooks in American society: politics, policy, and pedagogy*. Albany, NY: State University of New York Press.
- American Farm Bureau (2006). We are Farm Bureau. Retrieved March 31, 2006, from <http://www.fb.org/about/thisis/>.
- Babbie, E. (2002). *The Basics of Social Research*. Belmont, CA: Wadsworth Publishing.
- Berelson, B. (1952). *Content analysis in communication research*. Glencoe, IL: The Free Press.
- Berson, M. (2003). *United States History: From Civil War to Present*. Orlando, FL: Harcourt Publishing.
- Birkenholz, R.J., Frick, M.J., & Machtmes, K., (1995). Rural and Urban Adult Knowledge and Perceptions of Agriculture. *Journal of Agricultural Education*, 36(2) 44-53.
- Bricker, G. A. (1914). *Agricultural education for teachers*. New York: American Book Company.
- Brown, L. G., & Coffey, D. M. (1992). Contributing to agricultural literacy: The science of agriculture. *Journal of Natural Resources and Life Sciences Education*, 21 (2), 169-170.
- Budd, R. W., Thorp, R. K., & Donohew, L. (1967). *Content analysis of communications*. New York: Macmillan.
- Chambliss, M. J. & Calfee, R. C. (1998). *Textbooks for learning: Nurturing children's minds*. Malden, MA: Blackwell Publishers.

- The Cognition and Technology Group at Vanderbilt (1990). Anchored instruction and its relationship to situated cognition. *Educational Researcher*, 19, 2-10.
- Deighton, L.C. (1971). *The Encyclopedia of Education*. (vol. 9). New York: The Macmillan Company and The Free Press.
- DeFattore, J. (1992). *What Johnny shouldn't read: Textbook Censorship in America*. New Haven: Yale University Press.
- De Sola Pool, I. (1959). *Trends in content analysis; papers*. Urbana, IL: University of Illinois Press.
- Douglass, G. K. (Ed.). (1985). *Cultivating agricultural literacy: Challenge for the liberal arts*. Battle Creek, MI: W. K. Kellogg Foundation.
- Dyer, J.E., & Whittaker, B.K., (2000). Identifying Sources of Bias in Agricultural News Reporting. *Journal of Agricultural Education*, 41(4) 125-133.
- Flood, R. A. & Elliot, J. (1994). Agricultural awareness in Arizona. *Proceedings of the National Agricultural Education Research Meeting*, 21, 103-109.
- Frick, M. J., Birkenholz, R. J., Gardner, H., & Machtmes, K. (1995). Rural and urban inner-city high school student knowledge and perception of agriculture, *Journal of Agricultural Education*, 36 (4), 1-9.
- Frick, M. J., Birkenholz, R. J., & Machtmes, K. (1995). Rural and urban adult knowledge and perceptions of agriculture, *Journal of Agricultural Education*, 36 (2), 44-53.
- Frick, M. J., Birkenholz, R. J., & Machtmes, K. (1995). 4-H member knowledge and perception of agriculture, *Journal of Agricultural Education*, 36 (3), 43-49.
- Frick, M. J. & Elliot, J. (1995). Food and agricultural awareness of land grant university education faculty. *Proceedings of the National Agricultural Education Research*

Meeting, 22, 379-387.

Frick, M.J., Kahler, A.A., & Miller, W.W. (1991). A Definition and the Concepts of Agricultural Literacy. *Journal of Agricultural Education*, 32(2), 49-57.

Frick, M. J. & Spotanski, D. (1990). Coming to grips with agricultural literacy. *The Agricultural Education Magazine*, 62 (8), 6, 13.

Harris, C. R. (1993). *Agricultural literacy assessment among educators in Missouri secondary schools that offer agricultural education programs*. Unpublished doctoral dissertation, University of Missouri-Columbia.

Hayakawa, S.I. (1978). *Language in Thought and Action*. Orlando, FL: Harcourt Brace Jovanovich.

Hillison, J. (2005). *AEE 5074 Foundations of Agricultural and Extension Education: Lesson 2 Early American Agriculture*. Blacksburg, VA. Virginia Polytechnic Institute and State University.

Holsti, O.R. (1969). *Content Analysis for the Social Sciences and Humanities*. Reading, MA: Addison Welsley Publishing Company.

Horn, J. & Vining, B. (1986). *An assessment of students' knowledge of agriculture*. Manhattan, KS: Center of Extended Services and Studies, College of Education, Kansas State University.

Igo, C. G., Leising J., & Frick, M. (1999). An assessment of agricultural literacy in k-8 schools. *Proceedings of the National Agricultural Education Research Meeting*, 26, 49-61.

Johnsen, E.B. (1993). *Textbooks in Kaleidoscope: A Critical Survey of Literature and Research on Educational Texts*. New York, NY: Oxford University Press.

- Kirst, M. W., Anhalt, B., & Marine, R. (1997). Politics of Science Education standards. *Elementary School Journal*, 97 (4), 315-328.
- Leising, J. (1990). Agricultural literacy: Challenge of the nineties. *The Agricultural Education Magazine*, 62 (8), 4.
- Leising, J. G., Pense, S. L., & Igo C. G. (2001). An assessment of student agricultural literacy knowledge based on the food and fiber systems literacy framework. *Proceedings of the National Agricultural Education Research Meeting*, 28, 259-268.
- Lowry, D.T. (1985). Establishing construct validity of the Hayakawa-Lowry news bias categories. *Journalism Quarterly*, 62 (3), 573-580.
- Lowry D.T. (1971). Agnew and the network TV news: A before/after content analysis. *Journalism Quarterly*, 48(1), 205-210.
- Massachusetts Institute of Technology. (1997). Inventor of the Week: John Deere. Retrieved March 18, 2006, from <http://web.mit.edu/invent/iow/deere.html>.
- Mawby, R. G. (May, 1984). Agriculture colleges must take the lead in ending ignorance about farming. *The Chronicle of Higher Education*, 72.
- National Parks Service. (2004). The Homestead Act. Retrieved March 26, 2006, from http://www.nps.gov/home/homestead_act.html.
- National Research Council, Committee on Agricultural Education in Secondary Schools, Board of Agriculture. (1988). *Understanding agriculture: New directions for education*. Washington, D.C.: National Academy Press.
- Online Highways. (2006). Homestead Act. Retrieved March 31, 2006, from <http://www.u-s-history.com/pages/eras.html>.

- Online Highways. (2006). Stock Market Crash. Retrieved March 31, 2006, from <http://www.u-s-history.com/pages/h1527.html>.
- Online Highways. (2006). Agricultural Adjustment Act. Retrieved March 31, 2006, from <http://www.u-s-history.com/pages/h1639.html>.
- Pense, S. L. & Leising, J. G. (2003). Agricultural literacy assessment of selected Oklahoma high school seniors. *Proceedings of the National Agricultural Education Research Meeting*, 28 444-455.
- People for the American Way (2006). *Back to school with the religious right*. Retrieved March 22, 2006, from <http://www.pfaw.org/pfaw/general/default.aspx?oid=3634>.
- Roberts, C. W. (1997). *Text analysis for the social sciences: Methods for drawing statistical inferences from texts and transcripts*. Mahwah, NJ: Lawrence Erlbaum.
- Russell, E. B., McCracken, J. D., & Miller, W. D. (1990). Position statement on agricultural literacy, *The Agricultural Education Magazine*, 62 (9), 13-14, 23.
- Shribman, D. (1989, September 26) Going mainstream: Religious right drops high-profile tactics, works on local level. *Wall Street Journal*, New York.
- Sorenson, D. D. (1987). How to keep'em up on the farm and farming. *American School Board Journal*, 174, 6-28.
- Stempel, G. H., & Westley, B. H. (eds.) (1989). *Research methods in mass communication*. Englewood Cliffs, N.J. : Prentice Hall
- Sticht, T. G. & Hickey, D. T. (1988). Functional context theory, literacy, and electronics training. In R. Dillon & J. Pellegrino (Eds.), *Instruction: Theoretical and Applied Perspectives*. NY: Praeger Publishers.

- Swafford, M. R. (2005). *Assessment of references to agriculture in a middle grade science textbook*. Unpublished master's thesis, University of Missouri-Columbia.
- Terry, H. R., Jr. (1990). *Assistance needed for elementary school teachers in Texas to implement programs of agricultural literacy*. Unpublished doctoral dissertation, Texas A & M University.
- Terry, H. R., Jr. (1994). Agricultural literacy of information gatekeepers. *Proceedings of the Southern Agricultural Education Research Meeting*, 43, 198-210.
- Terry, R., Jr., Dunsford, D., & Lacewell, T. B. (1996). Evaluation of information sources about agriculture: National news publications. *Proceedings of the National Agricultural Education Research Meeting*, 23, 215-226.
- Terry, R., Jr., Herring, D. R., & Larke, A., Jr. (1992). Assistance needed for elementary teachers in Texas to implement programs of agricultural literacy. *Journal of Agricultural Education*, 33 (2) 51-60.
- Terry, R., Jr. & Lawver, D. E. (1995). University students' perceptions of issues related to agriculture. *Journal of Agricultural Education*, 36 (4) 64-71.
- Trexler, C. (2000). Suburban and urban elementary student understandings of pest-related science and agricultural education benchmarks. *Journal of Agricultural Education*, 41 (3), 22-34.
- United States Department of Agriculture. (2005). Agriculture and Biotechnology
Retrieved April 27, 2006, from
http://www.usda.gov/wps/portal/!ut/p/_s.7_0_1OB?contenetidonly=true&navid=AG...

- Virginia Agricultural Experiment Station. (2002). Grain Harvesting History. Retrieved March, 20 2006, from <http://www.vaes.vt.edu/steeles/mccormick/harvest.html>.
- Vitz, P, C. (1986). *Censorship: Evidence of bias in our children's textbooks*. Ann Arbor, MI: Servant Books.
- Wade, S.E., & Moje, E.B. (2001, November). The role of text in classroom learning: Beginning an online dialogue. *Reading Online*, 5 (4). Retrieved May 22, 2004 from http://www.readingonline.org/articles/art_index.asp/HREF=/articles/handbook/wade/index.html
- Wessel, T. (1977). Agriculture in the Great Plains. *Agricultural History Society*, 51 (1), 236.
- Whitaker, B. K., & Dyer, J. E. (2000). Identifying sources of bias in agricultural news reporting. *Journal of Agricultural Education*, 41 (4), 125-133.
- Whitaker, B. K., & Dyer, J. E. (1998). A comparison of levels of bias in environmental and food safety articles: Agricultural versus news periodicals. *Proceedings of the National Agricultural Education Research Meeting*, 25, 436-446.
- Williams, G. & White, J. D. (1991). Agricultural literacy in agriculture's heartland. *The Agricultural Education Magazine*, 63 (8), 9.
- Wright, D. E. (1992). *Agricultural knowledge and perceptions of eleventh grade students in out-state Missouri schools*. Unpublished doctoral dissertation, University of Missouri, Columbia.
- Wright, D., Stewart, B. R., & Birkenholz R. J. (1994). Agricultural awareness of eleventh grade students in rural schools. *Journal of Agricultural Education*, 35 (4), 55-60.

Appendix A

Global and Societal Significance of Agriculture References

1. Page 7 text “The workers who advanced the industrial boom were immigrants and people who moved from farms to the cities.”
2. Page 7 text “Pioneers changed the Great Plains from wilderness to farmland.”
3. Page 19 text “Sometime after the early settlements in Mexico, people began farming in what is now the Southwestern United States.”
4. Page 19 text “Not all the early peoples in the Americas farmed, however.”
5. Page 19 text “Some remained nomadic hunters, and others relied on fishing or trading instead of agriculture.”
6. Page 19 text “Farming allowed people to spend time on activities other than finding food.”
7. Page 19 text “Knowing that they would harvest an abundant supply of grains and vegetables, the people of ancient Mexico began to improve their lives in other ways.”
8. Page 19 text “Agriculture changed the lives of these early people and lead to a new culture, or way of life.”
9. Page 19 text “Rather than move from place to place in search of food, the people who farmed were able to settle down.”
10. Page 19 assessment “What did farming mean for nomadic people.”
11. Page 30 text “Farmers and traders, the Hopewell built huge burial mounds in the shape of birds, bears, and snakes.”
12. Page 34 text “The Maya create a written language and develop new ways of farming.”

13. Page 35 activity “Create a cause and effect chart. Write on your chart: Cause:
The development of farming changed the way early nomads lived. Then describe at least two effects.”
14. Page 42 text “The country was mainly agricultural, but gold mines enriched the kingdom.”
15. Page 54 text “Missions were religious communities that usually included a small town, surrounding farmland, and a church.”
16. Page 65 assessment “Juana Ines de la Cruz was an unusual woman because she was famous as a “A. writer B. prince **C. Farmer** D. warrior
17. Page 77 text “They were common people-servants, crafts-people, and poor farmers- who hoped to find a better life in America.”
18. Page 90 text “He kept the size of the farms small and banned slavery, Catholics, and rum.”
19. Page 91 diagram “Profit from fur trade, farming; religious and political freedom.”
20. Page 103 text “Although good farmland was lacking in much of the region, New England’s population grew and towns and cities developed.”
21. Page 104 text “Using agricultural methods developed in Europe, these immigrants became successful farmers.”
22. Page 106 assessment “How did farming in New England compare with farming in Southern Colonies?”
23. Page 112 text “A colonial farm was both home and workplace.”
24. Page 112 text “Women cooked made butter and cheese and preserved food.”
25. Page 112 text “They spun yarn, made clothes, and tended chicken and cows.”

26. Page 112 text “Men worked in the fields and built barns, houses, and fences.”
27. Page 112 text “In many areas, women worked in the fields next to their husbands.”
28. Page 112 text “They managed the farms and represented the family in community affairs.”
29. Page 182 text “They wanted to see an end to the war that was destroying their homes and farms.”
30. Page 260 text “When his father died, Banneker sold the family farm and devoted the rest of his life to mathematics and natural sciences.”
31. Page 262 text At the time, most Americans earned their living by farming.”
32. Page 263 text “Western farmers revolt in whiskey rebellion.”
33. Page 263 text “Far removed from the bustle of trade and shipping along the Atlanta coast, farmers on the western frontier lived quite differently.”
34. Page 263 text “Living in scattered or isolated homesteads, frontier farmers were proud of their self reliance.”
35. Page 282 text “They made a long and exhausting journey over the Appalachian Mountains.”
36. Page 285 text “When the expedition returned in September, it had collected valuable information on people, plants, animals and the geography of the West.”
37. Page 292 text “They should, he said, give up practices learned from the white invaders-wearing western dress, using plows and firearms, and especially drinking alcohol.”

38. Page 306 text “An English journalist described the farmers of Long Island in 1818: “Every man can use an axe, a saw, and a hammer.”
39. Page 306 text “Scarcely one who cannot do any job at rough carpentering, and mend a plough and wagon...”
40. Page 306 text “They take care of everything pertaining to the domestic economy, for example, making candles, boiling soap, preparing starch, canning berries, fruit and cucumbers, baking, and spinning, sewing, and milking the cows.”
41. Page 328 diagram “Samuel Slater builds first cotton mill in America.”
42. Page 328 diagram “Eli Whitney invents the cotton gin”
43. Page 329 assessment “When would a cotton gin be necessary in this process?”
44. Page 483 text “The need for a steady supply of food for Union troops helped farmers prosper.”
45. Page 483 text “Because most fighting occurred in the South, Southern farmland was overrun and rail lines were torn up.”
46. Page 509 text “After the Civil War the South had to rebuild not only its farms and roads, but its social and political structures as well.”
47. Page 520 text “Although Southern agriculture took a new form, the South still a rural economy, and that economy was still very poor.”
48. Page 538 text “The climate of the plains presented farmers with their greatest challenge.”
49. Page 538 text “Generally there was little rainfall, but in some years rain came down in torrent, destroying crops and flooding homesteads.”
50. Page 538 text “The other extreme- drought also threatened crops and lives.

51. Page 538 text “In times of drought, brushfire swept rapidly through a region, destroying crops, livestock, and homes.”
52. Page 538 text “Winds howled across the open Plains, and deep snow could bury and trap families in there homes.”
53. Page 538 text “Farm families had to plan ahead and store food for the winter.”
54. Page 538 text “Farming on the Great Plains was a family affair.”
55. Page 538 text “A farm wife sewed clothing, made candles and cooked and preserved food.”
56. Page 538 text “When her husband was away-taking the harvest to town or buying supplies-she bore all responsibility for keeping the farm running.”
57. Page 538 text “When children grew old enough, they to worked on the farm.”
58. Page 538 text “Children helped in the fields, tended animals, and did chores around the house.”
59. Page 538 text “Farmwork often kept children from attending school.”
60. Page 539 activity “Create a poster that the United States government might have used to encourage farmers to move west.”
61. Page 552 assessment “What attracted farmers to the great plains?”
62. Page 553 activity “Reread and take notes on the section of the chapter that discusses the chores of a farm wife. Use your notes to create an hour-by-hour schedule to show one day’s typical activities for a farm wife living on the Great Plains.”

63. Page 553 assessment “People in the late 1800’s took advantage of the open grasslands of the West to develop which of these industries?” A Banking B Manufacturing **C Ranching** D Mining
64. Page 559 text “As farmers settled the Great Plains, the manufacturing center for agricultural equipment moved from central New York state to Illinois and Wisconsin.”
65. Page 568 text “The change from an agricultural economy to an industrial one was possible because the United States had the resources needed for a growing economy.”
66. Page 585 text “Because they lacked the money to buy farmland in America, however, they often settled in industrial cities.”
67. Page 590 text “Many Americans left the nations farms, hoping to make their fortunes in the cities.”
68. Page 591 text “New farm machinery made it possible to produce crops, using fewer workers.”
69. Page 598 text “An 1862 law called the Morrill Act gave the states large amounts of federal land that could be sold to raise money for education.”
70. Page 598 text “The states could use these funds to start dozens of schools called lands-grant colleges.”
71. Page 601 text “Winslow Homer painted Southern farmers, Adirondack campers, and stormy sea scenes.”
72. Page 602 text “Unlike round the clock farmwork, professional and industrial jobs gave people hours and even days of free time.”

73. Page 642 text “I was determined to have the students do not only the agricultural and domestic work, but to have them erect their own buildings.
74. Page 689 text “Much of its landscape was devastated, its farms and towns destroyed.”
75. Page 712 text “Farmers had an especially difficult time.”
76. Page 712 text “During the war, the federal government had purchased wheat, corn, and other products and farmers had prospered from higher prices.”
77. Page 712 text “When the war ended, farmers had to compete with European agriculture again.”
78. Page 712 text “Food prices fell, and farm income plummeted.”
79. Page 712 text “Unable to pay their debts, many farmers lost their farms.”
80. Page 719 text “When large numbers of farmers migrated to cities during the 1920’s, they brought fundamentalism with them.”
81. Page 726 text “Farmers bought land, equipment, and supplies on credit.”
82. Page 726 text “Farm income shrank throughout the decade.”
83. Page 734 text “Farmers continued to lose their land.”
84. Page 735 chart “Great Plains farmers”
85. Page 737 text “Thousands of Dust Bowl farmers went bankrupt and had to give up their farms.”
86. Page 737 text “Using new technology such as tractors and disc plows, farmers had cleared millions of acres of sod for wheat farming.”
87. Page 737 text “Strong prairie winds simply blew the soil away.”
88. Page 737 text “The drought and the storms continued for years.”

89. Page 738 text “They worked as farmers, migrant workers, and laborers.”
90. Page 741 text “The migrants many of them living out of their cars, would travel from farm to farm hoping to find work picking fruit, vegetables, or cotton.”
91. Page 748 text “Industry and agriculture supply exceeds demand.”
92. Page 766 text “Americans used government-issued books of ration coupons to purchase certain items, such as shoes, gasoline, tires, sugar, and meat.”
93. Page 821 text “Business, industry, and agriculture adopted new technology and new production methods, resulting in greater productivity- the ability to produce more goods with the same amount of labor.”
94. Page 858 text “The fight for rights started among Mexican American migrant farm-workers.”
95. Page 858 text “ These people, who planted and harvested a large share of the nation’s food supply, faced great hardships.”
96. Page 858 text “The migrant farmers did backbreaking work, laboring from dawn to dusk for low wages.
97. Page 858 text “When one job ended, they had to travel from farm to farm in search of the next job.”
98. Page 858 text “In the early 1960’s, migrant workers formed unions to fight for better wages and working conditions.”
99. Page 858 text “Their leader, Cesar Chavez, organized thousands of farm-workers into the United Farm Workers (UFW).”
100. Page 858 text “Consumers across the country supported the UFW buy refusing to buy grapes, lettuce, and other farm produce under boycott.”

101. Page 858 text “The success of the boycotts enabled the UFW to win higher wages and shorter work hours for many farmworkers.

102. Page 862 text “Cesar Chavez organizes United Farm Workers.”

103. Page 863 activity “The United Farm Workers are still active today. Search the Internet for information about this organization, and create a brochure that explains its goal.”

Appendix B

Public Policy in Agriculture References

1. Page 144 text “All along the road from Concord to Boston, farmers, blacksmiths, saddle makers, and clerks hid behind trees, rocks and stone fences.”
2. Page 200 text “American farmers suffered because they could not sell their goods.”
3. Page 226 text “These include aeronautics and space, banking, communication, farm credit, and trade.”
4. Page 200 text “They had problems paying the request for money that the states levied to meet Revolutionary War debts.”
5. Page 263 text “Living in scattered, isolated homesteads, frontier farmers were proud of their self reliance.”
6. Page 263 text “The farmers were in an uproar over having to pay a special tax on the whiskey they made from surplus corn.”
7. Page 268 text “Republican policies appealed to small farmers and urban workers, especially in the Middle Atlantic states and the South.”
8. Page 274 assessment “What caused farmers in western Pennsylvania to revolt during the whiskey rebellion?”
9. Page 280 text “He believed the strength of the United States was its independent farmers.”
10. Page 336 text “For the first time white male sharecroppers, factory workers, and many others were brought into the political process.”
11. Page 349 text “When laws make the rich richer, and the potent more powerful, the humble members of society the farmers, mechanics, and laborers who have

neither the time nor the means of securing like favors to themselves, have a right to complain of the injustice of their Government.”

12. Page 351 text “To win the election, Harrison had to gain the support of the laborers and farmers who had voted for Jackson.”
13. Page 377 text “Agriculture, shipping, and trade expanded to meet the miners’ needs for food and other goods.”
14. Page 510 text “Many were non-slaveholding farmers or business leaders who had opposed secession in the first place.”
15. Page 537 text “The federal land policy brought farmers to the Plains to homestead earn ownership of the land by settling on it.”
16. Page 548 text “In the late 1800’s farmers began to band together in groups and associations to fight their problems.”
17. Page 548 diagram “Farmers’ Alliances seek federal support”
18. Page 549 text “Farmers began to organize in an effort to solve their problems.”
19. Page 549 text “Within a short time, they had created a mass political movement.”
20. Page 549 text “The first farmers’ organization of this period was a network of local self-help organizations that eventually came to be called the National Grange.”
21. Page 549 text “The Grange offered farmers education, fellowship, and support.”
22. Page 549 text “For inexperienced farmers, the Grange provided a library with books on planting and livestock raising.”
23. Page 549 text “For lonely farm families, it organized social gatherings.”

24. Page 549 text “Above all, the Grange tried to encourage economic self-sufficiency.”
25. Page 549 text “It set up “cash-only” cooperatives, stores where farmers bought products from each other.”
26. Page 549 text “The purpose of the “cash-only” policy was to remove the burden of credit buying that threatened farmers.”
27. Page 549 text “In the 1870’s the Grange tried to cut farmers’ cost by getting state legislatures to limit railroad shipping rates.”
28. Page 549 text “Farmers were always short of cash and had to borrow money until their next crop was sold.”
29. Page 549 text “Rural reformers the tried to help farmers through the Farmers’ Alliances.”
30. Page 549 text “The Farmers’ Alliances were networks of organizations that sprang up in the West and the South in the 1880’s.”
31. Page 549 text “The Southern Alliance was founded in Texas when farmers rallied against the railroads and against ‘money power’.”
32. Page 549 text “By 1890 the Southern Alliance had more than three million members and the Colored Farmers’ National, a separate organization of African American farmers had one million members.”
33. Page 549 text “Like the Grange, the Farmers; Alliances sponsored education and cooperative buying and selling.”

34. Page 549 text “The Alliances also proposed a plan in which the federal government would store farmers’ crops in warehouses and lend money to the farmers.”
35. Page 549 text “When the stored crops were sold, the farmers would pay back the government loans.”
36. Page 549 text “Such a plan would reduce the power that railroads, banks, and merchants had over farmers and would offer farmers federal protection.”
37. Page 550 text “They believed that putting more silver coins into the economy would give farmers more money to pay their debts.”
38. Page 552 assesment “What attracted farmers to the Great Plains?”
39. Page 552 assesment “How did the grange help farmers?”
40. Page 552 assesment “Describe the problems that led farmers to organize granges and alliances.”
41. Page 613 text “The uproar of Sinclair’s book helped persuade Congress pass the Meat Inspection Act in 1906.”
42. Page 613 text “The same year Congress also passed the Pure Food and Drug Act, requiring accurate labeling of food and medicine and banning the sale of harmful food.”
43. Page 613 text “Fighting Bob,” as he was called, won the support of farmers and workers with his fiery attacks on big business and the railroads.”
44. Page 622 text “He supported the Meat Inspection and the Food and Drug Acts; these acts gave the Department of Agriculture and the Food and Drug Administration the power to visit businesses and inspect their products.”

45. Page 624 text “He persuaded the Democrat-controlled Congress to adopt a lower tariff on imported goods such as sugar, wool, steel, and farm equipment.”
46. Page 732 diagram “Farm Security Administration begun in 1937, it lent money to sharecroppers; set up camps for migrant workers.”
47. Page 733 text “New Deal laws and regulations affected banking, the stock market, industry, agriculture, public works, relief for the poor, and conservation of resources.”
48. Page 733 text “Roosevelt did not forget agriculture.”
49. Page 733 text “On May 12, Congress passed the Agricultural Adjustment Act.”
50. Page 733 text “The act had two goals : to raise farm prices quickly and to control production so that farm prices would stay up over the long term.”
51. Page 734 assessment “What were the goals of the Agricultural Adjustment Act?”
52. Page 734 assessment “Create a table that lists the positive and negative aspects of the New Deal farm program.”
53. Page 745 text “In January 1936, the Supreme Court struck down the Agricultural Adjustment Act.”
54. Page 749 assessment “All of the following programs were created by Roosevelt in the First New Deal Except the” A. Agricultural Adjustment Act B. Civilian Conservation Corps C. Fair Labor Standards Act D. Tennessee Valley Authority

Appendix C
Plant Science References

1. Page 19 text “They learned to plant and raise an early form of corn called maize.”
2. Page 19 text “Their harvests of maize provided a steady, reliable source of food.”
3. Page 19 text “Early Americans in Mexico also experimented with other kinds of seeds.”
4. Page 19 text “They planted pumpkins, beans, and squashes.”
5. Page 19 text “The population grew along with the growing food supply.”
6. Page 19 text “Sometime after the early settlements in Mexico, people began farming in what is now the southwestern United States.”
7. Page 19 text “Knowing that they would harvest an abundant supply of grains and vegetables, the people of ancient Mexico began to improve their lives in other ways.”
8. Page 23 text “They planted maize, beans, sweet potatoes, and other vegetables.”
9. Page 24-25 diagram Crops of the time
10. Page 24 text “Perhaps the soil became too exhausted by erosion and fire to produce enough food for the people.”
11. Page 24 text “They filled parts of the lake with earth so they could grow crops.”
12. Page 25 text “Aztec warriors took everything they could carry from their victims, including maize, cotton cloth, copper and weapons. “
13. Page 25 text “The Aztec believed that human sacrifices were necessary to keep the gods and to ensure abundant harvests.”
14. Page 29 text “In addition to hundreds of miles of irrigation channels, the Hohokam left behind pottery, carved stone, and shells etched with acid.”

15. Page 29 text “Their large villages may have been abandoned because of droughts, long periods of little rainfall, during which the crops dried up.”
16. Page 32 text “The root of the camas plant, a relative of the lily, was an important part of their diet.”
17. Page 32 text “In the more barren environment of the southern deserts, nomadic groups wandered from place to place collecting roots and seeds.”
18. Page 32 text “They also grew beans, squash, melons, pumpkins and fruit.”
19. Page 32 text “In addition to hunting and gathering, they began to grow maize and beans.”
20. Page 32 text “The women tended plots of maize, squash and beans.”
21. Page 33 text “There they grew corn, tobacco, squash and other crops.”
22. Page 34 text “In the southwest, Native American peoples adapt to their harsh environment by improving techniques of irrigation to farm the land.”
23. Page 35 picture Map with pictures of corn on it.
24. Page 52 text “These cities were forced to give crops, clothing, gold, and precious stones to the Aztec as tribute.”
25. Page 55 text “To raise these crops, the Spanish developed the plantation system.”
26. Page 56 picture of Crops
27. Page 57 picture of Wheat
28. Page 57 text “Spaniards introduced wheat and other crops.”
29. Page 57 text “By introducing livestock, wheat, European fruit, and other new crops, the missionaries altered the economy of the region.”

30. Page 57 assessment “How did the introduction of food crops and domestic animals affect the development of the Southwest?”
31. Page 60 picture of Vegetables
32. Page 60 text “From native Americans, Europeans acquired foods such as corn, potatoes, tomatoes, beans, and chocolate.”
33. Page 60 text “Easy-to-grow food crops, such as the potato, fed Europe’s growing population. Some foods, such as corn also spread to Asia and Africa.”
34. Page 62 text “The goods probably included cloth, and valuable tools such as axes, hoes, and awls.”
35. Page 72 text “Because the London investors expected a quick profit from their colony, the settlers searched for gold and silver when they should have been growing food.”
36. Page 72 text “Smith forced the settlers to work, explored the area and managed to get corn from the local Native Americans.”
37. Page 72 text “John Rolfe, learned to grow a type of tobacco using seeds from the West Indies.”
38. Page 72 text “The first crop was sold in England in 1614.”
39. Page 72 text “Soon planters all along the James River were raising tobacco, and the colony of Virginia began to prosper and grow.”
40. Page 74 text “Settlers learned to grow crops in the new land.”
41. Page 74 text “When tobacco from the West Indies was introduced, it became a commercial success and guaranteed Jamestown’s future.”
42. Page 74 picture of woman working in the fields

43. such as corn, beans, and squash. Corn quickly became the staple food.”
44. Page 78 text “Squanto and Samoset showed the Pilgrims how to grow corn, beans, and pumpkins and where to hunt and fish.”
45. Page 78 text “Pilgrims also felt relieved to be raising food.”
46. Page 78 text “ During the feast the Pilgrims thanked God for the harvest and their survival.”
47. Page 79 text “The fertile Connecticut River valley, south of Massachusetts, was much better for farming and than was the stony soil around Boston.”
48. Page 83 text “Settlers owed the patron labor and a share of their crops.”
49. Page 86 activity “As you read the section, re-create the diagram below and identify the main crops of three of the Southern Colonies.”
50. Page 86 text “By 1660, while tobacco prices fell, large plantations continued to prosper because they were better able to maintain high profits that were small farms.”
51. Page 86 text “Along with the growth of plantations, there was an increasing need for workers in the newly settled Southern Colonies.”
52. Page 87 text “Knowing that tobacco had saved the Virginia colony, the Maryland colonists turned first to tobacco farming.”
53. Page 87 text “In addition to corn, most Maryland tobacco farmers produced wheat, fruit, vegetables, and livestock to feed their families and their workers.”
54. Page 87 text “The climate in the Southern Colonies allowed colonists to grow rice and tobacco.”
55. Page 87 picture Map with pictures of rice, grain and tobacco.

56. Page 89 text “The northern part of Carolina was settled mostly by farmers from Virginia’s backcountry.”
57. Page 89 text “They grew tobacco and sold forest products such as timber and tar.”
58. Page 90 text “Many enslaved Africans who arrived in the Carolinas worked in the rice fields.”
59. Page 90 text “Some of them knew a great deal about rice cultivation because they had come from the rice-growing areas of West Africa.”
60. Page 90 text “Growing rice required much labor, so the demand for slaves increased.”
61. Page 102 text “Others were forced to mine gold or work in farm fields.”
62. Page 103 text “Although good farmland was lacking in much of the region, New England’s population grew and towns and cities developed.”
63. Page 105 text “The backcountry settlers grew corn and tobacco on small farms.”
64. Page 105 text “Each plantation was a self contained community with fields stretching around a cluster of buildings.”
65. Page 115 text “Have your corn cake and eat it too.”
66. Page 120 text “Colonist need to grow cash crops, such as tobacco and rice.”
67. Page 120 text “European demand for tobacco increases.”
68. Page 120 text “Growing tobacco and rice requires large labor force.”
69. Page 201 text “Two Americans active in the movement for change were James Madison, a Virginia planter, and Alexander Hamilton, a New York lawyer.”

70. Page 201 text “The 55 delegates included planters, merchants, lawyers, physicians, generals, governors, and a college president.”
71. Page 270 text “Johnny Appleseed did not did not scatter seeds as her wandered, as many people believe.”
72. Page 270 text “As he traveled, he would spot good sites for planting.”
73. Page 270 text “There he would clear the land and plant the seeds.”
74. Page 270 text “His orchards varied in size.”
75. Page 270 text “Some covered about an acre.”
76. Page 270 text “Others covered many acres.”
77. Page 270 text “When settlers arrived, they found Johnny Appleseed’s young apple trees ready for sale.”
78. Page 283 text “The new territory would provide cheap and abundant land for farmers for generations to come.”
79. Page 286 text “Lewis collects the bitterroot and some other plant specimens on the journey.”
80. Page 304 text “Eli Whitney invents the cotton gin.”
81. Page 305 picture Yosemite Valley landscape
82. Page 306 text “Cotton gin.”
83. Page 307 text “New England’s soil was poor , and farming was difficult.”
84. Page 307 text “The first steps in textile production clean the raw cotton and turn loose cotton into crude yarn.”

85. Page 308 text “In 1793 Eli Whitney of Massachusetts invented the cotton gin, a simple machine that quickly and efficiently removed the seeds from the cotton fiber.”
86. Page 319 text “Both men and women participated in cornhuskings-gatherings where farm families shared the work of stripping the husks from the ears of the corn.”
87. Page 322 text “John C. Calhoun, a planter from South Carolina, was one of the War Hawks who had called for war with Great Britain in 1812.”
88. Page 328 text “Samuel Slater builds first cotton mill in America.”
89. Page 328 text “Eli Whitney invents the cotton gin.”
90. Page 329 assessment “When would a cotton gin be necessary in this process?”
91. Page 333 text “Deadly fungus destroys much of Ireland’s potato crop.”
92. Page 370 text “Smith reported that the Native Americans farmed thousands of acres and worked at weaving and other crafts.”
93. Page 374 text “Settlers traveling west encountered new wildlife, vegetation, and landforms.”
94. Page 378 text “They planned their towns carefully and built irrigation canals to water their farms.”
95. Page 379 text “Although he gave up the life of a prairie farmer, Garland’s work fiction and nonfiction reflects his background and his concern for the hard, lonely lives of pioneer men and women.”
96. Page 379 text “‘Well, children, here we are on The Big Prairie,’ we looked about us with awe, so endless seemed this spread of wild oats and waving blue-joint.”

97. Page 382 text “These travelers keep speaking of free, fertile land and new opportunities.”
98. Page 382 text “The crops have failed, and surviving winter would be downright tough.”
99. Page 384 picture Steel tipped plow
100. Page 385 picture Plantation picture
101. Page 385 text “During the mid 1800’s, plantations in southern Louisiana were entire communities in themselves.”
102. Page 385 text “Beginning of Irish potato famine”
103. Page 390 text “Settlers worried that wooden plows could not break the prairie’s matted sod and that the soil was not fertile.”
104. Page 390 text “One was the steel tipped plow that John Deere invented in 1837.”
105. Page 390 text “Far sturdier than the wooden plow; Deere’s plow easily cut through the hard packed sod of the prairies.”
106. Page 390 text “Equally important was the mechanical reaper, which sped up the harvesting of wheat, and the thresher, which quickly separated the grain from the stalk.”
107. Page 390 text “For hundreds of years, farmers had harvested grain with handheld sickles.
108. Page 390 text “McCormick’s reaper could harvest grain much faster than a hand operated sickle.”

109. Page 390 text “Because farmers could harvest wheat so quickly; they began planting more of it.”
110. Page 390 text “Growing wheat became more profitable.”
111. Page 390 text “New machines and railroad helped farmers plant more acres in “cash” crops planted strictly for sale.”
112. Page 393 text “The Irish migration to the United States was brought on by a terrible potato famine.”
113. Page 393 text “A famine is an extreme shortage of food.”
114. Page 393 text “Potatoes were the main part of the Irish diet.”
115. Page 393 text “When a devastating blight, or disease, destroyed the Irish potato crops in the 1840’s, starvation struck the country.”
116. Page 397 text “Eli Whitney invent the cotton gin.”
117. Page 397 text “Removal of Native American spurs expansion of cotton production.”
118. Page 397 text “The South remains largely rural and dependent on cotton.”
119. Page 397 text “Technology, a favorable climate, and rising demand led to the cotton boom in the deep South.”
120. Page 397 text “Cotton was “king” in the South before 1860.”
121. Page 397 text “Cotton was the main topic of conversation: “I believe that in the three days that I was there...I must have heard the word cotton pronounced more than 3,000 times.”
122. Page 397 text “In 1790 the South seemed to be an underdeveloped agricultural region with little prospect for future growth.”

123. Page 398 text “In colonial times, rice, indigo, and tobacco made up the South’s main crops.”
124. Page 398 text “European mills wanted Southern cotton.”
125. Page 398 text “But cotton took time and labor to produce.”
126. Page 398 text “After harvest, workers had to painstakingly separate the plant’s sticky seeds from the cotton fibers.”
127. Page 398 text “Cotton production was revolutionized when Eli Whitney invented the cotton gin in 1793.”
128. Page 398 text “The cotton gin was a machine that removed seeds from cotton fibers dramatically increasing the amount of cotton that could be processed.”
129. Page 398 text “A worker could clean 50 pounds of cotton a day with the machine instead of 1 pound by hand.”
130. Page 398 text The cotton gin led to the demand for more workers.
131. Page 398 text “Because the cotton gin processed cotton fibers so quickly, farmers wanted to grow more cotton.”
132. Page 398 text “Many Southern planters relied on slave labor to plant and pick the cotton.”
133. Page 398 diagram Cotton production as a percentage of U.S. exports
134. Page 398 picture Map of cotton production from 1820-1860
135. Page 399 text “Both parts of the South were agricultural, but the Upper South still produced tobacco, hemp, wheat, and vegetables.”
136. Page 399 text “The Deep South was committed to cotton and, in some areas, to rice and sugarcane.”

137. Page 399 text “The value of enslaved people increased because of their key role in producing cotton and sugar.”
138. Page 399 text “One reason was the boom in cotton sales.”
139. Page 399 text “Because agricultural was so profitable, Southerners remained committed to farming rather than starting new businesses.”
140. Page 399 text “They believed that an economy based on cotton and slavery would continue to prosper.”
141. Page 399 picture Cotton Gin
142. Page 399 text “In 1793 Eli Whitney visited Catherine Greene, a Georgia plantation owner. She asked him to build a device that removed the seeds from cotton pods. Whitney called the machine the cotton gin-“gin” being short for engine.”
143. Page 400 text “As long as we have our rice, our sugar, our tobacco, and our cotton.”
144. Page 400 text “While most Southerners felt confident about the future of the cotton economy, some leaders wanted to develop industry in the region.”
145. Page 400 text “They argued that, by remaining committed to cotton production, the South was becoming dependent on the North for manufactured goods.”
146. Page 400 text “In 1860 the region remained largely rural and dependent on cotton.”
147. Page 400 assessment “Describe the differences in agriculture addressed in the text between the Upper South and the Deep South.”
148. Page 401 text “Planters gathered in the bright Savannah sunshine.”

149. Page 401 text “They were asked to bid on a strong slave who could plow their fields.”
150. Page 401 text “In reality most white Southerners were either small farmers without slaves or planters with a handful of slaves.”
151. Page 401 text “Only a few planters could afford the many enslaved Africans and the lavish mansions shown in fictional accounts of the Old South.”
152. Page 402 text “Most white Southerners fit into the on of four categories: yeomen, tenant farmers, the rural poor, or plantation owners.”
153. Page 402 text “A yeoman’s farm usually ranged from 50 to 200 acres.”
154. Page 402 text “Yeomen usually grew crops both for their own use and to sell, and they often traded their produce to local merchants for goods and services.”
155. Page 403 text “Most of the enslaved African Americans, however, were field hands.”
156. Page 403 text “They worked from sunrise to sunset planting, cultivating, and picking cotton and other crops.”
157. Page 404 text “Enslaved workers reached the fields when the sun came up and they stayed until the sun went down.”
158. Page 404 text “Planters wanted to keep the slaves busy all the time, which meant long and grueling days in the fields.”
159. Page 406 text “Born as a slave in Maryland, Harriet Tubman worked in plantation fields until she was nearly 30 years old.”
160. Page 408 picture Slaves working in the corn fields
161. Page 408 text “Cotton is leading cash crop.”

162. Page 408 assessment “How did the cotton gin affect cotton production?”
163. Page 409 activity “Search encyclopedias and other library resources for information about cotton production in the world today. Find out what countries grow cotton, what quantities are grown, and any types of fertilizers used.”
164. Page 419 text “Moreover, the number of enslaved persons had sharply increased because of the cotton boom in the Deep South made planters increasingly dependent on slave labor.”
165. Page 434 text “Many people begin emigrating to escape potato famine in Ireland.”
166. Page 455 text “Cotton hand”
167. Page 463 text “The South expected that Britain and France, which imported large quantities of Southern cotton, would pressure the North to end the war to restore their cotton supply.”
168. Page 472 text “In the time that I am writing, every stalk of corn was cut as closely as could have been with a knife, and the slain lay in rows precisely as they stood in their ranks a few minutes before.”
169. Page 512 text “The most common form of farmwork for freed individuals was sharecropping.”
170. Page 512 text “In this system a landowner rented a plot of land to a sharecropper, or farmer, along with a crude shack, some seeds and tools, and perhaps a mule.”
171. Page 512 text “In return the sharecroppers shared a percentage of their crop with the landowner.”

172. Page 518 text “Before the Civil War, Southern planters had shipped cotton to textile mills in the North or in Europe.”
173. Page 518 text “The tobacco industry was developed largely through the efforts of James Duke of North Carolina.”
174. Page 518 text “Duke’s American Tobacco Company eventually controlled almost all of the tobacco manufacturing in the nation.”
175. Page 518 text “They pictured small, profitable farms raising a variety of crops rather than large plantations devoted to growing cotton.”
176. Page 518 text “The quickest way for farmers to repay that debt, they thought, was to grow cash crops, crops that could be sold for money.”
177. Page 518 text “The farmers had to grow even more cotton to cover their losses.”
178. Page 518 text “Sharecropping and reliance on a single cash crop hampered the development of a more modern agriculture economy.”
179. Page 519 picture Graphs of agricultural production in the South, 1850-1890
180. Page 522 assessment “Why did growing cotton after the Civil War send many Southern farmers into debt?”
181. Page 523 activity “What happened to the price of cotton when an oversupply of cotton was on the market? How do you think prices would change if the demand for cotton were greater than the supply?”
182. Page 533 picture Map of Western land use
183. Page 537 text “In the late 1860’s, however, farmers began settling there and planting crops.”

184. Page 537 text “A plains family’s first home was usually made of sod, rectangular pieces of soil and grass.”
185. Page 538 text “Generally there was little rainfall, but in some years rain came down in torrents, destroying crops and flooding homesteads.”
186. Page 538 text “The other extreme drought, also threatened crops and lives.”
187. Page 539 text “Most parts of the region had little rainfall and too few streams for irrigation.”
188. Page 539 text “The Plains farmers, known as sodbusters needed new methods and tools.”
189. Page 539 text “One approach, called dry farming, was to plant seeds deep in the ground where there was some moisture.”
190. Page 539 text “Wooden plows could not penetrate the tough of sod, but in the late 1870’s farmers could use the newly invented lightweight steel plows.”
191. Page 547 text “Native Americans often received dry gravelly plots that were not suited for farming.”
192. Page 548 text “The supply for crops grew faster than the demand for them, however, and prices fell steadily.”
193. Page 548 text “At the same time, farmers’ expenses for transporting their goods to market, for seed, and for equipment and other manufactured goods.”
194. Page 588 text “They fled from crop failures, political repression and military service.”
195. Page 588 text “They were escaping from a disastrous cholera and repeated crop failures.”

196. Page 588 text “Soon Japanese immigrants were growing 10 percent of California’s produce.”
197. Page 599 text “From the peanut, which was formerly of little use, Carver developed hundreds of products, including plastics, synthetic rubber, shaving cream, and paper.”
198. Page 621 text “During the rest of Roosevelt’s term as president, he obtained a total of 25 indictments (legal charges) against trusts in the beef, oil, and tobacco industries.”
199. Page 632 text “Chemist George Washington Carver , director of agricultural research at Tuskegee Institute, helped improve the economy of the South through his discoveries of plant products.”
200. Page 645 text “The sugar industry grew quickly, and plantation owners brought in thousands of immigrants from Japan, China, and other Pacific lands to work in the fields.”
201. Page 648 activity “Research the process of turning sugarcane into the refined sugar available in the supermarkets.”
202. Page 650 text “The rebels burned sugarcane fields and destroyed buildings in hopes of forcing the Spaniards to leave.”
203. Page 684 text “The agency urged people to observe “Wheatless Mondays,” “Meatless Tuesdays,” “and “Porkless Thursdays,” and to add their own store of food by planting “victory gardens.”
204. Page 737 text “Using new technology such as tractors and disc plows, farmers had cleared millions of acres of sod for wheat farming.”

205. Page 737 text “They did not realize that the roots of the grass had held the soil in place.”
206. Page 737 text “When a severe drought struck in 1931, crops dried and the soil.”
207. Page 737 text “Strong prairie winds simply blew the soil away.”
208. Page 737 text “Each storm stripped away more soil.”
209. Page 737 text “One storm in 1934 carried about 300 million tons of soil, depositing some of it on ships 300 miles out in the Atlantic Ocean.”
210. Page 737 text “About 400,000 farmers migrated to California and became migrant workers, moving from place to place to harvest fruits and vegetables.”
211. Page 741 text “Settlers had flocked to the plains and plowed up the grasses to plant wheat and other crops.”
212. Page 741 text “Repeated deep plowing destroyed the protective root layer of the tough grasses and sod that held the moisture and anchored the soil.”
213. Page 741 text “Desperate farmers watched their crops shrivel and blow away.”
214. Page 741 text “The migrants, many living out of their cars, would travel from farm to farm hoping to find work picking fruit, vegetables, and cotton.”
215. Page 764 text “Reluctantly, Audie Murphy, the orphaned son of Texas sharecroppers, enlisted in the Army.”
216. Page 828 text “Huge crop surpluses during those years caused the prices of farm products and thus farming income to decline dramatically.”
217. Page 829 text “Farm workers suffered as well.”
218. Page 829 text “In the South, African American sharecroppers and tenant farmers had always struggled to survive,”

219. Page 829 text “Their problems increased when mechanized cotton pickers replaced workers.”
220. Page 829 text “The popularity of synthetic fibers reduced the demand for cotton.”
221. Page 829 text “Southern farm workers lost their jobs cotton production fell, and thousands of farmers lost their land.”
222. Page 834 activity “Re-create the diagram below and explain how these two factors(crop surpluses and synthetic fiber industry) created problems for farmers and farm workers.”
223. Page 856 text “Mexican American farm worker Jesse de la Cruz had labored for decades in the grape and cotton fields of the Southwest.”
224. Page 898 text “They also hoped to gain access to the United States technology and to buy badly needed American grain.”
225. Page 908 text “He called on Americans to save their money rather than spend it to plant their own gardens to counter rising food prices.”
226. Page 911 text “A former governor of Georgia, Carter liked to say he was just a peanut farmer from a small town called Plains who wanted to serve his country.”
227. Page 934 picture Almonds grown in the United States
228. Page 965 text “The fruits of our country, our flocks and our fleeces”
229. Page 965 text “Refinement and wealth through our forests shall roam”
230. Page 974 picture A man selling fruit
231. Page 974 text “ A fruit seller”
232. Page 975 picture A wartime poster promoting fruits and vegetables

233. Page 980 text “George Washington-planter”
234. Page 980 text “Thomas Jefferson-planter”
235. Page 980 text “James Madison-planter”
236. Page 981 text “William H. Harrison-planter”
237. Page 982 text “Ulysses S. Grant-farmer”
238. Page 983 text “Harry S. Truman-farmer”
239. Page 984 text “James E. Carter, Jr.-farmer”

Appendix D
Animal Science References

1. Page 32 text “Native Americans captured and tamed the wild horses, and the Comanche, the Dakota, and other Plains peoples became skilled riders.”
2. Page 32 text “They learned to hunt on horseback and to use the horses in warfare, attacking their enemies with long spears, bows and arrows, clubs, and knives.”
3. Page 54 text “They found nothing but “windswept plains” and strange “shaggy cows” (buffalo).”
4. Page 54 text “In 1598 Onate founded the province of New Mexico and introduced cattle and horses to the Pueblo people.”
5. Page 56 picture Horses in a Spanish mission
6. Page 87 text “In addition to corn, most Maryland tobacco farmers produced wheat, fruit, vegetables, and livestock to feed their families and their workers.”
7. Page 87 picture Map of the south with pictures of cattle
8. Page 101 text “The meetinghouse faced a piece of land called the green, or common, where cows grazed and the citizen army trained.”
9. Page 102 picture European settlers and the Indians with cattle
10. Page 105 text “A plantation included slave cabins, barns and stables, and outbuildings such as carpenter and blacksmith shops and storerooms.”
11. Page 170 text “Meal made of pigeon, rabbit, sheep tongues, and the red growth on the heads of rooster.”
12. Page 173 picture Horses during Valley Forge
13. Page 176 picture Man and a horse
14. Page 176 text “The cartoon drawn in 1779, shows a rider being thrown by a horse. Cartoonists often used animals as symbols. For example, an eagle is often used to

symbolize the United States. The Republican Party is often represented by an elephant, while the Democratic Party symbol is the donkey.”

15. Page 183 text “If ponies rode men and if grass ate the cows, and cats should be chased into holes by the mouse.”
16. Page 184 picture Solder and a horse
17. Page 194 picture People pulling carriages with horses
18. Page 214 picture Soldier and a horse
19. Page 276 picture Napoleon on a horse
20. Page 278 text “Between them stretched about two miles of muddy streets on which pigs and chickens roamed freely.”
21. Page 280 picture Soldiers and cattle
22. Page 285 text “When the expedition returned in September 1806, it had collected valuable information on people, plants, animals, and the geography of the West.”
23. Page 286 picture Prairie dogs
24. Page 286 text “As they travel through the Great Plains, the expedition sees animals that are unknown to the East, including prairie dogs, coyotes, and antelope. The men catch a prairie dog to ship to President Jefferson.”
25. Page 287 text “The Corps continue on horseback.”
26. Page 293 picture Horses pulling wagons to the West
27. Page 293 text “Six to eight draft horses or a dozen oxen pull the wagon.”
28. Page 293 text “The driver rides or walks beside the animal.”

29. Page 301 text “The streets were crowded with soldiers and senators, men, women, and children, horses, carriages, and carts loaded with household furniture, all hastening towards a wooden bridge which crosses the Potomac.”
30. Page 317 picture Horse drawn carriage
31. Page 318 text “Instead, teams of mules or horses hauled the boats and barges.”
32. Page 318 text “A two-horse team pulled a 100-ton barge about 24 miles in one day, astonishingly fast compared to travel by wagon.”
33. Page 331 picture Horses and wagons
34. Page 343 picture Indians, horses, and wagons on the Trail of Tears
35. Page 347 picture Indians, horses, and wagons on the Trail of Tears
36. Page 352 picture Indians, horses, and wagons on the Trail of Tears
37. Page 357 text “They lived in buffalo-skin lodges and dressed in fringed buckskin pants, moccasins, and beads.”
38. Page 359 picture Cattle and horses pulling a wagon
39. Page 370 picture Mexican Americans working on a ranch
40. Page 370 text “Mexican American cowhands, or vaqueros, work on a ranch in the Southwest.”
41. Page 371 text “The Mexican settlers persuaded Native Americans to work their lands and tend to their cattle in return for food and shelter.”
42. Page 374 activity “Settlers traveling west encountered new wildlife, vegetation, and landforms. Choose one region of the west and investigate as a traveling scientist would. List plants and animals you would see there.”
43. Page 378 picture Horse drawn carriage

44. Page 379 text “Late in August my father again loaded our household goods into wagons, and with our small herd of cattle following, set out toward the west, bound once again to overtake the actual line of the middle border.”
45. Page 379 text “Far away dim clumps of trees showed, but no chimney was in sight, and not living thing moved save our own cattle and the hawks lazily wheeling in the air.”
46. Page 379 text “Just at nightfall we came to a beautiful little stream and stopped to let the horses drink.”
47. Page 388 text “Early trains were pulled by horses rather than by locomotives.”
48. Page 388 text “In a race against a horse-drawn train in Baltimore, the Tom Thumb’s engine failed.”
49. Page 389 picture Horse-drawn train
50. Page 403 text “Still others worked in the pastures, tending the horses, cows, sheep, and pigs.”
51. Page 454 text “Here we left unknowingly, our [daughter] Lucy behind, not a soul missed her until we had gone some miles, when we stopped to rest the cattle; just then another train drove up behind us, with Lucy.”
52. Page 454 text “Lost one of our oxen.”
53. Page 454 text “We were traveling slowly along, when he dropped dead in the yoke, I could hardly help shedding tears, when we drove to this poor ox who had helped us along thus far, and had given us his very last step.”
54. Page 454 picture Horses and oxen

55. Page 480 text “Shortages in feed for animals and salt for curing meant that little meat was available.”
56. Page 480 text “Shortages in meat were matched by shortages in clothing, medicine, and even shelter.”
57. Page 492-493 picture Soldiers and horses during war
58. Page 526 text “Many Native American nations lived on the Great Plains, along with the buffalo herds that were their primary source of food.”
59. Page 527 picture Horse-drawn carriage
60. Page 533 picture Map of farming and ranching
61. Page 534 text “When the Spanish settled Mexico and Texas, they brought a tough breed of cattle with them.”
62. Page 534 text “Called Longhorns because of their prominent horns, these cattle gradually spread across Texas.”
63. Page 534 text “Ranchers added to their own herds by rounding up wild cattle.”
64. Page 534 text “The ranchers burned a brand, or symbol, into the animals’ hides to show who owned the cattle.”
65. Page 535 text The sudden increase in the longhorns’ value set off what became known as the Long Drive, the herding of cattle 1,000 miles or more to meet the railroads.”
66. Page 535 text “The drives left Texas in the spring, when there was enough grass along the way to feed the cattle.”
67. Page 535 text “The longhorns had to remain well fed because underweight cattle could not be sold.”

68. Page 535 text “The cattle drives and the cowhands who worked on them captured the imagination of the nation.”
69. Page 535 text “Cattle driving, however, was hard work.”
70. Page 535 text “Cowhands rode in the saddle up to 15 hours every day, in driving rain, dust storms, and blazing sun.”
71. Page 535 picture Cowhands working cattle
72. Page 535 text “Celebrated for his detailed and dramatic scenes of Western life, Charles Russell depicts cowhands on their surefooted horses lassoing cattle.”
73. Page 536 text “In fact, the traditions of herding cattle began with Hispanic ranch hands in the Spanish Southwest.”
74. Page 536 text “These vaqueros developed many of the skills, riding, roping, and branding, that cowhands used on the drives.”
75. Page 536 text “Cowhands wore wide-brimmed hats to protect themselves from the sun and leather leggings, called chaps, to shield their legs from brush and mishaps with cattle.”
76. Page 536 text “They used ropes called lariats to lasso cattle that strayed from the herd.”
77. Page 536 text “During the months on the trail the cowhands faced violent storms, “rustlers” who tried to steal cattle, and many other problems.”
78. Page 536 text “They had to drive the herds across swift-flowing rivers, where cattle could be lost.”
79. Page 536 text “One of the greatest dangers on the trail was the stampede, when thousands of cattle ran in panic.”

80. Page 536 text “Any sudden sound, a roar of thunder or the crack of a gunshot could set off cattle.”
81. Page 536 text “The cowhands had to race on horseback with the stampeding cattle and bring them under control.”
82. Page 536 text “As profits from cattle increased, cattle ranching spread north from Texas.”
83. Page 536 text “On the northern Plains, ranchers crossbred the longhorns with fatter Hereford and Angus cattle to produce hardy and plumper new breeds.”
84. Page 536 text “On the northern plains ranching began to replace the long drive.”
85. Page 536 text “The sturdy crossbred cattle multiplied on the open-range ranches.”
86. Page 536 text “When cattle prices “boomed” in the early 1880’s ranchers became rich.”
87. Page 536 text “Overgrazing depleted grasslands.”
88. Page 536 text “In addition, too many cattle glutted the beef market and prices fell.”
89. Page 536 text “The bitterly cold winters of 1885 and 1886 killed large numbers of cattle.”
90. Page 541 picture Woman milking a cow
91. Page 541 picture of Horse
92. Page 542 text “A vast pony herd grazed nearby, the grass was green; there was dancing at night...”
93. Page 542 text “Starting in the mid-1850’s, miners, railroads, cattle drives, and farmers came to the plains.”

94. Page 545 text “Bands of Cheyenne and Arapaho began riding wagon trains and stealing cattle and horses from ranches.”
95. Page 553 assessment “In what part of Texas were most of the large cattle ranches located?”
96. Page 553 picture Map of the cattle kingdom
97. Page 588 text “The men worked in steel mills and slaughterhouses.”
98. Page 592 text “Garbage and horse manure accumulated in city streets, and the sewers could not handle the flow of human waste.”
99. Page 626 text “Dall’s sheep and many other animals roam Alaska’s Denali National Park.”
100. Page 637 picture Soldiers on horseback
101. Page 640 picture Men on horseback
102. Page 652 text “Theodore Roosevelt was not only the twenty sixth president of the United States, he was also a writer, historian, explorer, soldier, conservationist, and rancher.”
103. Page 652 text “After serving in the New York State Assembly, Roosevelt headed west in 1883 where he hunted and operated a cattle ranch.”
104. Page 661 picture Pancho Villa on horseback
105. Page 665 Soldiers on horseback
106. Page 718 text “Part Native American, Will Rogers grew up in the West roping cattle and riding on the range.”
107. Page 795 picture A book cover for Animal Farm by George Orwell

108. Page 795 text “First published at the beginning of the Cold War, Animal Farm by George Orwell tells the story of a farm taken over by its overworked, mistreated animals.”

109. Page 867 picture A bull helping work the land in Ethiopia

110. Page 958-959 text “White Buffalo Calf Woman brings the first pipe.”

111. Page 960 text “If he travels through our rural districts he views not the hostile castle, and the haughty mansion, contrasted with the clay-built hut and miserable cabin, where cattle and men helped keep each other warm, and dwell in meanness, smoke, and indigence.”

112. Page 965 text “The fruits of our country, our flocks and our fleeces,”

113. Page 966 text “On Tuesday evening we fell in with a detachment of the poor Cherokee Indians, about eleven hundred Indians, sixty wagons, six hundred horses, and perhaps forty pairs of oxen.”

114. Page 883 text “Theodore Roosevelt-Historian and rancher”

Appendix E

Processing of Agricultural Products References

1. Page 18 text “A single mammoth provided tons of meat, enough to feed a group of people for months.”
2. Page 18 text “The hunters and their families used every part of the animal.”
3. Page 18 text “They made the skin into clothing, carved the bones into weapons and tools, and may have used the long ribs for shelter.”
4. Page 20 text “The team also found burned bones of mud turtles, white-tailed deer, and other mammals, and bits of charcoal left over from hunters cooking the animals.”
5. Page 78 text “They most likely ate wild fowl, duck, and turkey shot by the colonist and deer provided by Wampanoag.”
6. Page 543 text “After the Civil War, though, American hunters hired by the railroads began slaughtering the animals to feed the crews building the railroads.”
7. Page 613 text “In his novel *The Jungle* (1906), Upton Sinclair described the horrors of the meatpacking industry in Chicago.”
8. Page 975 text “War in the Pacific has greatly reduced our supply of vegetable fats from the Far East.”
9. Page 975 text “Fat makes glycerine.”
10. Page 975 text “And glycerine makes explosives for us and our Allies, explosives to down Axis planes, stop their tanks and sink their ships.”
11. Page 975 text “We need millions of pounds of glycerine and you housewives ca

Appendix F

Marketing and Distribution of Agricultural Products References

1. Page 83 picture Map of distribution of agriculture products in the middle colonies.
2. Page 101 text “Farmers in New England practiced subsistence farming which means that they generally produced just enough to meet the needs of their families, with little left over to sell or exchange.”
3. Page 261 text “While waiting for the payment, many of the original bond owners, shopkeepers, farmers, and soldier had sold the bonds for less than their value.”
4. Page 290 text “The British simply traded with Latin America for its agricultural goods.”
5. Page 310 text “In the Northeast, farms tended to be small, and produce was usually marketed locally.”
6. Page 310 text “Between 1790 and 1820, cotton production soared from 3,000 to more than 300,000 bales a year.”
7. Page 316 text “Wagons hauled produced from frontier farms to the East Coast, often passing wagons filled with staples such as sugar for the western settlements.”
8. Page 319 text “Pioneer families tended to settle in communities along the great rivers, such as the Ohio and the Mississippi, so they could ship their crops to market.”
9. Page 389 text “The development of the east-west canal and the rail network allowed grain, livestock, and dairy products to move directly from the Midwest to the East.”
10. Page 390 text “The railroads gave farmers access to new markets to sell their products.”

11. Page 393 text “These cities became centers of growing trade that connected the farmers of the Midwest with the cities of the Northeast.”
12. Page 403 text “To receive the best prices, planters sold their cotton to agents in cities such as New Orleans, Chareston, Mobile, and Savannah.”
13. Page 403 text “The cotton exchanges, or trade centers, in Southern cities were vital importance to those involved in the cotton economy.”
14. Page 403 text “The agents of the exchanges extended credit, a form of laon, to the planters and held the cotton for several months until the price rose. “
15. Page 403 text “Then the agents sold the cotton.”
16. Page 532 text “Towns sprang up along the rail lines that carried the settlers’ agricultural goods to market.”
17. Page 535 text “Although Texas ranchers had plenty of cattle, the markets for beef were in the North and the East.”
18. Page 535 text “In 1866 the Missouri Pacific Railroad reached Missouri, and Texas cattle suddenly increased in value.”
19. Page 535 text “The cattle could be loaded onto trains in Missouri for shipment north and east.”
20. Page 535 text “Some Texans drove their combined herds, sometimes 260,000 head of cattle, north to Sedalia Missouri, the nearest rail point.”
21. Page 535 text “Longhorns that had formerly been worth \$3 each quickly rose in value to \$40.”
22. Page 535 text “Cattle drives to cow towns, towns located near railroads to market and ship cattle, turned into a yearly event.”

23. Page 535 text “Over the next decade, cow towns such as Abilene and Dodge City, Kansas, and Cheyenne Wyoming, became important rail stations.”
24. Page 535 text “During the heyday of the “Cattle Kingdom,” from the late 1860’s to the mid 1880’s, the trails carried more than five million cattle north.”
25. Page 536 text “After many tiring weeks on the trail, the cowhands delivered their cattle and enjoyed some time off in cow towns.”
26. Page 557 text “They also carried manufactured goods from factories to markets and transported from farming areas to the cities.”
27. Page 558 picture Map of the Major Western Railroads before 1900
28. Page 558 text “The refrigerated railroad car in the 1870’s allowed fresh meat and produce to be transported all over the nation.”
29. Page 559 text “Giving discounts to big customers raised freight rates for farmers and other customers who shipped a small amount of goods.”
30. Page 566 text “Companies such as Montgomery Ward and Sears Roebuck published catalogs that offered a wide range of goods from shoes to farm equipment.”
31. Page 727 text “Unemployed people tried to earn a few cents by shining shoes or selling apples on street corners.”

Appendix G
Agriculture's Relationship with the Environment
and Natural Resources References

1. Page 18 text The mammoths and other large animals began to die out, from being over hunted or because of changes in the environment.
2. Page 73 activity Create a poster to attract early colonists to your area. Focus on the location as well as natural features in your area such as good farmland, waterways and mineral resources.
3. Page 622 text As president, Roosevelt took steps to conserve the country's forests, mineral deposits, and water resources.
4. Page 622 text In 1905 he proposed the U.S. Forest Service.
5. Page 622 text He pressured Congress to set aside millions of acres of natural forests and created the nation's first wildlife sanctuaries.
6. Page 622 text Roosevelt also formed the National Conservation Commission, which produced the first survey of the country's natural resources.
7. Page 626 text Scientists studies the plants and animals so they can protect them.
8. Page 636 text With 430 species of flowering plants, 37 species of mammals and 156 species of birds, Denali stands as one of America's great areas of unspoiled wilderness.
9. Page 944 text they warned that the steady increase in the average temperatures could bring about major changes in weather patterns, the environment, and crop production.

Appendix H
Percent Agreement Table

Table 6

Percent Agreement of Categorized References between Researcher and Check-Coders

Agricultural Literacy Category	Researcher	Check-Coder #1	Percent Agreement	Check-Coder #2	Percent Agreement	Total Percent Agreement
Global Significance	6	6	100.0	6	100.0	100.0
Public Policy	4	4	100.0	4	100.0	100.0
Relationship with Environment	0	0	100.0	0	100.0	100.0
Plant Science	78	75	96.1	76	97.4	96.8
Animal Science	21	21	100.0	21	100.0	100.0
Processing Products	0	0	100.0	0	100.0	100.0
Marketing & Distribution	11	10	91.0	11	100.0	95.5
Total	120	116	98.2	118	99.6	99.0

Appendix I

CODING INSTRUCTIONS

for

MIDDLE GRADE SOCIAL SCIENCE TEXTBOOK

The following coding instructional manual is based upon the coding procedures defined by Lowry which was used to determine the bias levels of the 1984 presidential campaign news bias study. When necessary, Lowry's methods were modified to meet the needs of the given study.

Background

The method of this study is content analysis. The content I have coded consists of the Reagan/Mondale/Bush/Ferraro news items contained in a sample of 75 network TV newscasts from the Campaign '84 period (25 newscasts from each network). Your function as a check-coder will be to re-code the political news items in a sample of the 75 newscasts.

The purpose of using check-coders is to obtain a measure of the objectivity or explicitness or reliability (or whatever term you want to use) of my system of content categories and my coding. In other words, were these categories explicitly defined and consistently applied, or were they simply vague, loosely-defined categories that I had in my head and applied inconsistently? This is the question that must be answered.

The Content Categories

The system of categories I have developed is based upon a trichotomy of sentence types discussed by S. I. Hayakawa in Language in Thought and Action (1978, Ch. 3). According to Hayakawa, the report is the basic symbolic act that enables people to exchange information on what they have seen, heard, and felt. "Reports adhere to the following rules: first, they are capable of verification; second, they exclude, as far as possible, inferences and judgments." I have expanded Hayakawa's trichotomy of reports, inferences and judgments into the system of 21 categories listed on page 3, and it is these

21 categories that you will be using. Thus, you will be placing each sentence in the Regan/Mondale/Bush/Ferraro news items into one, and only one, of the 21 categories, and I will then compare your coding with the coding I have already done. The detailed explanation of each of the categories begins on page 4.

I should point out that the system of categories I am using is only one possible system that might have been used, and probably not the same system you would have chosen if this was your study. Given this restriction, then, the important question is: how well did I operationalize the categories that I did choose to use?

Types of Sentences

1. Report sentence/attributed
2. Report sentence/unattributed

3. Inference sentence/attributed
4. Inference sentence/unattributed

5. Judgment sentence/attributed/favorable to Reagan*
6. Judgment sentence/attributed/favorable to Mondale**
7. Judgment sentence/attributed/favorable to Bush*
8. Judgment sentence/attributed/favorable to Ferraro**

9. Judgment sentence/attributed/unfavorable to Reagan*
10. Judgment sentence/attributed/unfavorable to Mondale**
11. Judgment sentence/attributed/unfavorable to Bush*
12. Judgment sentence/attributed/unfavorable to Ferraro**

13. Judgment sentence/unattributed/favorable to Reagan*
14. Judgment sentence/unattributed/favorable to Mondale**
15. Judgment sentence/unattributed/favorable to Bush*
16. Judgment sentence/unattributed/favorable to Ferraro**

17. Judgment sentence/unattributed/unfavorable to Reagan*
18. Judgment sentence/unattributed/unfavorable to Mondale**
19. Judgment sentence/unattributed/unfavorable to Bush*
20. Judgment sentence/unattributed/unfavorable to Ferraro**

21. All other sentences

* This includes his campaign, the Regan administration, his policies, aids, etc., but does not include statements about the Republicans in general or about Reagan/Bush family members.

** This includes his/her campaign, policies, aids, etc., but does not include statements about the Democrats in general or about Mondale/Ferraro family members.

Category 1 --- Report sentences/attributed

“Reports adhere to the following rules: first, they are capable of verification; second, they exclude, as far as possible, inferences and judgments.” A report sentence, then, is one which states verifiable facts --- facts which are out in the open and observable, not things which are matters of personal opinion or inside somebody’s head.

Even though the receiver may not always be able to spend the time, money and energy to verify it himself, the important thing is that a report sentence is of such a form that is capable of being verified. One of the tests you, as a coder, should apply to each sentence to determine whether it is a report sentence is: “Is the information in this sentence verifiable?”

Rule 1: A report of an inference someone else is making is still a report sentence/attributed, and should be placed in category 1. (But a report of a judgment sentence someone else is making is a judgment sentence/attributed. See rule 6.)

Rule 2; Attribution can take the form of a direct quote or an indirect quote, and can be to a specific source or a general source (e.g., “Informed sources said...”).

Rule 3: A news source’s on-air report sentence should be coded as a report sentence/attributed (category 1).

Rule 4: When a correspondent signs on or off (e.g., “Sam Donaldson, ABC News, with the Reagan campaign in California”), this should be coded as a report sentence/attributed (1). The rationale is that the correspondent is reporting about himself in these statements and, by making the sign-off statement on-air, the attribution to himself is implicit even though the normal forms of attribution are not used.

The following are example of report sentences/attributed taken from newscasts you will not be coding:

- President Nixon said today that the nation faces a national crisis in health care. (This illustrates Rule 1. IF the correspondent said, “We are facing a national crisis in health care,” this would be an inference on his part. But since the correspondent said the president said it, this makes it a report of an inference.)
- Secretary Laird said draft call for the rest of this year will average less than 10,000 a month.
- He said the pas pledges to Thailand will be honored.
- Involved preparations, we are told, would require more time. (This illustrates Rule 2. The attribution is not specific here, but the

correspondent is pointing out that the information came from someone else; he is not simply making the statement on his own.)

Category 2 --- Report sentences/unattributed

The only difference between category 1 and this category is that report sentences/unattributed are simply straight-forward reports that the correspondent makes without citing someone else as being the source of that statement or information.

Some actual examples:

- It was the 19th visit every by a president of the United States to our contiguous neighbor. (Either it was, or it wasn't.)
- The Mexican president, Gustavo Diaz Ordaz, is retiring in December. (Either he is, or he isn't.)
- President Nixon will fly to Louisville, Kentucky tomorrow for a meeting the 13 governors representing the states of Appalachia. (This is a future event, but it can be safely assumed that the White House released this information and it can be verified.)
- Alexander Herd, the Chancellor of Vanderbilt University, is President Nixon's advisor on student dissent. (Either he is, or he isn't.)
- Secretary of State Rogers is in Tokyo. (Either he is, or he isn't.)
- Members voted to cut the Bureau of Indian Affairs budget by six-and-a-half million dollars. (Either they did, and the figure is correct, they didn't and the figure is not correct.)
- There's been more school desegregation action in the past three days than in the past six months, since the Administration took office. ("Action" was defined elsewhere in this news item as being law suits; otherwise this would be an inference sentence if "action" could not be verified.)
- After the arrival ceremonies, there was a motorcade into town.
- On his way back to Washington from San Clemente today, President Nixon stopped in Denver to talk to a meeting of law enforcement officials.

Category 3 --- Inference sentences/labeled

Inferences are not capable of verification, at least not at the time they are made. As Hayakawa defines them, they are "statements about the unknown made on the basis of the known." Some of the characteristics of inferences are:

- They rely on personal or subjective opinions, conclusions, beliefs, feelings
- They attempt to interpret events
- They talk about the implications of an event
- They attempt to make generalizations
- They attempt to make predictions (This refers to predictions the correspondent attempts to make himself, as opposed to (a) reports of up-coming events which can be verified and (b) predictions attributed to someone else.)
- They attempt to tell what a certain event means

- They attempt to evaluate
- They attempt to say what other people think or feel, as opposed to a report of what other people say they think or feel
- They attempt to explain someone's reasons or motives for doing something

Labeled inferences are a particular kind of inference. When the correspondent uses a labeled inference, he is giving his viewer a tip-off that he is using an inference, that what he is reporting has not been confirmed. For example, when the correspondent says, "It appears..." he is saying parenthetically, "It appears (to me)..." While a number of inference words could be considered tip-off words, only the following common ones will be coded as such in this study:

- appear, appears, appeared, apparently, appearing, apparent
- could
- look, looks, looked, looking
- may, maybe
- might
- perhaps, possible
- probable, probably
- seem, seems, seemed, seemingly
- sound, sounds, sounded, sounding
- think (in the sense of "I (the correspondent) think...")

The following are some actual examples of inference sentences/labeled:

- Other classmates recall Richard Nixon as hard-working, driving, serious and somewhat shy, which he certainly did not seem to be today.
- Until this week, presidential decisions seemed to be catering to conservatives on the right.
- Now, in three consecutive days, the White House has concentrated on liberal programs, in what appears to be a concerted effort by the Administration to swing back to the more solid political ground in the middle of the road.

Rule 5 : A news source's on-air inference should be coded as a report sentence/attribution (category 1). The rationale is as follows:

- (a) The primary purpose of categories 3 and 4 is to measure inferences that the anchorman and correspondents are making, not inferences made by sources who are being quoted on-air.
- (b) If the correspondent spoke those same words, prefaced or followed by the attribution, "he said," the sentence would be coded 1. It can be argued that the network is doing even better by letting people hear the candidate himself, in his own words.
- (c) By putting the candidate's own words on-air, this is in effect providing verification --- the best kind of verification -- that the candidate did indeed speak those words, The attribution is implicit, even though the correspondent doesn't use the words "he said."

Category 4 --- Inferences sentences/unlabeled

The characteristics of inferences described on the top half the previous page also apply here. In fact, all other inferences made by the correspondent or anchorman (except labeled inferences) are placed in this category. It should be repeated that inferences that are attributed to someone else are considered reports of inferences, and thus, placed in category 1. When you come across an inference you should ask yourself, “Who is making this inference, the correspondent or someone else?”

While thousands of words can be inference words, the following frequently-used words are almost always inferences:

- problem (What is a problem to one person may not be to another.)
- long (What is long to one person may not be long to another.)
- short (What is short to one person may not be short to another.)
- big, small, several, huge, few (Same as above.)
- only (A unit of X is simply a unit of x; using the “only” indicates that the speaker thinks it should have been more.)
- warned (when used as said) (when someone makes a statement, he makes a statement; whether that statement is a warning depends on how it is perceived.)
- charged, challenged, attacked, accused (when used as said) (Same as above.)
- about (specific numbers can be verified; “about 100” cannot be verified.)
- traditional (What is traditional to one person may not be to another.)
- routine (What is routine to one person may not be to another.)

Some actual examples of inference sentence/unlabeled follow:

- In the course of his remarks he made a statement about the current trial of Charles Manson in the Sharon Tate murder case that surprised those who heard it. (Whether they were surprised is an inference. If the correspondent had said “seemed to surprise,” this would have been a labeled inference.)
- The Justice Department gave Georgia only fifteen days in which to come up with a desegregation plan for all of its 194 school systems. (The Justice Department gave Georgia fifteen days, not “only fifteen days.”)
- The President is anxious to have the Midway conference interpreted as the beginning of a turning point in Viet Nam negotiations. (Any statement regarding the internal state of an individual, in this case anxiety, must of necessity be an inference, unless that individual has said what his internal state is.)
- Defense Secretary Melvin Laird argued that the one-and-a-half billion dollars spent on the MOL program was not wasted. (Laird said the money was not wasted; whether or not he was arguing can only be an inference.)

Categories 5 -20 were consolidated into four categories to meet the needs of the textbook bias study.

Category 5 --- Judgment sentence/attributed/favorable to agriculture

Category 6 --- Judgment sentence/attributed/unfavorable to agriculture
Category 7 --- Judgment sentence/unattributed/favorable to agriculture
Category 8 --- Judgment sentence/unattributed/unfavorable to agriculture

Judgment sentences, as Hayakawa defines them are “expressions of the writer’s approval or disapproval of the occurrences, person, or objects he is describing.” In other words, sentences that indicate approval/disapproval, like/dislike, good/ bad, and so on are classified as judgment sentences. When judgment sentences are found, they are further classified as to direction: favorable or unfavorable toward agriculture.

The attributed/unattributed factor is the same as used with report sentences. When favorable or unfavorable judgment is found, is the correspondent making this judgment himself, or is he merely reporting a judgment that someone else made?

Rule 6: A report of a judgment sentence someone else is making should be coded as a judgment sentence/attributed (categories 5 and 6). Note: This contrasts with the handling of reports of inference sentences; see Rule 1.

Rule 7: A news source’s on air judgment sentence about [agriculture] should be coded as a judgment sentence/attributed (categories 5 and 6).

Rule 8: A news source’s on-air judgment sentence about topics other than [agriculture] should be coded as a report sentence/attributed (category 1).

Rule 9: If the same sentence can be interpreted as either a favorable or unfavorable judgment sentence it should be coded as an unfavorable judgment sentence. (Note: Negative take precedence or positive.) Example: If Mondale says, “This country needs a president who cares for poor people, “this should be coded as an anti-Reagan statement rather than a pro-Mondale statement.

Rule 10: If a sentence contains two or more judgments aimed at [agriculture] only the first negative judgment will be coded. (Note: Negatives take precedence over positive.) If the two or more judgments are all positive or all negative, then only the first judgment in the series will be coded. Rationale: This type of sentence will be extremely rare and will have no significant effect upon the outcome of the study. The benefit of this rule is that it prevents the possibility of double-coding; each sentence will be placed in only one category.

Some examples of judgment sentences:

- The policies of the Reagan administration have been a disaster.
- Reagan favors the rich, but doesn’t care about the poor.
- He showed his usual lackluster speaking style today.
- If I had a record like his, I wouldn’t say much on this issue.
- His policies are based upon voodoo economics.
- He’s too old to be president for another four years.
- Her foreign policy experience is minimal at best.

Category 10 --- All other sentences

This is simply a catch-all category that includes:

- rhetorical questions which the correspondent asks and then goes on to answer, e.g., “Why?”
- on-air questions asked by reporters or others (Note: Sometimes these “questions” during Q and A format are in the form of a declarative sentence rather than a question per se. However, they serve the function of a question in that the interviewee is expected to respond to them.)
- sentences which for other reasons do not fit one of the other 9 categories

The following rules should be used to classify those sentences which are “mixed” sentences:

Rule 11: If a sentence contains both a report/attribution and a report/unattributed, it should be coded as a Report sentence/unattributed.

Rule 12: If a sentence contains both statements of fact and inference, it should be coded as an inference sentence.

Rule 13: If a sentence contains both statements of fact and judgment, it should be coded as a judgment sentence.

Rule 14: If a sentence contains both an unlabeled inference and a labeled inference, it should be coded as an Inference sentence/unlabeled.

Rule 15: If a sentence contains both an inference and a judgment, or all three types of sentences, it should be coded as a judgment sentence.

Thus, the general principle in handling “mixed” sentences is that they should be placed in the highest-numbered appropriate category.

Some general suggestions

- Each sentence must be read in full before you code it. Frequently a sentence would be placed in one category based upon something said in the first part, but a single, word, phrase or quote at the end will require its being placed in another category.
- First decide the overall category of the sentence --- report, inference or judgment --- and then decide which sub-category.

